

Hopkinton Onsite Wastewater Management Plan

Town of Hopkinton
Hopkinton, RI

April 2010



317 Iron Horse Way
Suite 204
Providence, RI 02908

Table of Contents

Onsite Waste Water Management Plan Town of Hopkinton, RI

1	Introduction	1
1.1	The Case for Onsite System Management.....	1
1.2	Plan Overview	3
2	The Basics of Onsite Waste Water Treatment and Disposal.....	3
2.1	Typical Components in an Onsite Wastewater Treatment System	4
2.2	Onsite System Treatment Performance	4
2.3	Failing and Substandard Systems	5
2.3.1	Cesspools and Other Substandard Systems	5
2.3.2	Failing Systems	5
2.4	Patterns of Development and Implications for the Environment	6
3	Existing Conditions	7
3.1	Land Use/Zoning and Demographics.....	7
3.2	Topography	8
3.3	Surficial and Bedrock Geology	8
3.4	Soils	9
3.5	Surface Water and Water Quality	10
3.6	Groundwater and Drinking Water Supplies	11
3.7	Current Wastewater Infrastructure.....	11
4	State Policy.....	14
4.1	RIDEM Regulations	14
4.1.1	Licensing Requirements for OWTS Design and Construction	15
4.1.2	Upgrading Dwellings with OWTSs.....	15
4.2	Rhode Island Cesspool Phaseout Act of 2007	16
5	OWTS Wastewater Management Approaches	17
5.1	System Inventory/Tracking and Public Education and Outreach	17
5.2	Special Design Standards	18
5.3	Wastewater Management Districts	18
5.3.1	Community Required Maintenance Inspections	18
5.3.1.1	Setting an Inspection Schedule.....	19
5.3.2	Community Operated Maintenance Program	19
5.3.3	Community Owned OWTS's.....	20
5.4	Financial Assistance	20
5.4.1	Financial Assistance for Repair and Replacement	20
5.4.2	Financial Assistance for Inspection and Maintenance	22
5.5	Management Approaches Used by Other Rhode Island Municipalities..	22
5.5.1	Charlestown	24
5.5.2	Narragansett.....	25
5.5.3	South Kingstown	25

Table of Contents

Onsite Waste Water Management Plan Town of Hopkinton, RI

5.5.4	Jamestown.....	26
6	Recommendations and Next Steps	27
6.1	Education and Outreach	27
6.2	CSSLP	27
6.2.1	General Eligibility	27
6.2.2	Additional Eligibility Issues and Features	28
6.2.3	Expected Activity of the Hopkinton Loan Program.....	29
6.2.4	Application Procedure	30
6.3	Methods of Advertising	31
7	Program Responsibilities and Administration	31
8	Method of Septage Disposal	31
9	Implementation Plan	33
9.1	Anticipated Project Costs	33
9.2	Implementation Schedule	34

Tables	Following Page	
1	Characteristics of Typical OWTS Applications	6
2	Soil Survey of Rhode Island Topographical Description	8
3	Soil Development Classifications for Hopkinton	9
4	Summary of OWTS System Permit Data (1992-2003)	12
5	RIDEM OWTS Regulations Minimum Setbacks for Disposal Trenches, Beds, or Chambers	14
6	Summary of Rhode Island Municipal Onsite Wastewater Standards and Programs	23
7	Estimated Cost of Repair per OWTS Failure	29
8	Cost of Expected Repair Activity Per Year for the Duration of the CSSLP Loan	30
9	Program Development Cost	33
10	Onsite Wastewater Management Program Development Schedule	34

Table of Contents

Onsite Waste Water Management Plan Town of Hopkinton, RI

Figures

End of Report

- 1 Town of Hopkinton Onsite Wastewater Management Area
- 2 Town of Hopkinton Soil Characterization
- 3 Town of Hopkinton Environmental Constraints and Sensitive Areas
- 4 Known OWTs Repairs and Enforcement Issues From 1992-April 2009
- 5 Known OWTs Repairs and Enforcement Issues in Sensitive Areas and Areas with Environmental Constraints

Appendices

End of Report

- A Agenda and Town Council Resolution
- B Cesspool Phaseout Act of 2007
- C *Septic System Checkup: The Rhode Island Handbook for Inspection* (Riordan, 2000)
- D CSSLP Regulations
- E *Rhode Island Municipal Septic System Standards and Programs* (Riordan, 2001) and *Summary of Rhode Island Municipal Onsite Wastewater Programs* (RIDEM, 2008).
- F Cost Estimate to Replace Leachfield and Septic Tank

1 Introduction

The Town of Hopkinton, Rhode Island (the Town) has gathered information about both current and future environmental and public health issues related to onsite wastewater treatment and disposal. The Town is located in the south central region of Rhode Island in the Wood and Pawcatuck River watersheds in Washington County. The Town includes a mix of agricultural fields and woods with scattered residences. Small villages, limited commercial development, and light industrial land uses are also scattered throughout the area. The Town values the health of its community and environment, and has therefore, started to assess the effect of current wastewater treatment and disposal practices and the options available for improving the performance of these methods.

This Onsite Wastewater Management Plan (OWMP) provides information about how onsite systems work, how to improve system performance in sensitive environments, why maintenance of the systems is important, and what options a community or group of communities has for managing onsite systems. The entire Town of Hopkinton is considered the management area for this OWMP, as shown on *Figure 1*. Current environmental conditions and onsite wastewater treatment practices are also summarized. Fuss & O'Neill, Inc prepared this plan building on the previous draft Exeter, Hopkinton, Richmond OWMP (Stone Environmental, 2003) and with input from the Community Development Consortium. The Town Council resolution provided in *Appendix A* demonstrates the Town of Hopkinton has motioned to participate in development and submittal of this plan.

1.1 The Case for Onsite System Management

In their 1997 Response to Congress, the United States Environmental Protection Agency (US EPA) concluded that “adequately managed decentralized wastewater systems are a cost-effective and long-term option for meeting public health and water quality goals, particularly in less densely populated areas.” To support onsite system management programs at the local and state levels, the US EPA recently released guidelines that are structured to reflect an increasing need for more comprehensive management as the sensitivity of the environment or the degree of technological complexity increases (US EPA, 2003). Local or state regulators can use these voluntary guidelines as a basis for their onsite system management programs to reduce the public health and water quality concerns associated with these systems.

Domestic sewage contains high concentrations of total suspended solids (TSS), 5-Day biochemical oxygen demand (BOD₅), pathogens, ammonium nitrogen, total nitrogen, and total phosphorus, as well as varying amounts of heavy metals, organic compounds, pharmaceuticals, and other potentially hazardous materials. A properly installed and operated onsite system can treat many of the constituents present in residential wastewater. Standard and properly installed onsite systems that protect public health may not, however, protect drinking water supplies, recreational waters, or aquatic habitats from the nutrient loading that onsite systems can add to local waters.

Improperly designed or constructed systems, where the disposal field is too close to groundwater, can affect groundwater through the release of pathogens, nitrate, and other contaminants. Cesspools are no longer allowed in Rhode Island for new construction because they do not provide adequate treatment. Notwithstanding, some cesspools still exist, particularly on older lots. Cesspools are also typically undersized and can be deep in the soil profile, requiring additional separation to seasonal groundwater tables, impervious soils, and bedrock. Even when onsite systems are properly designed, located, and operated, they can have public health and ecological affects on groundwater and surface waters. Where very coarse soils exist, pathogens and nitrate can more easily wash through the soils into groundwater.

The sole-source Wood-Pawcatuck aquifer that underlies most of the Town is extremely vulnerable to contamination because of the generally shallow depth to groundwater, the highly permeable nature of the aquifer, and the absence of any subsurface confining layers that might protect the groundwater. Most of the population within Hopkinton relies on individual private wells that draw drinking water from this aquifer without further treatment. Many of the private wells are drilled wells, but there are an unknown number of shallow wells currently used as water supplies in the Town. Drilled wells are usually sealed into solid bedrock and tap into groundwater reservoirs far below the surface. Thus, drilled bedrock wells are often somewhat protected from the potential effects of onsite systems. Shallow wells and springs use shallower groundwater sources and may not be adequately protected from sources of surface contamination, including pollutants from substandard or failing onsite systems.

Presently, approximately 3,175 developed properties within Hopkinton rely on onsite systems for wastewater disposal. Within the last ten years, about 3.9% of these onsite systems were repaired or upgraded due to system failure. Localized clusters of system failures, particularly in areas with small lots or older development may have the potential to affect local groundwater or surface water quality, although data documenting these effects generally do not exist.

In addition to the effects of onsite systems on local drinking water supplies, an overabundance of nutrients from human sources getting into surface waters can lead to the excessive growth of algae and other nuisance aquatic plants—a process known as cultural eutrophication. Freshwater lakes and ponds can be particularly affected by phosphorus from onsite system effluent. Coastal embayments with shellfisheries can also be negatively affected by high nutrient loads, and can be closed to production because of high pathogen counts in the waters. Since Hopkinton's surface waters all eventually discharge to the Little Narragansett Bay (the Bay), improperly functioning onsite systems in the Town can contribute to the cumulative effect of high nutrient and pathogen loadings in the Bay.

To ensure the safe disposal of wastewater from onsite systems, the Rhode Island Department of Environmental Management (RIDEM) enacted regulations governing the installation and repair of septic systems. However, under normal circumstances, these rules cannot be applied to systems that were installed before the regulations were enacted, and the rules do not provide for the maintenance of onsite systems after they are constructed. Thus, using only the State rules to govern onsite wastewater disposal, communities are not able to ensure that onsite systems remain a viable infrastructure for protecting drinking water and surface water quality.

Local governments can implement onsite wastewater management programs (OWM programs) to address existing problems resulting from onsite wastewater disposal, or as proactive measures to protect drinking water and other sensitive resources where problems are not yet documented. Several Rhode Island towns, including Charlestown, Narragansett, South Kingstown, Block Island, North Kingstown, and Tiverton, established protective septic system siting requirements beyond those required by State regulations and implemented OWMPs to protect water quality and other natural resources in their communities.

1.2 Plan Overview

The purpose of this plan is to:

- Provide the Town and the public with a summary of onsite wastewater issues.
- Provide a substantive means of dealing with the Town's onsite wastewater issues in an environmentally responsible way.
- Enable the Town to qualify for a line of credit under Rhode Island's Community Septic System Loan Program (CSSLP).

The following sections describe the basics of onsite wastewater treatment and disposal, how the standards apply to existing conditions in the Town, regulatory and management issues, and plan implementation.

2 The Basics of Onsite Waste Water Treatment and Disposal

Decentralized water supply and wastewater treatment and disposal technology choices can have a significant effect on protecting water supplies and surface waters, meeting development density goals, and preserving traditional New England village land use patterns. These onsite and clustered systems can be protective of public health, drinking water supplies, and the quality of water resources if they are properly planned, installed, operated, and maintained. When they are managed properly, these systems can also protect property values, preserve tax bases, result in life-cycle cost savings, and further Rhode Island's ultimate goals for thoughtful development and land use. Current state regulations, recent technology improvements (including management system technologies for smaller systems), and new management models give communities more options for meeting public health, environmental, and land use planning goals. The following sections explain how septic systems function, what land characteristics and soil conditions are needed for proper treatment performance, and what types of effects systems can have on the environment.

2.1 Typical Components in an Onsite Wastewater Treatment System

A typical onsite wastewater treatment system (OWTS)¹ contains two major components: a septic tank and a disposal field. The septic tank is a watertight structure that allows solids to settle to the bottom. Scum, grease, and oils rise to the top of the tank, and are kept from leaving the tank by baffles. Relatively clear effluent leaves the septic tank. Newer tanks include access risers to the ground surface for easy access and maintenance and an effluent filter at the tank outlet that keeps solids from leaving the tank and clogging the disposal field. The septic tank provides primary treatment of the sewage and is a vitally important part of the entire system. Older tanks may leak and may eventually collapse. The baffles in older tanks may also deteriorate, allowing scum, oils, or solids to escape into the disposal field.

The disposal field is designed to maintain unsaturated soil conditions below the disposal field and provides both physical and biochemical treatment of wastewater effluent. As the effluent moves through the soil, solids and microbes are physically filtered out of the wastewater. Treatment processes that occur in the unsaturated soils between the disposal field and groundwater, impervious soils, and bedrock significantly reduce pathogen levels, provide some adsorption, and may transform forms of nitrogen compounds.

2.2 Onsite System Treatment Performance

Much of the treatment in the disposal field occurs at the interface between the media (i.e., stone) and the undisturbed soil, where a chemical and biological layer known as a biomat forms. This biomat is often less permeable than the surrounding soils, and system design standards take into account the long-term acceptance rate of this mat. Highly permeable soils with deeply placed disposal systems may not develop biomats, and thus may contribute more nitrogen and phosphorus to nearby groundwater or surface waters than shallow-placed systems on finer textured soils.

Soil can provide treatment of effluent through a series of physical, chemical and biological processes. However, some of the nutrients (such as nitrate) are capable of moving through the soil into the groundwater (and surface waters). Nitrogen can undergo several transformations in and below the disposal field. Nitrification, the conversion of ammonium nitrogen to nitrite and then nitrate by bacteria is the predominant transformation. However, if there is inadequate separation to seasonal groundwater, this conversion may not occur.

Although traditional onsite septic systems can treat many of the constituents present in residential wastewater, OWTSs can still have public health effects and ecological effects. Other wastewater constituents that can cause problems in drinking water and surface waters include the following:

¹ The term “onsite wastewater treatment system” is synonymous with individual sewage disposal system. In its regulations, RIDEM has recently replaced the term individual sewage disposal system (ISDS) with onsite wastewater treatment system.

- Toxic organic compounds in household chemicals can be persistent in groundwater and cause damage to surface water ecosystems and human health.
- Dissolved inorganic compounds like chloride and sulfide can cause taste and odor problems in drinking water.
- Pharmaceuticals can be persistent in groundwater and recent studies are evaluating their potential effect on drinking water and surface waters.

2.3 Failing and Substandard Systems

Failing or substandard septic systems that pollute water resources are considered a category of nonpoint source (NPS) pollution. This type of wastewater pollution is considered to be a significant contributor to water quality contamination both regionally and nationally.

2.3.1 Cesspools and Other Substandard Systems

Systems installed prior to the advent of permitting (circa 1968), were built without the benefit of today's regulatory requirements. These older systems may still "function" in the sense that sewage is not backing up into the plumbing or surfacing in the yard, but they do not always function properly in terms of treating the wastewater before it reaches groundwater or surface water. Many of these older systems are cesspools.

Cesspools are disposal systems without septic tanks, where raw sewage enters a single perforated or bottomless tank and leaches out through holes in the sides and bottom. Cesspools typically do not have an adequate area that interfaces with the soil surface and were often placed deep in the soil profile. This type of system does not provide adequate treatment and is not allowed in Rhode Island for new construction, although cesspools may still serve some older residences.

According to the Rhode Island Cesspool Act of 2007 (RIGL 23-19.15-2), there are approximately 50,000 cesspools in Rhode Island meaning that approximately one-third of Rhode Island's roughly 150,000 OWTs are cesspools. If we extrapolate this estimate to Hopkinton and assume that one-third of Hopkinton's approximately 3,175 OWTs are cesspools then we estimate that approximately 1,058 cesspools likely exist in the Town.

2.3.2 Failing Systems

Modern septic systems, even those that are sited and installed properly, can still fail if they are not maintained. Conditions that can cause the soil to provide poor treatment primarily involve hydraulic or organic overloading of the disposal field. This overloading is most commonly caused by failure to maintain the septic tank. If the disposal field receives wastewater effluent faster than the soil can assimilate it, contaminants can travel through the soil to groundwater without receiving adequate treatment.

Section 3.7 below discusses Town specific data pertaining to failing systems from 1992 to the present.

2.4 Patterns of Development and Implications for the Environment

Preserving compact village development patterns while also protecting public health and water quality by improving OWTs is a delicate balance. Both in small villages and in more rural areas, the use of OWTs for wastewater disposal creates important concerns regarding nutrient and bacterial loadings, particularly near or over important water resources, aquifers, and recreational waters. The most common environmental and public health effects attributed to OWTs are effects from the pathogens and nutrients that can be present in wastewater effluent.

Potential effects on surface waters that are used for bathing and recreation are typically monitored and swimming areas can be closed if indicator pathogens, such as *Enterococcus* or *E. coli*, are reported in high numbers. However, it is widely recognized that these bacteria indicate only the potential presence of other water-borne pathogens; thus, the presence of indicator bacteria does not exclude other sources of pathogens or necessarily mean that nearby OWTs are performing improperly. In recent years, new methods for monitoring pathogens near recreation areas have been developed. Microbial source typing, for instance, attempts to identify the type of animal that was the source for a certain bacteria.

As previously identified, an overabundance of nutrients from human sources in surface waters can lead to cultural eutrophication. Freshwater lakes and ponds can be affected by phosphorus from septic system effluent. Coastal embayments with shellfisheries can also be negatively affected by high nutrient loads, and can be closed to production because of pathogens in the waters. Since Hopkinton's surface waters all eventually discharge to Little Narragansett Bay, they can contribute to the cumulative effect of high nutrient and pathogen amounts.

The following table (*Table 1*) from USEPA's Onsite Wastewater Treatment Systems Manual lists the types of land and soil characteristics (along with other design factors) used in evaluating existing and future OWT locations.

Table 1
Characteristics of Typical OWT Applications

Characteristic	Typical Application	Applications to Avoid ¹
Type of wastewater	Domestic and commercial (residential, mobile home parks, schools, restaurants, etc.	Facilities with non-sanitary and/or industrial wastewaters. Local codes may contain additional restrictions.
Daily flow	<20 population equivalents unless a management entity exists	>20 population equivalents without a management program. Local codes may contain specific or special conditions (e.g., USEPA or state Underground Injection Control Program Class V rule)

Characteristic	Typical Application	Applications to Avoid ¹
Minimum pretreatment	Septic tank	Discharge of raw wastewater to disposal field, cesspool, etc.
Lot orientation	Loading along contour(s) must not exceed the allowable loading rate	Any site where hydraulic loads from the system will exceed allowable contour loading rates
Landscape position	Ridge lines, hilltops, shoulder/side slopes	Depressions, foot slopes, concave slopes, floodplains
Topography	Planar, mildly undulating slopes of $\leq 20\%$ grade	Complex Slopes of $>30\%$
Soil texture	Sands to clay loams	Very fine sands, heavy clays, expandable clays
Soil structure	Granular, blocky	Platy, prismatic, or massive
Drainage	Moderately drained or well-drained	Extremely well-drained, somewhat poor or very poorly drained
Depth to ground water or bedrock	>5 feet	<2 feet. Check local codes for specific requirements.

Notes:

1. Avoid when possible.

Source: Reprinted from draft Hopkinton, Richmond and Exeter OWMP (Stone Environmental, 2003). Adapted from WEF, 1990 and US EPA, 2002

3 Existing Conditions

An essential part of building an OWMP is an understanding of the local environment (e.g., soils, hydrogeology); sensitive resources (e.g., public and private drinking water supplies), regulatory conditions (e.g., municipal planning and zoning regulations); and current wastewater management infrastructure. The following sections of this plan describe the key characteristics in the Town that influence the locations and performance of septic systems.

3.1 Land Use/Zoning and Demographics

Hopkinton's boundaries are formed by the State of Connecticut to the west, Exeter to the north, Richmond to the east along the Wood River, and Charlestown and Westerly to the south along the Pawcatuck River. Hopkinton contains many villages, which are mostly along the major rivers, including Hope Valley, Centerville, Moscow, Rockville, Canonchet, Burdickville, and Ashaway.

As of the 2000 decennial census, Hopkinton has a population of over 7,800 (population density of approximately 186/square mile). From 1990 to 2000, population growth was approximately 14 percent. Year 2000 census data indicated that there were 3,112 housing units within the Town. Of these, 141 were vacant and 72 were considered seasonal.

Zoning regulations include a growth cap. The Town has developed and is implementing a Growth Management Plan that limits the number of building permits per year, contains impact fees for development to help fund purchase of open space, and includes creative zoning concepts including cluster development.

3.2 Topography

The general topography of the Town consists of bedrock hills overlain by glacial soils, river valleys, and extensive surface waters. Topographical descriptions used in this report are adapted from the Soil Survey of Rhode Island. These descriptions are summarized in *Table 2* in relation to the percent slopes of the terrain.

Table 2
Soil Survey of Rhode Island Topographical Descriptions

Percent Slopes	Topographical Description	Terrain Description
0-3	Nearly Flat	--
3-8	Gently sloping	Rolling
8-15	Sloping	Rolling
15-25	Moderately steep	Hilly
25-35	Steep	Hilly

The Town of Hopkinton encompasses 44 square miles, most of which is wooded. Open land appears mostly in the valleys and near streams and rivers. The Town's topography consists mostly of gently rolling hills with a few flat plains. Elevations range from 50 to 430 feet AMSL. The highest elevation in Hopkinton is Woody Hill on the northern Town boundary at approximately 430 feet AMSL. The lowest elevation of approximately 50 feet AMSL occurs in the Pawcatuck River valley, along the southeast boundary of the Town. Steeper slopes are more prevalent in the northern and western areas of the Town.

3.3 Surficial and Bedrock Geology

The hills and valleys found in the Town reflect the uplift of granite and metamorphic rocks into high mountains hundreds of millions of years ago, followed by erosion from stream drainage and glaciation. The surficial geology of the land derives both from the original soils of weathered bedrock and from materials deposited by the glaciers that covered New England during the Pleistocene period (10,000-17,000 years ago). The surficial geology at higher elevations consists of glacial till, mantling the bedrock and reflecting the topography of the underlying bedrock surface. In some higher areas, the bedrock is exposed, and in others the overburden of till is very thin. Geologic outwash deposits of well-sorted sands and gravels left behind by the meltwaters of retreating glaciers are found in the valleys and low-lying areas of the Town.

Areas with shallow depths to bedrock or bedrock outcrops are not suitable for septic systems. Rhode Island's rules require a minimum of six feet of permeable soil over bedrock, or a five-foot separation from the bottom of an OWTS to bedrock. Weathered and fractured bedrock can be more susceptible to contamination than hard rock types. Fractures can allow untreated

wastewater effluent to flow along preferential flow paths with little or no treatment and to easily enter groundwater aquifers. The potential for groundwater contamination by OWTs can also rise when the overlying soils are coarse sands and gravels. In these areas, OWTs treatment performance may be improved by designing disposal fields in shallower sandy loam soils, constructing fill systems, or providing advanced treatment to reduce concentrations of nitrogen and/or pathogens in wastewater effluent. This may be of particular importance in areas of dense development over coarse sands in groundwater recharge zones.

3.4 Soils

Soils vary based on parent geologic materials, slope, hydrology, human disturbance, and other factors. For this assessment, we are primarily concerned with soil properties that determine suitability for siting of OWTs. These properties include depth to seasonal high groundwater, depth to bedrock, soil texture and structure, and slope. State regulations require four feet from the ground surface to seasonal high groundwater table, or a vertical separation of three feet from the bottom of the system. A five-foot separation is required from the bottom of the system to impervious soils or bedrock.

According to the draft Hopkinton, Richmond and Exeter OWMP (Stone Environmental, 2003), the soils of Hopkinton generally fill out the outlines of the area's geology, with well-drained soils in the valleys and poorly drained, sloping uplands. Wet organic soils are located along streams and in topographic depressions, while excessively drained soils (usually associated with glacial outwash deposits) provide the recharge areas located over groundwater aquifers.

Table 3, adopted from the draft Hopkinton, Richmond and Exeter OWMP presents the percentage of land in Hopkinton by different soil development constraints.

Table 3
Soil Development Classifications for Hopkinton

Development Constraint	Percentage of Land
Soils have few constraints	45
Soils with shallow seasonal high groundwater tables	27
Hydric soils (typically wetlands)	21
Steep slopes (>15%)	15
Soils with significant constraints	<1

Forty-five percent of the land in Hopkinton is categorized as having few constraints for development. Soils with a shallow seasonal high groundwater table cover approximately 27 percent of the Town and hydric soils account for 21 percent. There is a higher percentage (15%) of land area defined by steep slopes in Hopkinton. Steep slopes appear within parts of Ashaway Village, Burdickville, and Cononchet. Steep slopes are also found around ponds and streams in the northwest area of Town, including Yawgoog Pond and Wincheck Pond. Shallow seasonal groundwater tables are also present around these ponds, the village of Moscow, and central Hopkinton.

Figure 2 characterizes soils based on severe, moderate, and slightly restrictive classifications. These classifications correspond to how restrictive the soil is in placement of the septic tank absorption field, and are dependent on various characteristics of each soil type and characteristics may include wetness, percolation rates, stone size, and slope. Classifications of “severe,” “moderate,” and “slightly” restrictive are based on those listed in the *Soil Survey of Rhode Island*. Below are brief descriptions of each classification according to the *Soil Survey of Rhode Island*:

- **Slight** – soils are generally favorable for the specified use and limitations are minor.
- **Moderate** – soils properties or site features are unfavorable for the specified use, but limitations can be overcome by special planning and design.
- **Severe** – soils properties or site features are so unfavorable or difficult to overcome that major soil reclamation, special designs, or intensive maintenance is required.

Figure 2 identifies central and northern portions of the Town generally having severely restrictive soils although soils of this type are found throughout the entire Town.

3.5 Surface Water and Water Quality

The Town of Hopkinton is bordered on two sides by major rivers. The Wood River forms the eastern border and flows south into the Pawcatuck River below the village of Alton. The Pawcatuck River also forms the southern boundary of the Town of Hopkinton. All of Hopkinton lies within the Wood-Pawcatuck River watershed. Natural lakes and ponds are scattered throughout the Town Wetlands are scattered throughout the Town, but primarily located adjacent to rivers, ponds, and lakes as shown in *Figure 3*.

Surface water quality in Hopkinton generally meets its water quality classification goal, meaning that state water quality standards are not violated. There are a few small streams in the Hope Valley area which feed into the Wood River, which do not meet water quality standards and are listed on the *State of Rhode Island 2008 303(d) List of Impaired Waters* (303(d) List). For example, Canonchet Brook discharges to the Wood River just south of Plain Pond and is on the 303(d) List due to cadmium, lead, pathogens, and lack of biodiversity.

Ponds in Hopkinton that are listed as impaired waterbodies due to high concentrations of mercury include Yawgoog and Wincheck Ponds in the northwest. Total maximum daily loads (TMDLs) have been approved by the EPA for each of these ponds. Additional impaired waterbodies with approved TMDLs include Ashville Pond, Locustville Pond, Wyoming Pond, and Alton Pond.

Figure 3 identifies impaired streams and waterbodies in the Town as of 2009, as these areas represent areas of constraints to placement of OWTs and are environmentally sensitive. That is, such areas can be easily contaminated and degraded by improperly installed and maintained septic systems.

3.6 Groundwater and Drinking Water Supplies

Groundwater is found in fractured rock and saturated soil formations, where water is stored in spaces within the rock or soil. Aquifers occur where these formations can yield substantial amounts of water. Unconfined aquifers occur where unsaturated porous materials overlie the saturated formations. These aquifers can be extremely complex and their yields can vary greatly. Unconfined aquifers are also susceptible to pollution from septic systems and other sources, since contaminants can move relatively quickly into the saturated materials. The entire Town is included in a sole source aquifer area.

Three major groundwater aquifers are at least partially located in Hopkinton: the Upper Wood River aquifer, the Bradford aquifer, and the Ashaway-Pawcatuck River aquifer. Many of Hopkinton's residents tap these aquifers and use the untreated groundwater as their only water supply. The Wood-Pawcatuck aquifer is recognized by the USEPA as a sole-source aquifer, meaning that more than 50 percent of the drinking water is groundwater and that no other water supply alternatives are feasible. Groundwater recharge areas as shown in *Figure 2* replenish these aquifers and can be affected by OWTs. These are sensitive areas and pose an environmental constraint to the placement and maintenance of OWTs.

Even when properly designed, located and operated, septic systems can affect groundwater through the discharge of nitrate, phosphorus and pathogens. Where very coarse soils exist, pathogens and nitrate can more easily wash through the soils into groundwater. Substandard systems, where the disposal field is below or too close to the seasonal high groundwater table, can affect groundwater through incomplete soil-based treatment that allows pathogens, nitrate, and other contaminants to enter the groundwater. Maintaining minimum setbacks and construction requirements typically provides protection from contamination. Higher levels of wastewater treatment can be required as additional protection from nutrients or pathogens.

Most of the population within the Town relies on private wells for their potable water supply. Most of these private water supply wells are drilled wells, but there are an unknown number of shallow wells that may be more prone to contamination. Drilled wells typically are sealed into bedrock and tap into deep groundwater reservoirs. Shallow wells and springs use a shallower source of groundwater, and these water supplies may or may not be adequately protected from surface contamination. They tend to vary in quality and quantity and are more likely to dry out during droughts. The location of non community (private) wellhead protection areas are provided in *Figure 3*. There are also a number of public water supply wells located in the Town. Community wellhead protection areas for public wells are identified in *Figure 3*.

3.7 Current Wastewater Infrastructure

There are no municipally owned and operated centralized wastewater treatment systems in the Town. Wastewater disposal is provided solely through the use of septic systems, which are regulated and permitted by RIDEM. Septic systems will continue to be the only means of wastewater disposal for the Town for the foreseeable future.

Septic system records compiled by the RIDEM, Office of Water Resources were reviewed for this project to identify the number of known disposal systems and failures over roughly the past 16 years. An electronic search was conducted for repair applications submitted to the RIDEM for the Town from 1992 through 2009. Repair applications were chosen for review because they often represent septic system failures. Failures may occur for a variety of reasons that include unfavorable soil conditions, high groundwater, ledge close to surface, improper maintenance, faulty construction, improper sizing, and/or increase in use above design conditions. System repair records help to establish the frequency of failures within a particular area and give an indication of the frequency of problems. The approximate locations of OWTS failures are shown in *Figure 4*. *Figure 5* shows these locations relative to environmentally sensitive areas and areas with environmental constraints. Failure rate in Hopkinton is summarized in *Table 4*.

Table 4
Summary of OWTS System Permit Data (1992- April 2009)

Total OWTS	OWTS Repairs and Unresolved Enforcement Actions	Percent of OWTS Repaired or with Unresolved Enforcement Actions
3,175 ¹	123 ²	3.9

Notes:

1. The total number of onsite disposal systems from 1992-2003 reported in the draft Hopkinton, Richmond and Exeter OWMP (Stone Environmental, 2003) was 3,100 systems. Review of the DEM OWTS permit database from 2004 to April 2009 indicates 69 new conventional OWTS systems, 36 of which have been conformed. These 36 systems are included in the value represented in the table. Also included are 39 newly constructed and conformed innovative and alternative systems.
2. This is the total number of repairs including innovative and alternative systems and conventional systems. 96 of these 123 known repairs have been conformed. 10 outstanding NOV's currently exist and are also included in this value.

Several factors were reviewed in order to map areas of apparent failure risk to onsite systems in the Town. Some of these issues were discussed in previous sections, and thus will be briefly summarized in the following sections:

1. Septic system failure/repair rates
2. Soil suitability for onsite disposal systems
3. Surface and groundwater quality
4. Density of housing (lot sizes)
5. Depth of groundwater
6. Age of septic systems

According to RIDEM septic system records there have been 123 repair applications submitted since 1992, representing 3.9 percent of the developed parcels in Town. This equates to a failure rate of approximately 0.2 percent per year. OWTS failures occur throughout Hopkinton, however, there are some areas in the Town where clusters of known OWTS repairs and enforcement issues are present. These areas are reflected in *Figure 4* and could pose

wastewater disposal problems in the future. Clusters of OWTS repairs and enforcement issues are generally found in the Hope Valley Area and Ashaway Village.

The Hope Valley Area is located in the eastern part of Hopkinton, west of the Wood River and near the intersection of Route 138 and Route 3. The soils in this area consist mostly of Hinckley and Canton/Charlton series soils and Hinckley-Enfield complex soils. All these soil types are well-drained to excessively well-drained and are rated as “moderate” in acceptability for septic systems in the Soil Survey of Rhode Island. The moderate rating implies that the soil properties are “unfavorable” for this type of use but can be overcome by special design and planning. The area surrounding Locustville Pond contains Hinckley gravelly sandy loam with steep slopes. These areas are rated as “severe” in acceptability for septic systems due to the steep slopes and high permeability. This rating means that soil properties of site features are so unfavorable or difficult to overcome that major soil reclamation, special designs, or intensive maintenance is required. Other environmental factors potentially contributing to the high rate of septic system failures in this area include areas of seasonal high groundwater and pockets of hydric soils located south of Locustville Pond and the intersection of Routes 3 and 138. Steep slopes and the high groundwater table around Locustville Pond are likely the main environmental factors influencing septic system failures.

The other main factor contributing to the high rate of failures in this area is the average system age. Based on the unpublished OWMP draft for Richmond, Exeter, and Hopkinton (2003), the approximate age of the systems in this area may be at least 50 years. Many of the systems consist of old cesspools which, combined with excessively drained soils, can allow wastewater to rapidly leach into the groundwater without adequate treatment. Due to the proximity of these failures, water quality effects to surface waters and groundwater may occur though no readily available water quality data exists for Wyoming Pond. The URI Watershed Watch data for Locustville and Wyoming Ponds show some water quality effects (low water clarity and seasonally high chlorophyll levels) that may be caused in part by failing septic systems.

Ashaway Village is located in the southwestern part of Hopkinton, south of Interstate 95 (Exit 1) along Route 3 heading into Westerly, RI. The predominant soil types in this area are Hinckley and Merrimac series soils. These well-drained to excessively drained soils are generally rated as “slight” in acceptability for septic systems in the Soil Survey of Rhode Island. However, Hinckley gravelly sandy loam in rolling terrain (HkC) is rated as “moderate” in acceptability for septic systems versus the “slight” rating for Hinckley gravelly sandy loam in flat terrain (HkA). The portion of Ashaway Village east of Route 3 is predominantly HkA soil, while the area west of Route 3 is predominantly HkC soil. The RIDEM septic system failure data shows higher failure rates west of Route 3 in Ashaway, coinciding with the more limited HkC soil type.

Other environmental factors potentially contributing to septic system failures in the area include areas of hydric soils typically associated with wetland areas and pockets of seasonal high groundwater in the southern portion of Ashaway. Another contributing factor could be the age of the septic systems. Water quality impacts to surface waters (specifically, the Ashaway River) and groundwater (private water supply wells) may occur due to the proximity of these failures; however, water quality data for surface water or for groundwater are not available.

4 State Policy

To ensure the safe disposal of wastewater, RIDEM enacted regulations governing the installation and repair of septic systems. Several towns in Rhode Island have also enacted standards that go beyond rules promulgated by the State to protect groundwater and other natural resources. This section summarizes Rhode Island's state regulations for septic systems and provides information about local wastewater management programs already established in some other Rhode Island towns. We have also provided it as a description of the Rhode Island Cesspool Phaseout Act of 2007.

4.1 RIDEM Regulations

In 2008, the RIDEM published the latest set of regulations (*Rules Establishing Minimum Standards Relating to Location, Design, Construction and Maintenance of Onsite Wastewater Treatment Systems*), referred to below as the 2008 RIDEM OWTS Regulations, concerning the use of septic systems. The regulations state that “no person shall begin any building construction, building renovation or change the use of any structure from which sewage is being or will be disposed by means of an individual sewage disposal system, without first obtaining approval from the RIDEM.”

The horizontal and vertical distances between the leaching field of the septic system and important physical and environmental features, as specified in the regulations, are summarized in *Table 5*. Additional distances are provided in the 2008 RIDEM OWTS Regulations.

Table 5
2008 RIDEM OWTS Regulations
Minimum Setbacks for Leachfields to Physical and Environmental Features

Physical or Environmental Feature	Minimum Horizontal Leachfield Setback (ft)
Seasonally High Groundwater	3 (vertical)
Private Drinking Water Wells	150 ¹
Public Drinking Water Supply Well	200 ²
Property Lines	10
Water Supply Line	25
Foundations	25 ³
Flowing Water and Open Bodies of Water	75 ⁴

Notes:

1. This distance assumes an OWTS design flow of 1,000- <2,000 gallons per day.
2. Assumes an OWTS design flow of 1,000-<2,000 galls per day and also assumes the well is drilled or driven.
3. May be varied under certain conditions.
4. Assumes an OWTS design flow of <5,000 gallons per day.

Variances to these minimum setbacks are allowed under specific conditions. Alternative distances and specific conditions under which variances apply are provided in the 2008 RIDEM OWTS Regulations.

4.1.1 Licensing Requirements for OWTS Design and Construction

A state license, issued by RIDEM, is required for professionals who design new systems or repairs or alterations for existing systems. A Class I designer's license authorizes the design of repair or alteration of a residential septic system or component with flows less than or equal to 900 gallons per day. A Class II license authorizes the design of repairs and alterations of residential systems with flows less than 2,000 gallons per day and commercial systems with flows less than 900 gallons per day. A Class II license also authorizes the design of new systems provided there are no variances to the requirements for depth to groundwater, depth to an impervious layer, or setbacks established for critical resource areas. Class III licenses authorize the design of any septic system. Class I and Class II licenses require registration as a Professional Land Surveyor or a Professional Engineer. Class III licenses can only be obtained by a Professional Engineer licensed by the State of Rhode Island.

A suitably licensed contractor must install septic systems. However, a licensed designer is responsible for witnessing and inspecting the installation and is responsible for issuing a Certificate of Construction. The Certificate of Construction certifies that the installation was completed in accordance with the approved application, plans, and specifications, and must be submitted to RIDEM.

4.1.2 Upgrading Dwellings with OWTSs

Because sewage flows can change significantly when building renovations are proposed or when there is a change in use, a determination of existing disposal system suitability must be rendered by RIDEM. RIDEM approval must be obtained before a Town building permit is issued. A building renovation includes any addition, replacement, demolition and reconstruction, or modification of a structure on a subject property, which meets one or more of the following:

- Results in any increase in wastewater flow into the OWTS, which for residential structures is equivalent to the addition of one (1) or more bedrooms.
- Involves demolition or replastering or replacement of interior wallboard, interior walls, ceilings, flooring, windows, plumbing fixtures, electrical wiring or kitchen cabinetry, which in total affects over fifty percent (50%) or more of the living area of the existing structure.
- Involves adding an additional floor level or portion of floor level of living space to the structure.
- Increases the footprint of the living space of the structure.

4.2 Rhode Island Cesspool Phaseout Act of 2007

In 2007, the State of Rhode Island passed the Cesspool Act of 2007 (see *Appendix B*). Under this legislation cesspools in Rhode Island located within 200 feet of tidal coastline, 200 feet of public wells, and within 200 feet of drinking water reservoirs must be inspected, and if failed these systems must be replaced with an OWTs meeting regulatory standards.

As described in RIDEM's "Frequently Asked Questions—Cesspools and the Rhode Island Cesspool Act of 2007" (2007) (hereinafter, Cesspool Phaseout FAQ), there are 3 possible scenarios under which a cesspool must be replaced:

1. The cesspool is] failed. This applies anywhere in the state and is required under current regulations.
2. [The cesspool] meets the definition of a "large capacity cesspool" that is, it serves a commercial facility or multifamily dwelling or commercial uses with the capacity to serve more than 20 people per day. This applies anywhere in the state under the proposed new septic system rules.
3. As of June 2008, [the cesspool] is located within one of the three areas described below:
 - ***Within 200 feet of the inland edge of all shoreline features bordering tidal water areas (i.e., Coastal Resources Management Council's jurisdiction)*** [emphasis added].
 - ***Within 200 feet of a public well*** [emphasis added].
 - Within 200 feet of a waterbody with an intake for a drinking water supply.

Within the three 200-foot zones identified above:

- ***All cesspools will have to be inspected within a 4-year time period, completed by January 1, 2012*** [emphasis added].
- ***All cesspools found to be failed will need to be replaced within 1 year*** [emphasis added].
- All cesspools found in already-sewered areas will need to be hooked-up to the sewer within one year of the sale of the associated property.

Other cesspools located within 200 feet of tidal coastline, 200 feet of public wells, and within 200 feet of drinking water reservoirs will need to be replaced by January 1, 2013. As discussed in the Cesspool Phaseout FAQ:

A failed cesspool is one that meets any of the criteria below. Note that a cesspool can appear to function in a manner that disposes of the waste and still be considered a “failed cesspool” under the criteria below. In other words, a backup of sewage or leakage onto the ground surface are not the only criterion for failure.

- Cesspool fails to accept sewage, as evidenced by sewage backing up onto the ground surface or into the building it serves.
- The liquid level in the cesspool is less than 6 inches from the bottom of the pipe (i.e., building sewer) that drains into it.
- The cesspool has to be pumped more than 2 times per year.
- The cesspool has been shown to have contaminated a drinking water well, stream or wetland.
- The bottom of the cesspool is below the groundwater table at any time of year, resulting in direct connection between the waste in the cesspool and the groundwater.

5 OWTS Wastewater Management Approaches

Several management approaches are available to communities that wish to develop onsite wastewater management plans. These are briefly described below.

5.1 System Inventory/Tracking and Public Education and Outreach

Under this approach, the Town develops an active educational program to inform homeowners about proper septic system care, inspections, and maintenance. The program may publicize and provide details of the CSSLP through a combination of local newspaper advertisements, local radio announcements, community cable television channels, and posted public notices. Pamphlets describing septic systems, operation and maintenance techniques, and adverse affects related to failing systems should be made available to all septic system owners/users. This effort should encourage property owners to be more proactive as they address concerns related to substandard or failing systems.

Data collection efforts under this approach include developing and maintaining a database. This database can be used for inventorying specific permit and system component information, following up on permit conditions, tracking maintenance contracts on advanced systems, collecting and tracking septic tank pumpout information, and tracking septic system failures. If system inspections or pumpouts are encouraged or required, the database can be used to generate notices for inspections and to track follow-up maintenance activities.

The Town may also encourage residents to perform voluntary inspections of their septic systems (e.g., at a recommended rate of once every three to five years).

5.2 Special Design Standards

Towns may adopt special design standards in their zoning regulations or code of ordinances such as cesspool elimination, increased treatment performance standards, or increased setbacks from surface waters. These design standards could include nutrient reduction in systems near sensitive environments, particularly where dense development may contribute to eutrophication or contamination of drinking water supplies.

5.3 Wastewater Management Districts

Many problems associated with septic systems are the result of substandard designs, construction, or poor maintenance practices. To overcome these problems, a regulatory framework can be developed at the local level to oversee septic system approvals, installations, and maintenance practices. Enabling legislation that was passed in the 1987 Rhode Island General Assembly Session allows municipalities to establish their own Wastewater Management Districts (WWMDs).

The purpose of WWMDs is to mitigate or eliminate contamination of state waters from malfunctioning septic systems through the implementation of local inspection and maintenance programs. Among other things, WWMDs allow a municipality to:

1. Access private property, when necessary, for the periodic inspection and/or maintenance of Onsite systems.
2. Raise funds for the administration, operation, and services of the WWMD by assessing property owners for taxes or annual fees and issuing bonds.
3. Establish the necessary administrative, financial, technical, enforcement, and legal structure to implement and conduct wastewater management programs and hire the necessary personnel to support the structure.
4. Receive grants or loans and establish a revolving fund to make grants and low interest loans available to property owners for the improvement, rehabilitation, or replacement of failed septic systems.
5. Levy fines for noncompliance. Such fines shall be no greater than \$500 per violation. Each day of continuing noncompliance shall constitute a separate and distinct violation.

5.3.1 Community Required Maintenance Inspections

Under this approach, the management entity requires homeowners to provide periodic maintenance to their septic systems, but does not provide the service directly. A notice is sent to system owners every three to five years to remind them to have their systems inspected or pumped out. A return receipt attached to the notice can be sent back to the Town by the inspector or pumping contractor once the inspection is complete. This approach requires

establishment of local legislation requiring periodic maintenance by property owners. The management entity should also have the authority to randomly inspect systems to ensure their proper operation.

5.3.1.1 Setting an Inspection Schedule

In 2000, RIDEM published *Septic System Checkup: The Rhode Island Handbook for Inspection* (Riordan, 2000) (see *Appendix C*). This handbook provides a state-approved method for inspection of conventional septic systems. For conventional systems, inspections are recommended on a three-to-five year basis, depending on system use, and can generally be completed by a service provider in few minutes. Inspections are recommended as the basis for determining pumpout need, which helps avoid the unnecessary expense of overkill maintenance. Inspection-based programs also provide protection from system failure as they ensure that the system is functioning properly and that minor repair needs do not become aggravated.

An inspection-based program is essential for innovative and alternative (I&A) systems, which generally include mechanical and electrical parts that are more likely to experience malfunction. I&A systems should be inspected annually. The University of Rhode Island's New England Onsite Wastewater Training URI-OWT Center has developed training and certification programs for service providers. These training programs include both conventional and I&A systems. A number of Rhode Island municipalities maintain lists of approved service providers and use satisfactory completion of the URI-OWT programs as the basis for service-provider registration.

5.3.2 Community Operated Maintenance Program

This approach may be financed through user fees assessed to individual property owners, and the management entity assumes responsibility for pumping systems on a regular schedule and providing periodic inspections. The management entity provides services either directly or through contracted private firms. Local legislation would be necessary to require participation in the program. Bonds can be issued to cover capital expenditures, should the Town decide to provide pump-out or inspection services directly. Since the management entity assumes responsibility for OWTS pumping schedules and periodic OWTS inspection under this alternative, proper system maintenance and operation is relatively certain. This has environmental and public health benefits, as groundwater and surface water resources are more likely to be protected from contamination associated with OWTS failures. This type of program would serve to eliminate the “flush and forget” attitude that is sometimes taken by the public toward system maintenance.

However, this alternative also has several negative aspects. Operating costs, in the form of additional personnel required to implement and administer the program, are high and the management entity assumes significant amounts of liability. Difficult local legislation requiring owner participation may also be necessary.

5.3.3 Community Owned OWTS's

Under this approach, the Town takes ownership of all septic systems within the management district and is responsible for their installation and operation. To finance this program, a user charge is assessed to each property owner included within the management district. A substantial amount of new local legislation would be required to allow the management entity to purchase equipment, assess fees on system owners, and to receive federal or state grants and loans. This alternative also requires significant capital expenditures for vehicles, computers, office equipment, and field equipment. Additional personnel, ranging from administrators to inspectors, would be needed to staff the program. The tremendous liabilities, the negative economic affects on private firms that design and install septic systems, and the high costs associated with this alternative do not support its feasibility.

5.4 Financial Assistance

5.4.1 Financial Assistance for Repair and Replacement

The costs to install, alter, or repair an OWTS to meet RIDEM standards can be substantial. A complete conventional system replacement for a three-bedroom home can cost between \$8,000 and more than \$15,000 depending on site constraints, while the cost of an innovative system can range from \$15,000 to more than \$30,000.

These costs present a significant expense for most homeowners and may form the basis for objections to community-based OWTS inspection and maintenance programs. Homeowners are often wary that inspection requirements create a gateway to potentially unaffordable upgrade requirements. Financial assistance can help to defray upgrade costs and may help to soften concerns.

Recently, the range of projects eligible for funding through the State Revolving Fund (SRF) has been expanded to incorporate non-point source pollution projects, including the repair and replacement of failing residential septic systems. The Rhode Island Clean Water Finance Agency has formulated a loan program known as the CSSLP. Under this program, every community in the State will be able to use the SRF—not just those served by municipal wastewater facilities. Funding for up to one million dollars annually will be provided through this program. A copy of the regulations for the CSSLP is included in *Appendix D*.

By law, the Rhode Island Clean Water Finance Agency (RICWFA) or SRF cannot make loans to private individuals. Therefore, the loan program allows loans to be provided to septic system owners through individual Towns. Rhode Island Housing (RIHousing) services the loan. RIHousing accepts homeowner loan applications, examines their ability to repay; issues payments to vendors for the work done; and collects repayments over the life of the loans. The community acts as the primary borrower and a loan agreement will be in place for the principal portion of outstanding homeowner loans. The community must provide a pledge for repayment through a dedicated source of revenue or a general obligation pledge.

Specifics of the CSSLP include:

Community Involvement

- The community must prepare an OWMP describing the specifics of the community's septic system management program. The plan identifies areas that the town wishes to be covered by the septic system management program and estimates a dollar cost for the remediation of septic systems. The RICWFA caps its CSSLP loans to communities at \$300,000. However, communities may borrow additional \$300,000 increments, once the original loan is depleted below \$50,000.
- RIDEM will approve the OWMP and issue a Certificate of Approval, thus making the septic system management program eligible for financing.

Homeowner Involvement

- Owners of one to four family properties will be eligible for participation in the loan program. Communities are free to decide whether the property must be owner occupied in order to be eligible for assistance. There is a maximum loan amount of \$30,000² that can be obtained and there are no income restrictions for eligibility.
- Recently RICWFA has begun to require that borrowers retain a designer and obtain an OWT's permit prior to obligating loan monies. This encourages immediate use of loans and reduces the potential for underutilized loans to tie up the Town's borrowing line (e.g., while permits are obtained). To further encourage the immediate use of loans, the Town will establish a one-year limit on the homeowner's borrowing line following loan approval. However, the cost of design and permitting can be rolled into the loan upon its approval.
- Homeowners are required, by the Town, to obtain three bids from designer/installers for the installation of the system to be repaired/installed to ensure a reasonable price. The East Greenwich Community Development Consortium will assist the Town in structuring the bid-review process.
- The loans are offered to the homeowners at 2.0 percent interest for a term of up to 10 years. No interest or service fees are charged to the Town. However, towns may subsidize loans if they wish.

RIHousing Involvement

² Towns may waive or adjust the maximum loan amount at their discretion.



- RIHousing will collect repayments from homeowners and make the debt service payment to the SRF on behalf of the community.

East Greenwich Community Development Consortium

- The Community Development Consortium will oversee the review homeowner bidding for designer/installer contractors.

5.4.2 Financial Assistance for Inspection and Maintenance

Some towns opt to encourage proper septic operation and maintenance by paying for it. Though inspection and maintenance present a much lesser cost than system upgrades, defraying operational costs may still encourage proper OWTS operation and maintenance. Some common methods of subsidizing inspection and maintenance include:

- Providing maintenance services through town staff or on-call service providers.
- Providing pumpout coupons for maintenance services from local vendors.
- Providing tax rebates or reimbursement for homeowners who turn in inspection forms or service receipts.

5.5 Management Approaches Used by Other Rhode Island Municipalities

Rhode Island municipalities enjoy significant state support for development of onsite wastewater management programs. In addition to CSSLP funding, the state has also offered grant funding for the development of municipal wastewater management programs as well as technical assistance in the form of several guidance documents. Two of these documents were developed to describe the onsite wastewater management implementation efforts of Rhode Island municipalities. They are:

- *Rhode Island Municipal Septic System Standards and Programs* (Riordan, 2001).
- *Summary of Rhode Island Municipal Onsite Wastewater Programs* (RIDEM, 2008).

Both documents are included in *Appendix E* of this report. A tabular summary of management approaches used by each municipality, adapted from the two aforementioned reports has been provided in *Table 6* below.

Table 6
Summary of Rhode Island Municipal
Onsite Wastewater Standards and Programs

Municipalities	Standards (Setbacks, etc.) Beyond State Regulations	Management (Inspection/Maintenance) Requirements	Required Use of Innovative and Alternative Technologies	Repair Replacement Programs
Burrillville	Yes	No	No	No
Charlestown	Yes	Yes	Yes	Yes(CSSLP)
Coventry	No	No	No	Yes (CDBG & CSSLP)
Cranston	No	Under consideration	No	In development (CSSLP)
Cumberland	No	Under consideration	No	In development (CSSLP)
East Greenwich	No	No	No	Yes (CDBG) ¹
Foster	Yes	In Development	No	Yes (WRIHRP) In development (CSSLP)
Glocester	Yes	Yes	Under Consideration	Yes (WRIHRP ² & CSSLP)
Johnston	No	Yes	No	Yes (CDBG & CSSLP)
Little Compton	No	No	No	No
Middletown	No	No	No	No
Narragansett	Yes	Yes	Based on staff recommendation	Yes (CSSLP)
New Shoreham	Yes	Yes	Yes	Yes (CSSLP)
North Kingstown	Yes	Yes	Yes	Yes (CSSLP)
North Smithfield	No	No	No	No
Portsmouth	Yes	Under consideration	Yes	Yes (CDBG) In development (CSSLP)
Scituate	Yes	Under consideration	No	Yes (WRIHRP) In development (CSSLP)
South Kingstown	Yes	Proposed	May be required through negotiation	Yes (CSSLP)
Tiverton	Yes	Under consideration	No	Yes (CSSLP)

Municipalities	Standards (Setbacks, etc.) Beyond State Regulations	Management (Inspection/Maintenance) Requirements	Required Use of Innovative and Alternative Technologies	Repair Replacement Programs
Warren	Yes	No	No	No
Warwick	No	No	No	Yes
West Greenwich	Yes	No	No	Yes (CDBG)
Westerly	No	Under Consideration	No	Under consideration

Notes:

1. CDBG means Community Development Block Grant funds have been programmed for septic system repair/replacement.
2. WRIHRP refers to the Western Rhode Island Home Repair Program.

Several communities in Rhode Island, including Charlestown, Narragansett, South Kingstown, and Jamestown have established more restrictive septic system siting requirements than those required by RIDEM and have implemented OWM programs. As they provide good local examples of OWM programs, we have provided summaries of them below.

5.5.1 Charlestown

Charlestown's subdivision regulations and zoning and ordinance establish standards for septic system siting and installation that include policies for protection of sensitive resources. The subdivision regulations require an evaluation of sewage disposal factors such as soils, slopes, and proximity to water bodies and wetlands. The zoning ordinance establishes setbacks for septic systems from water bodies and wetlands of:

- 100 feet from a coastal wetland
- 200 feet from a 10-foot wide flowing body of water
- 100 feet from flowing bodies of water less than 10- feet wide
- 100 feet from intermittent streams
- 100 feet from floodplains

Charlestown also has a wastewater management ordinance that mandates regular septic system pump-outs based on inspections. The Town sends a mailing to 1/3 of its residents each year requiring that the septic system be inspected. Residents that respond favorably have their systems inspected by one of three qualified firms whose services are retained by the Town. The property owner pays for the inspection. Significant points of the program are listed below.

- Septic system inspections occur at a minimum frequency of once every three years, or more frequently as determined by the WWMD.
- Pump-outs are based on inspection results but occur no less than once every 6 years.
- All OWTS owners are sent written notifications of regularly scheduled inspections.
- The WWMD maintains a record of each septic system inspected.
- If system requires pumping, the owner has 30 days to show proof that it was done.
- If system is failed, owner has 60 days to submit a repair/replacement application.

5.5.2 Narragansett

In its zoning ordinance, Narragansett requires special use permits for septic systems located within 200 feet of all coastal features. Under the Town's utility code, owners must pump their septic systems at least every 4 years and septic tanks must be accessible at all times. In the coastal overlay district, the town may require the use of innovative/alternative septic systems for systems sited within 200 feet of a coastal feature. Requirements for nitrogen reduction are based on staff recommendations.

5.5.3 South Kingstown

Special use permits are required in South Kingstown for septic systems located:

- Within 200 feet of flowing bodies of water 10 feet or more in width
- Within 100 feet of flowing bodies of water less than 10 feet in width
- Within 150 feet of floodplains
- Within 50 feet of a bog, marsh, swamp or pond
- Within 150 feet of other freshwater wetlands.

The Town's zoning ordinance also establishes setbacks, performance standards, and requirements for enhanced treatment. Portions of South Kingstown are served by a municipal sewer system. A Wastewater Management District that includes all unsewered areas has been established. The key points of the management program are:

- A Program Administrator supervises activities, serves as enforcement officer, and has authority to levy fines and orders maintenance of septic systems based on inspection results.
- Implementation will occur over a seven year period starting with the Green Hill Pond watershed, then other coastal ponds, then the groundwater protection overlay district, and finally the remainder of town.
- The program will create a town-wide inventory based on inspection results.
- The septic system owner is responsible for hiring septage haulers or maintenance contractors.
- If inspections reveal an immediate need to pump, a pumpout must be performed within 5 days.

5.5.4 Jamestown

Jamestown, like South Kingstown, is partially sewerred. However, in Jamestown's program, the wastewater management area covers the entire Town. Highlights of Jamestown's wastewater management program include:

- Administered through the Department of Public Works (DPW).
- Powers include:
 - Contract with septage haulers, installers, and inspectors as needed
 - Order maintenance of systems based on inspection results
 - Allow entry onto private property for inspection, pumping, and repair.
- Maintenance requirements are based on inspection results
- Inspection results are being used to complete a town wide inventory
- DPW maintains a list of approved inspectors
- DPW sends a notice to system owners telling them that an inspection is required and inspections must be scheduled within 45 days of notice.
- If inspection reveals an immediate need to pump, owners have 5 days to present evidence that it was done.

- Inspections are mandatory.
- Stringent design standards were established for high groundwater areas.

6 Recommendations and Next Steps

Hopkinton recognizes the importance of enhanced wastewater management in high-risk areas such as areas with high groundwater, shallow bedrock, and small lots served by private wells. Based on the information collected to date and presented in this plan, it is recommended that the Town implement a voluntary education and outreach effort as part of a CSSLP loan program.

6.1 Education and Outreach

The education and outreach goals are to provide information to property owners on the basic components of septic systems, how septic systems can affect water resources, and about system usage and maintenance requirements and the CSSLP program. The Town plans to:

- Town and other web sites—Hopkinton currently maintains a relatively simple website, which currently provides only limited data and resources. The Town is considering enhancing its website and will also consider posting information related to its OWMP. This may include planning documents, fact sheets, program descriptions, applications, pertinent web links, and other materials. The Town may also consider a web-based computer tracking system for maintenance activities contingent on the availability of funding. At a minimum, the web site will provide information regarding eligibility criteria and how to apply for CSSLP.
- Public meetings—Town has had three public meetings to discuss the development of its OWMP and if time allows a public hearing is planned.
- Fact sheets and advertisements—The Town will prepare a fact sheet for distribution to residents with its tax bill mailing.

6.2 CSSLP

The Town is interested in applying for and receiving funding for a residential loan program through the CSSLP. This program is described in *Section 5.4* of this OWMP. Following is additional information on establishing the loan criteria.

6.2.1 General Eligibility

The Town intends that any residential failed or substandard OWTS in Town that meets the CSSLP eligibility criteria for the state would qualify for the 2% loan funds. For determination of eligibility, this plan relies upon RIDEM's definition of "failed" and "substandard."

Currently, RIDEM defines a "failed" system as:

Any sewage disposal system that does not adequately treat and disperse wastewater so as to create a public or private nuisance or threat to public health or environmental quality, as evidenced by, but not limited to, one or more of the following conditions:

1. Failure to accept wastewater into the building sewer;
2. Discharge of wastewater to a basement; subsurface drain; stormwater collection, conveyance, or treatment device; or watercourse unless expressly permitted by the Department;
3. Wastewater rising to the surface of the ground over or near any part of OWTS or seeping from the absorption area at any change in grade, bank or road cut;
4. The invert of the inlet or the invert of the outlet for a septic tank, distribution box, or pump tank is submerged;
5. The liquid depth in a cesspool is less than six (6) inches from the inlet pipe invert;
6. Pumping of the cesspool or septic tank is required more than two (2) times per year;
7. OWTS is shown to have contaminated a drinking water well or watercourse;
8. If a septic tank, pump tank, distribution box, or cesspool is pumped and groundwater seeps into it; or
9. Any deterioration, damage, or malfunction relating to any OWTS that would preclude adequate treatment and dispersal of wastewater.
10. Excessive solids are evident in the distribution box or distribution lines.

“Substandard” refers to any OWTS that does not meet the current RIDEM standards for design and installation. This includes, but is not necessarily limited, to standards for design flow, vertical and horizontal setbacks, and treatment components.

6.2.2 Additional Eligibility Issues and Features

The property owner loan program is based on a projected number of failures and includes a process for establishing criteria for approving loans. These criteria can include prioritizing areas of environmental concern, prioritizing areas where older systems including cesspools are known, and other criteria developed by the community. Suggested eligibility criteria include:

1. Loans are for all single-family and multi-family homes up to four dwelling units in size. No institutions, condominiums, or commercial businesses are to be covered. All state and local approvals and procedures must be in place prior to any acceptance of applications.

2. If 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.
3. Replacing a septic tank, even when no drain field repairs are necessary, is considered a legitimate expense of CSSLP funds.
4. I & A systems may be required in areas where site conditions warrant, such as a wetland buffer, high watertable soils, small lots, and lots with inadequate separation distance from a well, etc. Upgrading to I&A technology is eligible for loan funds.
5. In order to qualify for the loan fund, the owner must submit three bids. The construction portion of the loan shall be limited to the low bid plus 10 percent. Engineering and permitting costs are also legitimate loan expenses.
6. The maximum loan amount is to be \$30,000.
7. When the available pool of money is \$50,000 or less, hardship situations and emergency repairs will be given priority.

6.2.3 Expected Activity of the Hopkinton Loan Program

We determined the expected activity of the loan program is based on a projected number of failures. For the Town's total of 3,175 onsite systems, an average failure rate of 3.9% yields 123 systems over roughly 16 years. This approximately equates to a 0.2% failure rate per year yielding roughly 6 system failures per year.

The following table summarizes anticipated costs of repair per OWTS failure. More detailed cost calculations are provided in *Appendix F*.

Table 7
Estimated Cost¹ of Repair per OWTS Failure

Type of Repair	Estimated Cost
Replace Leach Field	\$5,500
Replace Septic Tank	\$4,600
Full System Replacement	\$10,100

Notes:

1. Costs estimated from RIDOT Standard Unit Prices, Local Contractor Price Quotes, and Town of Old Saybrook Decentralized Wastewater Upgrade Program Estimated Construction Costs.

Assuming an inflation rate of three percent per year, it is anticipated that over a 10 year period, the duration of the CSSLP loan, the Town would need approximately \$757,000 for system repairs. The table below shows the cost of expected repair activity on an annual basis.

Table 8
Cost of Expected Repair Activity Per Year
for the Duration of the CSSLP Loan

Year	Cost per System¹	Total Cost	Cumulative Total Cost
Year 1	\$10,403	\$66,059	\$66,059
Year 2	\$10,715	\$68,041	\$134,100
Year 3	\$11,037	\$70,082	\$204,182
Year 4	\$11,368	\$72,185	\$276,366
Year 5	\$11,709	\$74,350	\$350,716
Year 6	\$12,060	\$76,581	\$427,297
Year 7	\$12,422	\$78,878	\$506,175
Year 8	\$12,794	\$81,244	\$587,419
Year 9	\$13,178	\$83,682	\$671,101
Year 10	\$13,574	\$86,192	\$757,293

Notes:

1. Cost per system includes an inflation rate of 3% per year and assumes that Year 1 begins in 2010 and, in order to be conservative on total cost, that each system will require full replacement.

The expected level of activity does not account for substandard system replacement (i.e., cases where homeowners chose to replace antiquated systems that have not failed hydraulically). Based conversations with RICWFA, we found that Towns that actively pursue wastewater management through mandatory inspection (e.g., Charlestown, North Kingstown, South Kingstown) experience high levels of borrowing activity (e.g., \$300,000/year or more). Towns that institute voluntary programs (e.g., Tiverton, Johnston) experience relatively low levels of borrowing activity (e.g., \$300,000/5 years). Therefore, Hopkinton plans to borrow \$200,000 as a starting point, which is anticipated to cover the first four years of repair activity.

6.2.4 Application Procedure

The following list outlines the general procedure for loan making to CSSLP applicants:

1. A system owner wishing to access the funds must obtain three bids for review by the East Greenwich Community Development Consortium.
2. The system owner hires the appropriate professional to design the system repair and then submits the application to RIDEM for design approval.
3. Once RIDEM permit approval has been received, the system owner applies for a CSSLP loan through RIHousing.

4. Following loan approval, RIHousing issues a two-party check to the contractor and system owner.
5. The system owner begins repayment of the loan within one month after the check is received.
6. Loan funds must be expended by the homeowner within one year of loan approval.

6.3 Methods of Advertising

Hopkinton anticipates using the following methods to advertise financial assistance for OWTS upgrades and repairs:

- Town and other web sites—Hopkinton currently maintains a website where municipal documents, programs, and items of interest are discussed. As the Town continues to develop a wastewater management program, it will post information to its website. This may include planning documents, fact sheets, program descriptions, applications, pertinent web links, and other materials. At a minimum, the web site will provide information regarding eligibility criteria and how to apply for CSSLP.
- Public meetings—Hopkinton has planned two public meetings and a hearing to discuss its OWMP.
- Fact sheets and advertisements—The Town will prepare a fact sheet for distribution to residents with its tax bill mailing.

7 Program Responsibilities and Administration

The Town Planner is expected to be responsible for overall implementation of the onsite wastewater management program. The Town Planner will also take the lead role on public education and development of a loan agreement with RICWFA as well as alternative financing such as grant seeking activities. Hopkinton anticipates coordinating day-to-day loan administration activities with RIHousing through the Town Planner. The East Greenwich Community Development Consortium will oversee review of homeowner bidding for design and installation services.

8 Method of Septage Disposal

Based on available data, Hopkinton has approximately 3,175 systems with an average volume of 1,000 gallons per pumpout. Assuming an average pumpout rate of one pumpout per system every four years, total volume of septage transported to regional waste water treatment facilities (WWTFs) is approximately 793,800 gallons per year. Septic haulers conducting work in Hopkinton transport septage to the following WWTFs:

- South Kingstown WWTF
- Quonset Development Corporation WWTF
- Cranston WWTF

Local septic haulers conducting work in Hopkinton include Paul Mumford, Briggs Cesspool Service, and Superior Septic. Conversations with personnel at these septic hauling companies generally indicate having, at times, been turned away from WWTFs (e.g., Narragansett and South Kingstown) due to capacity problems. Personnel at Briggs Cesspool Service indicate being turned away from the South Kingstown WWTF frequently and must wait until the following day to tip septage at the facility.

Based on conversations with employees at these facilities, septic haulers often get turned away because the facilities frequently reach their capacities. For example, the South Kingstown WWTF turns septic haulers away once the facility reaches its daily capacity of 20,000 gallons per day. The frequency at which septic haulers are turned away from the facility increases during the summer months. This facility primarily receives septage from the Town of Narragansett. Only when capacity is still available after septage is received from Narragansett can septic haulers tip septage from other towns. On some days, there is no capacity to receive septage from other towns.

Quonset recently reduced its daily receivable septage from 17,000 gallons per day to 12,000 gallons per day. This cap has at times caused septic haulers to be turned away from the facility, although personnel at the facility indicate this does not happen often.

The Cranston WWTF appears to be the regional facility to which a majority of septage is transported. This facility currently does not have a capacity limit for septage and so septic haulers who get turned away from other facilities will tip sewage in Cranston.

Conversations with personnel at Quonset and South Kingstown WWTFs indicate the possibility of increased capacity problems within the next five years due to the limited number of treatment facilities in the area accepting septage from multiple towns as well as growing capacity needs. Personnel at the Cranston facility currently do not anticipate capacity problems within the next five years. For at least the next few years we anticipate that the Cranston WWTF will have adequate capacity to handle the septage disposal needs of Hopkinton homeowners.

Correspondence with the Westerly WWTF personnel indicate the Town may consider receiving septage from Hopkinton in the future, although the facility is not set up for, nor does it allow, septage to be received from Hopkinton currently.

9 Implementation Plan

The following steps are to be taken to implement this onsite management plan:

1. Obtain SRF loan and establish Hopkinton in the CSSLP.
2. Advertise acceptance into the CSSLP program to Town residents via items outlined in *Section 6.3*
3. Add information to the Town's website that specifically addresses OWTs.
4. Consider tracking OWTs systems and maintenance and pumping in GIS.
5. Mail OWTs brochures to residents of the Town with the tax bill.
6. Consider establishing wastewater management districts through the necessary regulations and ordinances.
7. Revisit the OWMP and consider updating the plan.

9.1 Anticipated Project Costs

Table 9 provides a suggested order-of-magnitude budget for onsite wastewater management program development.

**Table 9
Program Development Cost**

Program Item	Order-of-Magnitude Costs
Obtain SRF loan and establish Hopkinton in the CSSLP.	\$2,000
Advertise acceptance into the CSSLP program to Town residents via items outlined in <i>Section 6.3</i>	Costs covered in other steps of implementation
Add information to the Town's website that specifically addresses OWTs.	\$1,000
Make guidance brochures available to the public at the Public Library and Town offices.	\$500 - \$1,000
Consider tracking OWTs systems and maintenance and pumping in GIS.	\$1,000 - \$5,000
Mail OWTs brochures to residents of the Town with the tax bill.	\$1,000 - \$2,000
Consider establishing wastewater management districts through the necessary regulations and ordinances.	\$5,000 - \$10,000
Total	\$11,500 - \$21,000

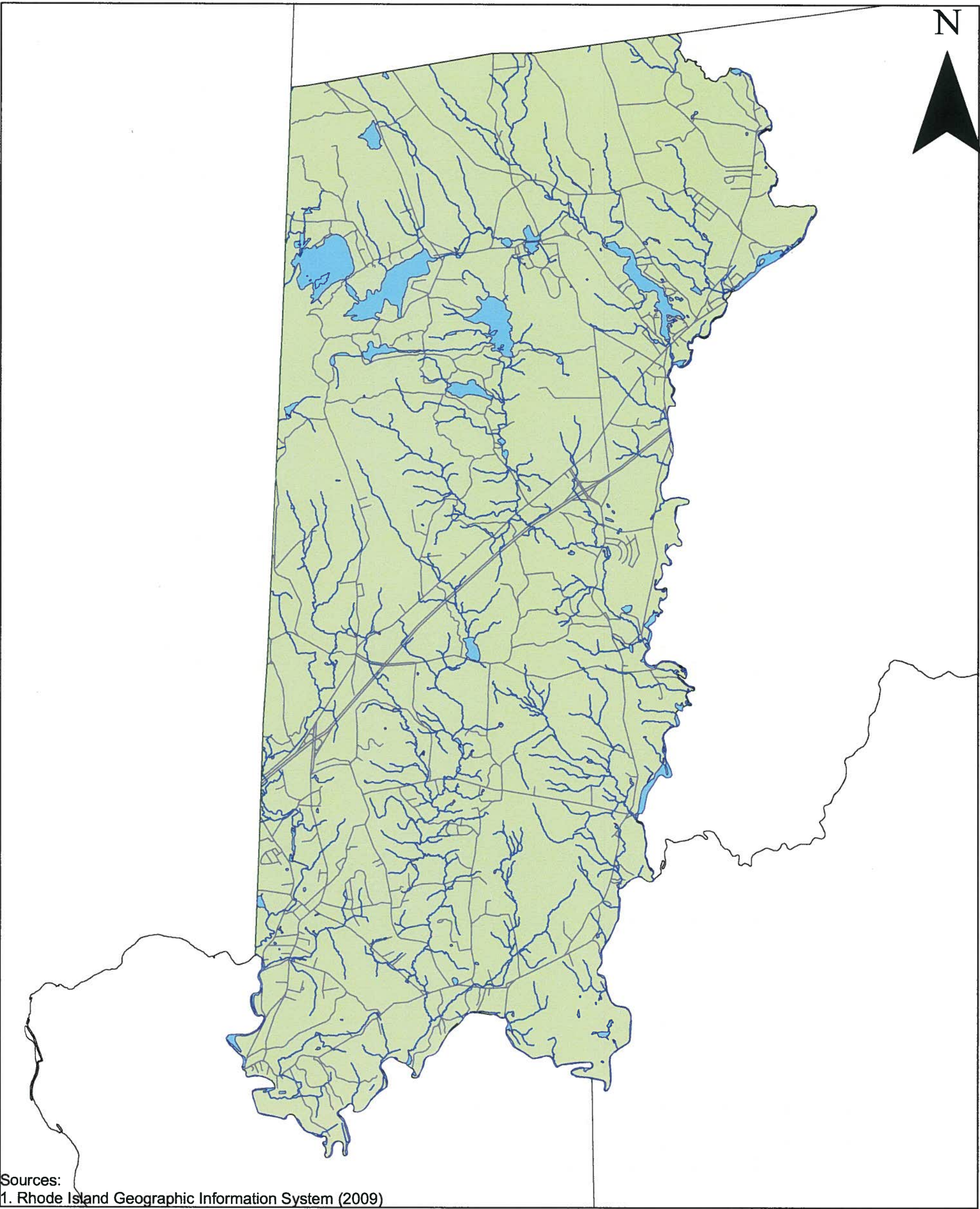
9.2 Implementation Schedule

Table 10 provides a suggested schedule of next steps.

Table 10
Onsite Wastewater Management
Program Development Schedule

Program Item	Number Month/Year
Obtain SRF loan and establish Hopkinton in the CSSLP.	Month 6
Advertise acceptance into the CSSLP program to Town residents via items outlined in <i>Section 6.3</i>	Month 8
Add information to the Town's website that specifically addresses OWTSS.	Month 8
Make guidance brochures available to the public at the Public Library and Town offices.	Month 8
Consider tracking OWTSS systems and maintenance and pumping in GIS.	Year 3
Mail OWTSS brochures to residents of the Town with the tax bill.	Year 1
Consider establishing wastewater management districts through the necessary regulations and ordinances.	Year 3

Figures



Sources:
1. Rhode Island Geographic Information System (2009)

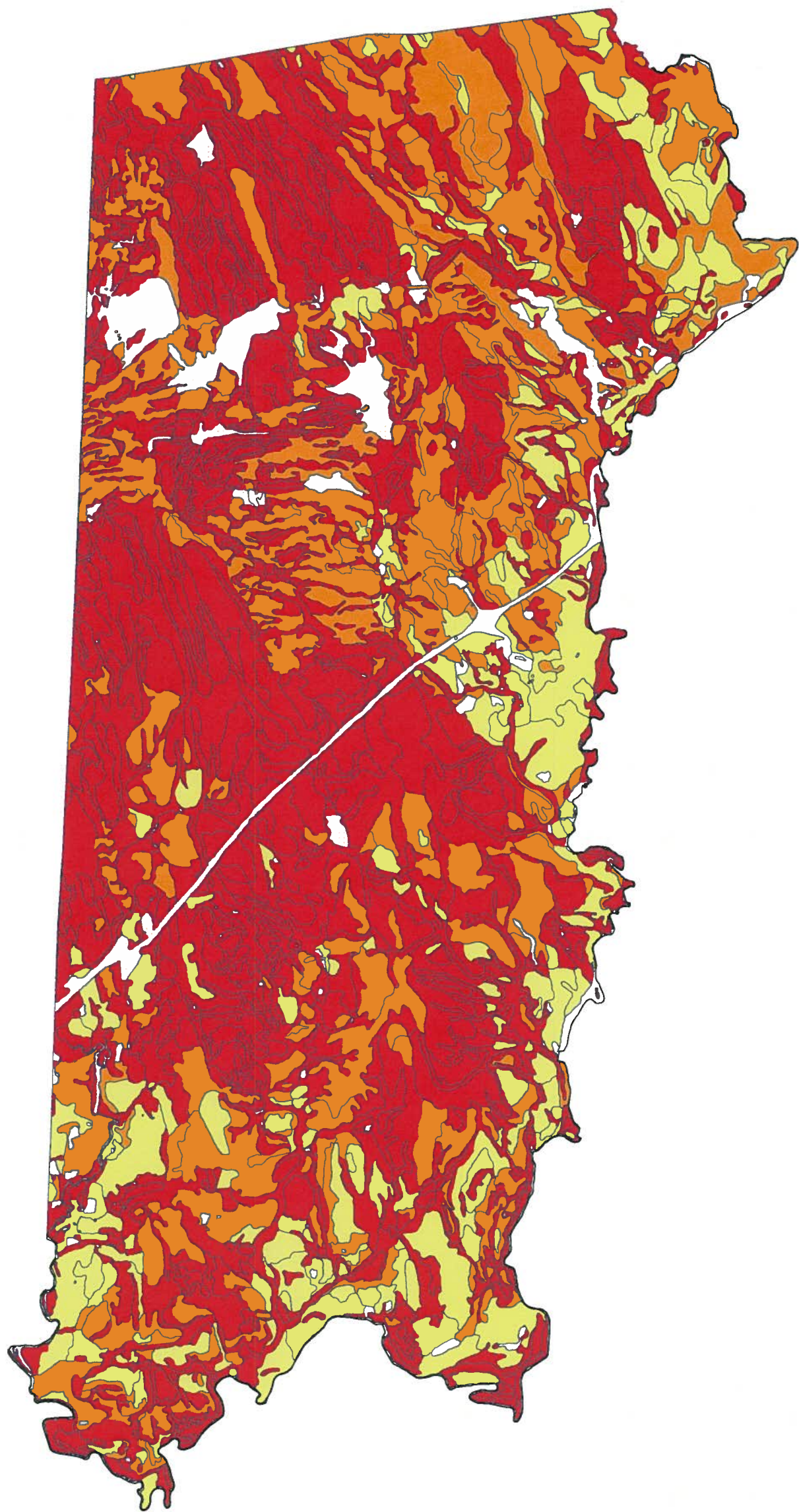
Figure 1
Town of Hopkinton
Onsite Wastewater Management Area

Legend

- Roads
- Streams
- Waterbodies
- Town of Hopkinton (Managment Area)
- Other Towns

0 2,500 5,000 10,000 Feet









Source:
Rhode Island Geographic Information System (2009)

Figure 2
Town of Hopkinton
Soil Characterization

0 2,500 5,000 10,000 Feet

Legend

-  Slightly Restrictive Soils
-  Moderately Restrictive Soils
-  Severely Restrictive Soils
-  No characterization



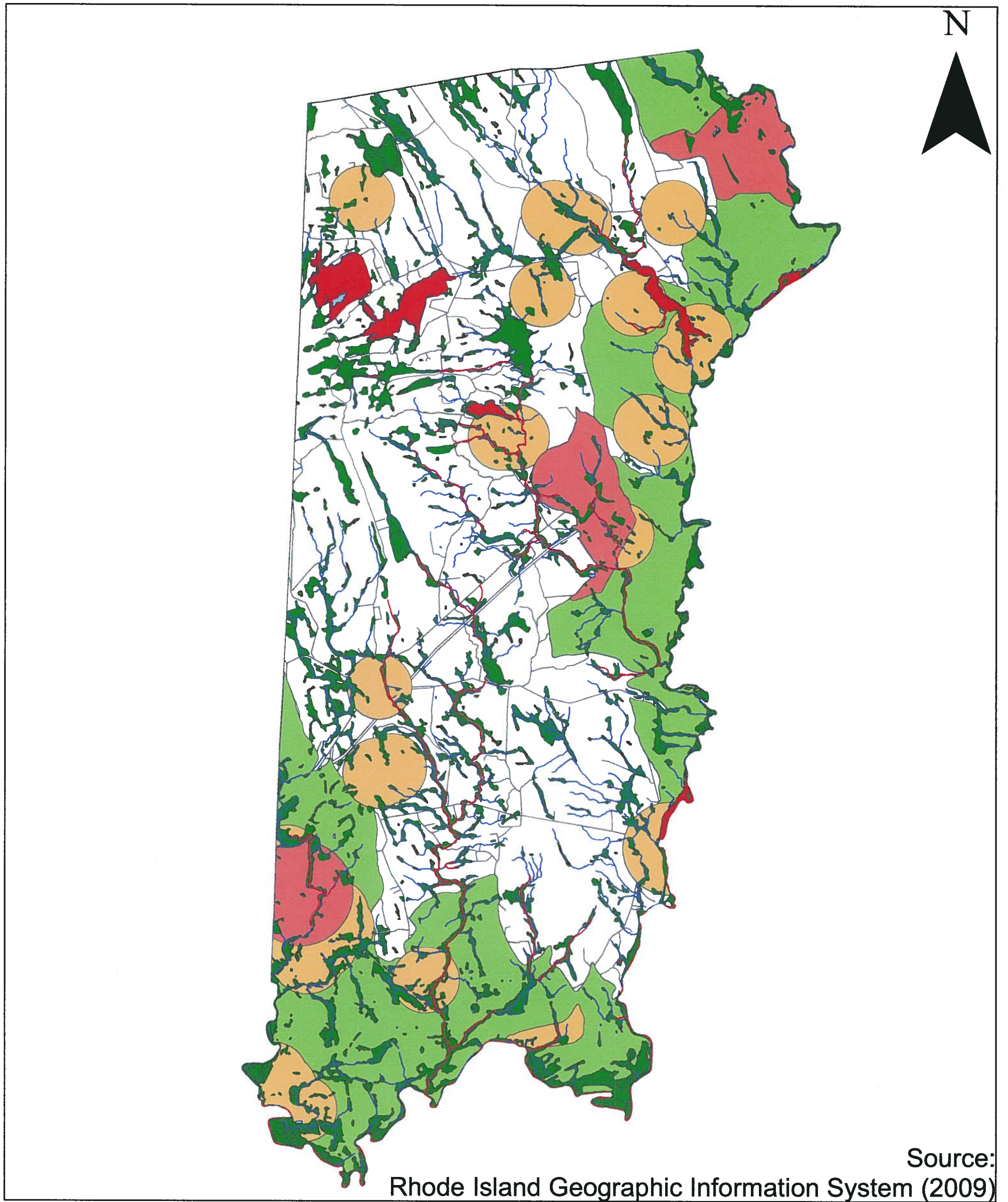


Figure 3
Town of Hopkinton
Environmental Constraints and Sensitive Areas

Legend

- | | |
|----------------------|---|
| — Roads | Community Wellhead Protection Areas |
| — Impaired Streams | Non Community Wellhead Protection Areas |
| — Streams | Groundwater Recharge Areas |
| Impaired Waterbodies | Town of Hopkinton |
| Waterbodies | |
| Wetlands | |

0 2,500 5,000 10,000 Feet



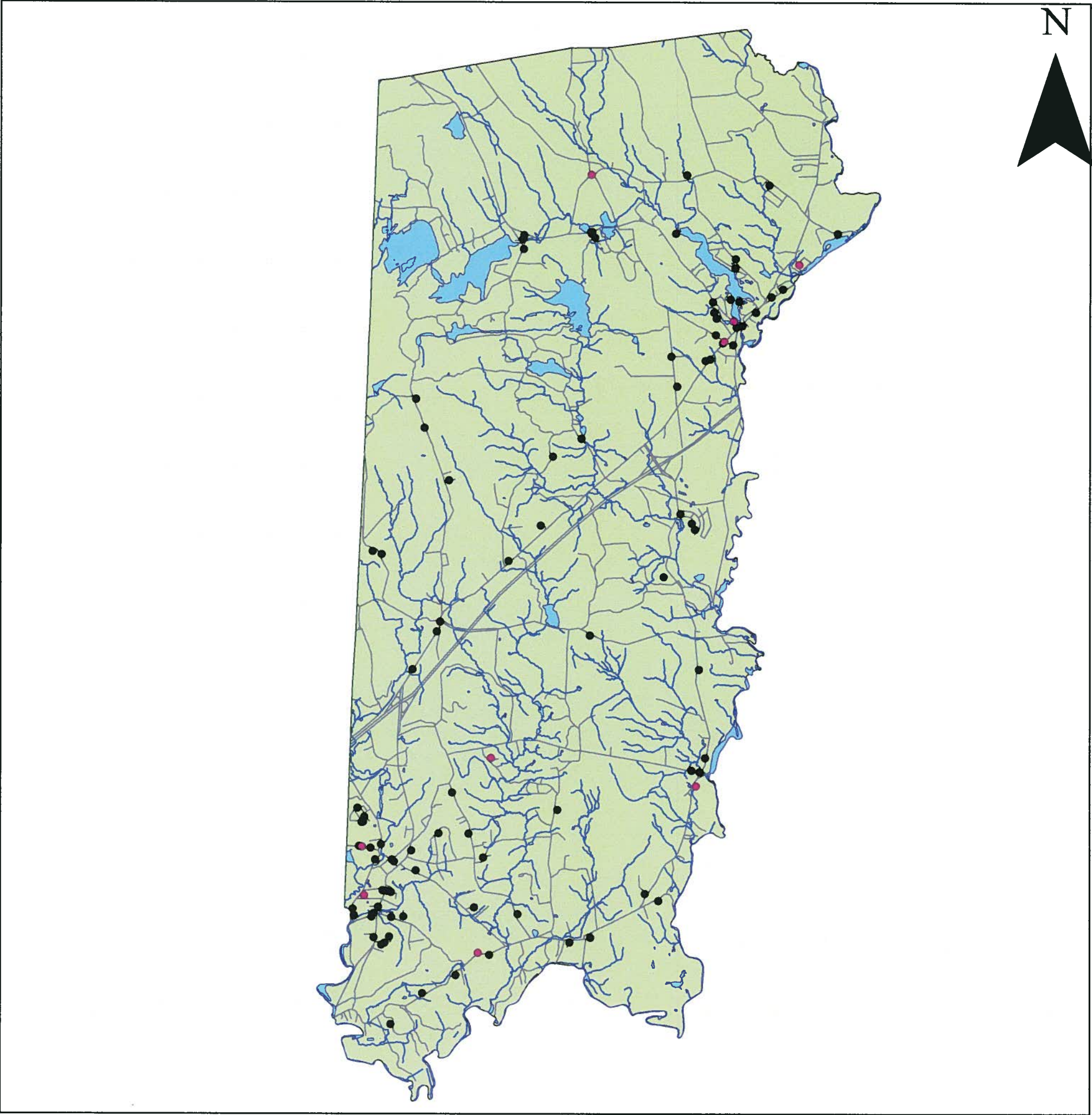


Figure 4
Known OWTs Repairs and Enforcement Issues
from 1992-April 2009

Notes:
1. 18 repair locations could not be mapped due to discrepancies in geocoding addresses.
2. 1 outstanding notices of violation (NOVs) could not be mapped due to discrepancies in geocoding addresses.

Sources:
1. Rhode Island Geographic Information System (2009)
2. Rhode Island Department of Environmental Management (RIDEM) OWTs enforcement and permit data (2009)

Legend

- Outstanding NOVs
- Repairs since 1992, basd on RIDEM data
- Roads
- Streams
- Waterbodies
- Town of Hopkinton

0 3,000 6,000 12,000 Feet

FUSS & O'NEILL
Disciplines to Deliver

June 2009
K:\GIS\IP2008\0554\abs_HopkintonOWMP_20090421.mxd

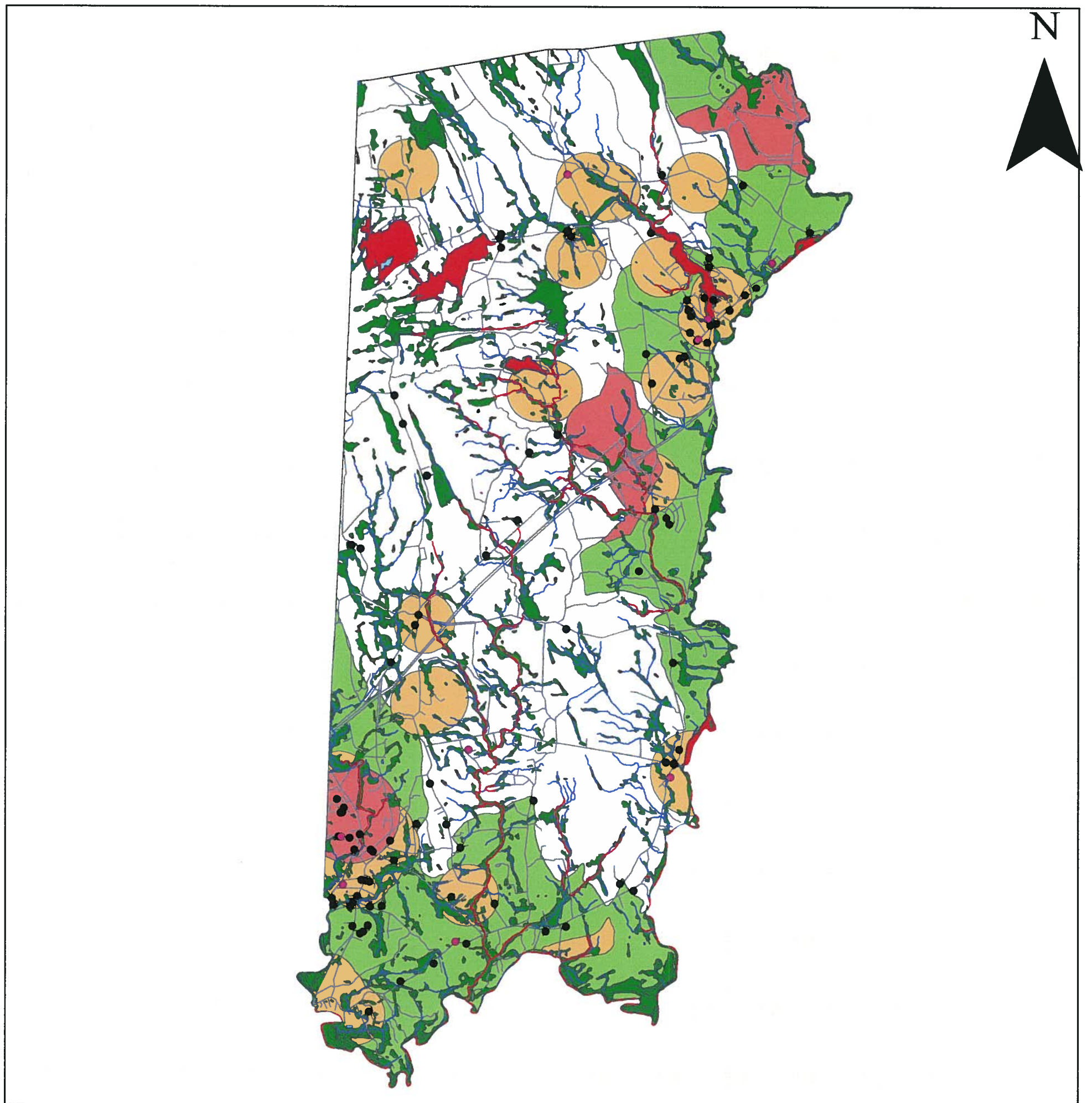


Figure 5
Known OWTs Repairs and Enforcement Issues
in Sensitive Areas and Areas
with Environmental Constraints

Notes:

1. 18 repair locations could not be mapped due to discrepancies in geocoding addresses.
2. 1 outstanding notices of violation (NOVs) could not be mapped due to discrepancies in geocoding addresses.

Sources:

1. Rhode Island Geographic Information System (2009)
2. Rhode Island Department of Environmental Management (RIDEM) OWTs enforcement and permit data (2009)

Legend

- | | |
|---|---|
| ● Outstanding NOVs | Waterbodies |
| ● Repairs since 1992, based on RIDEM data | Community Wellhead Protection Areas |
| — Impaired Streams | Non Community Wellhead Protection Areas |
| — Streams | Groundwater Recharge Areas |
| — Roads | Town of Hopkinton |
| ■ Impaired Waterbodies | |
| ■ Wetlands | |

0 2,500 5,000 10,000 Feet



FUSS & O'NEILL
Disciplines to Deliver

Appendix A

Agenda and Town Council Resolution

HOPKINTON TOWN COUNCIL MEETING – June 15, 2009
BUSINESS AGENDA

Town Hall, 1 Town House Road, Hopkinton, RI 02833

6:30 P.M. **Executive Session under RIGL 42-46-5A(2) Potential Litigation, Pending Litigation, (1) Personnel –Town Solicitor.**

7:00 P.M. Call to Order – Moment of silent meditation and a salute to the Flag.

Resolution Consider Energy Resolution continued from June 1, 2009.

HEARINGS

Zone Change hearing – National Grid

Petition for a Zoning Ordinance Amendment filed by The Narragansett Electric Company d/b/a National Grid, 280 Melrose Street, Providence, RI 02907 for property owned by The Narragansett Electric Company d/b/a National Grid and located at Main Street/Route 3 identified as Assessors Plat 22, Lot 19 an RFR-80 Zone and filed in accordance with Section 16 of Chapter 134 of the Zoning Ordinances of the Town of Hopkinton, as amended. The applicant seeks a text amendment to the District Use Table by adding a category (“486- Electric substation”) and a corresponding footnote to the Dimensional Regulations.

Applicant or representative present.

Council Discussion.

Motion to continue hearing or set date to consider amendment.

CONSENT AGENDA

Approve Town Council Meeting Minutes of April 20, 2009; Town Council Meeting Minutes of May 4, 2009; Accept the court transcript of May 18, 2009 as the record of the meeting pertaining to the zoning ordinance text amendment filed by National Grid; Accept the following reports: Animal Control Official, Town Clerk, Finance Director, Tax Collector – including adjustments & collections to date.

MOTION TO APPROVE CONSENT AGENDA

PUBLIC FORUM

TOWN SOLICITOR REPORT

COUNCIL PRESIDENT REPORT

TOWN MANAGER REPORT

OLD BUSINESS

Authorize the Finance Department to pay the Town Bills (Additions-Deletions).

Renova Lighting Systems, Inc. tax stabilization re: compliance with landscaping and lighting design.

Discussion & approval of Hopkinton Onsite Wastewater Management Plan.

Pending Legislation:

1. Elimination of straight party ballot.

Adopt Financial Resolutions.

NEW BUSINESS

Interviews – Appointments – Resignations.

Set date for Joint Town Council & Planning Board Workshop re: Comprehensive Plan.

Discussion re: Appointment of Interim Town Manager.

Budget Status

CORRESPONDENCE

PUBLIC FORUM

EXECUTIVE SESSION

Under RIGL 42-46-5A (2) Potential litigation; (2) Collective Bargaining – Police contract, Professional & Technical contract, Clerical contract.

ADJOURN

The Town of Hopkinton does not discriminate on the basis of disability. Anyone requiring special services or devices please call 377-7777 (V) or 377-7773 (TDD) 48 hours prior to the hearing.

Posting date: June 12, 2009

State of Rhode Island

County of Washington

In Hopkinton on the fifteenth day of June 2009 A.D. the said meeting was called to order by Town Council President Thomas Buck at 6:30 P.M. in the Town Hall Meeting Room, 1 Town House Road, Hopkinton, RI.

PRESENT: Thomas Buck, Sylvia Thompson, Beverly Kenney, Barbara Capalbo, William Felkner; Town Solicitor Patricia Buckley; Town Manager William DiLibero; Town Clerk Elizabeth Cook-Martin.

EXECUTIVE SESSION

A MOTION WAS MADE BY COUNCILOR KENNEY AND SECONDED BY COUNCILOR THOMPSON TO ENTER INTO EXECUTIVE SESSION UNDER RIGL 42-46-5A (2) POTENTIAL LITIGATION, PENDING LITIGATION, (1) PERSONNEL –TOWN SOLICITOR.

POLL VOTE:

IN FAVOR: Buck, Thompson, Kenney, Capalbo, Felkner

OPPOSED: None

SO VOTED

A MOTION WAS MADE BY COUNCILOR KENNEY AND SECONDED BY COUNCILOR THOMPSON TO RECONVENE IN OPEN SESSION AND SEAL THE MINUTES OF THE EXECUTIVE SESSION.

IN FAVOR: Buck, Thompson, Kenney, Capalbo, Felkner

OPPOSED: None

SO VOTED

The regular meeting opened with a moment of silent meditation and a salute to the Flag.

HOPKINTON ENERGY RESOLUTION - continued from June 1, 2009

Town Solicitor Buckley stated she had revised the resolution to reflect wording “where it was feasible and appropriate as determined by the Town”. A motion was made by Councilor Kenny and seconded by Councilor Thompson to adopt the revised energy resolution which led to discussion: Councilor Capalbo commented that it would be very expensive to require each department to have

LEED certified staff as #8 indicated. She noted #9 mentioned a revolving loan and questioned who would give and guarantee the loan. Councilor Kenney responded she thought funding might be through a State grant or CDGB and would be for homes and businesses as well. Mr. DiLibero stated access to the revolving funds would be through the State. CDBG Coordinator Geoffrey Marchant was present and confirmed no energy funding was coming through CDBG. Councilor Felkner stated he appreciated the efforts given in revising the resolution by the Solicitor. He added that no grants could operate without tax subsidies which cost the taxpayer money. He felt it was not reasonable for the Solicitor to put any more effort into the resolution. He stated he did not support the resolution and felt it should be put aside. Councilor Thompson suggested #8 be taken out in its entirety. Council President Buck questioned what LEED certification meant. Councilor Capalbo responded a person would have to be trained so they had knowledge on all forms of energy which entailed an enormous amount education and classes. Councilor Thompson suggested that it could be summed up in such a way that it was not locking in the Town or the taxpayer. Councilor Kenney agreed with this. Councilor Felkner questioned if the Washington County Regional Planning Council included all Towns in the Washington County. Councilor Kenney responded it did. Councilor Felkner noted the Town paid membership fees with tax dollars and they were lobbying to spend more money, which he did not agree with. Mr. DiLibero noted that supporting the resolution would go towards the application for an energy grant. Councilor Capalbo stated she would support the resolution if the wording fiscally prudent was included. A motion to amend the original motion followed this discussion:

A MOTION WAS MADE BY COUNCILOR THOMPSON AND SECONDED BY COUNCILOR CAPALBO TO AMEND THE MOTION TO ADOPT THE RESOLUTION TO ADD LANGUAGE “IF FISCALLY PRUDENT” AND TO DELETE REFERENCE TO “LEED” CERTIFICATION.

Vote on amended motion:

IN FAVOR: Thompson, Kenney, Capalbo

OPPOSED: None

ABSTAIN: Buck, Felkner

MOTION CARRIED

Vote on main motion to adopt the resolution as amended:

IN FAVOR: Kenney, Thompson, Capalbo

OPPOSED: Felkner

ABSTAIN: Buck

MOTION CARRIED

The Hopkinton Energy Resolution language follows:

HOPKINTON ENERGY RESOLUTION

Whereas, energy supply is of paramount concern to our region and our towns, and

Whereas, the cost of energy has increased dramatically and has negatively affected public and private budgets, and

Whereas, petroleum-based energy costs are driven by world forces and have become unpredictable, and

Whereas, increased demand management and local generation promise more predictable supply and lower energy costs, and

Whereas, sustainable and locally-controlled energy generation will foster higher energy independence, and

Whereas, the Town of Hopkinton supports the Regional Energy Policy adopted by the Washington County Regional Planning Council, and

Therefore, be it resolved by the Town of Hopkinton that where feasible, appropriate and fiscally prudent, as determined solely by the Town and on a schedule to be determined solely by the Town:

1. Full electrical and HVAC audits should be performed for all public buildings and all improvements in weatherization, system management, replacing/upgrading heating, cooling, hot water, lighting and irrigation systems should be implemented.
2. Feasibility of hot water heating using solar energy should be assessed and implemented where appropriate.
3. Landscape and grounds maintenance should be addressed to save water resources and control insulation.
4. Feasibility of photovoltaic and wind-powered electricity generation on all public buildings should be assessed and implemented.
5. Feasibility of geothermal heating and/or cooling sources should be assessed and implemented.
6. Municipal and school vehicles and equipment should be upgraded and/or managed to reduce energy over-usage.
7. Low-interest revolving loan funds may be specifically tailored to help low-income households, homeowners, landlords, and business owners cope with an uncertain energy future.
8. Public officials, including Building, Fire, and Planning officials should be trained to better address new and emerging energy technologies in building systems, HVAC, fire suppression, and site design.
9. Public information campaigns should be undertaken to show municipal progress towards energy independence and to involve residents and businesses in revolving loan programs.
10. Regional actions and programs to achieve these ends should be fostered.
11. Hopkinton and the Washington County Regional Planning Council should support all feasible and appropriate private and public/private sustainable energy ventures.
12. Financial resources may be secured to implement these policies as soon as possible.

HEARINGS

ZONE CHANGE HEARING – NATIONAL GRID

In regards to the Petition for a Zoning Ordinance Amendment filed by the

Narragansett Electric Company d/b/a National Grid, 280 Melrose Street,

Providence, RI 02907 for property owned by The Narragansett Electric Company d/b/a National Grid and located at Main Street/Route 3 identified as Assessor's Plat 22, Lot 19 an RFR-80 Zone and filed in accordance with Section 16 of Chapter 134 of the Zoning Ordinances of the Town of Hopkinton, as amended. The applicant seeks a text amendment to the District Use Table by adding a category ("486- Electric substation") and a corresponding footnote to the Dimensional Regulations.

Peter Lacouture, Esq., Michael Rook and Susan Moberg were present. A stenographer was present to record the proceedings. A copy of the transcript is attached and made part of this record.

A MOTION WAS MADE BY COUNCILOR THOMPSON AND SECONDED BY COUNCILOR CAPALBO TO CLOSE THE HEARING AND SET JULY 6, 2009 AS THE DATE TO CONSIDER THE ORDINANCE AMENDMENT.

IN FAVOR: Buck, Thompson, Kenney, Capalbo, Felkner

OPPOSED: None

SO VOTED

CONSENT AGENDA

Councilor Capalbo removed the Finance Director report; Councilor Kenney removed the court transcript of May 18, 2009 as the record of the meeting pertaining to the zoning ordinance text amendment filed by National Grid.

A MOTION WAS MADE BY COUNCILOR THOMPSON AND SECONDED BY COUNCILOR CAPALBO TO APPROVE CONSENT AGENDA AS FOLLOWS: Approve Town Council Meeting Minutes of April 20, 2009; Town Council Meeting Minutes of May 4, 2009; Accept the following reports: Animal Control Official, Town Clerk, Tax Collector – including adjustments & collections to date.

IN FAVOR: Buck, Thompson, Kenney, Capalbo, Felkner

OPPOSED: None

SO VOTED

Councilor Capalbo questioned why the dispatcher's salary line item was currently at 101%. Mr. DiLibero responded it was the result of overtime necessitated from people being out, requiring fill-ins. He noted dispatcher overtime was not dealt with as it was the police department.

Councilor Kenney requested a correction to the May 18, 2009 transcript so that the last name Peckham was correctly spelled.

A MOTION WAS MADE BY COUNCILOR KENNEY AND SECONDED BY COUNCILOR THOMPSON TO ACCEPT THE REPORT OF THE FINANCE DIRECTOR AND ACCEPT THE COURT TRANSCRIPT OF MAY 18, 2009 AS THE RECORD OF THE MEETING PERTAINING TO THE ZONING ORDINANCE TEXT AMENDMENT FILED BY NATIONAL GRID WITH CORRECTIONS.

IN FAVOR: Buck, Thompson, Kenney, Capalbo, Felkner

OPPOSED: None

SO VOTED

PUBLIC FORUM

Tim Ward of River Road stated he did not recall during the first zoning text amendment hearing regarding National Grid considering expansion of the Oak Street facility and stated electric company facilities of this nature in Glastonbury, CT were taller, but had a smaller footprint; noted Councilor Thompson had questioned lot size in manufacturing zones and that Connecticut Light & Power handled the size of substation as a ratio, based on the size of the facility; he suggested a consideration of installing electric facilities underground as there had been in the State of New York and California. He stated this would not be cheap but aesthetically it would look like the ISDS mound in Crandall Field.

Linda Barton of 108 Main Street reported her property was 300 feet from the proposed location of the substation. She stated she was aware that in the future additional power stations would be necessary, but did not feel it was acceptable in that location. She stated she had signed a petition with 170 others that was

representative of how they felt about the proposed zoning ordinance text change. She felt the text change would open up the Town to more transformer stations in residential zones which would radically change residential zones and result in spot zoning. She stated she had hoped to have an expert witness present to offer his services but he had not arrived yet. She stated the text change would open up the neighborhood to potential decreases in property value, safety issues and pollution to groundwater. She stated she did not know if there would be PCB's or any type of oils would be used at the substation and added that even vegetable oil was combustible. She stated the proposed the location was in or near an aquifer and was concerned there could be leaching of pollutants into the groundwater from the site. She noted the existence of feeder lines from Connecticut that appeared would connect to those at the proposed site. She suggested the Council look into a potential hazardous waste clean up on Narragansett Way as there is abandoned equipment and gas tanks that had been left on the site. She questioned if National Grid would be responsible enough to clean it up.

Roger Kenyon of River Road thanked the Council for their time and deliberation on such a difficult matter. He commented that a substation in this area was illogical in this instance resulting in the requirement for this neighborhood to carry a burden as a result of development at Exit 1, which was of prime concern to current residents. He noted a substantial portion would benefit the Town of Westerly. He felt National Grid should consider the 72 acre site off of Narragansett Way and that they had shown a disregard for the 6 acre site which contained ponds and possible wetlands.

Sandra Neugent of Alton Bradford Road reported that she had been informed that National Grid was considering the purchase of 42 acres in Ashaway and that surveying had been done and was worth investigation. Mr. Ward suggested that this property was in proximity to Amelia Street.

James Sloane, Esq. was present and entered his appearance. He stated he was present at the request of Linda Barton and indicated he had testified at various

hearings of this nature in other Towns in Rhode Island including whether granting the amendment would create a diminution of property values. He reported he had looked over the proposed amendment, had viewed the proposed site and could render an opinion if requested.

TOWN SOLICITOR REPORT

Town Solicitor Buckley reported that during the last meeting a dark sky ordinance was requested; that Town Planner James Lamphere had drawn a draft ordinance which had been passed to Solicitor Levesque; reported that the lights that had been on continuously on the Oak Street electric substation were now off; reported her law firm had undergone a name change and was now called Bengtson and Jestings.

COUNCIL PRESIDENT REPORT

Town Council President Thomas Buck reported he had been researching matters regarding the National Grid Petition and the possibility of locating it on Narragansett Way; reported the negotiations on the Clerical and Professional-Technical Contract were completed.

TOWN MANAGER REPORT

Town Manager William DiLibero reported on his involvement with the Council President negotiating pending contracts; that he was continuing to meet with Sergeant Lyman and Officer Cole regarding the police contract; had met with Daniel Kinder, Esq. in preparation for the Mauti arbitration; had attended the Senate hearing at the State House pertaining to the elimination of the Caruolo Act; had forwarded the proposals for the 1904 elementary school reuse which reflected a slight decrease in fees; had attended a meeting of the RI League of Cities & Towns; a meeting with the RI Foundation and local officials at the Washington Trust pertaining to funding opportunities; attended a labor and management seminar at Providence College; In regards to the double pole issue, he stated Public Works Director Doug Reese had reported to him that 33 poles had been taken care of with another 18 more ready for Verizon and the Cox Cable Company to move their lines. Councilor Kenney questioned if there was anything more that could be done to encourage Verizon to move their lines. Mr. DiLibero responded the Town could file a complaint to the Public Utilities Commission

(PUC). Councilor Thompson questioned when the draft graded bank ordinance could move forward. Mr. DiLibero responded he would speak to Town Planner James Lamphere the following day. Councilor Thompson stated she would like to see a workshop scheduled in August on the gravel bank ordinance.

Council President Buck stated it had been a pleasure working with Mr. DiLibero, who was leaving to take the Charlestown Administrators post. Councilor Thompson noted Mr. DiLibero had been a nice fit for Hopkinton. This was Mr. DiLibero's last meeting and the Council wished him well.

OLD BUSINESS

TOWN BILLS

There were three additions to the bills list: \$10,626.06 to Yardworks from CDBG funds for the Depot Square Park; \$85.00 to Charlestown Computers; \$292.69 to the Westerly Sun.

A MOTION WAS MADE BY COUNCILOR KENNEY AND SECONDED BY COUNCILOR CAPALBO TO AUTHORIZE THE FINANCE DEPARTMENT TO PAY THE TOWN BILLS WITH THE ADDITIONS OF VOUCHERS IN THE AMOUNTS OF \$10,626.06 TO YARDWORKS; \$85.00 TO CHARLESTOWN COMPUTERS; AND \$292.69 TO THE WESTERLY SUN, AND NO DELETIONS.

IN FAVOR: Buck, Thompson, Kenney, Capalbo, Felkner

OPPOSED: None

SO VOTED

RENOVAL LIGHTING SYSTEMS, INC. TAX STABILIZATION

Mr. DiLibero reported he had spoken to the owners of Renova Lighting Systems. They were requesting meet with the Council on July 20, 2009. He reported they would meet with the Town Planner regarding their landscape and lighting plans. The Renova Lighting Systems, Inc. tax stabilization status regarding compliance with their landscaping and lighting design was continued to July 20, 2009.

ONSITE WASTEWATER MANAGEMENT PLAN

This matter had been scheduled for discussion and approval of Hopkinton's Onsite Wastewater Management Plan (OWMP). Community Development Block Grant Coordinator Geoffrey Marchant was present. Fuss & O'Neill Senior Project Manager M. James Riordan was present. The development of the onsite wastewater management plan had been developed in conjunction with the Town's of Exeter and Richmond. Approval of a plan would provide access to low interest loans for residents with an interest rate of 2% for systems up to \$30,000.00 with a ten year term. The Town's had received a grant from the RIDEM back in 2001/2002 and the grant agreement would be closed out June 30, 2009. Town Solicitor Patricia Buckley had reviewed the OWMP. The OWPM describes how septic systems are to be managed. A reciprocal activity brochure was anticipated to be sent out with the annual tax bills and would explain the importance of maintenance, inspections, pump-out of septic systems every three to five years. The RI Cleanwater Finance Agency will be the agency to cut the loan agreements and would partner with RI Housing. The Town's responsibility would be if someone defaulted on a loan the Town would be required to make the loan payments back to the RI Cleanwater Finance Agency but the default rate was low, so there was minimal risk involved. Councilor Felkner questioned the requirements for the loan; whether labor law requirements, prevailing wage requirements, Davis Bacon Act, etc. would have to be adhered to. Mr. Riordan responded, no as it would be handled as third party. Councilor Felkner expressed some trepidation on the program as he was aware of situations with individuals who had been involved with the lead abatement program and it was found that the consumer had no power and no one to complain to. Mr. Marchant stated he too had concerns but they were very minor concerns. He stated the OWMP would make sure people got the best price for a septic system and RI Housing would approve the loan based on Town standards and underwriting criteria. He stated any contractor can design and/or repair a system. RI Housing only reviewed the application. The certificate of conformance would come from the RIDEM and the check would be cut by the RI Cleanwater Finance Agency. Councilor Felkner questioned if Mr. Marchant could provide him with a copy of the loan agreement. Councilor Capalbo asked if there were three bids for a septic repair/replacement,

would the lowest bid be chosen. Mr. Marchant stated it was contingent upon RIDEM approval of the design. It would be rebid otherwise. Councilor Capalbo questioned the grievance procedure if the job was of poor quality. Mr. Marchant stated the RIDEM would be involved and proof of system failure would be necessary. Councilor Kenney noted that it had nothing to do with the present procedure to approve the OWMP. Council President Buck noted those questions would not be dealt with now and asked what Mr. Marchant required of the Council. Mr. Marchant stated he needed approval of the Onsite Wastewater Management Plan so that it could be submitted to the RIDEM and RI Cleanwater Finance Agency. He suggested at some point the Council could have those agencies come down to address them regarding default rates and other questions from the Town Council. Mr. Marchant stated Town approval of the OWMP would fulfill the obligation to the RIDEM under the grant. Mr. DiLibero questioned if there was a risk to the Town regarding compliance with the financing program. Mr. Riordan responded no, the plan allowed for a range of septic management including septic system maintenance, public education and outreach. Councilor Felkner stated he could not support approval of the plan until he saw the loan agreement. Mr. Marchant stated approval of the plan did not automatically open the door to the financing. He stated it might be possible to get an extension of time on the grant. Mr. Riordan stated approving the plan it would keep the ball in the court for the Town and noted there was a verbal agreement from the Director that he would sunset the grant but there was no guarantee. Councilor Felkner stated he had an issue regarding if a septic was determined to be failed. Mr. Riordan explained that if the RIDEM issued notice of a failed septic system, the resident could have access to a low interest loan to repair the system. Councilor Thompson noted that this was just a plan, there was no cost to the Town because it was voluntary but it would allow access to low interest 2% loans. She felt the Town should move forward with the plan for residents who choose to fix their septic system. Councilor Felkner questioned if there would be means testing to determine eligibility as it would be a tax-subsidized loan. Mr. Marchant stated funding would be from the State revolving fund money. He noted capital improvement loans used to be at 4% and were now at 2% because of all the fish

kills in the past. Councilor Capalbo noted the default rate information was not available and felt the Council would need it. Councilor Thompson stated if a person defaulted and the Town ended up having to pay the loan the Town would place a lien on the property owner.

A MOTION WAS MADE BY COUNCILOR THOMPSON AND SECONDED BY COUNCILOR KENNEY TO ADOPT THE HOPKINTON ONSITE WASTEWATER MANAGEMENT PLAN.

IN FAVOR: Buck, Kenney, Thompson

OPPOSED: Capalbo, Felkner

MOTION CARRIED

PENDING LEGISLATION

This item had been continued from May 18, 2009 to allow Councilor Thompson to be present in the discussion on whether to support the elimination of the straight party on the ballot. Councilor Felkner supported this legislation as he felt voters should think about whom they were voting for. He noted voting the straight party ticket can negate a vote on the ballot.

A MOTION WAS MADE BY COUNCILOR THOMPSON AND SECONDED BY COUNCILOR CAPALBO TO ENDORSE THE ELIMINATION OF THE STRAIGHT PARTY BALLOT.

IN FAVOR: Thompson, Kenney, Capalbo, Felkner

OPPOSED: Buck

SO VOTED

FINANCIAL RESOLUTIONS:

RESOLUTION NO. 1

RESOLVED: In accordance with R.I.G.L. 44-5-2(c) (4), that the electors of the Town of Hopkinton qualified to vote on any proposal to impose a tax or for the expenditure of money, in a Town Financial Referendum, lawfully assembled on the 9th day of June A.D. 2009, adopted a budget for Fiscal Year 2009-2010 that is within the maximum tax levy authorized by Section 44-5-2 and imposed upon the Town. The estimated tax rate for 2009-2010 is \$14.79, an increase of 2% over the current rate of \$14.50. The tax rate for Motor Vehicles is \$21.18 according to R.I.G.L. 44-34.1-1, the tax rate for Tangible Property is \$14.79.

A MOTION WAS MADE BY COUNCILOR KENNEY AND SECONDED BY COUNCILOR CAPALBO TO ADOPT FINANCIAL RESOLUTION NO. 1.

IN FAVOR: Buck, Thompson, Kenney, Capalbo, Felkner

OPPOSED: None

SO VOTED

RESOLUTION NO. 2

RESOLVED: the voters of the Town of Hopkinton in consideration of the questions on the June 9, 2009 Town Financial Referendum Ballot did approve the following:

Local Question 1 – Earmarking the remaining balance of the following Line Items from the Fiscal Year 08/09 Public Works Department with 90% to be earmarked for the Public Works Capital Projects Account #02-620-5060 and 10% to be earmarked for the Public Works Snow Removal Account #03-600-2851: Repairs & Maintenance Line Item #5300; Repairs & Maintenance Equipment Line Item #5310; Repair & Maintenance Roads Line Item #5320; Repairs & Maintenance Vehicles Line Item #5330; Street Signs Line Item #5360 and Capital Equipment Line Item #6000; and

Local Question 2 – Earmarking the balance of the Sick Leave Fund Line Item #01-000-415 in Fiscal Year 2008/2009 in the estimated amount of \$10,000.00 for the Benefits Reserve Account #03-001-3405; and

Local Question 3 - Earmarking the balance of the Animal Control Vehicle Capital Account Line Item #01-410-5335 in the 2008/2009 Fiscal Year estimated at \$5,000.00 for a Capital Account for an Animal Control Vehicle; and

Local Question 4 – Authorization to borrow an amount not to exceed Two Million Dollars (\$2,000,000.00) for the acquisition and preservation of open space by the Hopkinton Land Trust and approving the financing thereof through the issuance of bonds and/or notes of the Town.

A MOTION WAS MADE BY COUNCILOR KENNEY AND SECONDED BY COUNCILOR CAPALBO TO ADOPT FINANCIAL RESOLUTION NO. 2.

IN FAVOR: Buck, Thompson, Kenney, Capalbo

OPPOSED: Felkner

SO VOTED

RESOLUTION NO. 3

RESOLVED: That the Town Finance Director be and is hereby authorized and empowered to credit to any appropriations fund any receipts or donations which apply against that fund and all others not so designated to the General Fund.

A MOTION WAS MADE BY COUNCILOR KENNEY AND SECONDED BY COUNCILOR THOMPSON TO ADOPT FINANCIAL RESOLUTION NO. 3.

IN FAVOR: Buck, Thompson, Kenney, Capalbo, Felkner

OPPOSED: None

SO VOTED

RESOLUTION NO. 4

RESOLVED: That the several appropriations specified be expended under the direction and supervision of the Town Council, except those pertaining to public schools, bills payable, and interest which sum shall be disbursed and paid out by the Town Finance Director.

A MOTION WAS MADE BY COUNCILOR KENNEY AND SECONDED BY COUNCILOR CAPALBO TO ADOPT FINANCIAL RESOLUTION NO. 4.

IN FAVOR: Buck, Thompson, Kenney, Capalbo, Felkner

OPPOSED: None

SO VOTED

RESOLUTION NO. 5

RESOLVED: That the Town Finance Director of the Town of Hopkinton be and is hereby authorized and empowered to borrow upon the credit of the Town as the same may be necessary during the present Fiscal Year such sum or sums as may be required to meet the expenses and obligations of the Town, provided however, that such loans shall not at any time exceed the sum of one million five hundred thousand dollars (\$1,500,000.00).

A MOTION WAS MADE BY COUNCILOR KENNEY AND SECONDED BY COUNCILOR CAPALBO TO ADOPT FINANCIAL RESOLUTION NO. 5.

IN FAVOR: Buck, Thompson, Kenney, Capalbo, Felkner

OPPOSED: None

SO VOTED

RESOLUTION NO. 6

RESOLVED: That the over-expenditures in the 2008-2009 Fiscal Year Budget, identified by the Town Finance Director, are hereby approved.

Councilor Capalbo stated she opposed this resolution to fill in the over-expenditure instead of staying within their budget as she felt it allowed all departments to overspend. Councilor Kenney stated the Town could not close out the year in the red. Agnes Hall from the Finance Office stated departments do not usually go over budget. She stated this year the Town was struggling with low revenues. Councilor Capalbo felt certain departments consistently overspend and referred to the dispatchers who were over budget. Ms. Hall noted that most often it was a problem with revenues. Mr. DiLibero stated it was a difficult situation when it involved public safety and emergency services He stated two dispatchers had been out due to surgery. He noted another situation was related to snow removal; that funds had to be moved around within the departments this year to cover costs. He stated the Town could not stop plowing snow. Councilor Felkner wondered if there was another way to deal with the problem and expressed concern on how the Town would address the problem if revenues tanked. Council President Buck stated there was a bottom line and Councilor Thompson wanted the Council to keep in mind that the dispatchers were under the police department

budget and that bottom line. Town Solicitor Patricia Buckley stated the Town was required to balance at the end of the year.

A MOTION WAS MADE BY COUNCILOR THOMPSON AND SECONDED BY COUNCILOR KENNEY TO MOVE THE QUESTION.

IN FAVOR: Buck, Thompson, Kenney, Capalbo, Felkner

OPPOSED: None

SO VOTED

A MOTION WAS MADE BY COUNCILOR KENNEY AND SECONDED BY COUNCILOR FELKNER TO ADOPT FINANCIAL RESOLUTION NO. 6.

IN FAVOR: Buck, Thompson, Kenney

OPPOSED: Capalbo, Felkner

SO VOTED

TAX RESOLUTION

RESOLVED: That the Town Council of the Town of Hopkinton based on the budget and warrants approved on June 9, 2009, hereby impose a tax levy at a Town Council Meeting held this 15th day of June 2009, and order the apportionment and collection of a tax on the ratable real estate and tangible personal property in a sum not less than \$15,750,000.00 and not more than \$16,050,000.00. Said tax is for ordinary expenses and charges of the Town, for payment of interest and indebtedness, and for the purposes authorized by Law. The assessor shall apportion said respective taxes upon the assessed valuations of the ratable property of said Town as determined by the said Assessor of the Town as of the 31st day of December A.D. 2008, at twelve o'clock midnight, according to Law. The said respective Tax Levies shall be applied to the assessment roll as aforesaid and the resulting tax roll certified by the Assessor to the Town Clerk not later than the thirtieth day of June A.D. 2009. The Town Clerk on receipt of said completed tax roll shall forthwith make a copy of the same and deliver it to the Town Finance Director, who shall forthwith issue and affix to said copy a Warrant under her hand, directed to the Collector of Taxes of said Town, commanding her to proceed and collect said taxes of the persons and estates liable therefore. Said Taxes shall be due and payable on and between the first day of August and the fifteenth day of September A.D. 2009 next, and/or may be paid in equal quarterly installments, the first installment of twenty-five per centum on or before the fifteenth day of September A.D. 2009, and the remaining installments as follows:

Twenty-five per centum on the fifteenth day of December A.D. 2009, twenty-five per centum on the fifteenth day of March A.D. 2010 and twenty-five per centum on the fifteenth day of June A.D. 2010. Each installment of taxes, if paid on or before the last day of each installment period, successively and in order shall be free from all charge for interest.

EXCEPTING HOWEVER, that where the combined total of said tax and additional tax levied is an amount not in excess of one hundred dollars (\$100.00) it shall be due and payable in a single installment on and between the first day of August and the fifteenth day of September A.D. 2009.

If the first installment or any succeeding installment of taxes is not paid by the last date of the respective installment period, or periods, as they occur, then the unpaid quarterly payments shall be due and payable immediately and shall bear

interest on any unpaid quarterly payments at the rate of twelve (12) per centum, per annum.

RESOLVED: That the Collector of Taxes shall collect and pay unto this Town's Treasury, as the same is collected, the tax this day ORDERED.

A MOTION WAS MADE BY COUNCILOR KENNEY AND SECONDED BY COUNCILOR CAPALBO TO ADOPT THE TAX RESOLUTION.

IN FAVOR: Buck, Thompson, Kenney, Capalbo, Felkner

OPPOSED: None

SO VOTED

NEW BUSINESS

INTERVIEWS – APPOINTMENTS – RESIGNATIONS:

Planning Board Alternate

A MOTION WAS MADE BY COUNCILOR CAPALBO AND SECONDED BY COUNCILOR THOMPSON TO APPOINT DONALD SIMMONS AS PLANNING BOARD ALTERNATE.

IN FAVOR: Buck, Thompson, Capalbo, Felkner

OPPOSED: None

ABSTAIN: Kenney

SO VOTED

Zoning Board of Review Alternate

A motion was made by Councilor Thompson and seconded by Councilor Buck to appoint C. Wrigley Bynum as Zoning Board of Review alternate which led to discussion: Councilor Capalbo noted the interview with Mr. Bynum was a good one, she felt he was a nice man but he had only been in Town since September 2008. She felt it would be beneficial for a person appointed to the zoning board to be here longer and suggested he may wish to serve on another board or commission. She felt it may be premature to appoint him to the Zoning Board. Councilor Felkner stated it would be better to appoint him to a different board or commission. Council President Buck felt he had interviewed well and it would not matter if he had been in Town only nine months as the appointee would have to follow the letter of the law specified in the zoning regulations. Discussion ended and the Council proceeded to vote as follows:

A MOTION WAS MADE BY COUNCILOR THOMPSON AND SECONDED BY COUNCILOR BUCK TO APPOINT C. WRIGLEY BYNUM AS ZONING BOARD OF REVIEW ALTERNATE.

IN FAVOR: Buck, Thompson

OPPOSED: Felkner, Capalbo

ABSTAIN: Kenney

MOTION FAILED

A motion was made by Councilor Capalbo and seconded by Councilor Felkner to appoint Brian Steverman as Zoning Board of Review Alternate which led to discussion: Councilor Thompson did not feel it would be appropriate to appoint him. Councilor Capalbo noted he had lived in Town for many years and was interested in giving back, had worked as an engineer and coach, was quiet, thoughtful, balanced and had a calm nature. Councilor Felkner did not feel he should be guilty by association regarding his references on his application, it was an issue. Discussion ended and the Council proceeded to vote as follows:

A MOTION WAS MADE BY COUNCILOR CAPALBO AND SECONDED BY COUNCILOR FELKNER TO APPOINT BRIAN STEVERMAN AS ZONING BOARD OF REVIEW ALTERNATE.

IN FAVOR: Felkner, Capalbo

OPPOSED: Buck, Thompson

ABSTAIN: Kenney

MOTION FAILED

Councilor Kenney had abstained from voting on the last three appointments as she had not been present during the interviews for any of these individuals.

JOINT TOWN COUNCIL & PLANNING BOARD WORKSHOP

The Council set June 22, 2009 at 6:30 PM as a date for Joint Town Council and Planning Board Workshop regarding the Comprehensive Plan.

INTERIM TOWN MANAGER

Councilor Thompson stated a few names that had been floated to serve as interim Town Manager included David Holt and Elwood Johnson. She reported she had spoken to Mr. Holt and Mr. Johnson to consider serving as the Interim Town

Manager and both had declined. She stated she had called M. Linda Urso, who had agreed to come in and talk to the Town Council. Solicitor Buckley commented that Ms. Urso was the Probate Judge. Councilor Thompson stated that she was not an employee of the Town. She received a stipend for the position of Probate Judge. Mr. DiLibero noted he had approached Doug Reese but could not because Mr. Reese did not have a clerk to assist him. The Council will interview M. Linda Urso in executive session on June 22, 2009.

BUDGET STATUS

Council President Buck questioned the status of the budget for FY ending 08/09. Agnes Hall from the Finance Office stated we were close, the Finance Director was finalizing the numbers.

Town Solicitor Patricia Buckley left the meeting.

CORRESPONDENCE

No correspondence was discussed.

PUBLIC FORUM

No one spoke during the second public forum

EXECUTIVE SESSION

A MOTION WAS MADE BY COUNCILOR KENNEY AND SECONDED BY COUNCILOR CAPALBO TO ENTER INTO EXECUTIVE SESSION UNDER RIGL 42-46-5A (2) POTENTIAL LITIGATION; (2) COLLECTIVE BARGAINING – POLICE CONTRACT, PROFESSIONAL & TECHNICAL CONTRACT, CLERICAL CONTRACT.

POLL VOTE:

IN FAVOR: Buck, Thompson, Kenney, Capalbo, Felkner

OPPOSED: None

SO VOTED

A MOTION WAS MADE BY COUNCILOR AND SECONDED BY COUNCILOR TO RECONVENE IN OPEN SESSION AND SEAL THE MINUTES OF THE EXECUTIVE SESSION.

IN FAVOR: Buck, Thompson, Kenney, Capalbo

OPPOSED: Felkner

SO VOTED

ADJOURNMENT

A MOTION WAS MADE BY COUNCILOR KENNEY AND SECONDED BY
COUNCILOR FELKNER TO ADJOURN.

SO VOTED

Elizabeth J. Cook-Martin

Town Clerk

Appendix B

Cesspool Phaseout Act of 2007

Chapter 136
2007 -- H 5037 SUBSTITUTE B AS AMENDED
Enacted 06/27/07

A N A C T
RELATING TO HEALTH AND SAFETY - RHODE ISLAND CESSPOOL ACT
OF 2007

Introduced By: Representatives Walsh, Ginaitt, Handy, Long, and Dennigan
Date Introduced: January 10, 2007

It is enacted by the General Assembly as follows:

SECTION 1. Title 23 of the General Laws entitled "HEALTH AND SAFETY" is hereby amended by adding thereto the following chapter:

CHAPTER 19.15

THE RHODE ISLAND CESSPOOL ACT OF 2007

23-19.15-1. Short title. -- This chapter shall be known and may be cited as the "Rhode Island Cesspool Act of 2007."

23-19.15-2. Legislative findings. -- The general assembly hereby recognizes and declares that:

(1) There exists within certain portions of the state the need to abate pollution and threats to public health caused by cesspools, particularly high-risk cesspools that pose direct threats to public health and the environment.

(2) It is estimated that there are more than fifty thousand (50,000) cesspools within the state as of 2006.

(3) Cesspools are a substandard and often inadequate means of sewage treatment and disposal.

(4) Many cesspools contribute directly to groundwater and surface water contamination.

(5) Wastewater disposed from cesspools contains bacteria, viruses, ammonium and other pollutants with high biochemical oxygen demand, and may also include phosphates, chlorides, grease, and chemicals used to clean cesspools.

(6) Wastewater disposed from cesspools frequently exceeds drinking water health standards for certain contaminants.

(7) Wastewater disposed from cesspools can pose significant health threats to people who come into contact with, or consume, contaminated surface waters or groundwaters.

(8) Appropriate treatment of sewage disposed into the ground is essential to the protection of public health and the environment, particularly in relation to Narragansett Bay and the rest of the state's coastal region, and public drinking water resources.

(9) Replacement of cesspools with modern ISDS technology reduces risks to public health and the environment.

(10) In sewerred areas, sewer tie-ins offer a readily available, low-cost means of mitigating problems and threats caused by cesspools.

(11) A fund exists to assist homeowners with the costs of removing cesspools and inadequate septic systems and replacing them with an approved ISDS if the community in which the homeowner resides has created a wastewater management district in accordance with chapter

45-24.5.

23-19.15-3. Declaration of purpose. -- The purpose of this chapter is to phase-out use of cesspools that present the highest risk to public health and/or the environment – namely, cesspools located in close proximity to tidal water areas and public drinking waters. Additionally, this chapter is intended to allow for the identification and assessment of cesspools on all properties throughout the state that are subject to sale, and to phase-out any such cesspools that are found to be failed.

23-19.15-4. Definitions. -- For the purposes of this chapter the following terms shall mean:

(1) "Cesspool" means any buried chamber other than an individual sewage disposal system, including, but not limited to, any metal tank, perforated concrete vault or covered hollow or excavation, which receives discharges of sanitary sewage from a building for the purpose of collecting solids and discharging liquids to the surrounding soil.

(2) "Department" means the department of environmental management as established in chapter 42-17.1.

(3) "Director" means the director of the department of environmental management or his or her designee.

(4) "Failed cesspool" means a cesspool where one or more of the following conditions exist: (i) the cesspool fails to accept or dispose of sewage, as evidenced by sewage at the ground surface above or adjacent to the cesspool, or in the building served; (ii) the liquid depth in a cesspool is less than six (6) inches from the inlet pipe invert; (iii) pumping is required more than two (2) times a year; (iv) the cesspool is shown to have contaminated a drinking water well or watercourse; or (v) there is shown to be direct contact between the bottom of the cesspool and the groundwater table.

(5) "Individual sewage disposal system" or "ISDS" means any system of piping, tanks, disposal areas, alternative toilets or other facilities designed to function as a unit to convey, store, treat and/or dispose of sanitary sewage, by means other than discharge into a public sewer system.

(6) "System inspector" means a person approved by the department as capable of properly assessing the condition of an ISDS.

23-19.15-5. Inspection. -- (a) Unless exempted under subsection 23-19.15-8(a), the owner of property served by a cesspool in the following areas shall cause an inspection to be performed on said cesspool by a system inspector in accordance with a schedule established by the department, but no later than January 1, 2012:

(i) which cesspool is within two hundred feet (200) of the inland edge of a shoreline feature bordering a tidal water area [corresponding to the jurisdiction of the RI Coastal Resources Management Council];

(ii) which cesspool is within two hundred feet (200) of a public drinking water well; and

(iii) which cesspool is within two hundred feet (200) of a surface drinking water supply, specifically the impoundment from which water is drawn via the intake.

The inspection shall be conducted and reported in accordance with procedures required by the department, and the results shall be recorded on forms prescribed by the department.

(b) Pursuant to section 5-20.8-13, every contract for the purchase and sale of real estate which is or may be served by a private cesspool, shall provide that potential purchasers be permitted a ten (10) day period, unless the parties mutually agree upon a different period of time, to conduct an inspection of the property's on-site sewage system in accordance with procedures required by the department in subsection 23-19.15-5(a), before becoming obligated under the contract to purchase.

23-19.15-6. Cesspool removal and replacement. -- (a) Cesspools found to be located within the areas identified in subsection 23-19.15-5(a) above shall cease to be used for sewage disposal and shall be properly abandoned in accordance with the following schedule:

(1) Tier 1 – Any cesspool deemed by the department or a system inspector to be failed in accordance with this chapter shall be properly abandoned within one year of discovery unless an immediate public health hazard is identified, in which case the director may require a shorter period of time.

(2) Tier – 2 Any cesspool located on a property which has a sewer stub enabling connection to a public sewer shall be properly abandoned, and the building served by the cesspool shall be connected into the sewer system of such premises with such sewer and fill up and destroy any cesspool, privy vault, drain or other arrangement on such land for the reception of sewage, excluding any Rhode Island department of environmental management ISDS approved system, prior to the one year anniversary of the sale in ownership. If such abutting owner or occupant of land who is required to connect to the sewage system fails to do so in prescribed time period, then such abutting owner or occupant of land shall be required to pay usage fees as if such abutting owner or occupant of land were connected to the sewage system.

(3) Tier 3 – Any cesspool within two hundred feet (200) of a public drinking water well, or within two hundred feet (200) of the inland edge of a shoreline feature bordering a tidal water area [corresponding to the jurisdiction of the RI Coastal Resources Management Council], or within two hundred feet (200) of a surface drinking water supply [specifically, the impoundment from which water is drawn via the intake], shall be properly abandoned by January 1, 2013, excluding those properties subject to section (a)(2) above.

(b) Any cesspool required to be abandoned pursuant to this chapter shall be replaced with an approved ISDS, or the building served by the cesspool shall be connected to a public sewer, prior to the applicable deadlines contained in subsection 23-19.15-6(a).

23-19.15-7. Waiver. -- The director may grant a waiver, to the extent necessary, from applicable provisions listed in subsection 23-19.15-6(a) provided the homeowner demonstrates undue hardship and the cesspool is not a failed system as defined herein. No waiver shall exceed five (5) years from the dates specified in subsection 23-19.15-6(a). Any waiver granted shall expire upon transfer or sale of the land or easement upon which the cesspool is located.

23-19.15-8. Exemption. -- (a) The provisions of section 23-19.15-5 and subsection 23-19.15-6(a) shall not apply to any cesspool located in an area of a community covered by municipal on-site wastewater management ordinance that requires the risk-based phase-out of cesspools on an alternative schedule that meets the purposes of this act.

(b) The provisions of subsection 23-19.15-6(a) shall not apply to any cesspool located on a property that is properly designated to be sewered no later than five (5) years after the applicable deadlines provided in subsection 23-19.15-6(a) provided: (i) it is not a failed cesspool as defined herein; (ii) the owner does not increase the design sewage flow into the cesspool or add bedrooms to the building served by the cesspool; (iii) the municipality holds bonding authorization or some other dedicated financial surety for expansion of sewers to the area of the building served by the cesspool; and (iv) the property owner certifies, in writing, that the dwelling/building will be connected to the sewer system within six (6) months of receipt of the notification to connect to the sewer system.

23-19.15-9. Notice to remove and replace cesspools. -- (a) The owner of any cesspool who has not complied with the requirements pursuant to this chapter shall be in violation of this chapter and subject to enforcement action by the department in accordance with chapters 42-17.1-2 and 42-17.6 of the general laws.

(b) Notwithstanding the above provisions, the director may require the abandonment and replacement of any cesspool with an approved ISDS prior to the dates specified in subsection 23-19.15-6(a) if the cesspool is a large capacity cesspool as defined pursuant to applicable federal regulations governing underground injection control (UIC) facilities.

23-19.15-10. Regulations. -- The department shall promulgate rules and regulations as may be necessary to implement and carry out the provisions of this chapter.

23-19.15-11. Severability and construction. -- The provisions of this chapter shall be severable, and if any court declares any phrase, clause, sentence, or provision of this chapter to be invalid, or its applicability to any government, agency, person, or circumstance is declared invalid, the remainder of the chapter and its relevant applicability shall not be affected. The provisions of this chapter shall be liberally construed to give effect to the purposes thereof.

SECTION 2. Section 5-20.8-2 of the General Laws in Chapter 5-20.8 entitled "Real Estate Sales Disclosures" is hereby amended to read as follows:

5-20.8-2. Disclosure requirements. -- (a) As soon as practicable, but in any event no later than prior to signing any agreement to transfer real estate, the seller of the real estate shall deliver a written disclosure to the buyer and to each agent with whom the seller knows he or she or the buyer has dealt in connection with the real estate. The written disclosure shall comply with the requirements set forth in subsection (b) of this section and shall state all deficient conditions of which the seller has actual knowledge. The agent shall not communicate the offer of the buyer until the buyer has received a copy of the written disclosure and signed a written receipt of the disclosure. If the buyer refuses to sign a receipt pursuant to this section, the seller or agent shall immediately sign and date a written account of the refusal. The agent is not liable for the accuracy or thoroughness of representations made by the seller in the written disclosure or for deficient conditions not disclosed to the agent by the seller.

(b) (1) The Rhode Island real estate commission may approve a form of written disclosure as required under this chapter or the seller may use a disclosure form substantially conforming to the requirements of this section. The following provisions shall appear conspicuously at the top of any written disclosure form: "Prior to the signing of an agreement to transfer real estate (vacant land or real property and improvements consisting of a house or building containing one to four (4) dwelling units), the seller is providing the buyer with this written disclosure of all deficient conditions of which the seller has knowledge. This is not a warranty by the seller that no other defective conditions exist, which there may or may not be. The buyer should estimate the cost of repair or replacement of deficient conditions prior to submitting an offer on this real estate. The buyer is advised not to rely solely upon the representation of the seller made in this disclosure, but to conduct any inspections or investigations which the buyer deems to be necessary to protect his or her best interest." Nothing contained in this section shall be construed to impose an affirmative duty on the seller to conduct inspections as to the condition of this real estate.

(2) The disclosure form shall include the following information:

- (i) Seller Occupancy -- (Length of Occupancy)
- (ii) Year Built
- (iii) Basement -- (Seepage, Leaks, Cracks, etc. Defects)
- (iv) Sump Pump -- (Operational, Location, and Defects)
- (v) Roof (Layers, Age and Defects)
- (vi) Fireplaces -- (Number, Working and Maintenance, Defects)
- (vii) Chimney -- (Maintenance History, Defects)
- (viii) Woodburning Stove -- (Installation Date, Permit Received, Defects)

(ix) Structural Conditions -- (Defects)
(x) Insulation -- (Wall, Ceiling, Floor, UFFI)
(xi) Termites or other Pests -- (Treatment Company)
(xii) Radon -- (Test, Company) "Radon has been determined to exist in the State of Rhode Island. Testing for the presence of radon in residential real estate prior to purchase is advisable."

(xiii) Electrical Service -- (Imp. & Repairs, Electrical Service, Amps, Defects)
(xiv) Heating System -- (Type, Imp. & Repairs, Underground Tanks, Zones, Supplemental Heating, Defects)
(xv) Air Conditioning -- (Imp. & Repairs, Type, Defects)
(xvi) Plumbing -- (Imp. & Repairs, Defects)
(xvii) Sewage System -- (Assessment, Annual Fees, Type, Cesspool/Septic Location, Last Pumped, Maintenance History, Defects)

"Potential purchasers of real estate in the state of Rhode Island are hereby notified that many properties in the state are still serviced by cesspools as defined in Rhode Island general law chapter 23-19.15 (The Rhode Island Cesspool Phase-Out Act of 2007). Cesspools are a substandard and inadequate means of sewage treatment and disposal, and cesspools often contribute to groundwater and surface water contamination. Requirements for abandonment and replacement of high-risk cesspools as established in Rhode Island general law Chapter 23-19.15 are primarily based upon a cesspool's non-treatment of wastewater and the inherent risks to public health and the environment due to a cesspool's distance from a tidal water area, or a public drinking water resource. Purchasers should consult Rhode Island general law chapter 23-19.15 for specific cesspool abandonment or replacement requirements. An inspection of property served by an on-site sewage system by a qualified professional is recommended prior to purchase. Pursuant to Rhode Island general law section 5-20.8-13, potential purchasers shall be permitted a ten (10) day period to conduct an inspection of a property's sewage system to determine if a cesspool exists, and if so, whether it will be subject to the phase-out requirements as established in Rhode Island general law chapter 23-19.15.

(xviii) Water System -- (Imp. & Repairs, Type, Defects) Private water supply (well).
"The buyer understands that this property is, or will be served, by a private water supply (well) which may be susceptible to contamination and potentially harmful to health. If a public water supply is not available, the private water supply must be tested in accordance with regulations established by the Rhode Island department of health pursuant to section 23-1-5.3. The seller of that property is required to provide the buyer with a copy of any previous private water supply (well) testing results in the seller's possession and notify the buyer of any known problems with the private water supply (well)."

(xix) Domestic Hot Water -- (Imp. & Repairs, Type, Defects, Capacity of Tank)
(xx) Property Tax
(xxi) Easements and Encroachments -- The seller of that real estate is required to provide the buyer with a copy of any previous surveys of the real estate that are in the seller's possession and notify the buyer of any known easements, encroachments, covenants or restrictions of the seller's real estate. A buyer may wish to have a boundary or other survey independently performed at his or her own expense.

(xxii) Deed -- (Type, Number of Parcels)
(xxiii) Zoning -- (Permitted use, Classification) "Buyers of real estate in the state of Rhode Island are legally obligated to comply with all local real estate ordinances; including, but not limited to, ordinances on the number of unrelated persons who may legally reside in a dwelling, as well as ordinances on the number of dwelling units permitted under the local zoning ordinances." If the subject property is located in a historic district, that fact must be disclosed to the buyer, together with the notification that "property located in a historic district may be subject to construction, expansion or renovation limitations. Contact the local building inspection official

for details."

(xxiv) Restrictions -- (Plat or Other)

(xxv) Building Permits

(xxvi) Minimum Housing -- (Violations)

(xxvii) Flood Plain -- (Flood Insurance)

(xxviii) Wetlands -- The location of coastal wetlands, bay, fresh water wetlands, pond, marsh, river bank or swamp, as those terms are defined in chapter 1 of title 2 and the associated buffer areas may impact future property development. The seller must disclose to the buyer any such determination on all or part of the land made by the department of environmental management.

(xxix) Multi-family or other Rental Property -- (Rental Income)

(xxx) Pools & Equipment -- (Type, Defects)

(xxxi) Lead Paint -- (Inspection) Every buyer of residential real estate built prior to 1978 is hereby notified that those properties may have lead exposures that may place young children at risk of developing lead poisoning. Lead poisoning in young children may produce permanent neurological damage, including learning disabilities, reduced IQ behavioral problems, and impaired memory. The seller of that property is required to provide the buyer with a copy of any lead inspection report in the seller's possession and notify the buyer of any known lead poisoning problem. Environmental lead inspection is recommended prior to purchase.

(xxxii) Fire

(xxxiii) Hazardous Waste -- (Asbestos and Other Contaminants)

(xxxiv) Miscellaneous

(c) Any agreement to transfer real estate shall contain an acknowledgement that a completed real estate disclosure form has been provided to the buyer by the seller in accordance with the provisions of this section.

(d) The Rhode Island real estate commission has the right to amend the seller disclosure requirements by adding or deleting requirements when there is a determination that health, safety, or legal needs require a change. Any change to requirements shall be a rule change, subject to the Administrative Procedures Act, chapter 35 of title 42. The power of the commission to amend the written disclosure requirements shall be liberally construed so as to allow additional information to be provided as to the structural components, housing systems, and other property information as required by this chapter.

SECTION 3. Chapter 5-20.8 of the General Laws entitled "Real Estate Sales Disclosures" is hereby amended by adding thereto the following section:

5-20.8-13. Cesspool inspection requirement. -- (a) Every contract for the purchase and sale of real estate which is or may be served by a private cesspool, shall provide that potential purchasers be permitted a ten (10) day period, unless the parties mutually agree upon a different period of time, to conduct an inspection of a property's on-site sewage system, before becoming obligated under the contract to purchase, to determine if a cesspool exists, and if so, whether it will be subject to the phase-out requirements as established in Rhode Island general law chapter 23-19.15.

(b) Failure to include the provision required in subsection (a) in the purchase and sale agreement for real estate does not create any defect in title.

(c) Failure to provide the results of any previous inspection of a cesspool servicing the property does not create any defect in title.

(d) Failure to include the purchase and sale agreement provision required in subsection (a) of this section or failure to provide previous inspection results of a cesspool servicing the property entitles the purchaser to void the purchase and sale agreement by providing notice in writing to the seller prior to the transfer of the title at closing.

SECTION 4. This act shall take effect on June 1, 2008.

=====

LC00321/SUB B

=====

Appendix C

Septic System Checkup: The Rhode Island Handbook for Inspection
(Riordan, 2000)

SEPTIC SYSTEM CHECKUP: THE RHODE ISLAND HANDBOOK FOR INSPECTION

By
M. JAMES RIORDAN

LAYOUT DESIGN AND DRAWINGS BY
ANNE SHERMAN JETT



Funded by DEM using a grant from
the U.S. Environmental Protection Agency
Clean Water Act, section 319

"You can observe a lot by watching."

Yogi Berra, 1968

TABLE OF CONTENTS

PREFACE	1
ACKNOWLEDGMENTS	3
CHAPTER 1 Inspecting Operating Septic Systems: An Overview	5
1.1 Types of Inspections 6	
1.1.1 Maintenance inspections 6	
1.1.2 Functional inspections 8	
1.2 Types of Septic Systems and How Their Workings 13	
1.2.1 Cesspools 13	
1.2.2 Conventional septic systems 15	
CHAPTER 2 Gathering Records and Data for Inspections	19
2.1 Acquiring Records from DEM 20	
2.1.1 System conformance and construction 20	
2.1.2 Determining system history (optional) 21	
2.1.3 Acquiring the most recent system drawings 22	
2.2 Acquiring Information from Community Officials 22	
2.3 Interviewing System Owners 23	
CHAPTER 3 In-Home Plumbing Evaluation	25
3.1 Wastewater Routing 25	
3.2 Estimating Water Use 26	
3.2.1 Estimating water use with a water meter 26	
3.2.2 Estimating water use in unmetered homes 28	
3.2.3 Reducing excessive water use 29	

- 3.3 Leak Diagnosis and Repair 30
 - 3.3.1 Measuring flow rate 30
 - 3.3.2 Toilets 31
 - 3.3.3 Faucets 33
 - 3.3.4 Water treatment appliances 34
- 3.4 Retrofitting Household Fixtures with Water Conservation Devices 36

CHAPTER 4 Techniques for Accessing Septic System Components 37

- 4.1 Locating Septic Tanks and Cesspools 37
- 4.2 Locating Distribution Boxes and Soil Absorption Systems 39
- 4.3 Opening and Closing Component Accesses 40
 - 4.3.1 Accesses at grade 40
 - 4.3.2 Buried accesses 41
- 4.4 Suggested Retrofits for Conventional Septic Systems 42
 - 4.4.1 Risers to grade 43
 - 4.4.2 Effluent filters and gas baffles 44

CHAPTER 5 Evaluation and Maintenance Procedures for Septic System Components 45

- 5.1 Inspecting and Maintaining Septic Tanks 45
 - 5.1.1 Examining the external condition of septic tanks 45
 - 5.1.2 Determining when conventional tanks need pumping 45
 - 5.1.3 Cleaning sludge and scum measuring devices 48
 - 5.1.4 Pumping need for metal tanks 49
 - 5.1.5 Pumping septic systems automatically as part of the first maintenance inspection 49
 - 5.1.6 Procedures for multicompartment tanks or septic tanks in series 49
 - 5.1.7 Procedures for cleaning effluent filters 50
 - 5.1.8 Pumping procedures for septic tanks 51
 - 5.1.9 Determining septic tank volume (optional) 53
 - 5.1.10 Septic system additives 54
- 5.2 Procedures for Maintaining Distribution Boxes if an Inspection Port is Present 55
- 5.3 Maintenance Inspection for Cesspools 55
 - 5.3.1 Inspection prior to pumping 56
 - 5.3.2 Pump the cesspool regardless of solids depth 56

5.3.3	Cesspools with overflow pipes and other outlets	56
5.4	Observation of Site Conditions	57
5.5	Flow Trial for Identifying Gross Loss of Hydraulic Capacity	59
5.5.1	Limitation of the flow trial	59
5.5.2	Calculating the flow trial volume	61
5.5.3	Flow trial procedures	61
5.6	Dye Tracing for Confirming Treatment Bypasses	63
5.6.1	Identifying suspected treatment bypasses	63
5.6.2	Checking catch basins for bypasses	64
5.6.3	Investigating suspected bypasses	67
5.6.4	Preparation of dye-tracing solution	68
CHAPTER 6	Scheduling Maintenance Inspections	71
6.1	Conventional Systems Serving Single-Family Homes	71
6.1.1	Conventional systems serving 1-2 persons per bedroom	71
6.1.2	Conventional systems serving 1 person per bedroom or less	72
6.1.3	Effect of garbage grinders on maintenance	72
6.2	Nonconventional Systems Serving Single-Family Homes	73
6.2.1	Cesspools and other substandard systems	73
6.2.2	Alternative systems	73
6.3	Special Consideration for Systems Serving Rental Properties	74
6.4	Suggested Policy for Scheduling Inspections in Community Programs	74
6.5	Evaluation of Inspection Schedules	76
GLOSSARY OF TERMS		79
BIBLIOGRAPHY		87
SEPTIC SYSTEM MAINTENANCE POLICY FORUM AND SUBCOMMITTEES		95

PREFACE

How should septic systems¹ be maintained? How can one determine if a given septic system is working when purchasing a home? *Septic System Checkup* answers these questions by providing state-recommended standards for evaluating and maintaining septic systems that serve residences in Rhode Island. The handbook includes complete instructions for gathering septic system records, locating components, diagnosing minor in-home plumbing problems, conducting flow trials, dye tracing, and maintenance scheduling. It describes two types of inspections: (1) a maintenance inspection to determine the need for pumping and minor repairs; and (2) a functional inspection for use during property transfer.

Septic System Checkup is for everyone with an interest in ensuring septic system function. Home inspectors should use it to determine if a system is adequate to serve the needs of a prospective buyer. Homebuyers will find it useful in learning how septic systems should be evaluated. Maintenance professionals should use *Septic System Checkup* to determine the need for routine maintenance as well as repair. Community officials will find the handbook helpful in developing septic system maintenance programs. And do-it-yourselfers can use the handbook for instruction on how to conduct their own routine inspections.

1. This handbook applies to conventional septic system components and cesspools. Those readers interested in inspection and maintenance of innovative and alternative components should refer to the specific system's permit stipulations and manufacturer instructions.

ACKNOWLEDGEMENTS

Septic System Checkup: The Rhode Island Handbook for Inspection and Inspection Report Forms were authored by M. James Riordan, Principal Environmental Scientist of the Office of Water Resources, Department of Environmental Management. Mr. Riordan also oversaw all aspects of their development.

During development, Mr. Riordan was supervised--and generously mentored--by Russ Chateaufneuf, Division Chief of the Office of Water Resources, Sue Kiernan, Deputy Division Chief of the Office of Water Resources and Scott Millar, Supervising Environmental Scientist of the Office of Strategic Planning and Policy (who originated the concept of a septic system inspection handbook for Rhode Island).

Layout, design and graphic artwork for the handbook and report forms were all done by Anne Jett. Ms. Jett also devoted countless hours as one of the *Septic System Checkup*'s primary reviewers and editors. Without her assistance, *Septic System Checkup* would have remained unmanifest.

Development of *Septic System Checkup* occurred in cooperation with Rhode Island's Septic System Maintenance Policy Forum. The policy forum is a roundtable group that comprises approximately 100 representatives from federal, state and local government, as well as private associations, businesses and general public. The policy forum operates on a consensus-based approach. The meetings are open to all interested parties. It has met seventeen times since its inception in 1995. The cooperative spirit of the policy forum and dedication of all its participants has been no less than critical to successful development of *Septic System Checkup*. A list of the attendants of the policy forum can be found in "Septic System Maintenance Policy Forum and Subcommittees" at the rear of the handbook.

Several individuals provided particularly significant time and effort towards the development of the procedures of *Septic System Checkup* as well as the science behind septic system inspections in general. They include Bob Schmidt and Peter O'Rourke of the Rhode Island Department of Environmental Management; George Loomis and David Dow of the University of Rhode Island; and Joe Frisella of Frisella Engineering, Dave Burnham of the Rhode Island Independent Contractors and Paul Brunetti of Griggs and Browne. *Septic System Checkup* would not have been possible without the benefit of their knowledge and generosity of time.

Many others have also contributed to *Septic System Checkup* by reviewing the document, discussing issues with the author and providing emotional support (here especially, Jody-Kay Riordan, the author's wife). To all of you--both named and unnamed--thank you for broadening the author's field of view.

"If I have seen farther than others, it is because I was standing on the shoulders of giants." (Albert Einstein)

CHAPTER 1

Inspecting Operating Septic Systems: An Overview

Approximately 150,000 Rhode Island households, or one third of the state's population, use some form of septic system for sewage disposal. Rhode Island's septic systems discharge some seven billion gallons of wastewater into the ground each year.

When used properly, septic systems function very well. If mismanaged, however, these systems will fail, creating conditions that may threaten human health and the environment. Untreated effluent from malfunctioning septic systems may reveal itself by sight and smell, when a system backs up, or it may quietly percolate through the soil into the groundwater and adjacent waterbodies.

Failed systems have been associated with many serious problems. Outbreaks of diseases, such as hepatitis, dysentery, and gastroenteritis, may result from unmitigated wastewater pathogens. Untreated effluent can accelerate the eutrophication process of nearby waterbodies, lowering oxygen levels and suffocating aquatic life. From an economic point of view, septic system repair bills can be staggering. Yet, many of us live with and use septic systems, giving little or no thought for their existence...until they fail.

Inspection and maintenance is the key to ensuring that septic systems function properly. Nevertheless, few systems receive routine inspection and maintenance and those that do may receive inadequate care as inspectors have historically been without standardized procedures.

This handbook is about septic system inspections. It provides guidelines for performing inspections. It also provides answers to a number of important questions regarding the operation and maintenance of septic systems. For example, what is the

most convenient and least expensive maintenance method for ensuring that a septic system functions properly? How can prospective homebuyers make certain that a home purchase will include an adequate system? What is the minimum inspection regime necessary to determine if a septic system is working?

1.1 Types of Inspections

This handbook addresses the two types of inspections that are typically performed by properly trained wastewater professionals: maintenance inspections and functional inspections. The maintenance inspection is used to determine the need for pumping and to ensure proper function; the functional inspection is used primarily during property transfers and builds on the maintenance inspection.

1.1.1 Maintenance inspections

The maintenance inspection is used to determine the need for pumping and to identify minor problems before they become serious health and environmental hazards or cost prohibitive to repair. There are two maintenance inspection subtypes: a first maintenance inspection and a routine maintenance inspection. The first maintenance inspection consists of procedures that are designed to help an inspector locate the system components; the routine maintenance inspection assumes that the components have already been located. The following is an outline of first maintenance and routine inspection procedures (see also Tables 1.1 and 1.2).

First maintenance inspection

Gather Records and Data (chapter 2):

1. Interview user/homeowner (section 2.3).
2. Obtain most recent system drawings (section 2.1.3).

Locate the System Components (chapter 4):

1. Locate and gain access to the septic tank/cesspool (section 4.1).
2. Locate the soil absorption system (section 4.2).

3. Identify any potential retrofits (section 4.4).

Evaluate and Maintain the System Components (chapter 5):

1. Inspect and maintain the septic tank/cesspool (section 5.1).
2. Inspect the distribution box, if handhole is present (section 5.2).
3. Observe overall site conditions (section 5.4).

Establish an Inspection Schedule (chapter 6)

Report findings to the homeowner and, where required by municipal ordinance, a local official (*Septic System Checkup: Inspection Report Forms*)

Routine maintenance inspection

Locate the System Components (chapter 4):

1. Locate and gain access to the septic tank/cesspool (section 4.1).
2. Locate the soil absorption system (section 4.2).
3. Identify any potential retrofits (section 4.4).

Evaluate and Maintain the System Components (chapter 5):

1. Inspect and maintain the septic tank/cesspool (section 5.1).
2. Inspect the distribution box, if handhole is present (section 5.2).
3. Observe overall site conditions (section 5.4).

Establish an Inspection Schedule (chapter 6)

Report findings to the homeowner and, where required by municipal ordinance, a local official (*Septic System Checkup: Inspection Report Forms*)

In some instances, a maintenance service provider may perform an in-home plumbing evaluation, flow trial and dye tracing. However, these procedures should only be performed when a system problem is suspected and should not be done as a routine part of maintenance inspections.

1.1.2 Functional inspections

The functional inspection is used to determine whether a system is adequate to serve the wastewater disposal needs of the household. The functional inspection is especially intended for use during a property transfer as a means to protect the consumer and identify systems in need of upgrade or repair. It may involve, as appropriate, any of the procedures described in this handbook. The following is an outline of functional inspection procedures (see also Tables 1.1 and 1.2).

Gather Records and Data² (chapter 2):

1. Determine system conformance (section 2.1.1).
2. Determine the history of the system (section 2.1.2).
3. Acquire the most recent system drawings (section 2.1.3).
4. Acquire information about the system from community officials (as necessary) (section 2.2).
5. Interview the system user/owner (section 2.3).

Evaluate the In-Home Plumbing (chapter 3):

1. Estimate water use (section 3.2).
2. Conduct a leak diagnostics and repair evaluation (section 3.3).
3. Retrofit household fixtures with water conservation devices (section 3.4).

Locate the System Components (chapter 4):

1. Locate and access the septic tank/cesspool (section 4.1).
2. Locate the soil absorption system (section 4.2).
3. Identify any potential retrofits (section 4.4).

Evaluate and Maintain the System Components (chapter 5):

1. Inspect and maintain the septic tank/cesspool (section 5.1).
2. Inspect the distribution box, if handhole is present (section 5.2).
3. Observe overall site conditions (section 5.4).
4. Conduct a flow trial (section 5.5).
5. Conduct dye tracing (section 5.6).

2. Septic system permit records for functional inspections are typically obtained by homeowners and provided to home inspectors. Some home inspectors may provide record research services for a fee (see chapter 2).

Establish an Inspection Schedule (chapter 6)

Report findings to the homeowner, the potential homebuyer, where required by municipal ordinance, a local official, using maintenance and functional inspection reports (*Septic System Checkup: Inspection Report Forms*)

Many of the inspection procedures, described herein, require special equipment, information, and reference materials: Table 1.1, "Inspection Procedures and Necessary Information, Materials and Equipment," lists the equipment and materials necessary for each procedure. Table 1.2, "Types of Inspection and Necessary Information, Materials and Equipment," lists the items required to perform first maintenance, routine maintenance and functional inspections.

Table 1.1 Inspection Procedures and Necessary Information, Materials and Equipment

Procedure Type	Procedure	Items Required
Record and data gathering	Acquiring records from DEM and acquiring information from community officials Interviewing homeowners	<ul style="list-style-type: none"> •Name of owner •Address of system •Plat and lot of property •System records •Interview information sheet
In-home plumbing evaluation	Estimating water use Leak diagnosis and repair	<ul style="list-style-type: none"> •Recent water bills (see section 2.1) •Flashlight •Calculator (optional) •Calculator (optional) •Chalk, crayon or tape •Watch or stopwatch •Plumbing replacement parts and tools •Large and small metered collection cups •Clean cloth for wiping fixtures •Water conservation devices and tools as necessary •Pressure and flow meters
Accessing system components	Septic tanks and cesspools Distribution box	<ul style="list-style-type: none"> •System drawings (see section 2.1) •Shovel or spade •Metal prod •Electrician's snake •Wrench to open building sewer •Metal detector or other pipe locator (optional) •Access to septic tank and associated tools
Evaluation and maintenance procedures	Septic tank (once accessed)	<ul style="list-style-type: none"> •Sludge measuring device •Scum measuring device •Latex gloves •Rag for cleaning sludge and scum off measuring devices •Bleach and water solution

Procedure Type	Procedure	Items Required
Evaluation and maintenance procedures (continued)	Septic tank (once accessed)	<ul style="list-style-type: none"> •Pumptruck and pumping equipment •Flashlight for viewing interior •Mirror on pole •Eye protection •Septage spoon
	Cesspool (once accessed)	<ul style="list-style-type: none"> •Pumpout equipment •Electrician's snake •Flashlight for viewing interior •Angled mirror on pole
	Observation of site conditions	<ul style="list-style-type: none"> •System drawings
	Flow trial (once the tank is located and inspected)	<ul style="list-style-type: none"> •Calculator •Garden hose or other water source •Flow meter or other flow measuring equipment
	Dye tracing (once tank is located and inspected)	<ul style="list-style-type: none"> •Dye tracing solution <ul style="list-style-type: none"> · dye · protective clothing · latex gloves · 1½ gallon pitcher · measuring spoons · stir stick · funnel · storage bottles · carrying cases · paper towels •Checking for bypasses <ul style="list-style-type: none"> · municipal permission to access basins · 6 traffic cones · manhole cover hook · rope · flashlight · broom · crow bar •Investigating bypasses <ul style="list-style-type: none"> · garden hose · watch
Scheduling inspections		<ul style="list-style-type: none"> •System records (see section 2.1) •Calculator •Most recent inspection report
Reporting findings		<ul style="list-style-type: none"> •Appropriate report form •Educational materials

Table 1.2 Types of Inspection and Necessary Information, Materials and Equipment

Routine Maintenance	First Maintenance	Functional Inspection
	<i>All items from "Routine Maintenance" and...</i>	<i>All items from "Routine Maintenance" and "First Maintenance" and...</i>
<ul style="list-style-type: none"> •Most recent inspection report •Shovel or spade •Metal probe •Electrician's snake •Wrench to open building sewer •Metal detector or other pipe locator (optional) •Sludge and scum measuring device •Pumping equipment •Flashlight •Mirror on pole •Appropriate report form •Educational materials •Latex gloves •Rag for cleaning sludge and scum measuring device •Bleach and water solution 	<ul style="list-style-type: none"> •Name of owner •Address of system •System drawings (see section 2.1 "Acquiring records from DEM") •Calculator (optional) 	<ul style="list-style-type: none"> •Interview information sheet •Recent water bill (see section 2.1 "Acquiring Records from DEM") •Food coloring for identifying toilet leaks •Chalk, crayon or tape •Watch or stopwatch •Plumbing replacement parts and tools •Clean, dry cloth for wiping fixtures •Large and small metered collection cups •Water conservation devices and tools as necessary •Pressure and flow meters •Garden hose or other water source •Dye tracing solution •Municipal permission to access basins •Rope •6 traffic cones •Broom •Manhole cover hook •Crow bar •Metered (measuring) cup

1.2 Types of Septic Systems and Their Workings

Septic systems come in many forms and state-of-the-art technology is constantly evolving. The vast majority of systems in Rhode Island, however, fall into one of two basic categories: cesspools and conventional systems.

1.2.1 Cesspools

What exactly is a cesspool? Typically, a cesspool is a rock-walled, covered hole that receives wastewater from a home and allows it to drain into the surrounding soil. More sophisticated designs incorporate open-bottom concrete vaults with grated sidewalls and may discharge to a seepage pit or drainfield (refer to Figure 1.1). DEM's *Rules and Regulations Establishing Minimum Standards Relating to Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems* (hereafter referred to as the ISDS Regulations) define "cesspool" as follows:

The term "cesspool" shall be held to mean any buried chamber, including but not limited to, any metal tank, perforated concrete vault or covered hollow or excavation, which receives discharges of sanitary sewage from building sewer for the purpose of collecting solids and discharging liquids to the surrounding soil. Cesspools are not an approved method of sewage disposal under these Regulations and all existing cesspools are considered to be substandard. (SD 1.00)

Approximately 70,000 Rhode Island homes use cesspools for wastewater disposal. Irrespective of their wide distribution, cesspools provide inadequate wastewater disposal service for many users. Because of this inadequacy, households that rely on cesspools and employ modern appliances, such as garbage grinders, dishwashers and washing machines, tend to have system overflows or backups.

Cesspools also compromise public health and environmental quality. Cesspools allow wastewater to flow to ground- and surface-water resources without providing adequate treatment. This means that disease-causing bacteria and viruses, which are

commonly found in raw wastewater, go unchecked. When wastewater pathogens pass freely into the natural environment, they threaten fishing grounds, bathing beaches and drinking water supplies.

DEM strongly encourages owners of cesspools to upgrade their systems; however, the department also recognizes that not every owner has the immediate financial means to replace a septic system. Therefore, this handbook recommends procedures for cesspool maintenance that should be used when cesspools are not obviously failing or causing nuisance. Inspectors and owners should be aware, however, that even cesspools maintained according to handbook procedures provide, at best, marginal treatment and should be considered for upgrade as soon as practicable. Additionally, a failed cesspool is not considered repairable and should be replaced with a conventional septic system in accordance with regulatory standards.

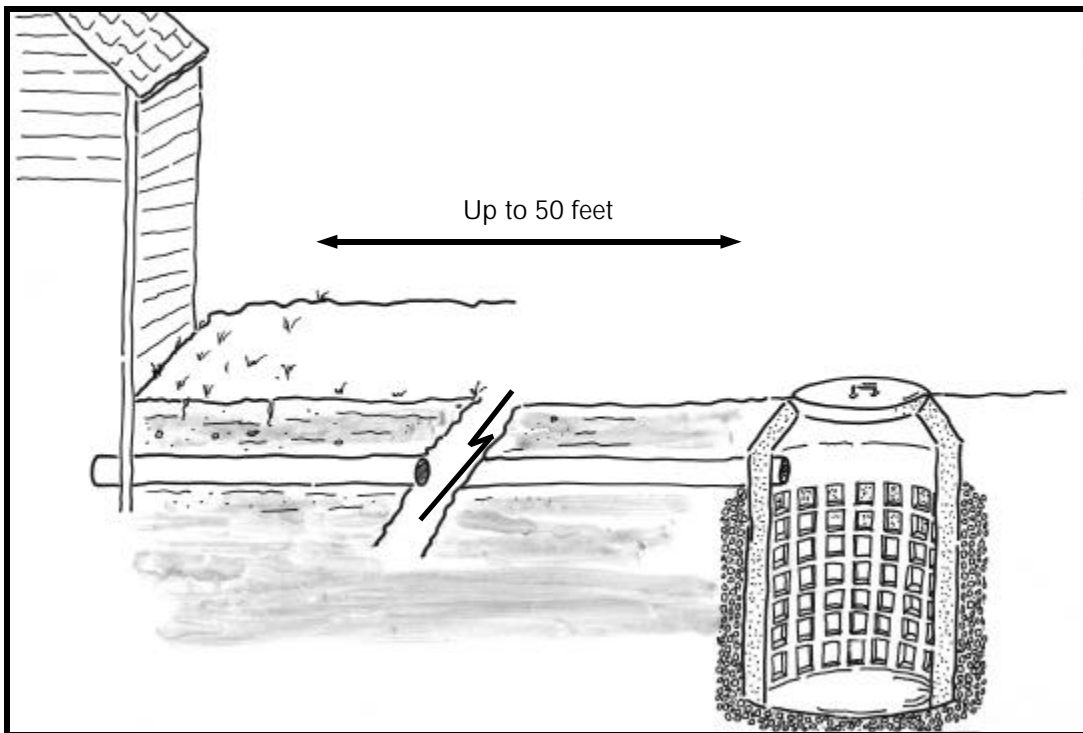


Figure 1.1 Cut away of a typical cesspool with a concrete vault. Wastewater flows by gravity from the building sewer to the cesspool, which may be located up to 50 feet from the foundation.

1.2.2 Conventional septic systems

A well-designed and maintained septic system provides an excellent means for sewage disposal. Once considered only a short-term option, experts now recognize that the conventional septic system can be long-lived and cost effective. In fact, in many suburban and rural areas, conventional septic systems are preferred over sewers.

In Rhode Island, a conventional septic system includes three basic components: building sewer, septic tank, and soil absorption system. The following sections describe the general workings of each.

Building sewer

Houses with conventional plumbing discharge all wastewater through a single pipe, called the building sewer or soil pipe, which delivers wastewater by gravity to some part of a sewage disposal system, typically the septic tank.

Septic tank

Modern septic tanks are generally rectangular boxes that are constructed of either concrete or fiberglass (refer to Figure 1.3a). Older tanks may be round (i.e., cylindrical) and built of substandard material, such as steel, which may corrode over time. Modern tank sizes typically range from 1000 - 1500 gallons, depending on the number of bedrooms served. Some older tanks may be as small as 500 gallons.

A septic tank is used to hold wastewater while the wastewater's solid and liquid constituents separate. The heavier material in the wastewater, called sludge, sinks to the bottom of the tank where it slowly decomposes. The floatable material (e.g., grease and oil), which is referred to as scum, rises to the surface and becomes trapped between devices at the tank's inlet and outlet, either baffles or sanitary tees. When wastewater enters the tank, it pushes relatively clean septage out of the tank from the "clear zone," which is the settling area between the scum and sludge layers, out of the tank.

Typically, solids accumulate in septic tanks faster than they decompose. This accumulation of solids reduces the clear zone of the tank. If the clear zone becomes

too small, the incoming wastewater will displace the wastewater before solids and liquids have properly separated. Wastewater with unsettled solids will clog a soil absorption system. Thus, tanks need to be pumped to maintain an appropriate clear zone. Failure to pump in a timely manner will cause the soil absorption system to fail.

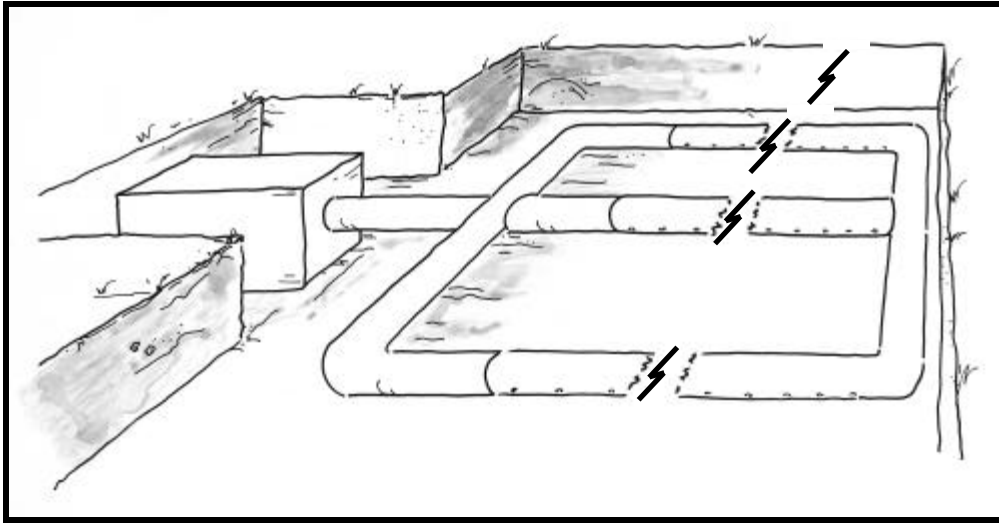


Figure 1.2a Soil absorption bed system

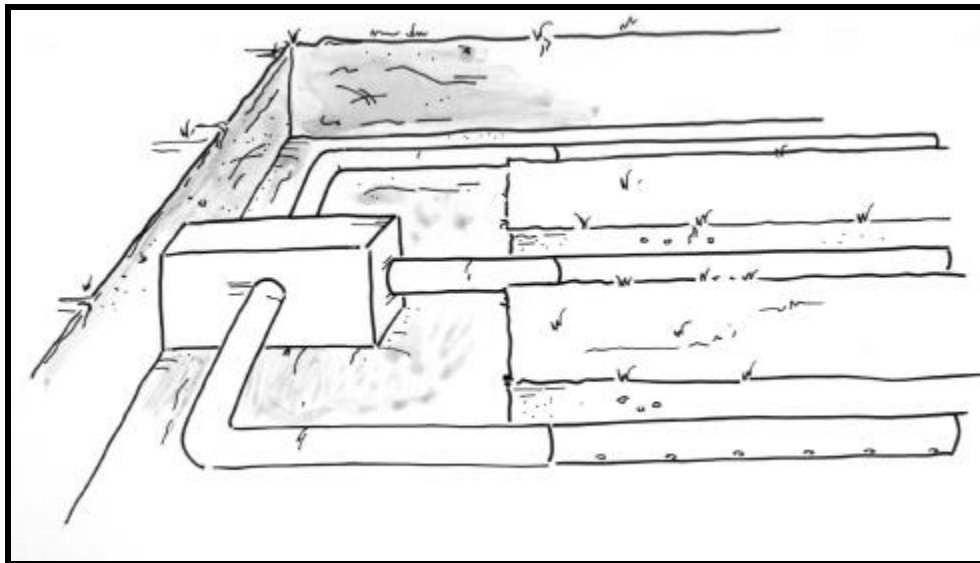


Figure 1.2b Soil absorption trench system

Soil absorption system

When effluent leaves the septic tank, it flows to the soil absorption system. If the septic tank of a conventional system is maintained in accordance with the procedures of this handbook, the soil absorption system should function properly for many, many years, perhaps in perpetuity. Three basic types of soil absorption systems are commonly used in Rhode Island: seepage pits, disposal beds and disposal trenches.

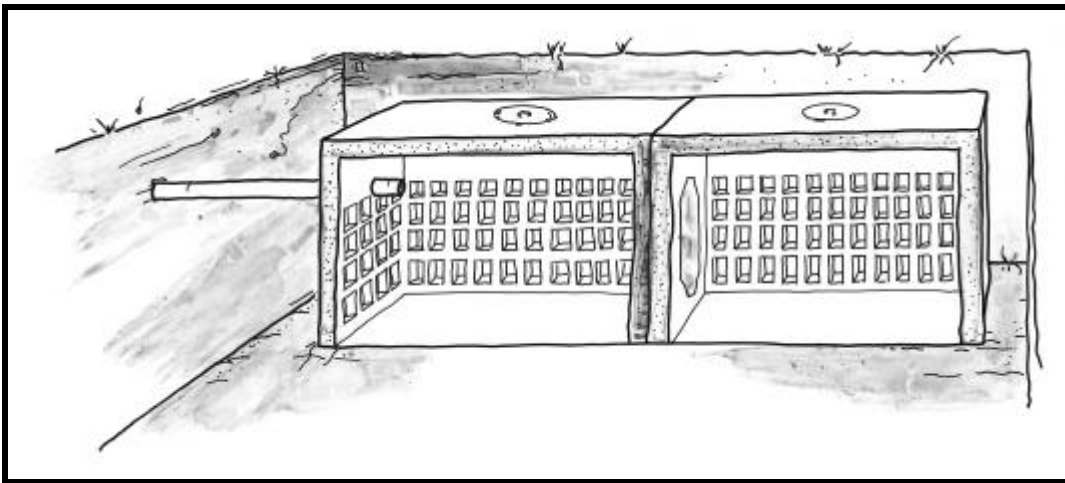


Figure 1.2c Cut-away view of soil absorption two galley-style seepage pits in series

Seepage pits (see Figure 1.2c)—sometimes referred to as flow diffusers or galleys—employ bottomless concrete structures with grated sides. The design of a seepage pit is similar to that of a cesspool; however, a seepage pit, by regulatory definition, is always downline from a septic tank.³

Disposal beds and disposal trenches are generically referred to as drainfields, but are in fact different. A disposal bed system is a shallow rectangular excavation that is partially backfilled with stone, lined with a network of perforated distribution pipe, and then filled to grade with earth. A disposal trench system consists of two or more parallel ditches that are partially filled with stone, each lined with singular perforated pipe, covered with a porous liner and then filled to grade with earth. Both system types typically utilize a distribution box (i.e., D-box, see Figure 1.3b). The D-box follows the septic tank, splitting the flow into approximately equal amounts, which it channels to the drainfield lines.

3. When a cesspool system has two chambers, the second is usually referred to as a seepage pit.

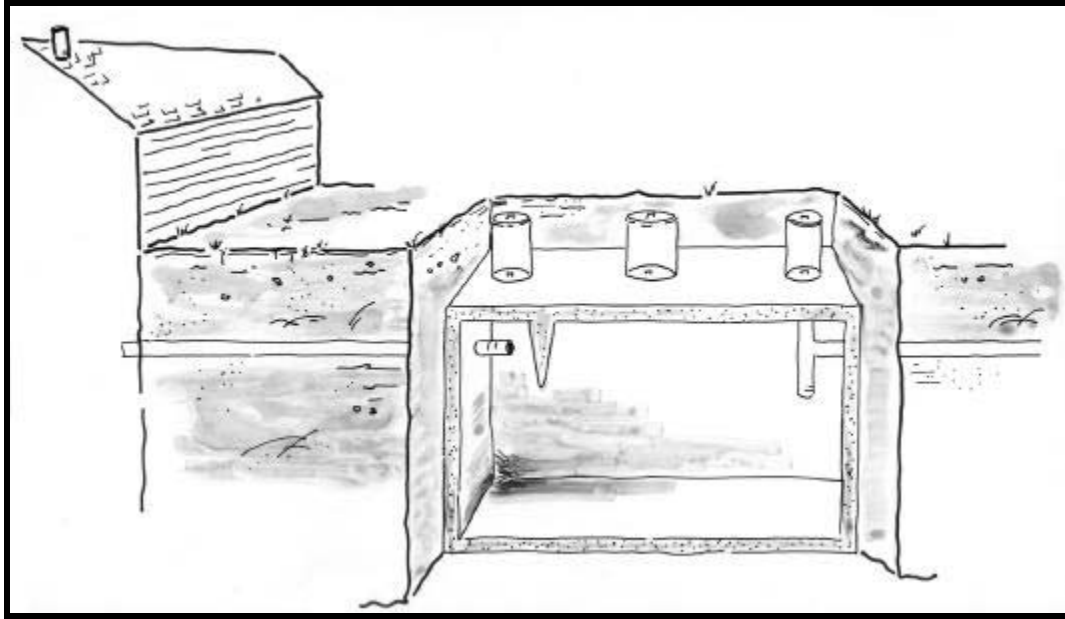


Figure 1.3a Cut-away view of a conventional 1000-gallon septic tank. Wastewater flows by gravity from the building sewer to the septic tank, followed by the distribution box and then to the soil absorption system.

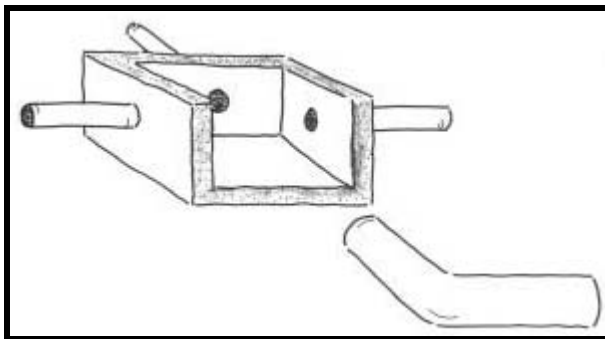


Figure 1.3b Exploded diagram of a conventional distribution box.

CHAPTER 2

Gathering Records and Data for Inspections

Determining the adequacy of a septic system requires knowledge about its design, use and maintenance. Such information may be obtained by reviewing its application, use and maintenance records and by talking with the system's users.

Inspectors should make certain to have written records available at the time of inspection. Table 2.1, "Obtaining Septic System Application, Use and Maintenance Records," lists types of records and where they can be obtained. These records are necessary to ensure system conformance. The records will also provide valuable time savings when attempting to locate buried components. Usually, records are gathered by the homeowner and provided to an inspector; however, this does not preclude inspectors from gathering records as a service to homeowners.

Table 2.1 Obtaining Septic System Application, Use and Maintenance Records

Type of information	Name of record	Availability
Application ^a	Applications for new system, alteration & repair Certification of conformance Certification of construction	DEM Homeowner Building official System designer
Use ^a	Septage pumping records Water bill	Homeowner or tenant Inspector/pumper (pumping records only)
Maintenance	Maintenance inspection report	Homeowner Wastewater management official

Note: a. Some information regarding application and use may have been recorded in functional inspection and first maintenance inspection reports. However, such information should be checked against the original source, whenever possible, to avoid repeating any data-gathering errors.

The following sections describe how inspectors and homeowners may obtain information from DEM and community officials. It also discusses how inspectors should interview homeowners and other system users, such as renters.

2.1 Acquiring Records from DEM

Application records demonstrate that a system is properly permitted. Most systems installed after April 6, 1968 will have application records. Homeowners and inspectors may obtain copies of these records from DEM, which generally has the most comprehensive and up-to-date records.

Whenever possible, an inspector should review records with the homeowner to make sure they are complete. If a homeowner notes any discrepancy, the inspector should request documentation. Homeowners should follow up with local officials and DEM regarding any discrepancies that are found.

DEM keeps records at 235 Promenade Street, Providence in the Office of Water Resources. DEM's Office of Technical and Customer Assistance is available to help the general public in obtaining permits. DEM's telephone number is in the Blue Pages of the telephone directory. To obtain optimum assistance, customers may wish to call DEM before visiting the office in person. With respect to DEM records, a functional inspection should include a review of the following:

1. System conformance and construction certificates, and optionally, a functional inspection may include records of system history such as violations or applications for repair or alteration.
2. Most recent as-built plans.

2.1.1 System conformance and construction

A functional inspection should include a determination of whether a system is conformed and constructed in accordance with regulations. All conformed systems are recorded in a reference set, entitled *Conformed ISDS Applications*. Conformance

records show that a system was constructed and installed in accordance with the regulations that were in force at the time of the application approval. *Conformed ISDS Applications* lists eight fields of information for each system:

1. Year of application.⁴
2. City/Town of system location.
3. Application number.
4. Microfilm number.
5. Street of system location.
6. Plat number.
7. Lot number.
8. Applicant name.

The reference indexes septic systems by town of location, and either street of location or application number.

In January 1992, DEM computerized its septic system records. Reference numbers since then have two parts that are separated by a hyphen. The first four digits include a two digit number for the year (e.g., "92" for applications in 1992) and two digits representing town number in an alphabetized listing (e.g. "30" for Scituate). The second part is a number of 1-4 digits representing order of receipt (e.g., "99" for the ninety-ninth ISDS application received by DEM in a given year). Thus, the application number for the system just described would be: 9230-99. Applications prior to 1992 were assigned reference numbers using other systems.

2.1.2 Determining system history (optional)

Though determining system history is not necessary for either functional or maintenance inspections, homeowners and potential homebuyers may wish to find out whether a system has a good history of regulatory compliance. The records of new construction, alteration or repair are bound in logbooks cataloged by year, town and application number. These records are available through DEM's Office of Technical and Customer Assistance.

4. An application, with proper renewals and transfers, may be valid for years after it has been approved. Thus a system may be built in one year, but have an application for another year.

DEM also keeps records of violations in a log entitled *EE. RIDEM ISDS Status Report*. The report is indexed by year, town, and street address. It dates back to 1982. Records of violations are available by request at the DEM Office of Technical and Customer Assistance, 235 Promenade Street, Providence.

2.1.3 Acquiring the most recent system drawings

To access system components, inspectors will need to know where system components are located. System drawings generally give reliable information. Using the techniques described in "Determining system history" (section 2.1.2), find the most recent permit application number for the system. Find the microfilm number in *Conformed ISDS Applications*. To obtain a hard copy of the application, contact DEM's Office of Technical and Customer Assistance.

2.2 Acquiring Information from Community Officials

Local officials may keep permit or maintenance records. Generally, building officials or wastewater officials provide appropriate points of contact.

Building officials keep records of all building permits. Before a town issues a certificate of occupancy, state law requires the town to confirm the existence of an up-to-date certificate of conformance for the septic system.

Towns with wastewater management programs may keep records of inspection and maintenance. To acquire such information, call the appropriate official as listed in the Blue Pages of the telephone directory. For questions about who to contact, call the town hall. DEM's Office of Water Resources is currently developing a reference text that also provides this information.

2.3 Interviewing System Owners

The functioning of a septic system is dynamic and complex. Sometimes observations during an inspection have more than one possible interpretation. Interviewing a system's owner and users may help to interpret inspection results. Figure 2.1 lists important information an inspector may wish to obtain from the homeowner or system users.

HOMEOWNER/OCCUPANT RECORDS & DATA, as available

Information collected pursuant to this section is to be provided voluntarily and at the discretion of the property owner. The property owner is solely responsible for record and data accuracy and completeness. The inspector assumes no responsibility for the accuracy of information provided by the property.

Indicate whether the following information was made available during the inspection. Attach copies of available records. If the property owner states that any of the following services were not provided—or in the case of application records that the system was installed prior to regulations (April 1968) — indicate not applicable (N/A). If the property owner states that partial records were provided, indicate "partial."

Source of Records & Data
Records and data were given to the inspector by:
_____ Property owner _____ Realtor _____ Other _____

Application Records

Yes	No	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Applications for septic system (inclusive of new systems, alteration, repairs). Indicate the number of each: _____ New system _____ Alteration _____ Repairs
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Certificate of Construction
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Certificate of Conformance

Use Records

Yes	No	N/A	Partial	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Last two septage pumping bills
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Water bills for the last 12-24 months

Maintenance Records

Yes	No	N/A	Partial	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Maintenance inspection reports

Resident Data
During the last 12 months, the inspected residence housed _____ year-round occupants
Plat Number _____ Lot Number _____

Figure 2.1 Important homeowner records and information as required for the functional inspection, see *Septic System Checkup: Inspection Report Form*.

Begin the interview by carefully reviewing all pertinent written information. Some written records may be out of date or contain inaccuracies. An interview may help to verify data on written reports.

Interviews are best done in person. When interviewing be sure to maintain a courteous and professional demeanor. Make the person being interviewed feel comfortable. This will help to optimize the quality of the interview. Interviews also provide an excellent opportunity to educate the user about how to care for their septic system. Inspectors may wish to leave educational materials with system users. Educational materials are available from DEM, the University of Rhode Island's Onsite Wastewater Training Center, and from some municipalities.

CHAPTER 3

In-Home Plumbing Evaluation

Faulty or outdated plumbing may add significantly to the wastewater load on a septic system. Overloaded systems tend to fail and as a result may generate expensive repair bills. Also, faulty plumbing adds to overall water use and may result in expensive water bills.

Inspectors performing functional inspections should carefully check all plumbing, water fixtures and water-using devices for malfunctions.⁵ Maintenance inspections, however, will not usually include in-home plumbing evaluation.

3.1 Wastewater Routing

For the purposes of this handbook, wastewater routing refers to the manner in which gray and black water outlets exit from a building. Unless otherwise allowed by a DEM-approved permit, all wastewater should route through the building sewer to the septic system. Inspectors should visually check to make certain that *only one* wastewater pipe exits the basement and, in particular, that the washing machine outflow goes to the septic tank. Homeowners may illegally route these out a window or to a storm drain.

If a gray water discharge to a dry well is approved by the department and it has not been altered since its permit approval, then it is usually an acceptable discharge.⁶ Nevertheless, having a permit approval does not ensure that a dry well functions properly. Homeowners should keep in mind that most inspectors *do not* assume responsibility for dry wells and therefore do not include them as part of a functional

5. While checking for faulty plumbing, an inspector may also wish to take the opportunity to locate the building sewer to help find the septic tank.

6. Black water discharges to dry wells are prohibited by regulation.

inspection. Currently, there is no procedure to ensure the proper functioning of a dry well.

Sump pumps and foundation drains should not be routed to the septic system. Water volumes generated by these devices will quickly overload a system and cause backups or other hydraulic failures. Instead, these devices should outlet to the ground surface or a dry well.

3.2 Estimating Water Use

Inspectors should analyze water use as part of the functional inspection. High water use contributes to septic system failure in two major ways: (a) high water flows tend to stress the absorptive capacity of soils; and (b) overly large flows are likely to carry over solids from the septic tank and thereby clog the soil absorption system. Inspectors should use the following method to diagnose water-use problems when a water meter is present.

3.2.1 Estimating water use with a water meter

1. Obtain water bills from the last 12-24 months including records of previous meter readings. Inspectors should obtain water bills from the homeowner (refer to section 2.3).
2. Locate the water meter by following any water line back to the main water supply line inlet. The meter may be in the basement or outside the house. Water meters generally have protective flap covers that lift open.
3. Read the meter. Water meters come in three types as shown in Figure 3.1. Use the Equation 3.1 to approximate water use per capita per day. Inspectors should also ask residents about their outdoor water-use habits (refer to section 2.3 for information on conducting interviews). Typical outdoor water use (e.g., lawn and garden) adds approximately 25 percent to water consumption. Inspectors should subtract outdoor water use from total water use before making the calculation in Step 3. Table 3.1 shows some general ranges for

Equation 3.1 Water Use Per Capita Per Day

$$W = (R_2 - R_1) / D \cdot O$$

Where:

W = water use per capita per day

R₂ = most recent water meter reading

R₁ = oldest water meter reading

D = number of days elapsed between the water meter readings

O = average occupancy of the residence between readings (R₁, R₂)

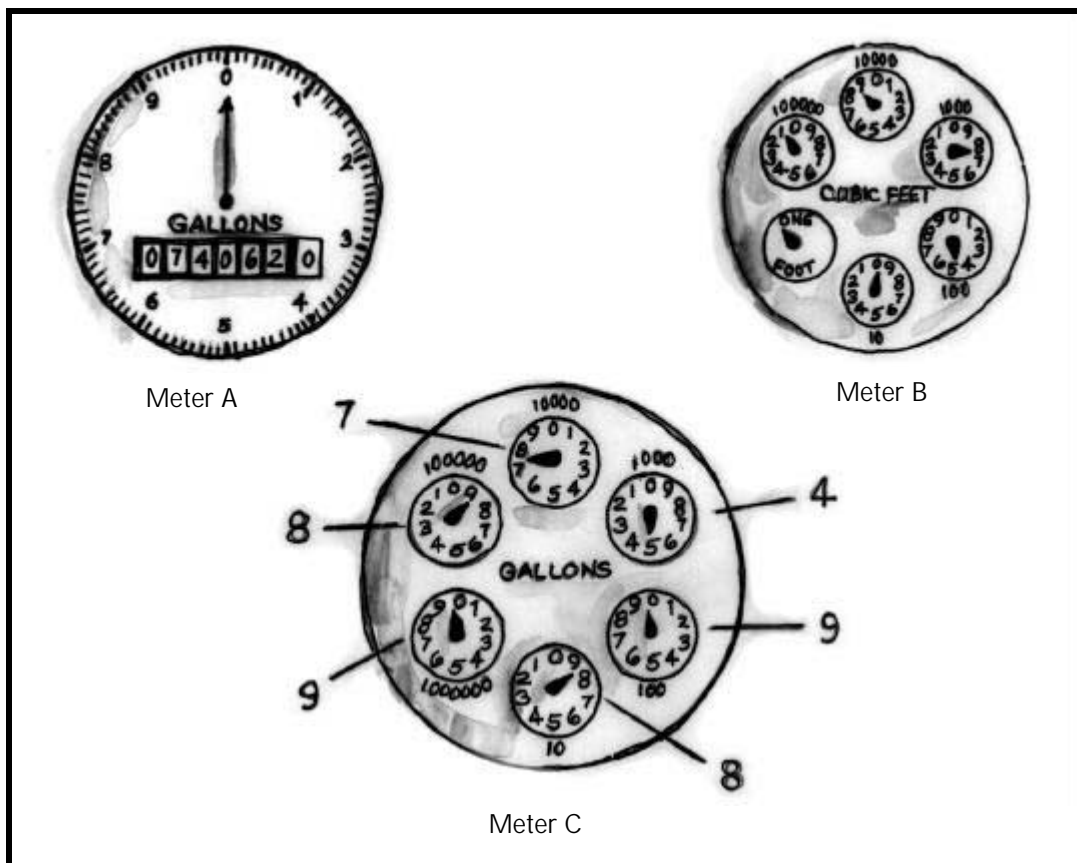


Figure 3.1 Water meters — Meter A reads 74,062.0 gallons, Meter B reads 187,499 cubic feet and Meter C reads 9,875,890 gallons.

Table 3.1 Typical Residential Outdoor Water Use

Type of use	Percentage of outdoor water use	Percentage of total water use
Lawn and garden	75-100	25-30
Swimming pool	0-12.5	0-5
Car washing	0-12.5	0-5

Note: Adapted from *Evaluating Urban Water Conservation Programs* (Planning and Management Consultants, 1993).

outdoor water use as a percentage of total usage.

4. Check the meter for units of measure.⁷ It should read in either gallons or cubic feet--sometimes hundreds of gallons or cubic feet. Usage, as calculated in Step 3 for a home that is occupied throughout the day, should not exceed 75 gallons or 10 cubic feet per person per day. Water use in homes where occupants are absent for long periods during the day should be less--no more than 50 gallons per person per day.

Water consumption above these levels suggests leakage and may compromise system function. If excessive water use is found, inspectors should follow up with leak diagnosis as described in section 3.3.

3.2.2 Estimating water use in unmetered homes

Many homes on private wells do not have water meters. When a water meter is unavailable, water use cannot be measured directly. Inspectors may rely on home occupancy to identify potential overloads. Septic system permits are granted for use by up to two year-round occupants per bedroom. Occupancy in excess of two occupants per bedroom may damage the system. To calculate occupancy per bedroom, refer to Equation 3.2. Inspectors should note excess occupancy.

7. Cubic foot = 7.48 gallons

Equation 3.2 Household Occupancy Per Bedroom

$$O_B = O_T / B$$

Where:

O_B = Occupancy per bedroom

O_T = Year-round occupancy, averaged over 12 months

B = Number of rooms in a house, which are of at least 100 square feet in floor area and which have at least one window and closeable passageway (i.e., doorway (see also Rule SD 1.00 of the ISDS Regulations)

Because excess water use may be generated by faulty plumbing, all fixtures and appliances in an unmetered home should be inspected carefully. Refer to section 3.3, "Leak Diagnosis and Repair."

In homes where there are water-use problems and no water meters, owners may wish to consider installing sewer-water meters. These meters apprise both the homeowner and septic system inspector of exactly how much water flows to the septic system over a period of time. Meters can help to find out if plumbing leaks or improperly routed water-using devices are adding to the hydraulic load in the septic system, and whether the home occupants are using more water than the system can handle.

3.2.3 Reducing excessive water use

In most cases where water use is above the acceptable range (approximately 50 to 75 gallons per person per day--see section 3.2., "Estimating Water Use"), it is because of leaky or out-of-date (i.e., high volume) water fixtures. Water-use problems can often be fixed by retrofitting a fixture with a water conservation device or by troubleshooting and repairing leaks. Sometimes, however, water-use problems may be best fixed by replacing a faulty fixture. Table 3.2, entitled "Intervention for Excess Water Use," lists typical remedies for residential water-use problems.

Table 3.2 Intervention for Excess Water Use

Fixture	Intervention	Repair person	Comment
Toilet	Retrofit	Homeowner Plumber	Retrofit devices are inexpensive, but work well only if carefully selected, installed and adjusted. Refer to section 3.4, "Retrofitting Household Fixtures with Water Conservation Devices."
	Leak repair	Homeowner Plumber	A leaky toilet can waste well over 100 gallons of water per day (see section 3.3.2, "Toilets").
	Replacement	Plumber	Toilets with a 1.6 gallon flush are required for replacement by code.
Faucets	Retrofit	Homeowner Plumber	Not recommended for faucets with intentionally high flows. Refer to section 3.4, "Retrofitting Household Fixtures with Water Conservation Devices."
	Leak repair	Homeowner Plumber	Due to the many types of fixtures, leak repair may require a plumber's service.
Showerheads	Retrofit	Homeowner Plumber	Retrofit devices are inexpensive, but work well only if properly selected, installed and adjusted. Refer to section 3.4, "Retrofitting Household Fixtures with Water Conservation Devices."
	Leak repair	Homeowner Plumber	Depending on the location of the leak, this may require the services of a plumber.
Water treatment appliance	Leak repair	Homeowner Plumber	A leaky water treatment appliance can waste hundreds of gallons of water per day. Refer to section 3.3.4, "Water treatment Appliances."

3.3 Leak Diagnosis and Repair

The following sections discuss step-by-step procedures for identifying and repairing leaky plumbing fixtures.

3.3.1 Measuring flow rate

Flow rates may be determined by measuring volume of flow over a period of time and substituting the measurements for variables in the flow rate equation. Inspectors should use Equation 3.3 when calculating the rate of flow from leaks.

Equation 3.3 Flow Rate

$$R = V/T$$

Where:

R = Flow rate

V = Volume of water accumulated

T = Time elapsed during accumulation of flow

3.3.2 Toilets

A leaky toilet may easily contribute a hundred gallons of water per day to the wastewater flow (see Table 3.3, "Flows from a Leaky Toilet"). Leaky toilets have also been found to cause septic system failure.

The following procedures may be used to determine if a toilet is leaking:

1. Sometimes leaks can be heard. Flush the toilet, wait for it to complete its refill cycle and then listen for flowing water. If no sound is detected, use either Procedure 2 or 3 to identify silent leaks.
2. Add a small amount of food coloring (as it will not stain) to the toilet cistern (i.e., tank or reservoir). Wait fifteen minutes. If the toilet is leaking, dye will appear in the toilet bowl.
3. Shut off the in-flow to the cistern and mark the level of water in it with crayon, chalk or tape. Wait a period of time--thirty minutes or so--and recheck the water level. If it has dropped, then the toilet is leaking. For a seeping (i.e., slight) leak, water level in a 3-5 gallon cistern may drop about an inch in 30

Table 3.3 Flows from a Leaky Toilet^a

Leak type	Approximate water loss (gallons per day)
Seeping	30 +
Open (stuck valve) ^b	6000

Notes: a. Adapted from *How Much is Enough* (Judd, 1993).
b. Assumes 4 GPM flow (i.e., as from an open valve).

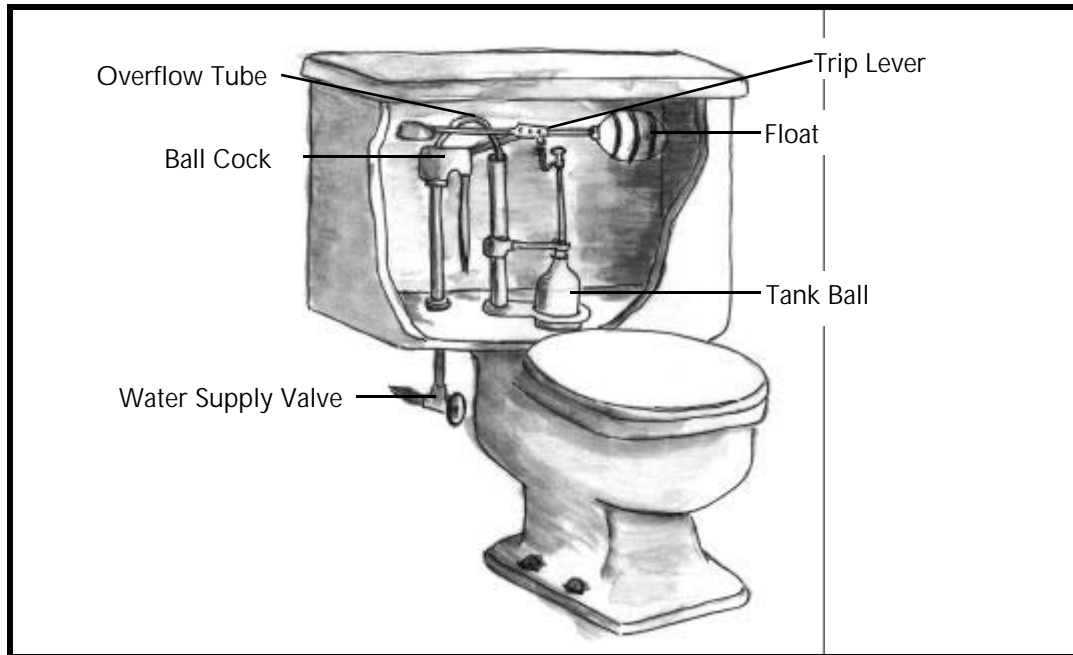


Figure 3.2 Diagram of a toilet

minutes. This represents a loss of approximately a half gallon or 24 gallons per day (see Table 3.3).

Toilet leaks are generally easy to fix. The following steps for fixing toilet leaks have been adapted from the text *Onsite Wastewater Disposal* (Perkins, 1989).

1. Check the water level in the cistern to make sure that water is not continuously running down the overflow tube. If it is, turn the adjustment screw to lower the float. If there is no adjustment screw, carefully bend the float arm.
2. If water flows in the cistern when the float is fully elevated, replace the shut off valve.
3. Inspect the overflow pipe below the water level. Replace it if there are any pitholes.
4. Check the plunger (tank ball) at the bottom of the cistern to see if it seals

properly. Remove any debris and replace any worn parts.

5. If the plunger does not drop exactly into the opening in the cistern bottom, adjust the vertical rod and/or the loops through which it passes to allow it to drop freely.
6. Make sure that the chain on the plunger rod is not twisted or caught.

3.3.3 Faucets

A water faucet that drips just a couple drops per second may add many gallons to the daily wastewater load (see Table 3.4). Often a leak can be fixed by changing a washer. If a faucet is leaking, the washer should be changed.

Sometimes leaks are not apparent. To check a fixture that is suspected of leaking, use the following procedure:

1. Open the fixture and allow water to flow for approximately 2-3 seconds.
2. Firmly close the fixture, but do not over tighten. The fixture should be closed as it would be after normal use.
3. Dry the fixture completely with a clean cloth, especially around the spout, control valves, and any plumbing joints. Watch carefully for 10 seconds to see if droplets form in the dried areas. If droplets form, recheck to be sure the control valves are firmly closed and dry the fixture again. Watch for another 10 seconds. If droplets continue to form on any part of the faucet or spout, this indicates a leak. Inspectors can use Procedures 4 and 5 to measure the rate of leakage; however, these are optional.

Table 3.4 Comparison of Leaks and Flows from a Typical Faucet ^a

Flow	Water loss (gallons per day)
Slow drip (approximately 1 drop per second)	36
Heavy leak	180
Fully open valve ^b	3600

Notes: a. Adapted from *How Much is Enough* (Judd, 1993).
b. Water loss rates assume a flow of 2.5 gallons per minute when a faucet is fully open.

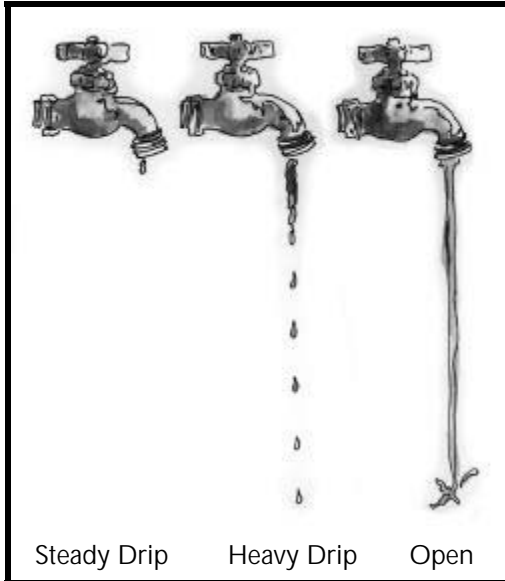


Figure 3.3 A slow steady leak (i.e., one drop per second) from a faucet may create a water loss of 36 gallons per day. A heavy leak may lose 180 gallons per day. A fully open faucet flowing at 2.5 gallons per minute will pour out 3600 gallons per day.

4. Place a dry metered cup or other collection device under the tap. Note the time and allow it to collect for at least fifteen minutes.
5. After fifteen minutes or so, recheck the collection cup. The flow rate of the leak can be calculated using the equation described in section 3.3.1, "Measuring flow rate."

3.3.4 Water treatment appliances

Water treatment appliances include softeners and purification systems. Water softeners remove minerals from domestic water. Water purifiers use filters to remove pathogens and low-level toxins from domestic water.

Most water treatment appliances backflush routinely. The backflush leaves the system via a small-diameter hose. The hose typically directs flow to one of three outlets: (a) the septic system via the washing machine outlet; (b) a sump pump outlet; or (c) an auxiliary soil absorption system (i.e., dry well) that is separate from the septic system.

Water treatment appliances backflush at a very high flow rate. Sometimes the backflush valve of a softener or purifier may stick open or leak. Such a leak may waste several hundred gallons of water per day. If a leaky softener or purifier is routed to the septic system, the system may become overloaded and back up. When softeners and purifiers are present, the following procedures should be used to locate the backflush outlet and check for leakage.

Finding water treatment backflush outlets:

1. Ask the residents. If the residents are unable to assist, proceed to Steps 2-4.
2. Some water treatment appliances are installed under the kitchen sink. Check there first.
3. Often, softeners and purifiers are designed to treat all the water coming into the house and thus intercept the main water supply line. If not found under the sink, locate a softener or purifier by following any water supply line (e.g., a cold water line from a sink) back to the incoming main.
4. Softeners and purifiers usually have four lines: (a) an incoming line--the main supply line coming into the house; (b) an outgoing line--the continuation of the supply main that delivers water to the house after it is treated by the appliance; (c) a bypass line--a line with a valve that will allow water to bypass the treatment appliance; and (d) a backflush line--usually a small, clear or black rubber hose that is approximately 10 feet long, though sometimes more, which directs backflush out of the appliance.
5. Follow the backflush line to its outlet. If the backflush line terminates in the building sewer or in another line that feeds to the septic system, it should be checked carefully for leaks. See the next procedure, "Identifying water treatment appliance leaks."

Identifying water treatment appliance leaks:

1. Locate the backflush line. See the previous procedure, "Finding water treatment backflush outlets." A backflush line will generally make a loose, unfastened connection to its outlet. Open the outlet and--being careful to avoid spillage--move the line from the outlet to a metered container (approximately 1 gallon). Observe the water treatment appliance and confirm that it is not performing a routine backflush. Generally, water treatment appliances use a timer to control backflushes. Backflushes typically occur late at night, so as not to conflict with normal water usage.
2. Backflush from a stuck valve usually flows out of a water treatment appliance under pressure and may squirt from the line. If water flows lightly and does not clearly indicate a leak, place the line in the container for 5 minutes and observe whether water flows continually. A very small amount of water may

be residual from a previous flush cycle.

3. In some cases, inspectors may desire to calculate the flow rate. Refer to section 3.3.1, "Measuring flow rate."

3.4 Retrofitting Household Fixtures with Water Conservation Devices

Excessive household water use may result from old, high-flow fixtures. Installing conservation devices is typically quick, inexpensive, and will reduce the wastewater load on a septic system. Retrofitting should, however, be undertaken thoughtfully, to avoid inappropriate remedies. Anyone who installs a conservation device should make sure of the following:

1. The new device fits the use of the fixture. Most homeowners will remove devices that are too restrictive and may damage the associated fixture in the process.
2. Water savings justify the cost of the device.
3. The new device complies with code (refer to Rhode Island State Building Code, Plumbing Code Regulation SBC-3, Article 15, Water Supply and Distribution, as amended).
4. The homeowner and/or potential homeowner are happy with the look and operation of the new device.
5. The simplest installation possible is used. Inspectors should be mindful of their skill limitations. Some installations may require a licensed plumber.
6. The retrofits are recommended after measuring flows and water pressure. Water pressure below 60 pounds per square inch requires specially designed devices. Use an in-line pressure meter to determine pressure.

Installing conservation devices in a toilet may seem simple, but can be tricky. Inspectors should be certain to use only properly designed and manufactured devices. Makeshift retrofits can damage toilets. Never use a brick or piece of concrete as a water displacement device. Both of these materials disintegrate and may gum up plumbing mechanisms over time.

CHAPTER 4

Techniques for Accessing Septic System Components

When a system receives its first maintenance or functional inspection, the location of system components may be unknown. The following techniques are simple methods to help an inspector find the exact location of the septic tank or cesspool and to approximate the location of the distribution box and soil absorption system. Refer to chapter 5, "Evaluation and Maintenance Procedures for Septic System Components," for information on how to inspect and maintain these components.

4.1 Locating Septic Tanks and Cesspools

Several procedures may be used to locate a septic tank or cesspool. They are presented here with the least invasive procedures listed first. In general, a septic tank will be located 5-15 feet from the foundation of the house and a cesspool will be located up to 50 feet from the foundation. Keep in mind, locating a septic tank or cesspool is as much an art as it is a science. Refer to section 4.3 for instructions on how to open septic system components.

1. Check for a past maintenance inspection or functional inspection report. The homeowner and the inspector who wrote the report should have a copy. Municipalities with septic system maintenance programs may also keep reports.
2. If no written records exist, ask the homeowner. The homeowner may know approximately or even exactly where the septic tank or cesspool is located.
3. Look for inspection ports at ground level. Tanks installed after 1990 should

have ports to grade. Also, many cesspools have manholes to grade. Tanks installed prior to 1990 should have accesses that are no more than 1 foot below grade.

4. Acquire a copy of the as-built design plans. The plans should accurately show the location of all system components. DEM keeps plans and other septic system permit information for most systems built after April 1968 (refer to section 2.1.3, "Acquiring the most recent system drawings"). Homeowners or local building inspectors may also have copies.
5. Look for indirect evidence of the building sewer pipe location. The sewer pipe usually exits the basement directly below the sewer vent pipe. Also, most building sewer lines will exit the basement from the area beneath the bathroom. If no access to the house is permitted, look for a bathroom window, which is typically a small window, to help determine the approximate vicinity of the pipe.

After determining the general location of the sewer line, precisely locate the tank using a steel probe. Most tanks are made of steel-reinforced concrete, so a metal detector may also be used. Attempt to locate buried cesspools in the same manner; however, as many cesspools have no metal parts, probing with a rod may be necessary. Be careful; probes may puncture orangeberg pipes.

6. If other procedures do not work, and if the inspector is given access to the basement, the building sewer can be used to help locate the tank.

Open the building sewer cleanout closest to where it exits the basement and insert a snake. (An electrician's snake works best.) The inlet baffle, tee or the furthest wall of the tank or cesspool should stop the snake as it is inserted. The length of snake inserted approximates the distance to the tank or cesspool from the building sewer access. A building sewer typically runs in a straight line to the cesspool or septic tank. Inspectors should note, however, that some building sewers bend or corner, offsetting the location of the tank or cesspool from the outlet in the basement.

Alternatively, a float with a remote sensing device may be used to locate a septic tank. Refer to the manufacturer's instructions for proper use.

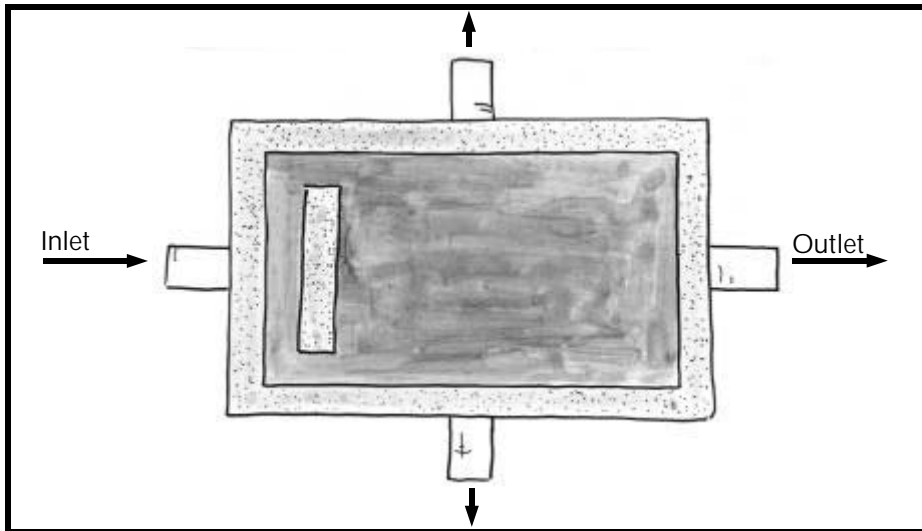


Figure 4.1 Top view of a distribution box

4.2 Locating Distribution Boxes and Soil Absorption Systems

The following techniques may be used to approximate locations for both the distribution box and soil absorption system.

1. Refer to past inspection reports. Ask the homeowner for copies. If there is a wastewater management program in town, inspection reports may also be available through the program. Refer to section 2.2 for procedures on acquiring information from community officials.
2. System components of conventional systems are constructed in accordance with as-built plans. Obtain the plans prior to the site visit and use the plans as a tool for locating components. See section 2.1.3, "Acquiring the most recent system drawings."
3. If system drawings and past inspection reports are unavailable, observe the direction of the outlet pipe of the septic tank to determine the general location of the distribution box and soil absorption system. Occasionally, the distribution box will have an inspection port (i.e., handhole) at the ground

level, providing direct access and evidence of location. Refer to section 4.3 for instructions on how to open septic system components.

4.3 Opening and Closing Component Accesses

In some cases, a component will have an access at grade. In others, the access is buried. A system component, once located, still needs to be opened. After the inspection is completed, it will also need to be closed. It is important to complete these procedures carefully and with minimal disturbance to any landscaping.

4.3.1 Accesses at grade

Sometimes, a septic system component is accessible via a riser. See Figure 4.2a, “Top view of septic tank risers at grade level.” Risers are vertical tubes with tight-fitting fiberglass or concrete covers at, slightly above, or just below the ground surface. Open a fiberglass cover by unfastening the lid and lifting it off. If the lid is locked, ask the homeowner to open it. Concrete covers do not usually lock or latch.

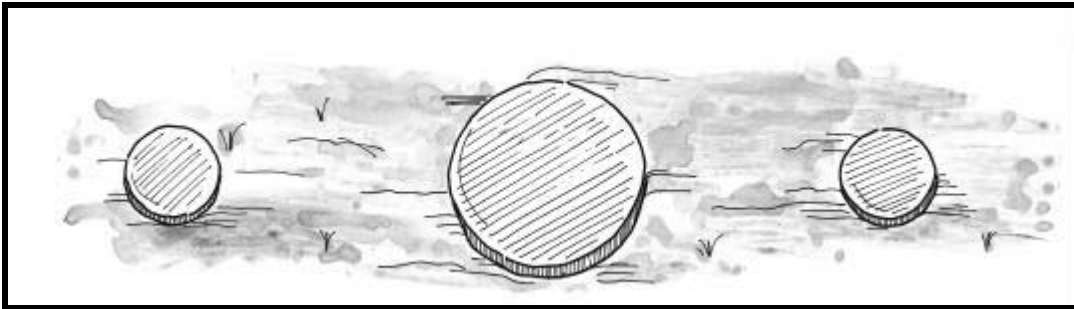


Figure 4.2a Top view of septic tank risers at grade level.

Close the access in the reverse manner to which it was opened. Be certain to replace any locks.

4.3.2 Buried accesses

Use the following procedures to open a buried access:

1. Locate the system component (refer to sections 4.1 and 4.2).
2. Approximate the location of the inspection ports or central manhole based on the anticipated component size. See Figure 4.1, "Top view of a distribution box" and Figure 4.2b, "Top view of a typical unearthed septic tank."
3. Use a spade to carefully cut and remove sections of sod. After removing the ground cover, dig as necessary to uncover the tank inspection ports. Pre-1990 code did not require that septic tanks have an access at grade. Post-1990 code requires accesses at grade.

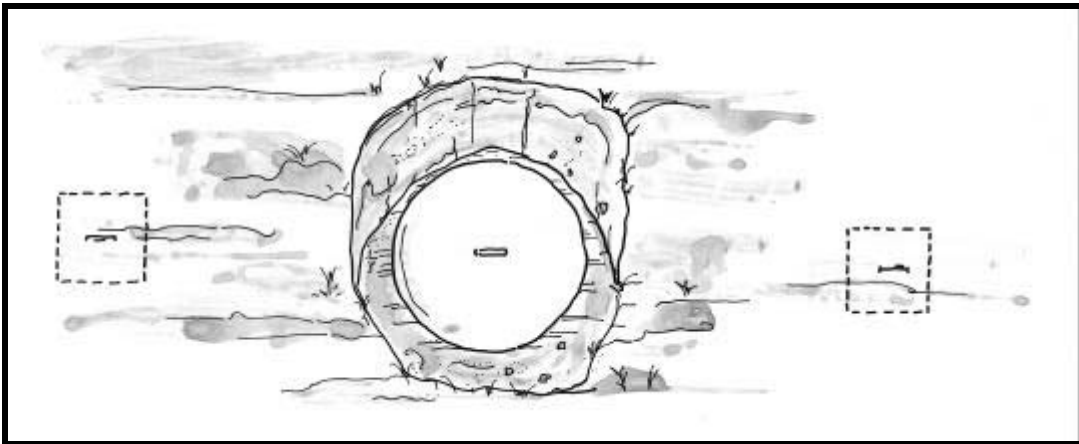


Figure 4.2b Top view of a typical unearthed septic tank main access (manhole). (Current regulations require a manhole and two inspection ports. DEM is revising the regulations to require two 20-inch manholes at the influent and effluent ends of the tank and no center manhole.)

Use the following procedures to close a buried access:

1. Be sure all port and manhole locations are correctly indicated on the current inspection report and the reports for first maintenance inspection, functional inspection and certificate of construction, as available. All component accesses should be located using swing-tie measurements. The term swing-tie

refers to two or more measurements made from the corners of a building foundation that intersect only at the point to be located. The length of each swing-tie from the intersection to the foundation corner is recorded to make finding the septic system easy.

2. Be sure port and manhole gaskets and seals are properly in place and intact before closing.
3. Rebury the access. Carefully replace the sod and tamp it down to ground level.

4.4 Suggested Retrofits for Conventional Septic Systems

The following retrofits are recommended to make inspections easier and to improve the longevity of the system. Inspectors should recommend these retrofits to system owners at the time of inspection.

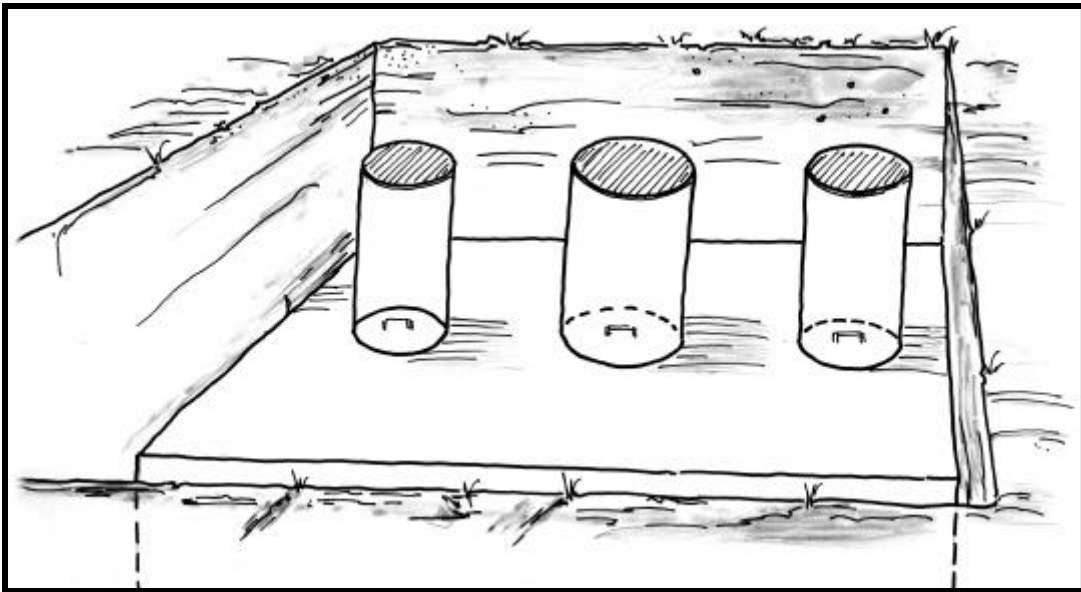


Figure 4.3a Proper installation of fiberglass risers.

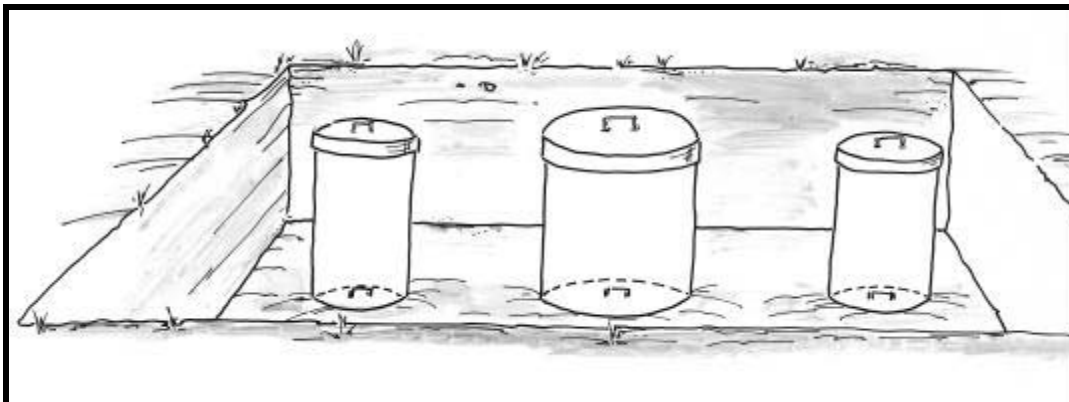


Figure 4.3b Proper installation of concrete well ring risers on the main access (manhole). Main access (manhole) cover remains on the tank; well rings are capped with a concrete cover that overlaps the outside of the rings to prevent leakage.

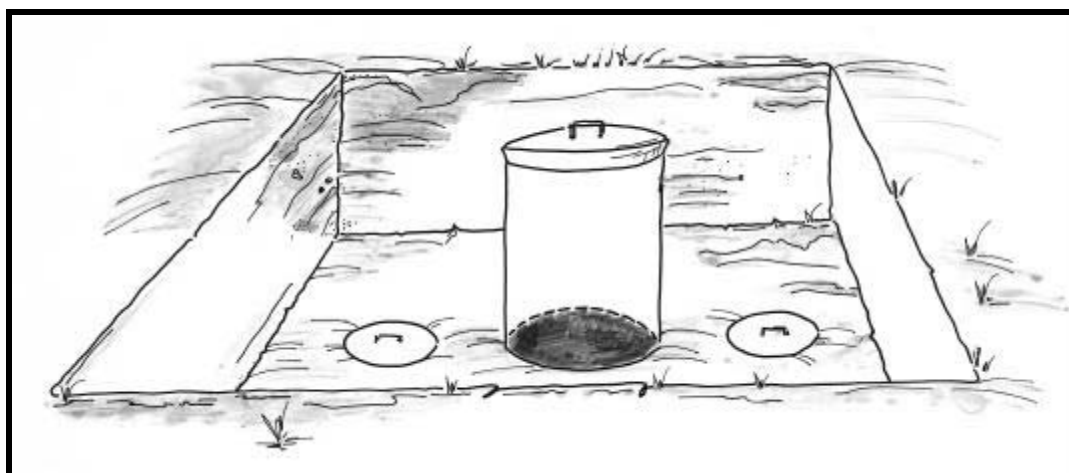


Figure 4.3c Improper installation of well ring risers with the septic tank main access (manhole) cover moved to the top of the well ring. This provides a poor fit, which may result in leakage as well as chipping of the concrete.

4.4.1 Risers to grade

Septic tank risers allow easy access to the septic tank, inspection port and manhole. Without risers, a tank must be unearthed during every inspection and pumpout. With risers, little or no digging is necessary.

System owners may also wish to install distribution box (D-box) risers. D-box risers allow inspectors to see if any solids are being carried over into the D-box. Solids carryover contributes to leachfield failure. D-box risers also allow easy access to the laterals of the soil absorption system, which may clog occasionally and require cleaning.

Risers come in two varieties: fiberglass risers and concrete well rings. Installers should make certain to use a riser with an interior dimension that is larger than access hole or manhole cover. Never use a tank's access cover as the lid for a riser. See Figures 4.3a, 4.3b and 4.3c. A tank cover will not seal a riser properly. Over time, an improper cover will damage a riser and allow stormwater to leak into the septic tank.

4.4.2 Effluent filters and gas baffles

Effluent filters attach at the outlet of a septic tank. Filters provide an easy and inexpensive means of capturing particulates to prevent them from carrying over to and clogging the soil absorption system. Properly sized filters only need cleaning at routine maintenance intervals (i.e., every 5 years or so). Refer to section 5.1.7, "Procedures for cleaning effluent filters," for more information. Gas baffles (refer to Figure 4.4) attach to the effluent sanitary tee of the septic tank and deflect gas bubbles, which may otherwise carry solids through the effluent outlet. Effluent filters and gas baffles

are simple and inexpensive ways to protect and extend the life of soil absorption systems.

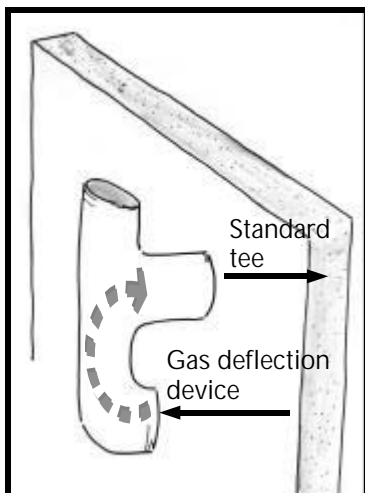


Figure 4.4 A gas baffle typically employs a standard sanitary tee fitted with a gas deflection device.

CHAPTER 5

Evaluation and Maintenance Procedures for Septic System Components

5.1 Inspecting and Maintaining Septic Tanks

This part of the inspection requires, at a minimum, access to one inspection port of the septic tank, preferably the effluent port (i.e., port at the outflowing side of the septic tank). If a pumpout is needed, the septic tank manhole must also be accessible. Locate and access the septic tank as described in sections 4.1 and 4.3. Inspectors should be aware that some septic tanks are built with two large access ports, instead of two small inspection ports with a large manhole or center hole. Two-port tanks should be inspected from the effluent port and may be pumped from either port.

5.1.1 Examining the external condition of septic tanks

Look for cracks or other signs of leakage on top of the tank and especially around the manhole and inspection ports. Leaks in the septic tank prevent proper wastewater treatment. Septic tank failures may contribute to soil absorption system failures. Any damage to the manhole or port should be repaired, but usually does not require a permit.

5.1.2 Determining when conventional tanks need pumping

Septic tanks must be pumped regularly to ensure proper functioning. If the septic system is not pumped in a timely manner, solids will bypass the effluent tee or baffle

and clog the soil absorption system. Unabated, this will eventually result in hydraulic failure (e.g., plumbing backup and wastewater breakout).

Septic tanks are usually sized to allow a little more than half their volume for accumulation of solids. The remaining volume of a tank, which is called the "clear zone," provides a quiescent area for holding wastewater while the solids settle out from liquids. Standard septic tanks have a flow depth of 48 inches. A standard septic tank, which is inspected routinely, in accordance with chapter 6 of this handbook, can store 16 inches of solids (i.e., scum and sludge combined) before pumping should be considered. Pumping should also be considered when sludge depth in a tank exceeds 13 inches or the scum depth exceeds 5 inches.

A combined solids accumulation of 16-34 inches, during a routine maintenance inspection, indicates a need to pump the tank. If accumulation is over 26 inches, evaluate the inspection schedule. Combined solids accumulation greater than 34 inches indicates a high potential for solids carryover and the need for more in-depth analysis by a licensed designer. Such an analysis should include a flow trial and recommendations to improve system operation. Refer to Table 5.1a for more information.

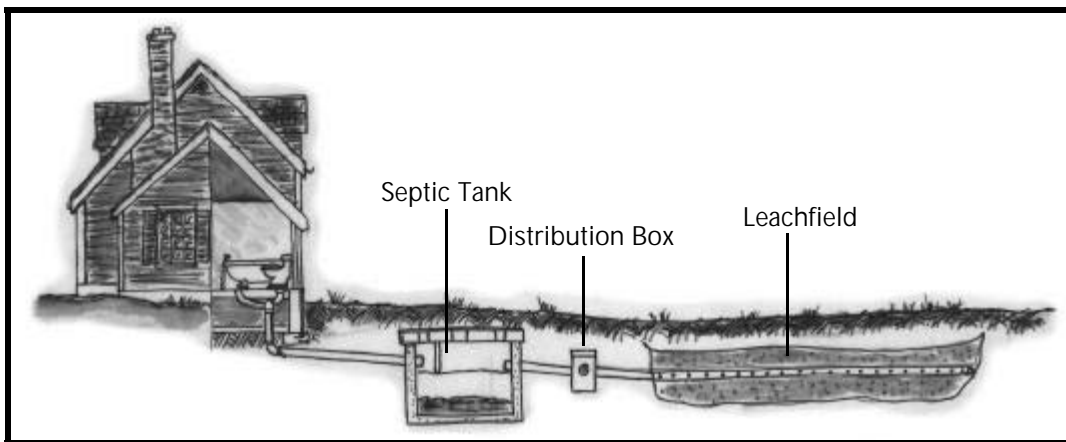


Figure 5.1 Diagram of a conventional septic system

Generally speaking, sludge accumulates at 3-4 times the rate of scum. However, relative accumulation rates may vary over a wide range, depending on such factors as the presence of a garbage disposal (see section 6.1.3 for more information on the

Table 5.1a Pumpout Guidelines for Conventional Septic Systems Serving Residential Properties

Solids 48 inch depth tank Depth Criteria Nonstandard depth tank		Recommended Action
Combined solids < 16 inches	Combined solids < 1/3 flow depth	Pump at owner's discretion. Consider setting a new Maintenance Inspection Schedule (see section 6.5 "Evaluation of Inspection Schedules."
Combined solids = 16 - 34 inches ^b	Combined solids = 1/3 - 3/4 flow depth ^b	Pump the tank and re-inspect as per section 6.5 "Evaluation of Inspection Schedules."
Either: Combined solids > 34 inches, Sludge > 26 inches, or Scum > 11 inches	Either: Combined solids > 3/4 flow depth, Sludge > 1/2 flow depth, or Scum 1/5 flow depth	Pump the tank and consider a system analysis by a licensed designer. A new inspection schedule, which accounts for system capacity and use, should be set by the licensed designer.

Note: a. Based on T. Bounds (1987) anticipated accumulation rates.
b. Refer to Table 5.1b to determine if relative accumulation rates of scum and sludge are within acceptable ranges. Accumulation of more than 26 inches (1/2 flow depth) of combined solids indicates a need for more frequent maintenance.

Table 5.1b Combined Solids Depths and Range of Sludge Depths at Pumpout for Maximum Septic Tank Efficiency

Combined Solids (inches)	Acceptable Range of Sludge Depth (inches) ^a	Combined Solids (inches)	Acceptable Range of Sludge Depth (inches) ^a
16	11-13	26	18-20
17	11-13	27	18-21
18	12-14	28	19-22
19	13-15	29	20-24
20	14-16	30	20-24
21	14-16	31	21-24
22	14-17	32	22-25
23	16-18	33	22-26
24	16-19	34	23-26
25	16-20		

Note: a. Acceptable sludge-depth range equals approximately 66-80% of combined solids. Ranges have been rounded conservatively to whole inch numbers (i.e., top-end ranges are rounded down; bottom-end ranges are rounded up).

impact of garbage grinders), cooking habits and clothes-washing habits. For a septic tank of any flow depth to operate efficiently, scum depth should make up about 20-33% of solids depth, while sludge depth should make up 66-80% of solids depth. Table 5.1b, "Combined Solids Depths and Range of Sludge Depths at Pumpout for Maximum Septic Tank Efficiency," lists relative depths of sludge for combined solids measurements to ensure proper and efficient operation of conventional septic systems.

The following procedures should be used to measure solids depths and determine if a tank needs to be pumped:

1. Locate and open the septic tank inspection port. If two ports are accessible, open the port on the effluent side. Refer to sections 4.1 and 4.3 for more information.
2. Put on latex gloves and measure the depth of the scum and sludge layers with appropriate scum and sludge measuring device(s) and record the results. There are several devices that may be used to make scum and sludge layer measurements. Refer to manufacturer instructions for information on proper use. URI's On-Site Wastewater Training Center can be contacted for information on manufacturers and vendors of such equipment.
3. Consider Tables 5.1a and 5.1b to determine the need for pumping and other appropriate actions.

5.1.3 Cleaning sludge and scum measuring devices

The following procedures should be used for cleaning sludge and scum measuring devices:

With a garden hose

If a garden hose is available, hose down each measuring device into the septic tank and wipe each device clean with a rag that has been thoroughly wetted with a bleach and water solution. (Use 1 tablespoon of bleach to a gallon of water. Because chlorine is volatile, a batch of bleach solution is good for approximately

two days.) Let the sun dry the devices as the weather allows and store for transport in a sheath, case or other container.

Without a garden hose

If no garden hose is available, wipe each measuring device down with the rag and bleach solution as directed for cleaning “With a garden hose.” Let the sun dry the devices and store for transport as above.

5.1.4 Pumping need for metal tanks

Some older septic systems may use metal septic tanks. Metal septic tanks tend to rust, causing a loss of structural integrity. Occasionally, this may result in a collapse or cave-in. Internal rusting may cause baffles and sanitary tees to break apart or drop off. Because they are prone to failure, metal septic tanks should be pumped out as part of every inspection and then inspected carefully for structural problems. Metal tanks should be replaced with tanks that are up to code as soon as possible.

5.1.5 Pumping septic systems automatically as part of the first maintenance inspection

In many cases, the first maintenance inspection will mark the first time that a system receives thorough and proper maintenance. For this reason, it is a good idea to have tanks pumped initially, regardless of solids levels, in order to fully inspect the tank.

5.1.6 Procedures for multicompartment tanks or septic tanks in series

Some septic systems may have multicompartment tanks (Figure 5.2) or two septic tanks in series. Septic tanks in series are not always visually apparent. To determine if more than one tank is in use, refer to the application information (see Table 2.1), which should include a drawing of the complete system. Multicompartment tanks

may also be identified by referring to the application information, but are usually evident at inspection.

Maintenance for multicompartment tanks and tanks in series is similar to that for single-compartment and single-tank systems. Simply replicate the inspection procedures on all tanks and compartments and pump out as needed per Table 5.1a.

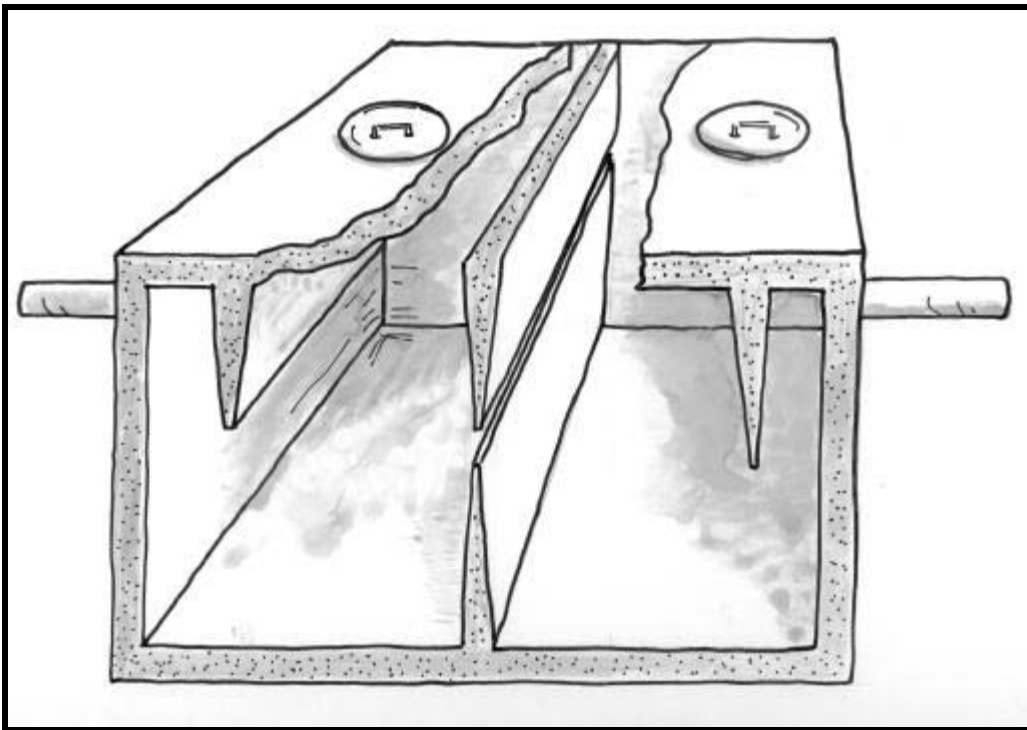


Figure 5.2 Cut-away view of a multicompartment septic tank

5.1.7 Procedures for cleaning effluent filters

Effluent filters protect soil absorption systems from clogging by removing particulates from the waste stream. Properly designed effluent filters will self-clean between routine maintenance inspections. Particles in the waste stream get caught in the filter during high-flow conditions. Most then drop to the bottom of the tank as flows subside. Septic tank bacteria eat away and dislodge the remaining particles,

keeping the filter clear enough to pass wastewater.

Effluent filters should be inspected and cleaned as part of each maintenance inspection (i.e., at 3-5 year intervals). To clean a filter, put on latex gloves and remove the filter cartridge from its housing. Tap the filter against the inside of the inspection port or hose it off into the tank. The filter does not need to be cleaned spotlessly. In fact, the bio-mass that accumulates naturally on the filter helps to prevent solids carryover. After cleaning, replace the filter and continue with the inspection.

5.1.8 Pumping procedures for septic tanks

Septic tanks need pumping only when the solids buildup in the tank begins to exceed storage capacity or when a complete internal inspection is to be done. To determine if maintenance pumping is needed, refer to section 5.1.2, "Determining when conventional tanks need pumping." If the tank requires pumping, do so using the following procedures:

1. Before pumping, note the liquid level of the tank in relation to the tank's outlet pipes. Consider Table 5.2 for troubleshooting flow-level problems in the septic tank and record the tank's condition on the inspection report.
2. If not already accessed, open the appropriate access port--usually the large central access on the septic tank--using the procedure described in section 4.3, "Opening and Closing Component Accesses." Only pump out the tank from the manhole. Pumping from inspection ports may damage tees and baffles. Also, the inspection ports do not allow pumping access to all areas of the tank.⁸
3. As the tank is pumped, watch for backflow from the tank outlet. Backflow indicates a soil absorption system backup. Notify the owner and record the occurrence on the inspection report.
4. Pump the tank completely. Use a septage spoon to loosen the sludge in the corners of the tank. There is no need to seed the tank by leaving septage in it. Conversely, there is no need to scrub or powerwash the tank's walls.
5. Once the tank is pumped, look at it to visually check the integrity of the

8. Some tanks are designed with large (20 inch) access ports and no center hole (e.g., Connecticut-style tanks). These tanks can accommodate pumpout from either port.

Table 5.2 Troubleshooting for Flow Problems Based on Liquid Level in a Septic Tank

Observation	Condition and Cause
Liquid level is approximately 2 inches below the inlet and even with the outlet bottom. There is no apparent wastewater flow in the tank.	Tank is installed properly and at rest with no indication of backup based on liquid level.
Liquid level is below the inlet and elevated less than 2 inches above the bottom of the outlet. Free flow of wastewater from inlet to outlet is apparent.	Tank is installed properly and is currently in use with no indication of backup based on liquid level.
Regardless of observed wastewater flowage in septic tank, liquid level is at or above inlet bottom or elevated by 2 inches or more above the outlet bottom.	Tank is probably installed properly, but elevated wastewater levels indicate probable backup in the system down-flow of the the tank. The inspector should perform a flow trial.
Regardless of observed wastewater flowage in the septic tank, the liquid level is at or below the outlet and the inlet is submerged.	Tank is installed up gradient or installed backwards (i.e., with the inlet in the outlet's position). Up-gradient tanks may appear to slope up towards the outlet end. Tanks installed backwards may have tees and baffles in reverse positions. Either condition should be corrected by a licensed installer.
Regardless of observed flowage in tank, liquid level is more than 2 inches below the inlet and the outlet appears and no more than 2 inches above the outlet bottom.	Tank is sloped down gradient. Depending on the severity of the slope, the tank may actually appear to slope downward toward the outlet. If the slope is minimal, no repair is necessary. Consider evaluation by a licensed installer.
Regardless of observed flowage in tank, liquid level is below inlet and outlet.	Tank may be leaking and may have structural problems. Pump the system and have a licensed installer make repairs as necessary.

sanitary tees, baffles and overall structure. Under current regulations, tanks should have an inlet tee or baffle and an outlet tee. Use a mirror on a pole and flashlight, as necessary, to look around corners and see in darkened areas. Inspection of baffles and tees can visually be done without a mirror from the inspection ports. Look for groundwater seepage through cracks or holes in the tank. Listen for trickling sounds that may indicate either backflow from the soil absorption system or groundwater seepage through a crack in the tank. Most tank in Rhode Island have a lateral midseam that may be susceptible to leakage. Tanks manufactured using a monolithic poring have a seam around the top and are susceptible to leakage there. Leakage may also occur at inlets and outlets. If there appears to be any damage, notify the owner and record the observation on the inspection report. Carefully inspect the influent side of the inlet baffle. Sometimes, baffles may trap a plug of scum or floatables that could create a plumbing backup.

5.1.9 Determining septic tank volume (optional)

Occasionally, inspectors may wish to determine the volume of a septic tank. The following procedures may be used to approximately measure volumes of rectangular and round (i.e., cylindrical) tanks.

1. Use a tape measure to determine the outer top-side dimensions of the septic tank in inches. Measure the diameter, if the tank is round. Measure the length and width if the tank is rectangular.
2. Use a sludge-measuring device to determine the flow depth of the tank in inches (i.e., the distance from the internal bottom or floor of the tank to the bottom of the tank's outlet pipe).
3. The following tables may be used to determine the volume of most tanks.

Table 5.3a Typical Rectangular Tank Volumes, Styles and Approximate Dimensions

Volume	Style	Dimensions outside length × outside width × flow depth in inches
1,000	Single compartment	102 × 58 × 48
1,000	Lowboy	126 × 68 × 40
1,250	Single compartment	126 × 60 × 48
1,500	Single compartment	126 × 68 × 48

Table 5.3b Approximate Flow Depths and Diameters for Typical Round-Tank Volumes

Diameter (inches)	Volume (gallons) and Flow Depth (inches)			
	500	600	750	900
60	41	49	61	74
72		34	43	51
84			31	38

If the tank's dimensions are atypical and the volume cannot be determined with the previous tables, use Equation 5.1 or 5.2 to approximate volumes.

Equation 5.1 Volume of Rectangular Tanks

$$V = D \times L \times W \times 0.00439 \text{ gallons/cubic inch}$$

Where:

V = Volume

D = Flow Depth

L = Length

W = Width

0.00439 gallons/cubic inch = Conversion factor (cubic inches to gallons)

Equation 5.2 Volume of Round Tanks

$$V = D \times \text{Pi} \times r^2 \times 0.00439 \text{ gallons/cubic inch}$$

Where:

V = Volume

D = Flow Depth

r = Radius ($r = d/2$)

d = Diameter

Pi = 3.14

0.00439 gallons/cubic inch = Conversion factor (cubic inches to gallons)

5.1.10 Septic system additives

A number of companies market products (e.g., enzymes and baking soda) under the claim that routine addition to the toilet or septic tank will improve septic system function and restore flow to "slow plumbing." Most experts consider these product claims to be unsubstantiated. Consumers should be aware that wastewater flow problems, which originate in a septic system, are symptomatic of major system failure. Without the proper attention of a wastewater professional, such problems will usually get worse and more expensive to repair. Relying on additives to fix septic system problems is ill-advised at best.

Some septic system service companies offer acid and organic chemical treatments as a remedy for septic system backups or even as preventative maintenance. Use of such solvents is extremely dangerous. They are caustic, typically poisonous and may contaminate nearby water supplies (e.g., private wells). Use of such solvents is also a violation of Rhode Island's ISDS Regulations. The only exception is hydrogen peroxide, which may sometimes be used in conjunction with a system enlargement to rehabilitate a failing system.

Septic system owners should note that backups are often the result of wastewater overload. Beyond danger and regulatory infraction, a solvent cannot increase the long-term capacity of a septic system. Septic systems that are undersized will need to be enlarged in order to function properly.

5.2 Procedures for Maintaining Distribution Boxes if an Inspection Port is Present

Occasionally, a distribution box may have a handhole at grade. If present, open the port and check the distribution box. There should be no solid material or standing water above the outlets in the box. If standing water is present, it may indicate a backup in the soil absorption system. If solids are present, it indicates solids carryover and the likelihood of an impending failure. If either condition is present, notify the owner and record it on the inspection report.

5.3 Maintenance Inspection for Cesspools

It is estimated that 20-30 percent of existing cesspools in Rhode Island are hydraulically failed (i.e., backing up into the building sewer or onto the surface of the ground). Cesspools need more frequent maintenance than conventional septic systems as they are typically of smaller design capacity, more prone to failure and therefore, less protective of public health and the environment. At first sign of failure, cesspools, like other substandard systems, should be upgraded.

If a cesspool has not failed and is not being immediately upgraded, then it should be maintained using the procedures that follow. Nevertheless, system owners should be reminded of the potential pitfalls of these substandard systems.

5.3.1 Inspection prior to pumping

1. As with a septic tank, inspect the cesspool for cracked covers. Cracked covers should be replaced as soon as possible.
2. Inspect for backup into or above the inlet pipe. If septage is found above the inlet, the system has reached the end of its useful life and should be upgraded to regulatory standard as soon as possible.

5.3.2 Pump the cesspool regardless of solids depth

1. As with a septic tank, pump a cesspool completely. No additional maintenance is necessary.
2. After the system is pumped, observe the inside. If water is rising from the bottom or seeping through the sidewalls, so as to create standing water, the cesspool is likely to be installed in the groundwater and should be upgraded. If the system has apparent structural problems, the system is failed and should be upgraded as soon as possible.

5.3.3 Cesspools with overflow pipes and other outlets

Some cesspools may have one or more overflow pipes or other outlets.⁹ Outlets may outfall into a secondary soil absorption system (e.g., seepage pits, leaching trenches, etc.), waterbody, catch basin, or onto the surface of the ground.

Because an outlet may direct wastewater to the ground surface, an inspector should attempt to locate the outlet's terminus using the procedures of section 5.6.1, "Identifying suspected treatment bypasses." If a suspected treatment bypass is

9. Cesspool overflows and outlets are generally illegal unless they direct flow to a secondary soil absorption system.

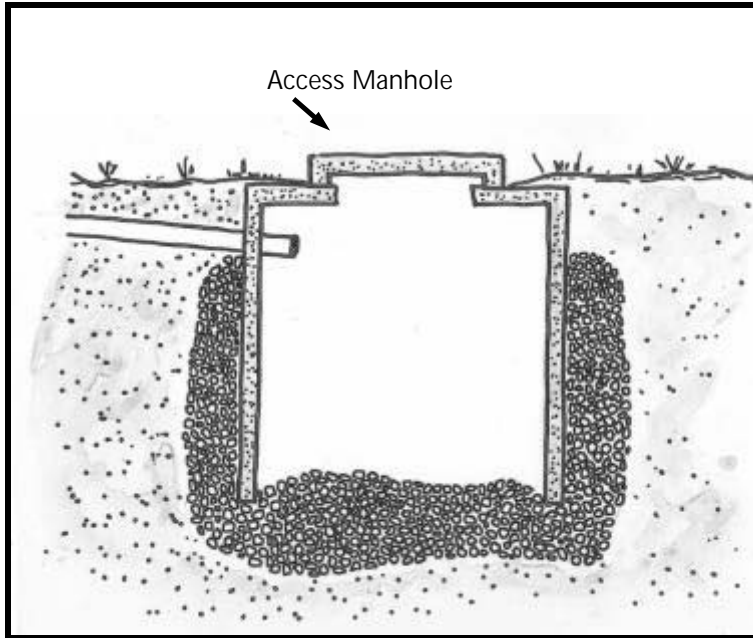


Figure 5.3 Diagram of a cesspool

identified, the inspector should notify the system owner and indicate the bypass on the inspection report.

If no bypass is observed, the inspector should assume that the overflow pipe leads to a secondary soil absorption system. Attempt to locate the absorption system, applying the principles used for locating the cesspool (see section 4.1).

If a secondary soil absorption system, which could need maintenance, is found, access, inspect and clean it as per sections 5.3.1-2.

5.4 Observation of Site Conditions

This portion of the inspection requires general knowledge of the location of certain components. These are the cesspool or septic tank and soil absorption system. Location of components can be determined by referring to the results of a first maintenance inspection, functional inspection or conformed system drawings.

Location may also be determined at the site by the inspector (refer to chapter 4, "Techniques for Accessing Septic System Components"). Once components are located, inspectors should do the following:

1. Look for any trees, large shrubs or other plants with extensive root systems growing over or within 10 feet of any system components. If any such plants are present, the owner may wish to have them removed. Owners may wish to leave ornamental and other such plants in place. However, inspectors should inform owners that large roots may crack, offset or otherwise intrude and damage components (Figure 5.4).
2. Look for any indication (e.g., tire tracks and other imprints) that heavy machinery or heavy objects (e.g., cars, above-ground pools, etc.) are or have been over any system components. If any heavy objects or indication of heavy objects are present, the owner should remove objects and discontinue the placement of such objects over the system components. Heavy objects may crush or offset system components.
3. Look for any indication that stormwater (e.g., roof runoff or outflow from foundation drains such as sump pumps) is flowing into or over any septic system components. If this condition is present, the owner should take steps to redirect the flows. Runoff that is diverted to the area of the soil absorption system may flood it and interfere with proper wastewater treatment or cause backup. Runoff diverted over other system components adds to wear and tear. Runoff may also infiltrate components,

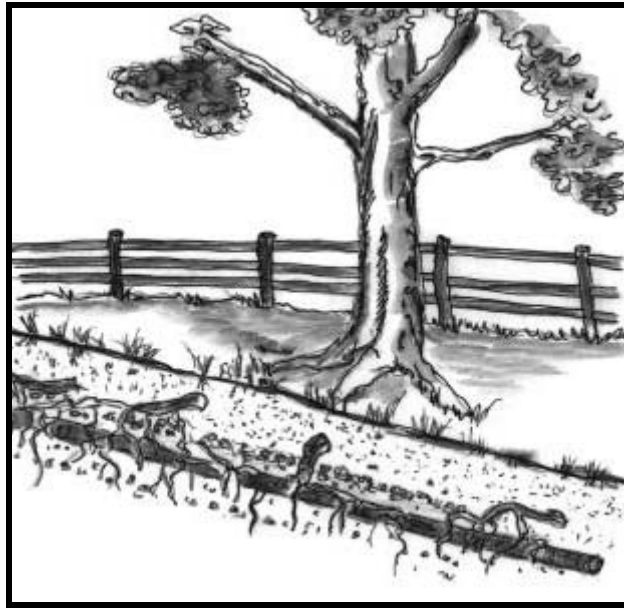


Figure 5.4 Root systems of large plants may intrude into a septic system when proper setbacks (i.e., 10 feet) are not observed.

eventually flooding the soil absorption system.

4. Look for physical evidence of system malfunction, such as cave-in or exposed components. If present, the owner should be instructed to have the malfunction fixed by a repair professional.
5. Look for impermeable surfaces, such as driveways or patios, within 10 feet of components. Impermeable surfaces block the natural movement of air and moisture in soil, inhibiting biological activity and hindering wastewater treatment. The owner should have any such surfaces removed.
6. Look for any observable signs of system malfunctioning, such as septic odors, ponding, or other signs of wastewater outbreak, patches of lush green grass (in conjunction with other signs of failure and giving consideration to seasonal growth patterns), burnt-out grass or ground staining. Symptoms, such as the aforementioned, indicate a major system failure and should receive the immediate attention of a repair professional.

5.5 Flow Trial for Identifying Gross Loss of Hydraulic Capacity

Hydraulic capacity--the potential for a soil absorption system to accept wastewater--varies as a result of changes in effective absorption area, wastewater flow, waste strength and biological activity in the soil. When overly stressed by excessive flows or waste strengths, a system may lose hydraulic capacity. In the most severe cases, this may result in a complete failure (i.e., a wastewater backup into the house or onto the ground surface). The functioning of a soil absorption system may also be impaired as a result of cave-ins, crushed pipes or objects stuck in lines. The flow trial is a means for identifying blockages or significant reduction of hydraulic capacity.

5.5.1 Limitations of the flow trial

The flow trial is one of a suite of techniques that may be used to assess a septic system during a functional inspection. It is not a be-all-and-end-all test, nor is it

accurate under all conditions. The results of a flow trial should always be interpreted within the context of the entire inspection. If a system is showing signs of failure, certain flow-trial procedures may actually aggravate the problem (see “Situations when a flow trial performed at the septic tank outlet is recommended . . .,” which follows). Under such circumstances, if a flow trial cannot be done at the outlet, do not perform a flow trial. If there is an obvious cave-in over the soil absorption system, the system clearly needs a major repair and no flow trial is necessary.

Situations when a flow trial may give unreliable results

1. During the last 12 months, the home was unoccupied for a continuous period of one month or more.
2. The system has had a recent hydrogen peroxide treatment (usually evidenced by chemical scouring or a bleached-out appearance on concrete components). Inspectors should be mindful that use of hydrogen peroxide generally indicates an attempt to fix a major system failure, which will be likely to recur.

Situations when a flow trial performed at the septic tank outlet is recommended as other methods may contribute to a failure (refer to section 5.5.3, “Flow trial procedures,” for more information on various methods to load a system with the flow trial volume)

1. Overaccumulation of solids: (a) depth of combined solids is greater than 34 inches; (b) depth of scum is greater than 11 inches; or (c) depth of sludge is greater than 26 inches.
2. Evidence of structural damage to the system: (a) broken tee or baffle; (b) cracked tank; (c) evidence of a heavy object placed over the soil absorption system; or (d) one component or more has been exposed as a result of soil erosion.
3. Inspector has not measured the depth of solids and the system has not been pumped in over 3 years. An adequately sized, conventional system, which has been pumped in the last 3 years, is unlikely to have an overaccumulation of solids; however, inspectors may wish to measure solids for added certainty.

5.5.2 Calculating the flow trial volume

Normal wastewater flows vary over the course of a day, peaking during the morning and evening hours when people are most likely to use the kitchen, bathroom and laundry facilities. The greatest flow that may enter a system during an hour of time is called the peak one-hour flow. As it is typically the most stressful condition experienced by a system, the peak one-hour flow is also the condition that the flow trial is designed to approximate (i.e., peak one-hour flow = flow trial volume).

An examination of the literature indicates that peak one-hour flow can be estimated as 12 times the average hourly flow or half the daily flow. Systems in Rhode Island are designed based on the daily flow (i.e., design flow = daily flow), which can be calculated as 150 gallons per bedroom per day.¹⁰ Therefore, flow trial volumes can be calculated as half the design flow or as the number of bedrooms times 75 gallons. Table 5.4 indicates flow trial volumes for homes relative to number of bedrooms and design-flow volumes.

Table 5.4 Minimum Flow Trial Volumes Relative to Number of Bedrooms and Design Flow

Number of Bedrooms	Design Flow (Gallons/Day)	Flow Trial Volume (Gallons)
2	300	150
3	450	225
4	600	300
5	750	375
6	900	450

5.5.3 Flow trial procedures

The following are procedures for a flow trial. Inspectors should keep in mind that a flow trial requires a large volume of water, which creates a good condition for dye tracing. If both a dye tracing and flow trial are to be done, an inspector should perform them together to avoid waste (to determine if dye tracing is necessary refer to section 5.6, "Dye Tracing for Confirming Treatment Bypasses").

10. The design flow should also be indicated on the certificate of construction.

1. Ask occupants to refrain from using any plumbing fixtures (e.g., sinks, toilets, spigots, etc.) during the flow trial.
2. Consider the condition of the septic tank (refer to section 5.1.1, "Examining the external condition of septic tanks" and to section 5.5.1, "Limitations of the flow trial"). If there is evidence of backflow from the soil absorption system, evidence of solids carryover or other situations of concern, do not flow trial the system at the inlet or by using in-home water fixtures. Instead, consider doing a flow trial by running water through a garden hose that has been inserted into the tank outlet. If the inspector opts not to do the flow trial at the outlet, then the tank should be pumped and the inspector should refer the system owner to a repair professional.

In general, if a system has been pumped in the last three years, then it can be assumed that there will be no solids carryover during a flow trial. If no pumpout record is available, the inspector should measure the depth of both the scum and sludge layers. (Refer also to Item 1 of "Situations when a flow trial performed at the septic tank outlet is recommended..."). If the system appears to be in working order, the flow trial volume may be added via either the inlet or the outlet of the septic tank.

3. The flow trial volume (refer to section 5.5.2, "Calculating the flow trial volume") may be added at a rate of between 5 and 10 gallons per minute. This may be done by placing a garden hose at the inlet inspection port of the tank or by opening water taps in the house.

If the house has a water meter, then the meter may be used to measure flow (refer to section 3.2, "Estimating Water Use"). (Be sure to note the volume unit of flow on the meter--a cubic foot is approximately 7.48 gallons.) If a household water meter is not present, an in-line flow meter may be used on a garden hose to measure flow rate. If no metering device is available, flow rate from a garden hose may be estimated by opening the tap fully and timing the fill up of a 5 gallon bucket (refer to section 3.3.1, "Measuring flow rate," for more details).

If dye tracing is being performed on the system, dye should be added to the outlet of the septic tank during this step (refer to section 5.6, "Dye Tracing for Confirming Treatment Bypasses").

4. Measure and record the time it takes to add the flow-trial volume as determined in Step 2. If water begins to back up (i.e., rises more than two inches above the outlet bottom), record the time it took for this to occur. Inspectors should note that when first adding flow to the soil absorption system, a small rise in water level (1 or 2 inches) will occur in the septic tank. This is not a backup.
5. Calculate the volume of flow accepted by the soil absorption system (refer to section 3.3.1, "Measuring flow rate," for more details). Record the results on the inspection report form. If the system did not accept the full flow-trial volume, refer the owner to a repair professional.

5.6 Dye Tracing for Confirming Treatment Bypasses¹¹

Soil absorption systems use the soil to treat wastewater and remove pathogens, (i.e., disease-causing organisms and viruses) from wastewater. When wastewater bypasses soil treatment, wastes and pathogens are not adequately removed and remain in unhealthful concentrations. For example, treatment may be bypassed by an overflow pipe that routes flow out of a septic system component, preventing it from reaching the soil absorption system. Bypasses are illegal under Rhode Island law and should be eliminated when they are confirmed.

Bypasses may take complex and broken paths, making them difficult to trace visually or even by use of a snake. Dye tracing overcomes this problem, as dye will resurface and flow wherever wastewater does (i.e., up to the ground surface, into a waterbody or stormwater system). Inspectors should use the following procedures when dye tracing.

5.6.1 Identifying suspected treatment bypasses

Most bypasses are installed to drain undersized or failed cesspools or drain gray-water appliances (e.g., washing machines). Bypasses in conventional septic systems

11. Procedures are based on *Identification of Sewage Contamination Sources: A Field Handbook* (RIDEM, in draft).

are rare, but not entirely unheard of. Therefore, check all systems thoroughly.

The following procedures may be used to find potential bypasses, but require a large volume of water to be effective. Therefore, the dye tracing and flow trials should be performed together. If a flow trial is not being performed because of solids-carryover concerns, do not perform dye tracing either (refer to section 5.5).

1. Ask the residents if they know of any wastewater bypasses or overflow pipes.
2. Walk the property boundary and note any catch basins within view, pipes emerging from the ground or retaining walls as well as waterbodies that border the property. Also, walk throughout the whole property and note any waterbodies and groundwater upwellings. Inspectors should note both visible outlets and wet areas where outlets are likely to discharge.

Check the interiors of cesspools and septic tanks using a mirror and flashlight if necessary. A bypass is most likely installed at or just above the flow line, therefore, pumping the tank is not required for inspection purposes.

3. If any potential bypasses are observed, note their locations and any signs of flowage (i.e., actual flow or evidence of flow, such as laundry lint, algal growth, or erosion patterns on the ground). If any catch basins are found, they should be checked for bypass lines (refer to section 5.6.2, "Checking catch basins for bypasses").
4. If no potential bypasses are visible and the residents report no bypasses, dye tracing is not necessary. Proceed with the remainder of the inspection. If a suspected bypass is identified, proceed to section 5.6.3, "Investigating suspected bypasses."

5.6.2 Checking catch basins for bypasses

Safety precautions for observing and opening catch basins

1. Opening and working near catch basins must be undertaken carefully in order to avoid risk to both the inspector and unwary onlookers. Removal of a catch basin grate or manhole cover is heavy work and somewhat dangerous.

Removing a catch basin cover should only be done by a trained drainlayer or municipal employee.

2. Never enter a catch basin without following appropriate Occupational Safety and Health Administration precautions (refer to OSHA 1910.146 Permit Required Confined Space Rule). Never leave an open catch basin unattended (i.e. out of view) as water in the basin may present a drowning hazard.
3. Catch basins are usually owned by a municipality. Notify and obtain permission from local officials--both at the police and public works departments--prior to accessing a catch basin.

Ask for assistance in following safety procedures as these may change from one municipality to another.

4. Oncoming traffic can be dangerous. Do not attempt to open or look inside catch basins where posted speeds exceed 25 miles per hour.
5. Do not attempt to open or look inside covers, located more than five feet laterally from the curb edge to the furthest point on the cover.

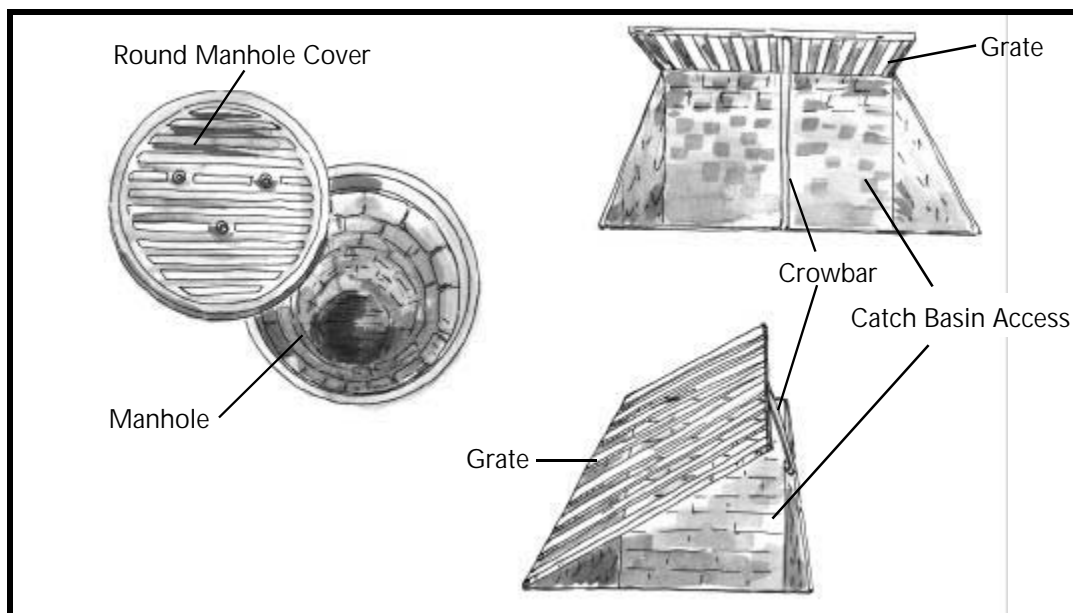


Figure 5.5 Opened storm drain grates.

6. Catch basins should not be opened or observed during inclement weather or when driving conditions are otherwise poor.
7. To limit traffic hazards, park a vehicle, with the hazard lights flashing, approximately 10 feet up-traffic of the catch basin being accessed. Place three traffic cones up-traffic of the parked vehicle. Place three additional cones at five-foot intervals around the cover in a triangular formation.

Determining the need to open catch basins (refer to “Safety precautions for observing and opening catch basins,” listed above)

If the cover is a grate, dye may be observable without opening the grate. Attempt to look inside the access hole using a flashlight. If a suspected bypass, bottom of the basin or water in the basin can be viewed clearly, then the tracing dye will also be visible and opening the basin is not necessary.

Opening and closing catch basins (refer to “Safety precautions for observing and opening catch basins,” listed above)

1. Sweep debris and sand from the general area of the catch basin to prevent it from falling into the cover seating when the basin is opened. This makes resetting the cover easier.
2. If pivoted diagonally, a rectangular grate may fall into its access hole. Before attempting to open a rectangular grate, secure a rope to it and then to something that can support its weight if it falls (e.g., your vehicle bumper, if it is sturdy enough). Circular covers cannot fall into their access holes and do not need to be secured.
3. Wedge a crowbar into any notch around the edge of the cover and pry the cover with the crowbar until it is raised an inch or so above its seating. Insert a manhole cover hook and use it to grab the cover. Circular covers may be swung along side the catch basin access hole. Rectangular covers should be propped up on one side of their seating using the crowbar as a prop (see Figure 5.5).
4. Check the inside of the catch basin for bypass lines. A bypass line is typically a 2-inch diameter pipe. However, the minimum standard pipe size for a

stormwater drain is 12 inches; therefore, an inspector should be suspicious of any pipes less than 12 inches in diameter. If no suspected bypass is found, close the catch basin (refer to Step 6) and proceed with the inspection as appropriate.

5. If a suspected bypass is identified, proceed with dye tracing (refer to section 5.6.3, "Investigating suspected bypasses"). Be certain to replace any removed catch basin covers at the end of the dye-tracing procedure.
6. Before closing a catch basin, sweep its cover seating to remove sand or other obstructions. Replace the cover, being certain that the cover resets tightly.

5.6.3 Investigating suspected bypasses

Use the following procedures to determine if a suspected bypass is actually diverting flows and interrupting septic system treatment. Only use this procedure after suspected bypasses have been identified (refer to section 5.6.1, "Identifying suspected treatment bypasses").

1. After following the steps of "Identifying suspected treatment bypasses," add one quart of dye solution (refer to section 5.6.4, "Preparation of dye-tracing solution").
2. Dye testing is typically done in conjunction with a flow trial. Proceed with a flow trial (refer to section 5.5, "Flow Trial for Identifying Gross Loss of Hydraulic Capacity"). Look through the outlet inspection port to make certain that dye is moving into the outlet pipe. If the dye appears to be pooling or if the flow trial is being done at the septic tank outlet, use a garden hose to wash it through.
3. Once the flow trial is in process and water is being added to the septic system, begin observation of the suspected bypasses by checking them every 10 minutes for dyed water. If no dye is apparent by the end of the flow test, a bypass is not present. If dye is present, it indicates a bypass. Record the occurrence in the inspector's report, noting the location and general description of the bypass and recommend that the owner seeks the advice of a repair professional.

5.6.4 Preparation of dye-tracing solution

Fluorescein dye, which is used for the dye-tracing procedures, may be purchased in powder or liquid concentrates. Liquid concentrates are generally easier to work with than powder. The dye powder can be messy to handle. It may permanently stain clothing, carpets and other textiles. Dye powder may be blown about by very light air movement.

If powder is being used, an inspector should prepare dye solution before visiting the inspection site. The following is a procedure for making a dye tracing solution from powdered dye, which was adapted from *Identification of Sewage Contamination Sources: A Field Handbook* (RIDEM, in draft).

Equipment

1. Utility sink with a nearby counter or other clear work surface.
2. Lab smock or other covering to protect clothing from dye stains.
3. Latex gloves to prevent staining of hands.
4. A 1½ gallon pitcher for mixing and pouring the solution.
5. Measuring spoons: teaspoon and tablespoon.
6. Stir stick or long-handled mixing spoon.
7. Funnel.
8. 4 clearly labeled,¹² quart-sized, plastic bottles with screw-on tops (to prevent poisoning do not use drink containers) for storing and dispensing the dye solution.
9. Waterproof carrying case (such as a smaller cooler) to transport the bottles of dye solution.
10. Paper towels for cleanup.

12. Inspectors should clearly label bottles as follows: **"Caution - fluorescein dye solution, not for human consumption"** to ensure that it is not confused with a beverage.

Materials per 1 gallon batch

1. 2 teaspoons of fluorescein yellow dye powder. Yellow dye is recommended as it is easy to see in the field.
2. 1 gallon and 1 tablespoon of water (tap water is acceptable).

Preparation steps

1. Put on the smock and gloves and arrange all materials and equipment at the utility sink. In the sink, place the mixing pitcher and 4 storage bottles. On the nearby work surface, spread out 1 or 2 paper towels with the opened dye powder container and measuring spoon on top. Place the carrying case, funnel, and stir stick nearby so it will be ready for use.
2. Holding the dye powder container over the sink, measure 2 teaspoons of dye powder carefully into the mixing pitcher. Put the dye powder back on the paper towel and re-cover it.
3. Add 1 tablespoon of water--in a few dribbles--to the dye in the mixing pitcher. Mix the powder and water with the stir stick so that the powder becomes wetted and pasty. If the powder is not completely wetted, it will not mix in when the larger volume of water is added, but instead will float like unsweetened cocoa powder in cold milk. Add the gallon of water and mix thoroughly.
4. Place the funnel into the neck of a storage container. With one hand, grasp the neck of the bottle and funnel together, giving them support. Use the other hand to pour off dye solution from the pitcher and fill the storage bottle. Fill each of the remaining bottles in the same manner.
5. Cap the storage bottles tightly and wipe off any dye residue with paper towels. Discard the used towels and place the bottles in the carrying case. Carefully fold up and discard the paper towels on the counter. Use additional paper towels to wipe up any spilled dye from the sink and counter area.

CHAPTER 6

Scheduling Maintenance Inspections

6.1 Conventional Systems Serving Single-Family Homes

All septic systems require regular maintenance, which should include inspection and pumping if necessary. Because pumpouts are the most regularly required type of maintenance for conventional systems, maintenance schedules may generally be based on the anticipated need for pumping. In some cases, however, systems may go for long periods without needing pumpout. Such systems should still be inspected at least once every 5 years to ensure that other types of maintenance and repair are not needed.

6.1.1 Conventional systems serving 1-2 persons per bedroom

When scheduling inspection based on the anticipated need for pumping, inspectors should consider two factors: tank volume and household occupancy. Table 6.1, "Longest Recommended Inspection Frequency in Years for Single-Family Residences on Conventional Systems," may be used to determine the maximum recommended interval between maintenance inspections. Table 6.1 also accounts for the 5-year inspection limit. As mentioned above, systems should be inspected at least once every 5 years to ensure proper function. To calculate number of persons per bedroom refer to Equation 3.2 in section 3.2.2.

Table 6.1 Longest Recommended Inspection Frequency in Years for Single-Family Residences on Conventional Systems

Tank Size (gallons)	Household Occupancy (number of people)			
	1-4	4-6	6-8	10 or more
1000	5	3	Undersized Tanks	
1250	5	4	3	
1500	5	5	4	

Notes:

- a. Inspections frequencies are based on worst-case scenarios for solids accumulation as determined by the US Public Health Service study (1954) and T. Bounds study (1987); as well as the 5-year anticipated need for preventative maintenance.
- b. Inspection frequencies are based on a household wastewater disposal rate of 150 gallons per bedroom per day.
- c. "Undersized Tanks" means that based on ISDS Regulations, the tank size is substandard for the number of people indicated.

6.1.2 Conventional systems serving 1 person per bedroom or less

The inspection frequencies listed in Table 6.1 allow for fairly high household occupancy. Households that can document stable occupancy of 1 person per bedroom or less can extend their inspection frequencies to the maximum of 5 years. To calculate number of persons per bedroom refer to Equation 3.2 in section 3.2.2.

6.1.3 Effect of garbage grinders on maintenance

Garbage grinders can be compatible with well-designed conventional septic systems; however, they are known to increase scum layer accumulation rates by approximately 20 percent (Bounds, 1987). Certain food wastes tend to biodegrade slowly. For example, egg shells and coffee grounds break down at a very slow rate. Disposal of such wastes via a septic system will necessitate more frequent maintenance.

For a septic system with a garbage grinder, an owner should consider that maintenance pumpouts will probably be needed 1-2 years earlier than for the same system without a garbage grinder. Effluent filters are recommended for any system with a garbage grinder to prevent solids from carrying over to the soil absorption system (refer to section 4.4.2, “Effluent filters and gas baffles.”) Garbage grinders are not recommended for use with substandard systems.

6.2 Nonconventional Systems Serving Single-Family Homes

6.2.1 Cesspools and other substandard systems

All substandard systems, including cesspools, systems with metal tanks and systems with undersized tanks, should be inspected¹³ on a 1-3 year basis. Because cesspools are set deep into the ground, they are susceptible to groundwater infiltration. Cesspools should be inspected during the rainy season (i.e., early spring) if possible. The scheduling frequency should be based on the sensitivity and proximity of local natural resources as well as local conditions that predispose systems to failure. In particular, communities may wish to consider proximity to water resources (e.g., coastal resources, surface water supplies and wellheads), local soil type, local depth to groundwater, depth to restrictive layers (e.g., bedrock), lot size and household occupancy.

6.2.2 Alternative systems

A wide variety of alternative technologies are available for wastewater treatment. Rhode Island has formed a technical review committee to determine what forms of alternative treatment technology will be allowable in the state. These various alternative treatment technologies and their specific maintenance requirements are not described in this document. However, the companies that manufacture these systems are required by the state to make operation and maintenance information

13. Inspections for cesspools and substandard systems should always include pumping the system (see section 5.3, “Maintenance Inspection for Cesspools”).

available to homeowners. Owners and inspectors should also refer to requirements for maintenance included as part of their permits.

6.3 Special Consideration for Systems Serving Rental Properties

Though not always the case, some renters tend to be less attentive to septic systems than are owners. In addition, rental properties are frequently occupied by more people per bedroom than single-family houses. Septic systems serving rental units with year-round occupancy should be inspected on a 1-3 year schedule. Septic systems serving summer rental units or other temporary rental units should be inspected every year.

Different tenants are likely to have different water-use habitats. For this reason, property owners should consider having their systems inspected within 6 months to a year after a change in tenancy.

Owners should consider doing regular water-use surveys to monitor for system leaks and level of water usage. Chapter 3 of this handbook describes how to detect leaks in various household water-using devices. For more information, readers may contact the American Water Works Association. *How Much is Enough? Controlling Water Demand in Apartment Buildings* (Judd, 1993) is one publication that describes leak diagnosis for household plumbing.

6.4 Suggested Policy for Scheduling Inspections in Community Programs

Communities adopting wastewater management programs may wish to simplify the inspection scheduling process. The following six statements could be used to frame such a policy. Table 6.2, "Policy for Inspection Frequency Based on Household Type and System Type," summarizes these policies.

14. A standard tank is one that meets current DEM ISDS regulatory standards by size and construction.

Table 6.2 Policy for Inspection Frequency Based on Household Type and System Type

Household Type	System Type	Inspection Frequency
Water use of 75 gals./bedroom or less (i.e., 1 occupant per bedroom or less)	Conventional (standard tank) ^a	5 years
Single family	Conventional	5 years
Single family 3 or more bedrooms	Conventional (large tank) ^b	4 years
	Conventional (standard tank)	3 years
Rental or seasonal property	Any system	1-3 years (determined on a case-by-case basis)
Any household	Substandard (i.e., cesspool, metal tank, undersized tank, excessive occupancy, etc.)	1-3 years (determined on a case-by-case basis)
	Innovative or alternative	Based on type of technology

Notes: a. A standard tank is a tank that meets current RIDEM ISDS regulatory standards for size and construction.
b. A large tank is a septic tank that is larger than required by ISDS Regulations.

- (a) All conventional systems with standard tanks,¹⁴ serving a residence with low occupancy (1 person per bedroom or less), should be inspected on a 5-year schedule. Refer to Equation 3.2 in section 3.2.2 to calculate occupancy per bedroom.
- (b) All conventional systems with at least 1000 gallon tanks, serving 1-2 bedroom homes, should be inspected on a 5-year schedule.
- (c) All conventional systems with tanks that are larger than required by regulation and serving a residence with up to 2 persons per bedroom should be inspected on a 4-5 year schedule.¹⁵ Refer to Equation 3.2 in section 3.2.2 to calculate occupancy per bedroom.
- (d) All conventional systems with standard tanks, serving 3-bedroom or larger homes with up to 2 persons per bedroom, should be inspected on a 3-year schedule. Refer to Equation 3.2 in section 3.2.2 to calculate occupancy per bedroom.

15. Large tanks are fairly rare and communities may wish to drop this provision.

16. Undersized tanks are tanks that do not meet DEM's current volumetric standards.

- (e) All substandard systems, including cesspools, systems with metal tanks and systems with undersized tanks,¹⁶ and systems serving households with occupancy of more than 2 persons per bedroom, should be inspected on a 1-3 year schedule to be determined by the community on a case-by-case basis. Refer to Equation 3.2 in section 3.2.2 to calculate occupancy per bedroom.
- (f) All systems serving rental properties should be inspected on a 1-3 year schedule as determined by the community.
- (g) All systems using alternative wastewater disposal mechanisms should be scheduled for inspection based on the type of technology and DEM permit requirements.

Table 6.3 Adjusted Inspection Intervals for Conventional Systems Serving Single Family Residences Based on Combined Solids Accumulation Since the Last Pumpout ^{a, b}

Combined Solids Accumulation		System Pumped 3 Years Ago	System Pumped 4 Years Ago	System Pumped 5 Years Ago
48-inch tank	nonstandard depth tank			
30-34 inches	3/5-3/4 of depth flow	System Analysis Required ^c		3 years
26-30 inches	1/2-3/5 of flow depth			4 years
20-26 inches	2/5-1/2 of depth flow	3 years	4 years	5 years
16-20 inches	1/3-2/5 of depth flow	4 years	5 years	5 years
< 16 inches	< 1/3 of depth flow	5 years	5 years	5 years

- Notes:
- a. Recommended inspection intervals are based on worst-case scenario for rate of solids accumulation, (Bounds, 1987).
 - b. Inspection intervals are valid for systems where scum makes up 20-33% of combined solids and sludge makes up 66-80% of combined solids (see also Table 5.1b). Other systems should be assessed by a design professional and are likely to need more frequent inspections.
 - c. "System Analysis Required" means that combined solids accumulation will necessitate maintenance every 2 years or less. Such systems may need upgrades (e.g., larger tank).

6.5 Evaluation of Inspection Schedules

Occasionally a system's inspection schedule may need adjustment. Whenever a home changes ownership or occupancy, changes to an inspection schedule should be considered in accordance with Table 6.3. Other conditions that necessitate an inspection schedule evaluation include evidence of system failure and greater or lesser than anticipated accumulation of solids in the septic tank.

If a system has no more than 26 inches of scum and sludge combined and the system requires only routine maintenance (i.e., pumpout), then the time between inspections may be increased as per Table 6.3. However, inspection intervals should never exceed 5 years and an inspector should only recommend lengthening an inspection interval if the system is also being pumped.

From time to time, an inspector may observe a system that has an overaccumulation of solids. If a system has an overaccumulation of solids (greater than 26 inches of combined solids), but no signs of failure, then use Table 6.3 to recommend a more appropriate inspection frequency.

Setting inspection frequencies after a system has failed is beyond the scope of this handbook. If a system has failed, it should be referred to a repair professional.

GLOSSARY OF TERMS

Alternative (Innovative) System: See "Septic System."

Angled Mirror on a Pole: A pole of approximately 6 feet in length with a mirror attached to one end at a 45 degree angle. The device is used to see the interior parts of a septic tank, which are not otherwise visible from the manhole or inspection ports.

Application: See "System Records."

As-Built Plans: See "System Drawing."

Baffle: A downward extension from the ceiling of the septic tank that spans the sides, but leaves area underneath itself for wastewater flow. Baffles are typically designed to trap scum in the top portion of the septic tank.

Bedroom: Any room in a residential structure that is more than 100 square feet in floor area and has at least one window and a closeable passageway (i.e., doorway). Refer also to SD 1.00 of the ISDS Regulations for more detail.

Black water: Refers to sanitary sewage that is, in some substantial part, made up of human or animal excrement.

Building Sewer: A pipe beginning outside a building wall and extending to a septic system component (e.g., septic tank or cesspool).

Bypass: A pipe or other conveyance that allows sewage to short-circuit normal treatment. In a cesspool a bypass may also be referred to as an overflow pipe.

Bypasses are typically installed to prevent septage from backing up into the building sewer.

Certificate of Conformance: See "System Records."

Cesspool: A buried chamber that receives sanitary sewage from a building sewer for the purpose of collecting solids and discharging liquids to the surrounding soil. An overflow cesspool refers to a secondary cesspool intended to collect overflow from a primary cesspool. Cesspools in a series refers to two or more cesspools linked together, consecutively.

Clear Zone: The relatively clear liquid layer between scum layer and sludge layer in a septic tank. In a properly functioning tank, effluent is taken from the clear zone as it is relatively free of solids.

Combined Solids: The combined thickness of the scum layer and sludge layer. In a typical septic tank, which has 48-inch liquid depth, combined solids accumulation should not exceed 26 inches as measured at the effluent inspection port.

Conventional Septic System: See "Septic System."

Design Plans: See "System Drawings."

Distribution Box (D-box): A watertight compartment that receives septic tank effluent and distributes it in approximately equal amounts to two or more pipe lines of a soil absorption system.

Effluent Filter: A filter installed on the outlet side of a septic tank that traps solids to prevent them from carrying over to the distribution box and soil absorption system.

Gray Water: Wastewater that is discharged from a structure, but does not contain human or animal excrement or discharges from water closets. For example, gray water sources include sink water and washing machine discharge.

Handhole: A small access or inspection port (approximately 6-inch diameter) that allows access to a septic system component.

Inspection Report: See "System Records."

ISDS Regulations: The most recently adopted *Rules and Regulations Establishing Minimum Standards Relating to Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems*.

Riser: A cylinder, typically made of concrete or fiberglass, which allows easy access to the manhole or inspection ports of a septic system component.

Scum Layer: Scum is the wastewater constituent that is lighter than water and therefore tends to float. The scum layer is that portion of wastewater that accumulates in the top portion of a septic tank.

Scum Layer Measuring Device: A device for measuring the thickness of scum that accumulates in the upper part of a septic tank.

Septage Pumping Records: See "System Records."

Septic System: A device that receives wastewater from a building sewer and typically discharges it to the soil on site.

Alternative System: A septic system with components that are intended to deal with special site conditions (e.g., nitrogen-reduction systems, shallow trench soil absorption systems, sand filters).

Conventional System: A septic system that includes a building sewer, septic tank and soil absorption system. Conventional systems may have substandard components.

Substandard System: A septic system that does not meet the current minimum standards of the ISDS Regulations. Substandard systems include, but are not limited, to cesspools, systems with an undersized tanks and systems with metal tanks.

Septic System Inspections: For the purposes of this handbook, septic system inspections refer to inspections done for maintenance or for property transfers.

First Maintenance Inspection: The first inspection for maintenance purposes that is done on a septic system. First maintenance inspections involve some record and data gathering and locating of components that is usually not necessary for routine maintenance inspections.

Functional inspection: Inspection of a septic system that typically includes investigation of permit records, in-home plumbing evaluation, and evaluation of septic system components including flow trial and dye tracing, as appropriate. Functional inspections are primarily done at property transfers.

Routine Maintenance Inspection: An inspection of the septic tank or cesspool and the system site to determine the need for pumping and repairs. Routine maintenance inspections are typically done every 1-5 years.

Septic Tank: A receptacle that receives wastewater from a building sewer, segregates scum and sludge via settling, and discharges clarified effluent to a distribution box or soil absorption system.

48-Inch Tank: A septic tank with a liquid depth of 48 inches. 48 inch tanks are the industry standard.

Large Tank: A septic tank that has more liquid volume than required by the ISDS Regulations. Large tanks require less frequent maintenance than standard and undersized tanks.

Metal Tank: A septic tank that is constructed of metal, typically steel. Metal tanks are substandard and tend to rust out over the course of years.

Multicompartment Tank: A septic tank with two or more consecutively linked chambers. Multicompartment tanks generally improve the settling process and produce cleaner effluent than noncompartmentalized tanks.

Nonstandard-Depth Tank (e.g., lowboy or ledge tank): A septic tank that does not have a liquid depth of 48 inches.

Septic Tanks in Series: Two or more septic tanks linked together consecutively. Septic tanks in series, like multicompartmental tanks, generally produce a cleaner effluent than singular tanks.

Sludge Layer: Sludge is wastewater material that is heavier than water and therefore sinks. The sludge layer is that portion of wastewater that accumulates at the bottom of a septic tank.

Sludge Layer Measuring Device: A device for determining the depth of sludge that has accumulated in the bottom of a septic tank.

Soil Absorption System: A component of a septic system that allows wastewater to leach into the soil for the purpose of treatment. Soil absorption systems include, but are not limited to, seepage pits (i.e., galleys), disposal beds, disposal trenches and cesspools.

Substandard System: See "Septic System."

System Drawings: A schematic for a septic system that includes components and their locations.

As-Built Drawings: System drawings that precisely and accurately indicate the installation of a completed septic system.

Design Plans: System drawings that indicate specifications for the proposed installation of a septic system.

System Records: Written forms that indicate the design, use and maintenance of a septic system.

Applications: Plans and specifications for installing, constructing, altering or repairing a septic system. There are three types of septic system application: Application for a New System, Application for Alteration, and Application for Repair. (See ISDS Regulations for more information.)

Certificate of Conformance: A form issued by DEM, which indicates that an

installed system conforms with the ISDS Regulations. A municipality may not issue a certificate of occupancy without a certificate of conformance. Buildings may not be occupied or sold until a certificate of occupancy is issued. (See ISDS Regulations for more information.)

Certificate of Construction: A form filled out by an installer and approved by DEM, which indicates that a septic system was installed in accordance with permit plans as approved by DEM. Installers who encounter unanticipated conditions during construction, which prevent installation as per the permit plans, must file a revised application for DEM approval. Installers should leave a copy of the certificate in the home near the building sewer. (See the ISDS Regulations for more information.)

Inspection Reports: One of four reports prepared pursuant to this handbook: Functional Inspection Report, First Maintenance Inspection Report, Routine Maintenance Report, and Maintenance Report Supplement.

Septage Pumping Records: A bill or official record (e.g., an inspection report) that indicates that a septic system was pumped on a particular date.

Tees (Sanitary): A T-shaped pipe that is installed in a septic tank, typically on the effluent end, so as to prevent scum from flowing out of the tank.

Undersized Tanks: See “Septic System, Substandard System.”

Wastewater: For the purposes of this handbook, wastewater refers to gray or black water discharge from toilets, laundry tubs, washing machines, sinks, and dishwashers, as well as the contents of septic systems.

Wastewater Management Program: A program that either encourages or compels proper septic system maintenance within the boundaries of a municipality or other geographic region (i.e., wastewater management district). A wastewater management program may either work through a voluntary or an enforceable approach. Wastewater management programs may be involved in public education, technical assistance, financial assistance, maintenance record tracking as well as other activities associated with areawide management of septic systems.

Wastewater Management Official: A person who is charged with some aspect of operating a wastewater management program.

Water Treatment Appliance: A device that filters or softens the water supply to a building. Water treatment appliances, as referred to in this handbook, have backflush cycles.

BIBLIOGRAPHY

- Adamowicz, S. (1995). Home owners' septic system fact sheet. Providence: Rhode Island Department of Environmental Management Narragansett Bay Project.
- Alexander, D.J., Jones, C., Sandman, P. (1992). The systematic evaluation and repair of failing drainfields in the coastal zone area of Virginia. Richmond, VA: Commonwealth of Virginia Department of Health.
- Aley, T. (1991). The water tracer's cookbook and related groundwater tracing information. Protom, MO: Ozark Underground Laboratory.
- Amended/revised plans for subsurface sewage disposal systems. (1997). [Fact Sheet No. WD-SSB-3]. Concord, NH: New Hampshire Department of Environmental Services.
- "Approval for Operation" requirements for subsurface disposal systems. (1997). [Fact Sheet No. WD-SSB-8]. Concord, NH: New Hampshire Department of Environmental Services.
- Atlantic States Rural Water & Wastewater Association. (1997). The source: A technical bulletin of Atlantic States Rural Water & Wastewater Association, Volume 1. Norwich, CT: Authors.
- Barnstable County. (1997). Alternative septic system update, Issue Number 10. Barnstable, MA: Barnstable County Department of Health and the Environment.
- Bounds, T.R. Septic tank septage pumping intervals. Sutherlin, OR: Orenco Systems.
- Bounds, T.R. (1988). Glide audit 1986-1987, summary of sludge and scum accumulation rates. Roseburg, OR: Douglas County Department of Public Works.
- Bounds, T.R. (September 22, 1997). Personal communication and accompanying Orenco Systems corporate literature. Sutherlin, OR: Orenco Systems.

- Bounds, T.R. (1997). Design and performance of septic tanks. In M.S. Bedinger, J.S. Fleming, and A.I. Johnson, (Eds.) Site Characterization and Design of On-Site Septic Systems ASTM STP 1324. (pp. 217-234). American Society for Testing and Materials.
- Bureau of Water Quality Management. Consumers guide to on-lot sewage system permits. (Publication Number DER#516-3/90). Pennsylvania Department of Environmental Resources.
- Burks, B.D., Minnis, M.M. (1994). Onsite Wastewater Treatment Systems. Madison, WI: Hogarth House.
- Buying a home or business? Questions you should ask on sewage disposal. (1991). [Fact Sheet No. WD-SSB-6]. Concord, NH: New Hampshire Department of Environmental Services.
- Buzzards Bay "SepTrack" Initiative. [Publication No. EPA842-F-97-002G]. Washington, D.C.: EPA.
- Cameon, P.J. (Ed.). (1997). Small Flows. 11 (2).
- Cameon, P.J. (Ed.). (1997). Small Flows. 11 (4).
- Canody, J. (Ed.). (1998). Small Flows. 12 (1).
- Canody, J. (Ed.). (1998). Small Flows. 12 (3).
- Care and maintenance of your septic system. (1991). [Fact Sheet No. WD-SSB-2]. Concord, NH: New Hampshire Department of Environmental Services.
- Clark, J.W., Viessman, W., Jr., Hammer, M.J. (1971). Water Supply and Pollution Control. Scranton: International Textbook Company.
- Coastlines. (1997, Winter).
- Commonwealth of Massachusetts Department of Environmental Protection. (1995). Training manual for system inspectors; State Environmental Code Title 5. Boston: Commonwealth of Massachusetts Department of Environmental Protection Executive Office of Environmental Affairs.
- Commonwealth of Massachusetts Department of Environmental Protection. (1997). Guidance for the inspection of subsurface sewage disposal systems. Boston: Commonwealth of Massachusetts Department of Environmental Protection Executive Office of Environmental Affairs.

- Cromwell, N.M. (1990). Septic systems: a homeowner's manual. Providence: Save The Bay.
- Department of Environmental Management, Division of Groundwater and ISDS. (1992). Rules and regulations establishing minimum standards relating to location, design, construction and maintenance of individual sewage disposal systems. Providence: State of Rhode Island and Providence Plantations.
- Department of Environmental Management, Office of Water Resources. (1997). Amendments to rules and regulations establishing minimum standards relating to location, design, construction and maintenance of individual sewage disposal systems. [Regulation No. 12-120-002] Providence: State of Rhode Island and Providence Plantations.
- DiLibero, W.A. (1988). Septic systems: a homeowner's guide to their operation and maintenance. University of Massachusetts, Massachusetts Cooperative Extension.
- Dziegielewski, B., Opitz, E.M., Keifer, J.C., Baumann, D.D. (1993). Evaluating urban water conservation programs: a procedures manual. Carbondale, IL: Planning and Management Consultants, Ltd.
- Falvey, C. (Ed.). (1995). Pipeline: Small Community Wastewater Issues Explained to the Public. 6 (3).
- Falvey, C. (Ed.). (1996). Pipeline: Small Community Wastewater Issues Explained to the Public. 7 (1).
- Falvey, C. (Ed.). (1996). Pipeline: Small Community Wastewater Issues Explained to the Public. 7 (2).
- Falvey, C. (Ed.). (1998). Pipeline: Small Community Wastewater Issues Explained to the Public. 9 (2).
- Falvey, C. (Ed.). (1998). Pipeline: Small Community Wastewater Issues Explained to the Public. 9 (4).
- Frekot, L.L.C., Elvebak, M.L. (1997). Inspection manual for existing septic systems. In M.S. Bedinger, J.S. Fleming, and A.I. Johnson, (Eds.) Site Characterization and Design of On-Site Septic Systems ASTM STP 1324. (pp. 3-11). American Society for Testing and Materials.
- Frey, E. (Ed.). (1992). Criteria for regulation of on-site sewage treatment and disposal systems. Boston: New England Interstate Water Pollution Control Commission.

- Friedman, D. (1997). The home buyer's guide to septic systems. [WWW document]. URL <http://www.insepct-ny.com/septic/buyguide.htm>.
- Friedman, D. (1998). Where does it go when I flush? And... will we meet again? [WWW document]. URL <http://www.inspect-ny.com/septic/septtext.htm>.
- Fundamentals of on-site wastewater treatment & disposal. (1994, May 17, Westford, MA). [Conference Proceedings]. Wilmington, MA: New England Interstate Water Pollution Control Commission's On-Site Wastewater Task Force.
- Funding onsite/decentralized wastewater systems using the Clean Water State Revolving Fund (Draft). (1999). (Publication No. EPA 832-F-99-001). Washington, D.C.: United States Environmental Protection Agency Office of Water.
- Glocester Wastewater Management Commission. Glocester wastewater management study; public workshop summary. (1996, November 20, Glocester, RI). [Public Workshop]. Glocester, RI: Authors.
- Gover, N. (Ed.). (1996). Small Flows. 10 (1).
- Gover, N. (Ed.). (1996). Small Flows. 10 (2).
- Gover, N. (Ed.). (1996). Small Flows. 10 (3).
- Gustafson, D. (1998, February 19). Inspection workshop. [Workshop handbook]. Shakopee, MN: University of Minnesota Extension Service.
- Heufelder, G. (1997, January 14). [Transcript of presentation at the Runnins River Steering Committee meeting at Seekonk Town Hall]. Barnstable, MA: Barnstable County Health & Environmental Department.
- Hoover, M.T. Site evaluation, design, and engineering of on-site technologies within a management context. Cary, NC: The On-Site Corporation.
- I/A on-site wastewater technologies. (1998). Technovation: Current News and Events on Innovative Environmental Technologies, Fall/Winter.
- Investigation of failed individual sewage disposal systems and innovative solutions. (1996, March 29, Warwick, RI). [Conference Proceedings]. Wakefield, RI: Frisella Civil and Environmental Engineering.
- Joint Task Force on Existing Sewer Evaluation and Rehabilitation. (1983). Existing sewer evaluation & rehabilitation. NY: American Society of Civil Engineers.
- Judd, P.H. (1993). How much is enough? Denver: American Water Works Association.

- Knott, J.L, Jr. (1995). New frontiers in wastewater treatment. Environmental Protection, May. pp 19-23.
- Laak, R. (1980). Wastewater engineering design for unsewered areas. Ann Arbor: Ann Arbor Science Publishers.
- Laird, C. (1991). Water-efficient technologies: a catalog for the residential/light commercial sector (2nd edit.). Snowmass, CO: Water Program – Rocky Mountain Institute.
- Lazaro, T.R. (1979). Urban hydrology: a multidisciplinary perspective. Ann Arbor: Ann Arbor Science Publishers.
- Loomis, G., Calhoun, Y. (1988). Maintaining your septic system. [Fact Sheet No. 88-2]. Kingston, RI: Rhode Island On-site Wastewater Training Program, The University of Rhode Island.
- Loomis, G., Gullerton, G. (1996). Maintaining your septic system. [Fact Sheet No. 96-1]. Kingston, RI: Rhode Island On-site Wastewater Training Program, The University of Rhode Island.
- Lukin, J. (1992). Understanding septic systems. Winchendon, MA: Rural Housing Improvement.
- Maddaus, W.O. (1987). Water conservation. Denver: American Water Works Association.
- Managing small-scale, alternative & on-site wastewater systems: opportunities, problems and responsibilities. (1995, December). [Conference Summary]. Worcester, MA: *ad hoc* Task Force for Decentralized Wastewater Management.
- McCann, A., Husband, T.P. (1991). Water conservation in and around the home. [Fact Sheet No. 91-2]. Kingston, RI: Rhode Island On-site Wastewater Training Program, The University of Rhode Island.
- McComas, S. (1993). Lakesmarts: the first lake maintenance handbook. Washington, DC: Terrene Institute.
- Millar, S. (1987). Wastewater management districts...a starting point. Providence: The State of Rhode Island and Providence Plantations Department of Administration, Division of Planning.
- Minnesota Pollution Control Agency. (1998). Minnesota Pollution Control Agency manual for individual sewage treatment system inspections. St. Paul: Authors.

- National Onsite Wastewater Recycling Association. Homeowner's septic tank system guide and record keeping folder. Hartland, WI: Authors.
- National Small Flows Clearinghouse. (1999). Products guide. Morgantown, WV: National Small Flows Clearinghouse, West Virginia University.
- Nurse, J. (Ed). (1999). The Zabel Zone: An Onsite Wastewater Magazine , Spring.
- Onsite sewage disposal systems, water supplies and solid waste management. (1992). Chapter 420-2-1. Rules of the State Board of Health Bureau of Environmental and Health Service Standards, Division of Community Environmental Protection, The Alabama Department of Public Health.
- On-site sewage treatment systems. (1996, November). [Conference Proceedings]. Sturbridge, MA: Society of Soil Scientists of Southern New England.
- Otis, R.J. Design module number 18: septic tanks. Morgantown, WV: National Small Flows Clearinghouse, West Virginia University.
- Permitting of installers and designers of subsurface sewage disposal systems. (1991). [Fact Sheet No. WD-SSB-4]. Concord, NH: New Hampshire Department of Environmental Services.
- Protecting your community's water resources: a workshop for local officials on on-site wastewater management. (1999, June). [Conference Proceedings]. Lowell, MA: New England Interstate Water Pollution Control Commission.
- Recording of approvals for operation for subsurface sewage disposal systems. (1997). [Fact Sheet No. WD-SSB-5]. Concord, NH: New Hampshire Department of Environmental Services.
- Repair/replacement of an existing septic system. (1997). [Fact Sheet No. WD-SSB-9]. Concord, NH: New Hampshire Department of Environmental Services.
- Replacement of a failed subsurface disposal system. (1997). [Fact Sheet No. WD-SSB-1]. Concord, NH: New Hampshire Department of Environmental Services.
- Rhode Island Department of Environmental Management. (1995). Reducing the pollution potential in the Greenwich Bay and Green Hill Pond through septic system compliance activity. Providence: Authors.
- Robillard, P.D., Martin, K.S. Use of dyes and tracers to confirm septic system failures. [Fact Sheet. Publication Number SW-167]. University Park, PA: Penn State College of Agricultural Sciences, Cooperative Extension.

- Ross, J.A. (Ed.). (1994). The Small Flows Journal. 1, (1).
- Ross, J.A. (Ed.). (1997). Small Flows. 11 (1)
- Selling developed waterfront property: site assessment study required. (1993). [Fact Sheet No. WD-SSB-10]. Concord, NH: New Hampshire Department of Environmental Services.
- Septic systems and ground-water protection: a program manager's guide and reference book. (1986). (Publication No. EPA 440/6-86-006). Washington, D.C.: United States Environmental Protection Agency Office of Water Ground-Water Protection.
- Septic tank function. (1993). [Fact Sheet No. WD-SSB-11]. Concord, NH: New Hampshire Department of Environmental Services.
- Shephard, F.C. (1995). Managing wastewater: prospects in Massachusetts for a decentralized approach: a discussion of options and requirements. Woods Hole, MA: Author.
- Small wastewater systems: alternative systems for small communities and rural areas. (1980). (Publication No. FRD-10). Washington, D.C.: United States Environmental Protection Agency Office of Water.
- Small wastewater systems: alternative systems for small communities and rural areas. (1992). (Publication No. 830-F-92/001). Washington, D.C.: United States Environmental Protection Agency Office of Water.
- So...now you own a septic tank. [Brochure]. Morgantown, WV: National Small Flows Clearinghouse, West Virginia University.
- Staff. (1997). ASTM's guides for septic systems. Environmental Protection, September. pp 12-13.
- Suhrer, T. (Ed.). (1998). Small Flows. 12 (2).
- Test pits and percolation tests for subsurface disposal systems. (1993). [Fact Sheet No. WD-SSB-7]. Concord, NH: New Hampshire Department of Environmental Services.
- The care and feeding of your septic tank system. [Brochure]. Morgantown, WV: National Small Flows Clearinghouse, West Virginia, University.
- The magic box: your septic tank. (1988). [Pamphlet]. Lakeland, FL: Florida Septic Tank Association.

- The Water Quality Program Committee, Virginia Tech. (1995) Maintenance of mound septic systems. [Publication 448-401]. Blacksburg, VA: Virginia Cooperative Extension, Virginia Polytechnic Institute and State University.
- The Water Quality Program Committee, Virginia Tech. (1995) Maintenance of low pressure distribution septic systems. [Publication 448-402]. Blacksburg, VA: Virginia Cooperative Extension, Virginia Polytechnic Institute and State University.
- The Water Quality Program Committee, Virginia Tech. (1995) Septic system maintenance. [Publication 448-400]. Blacksburg, VA: Virginia Cooperative Extension, Virginia Polytechnic Institute and State University.
- Thompson, J. (Ed.). (1997). The source of Tennessee nonpoint news. Tennessee Nonpoint Source Newsletter. 2(1)
- U.S. Department of Labor, Occupational Safety and Health Administration. 29 CFR §1910 (1993).
- Understanding septic systems. (1996). [Fact Sheet, Publication No. 3640-FS-DEP1414 Rev. 4/96]. Commonwealth of Pennsylvania Department of Environmental Protection.
- Wastewater management alternatives for southern New England communities. (1995, May 11). [Conference Proceedings]. Kingston, RI: Rhode Island On-site Wastewater Training Program, The University of Rhode Island.
- Waterfront property site assessment study. (1999). Part Env-Ws 1025 New Hampshire Department of Environmental Services Administrative Rules. [WWW document] URL <http://www.state.nh.us/gencourt/ols/rules/env-ws1000.html>. pp. 121-125.
- Weiskel, P.K., Howes, B.L., Heufelder, G.R. (1996). Coliform contamination of a coastal embayment: sources and transport pathways. Environmental Science & Technology, 30(6), 1872-1881.
- Wesley, E.F., Jr. (1987). Easy ways to save water, money & energy at home. Potomac Rivers & Trails Council.
- Whalen, T. (March 6, 1996). Personal communication.
- Your septic system: a reference guide for homeowners. (1990). Annandale, VA: Northern Virginia Planning District Commission.

SEPTIC SYSTEM MAINTENANCE POLICY FORUM AND SUBCOMMITTEES

Septic System Maintenance Policy Forum

Sue Adamowicz; Rhode Island Department of Environmental Management
Rob Adler; US Environmental Protection Agency
Andy Alcusky; Beta Engineering
Linda Allen; Pete Fenner, Inc.
Martin Anderson; Fuss & O'Neill
Bob Ballou; Rhode Island Department of Environmental Management
Bill Bivona; Narragansett Conservation Commission
Jim Boyd; Coastal Resources Management Commission
Jeff Brownell; Save the Bay
Paul Brunetti; Griggs and Browne
Dave Burnham; Rhode Island Independent Contractors
Russ Chateauneuf; Rhode Island Department of Environmental Management
Clarkson Collins; Narragansett Community Development Department
Nicole Cromwell; Save the Bay
Kevin Cute; Coastal Resources Management Commission
Betsy Dake; Rhode Island Department of Environmental Management
Chris Deacutis; Rhode Island Department of Environmental Management
Steve DeNoyelle; Rhode Island Department of Mental Health, Retardation and
Hospitals Facilities and Maintenance
Tom DePatie; Charlestown Wastewater Management Commission
Brenda Dillmann; Planning Consultant
Oscar L. Doucett; Fidelity Inspection Service
David Dow; University of Rhode Island
Laura Ernst; Coastal Resources Management Commission

William Freeman; Superior Home Inspection
Joe Frisella; Frisella Engineering
Wenly Ferguson; Save the Bay
John Gagnon; Second Opinion Home Inspection
Darlene Gardner; Superior Septic Service
Dan Geagan; Warwick Planning Department
Bob Gilstein; Portsmouth Planning Department
Alicia Good; Rhode Island Department of Environmental Management
Tom Groves; New England Interstate Water Pollution Control Commission
Christopher Hamblett; Save the Bay
Tom Hansen; Fuss & O'Neill
Robin Hedges; Rhode Island Clean Water Finance Agency
Nancy Hess; Charlestown Planning Department
Eric Izzi; New England Interstate Water Pollution Control Commission
Philip Johnson; New Shoreham Sewer Commission
Lorraine Joubert; University of Rhode Island
Janet Keller; Rhode Island Department of Environmental Management
Sue Kiernan; Rhode Island Department of Environmental Management
Kevin Klein; Brown University
Jennifer Langheld; Rhode Island Department of Environmental Management
Elizabeth Leach; Rhode Island Clean Water Finance Agency
Kathleen Leddy; Rhode Island Department of Administration
Susan Licardi; North Kingstown Water Department
George Loomis; University of Rhode Island
Don Lucas; Town of Old Saybrook, Connecticut
Jay Manning; Rhode Island Department of Environmental Management
Eugenia Marks; Audubon Society of Rhode Island
David McCurdy; Atlantic States Rural Water and Wastewater Association
Galen McGovern; Rhode Island Department of Environmental Management
Bob Mendoza; US Environmental Protection Agency
Ted Mercier; Home Check
Joe Migliore; Rhode Island Department of Environmental Management
Laura Miguel; Coastal Resources Management Commission
Scott Millar; Rhode Island Department of Environmental Management
Chris Miller; University of Rhode Island
Dave Monk; Salt Ponds Coalition

Brian Moore; Rhode Island Department of Environmental Management
Tom Mulhern; Rhode Island Realtors Association
Mickie Musselman; Rhode Island Department of Environmental Management
Carlene Newman; Rhode Island Department of Environmental Management
Ray Nickerson; South Kingstown Planning Department
Craig Onorato; Warwick Sewer Authority
Peter O'Rourke; Rhode Island Department of Environmental Management
Ernie Panciera; Rhode Island Department of Environmental Management
Meg Parulis; Town of Old Saybrook, CT
Dick Pastore; RP Engineering
Roger Pease; Charlestown Wastewater Management Commission
Tony Perri; John Perri and Sons
Jesse Perry; Ocean State Home Inspection
Margret Pilaro; Warwick Planning Department
Margherita Pryor; US Environmental Protection Agency
Richard Ribb; Rhode Island Department of Environmental Management
Steve Richtarik; Beta Engineering
M. James Riordan; Rhode Island Department of Environmental Management
Deb Robson; Rhode Island Department of Environmental Management
Bob Schmidt; Rhode Island Department of Environmental Management
Robert Scott; Atlantic States Rural Water and Wastewater Association
Frank Sheppard; University of Massachusetts
Anthony Simeone; Rhode Island Clean Water Finance Agency
John Slivey; Rhode Island Cesspool Cleaners
Gregory Snow; Beta Engineering
Sally Spadaro; Governor's Policy Office
Jonathan Stevens; Warwick Planning Department
JoAnne Sulak; US Environmental Protection Agency
Beth Tetreault; Glocester Wastewater Management Commission
Warren Towne; Rhode Island Department of Environmental Management
Suzanne Vetromile; Narrow River Preservation Association
Dennis Vinaheirto; Warwick Sewer Authority
Alison Walsh; US Environmental Protection Agency
Jeff Willis; Coastal Resources Management Commission
Mike Young; Burrillville Cesspool

Issues related to septic system maintenance and inspection can be complex and occasionally controversial. The policy forum created subcommittees as issues arose that required special consideration. Subcommittee meetings were open to all interested parties and were attended as follows:

Flow Testing Subcommittee

David Dow; University of Rhode Island
Joe Frisella; Frisella Engineering
Scott Millar; Rhode Island Department of Environmental Management
Brian Moore; Rhode Island Department of Environmental Management
Peter O'Rourke; Rhode Island Department of Environmental Management
M. James Riordan; Rhode Island Department of Environmental Management
Dennis Vinaheirto; Warwick Sewer Authority

Inspection Subcommittee

Dave Burnham; Rhode Island Independent Contractors
Nicole Cromwell; Save the Bay
Tom DePatie; Charlestown Wastewater Management Commission
David Dow; University of Rhode Island
Joe Frisella; Frisella Engineering
Dan Geagan; Warwick Planning Department
Phil Johnson; Town of New Shoreham
George Loomis; University of Rhode Island
Eugenia Marks; Audubon Society of Rhode Island
Scott Millar; Rhode Island Department of Environmental Management
Brian Moore; Rhode Island Department of Environmental Management
Craig Onorato; Warwick Sewer Authority
Margaret Pilaro; Warwick Department of Planning
M. James Riordan; Rhode Island Department of Environmental Management
Bob Schmidt; Rhode Island Department of Environmental Management
Gregory Snow; Beta Engineering
Alison Walsh; Save the Bay

Field-Testing Subcommittee

Paul Brunetti; Griggs & Browne
David Burnham; Rhode Island Independent Contractors
David Dow; University of Rhode Island
Joe Frisella; Frisella Engineering
Gary Fullerton; University of Rhode Island
Darlene Gardner; Superior Septic System Service
Rick Gardner, Jr.; Superior Septic System Service
George Loomis; University of Rhode Island
Sue Licardi; North Kingstown Water Department
M. James Riordan; Rhode Island Department of Environmental Management
Adam Sykes; University of Rhode Island

Home Inspector and Pumper Workgroup

Paul Brunetti; Griggs & Browne
Russ Chateaufneuf; Rhode Island Department of Environmental Management
William Freeman; Superior Home Inspection
John Gagnon; Second Opinion Home Inspections
Darlene Gardner; Superior Septic Service
Rick Gardner; Superior Septic Service
Ted Mercier; House Check
Tony Perri; John Perri & Sons
Jesse Perry; Ocean State Home Inspections
M. James Riordan; Rhode Island Department of Environmental Management
John Slivey; Rhode Island Cesspool Cleaners
Mike Young; Burrillville Cesspool

Rhode Island Recommended
SEPTIC SYSTEM
FUNCTIONAL INSPECTION REPORT¹
as described in
Septic System Checkup:
The Rhode Island Handbook for Inspection

Inspection Date: _____

CLIENT INFORMATION

Client's Name _____ Phone # _____

Inspection Street Address & Town _____

INSPECTOR INFORMATION

Inspector's Name _____

Company _____ Phone # _____

Street Address & Town _____

IMPORTANT NOTICE

This inspection report indicates the present condition of the system based on state-recommended inspection procedures, *but is in no way a guarantee or warranty of future performance*. The inspection report excludes and does not intend to cover components that are concealed or are otherwise not observable. Dry wells are not included in this inspection.

HOMEOWNER/OCCUPANT RECORDS & DATA, As Available (chapter 2)²

Information collected pursuant to this section is to be provided voluntarily and at the discretion of the property owner. The property owner is solely responsible for record and data accuracy and completeness. The inspector assumes no responsibility for the accuracy of information provided by the property owner.

Indicate whether the following information was made available during the inspection. Attach copies of available records. If the property owner states that any of the following services were not provided—or in the case of application records that the system was installed prior to regulations (1968) — indicate not applicable (N/A). If the property owner states that partial records were provided, indicate "partial."

Source of Records & Data

Records and data were given to the inspector by:

_____ Property owner _____ Realtor _____ Other _____

Application Records

Yes No N/A
☐ ☐ ☐

Applications for septic system (inclusive of new systems, alteration, repairs). Indicate the number of each:

_____ New system _____ Alteration _____ Repairs

☐ ☐ ☐

Certificate of construction

☐ ☐ ☐

Certificate of conformance

Use Records

Yes No N/A Partial
☐ ☐ ☐ ☐

Last two septage pumping bills

☐ ☐ ☐ ☐

Water bills for the last 12-24 months

Maintenance Records

Yes No N/A Partial
☐ ☐ ☐ ☐

Maintenance inspection reports

Resident Data

During the last 12 months, the inspected residence housed _____ year-round occupants

Plat Number _____ Lot Number _____

1. The Functional Inspection Report is primarily intended for inspection as part of a property transfer or sale.
2. Chapter and section numbers refer to *Septic System Checkup: The Rhode Island Handbook for Inspection*.

IN-HOME PLUMBING EVALUATION (chapter 3)

Information reported in this section may in part be based on homeowner records and data. The inspector assumes no responsibility for inaccurate records or data.

Wastewater Routing (section 3.1)

Yes	No	Inconclusive	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All grey and black water plumbing is routed to the ISDS. Comments: _____

Occupancy/Water Use (section 3.2)

Yes	No	Inconclusive	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Water records and owner data show water use is over 75 gallons per person per day (GPD), indicating high usage or potential plumbing problems. ____ gallons were used by ____ occupants during ____ months.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Current occupancy is estimated to be over 2 occupants per bedroom, which may be stressful to the system. Owner data indicates there were ____ live-in occupants during previous ____ months. Based on in-home observations, there are ____ bedrooms.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	A garbage disposal is routed to the septic system and may place an added burden on it (section 6.1.3).

Leak Diagnosis (section 3.3)

The following fixtures were found and inspected (indicate #): ____ toilets ____ bathtub faucets ____ basin faucets ____ showerheads

Yes	No	Inconclusive	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	A water treatment appliance backflushes to the septic system.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is evidence of plumbing leakage from: toilet, basin faucet, bathtub faucet, showerhead or water treatment appliance. (Circle one or more of the aforementioned.) Indicate floor and room: _____

SYSTEM COMPONENT EVALUATION (chapters 1 and 5)

Type of septic system (section 1.2): ☐ Single Cesspool ☐ Conventional septic tank system ☐ Other _____

Type of tank, if present (section 1.2.2): ☐ Concrete ☐ Metal ☐ Other _____

Indicate if any of the following components or accessories are present:

____ ISDS effluent pump ____ D-box handhole ____ Effluent filter ____ In-door lift pump ____ Other _____

Access to the system (diagram below or attach existing drawings): ☐ At grade ☐ Below grade

- Outline approximate shape of the house, indicate front (F) and back (B).
- Use swing-tie measurements to indicate the manhole (main access) of the septic tank, if buried.
- Sketch in septic tank and other components as well as important surface features that may help to locate parts of the system.

Cesspools, before pumpout and dye tracing (section 5.3)

Yes	No	Not Observable	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is evidence of structural damage (section 5.3.1 and 5.3.2).
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There may be an overflow, second cesspool, soil absorption system, or other outlet from the cesspool. Dye tracing is recommended (section 5.3.3).
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is standing water in the cesspool above the invert (section 5.3.1).

Septic Tank, before pumpout, flow trial and dye tracing (section 5.1)

- | | | | |
|--------------------------|--------------------------|--------------------------|--|
| Yes | No | Not Observable | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | There is evidence of structural damage to the baffles, tees or superstructure of the tank (circle one or more)(section 5.1.8). |
| <input type="checkbox"/> | <input type="checkbox"/> | | Based on visual observations, sewage or septage may bypass the soil absorption system via a pipe or other conveyance. If a flow trial is being done, dye tracing should also be done (section 5.6.1). |
| <input type="checkbox"/> | <input type="checkbox"/> | | Flowage was seen or heard coming from the inlet even though all known water-use appliances/fixtures in the home are off. This condition may indicate in-home plumbing leakage (section 5.1.8). See also "In-Home Plumbing Evaluation" (chapter 3). |
| <input type="checkbox"/> | <input type="checkbox"/> | | Scum and sludge layer thickness measurements were taken. Scum is ___ ins. and sludge is ___ ins. Indicate the appropriate "Recommended Action" in the Pumpout Guidelines table which follows (section 5.1.2). |

Pumpout Guidelines for Conventional Systems (Table 5.1a)

Solids 48 inch depth tank Depth Criteria		Nonstandard depth tank	Recommended Action
Combined solids < 16 inches		Combined solids < 1/3 flow depth	Pump at owners discretion. Consider setting a new Maintenance Inspection Schedule (see section 6.5 "Evaluation of Inspection Schedules."
Combined solids = 16 - 34 inches		Combined solids = 1/3 - 3/4 flow depth	Pump the tank and re-inspect as per section 6.5 "Evaluation of Inspection Schedules."
Either: Combined solids > 34 inches, Sludge > 26 inches, or Scum > 11 inches		Either: Combined solids > 3/4 flow depth, Sludge > 1/2 flow depth, or Scum 1/5 flow depth	Pump the tank and consider a system analysis by a licensed designer. A new inspection schedule, which accounts for system capacity and use, should be set by the licensed designer.

SITE OBSERVATIONS (section 5.4)

- | | | | |
|--------------------------|--------------------------|--------------------------|---|
| Yes | No | Inconclusive | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Impermeable surface such as concrete, asphalt, or brick is located approximately over the soil absorption system. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | There are one or more of the following signs of system malfunction present:
___ Septic odors
___ Ponding or wastewater breakout
___ Burnt out grass or ground staining over the soil absorption system (only indicate if one or more other signs are present).
___ Patches of lush green grass over the soil absorption system (only indicate if one or other signs are present). |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Trees, large shrubs or other plants with extensive root systems were observed in the vicinity (10 feet as per Rule 11.06(2) of the ISDS Regulations) of the soil absorption system. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Heavy objects (e.g. cars or pools); or evidence from such objects (e.g. tracks and impressions) are in the vicinity (i.e. directly over) of the soil absorption system. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Stormwater, sump pumps, foundation drains or roof runoff is diverted to flow into the septic system. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | An apparent cave-in or exposed component was identified. A flow trial is not recommended. |

FLOW TRIAL AND DYE TRACING (section 5.5 and 5.6)

Flow trial (75 gals/bdrm. @ 5 - 10 gpm with less than 2 inch rise in septic tank fluid level (section 5.5))

Indicate one of the following:

- ☐ Preliminary evaluation indicates that a flow trial should be performed at the septic tank outlet for any of the following reasons (indicate one or more; section 5.5.1):
☐ Excessive depth of septic tank solids ☐ Structural damage ☐ No solids depths measured and no pumpout in over three years
- ☐ Flow trial shows the system accepted ☐ gals. over ☐ mins. (flow trial volumes are approximates), which is:
☐ At least 75 gals/bdrm. ☐ Is less than 75 gals/bdrm.
- ☐ Flow trial results were inconclusive for the following reasons (section 5.6.1): _____

Dye tracing, when indicated (section 5.6)

Indicate one of the following:

- ☐ Dye tracing was not done, as no potential system bypasses were identified (sections 5.6.1 and 5.6.2).
- ☐ Potential bypass(es) was/were identified but no dye tracing was performed for the following reasons (sections 5.6.1 and 5.5.1): _____
- ☐ Dye tracing was performed as ☐ potential system bypasses had been identified. Dye tracing results were as follows:
☐ No bypasses were confirmed.
☐ ☐ bypasses were confirmed originating from inside the home and ☐ bypasses were confirmed that originate outside the home.
- Describe where bypasses originate and terminate: _____

RESULTS & RECOMMENDATIONS

Results:

Inspection revealed (indicate one or more of the following):

- ☐ System functions properly.
- ☐ System is substandard or has substandard components. (Note reason(s) for indicating this on comment line below. Substandard systems may include, but are not limited to, cesspools, metal tanks, round tanks, undersized systems, and improper setbacks.)
- ☐ Structural damage to the system (such as cracks in the septic tank or a soil absorption system cave-in).
- ☐ Excessive wastewater backup in the soil absorption system.
- ☐ Plumbing leaks or wastewater routing problems in the home.
- ☐ Need for system maintenance.
- ☐ Due to the condition of the system or lack of information, the inspection results are inconclusive.

Comments: _____

The system was last inspected or pumped on _____ (indicate date or N/A if there is no knowledge of previous maintenance) based on:
☐ Pumping bill ☐ Inspection report ☐ Other _____

Recommendations:

Indicate one or more of the following:

- ☐ Further evaluation by a repair professional is recommended.
- ☐ System upgrade should be considered.
- ☐ Evaluation by a plumber is recommended.
- ☐ Pumping and completion of the inspection is recommended.

Indicate one of the following (chapter 6)

- ☐ Based on this inspection, the recommended maintenance interval is ☐ (years) and should occur on _____ (date).
- ☐ The system should receive further evaluation before a next inspection is scheduled.

Standard Inspection Schedules for Single-Family Residences on Conventional Systems (section 6.1.1)

Tank Size (gallons)	Household Occupancy			
	1-4	4-6	6-8	10 →
1000	5	3	Undersized Tanks	
1250	5	4		
1500	5	5	4	3

Please note: Substandard systems such as cesspools and systems with metal or undersized tanks should be on 1-3 year schedules, as should rental and seasonal properties. Innovative and alternative system should be scheduled based on DEM requirements.

Adjusted Inspection Schedules for Conventional Systems (section 6.5)

Combined Solids Accumulation <u>48 inch tank</u> <u>nonstandard depth tank</u>		System Pumped 3 Years Ago	System Pumped 4 Years Ago	System Pumped 5 Years Ago
30" - 34"	3/5- 3/4 of flow depth	System Analysis Required		3 years
26" - 30"	1/2- 3/5 of flow depth			4 years
21" - 26"	2/5- 1/2 of flow depth	3 years	4 years	5 years
16" - 21"	1/3- 2/5 of flow depth	4 years	5 years	5 years
< 16"	< 1/3 of flow depth	5 years	5 years	5 years

INSPECTOR SIGNATURE

Inspector's Name (printed or typed)

Inspector's Signature

Rhode Island Recommended
SEPTIC SYSTEM
FIRST MAINTENANCE INSPECTION REPORT¹

as described in
Septic System Checkup:
The Rhode Island Handbook for Inspection

Inspection Date: _____

CLIENT INFORMATION

Client's Name _____ Phone # _____

Inspection Street Address & Town _____

INSPECTOR INFORMATION

Inspector's Name _____

Company _____ Phone # _____

Street Address & Town _____

IMPORTANT NOTICE

This inspection report indicates the present condition of the system based on state-recommended inspection procedures, *but is in no way a guarantee or warranty of future performance*. The inspection report excludes and does not intend to cover components that are concealed or are otherwise not observable. Dry wells are not included in this inspection.

HOMEOWNER/OCCUPANT RECORDS & DATA, As Available (see chapter 2)²

Information collected pursuant to this section is to be provided voluntarily and at the discretion of the property owner. The property owner is solely responsible for record and data accuracy and completeness. The inspector assumes no responsibility for the accuracy of information provided by the property owner.

Indicate whether the following information was made available during the inspection. Attach copies of available records. If the property owner states that any of the following services were not provided—or in the case of application records that the system was installed prior to regulations (1968) — indicate not applicable (N/A). If the property owner states that partial records were provided, indicate “partial.”

Application Records

Yes	No	N/A
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Applications for septic system (inclusive of new systems, alteration, repairs). Indicate the number of each:
_____ New system _____ Alteration _____ Repair

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

Certificate of construction

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

Certificate of conformance

Maintenance and Inspection Records

Yes	No	N/A	Partial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Last septage pumping bill

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

Last maintenance or home inspection report

1. The Home Inspection Report is primarily intended for inspection as part of a property transfer or sale. For information on reports for use during other inspection circumstances, refer to *Septic System Checkup: The Rhode Island Handbook for Inspection*.
2. Chapter and Section numbers refer to *Septic System Checkup*.

SYSTEM COMPONENT EVALUATION (chapters 1 and 5)

Type of septic system (section 1.2): ☐ Single Cesspool ☐ Conventional septic tank system ☐ Other _____

Type of tank, if present (section 1.2.2): ☐ Concrete ☐ Metal ☐ Other _____

Indicate if any of the following components or accessories are present:

___ ISDS effluent pump ___ D-box handhole ___ Effluent filter ___ In-door lift pump ___ Other _____

Access to the system (diagram below or attach existing drawings): ☐ At grade ☐ Below grade

- Outline approximate shape of the house, indicate front (F) and back (B).
- Use swing-tie measurements to indicate the manhole (main access) of the septic tank, if buried.
- Sketch in septic tank and other components as well as important surface features that may help to locate parts of the system.



Cesspools, *before pumpout* (section 5.3)

Yes	No	Not Observable	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is evidence of structural damage (section 5.3.1 and 5.3.2).
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There may be an overflow, second cesspool, soil absorption system, or other outlet from the cesspool. Dye tracing is recommended (section 5.3.3).
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is standing water in the cesspool above the invert (section 5.3.1).

Septic Tank, *before pumpout* (section 5.1)

Yes	No	Not Observable	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is evidence of structural damage to the baffles, tees or superstructure of the tank (circle one or more) (section 5.1.8).
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Based on visual observations, sewage or septage may bypass the soil absorption system via a pipe or other conveyance. If a flow trial is being done, dye tracing should also be done (section 5.6.1).
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Flowage was seen or heard coming from the inlet even though all known water-use appliances/fixtures in the home are off. This condition may indicate in-home plumbing leakage (section 5.1.8). Performing an in-home evaluation should be considered (chapter 3).
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Scum and sludge layer thickness measurements were taken. Scum is ___ ins. and sludge is ___ ins. Indicate the appropriate "Recommended Action" in the Pumpout Guidelines table which follows (section 5.1.2).

Pumpout Guidelines for Conventional Systems (Table 5.1a)

<div> <div>Solids 48 inch depth tank</div> <div>Depth Criteria</div> </div> <div> <div>Nonstandard depth tank</div> <div></div> </div>		Recommended Action
Combined solids < 16 inches	Combined solids < 1/3 flow depth	Pump at owners discretion. Consider setting a new Maintenance Inspection Schedule (see section 6.5 "Evaluation of Inspection Schedules."
Combined solids = 16 - 34 inches	Combined solids = 1/3 - 3/4 flow depth	Pump the tank and re-inspect as per section 6.5 "Evaluation of Inspection Schedules."
Either: Combined solids > 34 inches, Sludge > 26 inches, or Scum > 11 inches	Either: Combined solids > 3/4 flow depth, Sludge > 1/2 flow depth, or Scum 1/5 flow depth	Pump the tank and consider a system analysis by a licensed designer. A new inspection schedule, which accounts for system capacity and use, should be set by the licensed designer.

SITE OBSERVATIONS (section 5.4)

- | | | | |
|--------------------------|--------------------------|--------------------------|--|
| Yes | No | Inconclusive | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Impermeable surface such as concrete, asphalt, or brick is located approximately over the soil absorption system. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | There are one or more of the following signs of system malfunction present: <ul style="list-style-type: none"> <input type="checkbox"/> Septic odors <input type="checkbox"/> Ponding or wastewater breakout <input type="checkbox"/> Burnt out grass or ground staining over the soil absorption system (only indicate if one or more other signs are present). <input type="checkbox"/> Patches of lush green grass over the soil absorption system (only indicate if one or other signs are present). |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Trees, large shrubs or other plants with extensive root systems were observed in the vicinity (10 feet as per Rule 11.06(2) of the ISDS Regulations) of the soil absorption system. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Heavy objects (e.g. cars or pools); or evidence from such objects (e.g. tracks and impressions) are in the vicinity (i.e. directly over) of the soil absorption system. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Stormwater, sump pumps, foundation drains or roof runoff is diverted to flow into the septic system. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | An apparent cave-in or exposed component was identified. A flow trial is not recommended. |

RESULTS & RECOMMENDATIONS

Results:

Inspection revealed (indicate one or more of the following):

- ☐ System functions properly.
- ☐ System is substandard or has substandard components. (Note reason(s) for indicating this on comment line below. Substandard systems may include, but are not limited to, cesspools, metal tanks, round tanks, undersized systems, and improper setbacks.)
- ☐ Structural damage to the system (such as cracks in the septic tank or a soil absorption system cave-in).
- ☐ Excessive wastewater backup in the soil absorption system.
- ☐ Need for system maintenance.
- ☐ Due to the condition of the system or lack of information, the inspection results are inconclusive.

Comments: _____

The system was last inspected or pumped on _____ (indicate date or N/A if there is no knowledge of previous maintenance) based on:

☐ Pumping bill ☐ Inspection report ☐ Other _____

Recommendations:

Indicate one or more of the following:

- ☐ Further evaluation by a repair professional is recommended.
- ☐ System upgrade should be considered.
- ☐ Evaluation by a plumber is recommended.
- ☐ Pumping and completion of the inspection is recommended.

Indicate one of the following:

- ☐ Based on this inspection, the recommended maintenance interval is ____ (years) and should occur on _____ (date) (sections 6.1. and 6.5).
- ☐ The system should receive further evaluation before a next inspection is scheduled.

Standard Inspection Schedules for Single-Family Residences on Conventional Systems (section 6.1.1)

Tank Size	Household Occupancy			
	1-4	4-6	6-8	10 →
1000	5	3	Undersized Tanks	
1250	5	4	3	
1500	5	5	4	3

Please note: Substandard systems, such as cesspools and systems with metal or undersized tanks, should be on 1-3 year schedules, as should rental and seasonal properties. Innovative and alternative system should be scheduled based on DEM requirements.

Adjusted Inspection Schedules for Conventional Systems (section 6.5)

Combined Solids Accumulation		System Pumped	System Pumped	System Pumped
<u>48 inch tank</u>	<u>nonstandard depth tank</u>	3 Years Ago	4 Years Ago	5 Years Ago
30" - 34"	3/5- 3/4 of flow depth	System Analysis Required		3 years
26" - 30"	1/2- 3/5 of flow depth			4 years
21" - 26"	2/5- 1/2 of flow depth	3 years	4 years	5 years
16" - 21"	1/3- 2/5 of flow depth	4 years	5 years	5 years
< 16"	< 1/3 of flow depth	5 years	5 years	5 years

INSPECTOR SIGNATURE

Inspector's Name (printed or typed)

Inspector's Signature

Rhode Island Recommended
SEPTIC SYSTEM
ROUTINE MAINTENANCE INSPECTION REPORT¹
as described in
Septic System Checkup:
The Rhode Island Handbook for Inspection

Inspection Date: _____

CLIENT INFORMATION

Client's Name _____ Phone # _____

Inspection Street Address & Town _____

INSPECTOR INFORMATION

Inspector's Name _____

Company _____ Phone # _____

Street Address & Town _____

IMPORTANT NOTICE

This inspection report indicates the present condition of the system based on state-recommended inspection procedures, *but is in no way* a guarantee or warranty of future performance. The inspection report excludes and does not intend to cover components that are concealed or are otherwise not observable. Dry wells are not included in this inspection.

HOMEOWNER/OCCUPANT RECORDS & DATA, As Available (see chapter 2)²

Information collected pursuant to this section is to be provided voluntarily and at the discretion of the property owner. The property owner is solely responsible for record and data accuracy and completeness. The inspector assumes no responsibility for the accuracy of information provided by the property owner.

Indicate whether the following information was made available during the inspection. Attach copies of available records. If the property owner states that any of the following services were not provided—or in the case of application records that the system was installed prior to regulations (1968) — indicate not applicable (N/A). If the property owner states that partial records were provided, indicate “partial.”

Maintenance and Inspection Records

Yes	No	N/A	Partial	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Last septage pumping bills
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Last maintenance or home inspection report

SYSTEM COMPONENT EVALUATION

Cesspools, before pumpout:

Yes	No	Not Observable	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	There is evidence of structural damage (section 5.3.1 and 5.3.2).
<input type="checkbox"/>	<input type="checkbox"/>		There may be an overflow, second cesspool, soil absorption system, or other outlet from the cesspool. Dye tracing is recommended (section 5.3.3).
<input type="checkbox"/>	<input type="checkbox"/>		There is standing water in the cesspool above the invert (section 5.3.1).

1. The Routine Maintenance Inspection Report is intended for use during a routine maintenance inspection. For information on reports for use during other inspection circumstances, refer to *Septic System Checkup: The Rhode Island Handbook for Inspection*.
2. Chapter and Section numbers refer to *Septic System Checkup*.

Septic Tank, before pumpout

Yes No Not Observable

- ☐ ☐ ☐ There is evidence of structural damage to the baffles, tees or superstructure of the tank (circle one or more). A flow trial is not recommended (section 5.1.1 and 5.1.8).
- ☐ ☐ Based on visual observations, sewage or septage may bypass the soil absorption system via a pipe or other conveyance. If a flow trial is being done, dye tracing should also be done (section 5.6.1).
- ☐ ☐ Flowage was seen or heard coming from the inlet even though all known water-use appliances/fixtures in the home are off. This condition may indicate in-home plumbing leakage (section 5.1.8).
- ☐ ☐ Scum and sludge layer thickness measurements were taken. Scum is ___ ins. and sludge is ___ ins. Indicate the appropriate "Recommended Action" in the Pumpout Guidelines table which follows (section 5.1.2).

Pumpout Guidelines for Conventional Systems (Table 5.1a)

Solids 48 inch depth tank Depth Criteria Nonstandard depth tank		Recommended Action
Combined solids < 16 inches	Combined solids < 1/3 flow depth	Pump at owners discretion. Consider setting a new Maintenance Inspection Schedule (see section 6.5 "Evaluation of Inspection Schedules."
Combined solids = 16 - 34 inches	Combined solids = 1/3 - 3/4 flow depth	Pump the tank and re-inspect as per section 6.5 "Evaluation of Inspection Schedules."
Either: Combined solids > 34 inches, Sludge > 26 inches, or Scum > 11 inches	Either: Combined solids > 3/4 flow depth, Sludge > 1/2 flow depth, or Scum 1/5 flow depth	Pump the tank and consider a system analysis by a licensed designer. A new inspection schedule, which accounts for system capacity and use, should be set by the licensed designer.

SITE OBSERVATIONS (section 5.4)

Yes No Not Observable

- ☐ ☐ ☐ Impermeable surface such as concrete, asphalt or brick is located approximately over the soil absorption system.
- ☐ ☐ ☐ There are one or more of the following signs of system malfunction present:
 ___ Septic odors
 ___ Ponding or wastewater breakout
 ___ Burnt out grass or ground staining over the soil absorption system (only indicate if one or more other signs are present).
 ___ Patches of lush green grass over the soil absorption system (only indicate if one or other signs are present).
- ☐ ☐ ☐ Trees, large shrubs or other plants with extensive root systems were observed in the vicinity (10 feet as per Rule 11.06(2) of the ISDS Regulations) of the soil absorption system.
- ☐ ☐ ☐ Heavy objects (e.g. cars or pools); or evidence from such objects (e.g. tracks and impressions) are in the vicinity (i.e. directly over) of the soil absorption system.
- ☐ ☐ ☐ Stormwater, sump pumps, foundation drains or roof runoff is diverted to flow into the septic system.
- ☐ ☐ ☐ An apparent cave-in or exposed component was identified. A flow trial is not recommended.

RESULTS & RECOMMENDATIONS**Results:**

Inspection revealed (indicate one or more of the following):

- ___ System functions properly.
- ___ Structural damage to the system (such as cracks in the septic tank or a soil absorption system cave-in).
- ___ Excessive wastewater backup in the soil absorption system is indicated.
- ___ Need for system maintenance.
- ___ Due to the condition of the system or lack of information the inspection results are inconclusive.

Comments: _____

The system was last inspected or pumped on _____ (indicate date or N/A if there is no knowledge of previous maintenance) based on:
 ___ Pumping bill ___ Inspection report ___ Other _____

Recommendations

Indicate one or more of the following:

- ___ Further evaluation by a licensed designer is recommended.
 ___ System upgrade should be considered.
 ___ Evaluation by a plumber is recommended.
 ___ Pumping and completion of the inspection is recommended.

Indicate one of the following

- ___ Based on this inspection, the recommended maintenance interval is ___ (years) and should occur on _____ (date).
 ___ The system should receive further evaluation before a next inspection is scheduled.

Standard Inspection Schedules for Single-Family Residences on Conventional Systems (section 6.1)

Tank Size (gallons)	Household Occupancy			
	1-4	4-6	6-8	10 →
1000	5	3	Undersized Tanks	
1250	5	4		
1500	5	5	4	3

Please note: Substandard systems such as cesspools and systems with metal or undersized tanks should be on 1-3 year schedules, as should rental and seasonal properties. Innovative and alternative system should be scheduled based on DEM requirements. To change schedules for systems with nonstandard-depth tank consult handbook.

Adjusted Inspection Schedules for Conventional Systems (section 6.5)

Combined Solids Accumulation 48 inch tank nonstandard depth tank		System Pumped 3 Years Ago	System Pumped 4 Years Ago	System Pumped 5 Years Ago
30" - 34"	3/5-3/4 of flow depth	System Analysis Required		3 years
26" - 30"	1/2-3/5 of flow depth			4 years
2" - 26"	2/5-1/2 of flow depth	3 years	4 years	5 years
16" - 21"	1/3-2/5 of flow depth	4 years	5 years	5 years
< 16"	< 1/3 of flow depth	5 years	5 years	5 years

INSPECTOR SIGNATURE

 Inspector's Name (printed or typed)

 Inspector's Signature

Rhode Island Recommended
**SEPTIC SYSTEM
MAINTENANCE INSPECTION REPORT
SUPPLEMENTS¹**

as described in
Septic System Checkup:
The Rhode Island Handbook for Inspection

Inspection Date: _____

CLIENT INFORMATION

Client's Name _____ Phone # _____
Inspection Street Address & Town _____

INSPECTOR INFORMATION

Inspector's Name _____
Company _____ Phone # _____
Street Address & Town _____

FLOW TRIAL AND DYE TRACING (sections 5.5 and 5.6)

Flow trial: 75 gals/bdrm. @ 5 - 10 gpm with less than 2 inch rise in septic tank fluid level (section 5.5)²

Indicate one of the following:

- ___ Preliminary evaluation indicates that a flow trial should be performed at the septic tank outlet for any of the following reasons (indicate one or more; section 5.5.1):
___ Excessive depth of septic tank solids ___ Structural damage ___ No solids depths measured & no pumpout in over three years
- ___ Flow trial shows the system accepted ___ gals. over ___ mins. (flow trial volumes are approximates), which is:
___ At least 75 gals/bdrm. ___ Is less than 75 gals/bdrm.
- ___ Flow trial results were inconclusive for the following reasons (section 5.5.1): _____

Dye tracing , when indicated (section 5.6)

Indicate one of the following

- ___ Dye tracing was not done, as no potential system bypasses were identified (sections 5.6.1 and 5.6.2).
- ___ Potential bypass(es) was/were identified but no dye tracing was performed for the following reasons (sections 5.6.1. and 5.5.1):
___ Dye tracing was performed as ___ potential system bypasses had been identified. Dye tracing results were as follows:
___ No bypasses were confirmed.
___ Bypasses were confirmed.
___ bypasses were confirmed originating from inside the home and
___ bypasses were confirmed that originate outside the home.

Describe where bypasses originate and terminate: _____

INSPECTOR SIGNATURE

Inspector's Name (printed or typed)

Inspector's Signature

1. The Home Inspection Report is primarily intended for inspection as part of a property transfer or sale. For information on reports for use during other inspection circumstances, refer to *Septic System Checkup: The Rhode Island Handbook for Inspection*.
2. Chapter and Section numbers refer to *Septic System Checkup*.

Appendix D

CSSLP Regulations

RHODE ISLAND CLEAN WATER FINANCE AGENCY

LOAN POLICIES AND PROCEDURES

COMMUNITY SEPTIC SYSTEM LOAN PROGRAM

REVISED - MARCH, 2005

AUTHORITY: Policies and Procedures adopted in accordance to Title VI of the Federal Clean Water Act and Chapter 46-12.2 of the General Laws of Rhode Island.

RHODE ISLAND CLEAN WATER FINANCE AGENCY

LOAN POLICIES AND PROCEDURES

for the

COMMUNITY SEPTIC SYSTEM LOAN PROGRAM

- I. **PURPOSE:** These Loan Policies and Procedures of the Rhode Island Clean Water Finance Agency (Agency) have been established to govern the lending activities between the Agency and local governmental units in the state of Rhode Island in connection with a Community Septic System Loan Program (CSSLP) under and pursuant to Title VI of the Federal Clean Water Act and Chapter 46-12.2 of the General Laws of Rhode Island as amended.
- II. **DEFINITIONS:** Except as otherwise defined herein, the words and phrases used within these Loan Policies and Procedures have the same meaning as the words and phrases have in Chapter 46-12.2 of the General Laws of Rhode Island as amended.
- III. **FINANCIAL ASSISTANCE:** The objective of these Loan Policies and Procedures is to provide financial assistance to local governmental units to initiate a program of septic system repair in their community. The CSSLP is a source of funds to provide subsequent loans to homeowners for the repair or replacement of failed or failing septic systems or substandard systems within areas identified in the local government unit's On-site Wastewater Management Plan.

The RICWFA and the local governmental unit will establish a relationship to be evidenced by a loan agreement to provide financing for repair or replacement of failed, failing or substandard systems in that community. Rhode Island Housing and Mortgage Financing Corporation (RI Housing) will be the loan servicer on the subsequent homeowner loans. RI Housing will: accept applications from homeowners; coordinate payments to septic system installers/homeowners; collect repayments from homeowners; credit the homeowner repayments to the principal payment responsibility of the local governmental unit; and make monthly reports to both the Agency and the local governmental unit.

- IV. **LOAN APPLICATION:** Request for financing under the Community Septic System Loan Program should be submitted in writing by the chief executive officer of the local governmental unit to the Executive Director of the Agency. No particular form of application shall be required but the written request should generally include:
 - 1) A projection of the estimated need for repair or replacement of failed or failing system as contemplated by the Community's program and identified

in the On-site Wastewater Management Plan prepared by the local governmental unit.

- 2) Indication of approval of the Local Governmental Unit program for on-site septic system repair or replacement as outlined in its On-site Wastewater Management Plan by the Department of Environmental Management (DEM).
- 3) A description of the dedicated source of loan security in the event of homeowner loan default or non-payment, i.e., pledge of general revenues from property taxes of cities and towns, property liens, or other source available to the local governmental unit and deemed appropriate by the RICWFA.
- 4) A description of the overall operation of the local governmental unit with an emphasis on (a) legal structure; (b) management; (c) sources of revenues; (d) operating expenses; (e) operating surpluses or deficits; (f) actual results versus budget; and (g) sources of financial liquidity. The most recent annual report or audited financials may be submitted in satisfaction of all or any part of this item.
- 5) Legal authority or authorities to borrow for the Community Septic System Loan Program.
- 6) Such other information as will support a finding by the Agency that committing to the loan will not have an adverse impact on the finances of the Agency or its other borrowers.

V. LOAN APPROVAL PROCESS: Subject to availability of Agency funds and to prioritization by DEM of programs as outlined in the communities' On-site Wastewater Management Plans, loans will be approved by the Board of Directors of the Agency for any eligible local governmental unit. The local governmental unit will provide a general obligation pledge, note in fully marketable form, or other assurance deemed appropriate by the Agency to ensure repayment of the CSSLP loan. A credit review of the local governmental unit and report by the Executive Director will be taken into consideration:

- 1) sources of revenue and financial liquidity;
- 2) historical and projected financial operating results;
- 3) present and future debt service requirements;
- 4) impact of dedicated user fees and/or general revenues;
- 5) socioeconomic conditions and trends; and
- 6) effects of legal structure and any regulatory control.

VI. TERMS AND CONDITIONS: The homeowner repayment stream will be credited towards the community's responsibility for repayment of the principal portion of the CSSLP loan.

- 1) Rate - The subsequent loans to homeowners will carry a rate equivalent to 2% which will include all homeowner fees to be distributed as follows:

RI Housing	1.0% Homeowner Loan Origination Fee
	0.5% Homeowner Loan Service Fee
RICWFA	.5% Community Loan Service Fee
	<u>2.0%</u> Total CSSLP Rate

(CSSLP loan rates are subject to periodic changes as per Section X of this document.)

- 2) Community Fees - The local governmental unit will be responsible for its own out of pocket closing costs, i.e. borrower's counsel fees and financial advisor fees.
- 3) Amortization - The loan repayments from the homeowners will provide the principal and interest repayments to the Agency. As the primary borrower, the local government unit is responsible for any shortfall or default in the repayments from the homeowners. Amortization on the local governmental unit's loan will begin on the first day of the quarter after the loan closing and on a quarterly basis thereafter. RI Housing will collect payments from the homeowners and make principal and interest payments to the Agency on behalf of the local governmental unit.
- 4) Prepayments - The loan may be prepaid by the borrower at any time but may be subject to a prepayment penalty based on the cost of reinvesting the prepayment or any other negative financial impact to the Agency.
- 5) Security - Loans will have a pledge of (a) general revenues; and/or (b) may be secured by any revenues or other assets which the Agency deems appropriate to protect the interest of the other participants in the loan programs of the Agency, other creditors of the Agency, bondholders, or the finances of the Agency. The obligations of the Borrower may be subject to and dependent upon appropriations being made by the Borrower for such purposes.
- 6) Loan Advances - The local governmental unit will indicate in written form an estimate of its yearly requirement for septic system or substandard system repairs. As loans to homeowners are originated, the Agency will advance the necessary amount for disbursement for approved project costs. RI Housing will act as paying agent on behalf of the local

governmental unit for payments to contractors/homeowners for approved project costs.

- 7) Community Specific Criteria for Homeowner Loans - The community may apply specific homeowner loan criteria such as; number of estimates needed from licensed septic system installers; maximum number of housing units per structure allowed access to CSSLP; owner/non-owner occupied borrowers; whether inhabitants of areas planned for sewer extension are eligible; and other such specific requirements. The community may not raise or lower the current homeowner CSSLP rate of 2% but may combine the CSSLP with other sources of money so as to provide a greater dollar amount available for loans or to provide a greater economic incentive for homeowners to repair or replace the failed septic systems. Any additional criteria applied by the local governmental unit cannot negate or otherwise overrule any federal and state laws and regulations which apply to the CSSLP.
- 8) Ineligible Project Costs - The funding of group or cluster septic system projects is not allowed under the CSSLP. Septic system projects on commercially owned property are not allowed under the CSSLP. Homeowner loans will be used for septic system repair or replacement only. CSSLP loans cannot be used for bathroom or kitchen improvements, additions or remodeling.

VII. REPORTING REQUIREMENTS: Community borrowers will be required to provide information to the Agency during the life of the loan. Required information includes:

- 1) A record of the number and type of repaired or replaced septic systems funded by this program.
- 2) A copy of its Annual Audited Financial Statements in accordance with Generally Accepted Government Accounting Standards annually within 180 days of end of fiscal year.
- 3) Copies of reports submitted to RIDEM, the Environmental Protection Agency (EPA) and any other regulatory agency relating to the septic systems financed by the loan.
- 4) Other information or reports that the Agency deems appropriate.

VIII. LOAN DOCUMENTS: The terms and conditions of each loan will be evidenced by a agreement outlining the specific terms and conditions of the loan and such agreement will be accompanied by an opinion of counsel, as required by the Agency enabling act.

- IX. COMPLIANCE WITH STATE AND FEDERAL LAW:** Recipients (the community) of loans must comply with all applicable state and federal laws and regulations.
- X. MODIFICATIONS:** Where deemed appropriate by the Agency, waiver or variation of any provisions herein may be made or additional requirements may be added.

Anthony B. Simeone, Executive Director

Public Notice Date: March 21, 2005

Public Hearing Date: April 11, 2005

Filed With Secretary of State: April 13, 2005

Effective Date: May 3, 2005

Appendix E

Rhode Island Municipal Septic System Standards and Programs (Riordan, 2001) and Summary of Rhode Island Municipal Onsite Wastewater Programs (RIDEM, 2008)

Summary of Rhode Island Municipal Onsite Wastewater Programs

April 2008

The R.I. Department of Environmental Management (DEM) has established minimum standards for onsite wastewater treatment systems throughout the state- *Rules Establishing Minimum Standards Relating to Location, Design, Construction and Maintenance of Onsite Wastewater Treatment Systems*. The rules are available online at: <http://www.dem.ri.gov/pubs/regs/regs/water/owts08.pdf>. DEM also encourages municipalities to establish local programs to meet the onsite wastewater needs of each town. Cities and towns have authority to set local standards for septic systems that are more stringent than state standards. Where established, these standards are part of municipal septic system management programs. These programs have been created with the assistance of State Bond funds or Federal Nonpoint Source funds distributed through DEM grants (with the exception of New Shoreham, where an EPA grant was used). Towns use these funds to develop an onsite wastewater management plan (OWMP) designed to meet local needs. An OWMP describes the elements of the municipal management program for septic systems. Program elements may include, for example, passing an ordinance requiring system inspections, enhancing homeowner education, or specifying stronger treatment requirements in environmentally sensitive areas. Once approved by DEM, an OWMP allows towns to participate in the Community Septic System Loan Program (CSSLP). CSSLP funds come from the State Revolving Fund and are administered by the R.I. Housing and Mortgage Financing Agency. Money is used by participating towns to provide low interest loans to homeowners to cover the costs associated with septic system repairs and upgrades.

This document provides a brief summary of local onsite wastewater management in Rhode Island. Nine towns have an approved OWMP; eight participate in the CSSLP. Eleven towns have a draft OWMP. The following cities and towns are primarily served by sewers and have not initiated local efforts to manage septic systems: Barrington, Central Falls, East Providence, Lincoln, Newport, North Providence, Pawtucket, Providence, Warren, West Warwick, and Woonsocket.

Bristol: Much of the Town of Bristol is served by municipal sewers, but some onsite systems are in use. The town received a \$10,000 grant from DEM to support development of an OWMP. The Plan has been approved by DEM and the town is implementing its management program. The plan calls for voluntary system inspections and homeowner education.

Burrillville: Burrillville is primarily served by onsite wastewater systems but there is no municipal program for these systems. The town and DEM are currently working on a grant agreement for \$10,000 to support the development of an OWMP.

Charlestown: Charlestown has an approved OWMP and has a municipal onsite wastewater management program in place. The town has a wastewater management ordinance requiring inspection of onsite systems. The town also maintains a web-based septic system inventory and tracking program, and has instituted a cesspool phaseout program. The town currently has a \$25,000 grant from DEM for the purpose of implementing the town's OWMP. Funds from this grant are used to reimburse homeowners for some of the costs associated with locating systems for inspection, installing tank access risers, and retrofitting effluent filters. Charlestown also participates in the CSSLP.

Coventry: Coventry has an approved OWMP and participates in the CSSLP. The approved OWMP proposes phased implementation of a management program based on improving homeowner awareness, creating a septic system inventory, and promoting voluntary system inspections. The management program focuses on making financial assistance available to repair or replace failed systems and cesspools. Through CSSLP, loans of up to \$10,000 are available to residents who meet the town's eligibility criteria.

Cranston: The City of Cranston is primarily served by sewers, but a small number of onsite systems are in use. Cranston has a draft OWMP but current municipal management activities are limited and work on the plan has been suspended. The OWMP is based on homeowner education to encourage septic system maintenance and system inventories to track performance. The plan also calls for phased implementation.

Cumberland: Cumberland does not have an active municipal onsite wastewater management program at this time. The town received a grant award from DEM in 1999 but no grant agreement has been reached and no OWMP has been developed.

East Greenwich: East Greenwich has a municipal sewer system for the area east of Route 2, serving approximately two-thirds of the town's population. The rest of the town is served by onsite systems. East Greenwich has a reimbursement program available to defray up to \$2000 of the costs to repair or replace a failing onsite system. The town does not have an approved OWMP and does not participate in CSSLP.

Exeter: Exeter has partnered with Richmond and Hopkinton and received grant funding from DEM for the purpose of developing an OWMP encompassing the three towns. Each town receives \$25,000 from the grant for a total amount of \$75,000. A draft plan has been reviewed by DEM and returned to the towns for revisions.

Foster: Foster has partnered with Scituate and received \$27,700 in grant funding for the development of an OWMP covering both towns. A draft plan has been reviewed by DEM and returned to the town for revision.

Glocester: Glocester has a municipal onsite wastewater management program in place. The program was developed as part of a DEM Nonpoint Source grant for the Chepachet Village Wastewater Demonstration Project. The town has an ordinance specifying more stringent standards than state regulations for septic system design and location as well as required system inspections. Glocester also participates in the CSSLP.

Hopkinton: See Exeter.

Jamestown: Jamestown has an approved OWMP and has a municipal onsite wastewater management program in place. The town participates in the CSSLP. Jamestown has an onsite wastewater management ordinance requiring septic system inspections at regular intervals. The town also has a High Groundwater Overlay Zone specifying additional septic system siting and treatment requirements. Jamestown uses a web-based inventory and tracking computer program to monitor septic system maintenance and track performance.

Johnston: Johnston has an approved OWMP and is participating in the CSSLP. The town has a municipal onsite wastewater management ordinance that requires more stringent standards than state regulations for system design and installation. Septic system inspections are also required.

Little Compton: Little Compton is in the process of developing an OWMP assisted, in part, by a \$25,000 grant from DEM. A draft plan has been submitted to DEM and is currently under review. The proposed OWMP will utilize homeowner education to encourage voluntary septic system inspections and maintenance.

Middletown: Middletown currently has no municipal onsite wastewater management program.

Narragansett: Narragansett has an approved OWMP and is working towards participation in the CSSLP. The town does not have an onsite wastewater management ordinance, but the zoning ordinance sets more stringent standards than the state regulations for septic system siting. The town utilities ordinance requires septic system pumping at least every 4 years.

New Shoreham: The Town of New Shoreham has an approved OWMP and has a municipal onsite wastewater management program in place. The town has an onsite wastewater management ordinance requiring system inspections and maintenance. A cesspool phaseout program is ongoing. New Shoreham's zoning ordinance specifies treatment standards based on location and soil conditions. The town's onsite wastewater program was developed as part of an EPA demonstration project grant. The town also participates in the CSSLP.

North Kingstown: The Town of North Kingstown has an approved OWMP and has a municipal onsite wastewater management program in place. The town has an onsite wastewater management ordinance requiring septic system inspection and maintenance at regular intervals. The town participates in the CSSLP with loan funds administered by the Water Department.

North Smithfield: North Smithfield has received a \$10,000 grant from DEM for the development of an OWMP.

Portsmouth: Portsmouth does not currently have a municipal onsite wastewater management program. The town has a draft OWMP, but further work has been suspended pending a decision on the future direction of wastewater management. The town is evaluating several options, including both expanded sewer service and enhanced management of onsite systems.

Richmond: See Exeter.

Scituate: See Foster.

Smithfield: Smithfield has received a \$10,000 grant from DEM for the development of an OWMP. A draft plan has been reviewed by DEM and returned to the town for revisions. The draft plan recommends creation of a wastewater management district encompassing the unsewered areas of town. The OWMP focuses on encouraging septic system maintenance through homeowner education. An onsite wastewater management ordinance is not proposed.

South Kingstown: South Kingstown has an approved OWMP and has an onsite wastewater management program in place. The town has a wastewater management ordinance requiring inspection of onsite systems. The town requires cesspools discovered via the inspection program to be upgraded within 5 years. Cesspools must be upgraded within 12 months of the sale of a property. The South Kingstown zoning ordinance contains more stringent setbacks from natural features than the state requirements. South Kingstown uses a computerized inventory and tracking program developed by the town's information technology department. The town has a \$25,000 grant from DEM for the purpose of implementing the OWMP, including providing reimbursement to homeowners for the installation of tank access risers and effluent filters. South Kingstown participates in the CSSLP.

Tiverton: Tiverton has an approved OWMP and is in the process of creating an onsite wastewater management program. The town participates in the CSSLP. The Tiverton Town Council has recently passed an onsite wastewater management ordinance. The ordinance requires septic system inspection and maintenance and mandates the installation of access risers and effluent filters when systems are repaired or upgraded. Tiverton received a grant from DEM for \$35,000 to support development of the OWMP.

Warwick: Much of Warwick is sewerage, but a significant number of onsite systems remain. The city is in the process of implementing a mandatory sewer tie-in program. Lots with access to municipal sewers will be required to abandon their onsite system and connect to the sewer line. The city is reallocating municipal bond funding from the underutilized Onsite Rehabilitation Program to support the sewer tie-in program.

West Greenwich: The Town of West Greenwich does not currently have a municipal onsite wastewater management program.

Westerly: The Town of Westerly has a municipal sewer system serving the downtown area, corresponding to approximately half the town's population. The rest of the town is

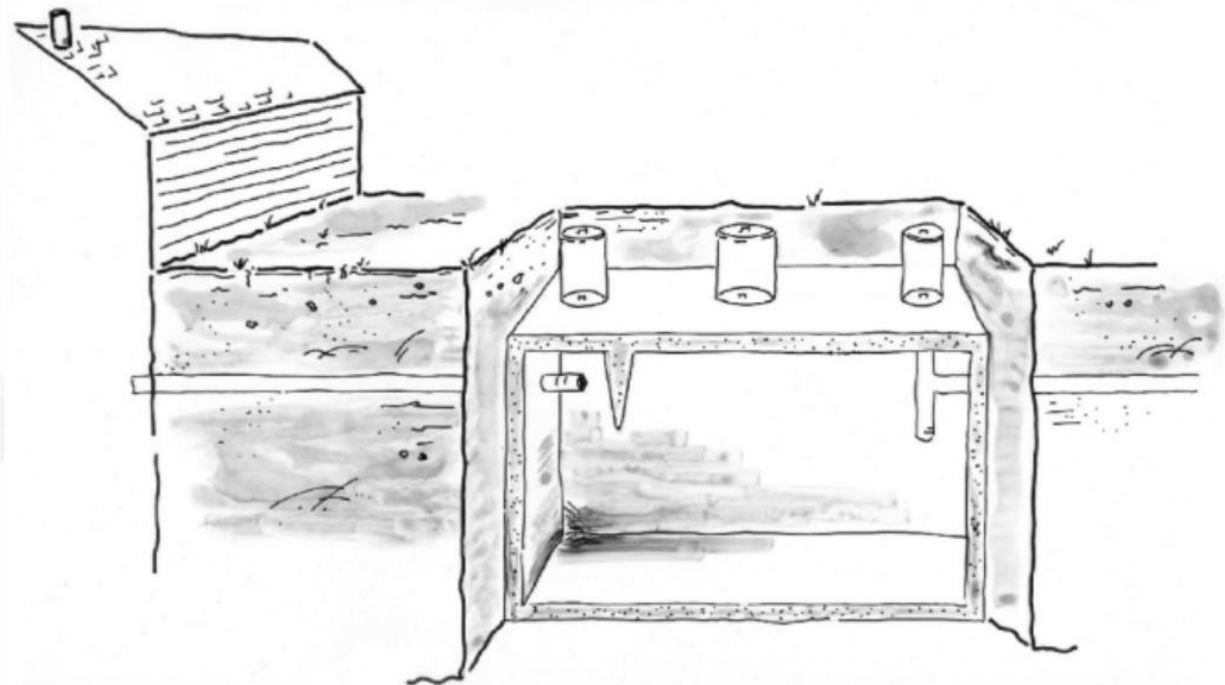
served by onsite systems. Westerly has an approved OWMP developed using a \$35,000 Onsite Wastewater Management Pilot Project grant from DEM. The OWMP calls for creation of a wastewater management district for areas not currently served by sewers. Within this district, the Town will create a homeowner education and outreach program and create a computerized inventory containing results of voluntary inspections. The town is working towards participation in the CSSLP.

Final Draft

Rhode Island Municipal Septic System Standards and Programs

Prepared by
M. James Riordan, RIDEM, Office of Water Resources

for the
Septic System Maintenance Policy Forum



February 26, 2001

Table of Contents

BURRILLVILLE	7
CHARLESTOWN	8
COVENTRY	11
CRANSTON	12
CUMBERLAND	13
EAST GREENWICH	14
FOSTER	15
GLOCESTER	16
JAMESTOWN	18
JOHNSTON	19
NARRAGANSETT	20
NEW SHOREHAM	22
NORTH KINGSTOWN	25
PORTSMOUTH	26
SCITUATE	27
SOUTH KINGSTOWN	28
TIVERTON	29
WARREN	30
WARWICK	31
WEST GREENWICH	32
WESTERLY	33

Introduction and Survey Methodology

The information in this report was compiled by M. James Riordan, Principal Environmental Scientist for the Rhode Island Department of Environmental Management, Office Water Resources for use by Rhode Island municipalities that are developing or revising septic system requirements and management programs. Brandon Fenneuf and Jennifer Langheld also worked on this project as seasonal employees under the supervision of Mr. Riordan. The Septic System Maintenance Policy Forum recommended development of this manual.

Data for this report was collected via phone survey to town planners, wastewater officials, wastewater commissioners and other officials. Mr. Riordan, Mr. Fenneuf, and Ms. Langheld conducted the survey. The following six questions were asked:

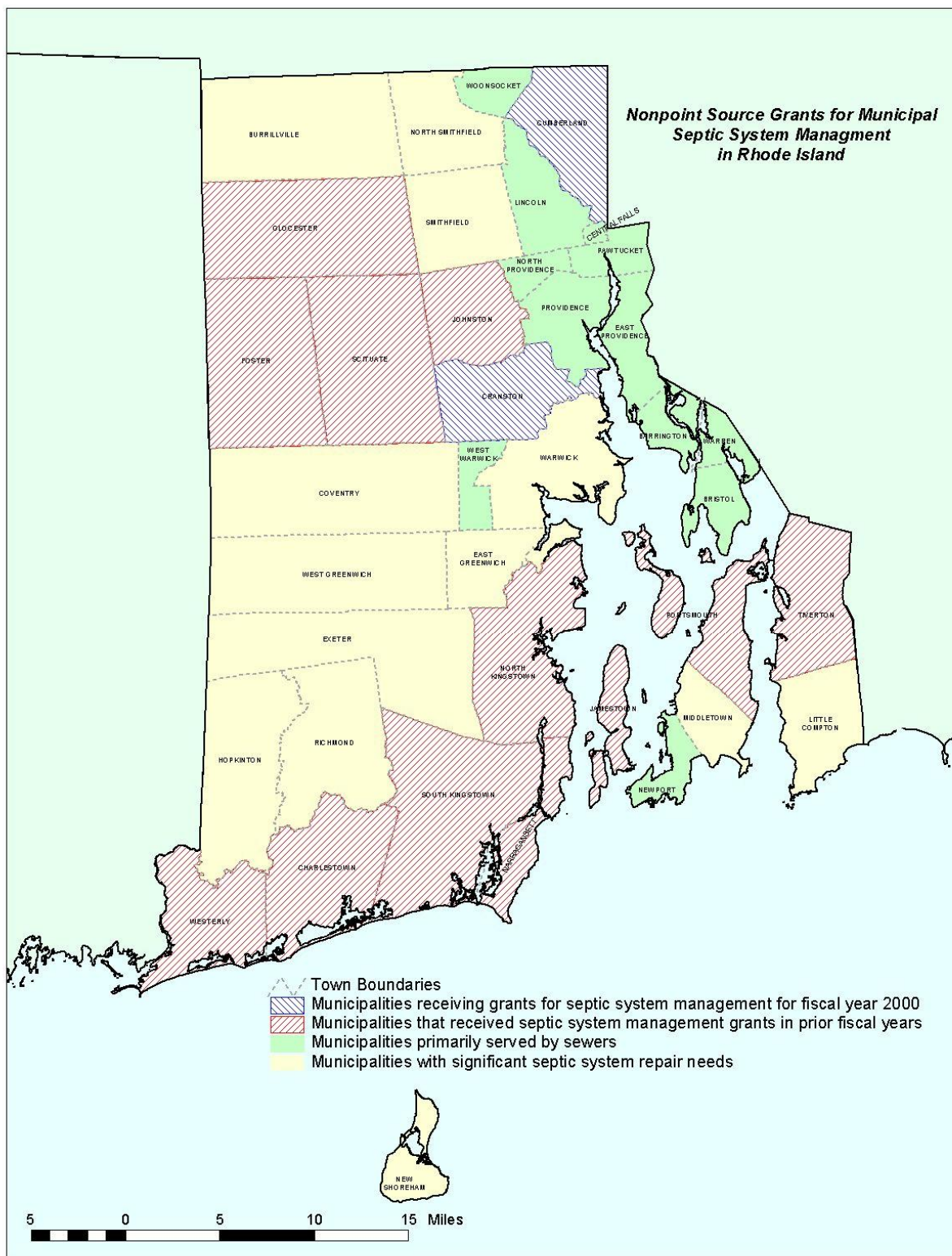
1. Does your town have septic system requirements or standards that go beyond the state septic system standards?
2. Does your town have requirements for managing septic systems (i.e., inspection and maintenance)?
3. Does your town require the use of innovative and alternative systems (e.g., within critical areas and water supply watersheds)?
4. Who is the contact for each of your municipal programs and requirements?
5. How are your municipal programs implemented and enforced?
6. Does your town have a repair replacement program?

Survey participants provided verbal and written information (e.g., ordinances and regulations). Written information collected during the survey is provided in Appendix A— Selected Rhode Island Municipal Ordinances and Regulations Regarding Septic Systems.

Tabular Summary of Survey Results Regarding Rhode Island Municipal Septic System Requirements

Municipalities Surveyed	Standards (Setbacks, etc.) Beyond State Regulations	Management (Inspection/Maintenance) Requirements	Required Use of Innovative and Alternative Technologies	Repair Replacement Programs
Burrillville	Yes	No	No	No
Charlestown	Yes	Yes	Yes	Yes(CSSLP)
Coventry http://www.town.coventry.ri.us/	No	No	No	Yes (CDBG)
Cranston	No	Under consideration	No	In development (CSSLP)
Cumberland	No	Under consideration	No	In development (CSSLP)
East Greenwich http://www.eastgreenwichri.com/	No	No	No	Yes (CDBG)
Foster	Yes	In Development	No	Yes (WRIHRP) In development (CSSLP)
Glocester	Yes	Yes	Under Consideration	Yes (WRIHRP) In development (CSSLP)
Hopkinton http://www.hopkintonri.com/	No	No	No	Yes (CDBG)

Johnston http://www.johnston-ri.com/	No	Yes	No	Yes (CDBG) In development (CSSLP)
Little Compton	No	No	No	No
Middletown	No	No	No	No
Narragansett	Yes	Yes	Based on staff recommendation	In development (CSSLP)
New Shoreham	Yes	Yes	Yes	In development (CSSLP)
North Kingstown http://www.northkingstown.org/waterdept/WAISDS.htm	Yes	Yes	Yes	In development (CSSLP)
North Smithfield http://www.northsmithfieldri.com/	No	No	No	No
Portsmouth http://www.portsmouthri.com/	Yes	Under consideration	Yes	Yes (CDBG) In development (CSSLP)
Scituate http://www.scituateri.org/	Yes	Under consideration	No	Yes (WRIHRP) In development (CSSLP)
South Kingstown	Yes	Proposed	May be required through negotiation	In development (CSSLP)
Tiverton	Yes	Under consideration	No	In development (CSSLP)
Warren http://www.townofwarren.org/	Yes	No	No	No
Warwick http://www.warwickri.com/	No	No	No	Yes
West Greenwich	Yes	No	No	Yes (CDBG)
Westerly	No	Under Consideration	No	Under consideration



Summary of Municipal Requirements and Management Programs for Septic Systems

Burrillville

Burrillville has established one enforceable policy that affects the construction and operation of septic systems:

- Burrillville Zoning Ordinance, Appendix A, section: 11-7.3, Lots containing wetlands.

Septic System Standards Beyond State Regulations

Burrillville's zoning ordinance establishes a 200-foot setback from wetlands and rivers for any site that contains a wetland, which encompass 40% or more of the total area.

Contacts

Katia Balassiano, Town Planner

105 Harrisville Main Street
Harrisville, RI 02830

Joseph Raymond, Zoning Official

Charlestown

Charlestown has established three bodies of enforceable policy that affect the construction and operation of septic systems. These are as follows:

- Chapter 210— Wastewater Management District.
- Charlestown Planning Commission Subdivision/Land Development Regulations.
- Charlestown Zoning Ordinance sections: 218-25, Special Use Permits; 218-36, Groundwater Protection District; 218-43, Site Plan Review— Standards; 218-87, Water Bodies; 218-101, Dwelling, Two Family; 218-114, Private School/College; 218-115, Convention Center.

Charlestown has completed an onsite wastewater management plan and has established eligibility for the Community Septic System Loan Program. They are the first town to take advantage of this program.

Septic System Standards Beyond State Regulations

Charlestown's subdivision regulations and zoning ordinance establish special standards for septic system siting and installation, which include policies for protection of sensitive resources. The subdivision regulations require an environmental analysis, which includes consideration of sewage disposal as well as factors related to sewage disposal, such as soils, slopes and proximity to waterbodies and wetlands. These regulations specifically allow the planning commission to enlarge the lot dimensions if this is deemed to be necessary for safe and affective operation of a septic system.

Section 218-87, Water Bodies of Charlestown's Zoning Ordinance establishes special requirements for setbacks from waterbodies and wetlands. These include the following setbacks:

- 100 feet from a freshwater or coastal wetland.
- 200 feet from a ten-foot-wide flowing body of water.
- 100 feet from flowing bodies of water less than 10 feet wide.
- 100 feet from intermittent streams.
- 100 feet from floodplains.

Septic System Management Requirements

Charlestown has established a wastewater management district ordinance, which is similar to the model ordinance developed for *Waste Water Management Districts... A Starting Point* (RIDOA/DOP, 1987). Charlestown's ordinance originally required septic systems to be pumped out on a three-year frequency. Recently, the ordinance was revised to require pumpouts based on inspection.

The Charlestown Wastewater Management Commission administers Charlestown's wastewater management program. The Charlestown Town Council appoints the five-member commission. Commissioners serve without compensation.

In addition to the requirements of the wastewater management ordinance, Charlestown also requires maintenance pumpouts for septic systems in subdivisions, which have been approved via subdivision review since 1992. This requirement is pursuant to enforceable policy. The pumpout requirement is recorded on the property deed.

Requirements for Innovative and Alternative Septic Systems

Charlestown recently established enforceable policy that requires innovative and alternative technologies for commercial uses, schools and convention centers. Each of these uses also requires a special use permit, as determined per Section 218-30, of the zoning ordinance. Demonstrating that a special use permit is not required is the burden of the applicant.

Charlestown requires innovative and alternative technologies if a variance from a sensitive-resource setback is requested. All multifamily dwellings within "lands developed beyond carrying capacity" in accordance with CRMC's Salt Ponds SAMP will also be required to use advanced technology.

Charlestown may also require use of innovative and alternative septic systems via site plan review. The need for a site plan review is determined per the requirements of Charlestown's zoning ordinance. In general, the ordinance necessitates a site plan review for most nonresidential uses. Single-family and two-family houses are exempted from review. The Charlestown Planning Commission conducts the review with the assistance of the Charlestown Planning Department.

Repair and Replacement Programs

Charlestown was the first municipality to receive approval of an onsite wastewater management plan and become eligible for the Community Septic System Loan Program.

Contacts

Wastewater Management

Commission

Roger Pease, Commission Chairman

Special Use Permits, Variances and Zoning Information

Don DiNucci, Zoning and Building
Official

(Copies of the Zoning Ordinance are
available for purchase.)

Charlestown Town Hall
4540 South County Trail
Charlestown, RI 02813

Site Plan Review and Subdivision Review

Unfilled, Town Planner

(Site plan and subdivision review
application packages are available
upon request.)

Coventry

Requirements for Innovative and Alternative Septic Systems

While Coventry has no regulation or ordinance that specifically requires advanced treatment, the Town may recommend such application on a case-by-case basis. In such instances, funding for innovative and alternative systems may be obtained through the Community Development Block Grant.

Repair Replacement Programs

Coventry receives a Community Development Block Grant (CDBG). It includes septic system repairs or replacements, among other household repairs.

Contact

Catherine LaPorte, Zoning Official
Coventry Town Hall
1670 Flat River Road
Coventry, RI 02816-8911

Cranston

Septic System Management Requirements

While Cranston currently has no management requirements implemented, they recently received a state nonpoint source management grant from DEM to establish a wastewater management plan and a program that will include maintenance requirements.

Repair Replacement Programs

The wastewater management plan will be used to establish eligibility under the Rhode Island Clean Water Finance Agency's Community Septic System Loan Program.

Contact

Kenneth Burke, Director
Cranston Department of Public Works
869 Park Avenue
Cranston, RI 02910

Cumberland

Septic System Management Requirements

While Cumberland currently has no management requirements implemented, they recently received a state nonpoint source management grant from DEM to establish a wastewater management plan and a program that will include maintenance requirements.

Repair Replacement Programs

The wastewater management plan will be used to establish eligibility under the Rhode Island Clean Water Finance Agency's Community Septic System Loan Program.

Contact

Town Planner
45 Broad Street
Cumberland, RI 02864

East Greenwich

Repair Replacement Programs

East Greenwich has established the Septic System Repair Program through Community Development Block Grant funding. In 1999, East Greenwich budgeted \$16,000 for septic system repairs via this program. Homeowners must receive a septic system permit from DEM and provide multiple estimates regarding the cost of the project. Homeowners submit for reimbursement once work is completed and paid. This repair program is targeted for cesspool upgrades.

Contact

Lee Whitaker, Town Planner
East Greenwich Town Hall
125 Main Street
East Greenwich, RI 02818-0111

Foster

Foster has established septic system requirements via one body of enforceable policy:

- Foster Zoning Supplemental Regulation--Section 6

Septic System Standards Beyond State Regulations

In its zoning regulation Foster establishes the following setbacks:

- Shallow surface leaching fields following a septic tank must be located 100 feet away from the side and rear property line of a lot.
- Sewage disposal must also be located at least 60 feet back from the front property line.
- There is a 200-foot setback from any pond, stream, spring or brook.

Septic System Management Requirements

Foster recently received a State nonpoint source management grant from DEM in conjunction with Scituate to develop an onsite wastewater management plan that will include consideration of inspection and maintenance requirements.

Repair Replacement Programs

Foster has received community development block grant funding along with Glocester and Scituate to develop the Western Rhode Island Home Repair Program. This program is not specifically used for septic systems, however certain septic system projects do qualify. Foster received a \$15,000 budget for Fiscal Year 1999. The program is generally used for moderate to low-income homeowners who must complete the application process.

The Foster-Scituate Onsite Wastewater Management Plan will be used to establish eligibility under the Rhode Island Clean Water Finance Agency's Community Septic System Loan Program.

Contact

Town Planner
Foster Town Hall
181 Howard Hill Road
Foster, RI 02825

Glocester

Glocester is currently undergoing development of a wastewater facilities plan and an onsite wastewater management plan. The town council appointed a Wastewater Management Board (as of June 17, 1999) to accomplish the following:

- Establish eligibility for the Community Septic System Loan Program.
- Make appropriate revisions to the draft wastewater facilities plan.
- Establish a townwide wastewater management district.

Glocester has developed two bodies of enforceable policy for septic systems:

- Glocester Zoning Ordinance
- Glocester Wastewater Management Ordinance

Septic System Standards Beyond State Regulations

Glocester's zoning ordinance establishes the following setback requirements:

- 150 feet from ponds, streams or springs.
- 100 feet from wells (DEM also makes this requirement).

Glocester's zoning official determines whether site plans for proposed developments meet the requirements of the zoning ordinance. If a proposed development will not meet the requirements, the developer may request a special use permit from the zoning board. Further appeals may be conducted through the court system.

Septic System Management Requirements

Glocester recently passed a wastewater management district ordinance and is currently implementing a management program as part of its onsite wastewater management plan. This ordinance is similar to the state's model ordinance and requires inspection and maintenance based on *Septic System Checkup*.

Requirements for Innovative and Alternative Septic Systems

Glocester is currently exploring development of requirements for innovative and alternative systems as part of its onsite wastewater management plan. Glocester recently received a State nonpoint source management grant from DEM to develop and implement an onsite wastewater management plan and demonstrate the use of innovative and alternative septic systems in the Village of Chepachet.

Repair Replacement Programs

Glocester has received community development block grant funding along with Foster and Scituate to develop the Western Rhode Island Home Repair

Program. This program is not specifically used for septic systems, however certain septic system projects do qualify. The program is generally used for moderate to low-income homeowners who must complete the application process.

The Gloucester Onsite Wastewater Management Plan will be used to establish eligibility under the Rhode Island Clean Water Finance Agency's Community Septic System Loan Program.

Contacts

Building permit review

Brian Lombardi, Zoning Official

Wastewater management board

Gene Pepper, Chairperson

Subdivision review

Ray Goff, Town Planner

Gloucester Town Hall

1145 Putnam Pike

PO Drawer B

Chepachet, RI 02814-0702

Jamestown

Jamestown has established one body of enforceable policy pertaining to septic systems.

- Jamestown Zoning Ordinance--Article 2, section 308

Septic System Standards Beyond State Regulations

Jamestown's zoning ordinance requires the following setbacks:

- Any type of septic system or sewage disposal system must be located 150 feet from any bog, floodplain, pond, marsh, swamp, stream, area subject to stormwater flowage, emergent or submergent plant community, or other freshwater as defined in RIGL section 2-1-20.

Septic System Management Requirements

While Jamestown currently have no management requirements implemented, they recently received a state nonpoint source management grant from DEM to establish a wastewater management plan and an ordinance that will include maintenance requirements.

Repair Replacement Programs

The wastewater management plan will be used to establish eligibility under the Rhode Island Clean Water Finance Agency's Community Septic System Loan Program.

Contacts

Frederick Brown, Zoning Official

Lisa Bryer, Town Planner

Jamestown Town Hall

93 Narragansett Avenue

Jamestown, RI 02835-1199

Johnston

Johnston recently passed a wastewater management ordinance entitled:

- An Ordinance Establishing a Wastewater Management District (Ordinance 1096).

Septic System Management Requirements

Johnston is currently implementing its onsite wastewater management ordinance. This ordinance is based on the Glocester wastewater management ordinance and is therefore also similar to the state's model ordinance.

Repair Replacement Programs

Johnston has recently received a state nonpoint source pollution management grant from DEM to develop an onsite wastewater management plan. The plan will be used to establish eligibility under the Rhode Island Clean Water Finance Agency's Community Septic System Loan Program.

Contacts

George Corrente, Director of Building Operations
Town of Johnston
1385 Hartford Avenue
Johnston, RI 02919

Narragansett

Narragansett has established septic system requirements via two bodies of enforceable policy:

- Narragansett Zoning Ordinance— Appendix B
- Narragansett Utilities Code— sections 20-212 – 214.

Narragansett is currently developing an onsite wastewater management plan that will establish eligibility for the Community Septic System Loan Program.

Septic System Standards Beyond State Regulations

In its zoning ordinance, Narragansett has established three overlay districts. Each district has special requirements for siting of septic systems. The three districts with their requirements are:

1. Coastal and Freshwater Wetlands Overlay District.
 - Septic systems are prohibited in all biological coastal and freshwater wetland areas.
 - Special use permits for septic systems in areas within 150 feet of biological coastal and freshwater wetlands.
2. Coastal Resources Overlay District.
 - Special use permits are required for septic systems in areas within 200 feet of all coastal features (i.e., CRMC's jurisdiction).
3. High Watertable Limitations Overlay District.
 - Septic systems are prohibited in areas where the groundwater is at 18 inches or less for significant portions of the year.
 - Special use permits are required for septic systems in areas where the groundwater is between 18-36 inches for significant portions of the year.

Narragansett's utilities code prohibits the use of garbage disposals with septic systems. Narragansett records garbage disposal prohibitions as deed restrictions.

Requirements for Innovative and Alternative Septic Systems

While Narragansett has no regulation or ordinance that specifically requires advanced treatment, the town may require nitrogen reduction in the coastal overlay district for systems sited within 200 feet of a coastal feature. Nitrogen reduction requirements are based on staff recommendation.

Parties who disagree with the staff recommendation may appeal to the zoning board. If the zoning board supports the recommendation, but the appellant still disagrees, a secondary appeal is referred to superior court.

If the zoning board issues a permit, but the permittee fails to fulfill the permit stipulations, the violation is referred to the building inspector and subsequently municipal court. Issues that remain unresolved after hearing in municipal court are referred to superior court.

Septic System Management Requirements

While Narragansett does not have a wastewater management district ordinance, the town has established septic system maintenance requirements in its utilities code. Narragansett's utilities code makes three important requirements for septic system maintenance:

- Owners must pump their septic systems at least every 4 years.
- Septic tanks must be accessible at all times.
- Use of septic tank additives is prohibited.

Municipal staff and court provide enforcement for the program. Municipal administrative staff issues a notice of violation to residents who fail pump their septic systems and provide a receipt to the town within the four-year pumpout schedule. If the municipality receives no response from the violator, Narragansett issues a summons to municipal court.

Repair Replacement Programs

Narragansett has received a state nonpoint source pollution management grant to develop an onsite wastewater management plan. The plan will be used to establish eligibility under the Rhode Island Clean Water Finance Agency's Community Septic System Loan Program.

Contact

Clarkson Collins, Director
Narragansett Department of Community Development
25 Fifth Ave.
Narragansett, RI 02882

New Shoreham

New Shoreham faces special environmental concerns as it is located entirely on Block Island and has no feasible source of drinking water beyond Sands Pond and groundwater sources. Thus, the town has established relatively protective septic system policies. New Shoreham's policies include:

- Zoning Ordinance— Section 506.
- New Shoreham Wastewater Management District Ordinance.

Septic System Standards Beyond State Regulations

New Shoreham, in November 1998, adopted an amendment to its zoning ordinance which, among other provisions sets a number of standards. These include:

- Use of access risers at inlet and outlet ends of the septic tank and effluent filters on all new, repaired and altered systems; and where technically feasible, retrofitting of existing tanks with access risers and filters by December 31, 2005.
- Certification of septic tank water tightness in situ.
- Prohibition on galleys for new ISDS, ISDS alterations, and major repairs.
- Requirement to renovate cesspools and failing septic systems to establish Treatment Level 1 (T1) or Treatment Level 2 (T2) performance standards by December 31, 2005.
- Conformation of all new ISDS installations, ISDS alterations, and major repairs to T1 or T2 standards.
- Designation of T1 and T2 performance standards based on site conditions, location on critical water resource areas, and location in wetland buffers.
- Analysis of groundwater flow and impact to water quality may be required for ISDS with maximum daily flow over 900 gallons, subdivisions, or other land development projects.

The following setbacks are also included:

- 150 feet of vegetated buffer shall be maintained from any septic system to a freshwater wetland or coastal feature.
- 200 feet of vegetated buffer shall be maintained from any septic system to Sands Pond, Peckham Pond and Fresh Pond.

The ordinance also establishes a requirement for special use permits for anyone requesting relief from the standards of the ordinance; or installations

within the T2 area where the water table is 2 1/2 feet or less or where there is an impermeable layer at 4 feet or less.

Septic System Management Requirements

The New Shoreham Waste Water Management Ordinance was approved in November 1996 as the first mandatory *inspection* ordinance in the State. Its purpose is to establish a wastewater management program to ensure systems are properly operated, regularly inspected and maintained. The ordinance requires:

- Routine inspection with maintenance as needed based on inspection results.
- Inspection schedules to be established by the town, with highest priority in critically resources areas, areas with a history of failure, high seasonal use or frequent pumping.
- Where inspection reveal a failing ISDS, the Building Official issues a notice of violation to repair the system, with a copy to RIDEM.
- Prohibits garbage disposal discharges to an ISDS.
- Requires water conservation.

The town is currently locating systems and wells using GPS and is evaluating the use of various septic system computer-tracking programs.

Requirements for Innovative and Alternative Septic Systems

Enhanced treatment is not required throughout the town unless tipping D boxes, effluent filters, access risers and watertight tanks are considered innovative and alternative. These improvements are required in T1 treatment zones to enhance primary treatment. It is important to note that the treatment level map was created to identify critical resource areas and approximate location of treatment zones based on general soil types. Site investigation is essential to determine the required treatment level.

All new ISDS installations, ISDS alterations and major repairs must conform to ISDS Treatment Level 1 (T1) or ISDS Treatment Level 2 (T2) standards. The standard requirements are:

T1 standards require with Tank Improvements:

- Tipping distribution box.
- Access risers.
- Effluent filter.
- Certified watertight tank..

T2 standards Include:

- The improvements made at the T1 level.
- Shallow drainfields may be required based on soils or proximity to wetlands.

The following treatment requirements are based on location within the T2 zone and site specific soil and water table information. A map entitled, *ISDS Treatment Level Zones for New Shoreham*, indicates whether Treatment Level 1 or Treatment Level 2 is likely to be required. This map is available through the Building Official or the Sewer Commission.

T2N

- Nitrogen (50% reduction or concentration of 19 mg/l) prior to the drainfield.
- Biochemical oxygen demand (30 mg/l) and total suspended solids (30 mg/l) prior to the drainfield.

T2C

- Fecal coliform (1,000 fecal coliform counts/100 ml) reduction prior to the drainfield.
- Biochemical oxygen demand (10 mg/l) and total suspended solids (10 mg/l) prior to the drainfield.

Repair Replacement Programs

New Shoreham has received a federal grant to develop an onsite wastewater management plan. The plan will be used to establish eligibility under the Rhode Island Clean Water Finance Agency's Community Septic System Loan Program. The plan has been accepted by DEM and is currently out to public notice prior to its formal approval.

Contacts

Nancy Dodge, Town Manager

Claire McElderry, Inspector

New Shoreham Town Hall
P.O. Drawer 220
Block Island, RI 02807

North Kingstown

North Kingstown has established two bodies of enforceable policy that affect the construction and installation of septic systems. They are as follows:

- North Kingstown Zoning Ordinance--Groundwater Reservoirs and Groundwater Recharge Areas
- North Kingstown Wastewater Management District Ordinance

North Kingstown has established Groundwater Recharge and Wellhead Protection Overlay Zoning that requires special use permits and enhanced treatment in the proximity of certain sensitive resources. Town is also in the process of facilities planning, which may incorporate an onsite wastewater management plan and use of the Community Septic System Loan Program. The Town Council has recently adopted a *Wastewater Management District Ordinance*. The ordinance requires that property owners inspect their septic systems.

Septic System Management Requirements

The Wastewater Management District Ordinance requires that homeowners inspect their septic systems once every three years. Inspections must be conducted by "town approved" inspectors hired by the property owner.

Requirements for Innovative and Alternative Septic Systems

North Kingstown has a discharge limit of 5 mg/l for nitrate in the groundwater overlay zones. New commercial uses must demonstrate that this limit can be met on site using a conventional septic system. The limit is assumed to be met on residential lots with a density of one unit per two acres. On residential lots that are nonconforming by area, all additions, expansions, enlargements or intensification require a special use permit and in cases where RIDEM determines that an upgrade of the ISDS is required, the upgrade must include the installation of a RIDEM-approved nitrogen-reducing septic system.

Repair Replacement Programs

N. Kingstown has recently received a state nonpoint source pollution management grant to implement an onsite wastewater management plan, which has been approved by DEM. The plan is being used to establish eligibility under the Rhode Island Clean Water Finance Agency's Community Septic System Loan Program.

Contact

Sue Licardi, Acting Director
North Kingstown Department of Water
80 Boston Neck Rd.
North Kingstown, RI 02852-5762

Portsmouth

Portsmouth has established one enforceable policy regarding septic systems:

- The Portsmouth Watershed Protection District (97-11-17, section H).

Septic System Standards Beyond State Regulations

Portsmouth makes the following development restrictions throughout the protection district:

- Reserve space for a replacement septic system.
- Certified watertight septic tanks.
- Prohibition on galleys.

The watershed protection district encompasses the watersheds of Sisson Pond, St. Mary's Pond, Lawton Reservoir and Bailey Brook. The protection district is split into two zones. Zone A includes all lands within 500 feet of the reservoirs or tributaries thereto. Zone UD (Upland District) includes the remainder of the watersheds, which are defined in the Portsmouth Watershed Protection District Ordinance.

In general, proposals for development are reviewed by the zoning official. The zoning board reviews variances and the planning board reviews special use permits.

Requirements for Innovative and Alternative Septic Systems

Portsmouth requires innovative and alternative systems, which have been approved by DEM, throughout Zone A of its watershed protection district.

Repair Replacement Programs

Portsmouth currently has a Community Development Block Grant for the Island Park area. Portsmouth has recently received state and federal nonpoint source pollution management funding to develop an onsite wastewater management plan. The plan will be used to establish eligibility under the Rhode Island Clean Water Finance Agency's Community Septic System Loan Program. Portsmouth is currently preparing a facilities plan amendment for the Portsmouth and Island Park areas.

Contact

Bob Gilstein, Town Planner
Portsmouth Planning Department
2200 East Main Rd.
Portsmouth, RI 02871

Scituate

Scituate has established two bodies of enforceable policy pertaining to septic systems. They include:

- Scituate Subdivision Regulations--Appendix B, section 4(b).
- Scituate Zoning Ordinance--Appendix A, section 7.

Septic System Standards Beyond State Regulations

Scituate has established the following setbacks in their subdivision regulations and zoning ordinance:

- Any sewage disposal facility designed to leach wastes into the soil must be located no closer than 150 feet from the edge of any pond, stream, spring or wetland.
- No private sewer system shall be constructed within 25 feet of a property line.
- No ISDS shall be constructed within 50 feet of a street boundary line.
- No ISDS shall be constructed within 100 feet of a subsurface drain.
- Prior approval from the plan commission is necessary to elude any of the above requirements.

Septic System Management Requirements

Although there are currently no management requirements in place, Scituate recently received a State nonpoint source management grant from DEM in cooperation with the Town of Foster to develop an Onsite Wastewater Management Plan to establish these requirements.

Repair Replacement Programs

Scituate is a member of the Western Rhode Island Home Repair Program along with Foster and Glocester. A portion of the program budget is used for septic system repair. The application process is provided through the Scituate Welfare Department. Applicants may use this program for any type of home repair, including septic system repair that meets the criteria.

Scituate's Onsite Wastewater Management Plan will be used to establish eligibility under the Rhode Island Clean Water Finance Agency's Community Septic System Loan Program.

Contact

David Provonsil, Planning Board Chairman/Zoning Official
Scituate Town Hall
195 Danielson Pike
North Scituate, RI 02857

South Kingstown

South Kingstown developed an onsite wastewater management plan, which was recently approved by town council. In addition, South Kingstown has established special requirements for septic systems sited in the vicinity of waterbodies. These requirements are described in the South Kingstown Zoning Ordinance, section 308.

Septic System Standards Beyond State Regulations

South Kingstown requires special use permits for all septic systems located:

- Within 50 feet of a bog, marsh, swamp or pond.
- Within 200 feet of flowing bodies of water 10 feet or more in width.
- Within 100 feet of flowing bodies of water less than 10 feet in width.
- Within 150 feet of floodplains.
- Within 150 feet of other freshwater wetlands.

Special use permits are also required for any septic system located within 150 feet of a coastal wetland, mean high water mark or tidal waterbody. An applicant may receive a special use permit from the zoning board of appeal. Per the zoning ordinance, the zoning board of appeal must seek an advisory opinion from the conservation commission in order to grant a special use permit.

Requirements for Innovative and Alternative Septic Systems

While South Kingstown has no particular requirement for use of innovative or alternative septic system technology, the conservation commission may advise a stipulation for such technology during negotiation of a special use permit.

Septic System Management Requirements

South Kingstown has recently drafted a wastewater management district ordinance, which requires inspection and maintenance based on *Septic System Checkup*. This ordinance also includes a requirement for all cesspools to be upgrade to prevailing standard by December 31, 2005.

Repair Replacement Programs

South Kingstown has received a state nonpoint source pollution management grant to develop an onsite wastewater management plan. The plan will be used to establish eligibility under the Rhode Island Clean Water Finance Agency's Community Septic System Loan Program. The plan has been drafted by the town and approved by DEM.

Contact

Ray Nickerson, Principal Environmental Planner
S. Kingstown Town Hall
180 High St.
Wakefield, RI 02879

Tiverton

Tiverton has established two bodies of enforceable policy that affect the construction and operation of septic systems. These are as follows:

- Chapter 18— Sewers and Sewage Disposal.
- Appendix A-Zoning, Article VIII, Watershed Protection Overlay District.

Septic system Standards Beyond State Regulations

Tiverton's zoning ordinance requires all ISDS systems within the Stafford Pond Watershed Overlay District to be improved to the prevailing standards by the year 2005.

Septic System Management Requirements

Currently, there are no management requirements in place. However, Tiverton recently received a State nonpoint source management grant from DEM to develop an onsite wastewater management plan.

Repair Replacement Programs

The Tiverton Onsite Wastewater Management Plan will be used to establish eligibility under the Rhode Island Clean Water Finance Agency's Community Septic System Loan Program.

Contacts

Noel Berg, Planning Board

Pat Sullivan, Chair
Tiverton Conservation Commission

Tiverton Town Hall
343 Highland Road
Tiverton, RI 02878

Warren

Warren has established one body of enforceable policy that affects the construction and operation of septic systems:

- Warren Zoning Ordinance--section 32-89 Setback from Wetlands and Water Bodies.

Septic Systems Standards Beyond State Regulation

Warren requires:

- Sewage disposal facilities shall be located no closer than 150 feet of any water body, including wetlands.

Contact

William Hanley, Zoning Official
Warren Town hall
514 Main Street
Warren, RI 02885

Warwick

Repair Replacement Programs

Warwick currently operates the Onsite Rehabilitation Program. Ongoing since 1983, the program is replenished through bonds. Applicants must own a house and reside there for at least two years to be considered for approval. Informational packets are sent to homeowners at their request, which explain the criteria for approval as well as the grant-loan process. Applicants, on a case-by-case basis, can accept the 40% grant and the 60% loan, or just the grant itself.

Contact

Craig Onorato, Business Manager
Warwick Sewer Authority
125 Arthur W. Devine Boulevard
Warwick, RI 02886

West Greenwich

Enforced by the zoning board, West Greenwich has established one body of enforceable policy pertaining to the construction and installation of septic systems:

- West Greenwich Zoning Ordinance--Article VII, section 5 Special Regulations

Septic System Standards Beyond State Regulations

According to the zoning ordinance, West Greenwich requires:

- All ISDS construction and installation be located at least 200 ft from the edge of any pond or stream.

Septic System Management Requirements

Currently, there is no legislation that requires management of septic systems. However, the zoning board may suggest on a case-by-case basis, that a better maintenance be performed on those systems that require it, or fall within the 200-foot setback.

Requirements for Innovative and Alternative Septic Systems

Although, there is no written law requiring innovative and alternative systems, any development within the Queens River Aquifer inside the 200-foot setback must be approved by the zoning board and use an innovative and alternative system.

Repair Replacement Programs

Currently, West Greenwich receives funding from the Community Development Block Grant to do home repairs, including septic system repairs. Homeowners must go through the application process with the ISDS Program at the Rhode Island Department of Environmental Management to be eligible for funding.

Contact

John Pagliarini, Town Planner
West Greenwich Town Hall
280 Victory Highway
West Greenwich, RI 02817

Westerly

Westerly is currently in the process of seeking approval by the Town Council for the Westerly ISDS Management Plan. Once established, the plan will be used to attain funding from the Community Septic System Loan Program.

Contact

Glen Hedman
Westerly Town Hall
45 Broad Street
Westerly, RI 02891

Appendix F

Cost Estimate to Replace Leachfield and Septic Tank

Cost Estimate to Replace Leachfield

Item		Unit	# of Units	Unit Cost	Cost
1	Remove Piping	L.F.	130	\$2	\$260
2	Dispose of Old Piping	L.F.	130	\$1	\$65
3	Excavate 4 (70') Trench for 12" High Galleys ¹	C.Y.	3.9	\$10	\$39
4	Off-site disposal of old stone ²	C.Y.	3.9	\$25	\$97
5	3/4" Crushed Stone Installed	C.Y.	3.9	\$75	\$292
6	Furnish and Install Distrubution Box	E.A.	1	\$85	\$85
7	Install 4" PVC Distribution Piping	L.F.	260	\$12	\$3,125
8	Rake & Seed Disturbed Area	S.Y.	20	\$4	\$80
9	Fertilize & Mulch Disturbed Area	S.Y.	20	\$1	\$20
10	Subtotal				\$4,225
11	Engineering Design/Survey (30%)				\$1,268
12	Total (Rounded)				\$5,490

Notes

1. Assume 4 trenches, 70 feet long, 3 feet wide
2. Assume 50% stone and pipe replacement

Cost Estimate to Replace Septic Tank

Item	Unit	# of Units	Unit Cost	Cost
1 Excavate and Remove Existing Septic Tank	L.S.	1	\$580.00	\$580
2 Dispose of Old Tank (1)	L.S.	1	\$200	\$200
3 Install New Septic Tank w/ Effluent Filter	L.S.	1	\$2,500	\$2,500
4 Rake & Seed Disturbed Area	S.Y.	20	\$4.00	\$80
5 Fertilize & Mulch Disturbed Area	S.Y.	20	\$1.00	\$20
6 Subtotal				\$3,515
7 Engineering Design/Survey (30%)				\$1,055
8 Total (Rounded)				\$4,570

Notes

1. Disposal fee is \$40 per ton, including transporation (TMC Services, Inc 11/05).
Assumed weight of concrete tank is 5 tons.