



PROTECT YOUR DRINKING WATER

Safe and healthy lives in safe and healthy communities

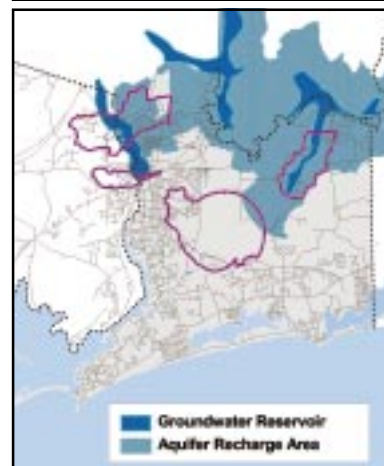
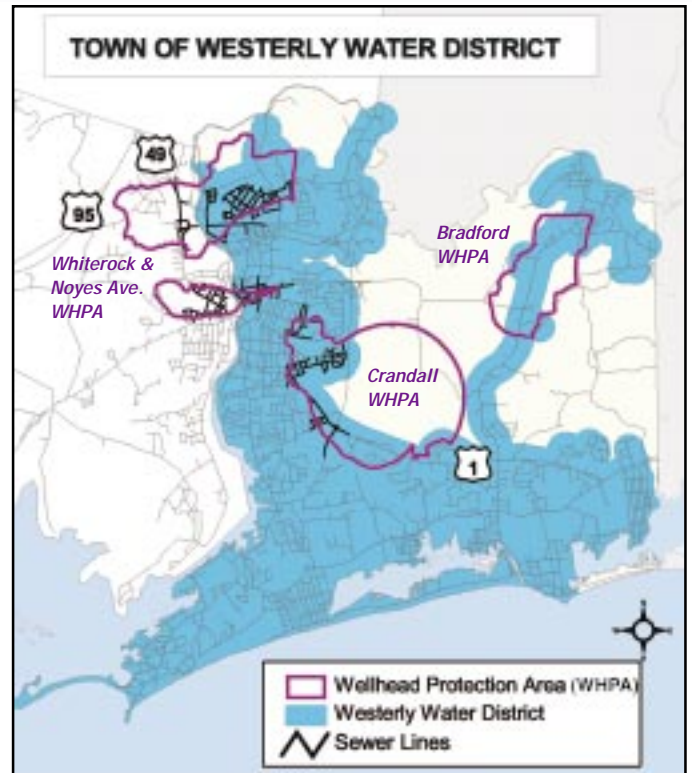
Westerly Drinking Water Assessment Results

All Westerly residents and businesses rely on groundwater as the only source of drinking water. The Westerly Water Department serves ninety-eight percent of Westerly residents, and about 2,400 customers in the neighboring Pawcatuck area of Connecticut. Each day, the town supplies an average of 6 million gallons of water to more than 23,000 persons. Town wells are located in four separate wellhead protection areas – the critical zone that recharges a well and the focus of this study. These include: the Bradford and Crandall wellhead protection areas, which are located entirely within Westerly; and the Whiterock and Noyes Avenue wellheads, which extend into Stonington, Connecticut.

Key Findings

The Westerly wells are situated in underground aquifers where water is held in the spaces among deep sand and gravel deposits. This yields a reliable and pure source of supply but one that is highly vulnerable to contamination.

- Commercial, industrial and dense residential development are the most serious threats to water quality due to the potential for hazardous material spills and fuel leaks. Additional industrial and commercial expansion allowed under current zoning is a serious concern unless storage and use of hazardous materials is strictly controlled.
- Water supplies are meeting all drinking water standards but bacteria contamination and fuel leaks have affected water quality in the past. Chlorination now protects against bacteria. Some wells have slightly elevated nitrogen levels – a sign that improved management of wastewater and fertilizers may be needed to maintain water quality as growth continues.
- Low density zoning limits development potential and helps keep future pollution risks near present levels. However, actual impacts are difficult to predict and depend on local development standards and how landowners manage their property.
- With primary wellhead protection areas shared by Westerly and Stonington, regional cooperation is needed to protect future drinking water quality.



Westerly study area

Source Water

The focus of this assessment is on public drinking water supply “source” areas – the wellhead protection area that recharges a well or the watershed that drains to a surface water reservoir. Source water is untreated water from streams, lakes, reservoirs, or underground aquifers that is used to supply drinking water.

This fact sheet summarizes results of a source water assessment conducted for the Town of Westerly. It identifies known and potential sources of pollution in drinking water supplies and ranks their susceptibility to future contamination. The goal of this study is to help water suppliers, local officials and residents living in drinking water supply areas to take steps to keep water supplies safe.

Land Use & Threats to Water Quality

To locate high-risk features most likely to affect water quality, this study evaluated and ranked each wellhead protection area (WHPA) considering factors such as: the intensity of development, the number of sites where hazardous materials are used, how easily contaminants may move through soils, the sampling history of the water, and estimated nutrient sources such as septic systems and fertilizers. A rating from high to low was assigned to each factor and summed to create a pollution risk score for each study area, and an average susceptibility rank for each water supplier.

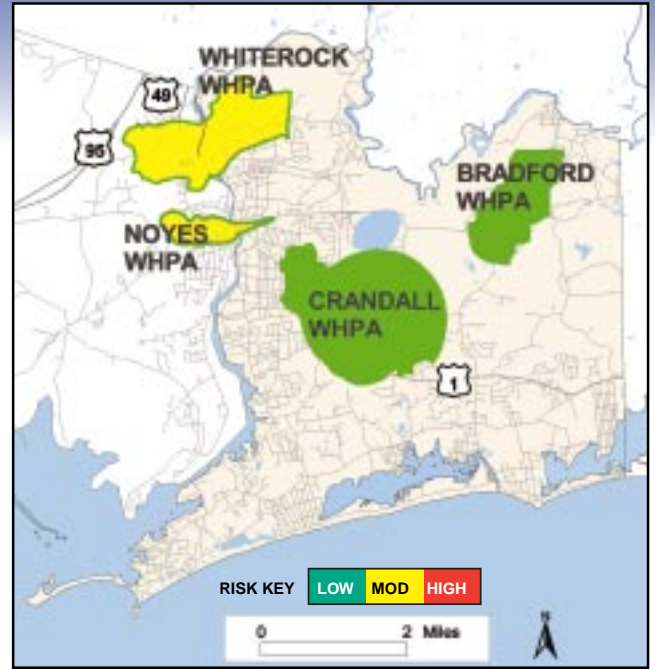
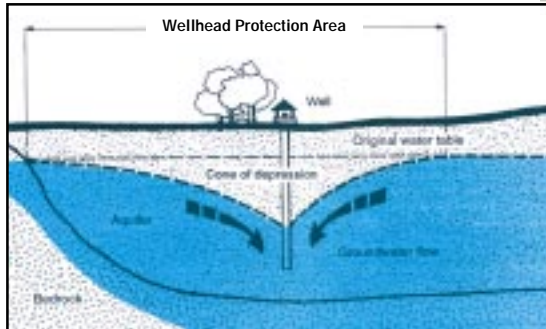
Susceptibility to Contamination



The results show that the Westerly water supply is moderately susceptible to contamination. This is an average ranking for the supply. Individual groundwater recharge areas may be more or less susceptible to contamination due to land use activities.

Note: A moderate ranking means that the water could become contaminated one day. Protection efforts are important to assure continued water quality.

A wellhead protection area is the land surrounding a well where infiltrating rainwater recharges groundwater flowing to a well or cluster of wells. Within a wellhead protection area pollutants entering groundwater can easily reach a pumping well. Source: Center for the Environment, Cornell University



Pawcatuck River, downtown Westerly, courtesy Brown University Environmental Studies Center.



Westerly aerial, courtesy Peter Flinker, Dodson Associates. Downtown Westerly looking east from Pawcatuck, CT to Westerly, RI, across the Pawcatuck River. The Noyes Ave. wellhead is just north of the Rt. 1 bridge.



WHITEROCK

Wells sited near the Pawcatuck River in the Whiterock area supply up to 70 percent of the town's water needs. Approximately half of the wellhead extends into Stonington, Connecticut.

Pumping wells located near the river have the potential to draw surface waters into the well recharge zone. The potential for induced recharge underscores the need to protect both surface and groundwater resources.

Water withdrawn from the Whiterock wells meets all federal and state drinking water standards. However, nitrate levels are slightly elevated, indicating inputs from fertilizers or wastewater. Sewers in developed portions of this wellhead, as well as in the Crandall and Noyes Avenue areas, help protect groundwater provided sewer lines and pump stations are checked for leaks.

Land use is a mix of higher density residential and agricultural use. While commercial and industrial land uses currently account for only a small proportion of the recharge area, over the last five years there have been seven documented spills of hazardous materials and two incidences of leaking underground storage tanks.

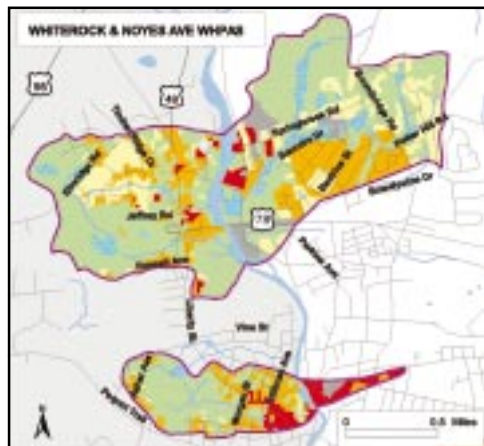
Under current zoning an additional 85 acres of commercial and industrial land could be built. This is a serious concern for future water quality given the past history of spill and leaks.

NOYES

This well has been inactive since 1993 due to contamination from fuel spills. Recent tests show no contamination. The town is in the process of returning the well to full time use. Most of this wellhead area lies in Connecticut.

Over 60 percent of the wellhead is developed in high intensity land use, including commercial and high density residential development clustered near the Pawcatuck River. The Westerly portion is entirely developed. Remaining farmland and forest in Stonington is zoned for lower density residential development, minimizing risks from future development.

The key threats are potential hazardous material spills and leaks from existing sources, including 18 underground storage tanks. There have been 12 documented spills in the past five years.



BRADFORD

The Bradford wellhead protection area, located in the northeast corner of town, includes two wells which supply about 20 percent of the town's average daily needs. This area is still largely rural, with more than 50 percent forest and farmland.

Septic systems in this unsewered area help to maintain groundwater recharge but increase the risk of groundwater contamination if not properly maintained. Systems clustered on small lots, large-flow systems, and those in close proximity to wells are of greatest concern. Monitored nitrate levels are slightly elevated, indicating inputs from fertilizers and septic systems.

Under current zoning almost all farmland and 70 percent of the forest will be fragmented by house lots. Eighty five acres of commercial and industrial land could be built increasing the proportion of this high risk land use from 2 to 10 percent.

Nutrient inputs are expected to remain the same or decrease slightly but septic systems, runoff and lawn fertilizers are expected to become more dominant sources. Actual impacts are difficult to estimate and may be much greater if landowners develop their properties intensively, if septic systems are not properly maintained, and if highly marginal sites are developed.



CRANDALL

The Crandall wellhead protection area, located just south of Chapman Pond, encompasses a well which contributes approximately 12 percent of the town's daily supply. An extensive wetland complex known as Crandall Swamp permanently protects over half of this wellhead. This wetland is likely to help moderate pollutant inputs from the remaining highly developed portions of the wellhead.

High intensity commercial, highway and residential activities make up 25 percent of this wellhead. Hazardous material spills are a serious concern, given the past record of four documented spills and two leaking underground storage tanks within the past five years.

Sixty additional acres of industrially zoned land could be built, further increasing risks to drinking water.



Stillmanville portage, courtesy Wood Pawcatuck Watershed Association.



What You Can Do to Protect Water Quality

Municipal Boards and Government

Because Westerly depends on groundwater as the only source of water supply, the town applied for and received U.S. Environmental Protection Agency designation as a "Sole Source Aquifer". This recognizes groundwater as the "sole or principal" source, justifying the highest level of protection. The town's complete dependence on sole source aquifers and existing high risk development point to the need for continued implementation of protection measures.

Town Planning and Land Use Ordinances

- Designate a working group to review assessment results, select priorities, and incorporate key recommendations into town plans and ordinances. Coordinate regionally on water quantity and quality issues. Coordinate drinking water protection with Phase 2 Stormwater Plans.
- Expand community pollution prevention education. Start by mailing this fact sheet to aquifer residents. Adopt model practices at municipal garages, schools and parks.

Hazardous Materials

- Review and update groundwater zoning as needed to prohibit new facilities using or storing hazardous materials. Require existing facilities to upgrade to state-of-the-art pollution prevention controls with expansion or redevelopment. Retrofit stormwater systems to treat runoff from gas stations, convenience stores and other high-use areas.
- Coordinate with RI DEM annually to review facility inspection results, monitoring, and compliance records. Promote employee education and voluntary participation in pollution prevention inspections.
- Prohibit disposal of "clean fill" and other construction waste in aquifer areas.

Controlling Runoff and Nutrients

- Use zoning setbacks for maximum protection of public and private wells, small headwater streams and wetlands.
- Set targets for maximum impervious cover at current levels or no more than 10 percent in less developed areas. Limit site disturbance and keep runoff volume at pre-development levels. Update site design and stormwater runoff controls to treat and infiltrate runoff.
- Use conservation development to preserve permeable soils as open space for stormwater recharge.

Managing wastewater/keeping septic systems functioning

- Inspect and maintain sewers to prevent leakage and infiltration
- Seek funding to develop a wastewater management program, beginning with adoption of a wastewater management plan and inspection ordinance requiring system inspection, maintenance and upgrading.

Water Supplier

- Implement recommendations of the latest water supply system management plan.
- Continue to acquire land for protection. Work with local officials to implement land use protection measures and education programs.
- Inspect water supply and protection area regularly for potential pollution sources.

Homeowners

- Recycle oil and dispose of other hazardous materials properly. Maintain wooded buffers or restore natural vegetation along wetlands or watercourses that run through your property. Reduce fertilizer and pesticide use. Limit watering.
- All septic systems need regular care to function properly and avoid costly repairs. Comply with town wastewater management requirements. For information contact URI Home*S*Syst (401) 874-5398, www.uri.edu/ce/wq

Farmers and Landowners

Work with the USDA Natural Resource Conservation Service to develop a conservation plan that addresses proper nutrient, manure, pest, and irrigation water management. Contact them at (401) 828-1300, www.nrcs.usda.gov

Commercial and Industrial Businesses

Adhere to all laws, regulations, and recommended practices for hazardous waste management, above and underground storage tanks, and wastewater discharges. Check local regulations with city/town hall and state regulations with the RI DEM Office of Water Resources (401) 222-4700, www.state.ri.us/DEM/program/benviron/water/index.htm

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For More Information

- **R.I. Department of Health, Office of Drinking Water Quality**, (401) 222-6867, www.HEALTH.ri.gov/environment/dwq/Home.htm
- **URI Cooperative Extension Nonpoint Education for Municipal Officials (NEMO)** (401) 874-2138, www.uri.edu/ce/wq
- **Westerly Water Department** (401) 348-2559, www.townofwesterly.com

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