

History of Rhode Island Wastewater Treatment Facility Construction & Upgrades



This document provides general information on the initial construction and major upgrades at Rhode Island’s municipal wastewater treatment facilities.

The document opens with a map showing the location of the facilities and information on the levels of flows they are designed to treat.

Facilities are then listed individually with the following information:

Facility Name	Approximate population served (based on 2010 values)	RIPDES number (RI#####)	Receiving Water Name
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Below this is general information for each plant related to construction, upgrades, and associated treatment limitations for particular pollutants.

When “secondary treatment” appears in a summary, this refers to technology that is designed to meet permit limits for conventional pollutants (typically biological oxygen demand and total suspended solids). The 1972 federal Clean Water Act required most facilities to meet these standards in the 1970s and 1980s.

By the 1990s, Rhode Island began imposing “water quality-based” permit limits for these and other parameters, such as chlorine residual and nutrients. As these limits are based on the individual needs of the particular receiving waters, they vary from plant to plant.

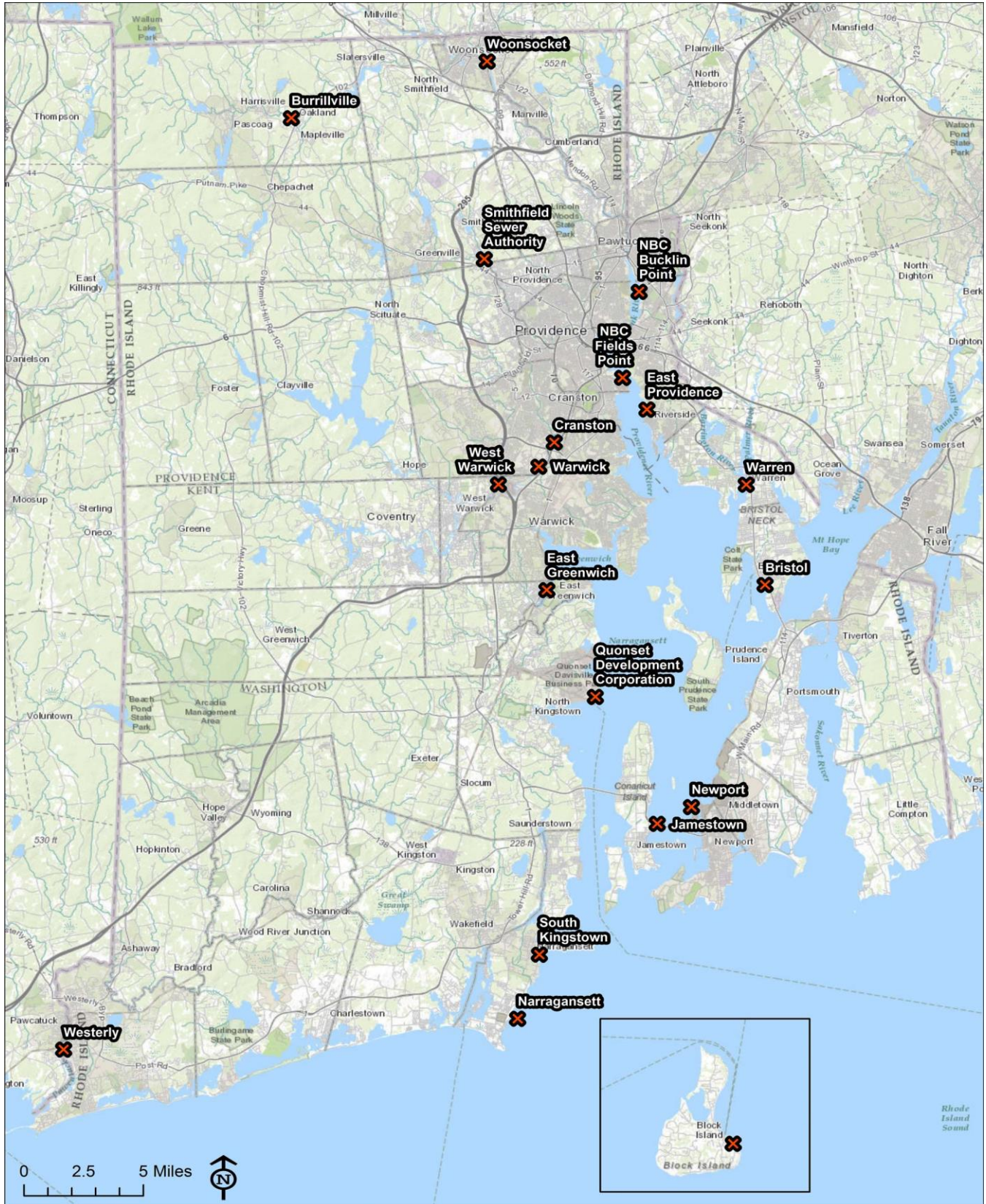
Because of this variability, the summaries that follow give special attention to compliance dates and permit limits for Total Residual Chlorine (TRC), Ammonia, Total Nitrogen, and Phosphorous. Of course, limits are also established for other pollutants that are not listed herein.

Additional notes:

- Dates provided for Nitrogen, Ammonia, Phosphorous, and TRC upgrades represent the date that the Department required *construction completion*, although actual reductions in discharge levels may have been met sooner due to accelerated construction schedules, etc. In some cases, the exact date provided is designated as “achieved” and is based on actual operating data.
- The permit limits provided are *monthly average values*. These are the maximum average values allowed for a parameter when all samples taken during a month are averaged together. (In addition to monthly average limits, facilities also have parameter limits for daily values and weekly averages, and others, depending on the facility and the needs of the receiving water.)
- Some listed parameters, especially nutrients, have seasonal or stepped limits that vary through the year, again based on the needs of the receiving water. For the sake of simplicity, only the most stringent of these seasonal limits are listed.
- Facilities submit all monitoring data to DEM and it is entered into the EPA national database for NPDES permit information. If you’re interested in seeing this data, it is available to the public at the US EPA’s Integrated Compliance Information System (ICIS) website <http://www.epa.gov/enviro/facts/pes-icis/search.html> or EPA’s Enforcement and Compliance History Online (ECHO) website <http://echo.epa.gov/>
- Review of effluent data may show improved performance prior to upgrade dates. This typically reflects upgrades completed in stages (one treatment train or unit at a time), projects completed earlier than required, or those built on a voluntary basis.

Facility Locations

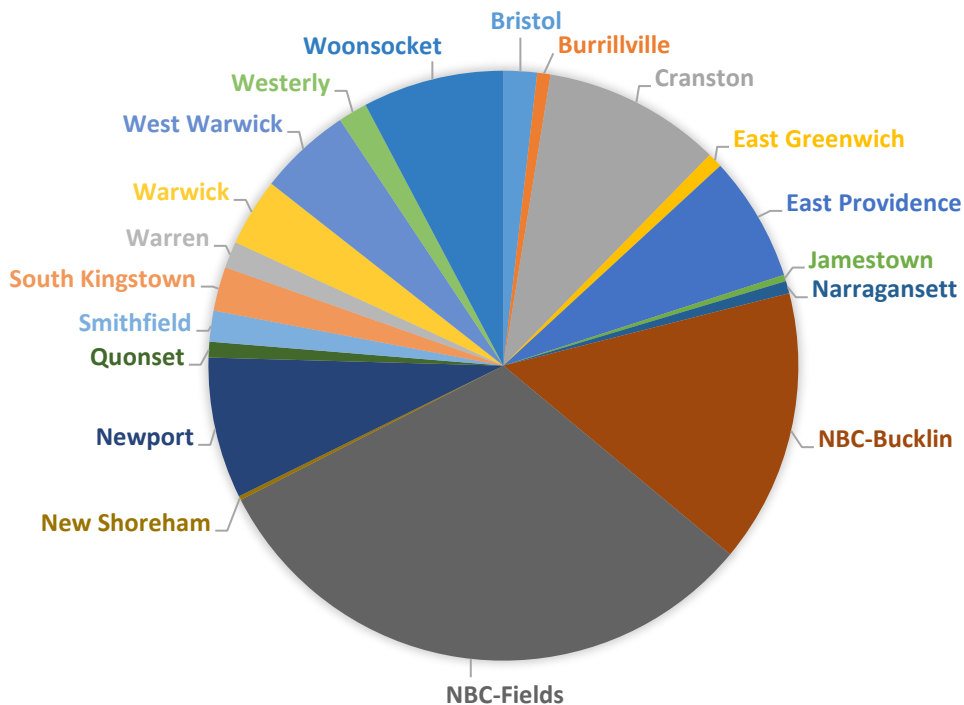
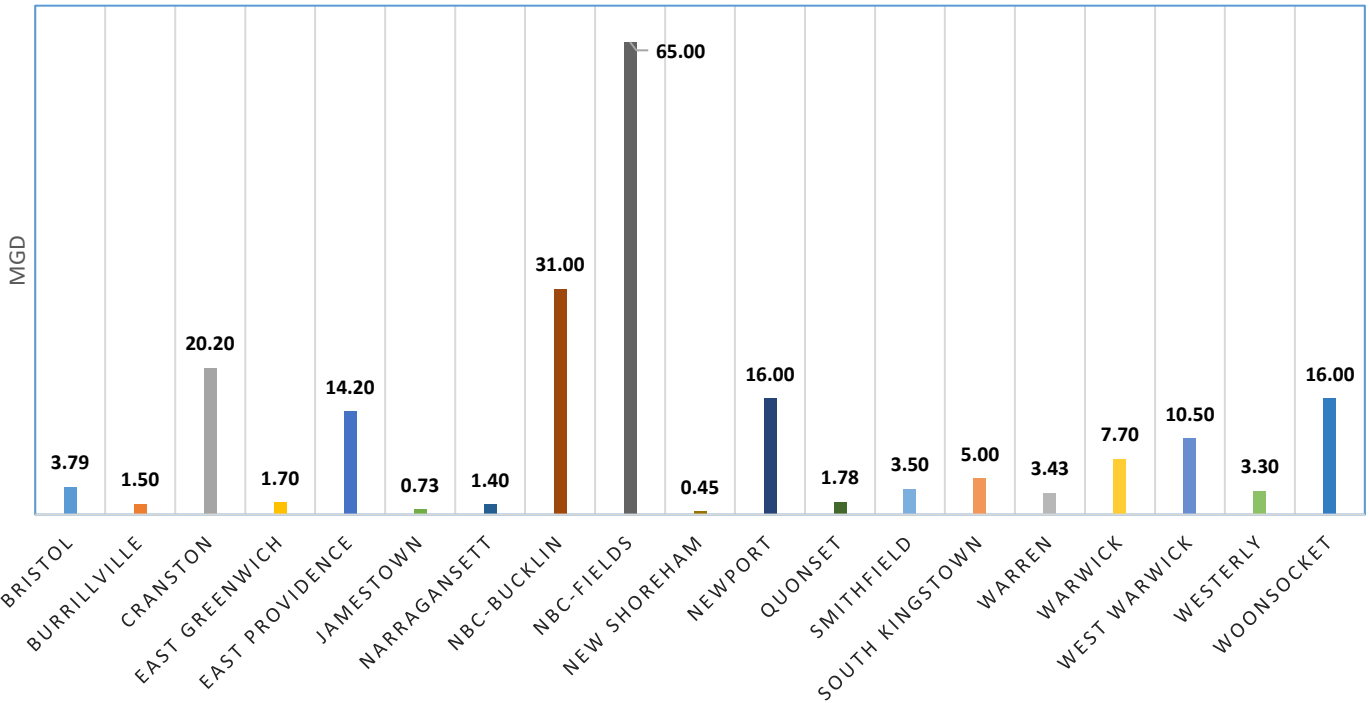
The following image provides the locations of the discharge points for each of the nineteen municipal wastewater treatment facilities in Rhode Island.



Design Flows

The following graphs compare design flows for the state's nineteen major wastewater treatment facilities. Design flows are established in wastewater facility plans based on current and future sewer service and twenty-year population predictions. In practice, facilities typically receive (and thus discharge) daily volumes that are less than design values.

The upper graph compares design flows in monthly average values (which are also given in the individual plant listings in the pages that follow). The pie chart then shows the relative contribution of each plant to total statewide flows.



Bristol	20,700 served	RI0100005	Bristol Harbor
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- Constructed in 1935 as a primary treatment plant
- Major upgrade in 1989 with Rotating Biological Contactors to provide secondary treatment
- Achieved water-quality based TRC limit of 0.364 mg/l in May 1996
- No advanced nutrient treatment required
- Design Flow: 3.79 MGD

Burrillville	9,700 served	RI0100455	Clear River
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- Constructed in 1980 as a secondary treatment plant; required to meet a Phosphorus limit of 1.0 mg/l by April 1981
- Achieved water-quality based TRC limits in May 1991 (0.041 mg/l at that time, but subsequently lowered to 0.022 mg/l in July 2020).
- Construction completion date of July 2017 to meet seasonal Phosphorous limit of 0.1 mg/l
- Design Flow: 1.5 MGD

Cranston	73,200 served	RI0100013	Pawtuxet River
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- Constructed in 1942 as a secondary treatment plant
- Upgraded in 1966
- New secondary treatment plant constructed in 1982
- Required to meet water-quality based TRC of limit 0.0225 mg/l in January 2001
- Construction completion date of January 2006 to meet the following seasonal nutrient limits: Ammonia (2 mg/l), Total Nitrogen (8 mg/l), and Phosphorus (1 mg/l)
- Construction completed September 2016 to meet the seasonal limit for Phosphorus of 0.1 mg/l
- Design Flow: 20.2 MGD

East Greenwich	6,000 served	RI0100030	Greenwich Cove
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- Constructed in 1927 as a primary treatment plant
- Upgraded in 1957 to trickling filters for biological treatment
- Major upgrade in 1989 with Rotating Biological Contactors to provide secondary treatment
- Converted to UV disinfection in February 2004; no need for water-quality based TRC limits
- Construction completion date of March 2006 to meet seasonal Total Nitrogen limit of 5 mg/l
- Reconstruction of advanced wastewater treatment sand filters completed in August 2019
- Design Flow: 1.7 MGD

East Providence	46,100 served	RI0100048	Providence River
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- Constructed in 1952 using trickling filters for biological treatment
- Upgraded in 1976 to secondary treatment
- Additional major upgrades in 1997
- Construction completion in November 2012 to meet seasonal Total Nitrogen limit of 5.9 mg/l
- Achieved water-quality based TRC limit in July 1998 (0.260 mg/l at that time, but subsequently lowered to 0.190 mg/l in April 2016).
- Design Flow: 14.2 MGD

Jamestown	2,100 served	RI0100366	Narragansett Bay West Passage
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- Constructed in 1980 as an “extended aeration” secondary treatment plant
- No advanced treatment required for discharge
- Constructed upgrades in 1995 for partial effluent diversion to seasonally irrigate town-owned golf course
- Technology based TRC limits of 2.0 mg/l meets water quality-based criteria
- Plant upgrades in 2007
- Design Flow: 0.73 MGD

Narragansett Scarborough	7,300 served	RI0100188	Rhode Island Sound
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- Built in 1965 as a primary treatment plant
- Upgraded in 1983 to “extended aeration” to provide secondary treatment
- Additional major upgrades in the mid 1990’s
- No advanced treatment required
- Achieved water-quality based TRC limit of 0.325 mg/l in November 1996
- Design Flow: 1.4 MGD

Narragansett Bay Commission Bucklin Point	120,000 served	RI0100072	Seekonk River
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- Constructed in 1954 as a primary treatment plant
- Upgraded to secondary treatment in 1972
- Additional major upgrades in 1985, 1989, and 1993
- Required to meet water-quality based TRC limit of 0.0075 mg/l in January 2000
- Converted to UV disinfection in June 2005; no need for water-quality based TRC limits
- Constructed wet weather treatment for combined sewage in December 2005
- Construction completion date of September 2006 to meet the following seasonal nutrient limits: Total Nitrogen (8 mg/l) and Ammonia (5.4 mg/l)
- Construction completion date of July 2014 to meet seasonal Total Nitrogen limit of 5 mg/l
- Design Flow: 31 MGD

Narragansett Bay Commission Fields Point	226,000 served	RI0100315	Providence River
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- Constructed in 1901 as a chemical precipitation plant, the third of its kind in the United States, and the largest of its type ever built
- Upgraded to secondary treatment 1930 -1934
- Major upgrades in 1946 - 1949, throughout the 1950s, and in 1992, which included a seasonal ammonia limit of 14.5 mg/L
- Constructed additional secondary clarifiers and Wet Weather CSO treatment in 1995
- Required to meet water-quality based TRC limit 0.065 mg/l in September 1999
- Required to meet seasonal total nitrogen limit of 5.0 mg/l in May 2015
- Phase 1 CSO Tunnel construction completed October 2008
- Phase 2 CSO interceptor and sewer separation construction completed in January 2015
- Construction completion in December 2013 to meet seasonal Total Nitrogen limit of 5 mg/l
- Aeration improvements completed August 2018
- Design Flow: 65 MGD

New Shoreham	Winter: 300 – 700 Summer: 4,000 served	RI0100196	Rhode Island Sound
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- Constructed in 1977 as a secondary treatment facility
- Achieved water-quality based TRC limit of 0.185 mg/l in November 1995
- Construction completion date of May 2005 to meet seasonal water quality-based Ammonia limits (11.2 mg/l at the time, subsequently reduced to 8.3 mg/l in July 2016, but no additional upgrades were required to meet the lower limit.
- Design Flow: 0.45 MGD

Newport	41,600 served	RI0100293	Narragansett Bay East Passage
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- Constructed in 1955 with “Imhoff Cone” technology, which provides primary treatment
- Upgraded in 1991 to secondary treatment
- No advanced treatment required for nutrient removal
- Required to meet water-quality based TRC limit 0.590 mg/ in September 2002
- Substantial plant upgrade including the conversion to ultra-violet disinfection in October 2018, thus there is no need for water-quality based TRC limits
- Design Flow: 16 MGD

Quonset	10,000 served	RI0100404	Narragansett Bay West Passage
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- Constructed in 1941 as a primary treatment plant
- Major upgrade in 1992 with Rotating Biological Contactors to provide secondary treatment
- No advanced treatment required for nutrient removal
- Required to meet water-quality based TRC limit 1.3 mg/l in February 2000
- Design Flow: 1.78 MGD

Smithfield	14,000 served	RI0100251	Woonasquatucket River
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- Constructed in 1978 as a secondary treatment facility
- Achieved water-quality based TRC limits of 0.02 mg/l in July 1996
- Construction completion date of July 2006 to meet the following seasonal nutrient limits: Ammonia (2.6 mg/l), Total Nitrogen (10 mg/l), and (on a limited basis) Phosphorous (0.2 mg/l)
- Construction completion date of May 2014 for technologies to meet Phosphorous limit of 0.2 mg/l during cooler weeks of early spring
- Design Flow: 3.5 MGD

South Kingstown	29,400 served	RI0100374	Narragansett Bay West Passage
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- Constructed in 1978 as a secondary treatment facility
- Constructed major upgrades in 1990
- No advanced treatment required for nutrient removal
- Achieved water-quality based TRC limit of 0.885 mg/l in December 1997
- Design Flow: 5.0 MGD

Warren	8,000 served	RI0100056	Warren River
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- Constructed in 1951 as a primary treatment plant
- Constructed new facility with secondary treatment in 1981
- Achieved water-quality based TRC limit 0.267 mg/l (Nov – Apr) and 0.361 mg/l (May – Oct) in February 1999
- Construction completion date of January 2020 to meet seasonal Total Nitrogen limit of 5 mg/l
- Upgrade of solids handling systems complete in November 2020
- Design Flow: 3.43 MGD (winter)/2.53 MGD (summer)

Warwick	60,200 served	RI0100234	Pawtuxet River
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- Constructed in 1965 as a secondary treatment facility
- Voluntarily made interim process and equipment changes in 2001 to reduce nutrients
- Required to meet water-quality based TRC limit of 0.020 mg/l in January 2002
- Construction completion date of November 2004 to meet the following seasonal nutrient limits: Ammonia (2 mg/l), Total Nitrogen: (8.0 mg/l), and Phosphorus (1 mg/l)
- Construction completed May 2016 to meet seasonal Phosphorous limit of 0.1 mg/l
- Design Flow: 7.7 MGD

West Warwick	31,600 served	RI0100153	Pawtuxet River
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- Constructed in 1942 as a secondary treatment facility
- Upgraded during the late 1960s
- Constructed a second full treatment train in 1973 (thus having two parallel trains)
- Constructed a new, single secondary treatment facility in 1993
- Required to meet water-quality based TRC limit of 0.019 mg/l in January 2001
- Construction completion date of July 2005 to meet the following seasonal nutrient limits: Ammonia (2 mg/l), Total Nitrogen (8 mg/l), and Phosphorus (1 mg/l)
- Converted to UV disinfection January 2005; no need for water-quality based TRC limits
- Construction completed February 2016 to meet seasonal Phosphorous limit of 0.1 mg/L
- Design Flow: 10.5 MGD

Westerly	16,500 served	RI0100064	Pawcatuck River
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- Constructed in 1927 with “Imhoff Tank” technology, which provides primary treatment
- Constructed a new primary treatment facility in 1957
- Constructed secondary treatment facility in 1980
- Required to meet water-quality TRC limit of 0.065 mg/l in November 1998
- Construction completion date of October 2003 to meet the following seasonal nutrient limits: Total Nitrogen (15 mg/l) and Ammonia (5.5 mg/l)
- Design Flow: 3.3 MGD

Woonsocket	51,400 served	RI0100111	Blackstone River
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- Constructed in 1897 as a chemically enhanced primary treatment facility
- Constructed a full primary and secondary treatment plant in 1931
- Constructed a new secondary treatment facility in 1975
- Required to meet water-quality based TRC limit of 0.056 mg/l in August 1999
- Construction completion date of September 2001 to meet the following nutrient limits: Ammonia 2 mg/l, Total Nitrogen 10 mg/l, and Phosphorus 1 mg/l
- Construction completed August 2016 to meet the following seasonal nutrient limits: Total Nitrogen (3 mg/l) and Phosphorus (0.1 mg/l)
- Design Flow: 16.0 MGD