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1 Introduction

The ideal surface water drinking supply would have excellent natural water quality and no potential contaminant sources (PCSs). There would be no development in the watershed and no surface use. We are fortunate to have good natural water quality in most of Connecticut's surface drinking water supplies, however PCSs exist for every surface water supply and development and recreational uses continue.

Atlantic States Rural Water & Wastewater Association (ASRWVA) believes that threats from many PCSs can be mitigated by proper construction, applying best management practices (BMPs) and the responsible use of the resource. Therefore education, outreach and the ability to develop and maintain working relationships in the community are important factors in sourcewater protection.

The purpose of the Little River Watershed Protection Plan is to reduce or eliminate potential and existing risks to the Putnam Water Pollution Control Authority (WPCA) drinking water supply and public water system wells in Woodstock. The management plan included here outlines specific actions available to the community to protect the watershed while avoiding adverse impacts on the other activities in the watershed.

The plan is prepared by the ASRWVA in cooperation with the National Rural Water Association. Program funding is provided by the United States Department of Agriculture's (USDA) Sourcewater Protection Program. The purpose of the program is to provide technical assistance to rural and small communities for the development of Sourcewater Protection Plans (SWPPs).

These Sourcewater Protection Plans build on the Sourcewater Assessment Program of the Connecticut Department of Public Health (DPH). This program determined the susceptibility of the public water systems in Connecticut to PCSs. The SWPP process is community based and uses the DPH assessment data to develop and implement a sourcewater protection plan. The main tasks are:

- ◆ Form a Local Sourcewater Protection Team
- ◆ Verify and update PCS inventory done by the DPH
- ◆ Assess threats to the drinking water source
- ◆ Develop management strategies for these threats
- ◆ Form a Steering Committee to oversee implementation and update plan periodically
- ◆ Develop a contingency plan in the event the supply is lost

2 Local Sourcewater Protection Team

The Little River Sourcewater Protection Team is a diverse group. The goal is to represent a cross-section of stakeholders in the watershed, including Putnam WPCA and town officials, Woodstock town officials and board members,

business, agriculture, and organizations currently involved in resource conservation efforts. Below is a list of local stakeholder groups and who they are represented by on the team:

Organization

Atlantic States Rural Water & Wastewater Assoc
 Audubon Society
 Connecticut Dept. of Environmental Protection
 E. CT Resource Conservation and Development
 Eastern Connecticut Conservation District
 Green Valley Institute
 Local Builders
 Local Farmers
 Local Outdoor Recreation Business
 Muddy Pond Neighborhood
 The Nature Conservancy
 Northeast District Department of Health
 Putnam Town Administration
 Putnam Water Pollution Control Authority
 Quinebaug-Shetucket Heritage Corridor
 Roseland Park
 UConn Cooperative Extension
 UDSA Natural Resources Conservation Service
 Woodstock Conservation Commission
 Woodstock Planning Department
 Woodstock Planning & Zoning Commission
 Woodstock Town Administration
 Woodstock Water Pollution Control Authority
 Wyndham Land Trust

Represented by

Marc Cohen
 Andy Rzezinkiewicz
 Eric Thomas
 John Guszowski
 Scott Gravatt, Greg Smith
 Holly Drinkuth
 Doug Porter
 Paul Miller
 Ian MacRae
 Mary Ellen Blake
 Cyrus Harvey, Jr
 Maureen Marcoux
 Doug Cutler
 Bill Trayner
 Jean Cass
 Ed Higgins
 Joyce Meader
 Nancy Ferlow
 Jean Pillo
 John Guszowski
 Sandy Rotival
 Delpha Very
 Peter Ellsworth
 Dick Booth



Team members (clockwise) Mary Ellen Blake, Jean Pillo, Sandy Rotival, Paul Miller, Doug Cutler, Bill Trayner, Stewart Morse, Maureen Marcoux (hidden) and John Guszowski review final draft of plan.

The Team would like to thank the Towns of Putnam and Woodstock for their support. Resolutions of support were passed in each town and are included as Exhibit I.

3 Little River Watershed

3.1 Natural Setting

Little River is located in northeast Connecticut and is a tributary of the Quinebaug River that, in turn, is a tributary of the Thames River which empties into Long Island Sound. Exhibit II shows the Little River watershed (CT DEP Basin Nos. 3706, 3707 & 3708) location and topography. The watershed lies primarily in the town Woodstock with small portions in Pomfret, Putnam and Thompson, Connecticut and Southbridge, Massachusetts.

The watershed is approximately 11 miles long (north to south) and approximately 5 miles wide (east to west) and covers 39.0 square miles. The diversion of water at the Peake Brook Road Water Treatment Plant is located at a dam approximately two and a half miles north of the confluence of Little River and Quinebaug River in Putnam. The area of the watershed located upstream of the diversion is 35.4 square miles.

Upstream of the diversion Little River is impounded in two surface water bodies – Shepherds Pond (nearest the diversion) and Roseland Lake. The lower end of Shepherds Pond is approximately one mile north of the dam. It is relatively narrow, surrounded by wetlands and has a surface area of approximately 11 acres. The lower end of Roseland Lake is approximately 1.8 miles upstream of the diversion (north of Stone Bridge Road in Woodstock). The lake is owned jointly by the Town of Woodstock and the State of Connecticut. Roseland Lake is roughly three-quarters of a mile long, has a surface area of about 96 acres, a maximum depth of about 20 feet and average depth of six feet. The primary surface flow to the lake is Muddy Brook. The lake is not managed as a reservoir for the Putnam WPCA and is used recreationally for boating, fishing and formerly for swimming.

Tributaries of Little River which are located upstream of the diversion are (from north to south) Muddy Brook, English neighborhood Brook, Mill Brook, and Peake Brook.

3.2 Characteristics and Water Quality

The Connecticut DEP has classified the water quality of Muddy Brook, Roseland Lake, Shepherds Pond and Little River, as B/AA. This classification indicates that the present conditions may meet the water quality criteria for “B” classification with a future goal of achieving an “AA” classification. Designated uses of surface water with a B classification include recreational use, fish and wildlife habitat, agricultural and industrial supply and other legitimate use including navigation. Designated uses of surface water with an AA classification

include existing or potential public drinking water supplies, fish and wildlife habitat, recreational use (which may be restricted), and agricultural and industrial supply. Four waterbody segments within the Little River watershed are listed by the DEP as impaired (i.e. not meeting the water quality standards for a B classification) and are shown below:

Segment Name	Location	Impaired Use	Cause	Potential Source
Roseland Lake	Southeast Woodstock	Primary & Secondary Contact Recreation	Exotic species, Noxious plants	Source unknown
Little River	Mouth to diversion	Primary Contact Recreation	Indicator bacteria	Source unknown
Muddy Brook	Between Rte 197 & Rte 169	Aquatic Life Support	Cause unknown	Agriculture, Source unknown
North Running Brook	0.3 miles upstream from mouth at Muddy Brook	Aquatic Life Support	Cause unknown (possible organic enrichment/low DO, nutrients)	Agriculture, Crop-related sources

Notes:

1. The Little River segment listed above is outside the sourcewater protection area of this plan (See Section 3.3 below).
2. It appears that the impairment on North Running Brook was due to a one-time release and the segment will be de-listed.



Some scenic Little River tributaries are impaired.

3.3 Sourcewater Protection Area

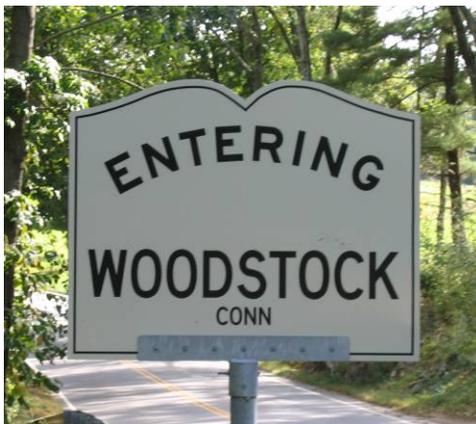
The Sourcewater Protection Area (SWPA) for the Little River watershed encompasses 35.4 square miles and includes most of the Little River Basin (#3708, includes Muddy Brook and Peake Brook), the English neighborhood Brook Basin (#3706) and the Mill Brook Basin (#3707). The land area drained by the Little River below the Putnam WPCA diversion is not part of the public drinking water supply source, but protection strategies developed here may benefit that area also.

3.4 Summary of the Putnam Water District

The Putnam WPCA water company serves approximately 2,150 residential, commercial and industrial accounts located within or adjacent to the Special Services District in the Town of Putnam, Connecticut. The actual population served by the water company is estimated to be 7,000 people out of the total population in Putnam of 9,002. In addition, the system serves 43 residences (138 people) on Sabin Street in Woodstock and 17 residences (70 people) on Oak Hill Drive in Thompson.



The Putnam WPCA draws water from two sources. One is the diversion of surface water from Little River (the subject of this plan). The second source is the Park Street well field. The water company facilities include a water treatment plant for the surface water supply, two one-million gallon storage tanks and approximately 38 miles of water distribution piping. The average daily water demand for the system is approximately 1.13 MGD, of which 0.90 MGD is diverted from Little River.



3.5 Town of Woodstock

Before European settlement the area was inhabited by the Wabbaquassetts who abandoned it after the King Philip's War. The area was settled in 1686 by people from the Massachusetts Bay Colony and called New Roxbury. It was renamed Woodstock in 1690 and was annexed to Connecticut in May of 1749. It has a population density of 119 people/square mile which ranks it 142nd out of the 169 Connecticut towns. Only 3,059 of Woodstock's 39,435 acres are considered

developed and it has one of the largest active agricultural communities in Connecticut. It is located in the Quinebaug and Shetucket Rivers Valley National Heritage Corridor.

3.6 Other Towns

Relatively small areas of the Little River watershed lie within the towns of Thompson and Pomfret, Connecticut and Southbridge, Massachusetts. These areas are similar to Woodstock, in that they have low levels of development. The lower reach of Little River in Putnam (below the WPCA diversion) becomes more developed as it nears the Quinebaug River.

3.7 Sourcewater Inventory

The diversion of water at the Peake Brook Road Water Treatment Plant is located at a stone masonry dam approximately two and a half miles north of the confluence of Little River and the Quinebaug River in Putnam. Water is diverted into a concrete chamber at the dam.

In addition to the Putnam WPCA diversion, there are 25 public water supply systems in Woodstock that draw water from wells within the SWPA. These systems service 3,631 people in apartment and condominium complexes, town buildings, public and private schools, and businesses. These systems are listed in Exhibit III.

4 Existing/Current Sourcewater Protection Measures

Following is a sampling of sourcewater protection initiatives that were already in place or ongoing during the spring, summer and fall of 2005. We recognize there may be other individuals and organizations not listed here who are actively working to protect the natural resources of this region.

4.1 Putnam WPCA

The Putnam WPCA staff conducts regular inspections of the watershed to identify violations and potential threats. When a threat or violation is identified, the WPCA takes action to resolve the problem – working with the landowner where possible. They also review new construction for potential impact on the water supply, and visit farms to survey for best management practices.

4.2 Wyndham Land Trust

The Wyndham Land Trust completed the purchase of three parcels of land north and east of the intersection of Route 171 and Little Pond Road in Woodstock. These parcels extend to the Little River and total roughly 35 acres. They are mostly wetlands and the Trust is developing plans for the construction of a raised boardwalk to provide access to part of the land.

4.3 Eastern CT Resource Conservation & Development Council

The Eastern CT RC&D expects to be awarded an FY 2005 319 Grant to provide support for the implementation of a system to use surplus manure to generate electricity and/or provide composted manure for resale. Under the grant, the RC&D will provide community outreach, farmer outreach and education in support of the implementation. The final scope of this “Phase 2” implementation

project is being developed by a consultant as part of a previously allocated Phase 1 grant.

4.4 Eastern CT Conservation District

The ECCD has won an FY 2005 319 Grant to address non-point pollution sources in the Little River watershed. The project begins with field observations and GIS mapping of land uses affecting water quality, with the goal of coordinating findings with water quality testing conducted by the USGS. The focus will be on impaired waters in Muddy Brook, Little River, North Running Brook, and Roseland Lake. This project will include evaluation and follow-up on an earlier 208 report, initiation of activities to abate NPS pollution, reduction of geese nutrient additions, coordination with other local efforts, and education and outreach.

4.5 Town of Woodstock

The Town of Woodstock has been active on several fronts. The Conservation Commission has been very active doing education and outreach and has developed an excellent web site with information for residents regarding septic system maintenance, household hazardous waste, lawn care and other best management practices that help protect surface and ground water resources.

In August the Planning and Zoning Commission issued new subdivision regulations that allow cluster development by right with a set-aside of at least 50% of the land for permanent protection.

5 Summary of CT DPH Sourcewater Assessment (Exhibit IV)

In 2003, the Connecticut Department of Public Health Drinking Water Section completed a state-wide survey of drinking water supplies under the Sourcewater Assessment Program. This program was mandated with the 1996 reauthorization of the Safe Drinking Water Act. The purpose of the program was to evaluate the susceptibility to contamination of each public drinking water source in Connecticut and communicate the results to the public.

The following information was used to assess the Little River watershed under the Sourcewater Assessment Program:

- ◆ Sanitary conditions in the sourcewater area
- ◆ The presence of potential or historic sources of contamination
- ◆ Existing land use coverages
- ◆ The need for additional source protection measures within the sourcewater area

Based on these parameters the DPH found that the Little River watershed had a high overall susceptibility rating. Below is a summary of sourcewater protection recommendations included in the assessment report:

- ◆ Determine the trophic status of Roseland Lake and Shepherds Pond
- ◆ Encourage homeowners to adopt residential best management practices regarding hazardous materials use, septic system maintenance and fuel storage tanks
- ◆ Work to increase the amount of preserved land within the watershed
- ◆ Establish local watershed protection regulations
- ◆ Support environmental awareness and education in the community

6 Potential Contaminant Source Inventory

6.1 Summary of DPH Potential Contaminant Source Inventory

The PCS inventory identifies potential threats to the drinking water source. The table below is excerpted from the DPH Sourcewater Assessment and lists the potential contaminant types and number in the Little River sourcewater protection area.

Category	Subcategory	Number of PCS Types
Waste Storage, Handling, Disposal	Hazardous Waste Facilities	3
	Solid Waste Facilities	2
	Miscellaneous	0
Bulk Chemical, Petroleum Storage	Underground Storage Tanks	16
	Tank Farms	0
	Warehouses	2
Industrial Manufacturing/Processing	Chemical & Allied Production	0
	Chemical Use Processing	0
	Miscellaneous	0
Commercial Trades and Services	Automotive and Related Services	4
	Chemical Use Services	0
	Miscellaneous	0
Miscellaneous	No Identifiable PCS Type	0
Agricultural Operations	Animal/Livestock Waste Handling	22
	Pesticide Storage or Application	1
Total Number of Contaminant Types		50

6.2 Update of Potential Contaminant Source Inventory

By and large the PCS inventory included in the CT Sourcewater Assessment is representative of the threats to the watershed. An effort is ongoing to verify the sources listed there. Preliminary results indicate a somewhat reduced number of agricultural sources (17 vs 22) and most Underground Storage Tanks listed have been cleaned up. The old landfill is closed, remediation at Linemaster has been completed and Rogers Corporation and Crabtree and Evelyn no longer discharge wastewater.

7 Assessment of Threats

7.1 Confirmed Contaminant Detects of Concern in Sourcewater

Routine monitoring by the Putnam WPCA has detected nitrates in Roseland Lake, Shepherds Pond and several feeder streams. Nitrites and sodium have also been detected in some areas. Monitoring samples required by the Connecticut Department of Public Health (DPH) of all public water systems has detected the presence of nitrate in ten public wells (three community water systems (CWS), three Non-Transient Non-Community systems (NTNC) and four Transient Non-Community systems (TNC). Trichloroethylene was been detected in one well, VOCs in one, and coliforms in another (see Exhibit III). Detection of these contaminants indicates that they have been released to surface and ground waters and are a threat to the Little River watershed.

7.2 Roadways

Roadways present a significant threat to drinking water sources. The possibility of an accident involving a truck transporting bulk shipments of hazardous materials poses a risk. Roadways are also a potential source of contamination due to potential petroleum leaks from vehicles; the application of road salts, which could cause elevated levels of sodium and chlorides; and maintenance activity which may include herbicide and pesticide applications.

7.3 On-Site Septic Systems

On-site septic systems represent potential sources of nitrates, chlorides, bacteria and viruses. In addition, if improperly used, such as for disposal of paints, solvents, petroleum products and other hazardous waste, they could be a source of organic compounds.

7.4 Land Use

7.4.1 Industrial

Industrial operations commonly use toxic substances as part of manufacturing, warehousing, and/or distribution. Chemicals, petroleum, cleaning supplies, machinery, metals, electronic products, asphalt, and others pose a potential threat to the water supply and must be managed.

The potential contamination inventory for the Little River watershed identified three industrial sites in the Source Water Protection Area (SWPA). The water sources in the SWPA are vulnerable to contamination from these facilities involved in the manufacturing and using toxic substances.

7.4.2 Commercial

Many commercial operations use toxic and hazardous materials in their processes. Examples include:

- ◆ Auto repair shops, gas stations, car washes, paint shops
- ◆ Road maintenance depots, de-icing operations

- ◆ Construction areas
- ◆ Dry cleaners, Laundromats
- ◆ Medical institutions, research laboratories, photography establishments, printing facilities
- ◆ Restaurants, bakeries
- ◆ Woodworking and finishing facilities

The storage, use, and disposal of chemicals required by these operations can pose a potential threat to water since even small amounts of the hazardous materials can contaminate large amounts of surface or ground water. Storing quantities of the material can also create a serious problem if they are not contained and stored properly. Leaks and spills from storage tanks and pipes can contaminate water, rendering the water unfit for consumption.

7.4.3 Residential

Residential contamination threats to surface or groundwater, if taken on a case-by-case basis, are normally less than other land use contamination, but in the aggregate, form a significant source of contamination. Most citizens are unaware of the effects of numerous potential contaminants stored, used, and disposed of from residential homes. The potential contaminants include:

- ◆ Household chemicals
- ◆ Automotive products
- ◆ Paint/solvents
- ◆ Fuel storage systems
- ◆ On-site septic/sand mound systems
- ◆ Lawn/garden chemicals
- ◆ Abandoned wells



7.4.4 Agricultural and Golf Courses

Improperly applied chemicals such as pesticides, fungicides and fertilizers can leach through the soil into the groundwater or run off into streams and can present a contamination threat to drinking water supplies. When stored in containers, there is the potential of leaks from the storage area into the ground. Manure storage facilities and manure/septage sludge spreading can also lead to high levels of E-Coli and nitrate levels within surface and groundwater due to runoff. Open agricultural and golf course land is also attractive to geese which have become an increasing problem in Connecticut due to the run-off of nutrients and bacteria from their waste. There are substantial agricultural areas and two golf courses within the Little River SWPA and, as a whole, the water source is vulnerable to contamination from them.

7.5 Anthropogenic (Man Made) Potential Contaminant Sources

7.5.1 Hazardous Waste Sites

The primary concern with facilities that generate or use hazardous materials is that leaks, spills, or improper disposal could allow contaminants to be discharged into the ground. Three facilities within the Little River SWPA use or generate hazardous waste.

7.5.2 Underground Storage Tanks

Fuel oil tanks represent a potential source of petroleum products, as well as chemical additives that may be present in the fuel. The potential threat of contamination from this source would be from a leak, overfill, or spill. The Little River SWPA contains both known Leaking Underground Storage Tanks (LUST) and potential Underground Storage Tanks (UST) sources of petroleum contamination. The Little River system is vulnerable to contamination from Underground Storage Tanks located within the SWPA.

7.6 Point Sources of Pollution

Point sources refer to discharges that enter surface waters through a pipe, ditch, or other well-defined point of discharge. The term applies to wastewater and storm water discharges from a variety of sources. Wastewater point source discharges include municipal and industrial wastewater treatment plants and small domestic wastewater treatment systems that may serve schools, commercial offices, residential subdivisions and individual homes. The primary pollutants associated with point source discharges are oxygen-demanding waste, nutrients, sediment, color and toxic substances including chlorine, ammonia, and metals.

Point source dischargers in Connecticut must apply for and obtain a National Pollutant Discharge Elimination System (NPDES) permit from the CT DEP. Two permits had been issued previously and have expired. As of the date of this report, there are no active NPDES permits within the Little River SWPA.

7.7 Non-Point Sources of Pollution

Non-point sources are described as dispersed contamination from many sources such as soil erosion, on-lot septic systems, storm water discharges, agricultural activities, geese, and pollution associated with resource extraction and silviculture. The most significant contamination associated with non-point sources is nitrates associated with the use of manure, fertilizer, and pesticides which drain into streams and infiltrate into ground water. Household hazardous and commercial/industrial waste (e.g., ammonia, chlorides, paint, paint thinners, waste oil, antifreeze, solvents, etc.), which are sometimes discharged into on-lot septic systems, are also sources of non-point pollution. The potential risk from non-point sources makes the Little River system vulnerable to contamination.



Erosion during construction is a significant source of non-point pollution.

7.8 Stormwater Management

The need to manage stormwater is created by increased land development since impervious surfaces prevent rain from soaking into the soil and allow pollutants to accumulate. Stormwater management, which has only been a subject of concern for the past ten to fifteen years, focuses on controlling the volume and peak discharge rate which increase dramatically when impervious surfaces cover an area. Connecticut requires municipalities to develop a stormwater management plan however Woodstock has obtained a waiver due to the low level of development.

7.9 Potential Future Sources

Undeveloped land areas represent the potential for future contamination sources. There are significant undeveloped land areas within the SWPA (see Exhibit V for Land Use map). These include areas zoned for Industrial and commercial land-uses. Based on the amount of undeveloped land within the SWPA, there exists the possibility for future contamination.

8 Management Plan

8.1 Comprehensive Evaluation of the Watershed

In order to effectively protect the Little River watershed it is necessary to have a comprehensive picture of the health of impoundments and tributaries and be able to zero in on sources of pollution. Many agencies have done testing with a specific, narrow intent. These include the USGS, CT DEP, Putnam WPCA, the Northeast District Department of Health (NDDH), and Aquatic Control Technologies. These tests are not part of an overall plan and the data is not centrally accessible.

As part of this plan, the NDDH has agreed to sample and test surface water at 16 points within the watershed over four seasons to better understand the health of the streams and identify reaches that are the most adversely impacted. The team will develop a GIS database of the data and will collect and input additional data as resources allow. The data will be made available to the DEP, USGS and others to coordinate protection and cleanup efforts more effectively. The team encourages those agencies to coordinate their work in the Little River watershed with the Sourcewater Protection Steering Committee (see Section 8.8).

The Team will coordinate with the Audubon Society's Citizen Science Coordinator, Paula Coughlin, to do stream walks and rapid bio-assessments in some of the streams being sampled above to obtain additional data.

8.2 Agricultural Best Practices

There are 37 agricultural sites in the watershed and 17 of them raise livestock. The control of nutrient runoff from manure handling and cropland fertilizing operations is one of the keys to decreasing the level of nitrogen compounds in the streams and ponds. The team encourages the farming community to continue to work with the E. CT Conservation District, FSA, NRCS, CT Farm Bureau and UConn Extension to implement best practices for handling manure, chemical fertilizers and pesticides.

To promote and advance agricultural best practices, the Team has applied for an FY 2006 319 Grant to study the effectiveness of liquid manure incorporation to reduce nutrient runoff. Under the lead of the Eastern Connecticut Conservation District, the grant will select and lease (or purchase) a manure incorporation unit. Participating farmers, who already use liquid manure, will be trained on the machinery and use it on fields selected for the steepness of their slopes and/or proximity to streams. A sampling and testing regimen will be developed to measure the effectiveness of the unit in reducing the loss of nutrients to runoff. Assuming a positive response from the DEP in early 2006, the Team will prepare a detailed workplan and then begin work when funding is available in late 2006. A copy of the grant application is attached as Exhibit VI.



One type of manure incorporation unit being considered under the 319 grant.

8.3 Purchase or otherwise Protect Watershed Land

Organizations represented on the Team will work with land trusts, private landowners, the state of Connecticut, and the towns of Putnam and Woodstock to protect land in the watershed from development by purchasing land or development rights and seeking donations of land. In particular the team will work in support of the purchase of the Valley Farm by the State, Town of Woodstock and The Trust for Public Lands. Another promising protection effort is the purchase of 116 acres around Morse Pond by the Opacum Land Trust.

8.4 Conduct Education and Outreach Campaign

Public education and awareness is a key part of this Sourcewater Protection Plan because everyone poses a risk to groundwater. Most homeowners and business owners will work try to protect their local groundwater if they know how to minimize contamination risks. The Little River education and outreach campaign will include, but will not necessarily be limited to the following:

- ◆ Send a tax bill stuffer with educational information to all residences and small businesses within the SWPA. This may include information on how to care for your septic system and household hazardous waste disposal tips. The NDDH has begun this effort by providing this information to the Muddy Pond homeowners (Exhibit VII)
- ◆ Develop a media campaign to reach the public with educational information about local drinking water, and about the current Sourcewater Protection effort.
- ◆ Incorporate groundwater activities into school curricula.
- ◆ Hold an informational meeting with local residents about the Sourcewater Protection effort to increase local awareness of the link between land use and drinking water quality and involve the public in Source Water Protection activities.

8.5 Include Drinking Water Protection in Town Planning and Ordinances

The team encourages the towns of Putnam and Woodstock to continue to keep sourcewater protection in the forefront when considering regulations and ordinances. Both towns would benefit by submitting a joint application to the DEP to declare the land along the Little River and its major tributaries an official greenway. This designation will offer an advantage in applying for DEP watershed protection grant monies, help Woodstock prioritize open space set-asides, and Putnam to secure funding to improve parklands along the river.

The towns should consider developing ordinances requiring homeowners to inspect and maintain septic systems at regular intervals and to have underground fuel storage tanks inspected and removed if failing. In addition, the towns should work to engage and educate developers regarding proper stormwater management during and after construction. Existing regulations should be aggressively enforced.

The Town of Woodstock is encouraged to organize and support ongoing household hazardous waste collection days to prevent this material from being illegally dumped or disposed of in individual septic systems.

The Towns of Putnam and Woodstock and the Putnam WPCA are encouraged to use the provisions of Connecticut statutes and regulations governing activities in public water supply watersheds, where appropriate, to protect the Little River system. Summaries of these are included as Exhibit VIII.

8.6 Support Efforts to De-list Roseland Lake

Roseland Lake has been a recreational resource for the people of northeastern Connecticut and beyond for some 125 years. Roseland Park is a historically significant part of the culture of the area and the Team encourages the Trustees to maintain and improve it as a resource for the area and as a buffer along the lake. In particular they should continue the efforts begun by the ECCD to control invasive phragmites reeds. The Team will work with the DEP to find ways to remove the lake from the Impaired Waterbodies List. The Team will work with DPH to again allow swimming at the Lake by virtue of the fact that the swimming area is over 2 miles from the diversion at Peake Brook Road.

8.7 Muddy Pond

Muddy Pond and Morse Pond are at the northern end of the watershed. Muddy Brook flows from Muddy Pond and is the longest tributary to the Little River. Muddy Brook and its tributaries (one of which flows from Morse Pond) are the major contributors to Roseland Lake and the Little River downstream. In addition Muddy Pond is the only public swimming area in the watershed and it has become infested with variable milfoil, an invasive species. This presents a unique opportunity to educate Woodstock residents to the importance of protecting the watershed. The Team requests that the town provide an interpretive sign explaining the importance of the watershed as a public water

supply and the dangers of invasive species and how to avoid introducing them. Information could include transport of invasive species by boats and releases from home aquariums. It is only a matter of time before milfoil migrates downstream and public awareness can help garner resources to fight this nuisance.

8.8 Form Sourcewater Protection Steering Committee

The following persons comprise the Little River Sourcewater Protection Steering Committee. They are members of the team that developed this drinking water protection plan for their community, and are committed to implementing the prevention measures outlined above. Furthermore, this committee will meet at a minimum of once a year to review and update the plan and to assess its progress.

Mary Ellen Blake	Muddy Pond Neighborhood
Doug Cutler	Putnam Town Administration
John Guskowski	E. CT RC&D, Town of Woodstock
Scott Gravatt	E. CT Conservation District
Maureen Marcoux	Northeast District Department of Health
Paul Miller	Farmer
Jean Pillo	Woodstock Conservation Commission
Sandy Rotival	Woodstock Planning & Zoning Comm.
Eric Thomas	CT DEP
Bill Trayner	Putnam WPCA

9 Contingency Plan

An Emergency Contingency Plan was prepared by the Putnam Water Pollution Control Authority as part of their current Water Supply Plan. Due to its size it is not reproduced here.

Exhibit I

[Passed June 2005]

**RESOLUTION – WOODSTOCK BOARD OF SELECTMEN
LITTLE RIVER SOURCE WATER PROTECTION PROGRAM**

WHEREAS, the Little River Watershed, lying primarily in the Town of Woodstock, was designated as the public water supply area for the Town/City of Putnam by Special Act of the Connecticut General Assembly, and

WHEREAS, *A Plan of Open Space and Conservation* for the Town of Woodstock cites the Little River Watershed/Putnam Water Supply as a high-priority area for water quality protection, and

WHEREAS, the *Woodstock Plan of Conservation and Development* explicitly supports the goals of *A Plan of Open Space and Conservation* concerning protection of water supply watershed areas, and

WHEREAS, the classifications for the Little River indicate that the raw water in the River presently does not meet the criteria for use as a public water supply without treatment and the land uses in the watershed upstream of the water treatment plan may be contributing to the degradation of the water supply, and

WHEREAS, the compromised water quality in many of the watercourses and waterbodies in the Little River watershed have reduced the opportunity for passive and active recreation, including fishing and swimming, and

WHEREAS, the U.S. Department of Agriculture has identified the Little River as a priority candidate for the Department's Source Water Protection Program, and

WHEREAS, the Nonpoint Source Management Program of the Federal Clean Water Act has identified four of the water bodies in the Little River Watershed as priorities for the development of watershed-based plans and restorative activities,

BE IT THEREFORE RESOLVED, that the Woodstock Board of Selectmen in joint cooperation with the Putnam Board of Selectmen does support the efforts of the Little River Source Water Protection team to collaborate in the development of a Source Water Protection Plan, and

BE IT FURTHER RESOLVED, that the efforts of the local team will develop the following as part of the plan for presentation and approval of the towns' Boards of Selectmen, including any proposed requests for grant funding: a map outlining the impacted area; an inventory of potential contaminant sources; a definition of areas that match up with entities and organizations; a definition of voluntary measures that may be initiated; identification of public education initiatives; and identification of entities and resources that will facilitate implementation of the plan and its sustainability.

Exhibit I (Cont'd)

[Passed July 2005]

**Resolution – Putnam Board of Selectmen
Little River Source Water Protection Program**

WHEREAS, the Little River Watershed by Special Act of the Connecticut General Assembly was designated as the public water supply area for the Town of Putnam, and

WHEREAS, the Putnam Water Pollution Control Authority maintains and operates the Little River Diversion as a source of the town's public drinking water, and

WHEREAS, the classifications for the Little River indicate that the raw water in the river presently does not meet the criteria for use as a public water supply without treatment and land uses in the watershed upstream of the water treatment plant may be contributing to the degradation of the water quality, and

WHEREAS, the town's draft Plan of Conservation and Development identifies the Little River for special protection and expansion of a greenway network, and

WHEREAS, the Connecticut Department of Health has evaluated the susceptibility of the Little River to contamination and finds that it has an overall High risk of contamination from identified potential sources of contamination, and

WHEREAS, the U.S. Department of Agriculture has identified the Little River as a priority candidate for the Department's Source Water Protection Program, and

NOW, THEREFORE, BE IT RESOLVED, that the Putnam Board of Selectmen in joint cooperation with the Woodstock Board of Selectmen does support the efforts of the Little River Source Water Protection team to collaborate in the development of a Source Water Protection Plan and that Mayor Daniel S. Rovero is authorized to appoint members, including representatives of the Water Pollution Control Authority, the Planning Commission, and the Recreation Department; to the team to assure an appropriate number of Putnam representatives participate in developing the Source Water Protection Plan, and

BE IT FURTHER RESOLVED, that the efforts of the local team will develop the following as part of the plan for presentation and approval of the towns' Boards of Selectmen, including any proposed requests for grant funding: a map outlining the impacted area; an inventory of potential contaminant sources; a definition of areas that match up with entities and organizations; a definition of voluntary measures that may be initiated; identification of public education initiatives; and identification of entities and resources that will facilitate implementation of the plan and its sustainability.

Exhibit II

Little River Watershed

Prepared by ASRWVA - December 2005

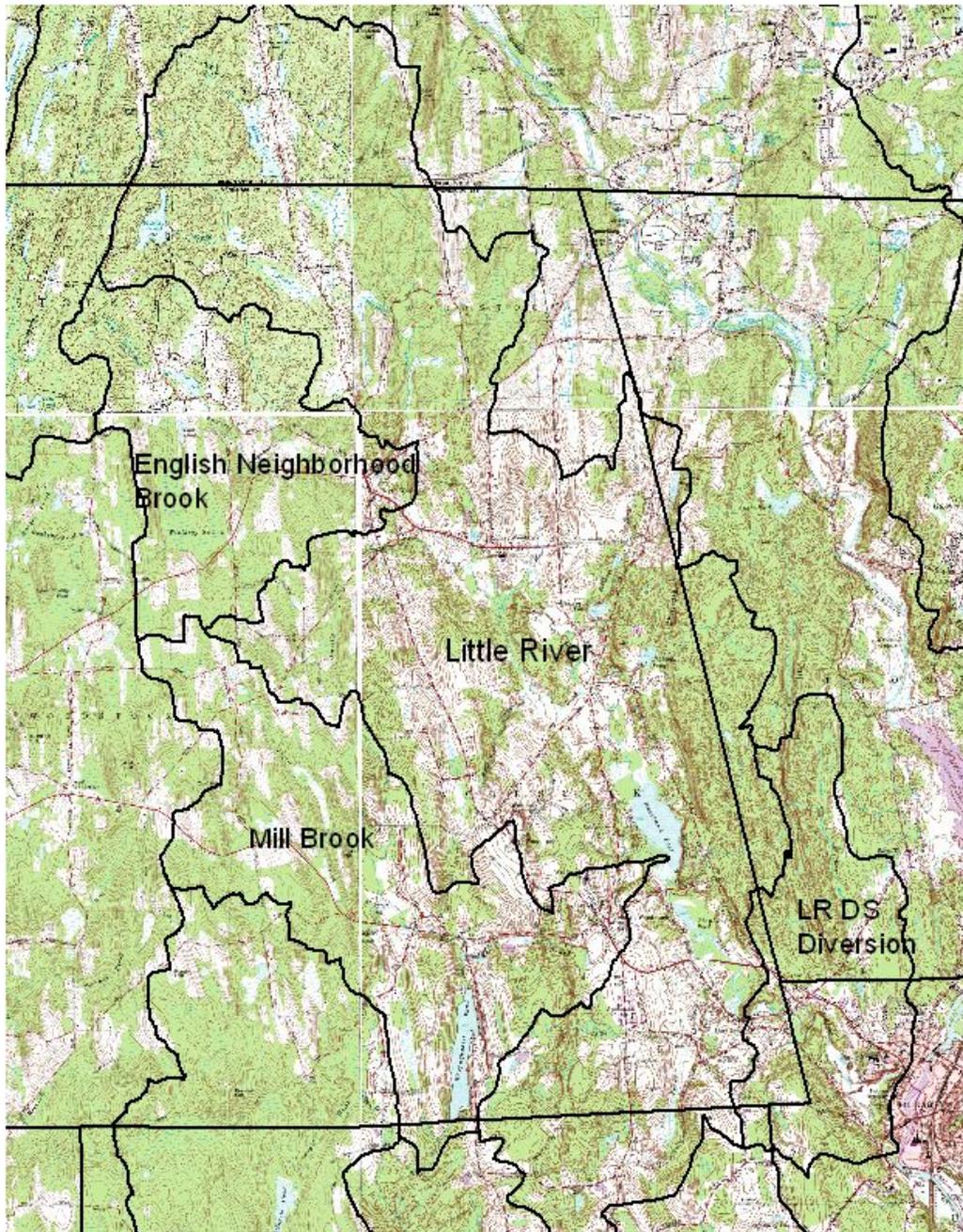


Exhibit III

Public Water Systems in the Little River Watershed

PWSID	SYSTEM NAME	POP SERVED	Susceptibility	Contaminants Detected
Community Systems				
CT1160011	PUTNAM WATER POLLUTION CONTROL AUTHORITY	8971	High	N/A
CT1698051	BIRMINGHAM UTIL - CORNFIELD POINT DIV.	95	High	Nitrates
CT1699011	BROOKWOOD APARTMENTS - SYSTEM #1	30	High	Nitrates, TCE
CT1690021	ROSELAND TERRACE ASSOCIATION	100	Medium	Nitrates
CT1690031	WOODSTOCK HOUSING AUTHORITY	26	Low	None
CT1698011	WOODSTOCK MEADOWS CONDOMINIUM ASSN.	180	Low	None
Non-Transient Non-Community				
CT1691163	CRABTREE & EVELYN	25	Low	None
CT1691153	FIRST CONGREGATIONAL CHURCH OF WOODSTOCK	60	Medium	Nitrates
CT1699043	HERITAGE CORNER, LLC	32	Medium	None
CT1691173	HYDE SCHOOL - SYSTEM #1 (SCHOOL)	310	High	None
CT1690442	LINEMASTER SWITCH CORP	170	Low	None
CT1690432	ROGERS CORP - PORON WELL	90	Low	Nitrates
CT1691112	WOODSTOCK ACADEMY	1063	Low	Nitrates
CT1690262	WOODSTOCK ELEMENTARY SCHOOL	636	High	VOCs
CT1699023	WOODSTOCK MIDDLE SCHOOL	511	Medium	None
Transient Non-Community				
CT1690334	CINNAMON TREE BAKERY	25	Low	None
CT1690084	EVANGELICAL COVENANT CHURCH	25	Low	Nitrates
CT1690094	HARRISVILLE GOLF COURSE	29	Medium	None
CT1690104	INN AT WOODSTOCK HILL	49	Medium	None
CT1690284	LITTLE RIVER PLAZA	25	Medium	Nitrates
CT1690184	ROSELAND PARK GOLF COURSE	25	Low	Nitrates
CT1690214	SOUTH WOODSTOCK BAPTIST CHURCH	25	Low	Nitrates
CT1690124	SWEET EVALINAS STAND	42	Low	Coliforms
CT1690264	WOODSTOCK FAIR	25	Medium	None
CT1696282	WOODSTOCK TOWN HALL	33	High	None

Exhibit IV

SOURCE WATER ASSESSMENT REPORT
AN EVALUATION OF THE SUSCEPTIBILITY OF PUBLIC DRINKING
WATER SOURCES TO POTENTIAL CONTAMINATION

CT1160011

Putnam Water Pollution Control Authority
Little River Diversion

The State of Connecticut Department of Public Health (DPH) in cooperation with the Department of Environmental Protection (DEP) recently completed an initial assessment of the Little River Diversion, which is a source of public drinking water that is maintained and operated by the Putnam Water Pollution Control Authority. This one-time assessment is part of a nationwide effort mandated by Congress under the Safe Drinking Water Act Amendments of 1996 to evaluate the susceptibility of all public drinking water sources in Connecticut to potential sources of contamination. DPH began working in partnership with the DEP in 1997 to develop Connecticut’s Source Water Assessment Program, which was approved by the U.S. Environmental Protection Agency in 1999. Sources of potential contamination that are of concern to public drinking water supplies here in Connecticut are generally associated with historic waste disposal or commercial, industrial, agricultural and residential properties that store or use hazardous materials like petroleum products, solvents or agricultural chemicals.

The assessment is intended to provide Putnam Water Pollution Control Authority consumers with information about where their public drinking water comes from, sources of potential contamination that could impact it, and what can be done to help protect it. This initial assessment complete will also assist the public water supply system, regional planners, local government, public health officials and state agencies in evaluating the degree to which the Little River Diversion may be at risk from potential sources of contamination. The assessment can be used to target and implement enhanced source water protection measures such as routine inspections, protective land use regulations, acquisition of critical land, proper septic system maintenance, and public education. General sources of contamination with the potential to impact the Little River Diversion include properties with underground fuel storage tanks, improperly maintained on-site septic systems, improper waste disposal, or commercial/industrial sites that store or use chemicals or generate hazardous wastes.

Little River Diversion Source Water Assessment Summary				
<p>STRENGTHS</p> <p>Point source pollution discharge points not present in this watershed area</p> <p>POTENTIAL RISK FACTORS</p> <p>Potential contaminant sources present in the watershed</p> <p>Less than 1% of watershed area owned by public water system</p> <p>Local regulations or zoning initiatives for the protection of public drinking water sources do not exist</p>	Susceptibility Rating			
	Rating	Environmental Sensitivity	Potential Risk Factors	Source Protection Needs
	Low			
	Moderate		X	
	High	X	X	
<p>Overall Susceptibility Rating: High</p> <p>This rating indicates susceptibility to potential sources of contamination that may be in the source water area and does not necessarily imply poor water quality.</p> <p>Detailed information about the specific factors and information used in establishing this rating can be found in Table 2. Information about opportunities to improve protection in the Little River Diversion is also presented in Table 2.</p>				



State of Connecticut Department of Public Health
Drinking Water Division
 410 Capitol Avenue – MS# 51WAT
 P.O. Box 340308 Hartford, CT 06134
 (860) 509-7333

Exhibit IV (Cont'd)

OVERVIEW - The Little River Diversion watershed encompasses some 22,651 acres of land in Pomfret, Thompson, Woodstock and Massachusetts. Approximately 0.2% of this watershed is owned by the Putnam Water Pollution Control Authority. Public drinking water sources in this system include Little River Diversion. State-wide satellite imagery developed by the University of Connecticut indicates that undeveloped land and residential properties presently account for approximately 74.7% percent of the land cover in the Little River Diversion. Commercial development at 0.4% and agricultural land use at 24.9% account for the remainder of the land coverage in the source water area. Approximately 1.1% of the land in the watershed area is preserved including all watershed land owned by the Putnam Water Pollution Control Authority, state forest and parklands, and municipally or privately held land designated as open space. Information about drinking water quality and treatment is available in the Putnam Water Pollution Control Authority’s annual Consumer Confidence Report.

ASSESSMENT METHODS.

The drinking water source assessment methods used by the Department of Public Health Drinking Water Division to evaluate the susceptibility of public drinking water sources to contamination are based on criteria individually tailored to surface water and groundwater sources. The criteria are keyed to sanitary conditions in the source water area, the presence of potential or historic sources of contamination, existing land use coverage’s, and the need for additional source protection measures within the source water area. Source-specific data for community and non-community systems were used to determine whether a particular criterion should be rated as low, moderate or high, relative to the risk of potential contamination at the drinking water source. Further, a ranking system was used to compute an average rank for each community drinking water source based on its environmental sensitivity, potential risk of contamination and source protection needs. Watersheds and reservoirs rated as having a low, moderate or high susceptibility to potential sources of contamination generally exhibit the characteristics summarized in Table 1.

Table 1 – General Watershed Area Characteristics and Susceptibility Ratings

Susceptibility Rating	General Characteristics of the Watershed Area*
Low	Low density of potential contaminant sources Lower intensity of land development
Moderate	Low to moderate density of potential contaminant sources Moderate intensity of land development
High	Moderate to high density of potential contaminant sources Higher intensity of land development No local watershed protection regulations Detectable nitrates and/or volatile organic chemicals in the untreated source water during the past three years that are below the maximum contaminant levels allowed by state and federal drinking water regulations

** Note: Not all characteristics may be present for a given susceptibility rating*

Readers of this assessment are encouraged to use the attached glossary to assist in the understanding of the terms and concepts used throughout this report.

Maps representing the location and features of the Little River Diversion source water area have not been included with this assessment report because of homeland security concerns.

LITTLE RIVER DIVERSION ASSESSMENT RESULTS.

Based on a combination of current reservoir and watershed area conditions, existing potential contaminant sources, and the level of source protection measures currently in place, the source water assessment for this watershed system indicates that it has an overall High risk of contamination from any identified potential sources of contamination. The assessment findings for the Little River Diversion are summarized in Table 2, which lists current conditions in the source water area and recommendations or opportunities to enhance protection of this public drinking water source. A listing of potential contaminant source types in the area, if present, can be found in Table 3. A summary of source water area features is shown in Table 4. It should be noted that this rating does not necessarily imply poor water quality or ongoing violations of the Connecticut Public Health Code.

The assessment of this and other comparable watershed areas throughout Connecticut generally finds that adopting recommendations similar to those presented in Table 2 could reduce the susceptibility of most surface water sources to potential sources of contamination.

Exhibit IV (Cont'd)

Table 2 Source Water Assessment Findings and Source Protection Opportunities For the Little River Diversion

Assessment Category	Conditions as of June 2002	Recommendations and Source Protection Opportunities
<p>Environmental Sensitivity Factors</p>	<p>Predominant watershed topography characterized by moderate slopes Reservoirs have unknown capacity to support excessive growths of algae and plankton None Click here to review EPA's current drinking water standards</p>	<p>Monitor runoff during heavy precipitation events Determine reservoir trophic status for source waters listed as unknown</p>
<p>Contaminants Detected in Untreated Source Water</p>	<p>Potential contaminant sources present in the watershed More than 50% of land for this source water area is undeveloped, which could present a risk if developed inappropriately. Major state or interstate roadways present in the watershed Known contaminant release points present in the watershed</p>	<p>Encourage homeowners to adopt residential best management practices that minimize the use of hazardous materials or generation of hazardous waste in the watershed. Periodically inspect these sites and maintain a water quality monitoring program consistent with the level of potential risk Proactively work with local officials and developers to insure that only low-risk development occurs within the watershed area Monitor road salt and herbicide usage along these roadways and address potential for hazardous material spills resulting from vehicular accidents Maintain an adequate level of surveillance around contaminant release point sites to insure that surface water contamination is not occurring</p>
<p>Potential Risk Factors</p>	<p>Less than 1% of watershed area owned by public water system Less than 5% of the land in the source water area exists as preserved open space Local regulations or zoning initiatives for the protection of public drinking water sources do not exist Comprehensive plans and policies for the protection of public drinking water sources do not exist at the local government level Point source pollution discharge points not present in this watershed area</p>	<p>Encourage residential property owners to inspect and regularly cleanout onsite septic systems and replace underground fuel storage tanks with above ground tanks. Increase ownership or control of watershed area whenever land becomes available for purchase or support land acquisition by public or private conservation/preservation organizations Support and encourage the acquisition of open space land within the watershed area Establish local watershed protection regulations to protect public drinking water sources Develop or enhance local governmental plans and policies that favor the protection of public drinking water sources</p>
<p>Source Protection Needs Factors</p>	<p>Point source pollution discharge points not present in this watershed area</p>	<p>Support environmental awareness and education within the community.</p>

Inventoried significant potential contaminant sources present in the Little River Diversion source water area are listed in Table 3. While these facilities, if present, have the potential to cause surface water contamination, there is no indication that they are doing so at this time.

Exhibit IV (Cont'd)

Table 3 – Summary of Significant Potential Contaminant Types in the Little River Diversion Source Water Area

Category	Subcategory	Number of SPCS Types
Waste Storage, Handling, Disposal	Hazardous Waste Facilities	3
	Solid Waste Facilities	2
	Miscellaneous	0
Bulk Chemical, Petroleum Storage	Underground Storage Tanks	16
	Tank Farms	0
	Warehouses	2
Industrial Manufacturing / Processing	Chemical & Allied Production	0
	Chemical Use Processing	0
	Miscellaneous	0
Commercial Trades and Services	Automotive and Related Services	4
	Chemical Use Services	0
	Miscellaneous	0
Miscellaneous	No Identifiable SPCS Type	0
Agricultural Operations	Animal or Livestock Waste Handling	22
	Pesticide Storage or Application	1
Total Number of Contaminant Types		50

Prominent features of the Little River Diversion source water area are summarized in Table 4.

Table 4 - Features of the Little River Diversion

Location of Watershed Area	Pomfret, Thompson, Woodstock and Massachusetts
Name of Reservoir(s) and Diversion(s)	Little River Diversion
Number and Type of Public Drinking Water Reservoirs or Diversions in the Watershed	1 Distribution
Trophic Status of Reservoir(s)	Unknown
DEP Surface Water Classification	B/AA
Watershed Area (total acreage)	22,651 acres
Preserved Land in the Watershed ^a	254 acres
Predominant Watershed Topography	moderate slopes
General Land Use and Land Cover in the Watershed ^b	
-Urban - Commercial or Industrial	0.4%
-Urban - Residential	4.9%
-Agricultural	24.9%
-Undeveloped Land	69.8%
Significant Potential Contamination Sources	
-Number of inventoried facilities in source water area ^c	41
-Count of inventoried facilities per square mile	1.16 per sq mile
-Number of contaminant types within inventoried facilities	50
Number of Contaminant Release Points Inventoried by CTDEP ^d	4

^a Preserved land includes any combination of land owned by the public water supply, state forest and parklands, and municipally or privately held land designated as open space.

^b Based on statewide data layer of land use and land cover developed by UCONN Dept of Natural Resource Management Engineering and Connecticut DEP satellite imagery averaged across the entire watershed.

^c Inventoried facilities reflect the actual number of SPCS sites present in the source water area, which may have more than 1 type of contaminant present at the facility.

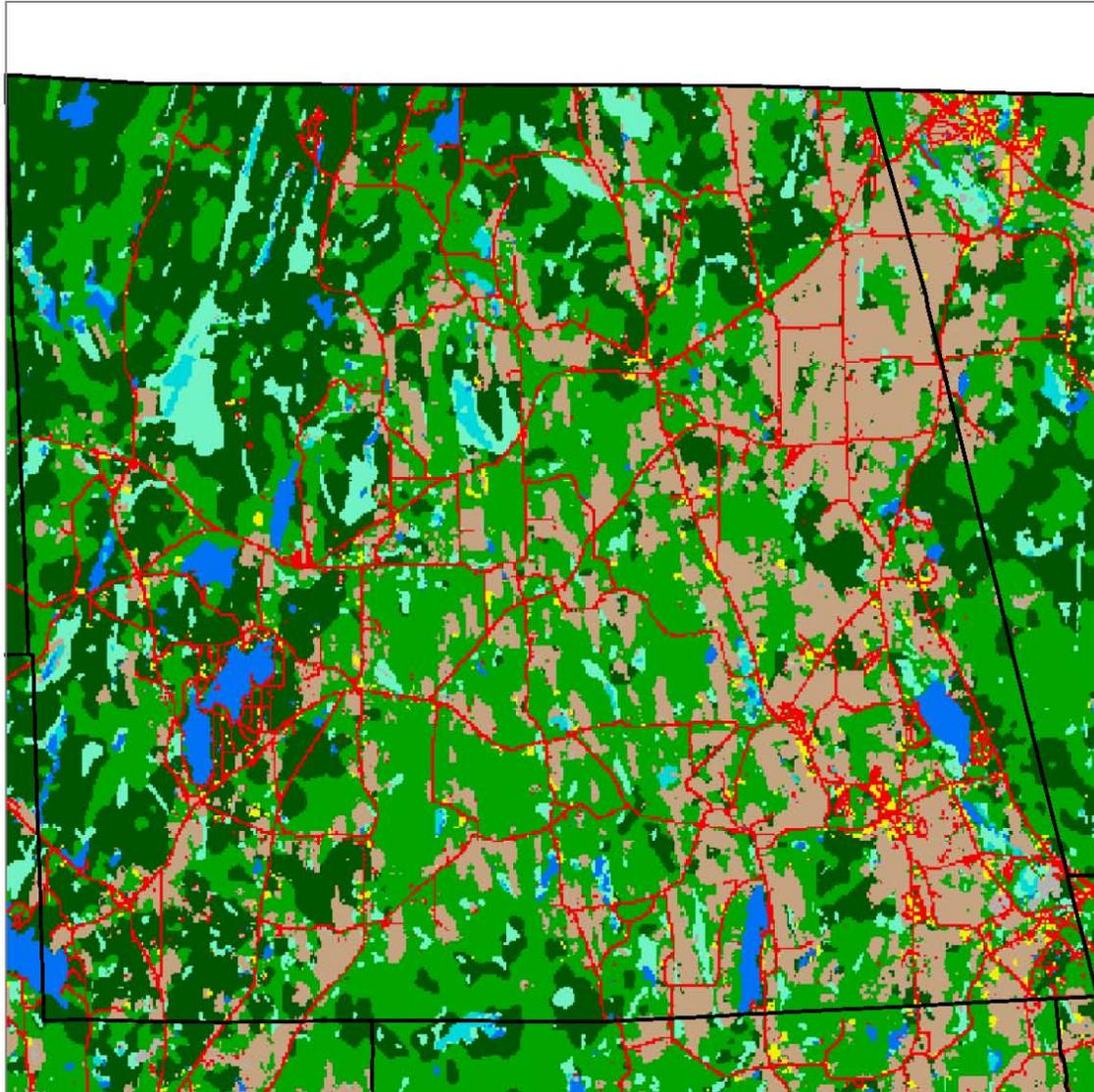
^d Sites or locations with documented accidental spills, leaks or discharges. While these sources, which are cataloged and tracked by the Connecticut DEP, may fall within a public drinking water supply source water area, they may or may not presently be discharging to the environment or causing contamination of a public drinking water source.

Exhibit V

2002 Connecticut Land Cover Woodstock



This map is a product of the Center for Land use Education And Research (CLEAR) at the University of Connecticut. For more information on CLEAR or this map, visit <http://clear.uconn.edu>.



*This map is intended for planning and educational purposes only. It is based on the interpretation and classification of remotely sensed satellite images, and the accuracy at any given location cannot be guaranteed (see CLEAR website for more information).
Copyright University of Connecticut.*

Exhibit VI

Connecticut Department of Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

**FY2006 Application – Work Plan
for the Nonpoint Source Management Grant Program**

Funded under Section 319 (h) of the Federal Clean Water Act

(Form created March 2005)



Proposals may be submitted by any interested Connecticut public or private organization, including municipalities, nonprofit environmental organizations, regional water authorities/planning agencies, and watershed associations. **Proposals submitted in response to the FY2006 RFP must be postmarked or received electronically by August 31, 2005. Proposals postmarked or received electronically after August 31, 2005 will not be considered for FY2006 funding.**

Please use this form when submitting a proposal. You may attach additional information or documentation to the proposals. **Project proponents whose proposals are selected for potential funding may need to submit a final work plan.** For questions or additional assistance call Stan Zaremba at (860) 424-3730.

Important note: DEP may require each successful applicant to provide additional information in a final work plan to ensure that each project is sufficiently documented.

Exhibit VI (Cont'd)

FY2006 §319 Application and Work Plan Form			
PROJECT TITLE/BRIEF SUMMARY/BASIN LOCATION – Descriptive name and location of the proposed project.			
PROJECT TITLE:	Introducing Equipment to Reduce Movement of Nutrients from Farm Fields		
BRIEF PROJECT SUMMARY: (Keep to three or four sentences long please)	This project will seek to reduce nutrient loading into the waters of the Little River Watershed through the introduction of equipment that incorporates manure into the soil as it is spread. Agricultural producers in the watershed will use the equipment in place of traditional surface spreading equipment. This watershed has been a concern for many years not only because it is an important natural resource to the region, but also because it is a public drinking supply source for the Town of Putnam, CT. Several segments in the watershed have been on the impaired waters list for many years. One of the primary sources of impairment is thought to be agriculture. Several of the watershed's dairy farms are relatively large and have storage capacity for liquid manure. These farmers currently spread their manure on the surface of the ground, and then incorporate it later. At least four of these farmers have expressed interest in trying the new equipment. (See attached letter from farmers.) The project will acquire the equipment, educate local dairy farmers about its use and applicability on their lands, and make the equipment available for no cost to use in place of surface spreaders on fields which have the highest impact on water quality. Water quality testing will be performed on representative fields during the project to determine the extent to which the new equipment improved nutrient retention in soils and reduced nutrient runoff.		
DESCRIBE LOCATION: ie. town, street, site. <i>Note: A site map must be included with this application. A site map is not necessary if the project is non-site specific or statewide.</i>	This project will take place in the Little River watershed in Woodstock, Connecticut.		
MAJOR BASIN:	Thames River		
PRIMARY REGIONAL BASIN # & NAME:	37	Quinebaug River	
RESPONSIBLE FOR IMPLEMENTATION OF THE PROJECT – This person will be considered the project manager (if applicable fill in co-manager section).			
PROJECT MGR. NAME/TITLE:	Scott Gravatt, District Director		
AFFILIATION:	The Eastern Connecticut Conservation District is applying for this grant on behalf of the Little River Sourcewater Protection Team . Please see the attached document describing the Team.		
STREET ADDRESS:	238 West Town Street		
CITY, STATE ZIP:	Norwich, CT 06360-2111		
PHONE NUMBER:	(860) 887-4163	FAX:	(860) 887-4082
PROJECT MGR. NAME/TITLE:			
AFFILIATION:			
STREET ADDRESS:			
CITY, STATE ZIP:			
PHONE NUMBER:	()	FAX:	()

Exhibit VI (Cont'd)

<p>ESTIMATED TOTAL COST AND NONFEDERAL SOURCES – Identify the amount of §319 funds requested (60%); nonfederal match (40%); and total cost of project (100%). To calculate the amounts use the following : Section 319 funds requested divided by .6 = Total cost Total cost – Section 319 funds requested = 40% nonfederal match</p>						
60% - § 319 FUNDS REQUESTED:		\$57,000.00				
40% - NONFEDERAL MATCH:		\$38,000.00				
100% TOTAL COST:		\$95,000.00				
<p>PREVIOUS 319 FUNDING AWARDED TO GROUP? If yes, indicate below project name and fiscal year, award amount, and balance to date.</p>						
<input type="checkbox"/> YES	NAME OF PROJECT:					
	EXPECTED COMPLETION DATE:					
	\$ AMT AWARDED:					
	\$ BALANCE TO DATE:					
<input checked="" type="checkbox"/> NO	§319 FUNDS HAVE NOT BEEN PREVIOUSLY AWARDED TO APPLICANT.					
<p>NOTE TO THOSE APPLICANTS PROPOSING IMPLEMENTATION OR RESTORATION ACTIVITIES:</p> <p>According to federal guidelines, a <u>watershed-based plan</u> must be developed for the water body in question before implementation activities can be funded by § 319 funds. You will need to provide the following information in order to satisfy that requirement, consistent with guidance at: http://www.epa.gov/fedrgstr/EPA-WATER/2003/October?Day-23/w26755.htm</p> <p>Please consult with DEP as to the level of commitment required to develop the watershed-based plan before implementation/restoration activities can begin.</p>						
IMPAIRMENT		<p>Identify causes and sources of nonpoint source impairment(s). Three waterbodies within the Little River watershed (above the Putnam WPCA diversion) are listed as impaired on the 2004 303d list. They are Roseland Lake and segments of Muddy Brook and North Running Brook. Muddy Brook is the main tributary flowing into Roseland Lake, which has had extensive algal blooms for many years. A definitive source of the nutrients in this system has not been identified, however a 2000 – 2001 USGS study of the Quinebaug Basin noted elevated levels of nitrogen (above 1.0 mg/L) and phosphorus (above 0.1.mg/L) at the mouth of the Little River. The report states, “The elevated concentrations at the station on the Little River reflect the contribution of nonpoint sources of nutrients from the Little River drainage area, which contains 24 percent agricultural land.” Between 1985 and 2002 only 0.8% of the land in Woodstock was lost to development. Therefore development does not explain the elevated levels of nutrients seen in the USGS study. In addition, there are no municipal wastewater discharges, or major industrial or commercial sources of nutrients in the watershed. Lacking more definitive studies of the watershed, the conclusion is that agricultural sources are the prime source of nutrient loading to the waterbodies in the watershed. There are 2,400 acres of cropland in the watershed where runoff may contribute nutrients to the system.</p>				
LOAD REDUCTION		<p>Estimate expected load reductions and whether the impairment is fully addressed. Based on available literature there is an anticipated reduction of at least 50% in N and P runoff on the fields where the equipment is to be used. Based on the rate at which the equipment can spread manure, and allowing for transportation, etc., it is estimated that the equipment can be used to apply manure to approximately 400 acres of cropland during the prime manure spreading times, which occur three times a year: 1) Spring; 2) Between first and second cuttings of hay; and 3) Fall.</p>				

Exhibit VI (Cont'd)

<p>MANAGEMENT MEASURES</p>	<p>Describe the specific nonpoint source management measures to be applied. Nutrient load reduction will be accomplished primarily through the utilization of equipment which both applies manure and incorporates it into the soil.</p> <p>An attached map shows the large portion of the watershed occupied by farm fields. The equipment will be used on fields that have been prioritized based on the likelihood of nutrient runoff. The equipment will be used in place of the traditional system of surface application followed by incorporation at a later time. This technique shift will allow manure and nutrients to be immediately incorporated into soils, increasing nutrient retention in soils and reducing nutrient runoff into waterbodies.</p> <p>An additional measure that will occur as a result of this project will be that the manure spreading will be calibrated, thus there will be reliable information regarding how much manure is being spread per acre.</p>
<p>TECH ASSISTANCE & FINANCIAL ASSISTANCE</p>	<p>Estimate needed technical and financial assistance by activity. Technical assistance required is primarily in the area of developing and implementing a monitoring and testing regimen under an approved QAPP. Financial assistance will be required to lease the manure application equipment. The QAPP/monitoring activity and the lease of equipment total approximately \$50,000 and will require a cash match of approximately \$20,000 dollars. We have preliminary commitments from the Putnam WPCA, Town of Putnam and the Roseland Lake Trustees to provide that match. Remaining activities will be matched by in-kind labor provided by the Eastern Connecticut Conservation District, local farmers and employees of the Towns of Woodstock and Putnam. In addition, other organizations represented on the Little River Sourcewater Protection Team have agreed to assist as needed. (See attached list of Team members.)</p>
<p>PUBLIC INFORMATION & EDUCATION</p>	<p>Describe public information and education efforts and their value to the project. Public information and outreach is a cornerstone of this project. Part of the grant is earmarked for developing an education and outreach program to provide information to residents, farmers and water system consumers about the project and its findings.</p> <p>The public will also be reached through the efforts of the organizations represented on the Little River Sourcewater Protection Team. (See attached list of Team members.)</p> <p>The value of the outreach will be to raise awareness in the public of the impairments to local waterbodies and to encourage other grass roots efforts to address them. It will also demonstrate to the dairy farming community a cost effective method of spreading manure where it is needed and without losing valuable nutrients to the air and runoff.</p>
<p>MANAGEMENT MEASURES</p>	<p>Provide an implementation schedule for NPS management measures. Equipment will be obtained shortly after the funds become available. The equipment will be utilized during the first possible manure application season, most likely spring of 2007. A water quality monitoring contractor will conduct testing after application, doing a side-by-side comparison with the traditional method of manure application. The schedule for the monitoring will be established by the QAPP. The tentative plan is to use the equipment for 2 years. Educational outreach will be ongoing, but will be culminated with a workshop near the end of the project to present the results of the project and promote the method, if it is successful.</p>
<p>MILESTONES</p>	<p>List the measurable milestones consistent with the implementation schedule. Milestones will be: Select the equipment; Prioritize and select fields; Develop schedule; Obtain equipment; Year 1: Utilization at Farm #1; Utilization at Farm #2; (etc.); Water quality monitoring; Year 2: Repeat utilization and monitoring; Farmer and public education/outreach.</p>
<p>PERFORMANCE</p>	<p>Provide a list of performance criteria that will be used to measure success.</p> <p>Performance criteria to be considered include:</p> <ul style="list-style-type: none"> Successful operation of equipment in the soils of the region Measured reduction in nutrient runoff Acceptance of method and equipment by farmers Cost of equipment, maintenance and repairs are acceptable to farmers

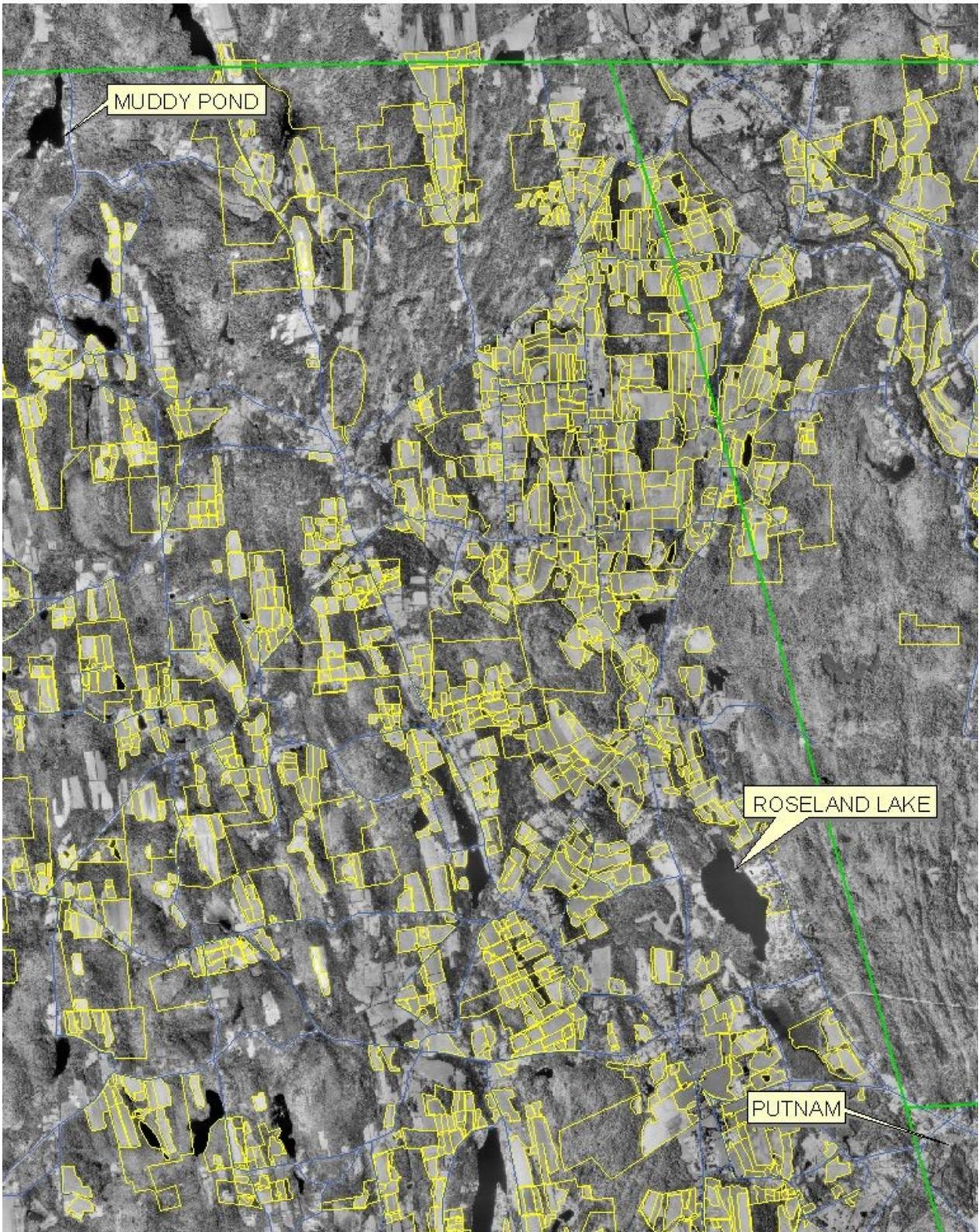
Exhibit VI (Cont'd)

<p>MONITORING</p>	<p>Discuss how you plan on monitoring your project. The Little River Sourcewater Protection Team will work together to accomplish the tasks, with the Eastern Connecticut Conservation District (ECCD) acting as the facilitator and organizer. The team will hold quarterly meetings and quarterly reports will be filed. A contractor/consultant will develop a QAPP and conduct water quality sampling and analysis as part of the project. The work of the contractor will be monitored by ECCD and/or other Team members.</p>	
<p>CONSTRUCTION PROJECT/LONG TERM MAINTENANCE</p>		
<p>If the project includes construction who is responsible for long-term maintenance? Not applicable.</p>		
<p>INTERAGENCY COORDINATION, ROLES, AND RESPONSIBILITIES – Describe participation and commitments expected from other agencies and organizations.</p>		
<p>The primary impetus for this project was a broad, interagency, public-private coordination effort known as the Little River Sourcewater Protection Team. See the attached list of agencies, organizations and individuals represented on this Team. The Boards of Selectmen from both towns have passed resolutions supporting the work of this Team to improve water quality in the watershed (see attached). The Team will act as primary managers of the project, with support from the Eastern Connecticut Conservation District, who will provide administrative and other services.</p> <p>The Little River Sourcewater Protection Team will also cooperate with the CT Department of Public Health and the Town of Putnam to coordinate this project's implementation and public outreach efforts with the mission to implement targeted source water protection efforts within the Town of Putnam's Little River Diversion watershed, as a result of the 2003 Connecticut Source Water Assessment Program report. This project will also compliment work currently being funded through NRCS and FSA to manage agricultural wastes in the watershed.</p>		
<p>QUALITY ASSURANCE QUALITY CONTROL – Will this project require a quality assurance quality control plan (QAPP).</p>		
<p><input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>If your proposed project involves the collection, analysis, or manipulation of environmental data and it is selected for funding, it will require a Quality Assurance Project Plan (QAPP). The QAPP must be approved by CT DEP/US EPA prior to the commencement of this work. Investigators need to include the preparation and implementation of this plan into their budget. All QAPP's should be written according to one of the following guidance documents : http://www.epa.gov/quality1/qa_docs.html</p> <ul style="list-style-type: none"> • EPA Requirements for Quality Assurance Project Plans EPA QA/R-5, EPA/240/B-01/003, March, 2001 guidance documents, and will be determined on a case-by-case basis. <p>Also note:</p> <ol style="list-style-type: none"> 1. The use of "secondary data" to make environmental decisions requires a QAPP. Secondary data are previously collected data (which may have been collected by other entities, not just the current grantee). A good example is the use of previously collected data in a computerized model to develop new data, e.g., about estimated pollutant levels. This might fall under your "manipulation" criterion. 2. If project proponent provides "in kind" services, such as sample analysis or sample collection, instead of money, a QAPP is necessary. 3. If the project is conducted with the deliberate intent to provide the data to EPA for its use, a QAPP should be written. 		
<p>TASKS, DELIVERABLE, ESTIMATED COST – List in sequence the major tasks, deliverables, and costs. A final project report is a required deliverable for every project identify, as appropriated, any contracts to be awarded or Quality Assurance Project Plan (QAPP) plans as tasks. Any type of data analysis or data reporting will require a QAPP.</p>		
<p>Task #</p>	<p>Description of Task & Deliverable</p>	<p>Cost \$ 319 funds</p>
<p>1</p>	<p>Team (including cooperating farmers) researches equipment options; evaluates equipment through actual demonstrations (likely to be in the State of NY); conducts cost/performance analysis; and calculates the # of acres the equipment can cover. Deliverable - Select equipment to be obtained.</p>	<p>3900</p>

Exhibit VI (Cont'd)

2	Evaluate the fields of the participating farmers, determine which fields are appropriate for the equipment selected, and prioritize the fields based on proximity to impaired waters, slope, soil type, etc. Deliverable - Prioritized list of fields where manure will be applied using the equipment.	3600
3	Coordinate the sharing of the equipment between participating farmers, making every effort to maximize use. Deliverable - A written plan, agreed to by the farmers, establishing a sharing schedule and transportation responsibilities.	3600
4	Obtain equipment. The Team's preferred option: A 2 year lease, with the option for one or more of the farmers to purchase the equipment at the end of the lease period. Deliverable - Acceptable agreement with dealer to obtain equipment, and delivery of the equipment to Woodstock, CT.	21,000
5	The equipment will be utilized by several farmers in the watershed to spread and incorporate manure on the pre-selected fields on each farm. It is planned that each farmer will be allowed to use the equipment for several days during the prime manure spreading seasons, according to the schedule. The equipment will be used outside of the prime spreading seasons as desired/scheduled. Alternative – Employ a Commercial Applicator to operate the equipment on all participating farms. Deliverable – Utilize the equipment on at least three farms to apply and incorporate manure on selected farm fields for one to two years.	5400
6	Using a qualified consultant/contractor, develop a QAPP and execute the plan to monitor the water quality in the vicinity of selected fields to determine the impact of using the equipment. Tentative plan is to select several fields for sampling, and use the new equipment on one portion of each and the traditional method on the other portion, then conduct a side-by-side comparison of the nutrient runoff from the two portions. Deliverable - Report presenting the results of the water quality monitoring.	9000
7	The equipment will be maintained, repaired, and stored. The participating farmers will preform minor maintenance and repair. If more serious repairs become necessary, they may be performed by employees at the Woodstock Town garage, or by a private business hired to do the work. Storage arrangements will be made through one of the Team members. Storage locations under consideration include Roseland Park, Woodstock Fairgrounds, Woodstock Town Garage, one or more of the participating farms, and ECCD property. Deliverable - Maintain, repair, and store equipment.	3300
8	An important part of this grant will be to use the project and the connections made possible by the extensive membership of the Little River Sourcewater Protection Team to educate both farmers and the public concerning the importance of protecting the watershed and new methods which can be employed to reach that goal. Deliverable – Provide outreach literature and conduct a workshop to present the results of the project and promote the use of the equipment, if deemed appropriate by the results.	2400
9	Quarterly and Final Reports	4800
Estimated duration (How many months do you expect project to run - up to 2 year duration): Estimate is 24 months		
PUBLIC PARTICIPATION – Describe how this will be accomplished.		
<p>Public participation has already begun, as this application is the outgrowth of a local citizen team’s work to develop a sourcewater protection plan for the Little River watershed. The effort is lead by Atlantic States Rural Water & Wastewater Association and the team has members who represent a wide cross-section of the community. See attached list of organizations and their representative on the Little River Sourcewater Protection Team.</p> <p>Efforts will continue through outreach to the public and the farming community.</p>		

Exhibit VI (Cont'd)



FARM FIELDS IN THE WATERSHED

Exhibit VI (Cont'd)

Confirmation of Farmer Interest

The note below was presented to several farmers who met criteria that the Sourcewater Team believes will be factors in this project: a) They have fields within the watershed; b) They handle at least a portion of their manure in liquid form; and c) They typically transport their manure to the fields via a tractor-drawn spreader. The farmers were asked to sign the note to indicate they are interested in participating.

Three farmers signed this note, and there is another who is interested but did not wish to sign a note at this time. This gives the project a core group to get started, and could lead to additional farmers showing interest.

August 2005

To: Little River Sourcewater Protection Team

From: Corn and Hay Growers in the Little River Watershed

I am interested in learning more about equipment that incorporates manure as the manure is applied on the corn and hay fields. I would consider participating in a grant project that would make the equipment available to me to try on my farm.

Signed by:

Paul Miller
Fairvue Farm
199 Rt. 171
Woodstock, CT 06281

David Morse
Mayhill Farm
P.O. Box 23
311 Dugg Hill Road
E. Woodstock, CT 06244

Donald Hibbard
Hibbard Hill Farm
Dugg Hill Road
Woodstock, CT 06281

(Mr. Hibbard qualified his signature with statements about when he spreads and bedding material.)

Exhibit VI (Cont'd)

Little River Sourcewater Protection Team

Background:

The Little River Sourcewater Protection Team is a non-governmental committee of local organizations, municipalities, agencies, and citizens organized to prepare a plan of protection for the watershed that supplies drinking water to the town of Putnam, CT and overlies groundwater sources in Woodstock, CT. The Team is lead by the Sourcewater Protection Specialist from the Atlantic States Rural Water & Wastewater Association. His position is funded by the USDA and he is tasked with working with local communities to protect drinking water supplies that have been identified as susceptible to contamination. Susceptibility is based on Sourcewater Assessments of public drinking water supplies prepared by the CT DPH along with input from the USDA/NRCS, EPA, DEP and ASRWWA staff. The protection plan includes an inventory of potential contaminant sources, goals for protecting the water supply based on those threats, and recommendations for implementing protection measures to meet the stated goals. The Team has identified reduction of non-point sources of nutrients as a goal and this grant is an excellent opportunity to implement a management practice that has real promise to reduce nutrient runoff.

Organizations Represented on the Team:

<u>Organization</u>	<u>Represented by</u>
Atlantic States Rural Water & Wastewater Assoc	Marc Cohen
Audubon Society	Andy Rzezinkiewicz
Connecticut Dept. of Environmental Protection	Eric Thomas
E. CT Resource Conservation and Development	John Guskowski
Eastern Connecticut Conservation District	Scott Gravatt, Greg Smith
Green Valley Institute	Holly Drinkuth
Local Builders	Doug Porter
Local Farmers	Paul Miller
Local Outdoor Recreation Business	Ian MacRae
Muddy Pond Neighborhood	Mary Ellen Blake, Carol Berner
Nature Conservancy	Cyrus Harvey, Jr
Northeast District Department of Health	Maureen Marcoux
Putnam Town Administration	Doug Cutler
Putnam Water Pollution Control Authority	Bill Trayner
Quinebaug-Shetucket Heritage Corridor	Jean Cass
Roseland Park	Ed Higgins
UConn Cooperative Extension	Joyce Meader
UDSA Natural Resources Conservation Service	Nancy Ferlow
Woodstock Conservation Commission	Jean Pillo
Woodstock Planning Department	John Guskowski
Woodstock Planning & Zoning Commission	Sandy Rotival
Woodstock Town Administration	Delpha Very
Woodstock Water Pollution Control Authority	Peter Ellsworth
Wyndham Land Trust	Dick Booth

Exhibit VI (Cont'd)

**RESOLUTION – WOODSTOCK BOARD OF SELECTMEN
LITTLE RIVER SOURCE WATER PROTECTION PROGRAM**

WHEREAS, the Little River Watershed, lying primarily in the Town of Woodstock, was designated as the public water supply area for the Town/City of Putnam by Special Act of the Connecticut General Assembly, and

WHEREAS, *A Plan of Open Space and Conservation* for the Town of Woodstock cites the Little River Watershed/Putnam Water Supply as a high-priority area for water quality protection, and

WHEREAS, the Woodstock *Plan of Conservation and Development* explicitly supports the goals of *A Plan of Open Space and Conservation* concerning protection of water supply watershed areas, and

WHEREAS, the classifications for the Little River indicate that the raw water in the River presently does not meet the criteria for use as a public water supply without treatment and the land uses in the watershed upstream of the water treatment plan may be contributing to the degradation of the water supply, and

WHEREAS, the compromised water quality in many of the watercourses and waterbodies in the Little River watershed have reduced the opportunity for passive and active recreation, including fishing and swimming, and

WHEREAS, the U.S. Department of Agriculture has identified the Little River as a priority candidate for the Department's Source Water Protection Program, and

WHEREAS, the Nonpoint Source Management Program of the Federal Clean Water Act has identified four of the water bodies in the Little River Watershed as priorities for the development of watershed-based plans and restorative activities,

BE IT THEREFORE RESOLVED, that the Woodstock Board of Selectmen in joint cooperation with the Putnam Board of Selectmen does support the efforts of the Little River Source Water Protection team to collaborate in the development of a Source Water Protection Plan, and

BE IT FURTHER RESOLVED, that the efforts of the local team will develop the following as part of the plan for presentation and approval of the towns' Boards of Selectmen, including any proposed requests for grant funding: a map outlining the impacted area; an inventory of potential contaminant sources; a definition of areas that match up with entities and organizations; a definition of voluntary measures that may be initiated; identification of public education initiatives; and identification of entities and resources that will facilitate implementation of the plan and its sustainability.

Exhibit VI (Cont'd)

**Resolution – Putnam Board of Selectmen
Little River Source Water Protection Program**

WHEREAS, the Little River Watershed by Special Act of the Connecticut General Assembly was designated as the public water supply area for the Town of Putnam, and

WHEREAS, the Putnam Water Pollution Control Authority maintains and operates the Little River Diversion as a source of the town's public drinking water, and

WHEREAS, the classifications for the Little River indicate that the raw water in the river presently does not meet the criteria for use as a public water supply without treatment and land uses in the watershed upstream of the water treatment plant may be contributing to the degradation of the water quality, and

WHEREAS, the town's draft Plan of Conservation and Development identifies the Little River for special protection and expansion of a greenway network, and

WHEREAS, the Connecticut Department of Health has evaluated the susceptibility of the Little River to contamination and finds that it has an overall High risk of contamination from identified potential sources of contamination, and

WHEREAS, the U.S. Department of Agriculture has identified the Little River as a priority candidate for the Department's Source Water Protection Program, and

NOW, THEREFORE, BE IT RESOLVED, that the Putnam Board of Selectmen in joint cooperation with the Woodstock Board of Selectmen does support the efforts of the Little River Source Water Protection team to collaborate in the development of a Source Water Protection Plan and that Mayor Daniel S. Rovero is authorized to appoint members, including representatives of the Water Pollution Control Authority, the Planning Commission, and the Recreation Department; to the team to assure an appropriate number of Putnam representatives participate in developing the Source Water Protection Plan, and

BE IT FURTHER RESOLVED, that the efforts of the local team will develop the following as part of the plan for presentation and approval of the towns' Boards of Selectmen, including any proposed requests for grant funding: a map outlining the impacted area; an inventory of potential contaminant sources; a definition of areas that match up with entities and organizations; a definition of voluntary measures that may be initiated; identification of public education initiatives; and identification of entities and resources that will facilitate implementation of the plan and its sustainability.

Exhibit VII

The care and feeding of your septic system

Septic systems are very much like automobiles. They need periodic inspections and proper maintenance to continue working properly. Also, like automobiles, they must be operated properly and cannot be overtaxed without the owner suffering consequences such as repair or replacement bills.

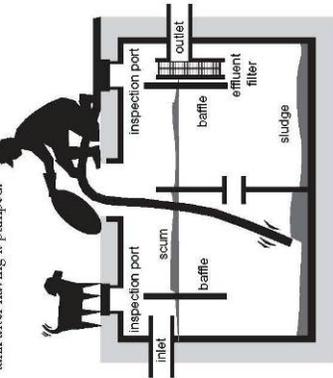
Often overlooked or neglected is the fact that a septic system should have a regular check-up to prevent problems. You should have your septic system inspected every 1-2 years by a professional and your tank pumped when necessary. The septic tank traps the solids in the wastewater and should be checked to determine whether or not it is time for it to be pumped out. The inspection port should be opened and the baffles (internal slabs or tees) should be checked to ensure that they are in good condition since the last check-up (see Figure 1). If you have a septic tank effluent filter, it should also be inspected. Effluent filters require periodic cleaning. Some filters are now equipped with alarm systems to alert the homeowner when the filter has become dirty and needs to be cleaned. Failure to keep the filter clean may result in a backup of wastewater in the home from a clogged filter. Septic systems that have mechanical parts such as a pump should be inspected at least once a year or more frequently as recommended by the manufacturer. The absorption field should be checked for sogginess or ponding, which indicates improper drainage, a clogged system, or excessive water use. The presence of damp or soggy areas or odors may indicate a leak in the system.

SEPTIC TANK

A properly designed septic system will have a septic tank with sufficient volume to accumulate solids for several years. As the level of solids rises in the tank, the wastewater has less time to settle properly and suspended solid particles

When to Have Your Septic Tank Pumped

A specific determination of when it's time to pump out the solids can be made by having the depth of solids and level of scum buildup on top of the wastewater in the septic tank checked periodically. Two factors affect how often you should have your septic tank pumped. Whether you need to have your tank pumped every year, once every five years, or some other time interval is affected by these factors. The first factor is the size or capacity of the tank itself. If more people are living in the home than when the system was installed, or if new high water use appliances or technologies such as a hot tub or whirlpool bath are now in use, then the capacity may be too small. The more people using a system, the faster the solids will accumulate in the tank, and the more frequently the tank will need to be pumped. Also, the additional surge of water from hot tubs and whirlpool baths may wash solids out of the tank and into the absorption field. An inspection can determine whether the system is of adequate capacity to handle the volume of solids and flow from the number of people in the household and types of appliances used. A larger capacity system provides better treatment and requires less pumping.



Cross-section of a two-compartment septic tank being pumped

Fig. 1

system. For example, up to 53 gallons of water are discharged into your system with each load of laundry. If several loads are done in one day, it can put considerable stress on your system. A better practice would be to space your laundry washing throughout the week.

The new ultra low-flush toilets use between 1 and 1.6 gallons of water per flush and will provide as much as a 30 percent water savings. Low-flow faucet aerators on sink faucets and low-flow showerheads will save additional water. There are also low-flow washing machines which use much less water than standard washing machines.

ABSORPTION FIELD

An absorption field generally does not require any maintenance. However, to protect and prolong the life of the absorption field, follow these simple rules:

- Plant only grass over and near your septic system. Roots from nearby trees or shrubs may clog and damage the absorption field.
- Do not drive or park over any part of your septic system. This can compact the soil and crush your system.
- Direct all wastewater from your home into the septic tank. This includes all sink, bath, shower, toilet, washing machine and dishwasher waste waters. Any of these wastewaters can contain disease-causing microorganisms or environmental pollutants.
- Keep roof drains, basement sump pump drains, and other rainwater or surface water drainage systems away from the absorption field. Flooding of the absorption field with excessive water will keep the soil from naturally cleansing the wastewater, which can lead to groundwater and/or nearby surface water pollution.

continued . . .

flow into the absorption field. If the tank is not periodically pumped out, these solids will eventually clog the absorption field to the point where a new field will be needed.

When the tank is pumped, the contractor should pump the contents through the manhole, which is usually located in the center of the tank, rather than through the inspection ports. Pumping through one of the inspection ports could damage the baffles inside the tank (see Figure 1). Damage to the baffles could result in the wastewater flowing directly into the absorption field without the opportunity for the solids to settle.

Remember, commercial septic tank additives do not eliminate the need for periodic pumping and may be harmful to the absorption field. You should check your local health department regulations before using additives. Be sure when the septic tank is pumped that it is completely emptied. It is not necessary to retain any of the solids to restart the digestive process. You do not need biological or chemical additives for successful restart or continuous operation of your septic system, nor should you wash or disinfect the tank after having it pumped.

The second factor is the volume of solids in the wastewater. If you have a garbage disposal, for example, you will have to pump out your system more frequently than persons disposing of their food wastes through other means. The use of a garbage disposal may increase the amount of solids in the septic tank by as much as 50 percent. Excessively soiled clothes may add solids to your septic tank. Sometimes, geographical location may also contribute to extra solids ending up in the septic tank. For example, systems in coastal areas may have an accumulation of sand in the septic tank from washing beach clothes.

Reducing the Flow of Wastewater

Generally, the more people, the more water will flow through the system. However, the use of water conservation devices such as low-flow toilets or shower fixtures greatly reduces the amount of wastewater thus prolonging the life of your septic

Exhibit VII (Cont'd)

Septic System Health Tips
What you put into your septic system will have a direct effect on whether or not you have a healthy, long-lasting and trouble-free system. Your septic system is not a dispose-all.

- Conserve water to avoid overloading the septic system. Be sure to repair any leaky faucets or toilets. Use low-flow fixtures.
- Do not use caustic drain openers for a clogged drain. Instead, use boiling water or a drain snake to open clogs.
- Do not use septic tank additives, commercial septic tank cleansers, yeast, sugar, etc. These products are not necessary and some may be harmful to your system.
- Use commercial bathroom cleaners and laundry detergents in moderation. Many people prefer to clean their toilets, sinks, showers, and tubs with a mild detergent or baking soda.
- Check with your local regulatory agency if you have a garbage disposal to make sure that your septic system can accommodate this additional waste.
- Check with your local regulatory agency before allowing water softener backwash to enter your septic tank.
- Your septic system is not a trash can. Do not put disposable diapers, sanitary napkins, tampons, condoms, paper towels, facial tissues, plastics, cat litter, or cigarettes into your septic system. These items quickly fill your septic tank with solids, decrease the efficiency, and will require that you pump out the septic tank more frequently. They may also clog the sewer line to the septic system causing wastewater to back up into your home.

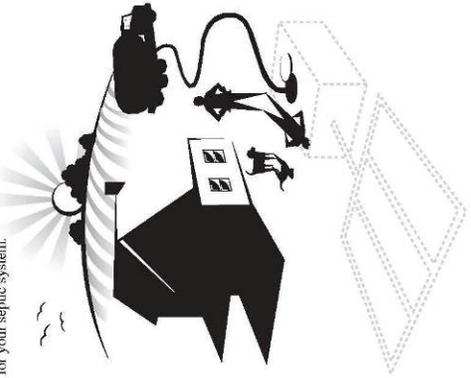
• Avoid dumping grease or fats down your kitchen drain. They solidify and the accumulation may contribute to blockages in your system.

• Keep latex paint, varnishes, thinners, waste oil, photographic solutions, pesticides, or other hazardous chemicals out of your system. Even in small amounts, these items can destroy the biological digestion taking place within your septic system.

Septic systems are a very simple way to treat household waste water and are easy to operate and maintain. Although homeowners must take a more active role in maintaining septic systems, once they learn how their systems work, it is easy for them to appreciate the importance of a few sound operation and maintenance practices.

The care and feeding of your septic system

One in a series of three brochures designed to aid you in caring for your septic system.





For more information regarding the care of your septic system, contact your local health department.

More information about septic systems is available from the National Small Flows Clearinghouse (NSFC) through other brochures in this series:
Groundwater protection and your septic system,
Item # **WVBRP121**

So... now you own a septic system,
Item # **WVBRP120**

For more information about this or other NSFC products, please contact us by writing to:
National Small Flows Clearinghouse
West Virginia University
P.O. Box 6064
Morgantown, WV 26506-6064
or phone:
(800) 624-8301, (304) 293-4191
or fax (304) 293-3161
www.nsfic.wvu.edu

Helping America's small communities meet their wastewater needs



Helping America's small communities meet their wastewater needs

Exhibit VIII

STATE OF CONNECTICUT
Department of Public Health
Drinking Water Division

Connecticut Statutes and Regulations
For The Protection Of Public Drinking Water Sources

Water Company Lands: P.H.C. Sections 25-37c-1 et seq. and 25-37d-1 et seq. regulates the sale and/or change of use of water company owned lands, along with defining watershed land classifications, and through Connecticut General Statute 25-32(b), prohibits the sale of the most critical watershed lands (i.e. Class I land). Less critical water company owned watershed lands, defined as Class II land, is allowed to be sold or have its present use changed through a permit process.

Source Abandonment: C.G.S. Sections 25-33k, 25-33l, & 25-33m regulates the sale and abandonment of public water supply sources.

Location of Cemeteries: C.G.S. Section 25-41 prohibits the location of cemeteries within one-half mile of a public water supply reservoir.

Prohibition of Sewage Discharge: C.G.S. Section 22a-417 prohibits sewage discharge within a public water supply watershed area.

Sanitation Of Watersheds: P.H.C. Section 19-13-B32 et. seq. mandates various separating distances from potential sources of pollution to the edge of an established watercourse within a public water supply watershed area or aquifer recharge area and requires that special protections be taken during construction to protect stream quality.

Watershed Survey: P.H.C. Section 19-13-B102(b) requires a water company having an active water source of supply under its control to conduct a sanitary survey of the watershed at least annually and report the results of this survey to the Department of Public Health by March 1 each year.

Sanitary Survey Of A System Using Groundwater: In conducting a sanitary survey of a system using groundwater pursuant to P.H.C. Section 19-13-B102(e)(7)(E)(iii), information on sources of contamination within the delineated wellhead protection area shall be considered.

Watershed Prohibitions, Fishing, Passive Recreation & Penalties For Polluting A Reservoir: C.G.S. Sections 25-43, 25-43c and 43(a) prohibits (i.e. bathing, aircraft, and general pollution) and regulates specific activities (i.e. fishing from boats with electric motors, fishing from shoreline) on public water supply reservoirs and associated watershed. Allows passive recreation for both surface and ground water source areas through a permitting process. Any person who causes or allows any pollutant or harmful substance to enter any public water supply reservoir is subject to a fine of not less than one hundred dollars or imprisonment for not more than thirty days, or both.

Threat of Pollution: C.G.S. Section 25-34 (a) The Department of Public Health may make orders as it deems necessary to protect public drinking water sources or ice supplies for any pollution or threatened pollution, which, in its judgment is prejudicial to public health.

Orders To Correct Pollution: C.G.S. Section 25-32g. allows, after investigation, the issuance of orders in writing to any person to discontinue, abate, alleviate or correct conditions or activities that constitutes an immediate threat to public water supplies

Exhibit VIII (Cont'd)

**Connecticut Statutes and Regulations
For The Protection Of Public Drinking Water Sources**

Monitoring Waivers: The department may grant a public water system a waiver from the monitoring requirement for certain chemicals pursuant to P.H.C. Section 19-13-B102(e)(7)(C)(xii) – (xvi) if the watershed or zone of influence is not subject to certain types of land uses, and for certain chemicals, previous analytical results showed no detectable limit of the contaminant to be waived.

Review of Projects In A Watershed By The Department of Public Health: C.G.S. Section 25-32f allows the State Department of Public Health to review and comment on proposed development projects and zoning changes within public water supply source water areas.

Water Company Review of Projects In A Source Water Area: C.G.S. Sections 8-3i and 22a-42f requires an applicant to either the municipal planning and zoning commission, zoning board of appeals or the inland wetlands commission to notify the water company of the proposed development if this proposal is within the water company's public water supply watershed area (8-3i also includes aquifer protection areas). The water company therefore has the opportunity to provide comments to the municipality concerning the development proposal.

Individual Water Supply Plans: C.G.S. Sections 25-32d and 25-32d-1 et seq. requires water companies which serve over 1000 people to produce long term water supply plans in which the water company must plan for adequate supply to meet projected demand for the next fifty years, which includes an evaluation of source water protection measures.

Regional Water Supply Plans: C.G.S. Section 25-33d through 25-33j mandates water supply planning on a regional basis. Regulations detail the creation of the regional water supply plan. Individual water supply plans are a part of this regional process.

Local Governmental Consideration Of Public Drinking Water Sources: C.G.S. Section 8-2 & 8-23 requires that a municipal plan of conservation & development and zoning regulations shall be made with consideration for the protection of existing and potential public surface and ground drinking water supplies.

Suggested Reading: The State's *Conservation and Development Policies Plan for Connecticut 1998-2003* sets-forth specific goals and policies for the State of Connecticut and local communities. Sections concerning potable water supplies are located on pages 59-68, 120-123. This document is revised and updated every five years by the Office of Policy and Management.

Drinking Water Section**860.509.7333 (business hours)****860.509.8000 (after hours)****www.dph.state.ct.us/BRS/Water/DWD.htm****For More Information Contact The Source Water Protection Unit***Abbreviations: C.G.S. - Connecticut General Statute**P.H.C. - Public Health Code Regulation*

Exhibit VIII (Cont'd)



STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

Drinking Water Section

RCSA 19-13-B32. Sanitation of Watersheds

Unless specifically limited, the following regulations apply to land and watercourses tributary to a public water supply including both surface and ground water sources.

- (a) As used in this section, "sewage" shall have the meaning found in section 19-13-B20 (a) of the public health code: "Toxic metals" shall be arsenic, barium, cadmium, chromium, lead, mercury and silver and the salts thereof: "high water mark" shall be the upper limit of any land area which water may cover, either standing or flowing, at any time during the year and "watershed" shall mean land which drains by natural or man-made causes to a public drinking water supply intake.
- (b) No sewage disposal system, cesspool, privy or other place for the deposit or storage of sewage shall be located within one hundred feet of the high water mark of any reservoir or within fifty feet of the high water mark of any stream, brook, or watercourse, flowing into any reservoir used for drinking purposes.
- (c) No sewage disposal system, cesspool, privy or other place for the deposit or storage of sewage shall be located on any watershed, unless such facility is so constructed that no portion of the contents can escape or be washed into the stream or reservoir.
- (d) No sewage shall be discharged on the surface of the ground on any watershed.
- (e) No stable, pigpen, chicken house or other structure where the excrement of animals or fowls is allowed to accumulate shall be located within one hundred feet of the high water mark of a reservoir or within fifty feet of the high water mark of any watercourse as above mentioned, and no such structure shall be located on any watershed unless provision is made in a manner acceptable to the commissioner of health for preventing manure or other polluting materials from flowing or being washed into such waters.
- (f) No toxic metals, gasoline, oil or any pesticide shall be disposed of as a waste into any watercourse tributary to a public drinking water supply or to any ground water identified as supplying a public water supply well.
- (g) Where fertilizer is identified as a significant contributing factor to nitrate nitrogen occurring in excess of 8 mg/l in a public water supply, fertilizer application shall be made only under current guidelines established by the commissioner of health in cooperation with the state commissioner of agriculture, the college of agriculture of the University of Connecticut and the Connecticut agricultural experiment station in order to prevent exceeding the maximum allowable limit in public drinking water of 10.0 mg/l for nitrite plus nitrate nitrogen.
- (h) Where sodium occurs in excess of 15 mg/l in a public drinking water supply, no sodium chloride shall be used for maintenance of roads, driveways, or parking areas draining to that water supply except under application rates approved by the commissioner of health, designed to prevent the sodium content of the public drinking water from exceeding 20 mg/l.
- (i) The design of storm water drainage facilities shall be such as to minimize soil erosion and maximize absorption of pollutants by the soil. Storm water drain pipes, except for crossing culverts, shall terminate at least one hundred feet from the established watercourse unless such termination is impractical, the discharge arrangement is so constructed as to dissipate the flow energy in a way that will minimize the possibility of soil erosion, and the commissioner of health finds that a discharge at a lesser distance is advantageous to stream quality. Special protections shall be taken to protect stream quality during construction.



Phone: (860) 509-8171, Fax: (860) 509-7333
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 Affirmative Action/An Equal Opportunity Employer

Exhibit VIII (Cont'd)



STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

Drinking Water Section

CGS Sec. 8-3i. Notice to water company re projects within aquifer protection area or watershed of water company

(a) As used in this section "water company" means a water company as defined in section 25-32a and "petition" includes a petition or proposal to change the regulations, boundaries or classifications of zoning districts.

(b) When an application, petition, request or plan is filed with the zoning commission, planning and zoning commission or zoning board of appeals of any municipality concerning any project on any site which is within the aquifer protection area delineated pursuant to section 22a-354c or the watershed of a water company, the applicant or the person making the filing shall provide written notice of the application, petition, request or plan to the water company, provided such water company has filed a map showing the boundaries of the watershed on the land records of the municipality in which the application, petition, request or plan is made and with the zoning commission, planning and zoning commission or zoning board of appeals of such municipality or the aquifer protection area has been delineated in accordance with section 22a-354c, as the case may be. Such notice shall be made by certified mail, return receipt requested, and shall be mailed within seven days of the date of the application. Such water company may, through a representative, appear and be heard at any hearing on any such application, petition, request or plan.

(c) Notwithstanding the provisions of subsection (b) of this section, when an agent of the zoning commission, planning and zoning commission or zoning board of appeals is authorized to approve an application, petition, request or plan concerning any site which is within the aquifer protection area delineated pursuant to section 22a-354c or the watershed of a water company without the approval of the zoning commission, planning and zoning commission or zoning board of appeals, and such agent determines that the proposed activity will not adversely affect the public water supply, the applicant or person making the filing shall not be required to notify the water company.

Sec. 22a-42f. Notice of application to water company re conduct of regulated activities within watershed of water company. When an application is filed to conduct or cause to be conducted a regulated activity upon an inland wetland or watercourse, any portion of which is within the watershed of a water company as defined in section 25-32a, the applicant shall provide written notice of the application to the water company provided such water company has filed a map showing the boundaries of the watershed on the land records of the municipality in which the application is made and with the inland wetlands agency of such municipality. Such notice shall be made by certified mail, return receipt requested, and shall be mailed within seven days of the date of the application. The water company, through a representative, may appear and be heard at any hearing on the application.



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Exhibit VIII (Cont'd)



STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

Drinking Water Section

CGS Sec. 25-43. Bathing in and pollution of reservoirs. Aircraft on reservoirs

(a) Any person who bathes or swims in any reservoir from which the inhabitants of any town, city or borough are supplied with water, or in any lake, pond or stream tributary to any distribution reservoir, or in any part of any lake, pond or stream tributary to any storage reservoir, which part is distant less than two miles measured along the flow of water from any part of such storage reservoir, and any person who causes or allows any pollutant or harmful substance to enter any such public water supply reservoir, whether distribution or storage, or any of its tributaries, or commits any nuisance in any public water supply reservoir or its watershed, shall be fined not less than one hundred dollars or imprisoned not more than thirty days, or both. For the purposes of this section, "storage reservoir" means an artificial impoundment of substantial amounts of water, used or designed for the storage of a public water supply and the release thereof to a distribution reservoir, and "distribution reservoir" means a reservoir from which water is directly released into pipes or pipelines leading to treatment or purification facilities or connected directly with distribution mains of a public water system.

(b) No person, after having received notice or after notice has been posted that any reservoir, lake or pond, or any stream tributary thereto, is used for supplying the inhabitants of a town, city or borough with water, shall wash any animal or clothing or other article or allow any animal to enter therein. No person shall cause or allow any pollutant or harmful substance to enter such reservoir, lake, pond or stream, nor shall any person, after receipt of written notice from the municipality, water company, as defined in section 25-32a, or the local director of health having jurisdiction, or their agents, that the same is detrimental to such water supply, permit any such substance to be placed upon land owned, occupied or controlled by such person, so that the same may be carried by rains or freshets or otherwise flow into the water of such reservoir, lake, pond or stream, or allow to be drained any sewage from such land into such water. Any person who violates any provision of this subsection shall be fined not less than one hundred dollars or imprisoned not more than thirty days or both.

(c) No person shall cause or permit an aircraft, as defined in subdivision (5) of section 15-34, to land upon, take off from or be operated, kept, parked, garaged, stored or otherwise maintained on any distribution or storage reservoir or on any watercourse tributary to any such reservoir.



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STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

Drinking Water Section

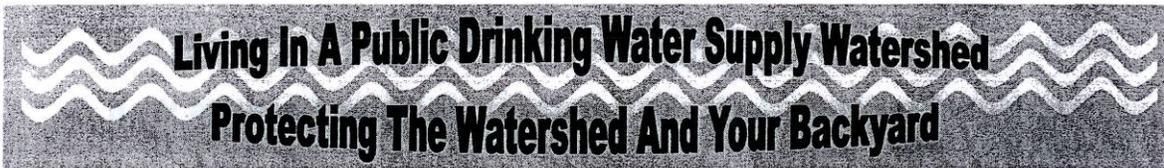
**General Construction Best Management Practices
For Sites Within A Public Drinking Water Supply Area**

- **Emergency Response Plan.** A response plan should be written for actions to be taken for the containment of accidental fuel or chemical spills that may occur during construction. Spill response equipment should be available on-site at all times along with personnel trained in the proper use of such equipment. A person or persons should be designated by the contractor for emergency response coordination on a 24/7 basis.
- **Vehicles and Machinery.** Designate one area for auto parking, vehicle refueling and routine equipment maintenance. The designated area should be well away from exposed surfaces or storm drains. Methods and locations of refueling, servicing, and storage of vehicles and machinery should be addressed and included as notes on the final site plans. Minor servicing and refueling of machinery should be completed on a fueling pad with containment. All major equipment repairs must be made off site. Onsite fuel storage should be discouraged.
- **General Site Conditions.** Keep pollutants off exposed surfaces. The burying of stumps or construction debris must not be allowed on the job site. Sediment fences and hay bales must be strategically placed, inspected and maintained to prevent sedimentation and erosion. Temporary storm water ponds and basins must be routinely inspected and maintained. If unexpected conditions occur, additional fences and hay bales should be available for use as needed to prevent runoff. Protect exposed stockpiles of soil to prevent runoff. Use as little water as possible for dust control. Clean up leaks, drips and other spills immediately to prevent or minimize soil contamination. Never hose down "dirty" pavement or surfaces where materials have spilled. Use dry cleanup methods whenever possible.
- **Hazardous Materials Storage.** Paints, paint products and other hazardous materials should be removed from the site during non-work hours or otherwise stored in a secure area to prevent vandalism. Place covered trashcans and recycling receptacles around the site. Cover and maintain dumpsters, check frequently for leaks, and never clean a dumpster by hosing it down on site.
- **Sanitation.** Make sure portable toilets are in good working order. Check frequently for leaks.
- **Notification.** Notification of the project start date should be sent to the Public Water System as soon as it has been determined. Public Water System personnel should be granted daily site access to review compliance with site best management practices. The Public Water System *and this office must be notified immediately of any chemical/fuel spill at the construction site, along with the Department of Environmental Protection's Oil and Chemical Spill Response Unit.* Emergency telephone numbers and a statement identifying the construction site as a sensitive public water supply area should be posted where they are readily visible to contractors and other on-site personnel. A note should be added to the construction documents stating the sensitivity of the area.



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Both surface and groundwater sources are vulnerable to potential contamination from non-point source pollution (NPS), which unlike pollution from industrial and sewage treatment plants, comes from widely distributed sources such as highways, large parking areas or land that is prone to erosion. Non-point pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff travels through a drinking water source area, it picks up and carries away natural and human-made pollutants, which are deposited into lakes, rivers, wetlands, coastal waters, and underground sources of drinking water. Non-point source pollutant categories include:

- **Sediment** from improperly managed construction sites, crop and forestlands, eroding streambanks and urban runoff;
- **Fertilizers, herbicides, and insecticides** from their use on agricultural lands and residential areas;
- **Bacteria and nutrients** from livestock, pet wastes, faulty septic systems and urban runoff;
- **Oil, grease, and toxic chemicals** from spills, releases, urban runoff and impervious surfaces and;
- **Airborne pollutants** from industrial and urban fallout.

Potential sources of non-point pollutants include agriculture and forestry operations, grazing, septic systems, recreational boating, urban and residential runoff, construction, physical changes to stream channels, and habitat degradation. Careless or uninformed household and yard management also contributes to non-point pollution problems. Non-point pollution is widespread because it can occur any time activities disturb the land or water.

The most common non-point pollutants are sediment and nutrients that wash into water bodies from agricultural land, construction sites, small and medium-sized animal feeding operations, and other areas of disturbance, including your backyard. Other common non-point pollutants include pesticides, pathogens (bacteria and viruses), salts, oil, grease, toxic chemicals, and heavy metals. Unsafe drinking water, destroyed habitat, fish kills, and many other severe environmental and human health problems can result from non-point pollutants. When non-point pollution occurs in the watershed of a public drinking water supply it may give rise to a number of conditions that can threaten the quality and quantity of drinking water and impact public health. Proactive pollution prevention of drinking water sources is Connecticut's first line of defense in providing safe drinking water.

The Department of Public Health Drinking Water Division (DWD) recently completed an assessment of all public drinking water sources to identify and inventory potential sources of contamination that could adversely impact drinking water quality and safety. To view assessment reports and learn more about Connecticut's source water assessment program, visit our website at: <http://www.dph.state.ct.us/BRS/Water/SWAP/swap.htm> or contact the Source Water Protection Program in Hartford at (860) 509-7333.

Public drinking water systems, local government and public health officials will be able to use the assessment reports to plan and direct drinking water source protection activities including: protective zoning regulations, land acquisition in critical source water areas, and the implementation of best management practices for the control of non-point pollution and the safe handling, storage and disposal of hazardous materials. **If you live on or near a watershed of a public drinking water supply reservoir you should know where the watershed boundaries are located and follow the watershed protection guidelines listed below.** Sensible backyard housekeeping and maintenance will help protect the watershed and your family's well from unnecessary pollution.

Exhibit VIII (Cont'd)

How To Protect The Watershed and Your Family's Well

Control Stormwater Runoff

- Keep litter, pet wastes, leaves, and debris out of the road and away from storm drains--these outlets drain directly to lake, streams, rivers, wetlands, and Long Island Sound.
- Apply lawn and garden chemicals sparingly and according to directions.
- Dispose of used oil, antifreeze, paints, and other household chemicals properly, not in storm drains or behind the stonewall. Support your Town's efforts to establish a program for collecting household hazardous wastes.
- Clean up spilled brake fluid, oil, grease, antifreeze, and fuel. Do not hose them into the street where they can eventually reach local streams and lakes or contaminate groundwater.
- Control soil erosion on your property by planting ground cover and stabilizing erosion-prone areas.

If You Have a Septic System

- Pump out and inspect your septic system regularly. (Pumping out every three to five years is recommended for a three-bedroom house with a 1,000-gallon tank; smaller tanks should be pumped more often.)
- Do not use septic system additives. There is no scientific evidence that biological or chemical additives aid decomposition in septic tanks; some additives may in fact be detrimental to the septic system or contaminate ground water.
- Do not divert gutters, storm drains or basement pumps into septic systems.
- Avoid or reduce the use of your garbage disposal because they add unnecessary solids to your septic system and can also increase the frequency your tank needs to be pumped.
- Don't use your toilet as a trash can! Excess solids may clog your drainfield and necessitate more frequent pumping or costly repairs.

When You Landscape Or Garden

- Select plants that have low requirements for water, fertilizers, and pesticides.
- Cultivate plants that discourage pests. Minimize grassed areas that require high maintenance.
- Preserve existing trees, and plant trees and shrubs to help prevent erosion and promote infiltration of water into the soil.
- Use landscaping techniques such as grass swales (low areas in the lawn) or porous walkways to increase infiltration and decrease runoff.
- Leave lawn clippings on your lawn so that nutrients in the clippings are recycled and less yard waste goes to landfills.
- If you use a professional lawn care service, select a company that employs trained technicians and follows practices designed to minimize the use of fertilizers and pesticides.
- Compost your yard trimmings. Compost is a valuable soil conditioner that gradually releases nutrients to your lawn and garden. Compost retains moisture in the soil and helps conserve water.
- Spread mulch on bare ground to help prevent erosion and runoff.
- Do not apply pesticides or fertilizers before or during rain due to the strong likelihood of runoff.

If You Have a Farm, Garden or Horses in Your Back Yard

- Manage animal waste to minimize contamination of surface water and ground water.
- Reduce soil erosion by using best management practices to eliminate runoff around the barn and pasture or in your garden.
- Protect drinking water by using less pesticides and fertilizers.
- Dispose of pesticides, containers, and tank wastes in an approved manner.

If You Have Your Property Logged

- Make certain that proper logging and erosion control practices are used by ensuring proper construction, maintenance, and closure of logging roads and skid trails.



Keeping Connecticut Healthy

Connecticut Department of Public Health Drinking Water Division

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<http://www.dph.state.ct.us/BRS/Water/DWD.htm>