



PROTECT YOUR DRINKING WATER

Safe and healthy lives in safe and healthy communities

Jamestown Drinking Water Assessment Results

As an island ecosystem, Jamestown depends on a limited supply of fresh water replenished only by rainfall. Forty-three percent of residents rely on municipal water provided by the Jamestown Water District (JWD). The main water service area is the village and Beavertail section of town. Fifty-seven percent of residents live outside this area and depend solely on private wells. Public water comes from two surface reservoirs, both part of the Jamestown Brook watershed, and bedrock wells closely associated with the northern reservoir. The Carr Pond Reservoir, also known as North Pond, is the primary supply. Its outlet forms Jamestown Brook. The Watson Pond Reservoir, or South Pond, is a 7-acre impoundment at the southern end of Jamestown Brook. Although the watershed is much larger, this is a secondary supply with much lower yield. The Jamestown Wellhead Protection Area (WHPA) overlaps large portions of the Jamestown Brook watershed. Groundwater pumped from wells just south of Carr Pond is discharged directly into the reservoir intake to augment the surface supply.

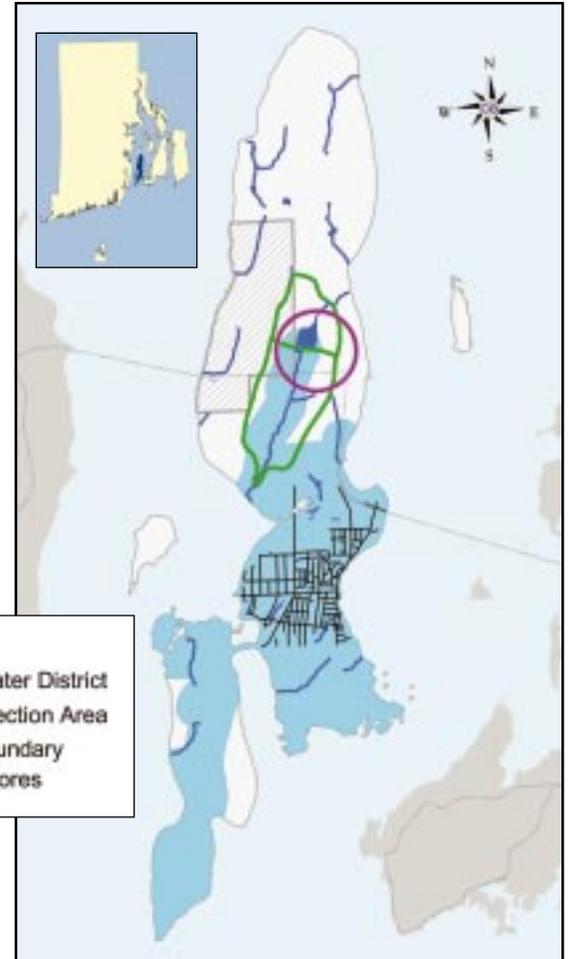
Key Findings

Public Water Supplies

- As a result of proactive town watershed management, 73 percent of the Jamestown Brook Watershed is preserved. Large minimum lot sizes further limit development potential.
- Future development threats are low provided runoff and fertilizer use is controlled and buffers to surface waters and wetlands are protected.
- The Jamestown water system has limited safe yield; increasing capacity is not possible without affecting water quality. Due to naturally occurring organic solids and low flow, water supplies are highly vulnerable to any additional stress.

Island Groundwater

- Groundwater is the only source of supply for most residents, however the island's bedrock wells have limited yield and are subject to saltwater intrusion with overpumping. Other threats to private wells include polluted runoff, loss of recharge with new construction, and substandard septic systems. Impacts are magnified in densely developed areas.
- Protecting private wells reserves public water capacity for the existing service area.
- Protecting the quality and quantity of the island's freshwater supplies depends on how landowners manage their property, as well as continued implementation of town protection measures.



Source Water

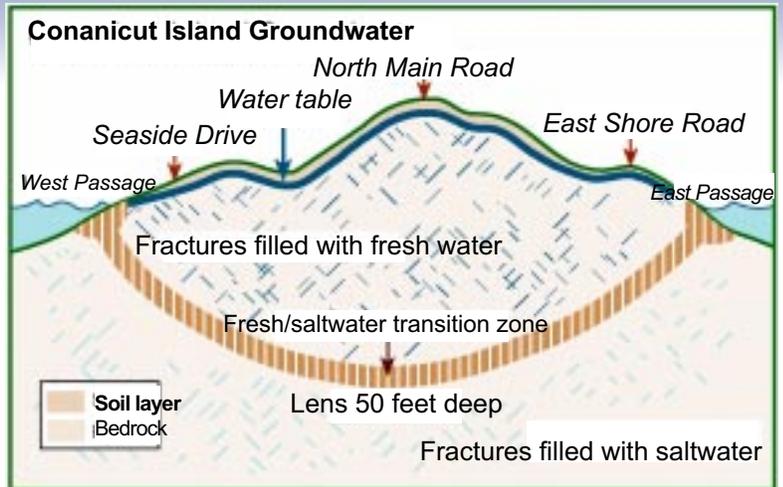
The focus of this assessment is on public drinking water supply "source" areas—the *wellhead protection area* that recharges a well or the *watershed* that drains to a surface water reservoir. Source water is untreated water from streams, lakes, reservoirs, or underground aquifers that is used to supply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

This fact sheet summarizes results of a source water assessment conducted for the JWD. It identifies known and potential sources of pollution in drinking water supplies and ranks their susceptibility to future contamination. To support town wastewater management planning, the Jamestown Shores neighborhood and the island as a whole were also evaluated. 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.



Jamestown's Groundwater Lens

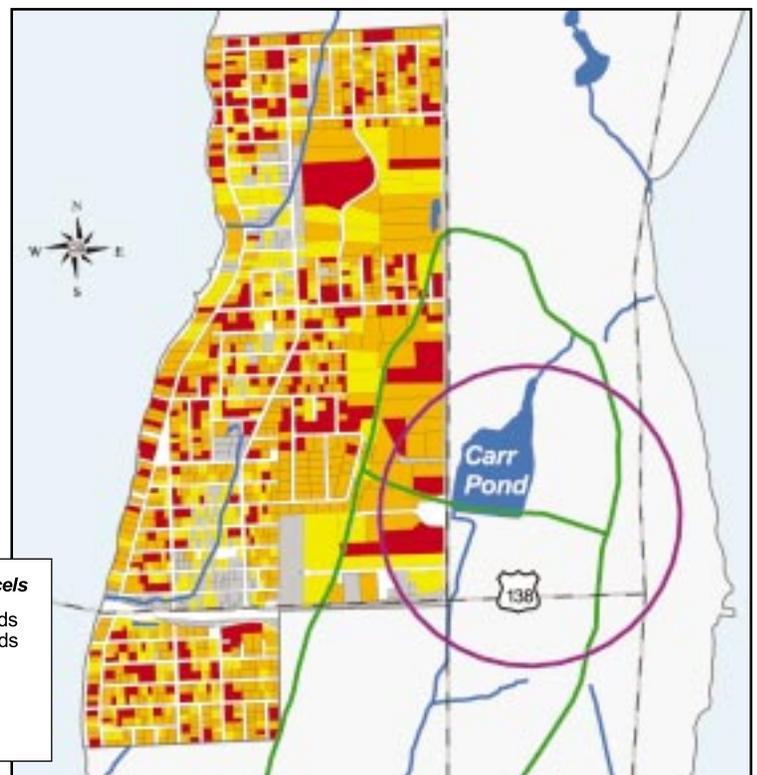
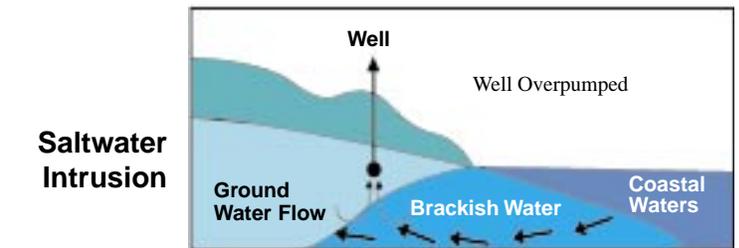
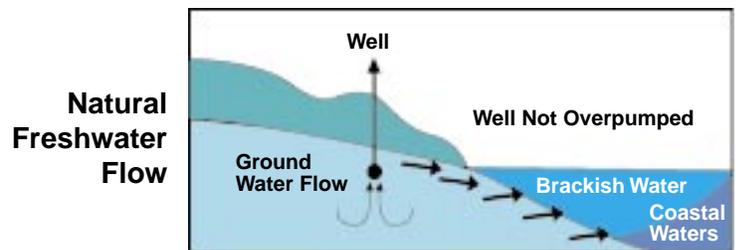
Freshwater in the island's fractured bedrock aquifer forms a lens-shaped body of water that "floats" on salt water because its density is less than the surrounding saltwater. Within this freshwater lens bedrock fractures are filled with fresh water. Below the lens and at the shoreline edges, bedrock fractures and sediments are filled with salt water. The lens is thickest at about 500 feet, near the middle of the island, and thins to about 25 feet near the perimeter. Over-pumping wells can draw salt water into the freshwater lens, and contaminate wellwater, especially at the perimeter of the island where the freshwater layer is thinnest.



The Water-Wastewater Connection

Island groundwater quality is directly related to the quality of septic system effluent. Septic systems are a cost effective, environmentally sound treatment option for much of the island, helping to recharge groundwater and prevent saltwater intrusion. But in densely developed areas, private wells can be contaminated by septic systems and runoff entering the wells.

- In Jamestown Shores up to 32 percent of septic systems are probably substandard. These present the greatest hazard to private wells, especially when located within 100 feet of wells, in high-water table, and on lots smaller than 1 acre.
- Recycled septic system effluent is estimated to make up 16 percent of total groundwater recharge in the Jamestown Shores area, possibly increasing to 24 percent in the future. At these high levels ensuring proper septic system maintenance and treatment is critical for public health protection. Maintaining groundwater recharge keeps the proportion of wastewater closer to present levels through dilution.
- Seventy-four percent of Jamestown residents rely on septic systems. Since most new development is outside the sewer district, the total number of systems is expected to double with future development, increasing the need for proper septic system care.
- The town has already taken steps to protect drinking water by establishing a wastewater management program and adopting development standards for high water tables in selected areas.



Jamestown Shores Developed Parcels

Orange square	Built before 1971 ISDS Standards
Red square	Built after 1971 ISDS Standards
Yellow square	Vacant
Grey square	Other
Purple outline	Wellhead Protection Area
Green outline	Watershed Boundary

ISDS = Individual Sewage Disposal System

Land Use & Threats to Water Quality Jamestown Brook Watershed and Wellhead

The Jamestown Brook watershed and wellhead were examined using landscape features to evaluate threats most likely to affect water quality, including percentage of pavement and other impervious surfaces, protected shoreline buffers, estimated nutrient sources in the watershed, and number of septic systems per acre. A rating from low to high was assigned to each factor and summed to create an average pollution risk score for the whole supply.

Susceptibility to Contamination*



The Jamestown public water supply has a low susceptibility to contamination. This is an average ranking based on land use and existing water quality. Individual study areas may be more or less susceptible to contamination.

Current Conditions

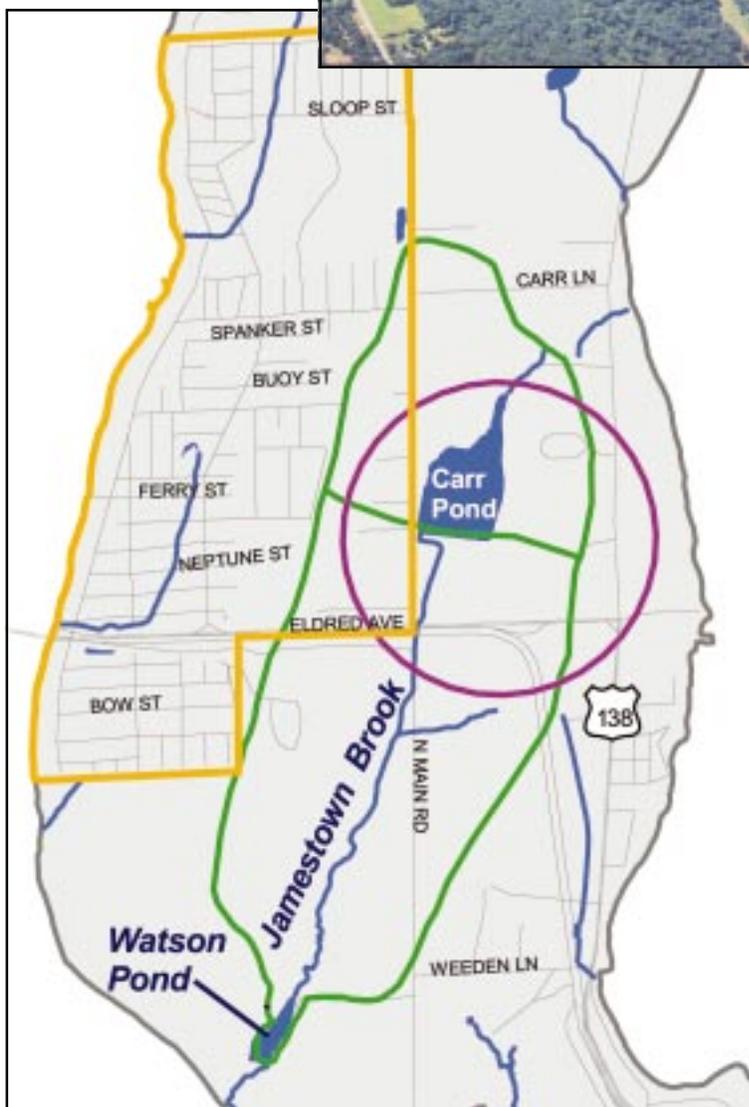
- About one-half of the Jamestown Brook watershed is forest and wetland. There are no known pollution sources.
- Development is limited to mostly low density residential in the Carr Pond watershed. The Watson Pond watershed has about one-third farmland where fertilizers may be used or animals grazed. Much of this sub-watershed is permanently protected open space.
- Route 138 cuts across the water supply area, however storm drains designed to divert runoff from the water supplies, minimize risk of hazardous spills.
- Jamestown Brook is not meeting state water quality standards for aquatic habitat and bacteria. Naturally occurring organic solids and low flow are considered responsible.

Future threats

- With future development, about 20 percent of the forest and pasture in source water areas could eventually shift to low-density residential in the water supply areas, and about 14 percent island wide. Pollution from nutrients and runoff is expected to remain about the same, provided runoff and fertilizer use is controlled and wetland and stream buffers are well protected.
- Most remaining vacant land is wet, with seasonal high-water tables making development impacts more difficult to control. In water supply areas, any increase in runoff or disturbance of wetland buffers is a concern given existing sensitivity and low flow stress.

Aerial view looking south showing Carr Pond (lower center) and Watson Pond (upper center).

Photo courtesy
Jamestown Water
District



***Note:** A low rating does not mean that the source is free from contamination risk. Without sufficient protection, any water supply can become contaminated. Even at levels well below safe drinking water standards, some contaminants can affect taste, odor and cost of water treatment.

What You Can Do to Protect Water Quality

Local Government

Implementing the town wastewater management program and high-water table ordinance are the two most effective steps the town can take to protect groundwater quality. In addition:

- Require phase-out of cesspools, beginning in densely developed areas.
- Expand the high-water table ordinance to include water supply sources and areas served by private wells.
- Monitor effectiveness of runoff control practices and update standards as needed.
- Evaluate effects of leaky sewer pipes to island groundwater levels and seal leaks as necessary. Leaky pipes drain between 200,000 to 1.3 million gallons of groundwater per day from the island.
- Apply limits of disturbance and strict erosion controls with development in critical areas. Assign field inspectors.

Water Supplier

- Implement recommendations in the latest water supply system management plan.
- Work with local officials to implement land use protection measures and education programs.
- Inspect water supply and protection area regularly for potential pollution sources.
- Expand reservoir sampling to monitor nutrient enrichment levels; track frequency and duration of algal blooms.

Homeowners

- Support the town wastewater management program. If you have a cesspool plan to replace it.
- Maintain wooded buffers or restore natural vegetation along wetlands or watercourses. Reduce fertilizer and pesticide use.
- For information about protecting your well, contact the University of Rhode Island Cooperative Extension (URI CE) Home*A*Syst Program at (401) 874-5398, www.uri.edu/ce/wq.

Farmers and Landowners

Work with the U.S. Department of Agriculture (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.ri.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 town hall and state regulations with the R.I. Department of Environmental Management (R.I. DEM) Office of Water Resources at (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** (401) 874-2138, www.uri.edu/ce/wq
- **Jamestown Water District** (401) 423-7220, www.jamestownri.net

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