



# Ashaway River

## Watershed Description

This **TMDL** applies to the Ashaway River assessment unit (RI0008039R-02A), a 1.8-mile long stream located in Hopkinton, RI (Figure 1). The Town of Hopkinton is located in the southwestern corner of the state and is bordered by Connecticut to the east and Westerly, RI, to the south. The Ashaway River is located in the southwestern section of town along the Connecticut border. The Ashaway River watershed is presented in Figure 2 with land use types indicated.

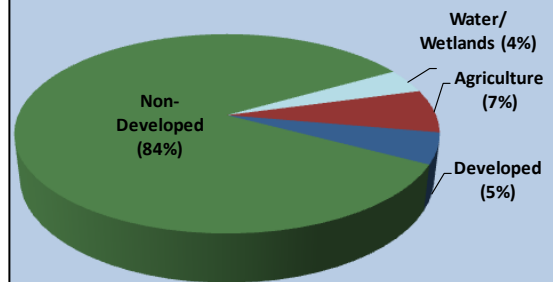
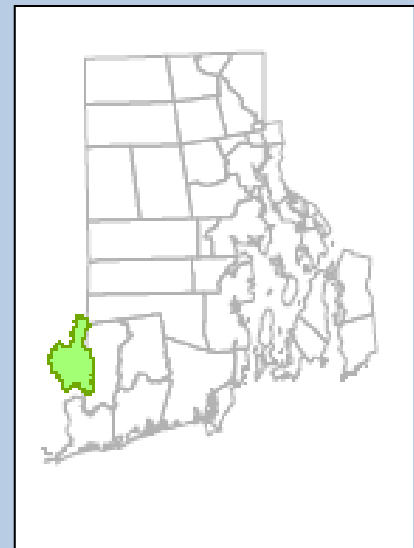
The Ashaway River begins at the confluence of Parmenter Brook and the Green Fall River in the southwestern section of Hopkinton, near Route 216. The brook flows south parallel to Laurel Street through a residential area before it empties into the Pawcatuck River along the Connecticut border.

The Ashaway River watershed covers 28.2 square miles in both Rhode Island and Connecticut, with the majority of the watershed located in Connecticut. Non-developed areas occupy a large portion (84%) of the watershed. Developed uses (including residential and commercial uses) occupy approximately 5%. Agricultural land uses occupy 7% and wetlands and other surface waters occupy 4%.

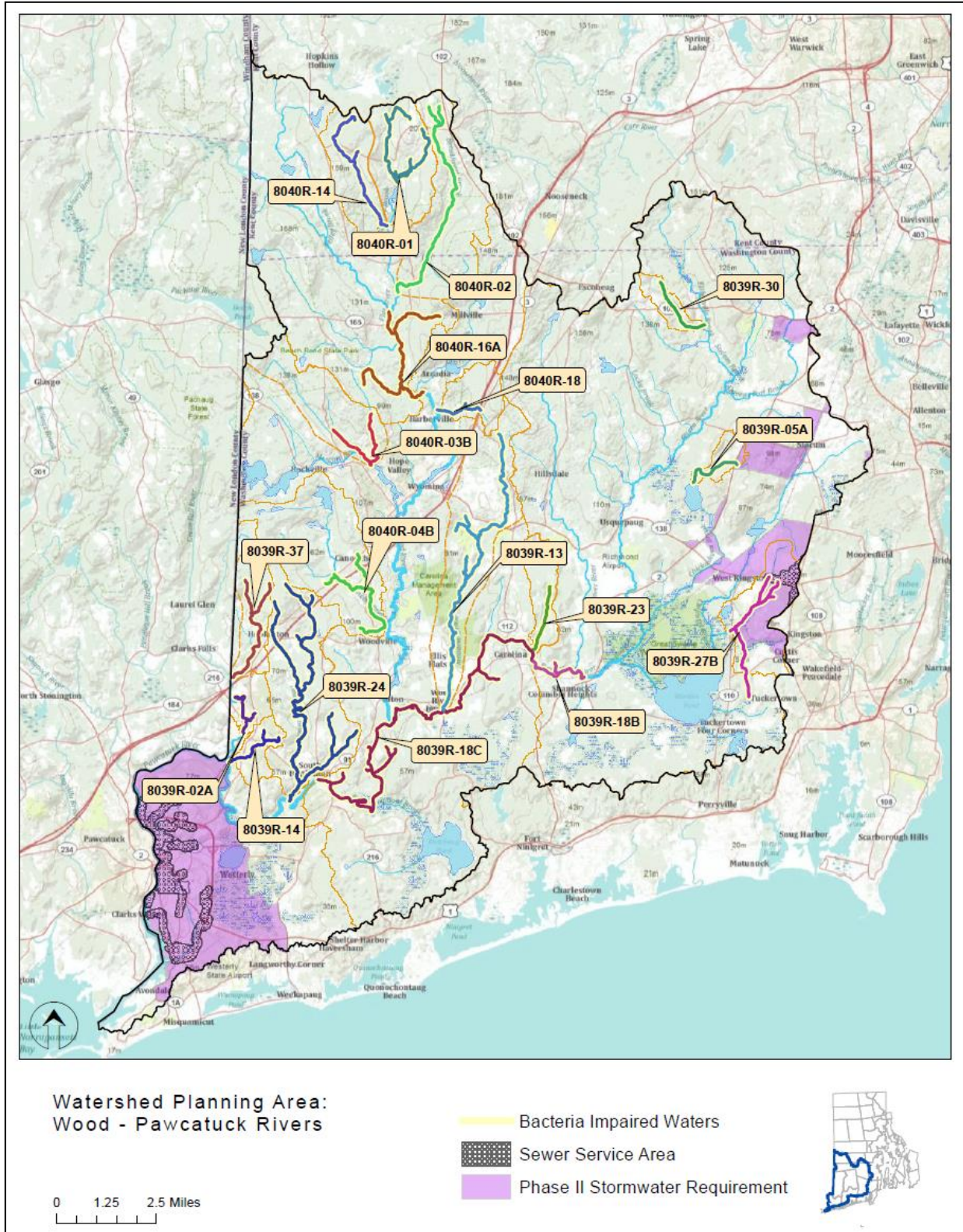
The Town of Hopkinton is 44 square miles and has a population of approximately 8,000 people. Hopkinton has over 1,000 acres of open space supporting various recreational activities, including hiking, fishing, and canoeing. The Hopkinton Land Trust was established in 2004 and has protected 875 acres of land through property acquisition and conservation easements (Town of Hopkinton, 2010).

## Assessment Unit Facts *(RI0008039R-02A)*

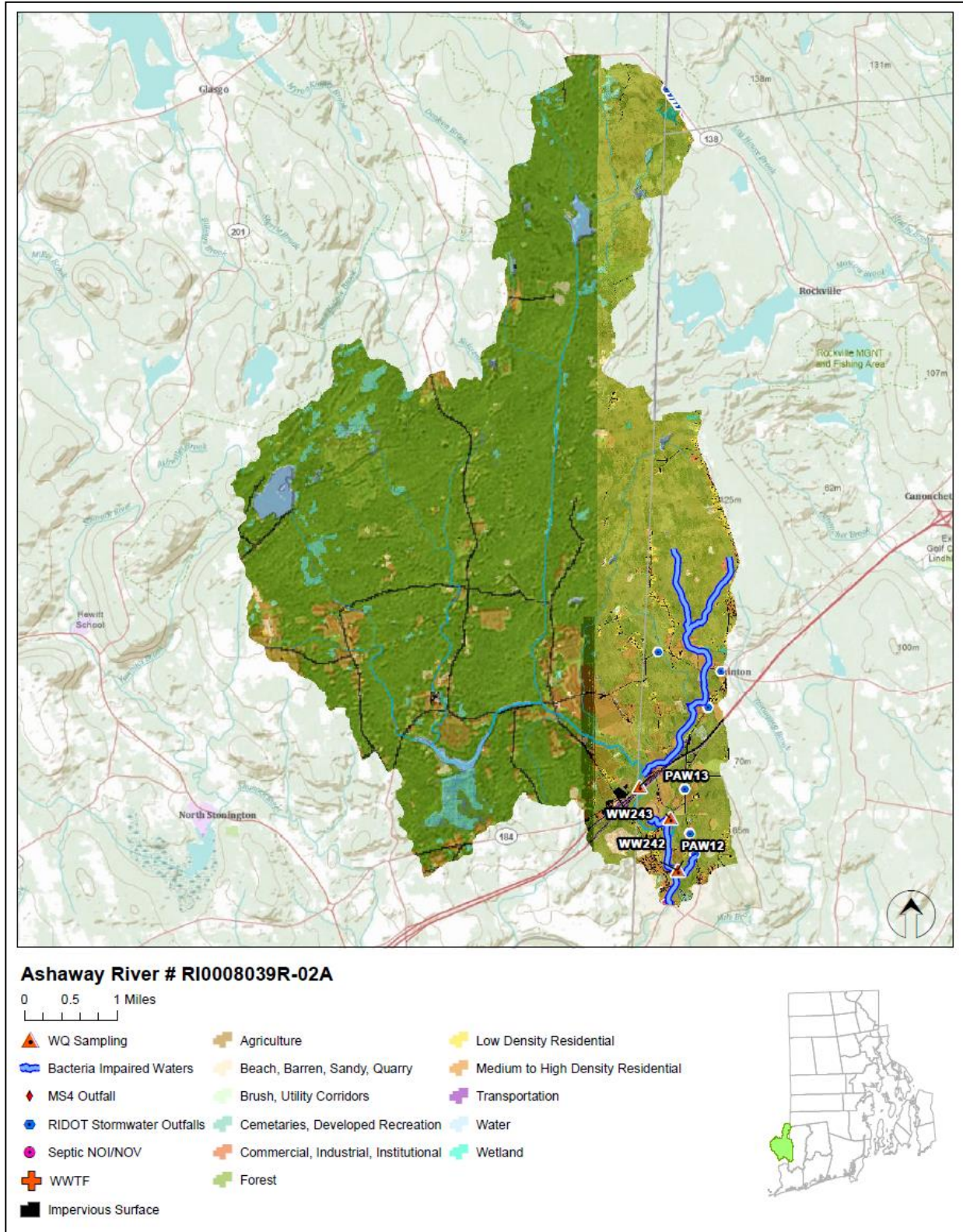
- **Town:** Hopkinton
- **Impaired Segment Length:** 1.8 miles
- **Classification:** Class A
- **Direct Watershed:** 28.2 mi<sup>2</sup> (18060 acres)
- **Imperious Cover:** < 1%
- **Watershed Planning Area:** Wood – Pawcatuck (#23)



**Watershed Land Uses**



**Figure 1: Map of the Wood-Pawcatuck Watershed Planning Area with impaired segments in the Statewide Bacteria TMDL, sewer service areas, and stormwater regulated zones.**



**Figure 2: Map of the Ashaway River watershed with impaired segments, sampling locations, and land cover indicated.**

### Why is a TMDL Needed?

The Ashaway River is a Class A fresh water stream, and its applicable designated uses are primary and secondary contact recreation and fish and wildlife habitat (RIDEM, 2009). From 2005-2008, water samples were collected from two sampling locations (PAW12/WW242 and WW243) and analyzed for the indicator bacteria, enterococci. The water quality criteria for enterococci, along with bacteria sampling results from 2006-2008 and associated statistics are presented in Table 1. The geometric mean was calculated for all stations and exceeded the water quality criteria value at both stations.

To aid in identifying possible bacteria sources, the geometric mean was also calculated for each station for wet-weather and dry-weather sample days, as appropriate. Both wet and dry geometric mean values exceeded the water quality criteria for enterococci at stations WW242 and WW243 with wet-weather values much higher than the dry-weather values. Possible dry and wet weather sources are described in the sections below.

Potential sources include improperly operating onsite wastewater treatment systems (OWTS), wastes from agriculture activities, as well as wastes from waterfowl, wildlife, and domestic pets. In wet weather, these sources can be carried to the river in stormwater runoff.

Due to the elevated bacteria measurements presented in Table 1, the Ashaway River does not meet Rhode Island's bacteria water quality standards, is identified as impaired, and was placed on the 303(d) list (RIDEM, 2008). The Clean Water Act requires that all 303(d) listed waters undergo a TMDL assessment that describes the impairments and identifies the measures needed to restore water quality. The goal is for all waterbodies to comply with state water quality standards.



**Figure 3: Partial aerial view of the Ashaway River watershed. (Source: Google Maps)**

### Potential Bacteria Sources

There are several potential sources of bacteria in the Ashaway River watershed including malfunctioning onsite wastewater treatment systems, agricultural activities, waterfowl, wildlife, and domestic animal waste, and stormwater runoff from developed areas.

#### Onsite Wastewater Treatment Systems

All residents in the Town of Hopkinton and the Ashaway River watershed rely on onsite wastewater treatment systems (OWTS) such as cesspools and septic systems. Failing OWTS can be significant sources of bacteria by allowing improperly treated waste to reach surface waters (RI HEALTH, 2003). If systems are not sized properly, malfunctioning, or in soils poorly suited for septic waste disposal, microorganisms such as bacteria, can easily enter surface water (USEPA, 2002). As shown in Figure 2, one OWTS Notice of Violation/Notice of Intent to Violate (NOV/NOI) has been issued by the RIDEM Office of Compliance and Inspection in the Ashaway River watershed.

#### Agricultural Activities

Agricultural operations are an important economic activity and landscape feature in the state's rural areas. There are multiple agricultural operations located within the Ashaway River watershed. Agricultural runoff may contain pollutants, including bacteria. Agricultural practices such as allowing livestock to graze near streams, crossing livestock through waterbodies, spreading manure as fertilizer, and improper disposal of manure can contribute to bacterial contamination.

#### Waterfowl, Wildlife, and Domestic Animal Waste

Most of the Ashaway River watershed is undeveloped. Wildlife, including waterfowl, may be a significant bacteria source to surface waters. With the construction of roads and drainage systems, these wastes may no longer be retained on the landscape, but instead may be conveyed via stormwater to the nearest surface water. As such these physical land alterations can exacerbate the impact of these natural sources on water quality.

Residential development is concentrated in the southern portion of the watershed. Waste from domestic animals, such as dogs, in these residential neighborhoods may also be contributing to bacteria concentrations in the Ashaway River. Other potential sources include the Cheyenne Farm Kennel, a 32-acre farm for the breeding and grooming of dogs.

### Developed Area Stormwater Runoff

Approximately 5% of the Ashaway River watershed is developed and most of the development is concentrated along major roads in the watershed. The Ashaway River watershed has an impervious cover of less than 1%. Impervious cover is defined as land surface areas, such as roofs and roads that force water to run off land surfaces, rather than infiltrating into the soil. Impervious cover provides a useful metric for the potential for adverse stormwater impacts. While runoff from impervious areas in these portions of the watershed may be contributing bacteria to the Ashaway River, as discussed in Section 6.3 of the Core TMDL Document, as a general rule, impaired streams with watersheds having less than 10% impervious cover are assumed to be caused by sources other than urbanized stormwater runoff.

The Rhode Island Department of Transportation (RIDOT) has identified and mapped stormwater outfalls within the Town of Hopkinton, including those for Interstate 95 (I-95). As shown in Figure 2, multiple outfalls are found in the watershed, particularly along major highways.

### Existing Local Management and Recommended Next Steps

Additional bacteria data collection would be beneficial to support identification of sources of potentially harmful bacteria in the Ashaway River watershed. These activities could potentially include sampling at several different locations and under different weather conditions (e.g., wet and dry). Field reconnaissance surveys focused on stream buffers, stormwater runoff, and other source identification may also be beneficial.

Based on existing ordinances and previous investigations, the following steps are recommended to support water quality goals.

#### Onsite Wastewater Management

All residents of the Town of Hopkinton and the Ashaway River watershed rely on OWTS (septic systems or cesspools). The Town of Hopkinton has a draft Onsite Wastewater Management Plan that provides a framework for managing the OWTS. As part of an onsite wastewater planning process, Hopkinton should adopt ordinances to establish an enforceable mechanism to ensure that existing OWTS are properly operated and maintained. RIDEM recommends that all communities, including Hopkinton, create an inventory of onsite systems through mandatory inspections. Inspections help encourage proper maintenance and identify failed and sub-standard systems. Policies that govern the eventual replacement of sub-standard OWTS within a reasonable time frame should be adopted. The Rhode Island Wastewater Information System (RIWIS) can help develop an initial inventory of OWTS and can track voluntary inspection and pumping programs (RIDEM, 2010b).

The Town of Hopkinton is not eligible for the Community Septic System Loan Program (CSSLP). The CSSLP program provides low-interest loans to residents to help with maintenance and replacement of OWTS. It is recommended that the town develop a program to assist citizens with the replacement of older and failing systems.

#### Waterfowl, Wildlife, and Domestic Animal Waste

The Town of Hopkinton should develop education and outreach programs to highlight the importance of picking up after dogs and other pets and not feeding waterfowl. Animal waste should be disposed of away from any waterway or stormwater system. Hopkinton should work with volunteers to map locations where animal waste is a significant and a chronic problem. The town should also evaluate strategies to reduce the impact of animal waste on water quality. This may include installing signage, providing pet waste receptacles or pet waste digester systems in high-use areas, enacting ordinances requiring clean-up of pet waste, and targeting educational and outreach programs in problem areas.

The town and residents can take several measures to minimize waterfowl-related impacts. They can allow tall, coarse vegetation to grow in areas along the shores of the Ashaway River that are frequented by waterfowl. Waterfowl, especially grazers like geese, prefer easy access to the water. Maintaining an uncut vegetated buffer along the shore will make the habitat less desirable to geese and encourage migration. With few exceptions, Part XIV, Section 14.13 of Rhode Island's Hunting Regulations prohibits feeding wild waterfowl at any time in the state of Rhode Island. Educational programs should emphasize that feeding waterfowl, such as ducks, geese, and swans, may contribute to water quality impairments in the Ashaway River and can harm human health and the environment.

#### Agricultural Activities

If not already in place, agricultural producers should work with the RIDEM Division of Agriculture and the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) to develop conservation plans for their farming activities within the watershed. NRCS and the RIDEM Division of Agriculture should ensure that all agricultural operations within the watershed have sufficient stream buffers, have fencing to restrict access of livestock and horses to streams and wetlands, and have animal waste handling, disposal, and other appropriate BMPs in place.

#### Stormwater Management

The Rhode Island Department of Transportation (RIDOT) (RIPDES permit RIR040036) is a municipal separate storm sewer (MS4) operator in the Ashaway River watershed and has prepared the required Phase II Stormwater Management Plan (SWMPP) for state-owned divided highways (I-95) within the watershed. The Town of Hopkinton is not currently regulated under the Phase II Program.

The Town of Hopkinton does not currently have an ordinance to address illicit discharges. This type of ordinance prohibits illicit discharges to the storm drain system and provides an enforcement mechanism. Dry weather enterococci values exceed criteria at both the Route 116 and Wellstone Street crossing of the Ashaway River. It is recommended that any stormwater outfalls discharging in the near vicinity of these sampling locations be monitored to check for illicit discharges. Illicit discharges can be identified through continued dry-weather outfall sampling and microbial source tracking.

RIDOT's SWMPP and its 2011 Compliance Update outline its goals for compliance with the General Permit. It should be noted that RIDOT has chosen to enact the General Permit statewide, beyond the General Permit's requirements regarding stormwater from urbanized and densely populated areas, as well as from divided highways outside of the urbanized and densely populated areas. RIDOT has finished mapping its outfalls throughout the state and is working to better document and expand its catch basin inspection and maintenance programs along with its BMP maintenance program. Storm Water Pollution Prevention Plans (SWMPP) are being utilized for RIDOT construction projects. RIDOT also funds the University of Rhode Island Cooperative Extension's Stormwater Phase II Public Outreach and Education Project, which provides participating MS4s with education and outreach programs that can be used to address TMDL public education recommendations.

As it is assumed that stormwater runoff is not the major contributor of bacteria to the Ashaway River based on the watershed's imperviousness, RIDOT will have no changes to its Phase II permit requirements and no TMDL Implementation Plan (TMDL IP) will be required at this time.

### Land Use Protection

Woodland and wetland areas within the Ashaway River watershed absorb and filter pollutants from stormwater runoff, and help protect both water quality in the stream and stream channel stability. As these areas represent the majority of the land use in the Ashaway River watershed, it is important to preserve these undeveloped areas, and institute controls on development in the watershed. The Hopkinton Land Trust was established in 2004 and has since protected 875 acres of land through property acquisition and conservation easements (Town of Hopkinton, 2011). The town should work with the land trust to protect more of the undeveloped land in Hopkinton, with a focus on lands around the Ashaway River.

The steps outlined above will support the goal of mitigating bacteria sources and meeting water quality standards in the Ashaway River.



**Table 1: Ashaway River Bacteria Data**

**Waterbody ID:** RI0008039R-02A

**Watershed Planning Area:** 23 – Wood-Pawcatuck

**Characteristics:** Freshwater, Class A, Primary and Secondary Contact Recreation, Fish and Wildlife Habitat

**Impairment:** Enterococci (colonies/100mL)

**Water Quality Criteria for Enterococci:** Geometric Mean: 54 colonies/100 mL

**Percent Reduction to meet TMDL:** 78% (Includes 5% Margin of Safety)

**Data:** 2005-2008 from RIDEM

**Single Sample Enterococci (colonies/100 mL) Results for Ashaway River (2005-2008) with Geometric Mean Statistics**

Station Name	Station Location	Date	Result	Wet/Dry	Geometric Mean
WW242	Ashaway River at Rte 216	10/25/2008	40	Dry	197 <sup>†</sup> (78%)*
WW242	Ashaway River at Rte 216	9/20/2008	101	Dry	
WW242	Ashaway River at Rte 216	8/16/2008	1553	Dry	
PAW12	Ashaway River at Rt 216	7/30/2008	236	Dry	
WW242	Ashaway River at Rte 216	7/12/2008	74	Dry	
PAW12	Ashaway River at Rt 216	7/9/2008	48	Dry	
WW242	Ashaway River at Rte 216	6/7/2008	2420	Wet	
WW242	Ashaway River at Rte 216	5/10/2008	178	Wet	
WW242	Ashaway River at Rte 216	10/20/2007	64	Wet	43
WW242	Ashaway River at Rte 216	9/15/2007	333	Wet	
WW242	Ashaway River at Rte 216	8/18/2007	93	Dry	
WW242	Ashaway River at Rte 216	7/21/2007	13	Dry	
WW242	Ashaway River at Rte 216	6/16/2007	27	Dry	
WW242	Ashaway River at Rte 216	5/12/2007	41	Dry	
PAW12	Ashaway River at Rt 216	10/27/2006	1	Dry	
PAW12	Ashaway River at Rt 216	8/9/2006	160	Dry	
PAW12	Ashaway River at Rt 216	5/31/2006	47	Dry	
PAW12	Ashaway River at Rt 216	9/21/2005	110	Dry	

**Single Sample Enterococci (colonies/100 mL) Results for Ashaway River (2005-2008) with Geometric Mean Statistics (continued)**

Station Name	Station Location	Date	Result	Wet/Dry	Geometric Mean
WW243	Ashaway River at Wellstone Rd.	10/25/2008	19	Dry	125
WW243	Ashaway River at Wellstone Rd.	9/20/2008	221	Dry	
WW243	Ashaway River at Wellstone Rd.	8/16/2008	816	Dry	
WW243	Ashaway River at Wellstone Rd.	7/12/2008	122	Dry	
WW243	Ashaway River at Wellstone Rd.	6/7/2008	109	Wet	
WW243	Ashaway River at Wellstone Rd.	5/10/2008	87	Wet	
WW243	Ashaway River at Wellstone Rd.	10/20/2007	201	Wet	186
WW243	Ashaway River at Wellstone Rd.	9/15/2007	2827	Wet	
WW243	Ashaway River at Wellstone Rd.	8/18/2007	980	Dry	
WW243	Ashaway River at Wellstone Rd.	7/21/2007	82	Dry	
WW243	Ashaway River at Wellstone Rd.	6/16/2007	39	Dry	
WW243	Ashaway River at Wellstone Rd.	5/12/2007	24	Dry	

Shaded cells indicate an exceedance of water quality criteria  
 \* Includes 5% Margin of Safety  
 † Geometric mean used to determine percent reduction

**Wet and Dry Weather Geometric Mean Enterococci Values for each Station**

Station Name	Station Location	Years Sampled	Number of Samples		Geometric Mean		
			Wet	Dry	All	Wet	Dry
WW242 PAW12	Ashaway River at Rte 216	2005-2008	4	13	110	310	80
WW243	Ashaway River at Wellstone Rd.	2007-2008	4	8	153	270	115

Shaded cells indicate an exceedance of water quality criteria  
 Weather condition determined from rain gage at URI in Kingston, RI

### References

- RIDEM (2008). State of Rhode Island and Providence Plantations 2008 303(d) List – List of Impaired Water Bodies. Rhode Island Department of Environmental Management.
- RIDEM (2009). State of Rhode Island and Providence Plantations Water Quality Regulations. Amended December, 2009. Rhode Island Department of Environmental Management.
- RIDEM (2010a). MS4 Compliance Status Report for RI Statewide Bacteria TMDL. Rhode Island Department of Environmental Management.
- RIDEM (2010b). Total Maximum Daily Load Analysis for the Pawcatuck River and Little Narragansett Bay Waters (Bacteria Impairments). Rhode Island Department of Environmental Management.
- RI HEALTH (2003). Aquidneck Island Drinking Water Assessment Results, Source Water Protection Assessment conducted by the University of Rhode Island for the Rhode Island Department of Health, Office of Drinking Water Supply.
- Town of Hopkinton (2010). Town of Hopkinton Comprehensive Plan 5- Year Update. Online:  
[http://www.hopkintonri.org/pdfs\\_downloads/Planning/Hopkinton%20Comp%20Plan%20Update%20Oct%201%202010%20FINAL%20-%20amended%20101510.pdf](http://www.hopkintonri.org/pdfs_downloads/Planning/Hopkinton%20Comp%20Plan%20Update%20Oct%201%202010%20FINAL%20-%20amended%20101510.pdf)
- USEPA (2002). Onsite Wastewater Treatment Systems Manual – Office of Water, Office of Research and Development – EPA/625/R-00/008. Online:  
[www.epa.gov/owm/septic/pubs/septic\\_2002\\_osdm\\_all.pdf](http://www.epa.gov/owm/septic/pubs/septic_2002_osdm_all.pdf).