TOWN OF NARRAGANSETT, RHODE ISLAND

Wastewater Facilities Plan

SEPTEMBER 2025

Wastewater Facilities Plan Update



WRIGHT-PIERCE
Engineering a Better Environment

Wastewater Facilities Plan Update
Town of Narragansett, Rhode Island

September 2025



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Section 1 Executive Summary

1.1 Project Need and Planning Area

The purpose of this Wastewater Facilities Plan is to evaluate the Town of Narragansett's wastewater needs for the next 20-year planning period. This includes review and analysis of the Scarborough Wastewater Treatment Facility and Narragansett's collection system. This report considers residential and commercial development in Town, sewer expansion needs to replace onsite wastewater treatment systems, and the wastewater needs for the fishing industry in the Port of Galilee.

The Town of Narragansett owns and operates the Scarborough Wastewater Treatment Facility, and the wastewater collection system serving the Town of Narragansett, Rhode Island. The Scarborough Wastewater Treatment Facility is located at 990 Ocean Road, Narraganset. It serves the southern end of Narragansett, including the port of Galilee. It is an activated sludge process that was originally constructed in 1983. The Narragansett collection system is divided into two parts. The north end of Town is served by the South Kingstown Regional Wastewater Treatment Facility on Westmoreland Street in Narragansett, and the south end of Town is served by the Scarborough Wastewater Treatment Facility.

1.2 Effluent Limitations

The Scarborough Wastewater Treatment effluent limits are governed by the Rhode Island Pollutant Discharge Elimination System (RIPDES) Permit No. RI0100188. The permit effective date is October 1, 2023. The key effluent limits for the Scarborough WWTF include: 1.4 MGD average monthly flow, 30 mg/l BOD5, 30 mg/l TSS, and 35 cfu/100 ml enterococci.

1.3 Flows and Loads Summary

1.3.1 Current Flows and Wasteloads

Operational data from the SWWTF from 2020 through 2023 was reviewed to identify the current flow and loading to the SWWTF. The current flows and loads are shown in Table 1-1.

Table 1-1 Current Flows and Wasteloads

Parameter	Flow (mgd)	BOD (lbs/day)	TSS (lbs/day)
Annual Average	0.72	1,250	1,400
Maximum Month	1.08	2,600	3,050
Maximum Day	2.38	3,750	5,250
Peak Hour	4.56	-	-
Peak Hour (99th percentile)	2.50	-	-

1.3.2 Future Flows and Wasteloads

Future wastewater flows and loads were projected to determine the future needs of the wastewater collection system and SWWTF for the 20-year planning period. Future wastewater flows and wasteloads were projected using

existing and future sewered population; projected residential and commercial growth; industry growth in the Port of Galilee; onsite wastewater treatment system (OWTS) to sewer conversions; and infiltration and inflow. The projected flows and wasteloads include current existing, projected future residential/commercial buildout, and projected future industrial. The projected future flows and loadings are summarized in Table 1-2.

Table 1-2 Future Wastewater Flows and Wasteloads

Parameter	Flow (mgd)	BOD (lbs/day)	TSS (lbs/day)
Future Residential/Commercial (Existing Plus Buildout)			
Annual Average	1.04	1,800	2,000
Maximum Month	1.56	3,750	4,450
Maximum Day	3.44	5,400	7,550
Peak Hour (99th percentile)	3.62	-	-
Future Residential/Commercial and Industrial (Fish Processing)			
Annual Average	1.06	2,300	2,350
Maximum Month	1.60	6,500	5,450
Maximum Day	3.53	9,000	9,000
Peak Hour (99th percentile)	3.69	-	-

1.4 Assess Current Situation

The Scarborough WWTF and Town's collection system were evaluated on their ability to reliably meet the projected future flows and wasteloads.

1.4.1 Scarborough WWTF

The SWWTF is an activated sludge treatment plant designed to remove biochemical oxygen demand (BOD_5) and total suspended solids (TSS) using an oxidation ditch followed by secondary clarification. Disinfection and dechlorination using sodium hypochlorite and sodium bisulfite follow secondary treatment before discharging treated effluent to Rhode Island Sound. Upstream of the secondary process influent wastewater is goes through screening and grit removal. Secondary sludge is stored in the sludge holding tank and the outer ring of the oxidation ditch. Waste sludge is thickened with a gravity belt thickener and hauled offsite for incineration.

The SWWTF is designed for 85% (minimum) removal of raw BOD_5 and TSS at an influent loading of 2,335 pounds (200 mg/l) of BOD_5 and TSS at a daily average flow of 1.4 mgd. Peak hydraulic capacity of the plant is designed for 4.2 mgd with three inner channels of the oxidation ditch in operation. The plant was designed to meet the discharge permit limits requiring a monthly average effluent BOD_5 and TSS not to exceed a concentration of 30 mg/l. Each unit process has adequate capacity for peak flow, but capacity in the secondary process is not sufficient for peak BOD and TSS loading.

Much of the equipment, buildings, and treatment units at the SWWTF have reached the end of their useful life. Some unit processes will require repair or replacement during the 20-year planning period, including:

- Aerated Grit
- Influent Pump Station
- Oxidation Ditch (Secondary Treatment)
- Secondary Clarifiers
- Disinfection and Dechlorination
- Solids Handling

1.4.2 Collection System

The collection system was evaluated on the ability to meet current peak flows and future peak flows for the 20-year planning period.

- The Burnside Pump Station was found to not have enough capacity for current peak flows. The remaining pump stations and interceptors are adequately sized for current peak flows.
- Operations staff reports Burnside Pump Station, Congdon Pump Station, Industrial Pump Station, Stanton Pump Station, and Lakewood Pump Station struggle to keep up with flow during wet weather events.
- Some pump stations have antiquated equipment and will require upgrades within the planning period. These include Circuit, Industrial Park, Wolfe, and Galilee Pump Stations.
- In the north collection system, Lakewood pump station does not have capacity to handle projected future flows.
- In the south collection system, Burnside, and Stanton pump stations do not have capacity to handle projected future flows.
- The sewer interceptors are adequate for future flows.

1.5 Alternatives Evaluation

1.5.1 Scarborough WWTF

Much of the equipment, tanks, and buildings at the SWWTF have reached the end of their projected service life and will need repair or replacement during the planning period. Baseline improvements are the minimum recommended repairs and replacements to ensure reliable plant operation. These baseline improvements will not expand capacity to meet projected future flows and loadings but are required to maintain reliable operation at existing levels. Baseline improvements include:

- Upgrades to aerated grit chamber, influent pump station, oxidation ditch, secondary clarifiers, chlorine contact tanks, solids handling process, Administration/Operations Building, and Maintenance/Control Building
- Construct a third secondary clarifier to provide capacity and redundancy.

Three alternatives were considered for expanding secondary treatment system capacity. Two alternatives were considered for the solids handling process. The opinion of probable project cost for the baseline improvements is $36.5 Million, which is included in the secondary treatment alternatives (One through Three).

1.5.1.1 Alternative 1: Optimization of Existing Facility

Alternative 1 aims to increase capacity in the secondary treatment system by maximizing the oxidation ditch. Alternative 1 includes the following:

- Baseline Improvements
- Replace existing aerators with new higher capacity aerators. Install additional aerators in Aeration Channel 2 and 3.
- Convert the Aerobic Digestion Channel, the outermost ring of the oxidation ditch, to an aeration tank for additional treatment volume.
- Construct a new waste sludge storage tank. (Aerobic Digestion Channel is no longer available for sludge storage).

Optimization of the existing oxidation ditch will provide capacity to treat the existing and forecasted future residential/commercial loads, but will not meet the needs of an expanded fishing industry.

The opinion of probable project cost for this alternative is: $41.7 Million.

1.5.1.2 Alternative 2: Primary Treatment, and Alternative 1 Improvements

Alternative 2 aims to increase capacity in the secondary treatment system by maximizing the oxidation ditch and adding a primary treatment process. Alternative 2 includes the following

In addition to the baseline alternatives recommended, Alternative 2 includes the following:

- Baseline Improvements.
- Construct two primary clarifiers, with associated scum and sludge storage, pump station, piping, and equipment.
- Modify influent pump station and force main to discharge to the primary treatment process.
- Optimize the existing oxidation ditch treatment, detailed in Alternative 1.
- Construct primary and secondary waste sludge storage tanks

Primary treatment and optimization of the existing oxidation ditch will provide capacity to treat the existing and forecasted future residential/commercial loads, but will not meet the needs of an expanded fishing industry.

The opinion of probable project cost for this alternative is: $52.2 Million.

1.5.1.3 Alternative 3: New Secondary Treatment System

Alternative 3 is to replace the existing oxidation ditch with a new diffused air activated sludge treatment process with anaerobic selectors. Alternative 3 includes the following:

- Baseline Improvements.
- Construct three rectangular aeration tanks with preceding anaerobic selector zones and aerated zones with fine bubble diffusers, with associated piping, mixers and blowers.
- Construct a new building to house blowers and electrical equipment.
- Construct three new secondary clarifiers.
- Construct a new waste sludge storage tank.

This alternative can be constructed to meet the current and future needs of the SWWTF including flows and loads from the expanded fishing industry in the Port of Galilee.

The opinion of probable project cost for this alternative is: $69.7 Million

1.5.1.4 Alternative 4: Solids Thickening Alternative

Alternative 4 is to upgrade the solids handling process with a new sludge thickening process. This alternative cost is additive to the selected Alternative 1, 2 or 3 which also include the Baseline improvement. This alternative includes:

- Install new Gravity Belt Thickeners (2 units), with additional sludge feed pumps and flow metering.
- Construct additional thickened sludge storage tank, with mixer and level sensors.
- Install additional polymer feed system with pump and appurtenances.

This alternative will treat the existing and forecasted future residential, commercial, and industrial (fish processing) loads. Future peak thickener operation will be 22 hours per week, and future peak sludge production will require 12 truckloads of thickened liquid sludge per week. Alternative sludge thickening technologies could also be considered.

The opinion of probable project cost for this alternative is: $3.8 Million

1.5.1.5 Alternative 5: Solids Dewatering Alternative

Alternative 5 is to replace the existing sludge thickening process with a sludge dewatering process. This alternative cost is additive to the selected Alternative 1, 2 or 3 which also include the Baseline improvement. his alternative will produce dry sludge cake for disposal rather than liquid sludge. This alternative includes:

- Install new dewatering equipment (Rotary drum thickener followed by a screw press, dewatering centrifuge or a rotary press) with additional sludge feed pump and flow metering
- Install conveyors and a trailer loading bay to handle dry sludge cake.
- Install additional polymer feed pump and appurtenances.

This alternative will treat the existing and forecasted future residential, commercial, and industrial (fish processing) loads. Future peak dewatering operation will be 43 hours per week, and future peak sludge production will require five trailer loads of sludge cake per week.

The opinion of probable project cost for this alternative is: $6.1 Million

1.5.1.6 Alternative 6: Maintain Sodium Hypochlorite Disinfection

Alternative 6 is to maintain and expand as necessary the sodium hypochlorite disinfection system. This alternative includes:

- Clean and inspect tanks during next scheduled maintenance when tanks are empty
- Repair all cracks in concrete by pressure injection of an epoxy resin as required
- Replace skimmer valves
- Replace Sodium Hypochlorite Shed and associated pumping equipment
- Construct additional volume for the chlorine contact tanks to meet 30 minutes of detention time at peak flow.
- This alternative will meat TR-16 disinfection guidelines for future peak flows.

The opinion of probable project cost for this alternative is: $0.75 Million

1.5.1.7 Alternative 7: UV Disinfection

Alternative 6 is to retrofit a UV disinfection system in the existing chlorine contact tanks as an alternative to sodium hypochlorite disinfection system. This alternative includes

- UV banks to be installed in retrofitted Chlorine Contact Chambers.
- Construction sequenced so UV banks are constructed in one contact chamber while sodium hypochlorite remains in use in the second chamber, to allow disinfection to continue during construction

The opinion of probable project cost for this alternative is: $1.3 Million

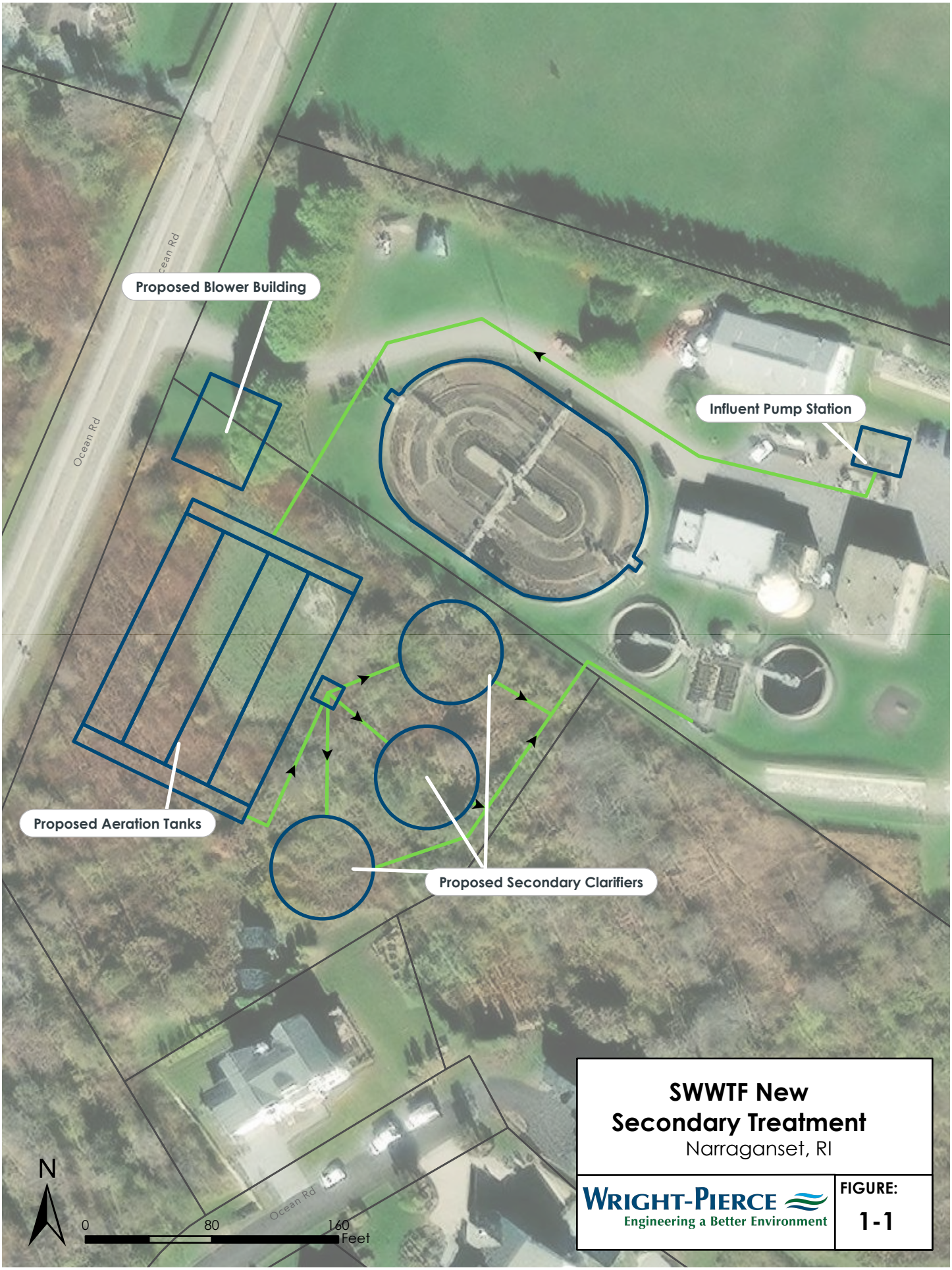
1.5.1.8 SWWTF Recommended Alternative

To meet existing, residential buildout/sewer expansion, and fishing industry flows and loads, a new secondary treatment and solids handling facility is recommended. The recommended plan is to construct the baseline plant improvements, construct a new secondary treatment system to replace the oxidation ditch, and replace the solids handling process with a new solids dewatering system.

- A new secondary treatment system is the only alternative that will provide enough treatment capacity to support economic development of the fishing industry in the port of Galilee. The new secondary treatment process will allow the oxidation ditch to be repurposed for aerobic sludge digestion and storage. The existing plant can operate uninterrupted while the new plant is constructed.
- Sludge dewatering is the recommended solids handling alternative because of the uncertainty of liquid sludge disposal at the Woonsocket Synagro facility. Sludge dewatering will also minimize the number of trucks required for sludge hauling and disposal.
- Maintaining the existing disinfection system (no chlorine contact tank expansion or UV installation) is recommended at this time. The Town has had success in meeting regulatory requirements for disinfection with this method.

Table 1-3 SWWTF Recommendation Opinion of Probable Cost Summary

Alternative	Description	Cost
B	Baseline Improvements	$36.5M
3	Secondary Treatment System	$33.2M
5	Solids Dewatering System	$6.1M
Total		**$75.8M**

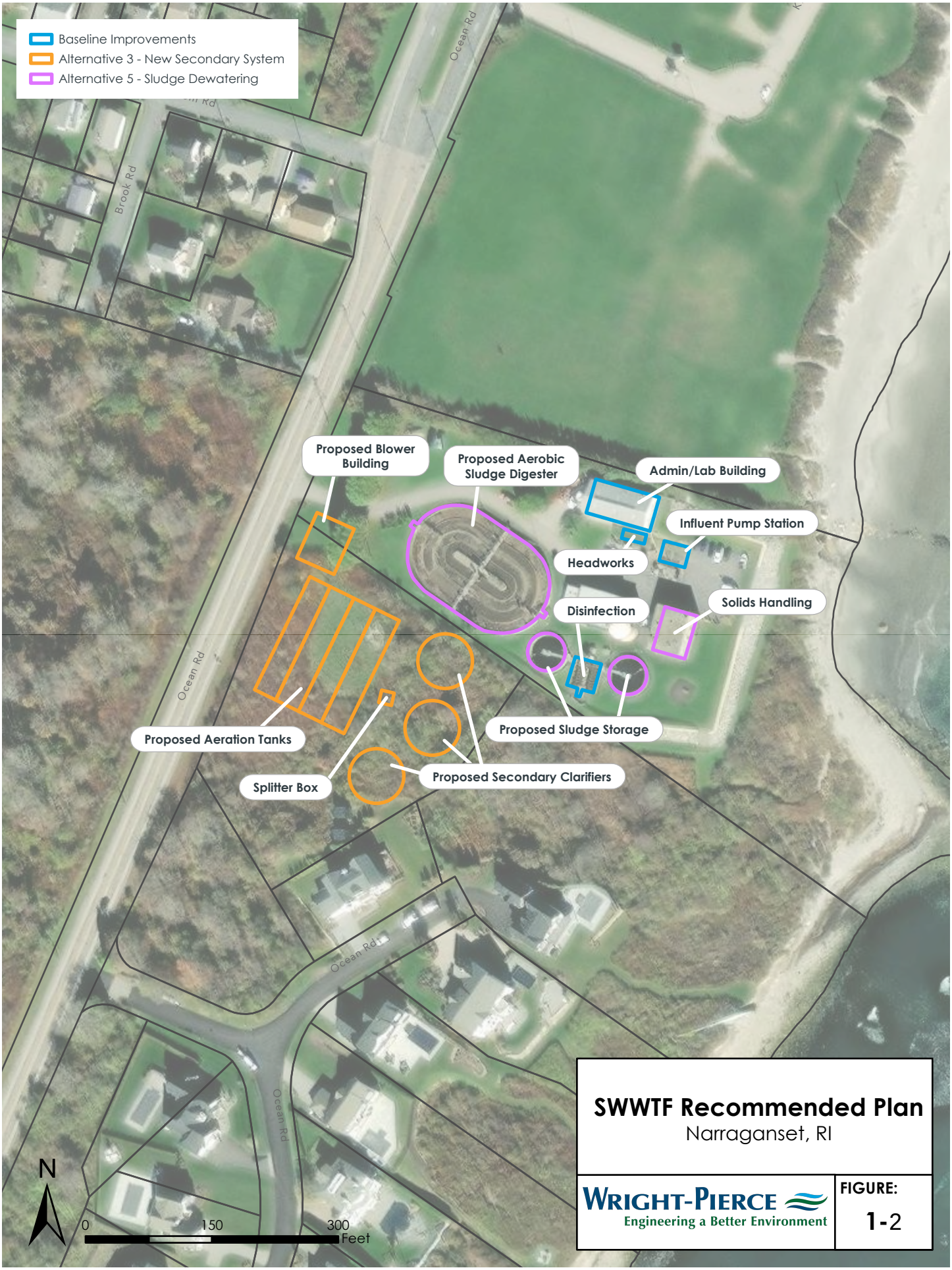


SWWTF New Secondary Treatment
Narraganset, RI

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FIGURE: 1-1

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SWWTF Recommended Plan

Narraganset, RI

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FIGURE: 1-2

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1.5.2 Collection System

The recommended plan for the collection system includes sewer expansion in areas with high concentrations of onsite wastewater treatment systems in areas with less than ideal soil conditions for proper OWTS functioning. Pump station improvements include capacity upgrades to meet future flow projections, and upgrades due to age/condition of equipment. The recommended plan for the collection system and pump stations are summarized in Table 1-4, Table 1-5, and Table 1-6.

Table 1-4 Summary of Collection System Expansion

Service Area	Cost	Description
Wandsworth Street	$18.9M	Pump Station, gravity and low pressure sewers, tributary to Lakewood PS
Bonnet Point	$11.3M	Low pressure sewer, tributary to Wolfe PS
Great Island	$27M	Pump Station, gravity and low pressure sewers, tributary to Galilee PS
Harbor Island	$26M	Pump Station, gravity and low pressure sewers, tributary to Briggs Farm PS
Baltimore Avenue	$5.4M	Gravity sewer, tributary to Burnside PS
Alexander Drive	$950,000	Gravity sewer, tributary to Burnside PS
Sunset Boulevard	$4.8M	Low pressure sewer, tributary to SWWTF by Point Judith Road Interceptor
Calef Avenue	$7.2M	Low pressure sewer, tributary to Point Judith PS
Sand Hill Cove Road	$3.1M	Low pressure sewer, tributary to Galilee PS
Total	$104.6M	

Table 1-5 Summary of Pump Station Recommendations North

Service Area	Cost	Description
Baneberry Pump Station	$550,000	Upgrade the electrical system.
Bonnet Shores Pump Station	$50,000	Replace equipment in-kind as needed. Install flood proofing improvements at pump station.
Circuit Pump Station	$1.5M	Comprehensive pump station upgrade due to age and condition of equipment.
Congdon Pump Station	$500,000	Upgrade pumps to meet future peak flows.
Industrial Park Pump Station	$640,000	Comprehensive pump station upgrade due to age and condition of equipment.
Lakewood Pump Station	$600,000	Comprehensive pump station upgrade due to age and condition of equipment.
Mettatuxet Pump Station	$200,000	Perform mechanical, electrical, and flood proofing improvements to the pump station.
Mumford Pump Station	$310,000	Upgrade the building's exterior.
Ouida Pump Station	$2.7M	Upgrade equipment in grit room, and replace process, mechanical, and electrical equipment as needed.
Seaport Pump Station	$200,000	Replace equipment in-kind as needed.
Sprague Pump Station	$650,000	Upgrade the electrical system, HVAC/mechanical upgrades, and building improvements.
Wilson Pump Station	$3.0M	Upgrade the pump station building.
Winterberry Pump Station	$3.4M	Upgrade the electrical system, and replace equipment in-kind as needed.
Wolfe Pump Station	$500,000	Comprehensive pump station upgrade due to age and condition of equipment.
Total	$14.8M	

Table 1-6 Pump Station Recommendations South

Service Area	Total Cost	Description
Briggs Farm Pump Station	$325,000	Replace equipment in-kind as needed.
Burnside Pump Station	$2.0M	Upgrade pumps to meet peak flows.
Galilee Pump Station	$4.0M	Comprehensive pump station upgrade due to age and condition of structure and equipment.
Point Judith Pump Station	$1.0M	Perform flood proofing improvements. Replace equipment in-kind as needed.
Stanton Pump Station	$2.0M	Upgrade pumps to meet future peak flows, perform equipment upgrades and flood proofing improvements.
Total	$9.3M	

2

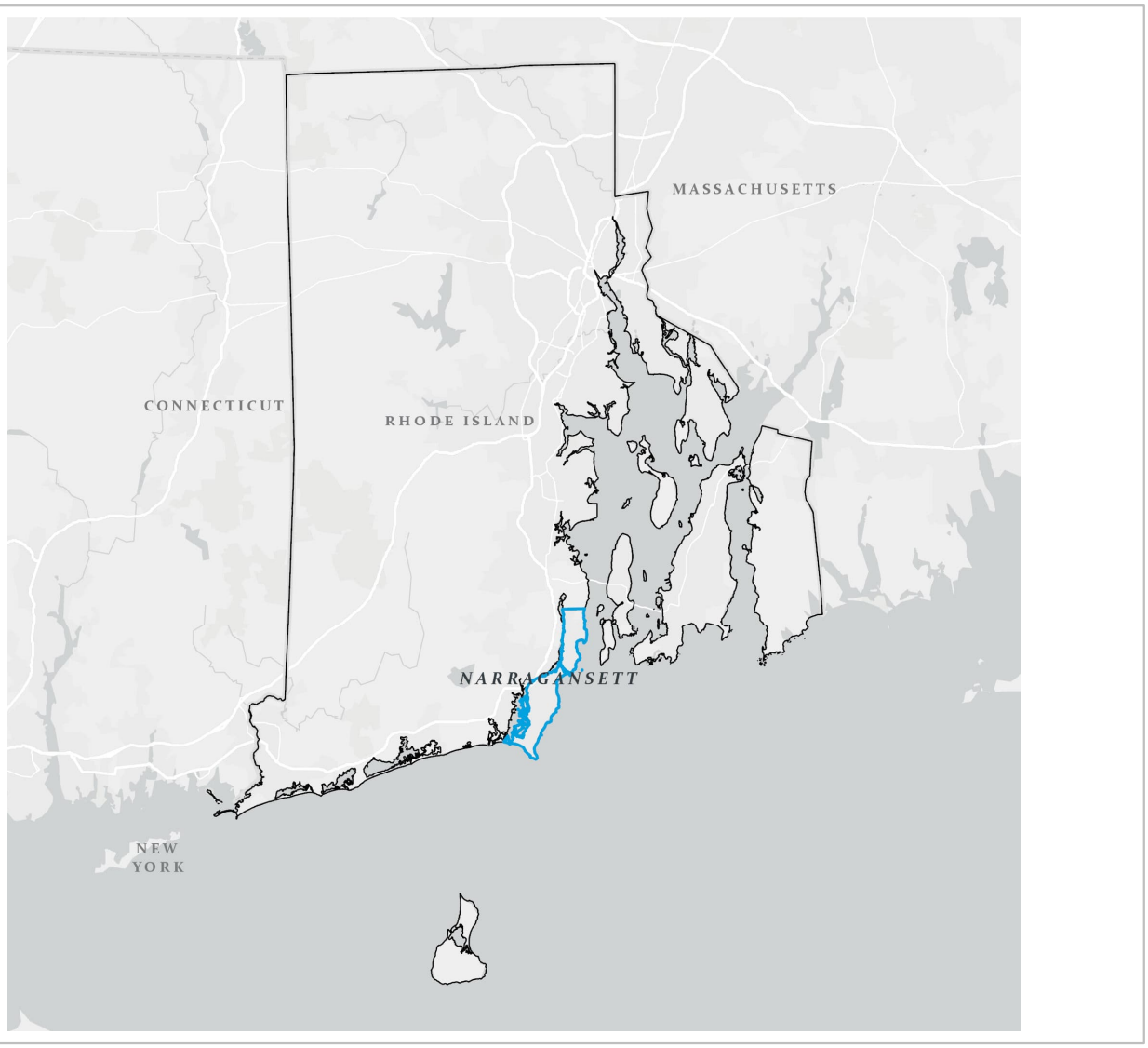
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Section 2 Statement of Project Need

The Town of Narragansett, Figure 2-1, owns and operates the wastewater collection system serving the Town of Narragansett, Rhode Island. The Narragansett collection system is divided into two parts. The north end of Town is served by the South Kingstown Regional Wastewater Treatment Facility on Westmoreland Street in Narragansett, and the south end of Town is served by the Scarborough Wastewater Treatment Facility. The collection system includes about 100 miles of sewer (65 miles in the north, and 35 miles in the south). The Town owns and operates 19 wastewater pumping stations (14 in the north and 5 in the south) and receives flow from ten privately-owned pump stations.

The last Town of Narragansett Wastewater Facilities plan was completed in 2007. The purpose of this report is to re-evaluate the Town of Narragansett's wastewater needs for the next 20-year planning period.

Figure 2-1 Narragansett, Rhode Island



2.1 Health, Security, Aging Infrastructure, & Resiliency

2.1.1 Scarborough WWTF

The Scarborough WWTF serves the southern end of Narragansett, including the port of Galilee. The Scarborough WWTF is permitted to treat 1.4 mgd. Treatment includes an oxidation ditch activated sludge process and disinfection by sodium hypochlorite. Treated effluent is disposed of through an ocean outfall off Scarborough Beach.

- Prior to 1994, the SWWTF experienced recurring permit violations that were directly attributable to overloading of the SWWTF with fish processing wastes from the Port of Galilee. At this time, the Town put ordinances in place requiring pretreatment. Enforcement of pretreatment requirements resulted in a decline in loadings to SWWTF and reliable RIPDES Permit compliance.

- Enforcement of the pretreatment program also resulted in less active seafood processing in Galilee. Seafood processors are operating at a reduced capacity and hauling process wastewater offsite, or shipping product landed in Galilee offsite for processing.

- Expanding wastewater treatment capacity for the Port of Galilee would allow the fishing industry to increase production and return seafood processing activities to Galilee. This would benefit not only Rhode Island, but the regional and national markets served by Rhode Island's fishing industry. Potential benefits include additional new jobs; an increase in the amount of fresh, locally processed seafood available to local consumers, an increase in the region's longer-term food security, and an increase in seafood product flowing through a shorter, less carbon-intensive, sustainable supply chain.

- The Town seeks to develop a wastewater facility expansion plan that will evaluate and recommend improvements required to expand wastewater treatment capacity to enable seafood processors in the Port of Galilee to discharge process wastewater to the WWTF.

2.1.2 Regional WWTF

The Regional WWTF is owned and operated by the Town of South Kingstown, and serves the towns of South Kingston and Narragansett, and the University of Rhode Island. Treatment capacity is allocated based on the historic capital investment provided by each partner. By the mid 1990s, the Town of Narragansett exceeded its allocated treatment capacity and is currently leasing unused treatment capacity from the University of Rhode Island. Sewer expansion and new sewer connection in the north end of Town tributary to the Regional WWTF is limited by available treatment capacity. The Town established a limit of 85 percent of Narragansett's total available capacity at the Regional WWTF as a not-to-exceed threshold for evaluating new sewer extensions.

- Sewer expansion in the northern portion of Narragansett is currently limited by available treatment capacity at the Regional WWTF.

- The Town seeks to identify sewer expansion need for the collection system tributary to the Regional WWTF and identify needed capacity at the Regional WWTF.

Current flow allocation at the RWWTF are shown in Table 2-1. The historical development of current flow allocations includes the following.

- 1972 Agreement. The Town of Narragansett enters into an intermunicipal agreement South Kingstown for regional sewerage service. Narragansett was allocated 19 percent (0.7847 mgd) of the plant capacity (4.13 mgd).
- 1991 Agreement. Improvements to the RWWTF expanded treatment capacity by an additional 0.87 mgd. The additional capacity was allocated equally between Narragansett (0.435 mgd) and South Kingstown (0.435 mgd). This agreement increased Narragansett's overall allocation to 24.4 percent (1.2197 mgd).
- 1995 Agreement. Narragansett entered an agreement to lease unused treatment capacity from the University of Rhode Island (URI). Narragansett leased 0.4 mgd capacity from URI for a term of five year
- 2001 Agreement. Narragansett leased 0.4 mgd unused treatment capacity from URI for an additional five year term. The agreement was renewed for an additional 5 year term.
- 2012 Agreement. Narragansett leased 0.2 mgd unused treatment capacity from URI for a five-year term. Lease agreement of 0.2 mgd is ongoing. The lease agreement was renewed in 2017, and 2023.

Table 2-1 Regional WWTF Flow Allocation

Partner	1974 Original Capacity mgd	Original Percentage	1991 Expansion Capacity mgd	Total Owned Capacity mgd	Current Owned Percentage
South Kingstown	1.6933	41	0.4350	2.1283	42.6
Narragansett*	0.7847	19	0.4350	1.2197*	24.4
University of Rhode Island	1.6520	40	0.00	1.652	33.0
Total	4.13	100	0.870	5.0	100

*Narragansett's available capacity includes 0.200 mgd leased from URI is 1.4197 mgd (28.4 percent)

2.2 Service Area Growth

The planning area for this project includes the entire Town of Narragansett, Rhode Island.

2.2.1 North Collection System

The north collection system is served by the Regional WWTF. Existing sewered area is shown in Figure 2-2. New sewer tie-ins are currently limited by the Town's treatment allocation at the Regional WWTF. Areas identified for sewer system expansion includes a majority of the north end area.

2.2.2 South Collection System

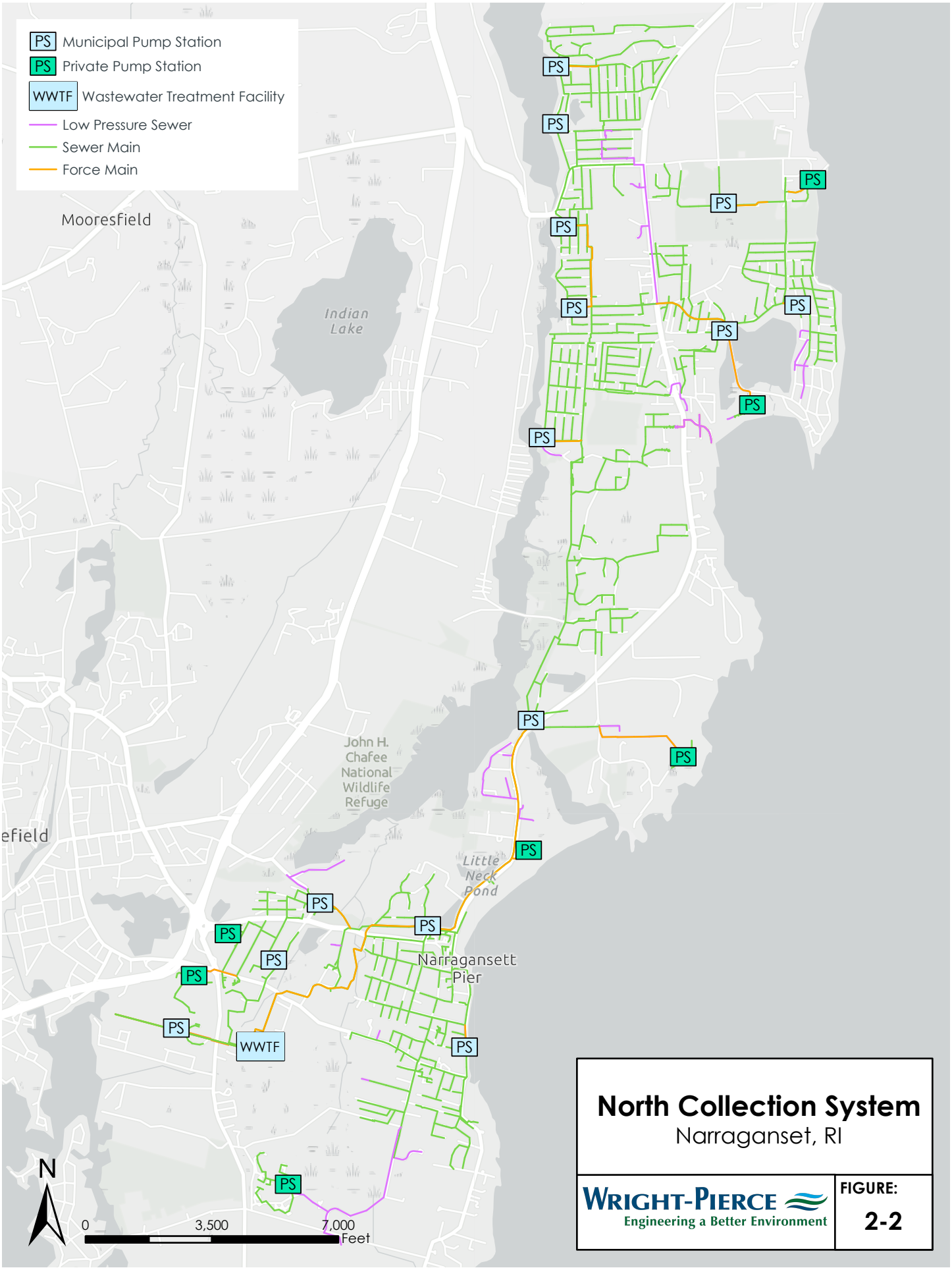
The south collection system is served by the Scarborough WWTF. Existing sewered areas are shown in Figure 2-3. Areas for collection system expansion includes a majority of the south end area except Jerusalem, located on the west side of Point Judith Pond.

2.3 New RIPDES Permit Limit(s) or Other Enforceable Actions

RIDEM issued a Rhode Island Pollutant Discharge Elimination System (RIPDES) permit (No. RI0100188) to the Scarborough WWTF which became effective on October 1st, 2023. This permit superseded the permit issued on August 1, 2017. Changes between the 2017 permit and the 2023 permit include:

- Monitoring for PFAS Analytes on a quarterly basis.
- Monitoring for TKN, Nitrate Total (as N), Nitrite Total (as N), and Nitrogen Total (TKN+Nitrate+Nitrite, as N) is now a year round requirement. The previous permit only required seasonal monitoring from May 1 to October 31.

No additional permit limits or enforceable actions are in place for Scarborough WWTF



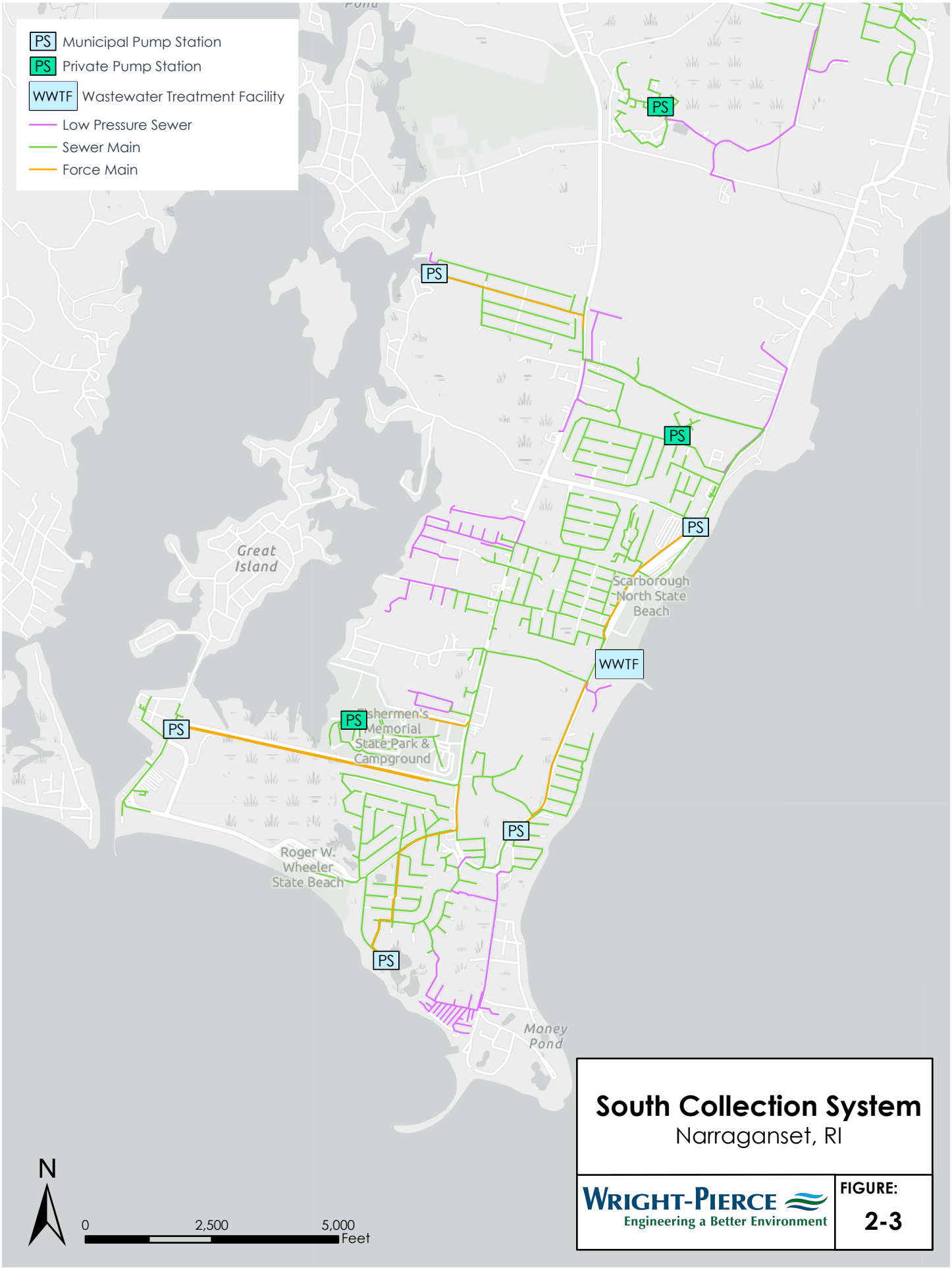
North Collection System

Narragansett, RI

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FIGURE: 2-2

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South Collection System

Narragansett, RI

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FIGURE:
2-3

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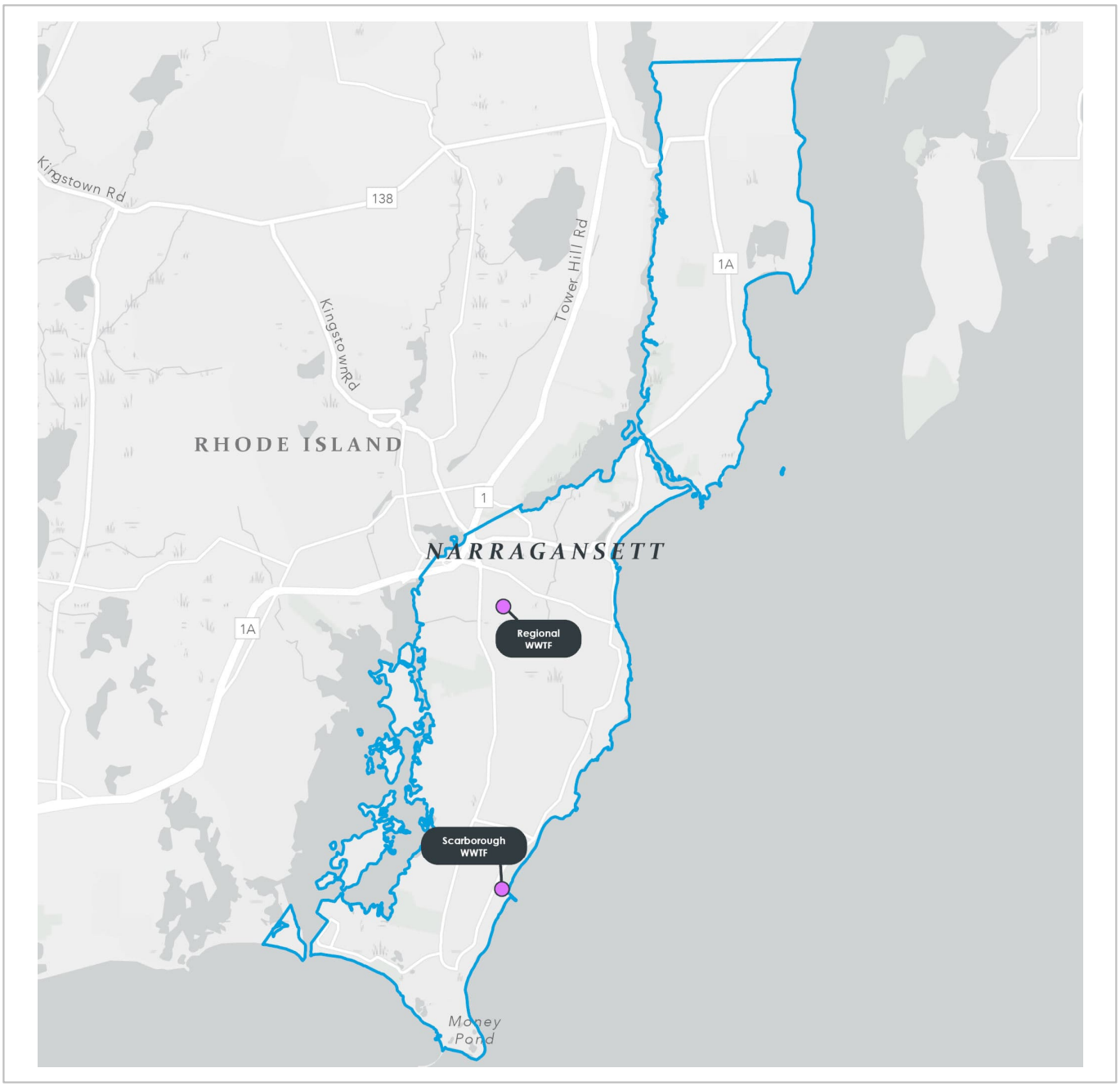
Section 3 Planning Area

3.1 Planning Area

3.1.1 Planning Area Description

The planning area for this project includes the entire Town of Narragansett Figure 3-1. Narragansett is located in southern Rhode Island, on the west side of Narragansett Bay. Narragansett is bordered by South Kingstown to the west, North Kingstown to the north, and the Rhode Island Sound and Narragansett Bay to the south and east.

Figure 3-1 Planning Area



3.1.2 Institutional (Governmental Unit) Structure

Narragansett government operates as a "council-manager" model. The Town Council is an elected body that sets town policies, passes local ordinance, and votes for appropriations. The Town Council appoints a Town Manager to oversee daily operations of the municipality.

3.1.3 Description of Wastewater Utility Management Structure

The Town's Engineering Department, through its Wastewater Division oversees wastewater utilities. Wastewater staff includes three supervisory personnel:

- The Superintendent has direct responsibility for the administration, operation and maintenance of the Scarborough WWTF and collection system.
- The Maintenance Supervisor oversees the daily plant maintenance activities as well as maintenance of the collection system.
- The Process Controller/Pretreatment Coordinator is a Grade II operator, responsible for coordinating plant operations and monitors the treatment process and permit compliance.
- Operations personnel include one Foreman and four Operators. Operators perform all preventative maintenance.

3.1.4 Current Rate Structure

The Town of Narragansett Wastewater Division operates as an Enterprise Fund, which is solely supported by user fees and charges (no property tax contribution). Sewer use billing is based on both an annual minimum charge and a usage charge, which is taken directly from the property's water meter reading. The minimum charge includes the first 8,000 cubic feet (59,800 gallons) of water consumption, and then a consumption charge for usage that exceeds the initial 8,000 cubic feet. Roughly 83% of our customers fall within this minimum annual usage allotment. The current rate structure is shown in Table 3-1.

Table 3-1 Sewer User Charge Rate

Description	FY23	FY24	FY25	FY26	FY27	FY28
Minimum Charge Per Unit Year (8,000 cubic feet of water consumption allowance)	$400.00	$484.00	$585.64	$603.24	$621.32	$639.96
Excess Rate: 8,001 – 20,000 cubic feet of water consumption (per 100 cubic feet)	$2.75	$3.33	$4.03	$4.15	$4.27	$4.40
Excess Rate: 20,001 – 30,000 cubic feet of water consumption (per 100 cubic feet)	$3.25	$3.93	$4.76	$4.90	$5.05	$5.20
Excess Rate: over 30,001 cubic feet of water consumption (per 100 cubic feet)	$2.75	$3.33	$4.03	$4.15	$4.27	$4.40

3.1.5 Entities Conducting Planning

This facilities plan is being conducted by the Town of Narragansett Engineering Department and Wastewater Division, in conjunction with their Consultant, Wright-Perce.

3.2 Relationship to Community Comprehensive Plan (CCP)

This facilities plan is consistent with the Town of Narragansett Community Comprehensive Plan: Baseline Report, Roadmap, Action Plan, prepared by Horsley Witten Group, Inc. and McMahon Associates, Inc., adopted by the Narragansett Town Council September 5, 2017. Buildout analysis, zoning and land use, and environmental concerns identified in the CCP were used to inform wastewater planning and needs assessment.

The CCP divides the Town into three planning districts: North End, Central, and South End. The South End planning district is generally served by the Scarborough WWTF. The Central and North End planning districts are generally served by the South Kingstown Regional WWTF.

3.3 Planning Area Maps

The Narragansett Community Comprehensive Plan mapping of natural, cultural, historical, and archeological resources has been included as Appendix A of this report. Maps include:

- Map 1 Washington County Region
- Map 2 Planning Districts
- Map 3 North End Current Land Uses
- Map 4 Central Area Current Land Uses
- Map 5 South End Current Land Uses
- Map 6 Zoning Districts
- Map 7 Community Facilities
- Map 8 Areas of High Density Residential and Commercial/Industrial Areas
- Map 9 Areas Vulnerable to Sea Level Rise
- Map 11 Historic, Cultural and Scenic Resources
- Map 12 Bedrock and Surficial Geology
- Map 13 Soil Constraints to Development
- Map 14 Hydrology
- Map 15 Areas Prone to Flooding
- Map 16 CRMC Water Use Categories
- Map 17 Inland Natural Resources
- Map 18 North End Protected Open Space, Outdoor Recreation and Farm, Forest & Open Space Program
- Map 19 Central Area Protected Open Space, Outdoor Recreation and Farm, Forest & Open Space Program
- Map 20 South End Protected Open Space, Outdoor Recreation and Farm, Forest & Open Space Program

4

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Section 4 Effluent Limitations

4.1 RIPDES Permit

The Federal Environmental Protection Agency has delegated to the State of Rhode Island the responsibility for establishing and enforcing effluent discharge limitations which would ensure the respective water quality standards of the receiving waters.

The water quality management program is overseen by the Rhode Island Department of Environmental Management (RIDEM). RIDEM issued a Rhode Island Pollutant Discharge Elimination System (RIPDES) permit (No. RI0100188) to the Scarborough WWTF which became effective on October 1st, 2023. This permit superseded the permit issued on August 1, 2017. Table 4-1 summarizes the RIPDES effluent limitations and monitoring requirements for the Scarborough WWTF. For more detailed information regarding the effluent limitations and testing procedures of Scarborough WWTF see the 2023 RIPDES Permit attached as Appendix B.

Changes between the 2017 permit and the 2023 permit include:

- Monitoring for PFAS Analytes on a quarterly basis.
- Monitoring for TKN, Nitrate Total (as N), Nitrite Total (as N), and Nitrogen Total (TKN+Nitrate+Nitrite, as N) is now a year round requirement. The previous permit only required seasonal monitoring from May 1 to October 31.
- Operation and maintenance of the sewer system now requires submission of a Resiliency Plan consistent with DEM's Guidance for the Consideration of Climate Change Impacts in the Planning and Design of Municipal Wastewater Collection and Treatment Infrastructure.
- Operation and maintenance of the sewer system will include inspection of the outfall pipe and associated effluent diffuser to ensure proper operation.

Table 4-1 Summary of Key RIPDES Permit Effluent Limitations

Effluent Characteristics	Discharge Limitations			Monitoring Requirements	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Flow	1.4 MGD	*(Average)	---MGD	Continuous	Recorder
BOD5	30 mg/L	45 mg/L	50 mg/L	3/Week	24-Hr. Comp.
CBOD5 – % Removal	85%			1/Month	Calculated
TSS	30 mg/L	45 mg/L	50 mg/L	3/Week	24-Hr. Comp.
TSS – % Removal	85%			1/Month	Calculated
Settleable Solids		--- mL/L	--- mL/L	1/Day	Grab

Effluent Characteristics	Discharge Limitations			Monitoring Requirements	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Enterococci	35 cfu /100 mL		276 cfu /100 mL	3/Week	Grab
Fecal Coliform	-- MPN /100 ml		-- MPN /100 ml	3/Week	Grab
Total Residual Chlorine (TRC)	325 µg/L		325 µg/L	Daily	Grab
pH	(6.0 SU)		(9.0 SU)	2/Day	Grab
Copper, Total	--- µg/L		--- µg/L	1/ Quarter	24-Hr. Comp.
Cyanide	--- µg/L		--- µg/L	1/ Quarter	Composite
Cadmium, Total	--- µg/L		--- µg/L	1/ Quarter	24-Hr. Comp.
Chromium, Hexavalent	-- µg/l		-- µg/l	1/Quarter	24-Hr. Comp.
Lead, Total	--- µg/L		--- µg/L	1/ Quarter	24-Hr. Comp.
Zinc, Total	--- µg/L		--- µg/L	1/ Quarter	24-Hr. Comp.
Nickel, Total	--- µg/L		--- µg/L	1/ Quarter	24-Hr. Comp.
Aluminum, Total	--- µg/L		--- µg/L	1/ Quarter	24-Hr. Comp.
Oil and Grease			--- mg/L	1/Month	3 Grabs
TKN (May 1- October 31)			--- mg/L	1/Month	24-Hr. Comp.
Nitrate, Total (as N) (May 1- October 31)			--- mg/L	1/Month	24-Hr. Comp.
Nitrite, Total (as N) (May 1- October 31)			--- mg/L	1/Month	24-Hr. Comp.
Nitrogen, Total (TKN+ Nitrate+ Nitrite, as N) (May 1- October 31)			--- mg/L	1/Month	Calculated
LC50 (Mysids)			100% or Greater	1/ Quarter	24-Hr. Comp.
PFAS Analytes			---ng/L	1/Quarter	Grab

Notes:

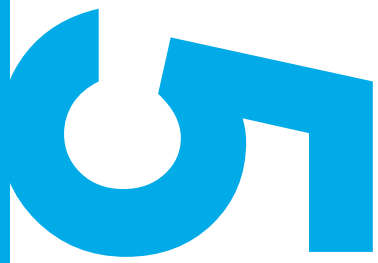
1. --- Signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.
2. Values in parentheses () are to be reported as Minimum/Maximum for the reporting period rather than Average Monthly/Maximum Daily.

4.2 Receiving Water 303(d) List Status

The Scarborough Wastewater Treatment Facility discharges to the coastal waters in the vicinity of Scarborough State Beach. The waters are identified on the April 2024 RIDEM list of impaired waters as Category 2. Category 2 indicates the waters fully support some of their designated uses and there is insufficient data to evaluate other designated uses.

4.3 Impact of Facilities Plan on 303(d) List Waters

The Town of Narragansett has four Category 4A waters identified on the RIDEM 2024 Impaired Waters List. Category 4A waters are waters for which a TMDL has been approved. Category 4A impacted waters in the planning area include Point Judith Pond, Mumford Brook, Crooked Brook, and the Pettaquanscutt (Narrow) River. The identified impairment/cause for each of these waters is fecal coliform. The impairment limits shellfish consumption, primary contact recreation, and secondary contact recreation. This facility plan aims to expand municipal sewer access. This will directly address one potential source of fecal coliform: inadequately treated wastewater from septic systems in close proximity to the water.



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Section 5 Assess Current Situation

5.1 Environmental Conditions

5.1.1 Geophysical

Narragansett is a coastal community, bordered on the east and south by the Atlantic Ocean (Rhode Island Sound and Narragansett Bay). The western boundary of the Town is generally formed by Point Judith Pond and the Pettaquamscutt (Narrow) River.

Narragansett geology includes two principal types of bedrock (Appendix A, Map 12). South of Wesquage Pond to Point Judith is Narragansett Pier Granite. North of Wesquage Pond is primarily Rhode Island Formation. Surficial geology (above bedrock, below soil) is 80 percent glacial till, poorly sorted and compacted mixture of boulders, gravel, silt, and clay. The remaining 20 percent is glacial outwash, deposits from melting streams on the margins of the retreating glaciers. Outwash deposits are primarily located along the shores of the Narrow River and Point Judith Pond.

Most soils in Narragansett originated from glacial till. The soils are highly compacted and contain soil layers that are nearly impervious to water. Low lying areas often remain saturated. In better drained areas, the glacial till soils are characterized by slow permeability and seasonally high water tables. Approximately 73 percent of the soils in Narragansett present constraints for the efficient operation of septic systems.

The Town has developed a High Water Table Limitation Overlay District (Appendix A, Map 13), identifying areas with a high water table. Town zoning laws have specific development constraints for this environmental overlay district. High Water Table District A is where the water table is zero to 18 inches from the surface, and is typically wetlands. District B is where the water table is 18 to 36 inches from the surface. In these areas, the high water table low soil permeability impairs the functioning of septic systems. Development in these areas is limited without sewers.

Around the Narrow River and Point Judith Pond, soils were formed from glacial outwash, and are generally a well sorted mix of sands and gravels which can have high percolation rates (five minutes per inch or greater). Soils with high percolation rates may not adequately treat septic effluent for pathogen, nitrate and nutrient removal CRMC requires denitrification septic systems for dwelling and businesses within its Special Area Management Plans. Any new or repaired septic system within the CRMC Critical Resource Boundary requires a denitrification system.

5.1.2 Surface Water

The state of Rhode Island categorizes wetlands into five principal types: marine, estuarine, riverine, lacustrine, and palustrine. Wetland features in Narragansett are shown on Appendix A, Map 14.

- Marine wetlands include the ocean and associated intertidal zone.
- Estuarine wetlands are associated with ecological systems that receive both fresh and saltwater inputs. Narrow River and Point Judith Pond are estuarine systems. Estuarine wetlands in Narragansett include over 400 acres of salt marsh.

- Palustrine wetlands are associated with small (less than 20 acres) fresh, open or vegetated freshwater systems. Palustrine wetlands in Narragansett include forested wetlands and scrub-shrub wetlands, and emergent non-woody vegetated wetlands. Palustrine wetlands generally correspond to High Water Table A District.

- Lacustrine wetlands are associated with fresh, open water areas greater than 20 acres. There are no lacustrine wetlands in Narragansett.

Narragansett includes four main watersheds (Appendix A, Map 14): Narrow River (2,848 acres), Point Judith Pond (2,337 acres), Atlantic Ocean/Narragansett Bay (3,112 acres) and Wesquage Pond (783 acres).

In Narragansett, flood zones are generally contiguous to the ocean/estuarine shoreline and adjacent low-lying areas. Flood zones include A zones and V zones. V zones (velocity zones) are subject to wave action as well as flooding (Appendix A, Map 15).

The Town does not have any surface water supplies within its borders. Water is purchased wholesale from the Town of North Kingstown (sourced from the Hunt/Annaquatucket/Pettaquamscutt Aquifer) and Veolia Water RI (sourced from Chipuxet Aquifer).

5.1.3 Groundwater

Narragansett does not have municipal water supply groundwater aquifers, recharge areas, or wellhead protection areas within its borders. Water is purchased wholesale from Town of North Kingstown (sourced from the Hunt/Annaquatucket/Pettaquamscutt Aquifer) and Veolia Water RI (sourced from Chipuxet Aquifer).

The surficial geology of Narragansett (glacial till) is generally not a good source for municipal drinking water supply. The compacted materials do not allow groundwater to flow easily. The glacial outwash deposits near Point Judith Pond and the Narrow River are situated too close to saltwater sources to be of any value for drinking water supply.

5.1.4 Surface and Groundwater Quality, Quantity, and Uses

The four main watersheds in Narragansett are Narrow River, Point Judith Pond, Atlantic Ocean/Narragansett Bay, and Wesquage Pond, shown on Map 14 in Appendix A. These marine and coastal resources are important economic and environmental assets for the Town of Narragansett. Tourism and fishing industries are vital for the town's economy, and depend on the protection of the town's water resources. The waterbodies are susceptible to non-point pollution sources including under-functioning septic systems, erosion from construction sites, and stormwater runoff from residential lawns, roads and parking lots.

5.1.4.1 Point Judith Pond

- Point Judith Pond is a salt pond with a watershed of about 2,337 acres. Point Judith Pond borders the Towns of Narragansett and South Kingstown.

- Point Judith Pond is home to the state's largest commercial fishing port, and one of Rhode Island's largest recreational boating centers.

- Point Judith Pond is connected to Block Island Sound by a permanent breachway. The waters close to the breachway are flushed rapidly with the tides and share qualities with the waters of Block Island Sound. Waters to the north of this area are brackish (mix of fresh and salt waters) with little wave action. This estuary is crucial for the survival of all important sports and commercial fisheries in the State. Point Judith Pond and similar estuaries serve as the breeding habitat for more than 70% of Rhode Islands commercial fin fish catch.

- Past analysis has shown elevated coliform and fecal coliform readings in Point Judith Pond. Contamination is likely due to many factors including failing septic systems, improper waste disposal from boats, increased number of boats, and urban runoff.

- Point Judith Pond is identified as a Category 4A impaired water by RIDEM. The impairment is fecal coliform. Point Judith Pond does not support shellfish consumption. Upper Point Judith Pond also does not support primary or secondary contact recreation.

- Point Judith Pond has been developed past it's carrying capacity per CRMC.

5.1.4.2 Narrow River

- The Narrow River is also known as the Pettaquamscutt River. The watershed is 2,848 acres. The River borders Narragansett and the Town of South Kingstown.

- The Narrow river is a popular recreation area for kayaks, windsurfing, motorboats and other small watercraft.

- The Narrow River estuary has deep northern basins (up to 60 feet). Remaining portions of the river are about 3 to 5 feet deep. Dense development, lack of sewers, poor soils and steep slopes of Narrow River makes adverse impact to waterbody.

- The Narrow River has been identified as a significant natural area by the Rhode Island Natural Heritage Program and a priority wetland in New England by the EPA.

- The watershed has been closed to all shell fishing since 1989.

- CRMC's Narrow River Special Area Management Plan, revised in 1998 outlines CRMC's policies and regulations relative to development in the watershed.

- Narrow River is identified as a Category 4A impaired water by RIDEM The impairment is fecal coliform. Narrow River does not support shellfish consumption.

- Sewer extensions to the Narrow River area and implementation of the Tri-Town Narrow River Stormwater Management Plan are designed to improve the existing water quality of the river.

- A dredging project at the mouth of the Narrow River, at the north end of Town Beach is currently in the planning/permitting stage.

5.1.4.3 Wesquage Pond

- Wesquage Pond is a 60 acre barrier pond located in Bonnet Shores. The soils around the pond are characterized by a high water table.

5.1.4.4 Narragansett Bay and Rhode Island Sound

- The water quality in Rhode Island Sound and the lower portion of Narragansett Bay is generally good due to few discharges and high rate of flushing. Two WWTF discharges are the exception.

- The Westmoreland Regional WWTF discharge is located 1500 feet east of the North Pier. The Scarborough WWTF discharge is located about 2,200 feet offshore from Scarborough Beach.

- The coastal watershed provides recreational fishing and some inshore commercial fishing (lobster trapping, fish traps, and inshore trawling).

5.1.5 Documentation of OWTS Problem Areas

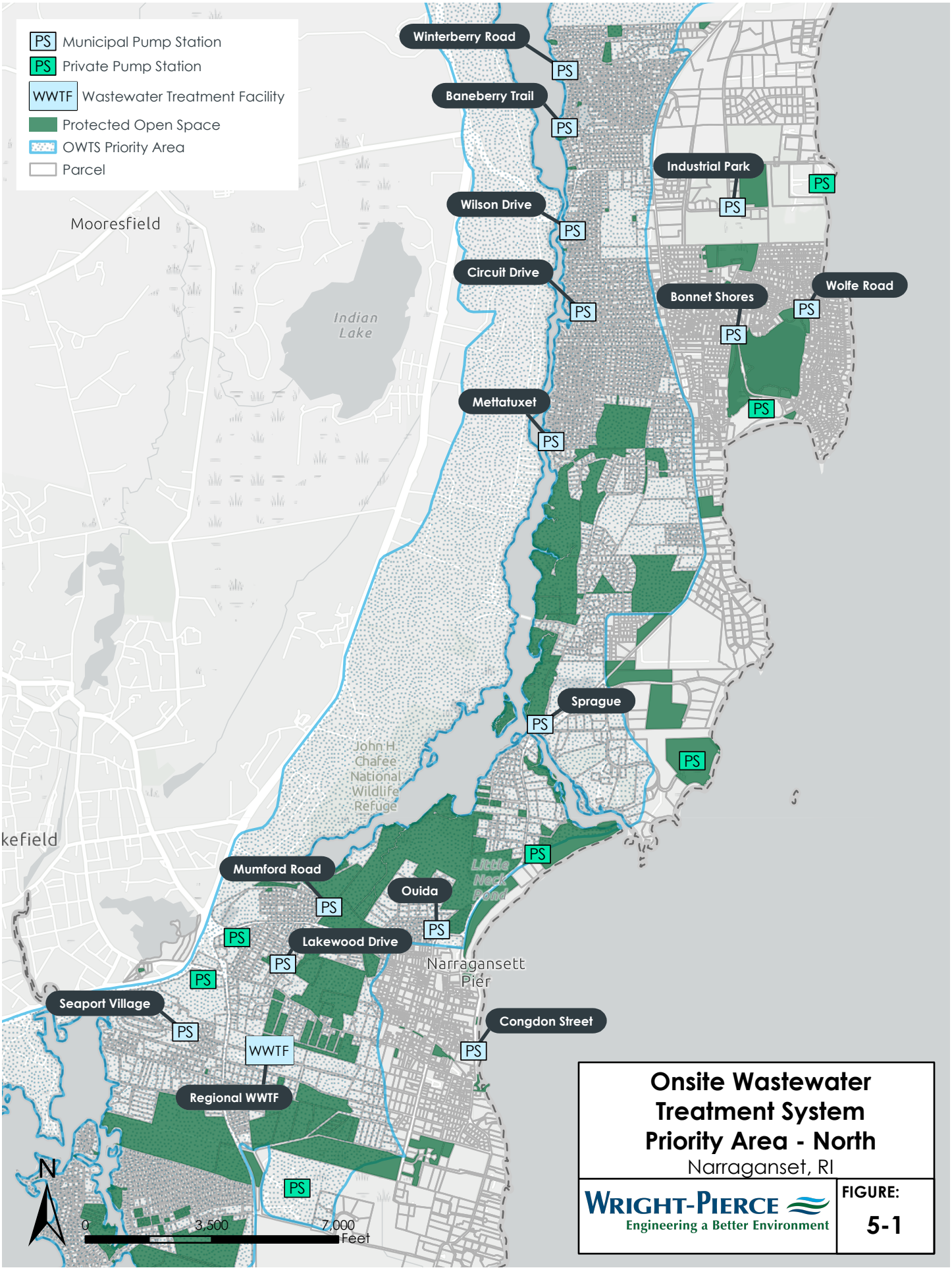
Most of the Town of Narragansett is sewered, but portions of the Town rely on onsite wastewater treatment systems (OWTS). The Town adopted the Narragansett Wastewater Management District to ensure these systems are properly maintained and regularly inspected. The ordinance mandates septic tank pumping every four years by property owners. Property owners are required to self-report septic system pumping. The Town maintains the Carmody database to track onsite wastewater treatment systems in Town. Homeowners with failed septic systems can consider the Rhode Island Infrastructure Bank's Community Septic System Loan Program. The program can provides low cost/long term financing for repairing substandard septic systems.

The Town provided records of existing properties OWTS. There are 943 OWTS in the northern service area, and 1,136 OWTS in the southern service area. The majority of the OWTS are concentrated in a few neighborhoods not currently served by sewers Table 5-1.

Table 5-1 Concentrations of Onsite Wastewater Treatment Systems

Neighborhood/Plat	Tributary Pump Station	OWTS	Sewer Area
Plats T,V,Y-4	Burnside PS	119	South
Great Island/Galilee	Galilee PS	420	South
Point Judith	Stanton PS /Point Judith PS	120	South
Sunset Boulevard	--	100	South
Harbor Island	Briggs Farm	355	South

Coastal Resources Management Council (CRMC) has developed and implemented Special Area Management Plans (SAMPs) for the Salt Pond and Narrow River areas. Many of the OWTS are located in the Special Area Management Plan boundaries. The regulated areas, shown in Figure 5-1 and Figure 5-2, have special requirements for the construction of OWTS and sewer extensions. Future sewer extensions will need to be reviewed and coordinated with CRMC.



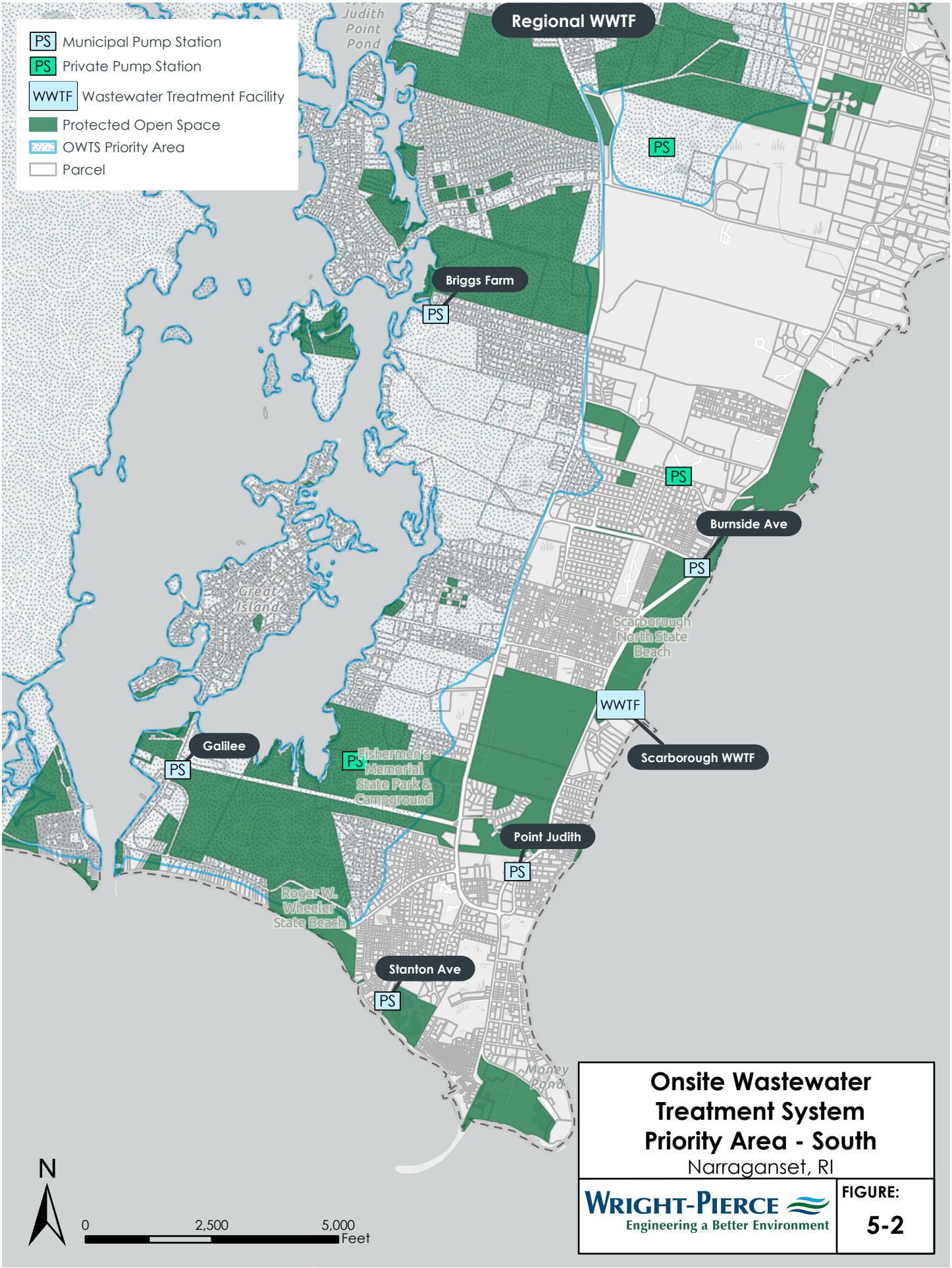
Onsite Wastewater Treatment System Priority Area - North

Narragansett, RI

WRIGHT-PIERCE
Engineering a Better Environment

FIGURE: 5-1

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Onsite Wastewater Treatment System Priority Area - South

Narragansett, RI

WRIGHT-PIERCE
Engineering a Better Environment

FIGURE: 5-2

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5.1.6 Land-Use and Demographic Data

The Town of Narragansett is shown on Appendix A, Map 1. The Community Comprehensive Plan divides the Town into three planning districts (Appendix A, Map 2): North End, Central Area, and South End. The South End planning district is in the service area for the Scarborough WWTF. The remainder of the Town (North End, Central Area) are in the service area of the Regional WWTF. Current land use is shown on Appendix A, Maps 3, 4, and 5. Map 8 shows areas of high density residential and commercial and industrial areas.

5.2 Scarborough Wastewater Treatment Facility (SWWTF)

5.2.1 General

The SWWTF is an activated sludge treatment plant designed to remove biochemical oxygen demand (BOD_5) and total suspended solids (TSS) using an oxidation ditch followed by secondary clarification. Disinfection and dechlorination using sodium hypochlorite and sodium bisulfite follow secondary treatment before discharging treated effluent. Upstream of the secondary process influent wastewater is pretreated for debris and grit removal. Secondary sludge is stored in the sludge holding tank and the outer ring of the oxidation ditch. Waste sludge is thickened with a gravity belt thickener and hauled offsite for incineration.

The SWWTF treats wastewater flows from the South End Sewer System of Narragansett, RI. Sources of wastewater flows to the SWWTF include single and multiple family residential units, motels and other small commercial establishments, public buildings, fishing industry, infiltration into the sewer system from groundwater, and inflow from stormwater run-off. The facility does not receive septage.

The SWWTF is designed for 85% (minimum) removal of raw BOD_5 and TSS at an influent loading of 2,335 pounds (200 mg/l) of BOD_5 and TSS at a daily average flow of 1.4 mgd. Peak hydraulic capacity of the plant is designed for 4.2 mgd with three inner channels of the oxidation ditch in operation. The plant was designed to meet the discharge permit limits requiring a monthly average effluent BOD_5 and TSS not to exceed a concentration of 30 mg/l. The SWWTF design parameters are shown in Table 5-2 and Table 5-3. The process flow diagram is shown in Figure 5-3.

Table 5-2 Scarborough WWTF Existing Design Parameters

Description	Design Value
Influent Average Flow (MGD)	1.4 MGD (ADF)
Influent Peak Flow	4.2 MGD (PF)
Influent BOD	2,335 lbs./day, 200 mg/L
Influent TSS	2,335 lbs./day, 200 mg/L
Effluent BOD	30 mg/L
Effluent TSS	30 mg/L

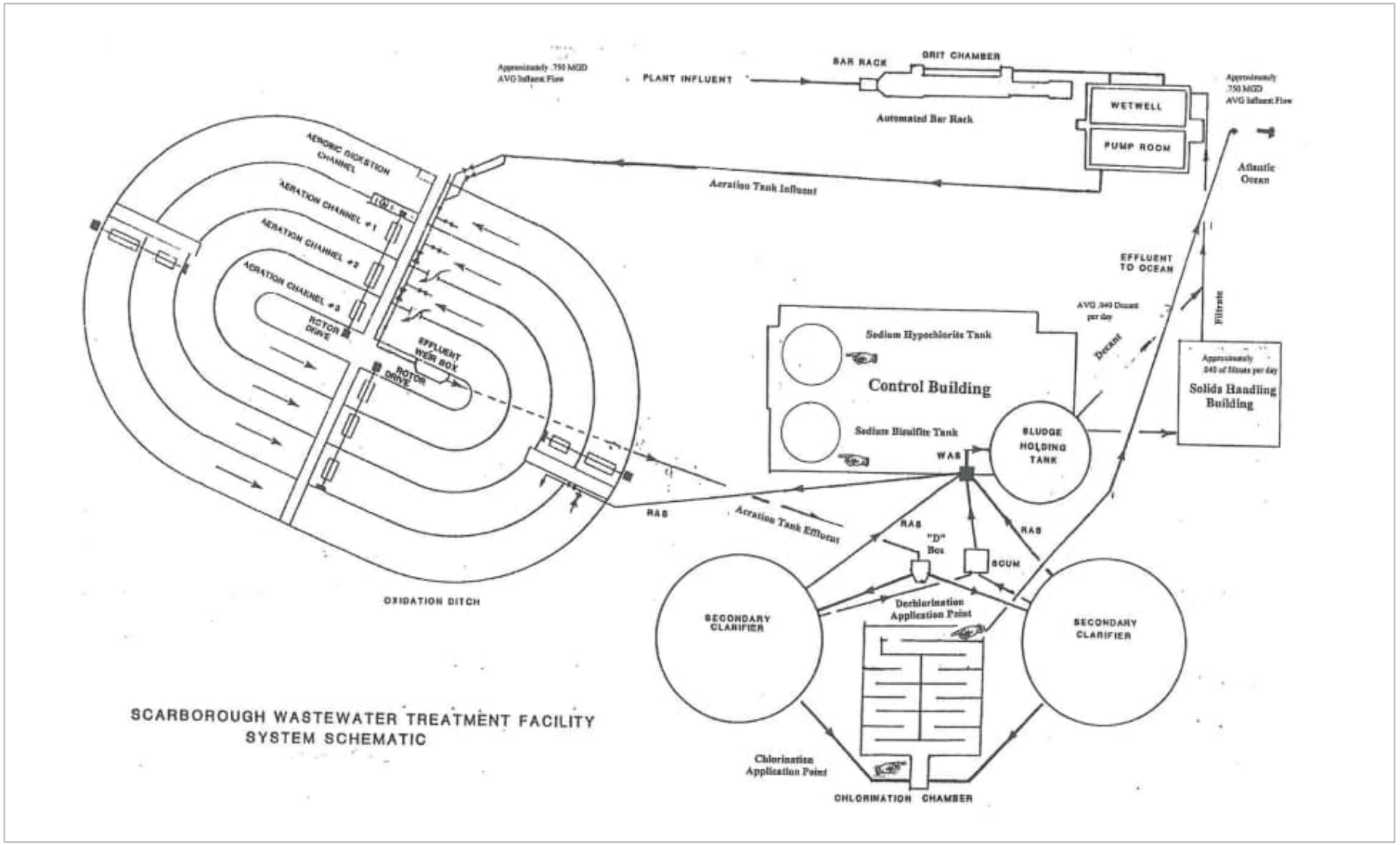
Table 5-3 Scarborough WWTF Unit Process Existing Design Parameters

Unit Process	Number of Units	Design Value	
Preliminary Treatment Data			
Bar Rack	1	Dimensions Depth of Flow @ 4.2 MGD Max Flow	24” W x 36” D 1.89 feet 6.7 MGD
Influent Screen	1	Capacity	3.0 MGD
Grit Chamber	1	Capacity	4.0 MGD
Influent Pump Station	2 1	25 HP each 20 HP	1,600 gpm, 44 TDH 1,200 gpm, 44 TDH
Aeration Basin / Oxidation Ditch Data / Secondary Treatment			
Aeration Basin Aeration Channel 1 Aeration Channel 2 Aeration Channel 3	3	Total Volume Volume Volume Volume	64,958 CF (485,886 gallons) 29,990 CF 20,383 CF 14,585 CF
Jet Aerators, Total Aeration Channel 1 Aeration Channel 2 Aeration Channel 3	8 4 2 2	29.5 lbs O_2/hour	Mixers 10 hp, blowers 2 hp
Operating Data		Return Sludge Rate Hydraulic Residence Time Volumetric Loading MLSS Total MLSS Volatile SS MLVSS Total MLVSS F/MLVSS Waste Sludge RAS Concentration (Estimate) Waste Sludge SRT Sludge Yield Horsepower Required	50% 15.7 hrs 16.6 lbs BOD/1000 CF 4,814 mg/l 19,508 lbs 81.2% 3,909 mg/l 15,840 lbs 0.07 8,302 GPD 1.0% 692 lbs/day 28.2 days 0.68 lbs TSS/lb BOD rem 38 HP

Unit Process	Number of Units	Design Value	
Aerobic Digestion Channel	1	Volume	38,191 CF (285,669 gallons)
Operating Parameters		Volumetric Loading HRT Digested Sludge Removal (Avg) Concentration TSS Reduction Solids Under Aeration SRT	14.7 lbs VSS/100 CF 34.4 days 2,362 GPD 395 lbs/day 2.0% 42.9% 47,650 lbs 121 days
Secondary Clarifiers	2	Volume (each) Volume (total)	103,396 gallons 206,792 gallons
		Surface Area (each) Surface Area (total)	1,257 sf 2,513 sf
		Weir Length (each) Weir Length (total)	126 lf 251 lf
		Surface Overflow Rate Average Daily Flow Peak Hourly Flow	 550 gpd/sf 1,652 gpd/sf
		Weir Loading Rate Average Daily Flow Peak Hourly Flow	 5,513 gpd/sf 16,434 gpd/sf
Disinfection			
Chlorine Contact Tank	2	Volume (each) Volume (total)	3,000 cf (22,440 gal) 6,000 cf (44,880 gal)
		Peak Flow Contact Time Avg. Daily Flow Contact Time	15 minutes 47 minutes
Chemical Storage Tanks Tank 1 Sodium Hypochlorite Tank 2, Sodium Bisulfite	2 1 1	 Storage Capacity Storage Capacity	 3,000 gallons 3,000 gallons
Chemical Metering Pumps Sodium Hypochlorite Sodium Bisulfite	4 2 2	 Capacity Capacity	 20 gph (each) 20 gph (each)

Unit Process	Number of Units	Design Value	
Solids Handling			
Thickened Sludge Pumps	3	GBT Feed, Thickened Sludge Transfer	Progressive Cavity 75 to 350 gpm
Sludge Storage Pumps	2	Sludge Pumps	Positive Displacement Type 150-200 gpm
Gravity Belt Thickener	1	Size Feed Solids Discharge Solids	2 meter 0.5 percent 5 percent
Plant Water Pumps	3	Type Capacity	Centrifugal 80 gpm
Plant Water Tank	1	Type Capacity Pressure Range	Diaphragm 88 gallons 40-60 psi

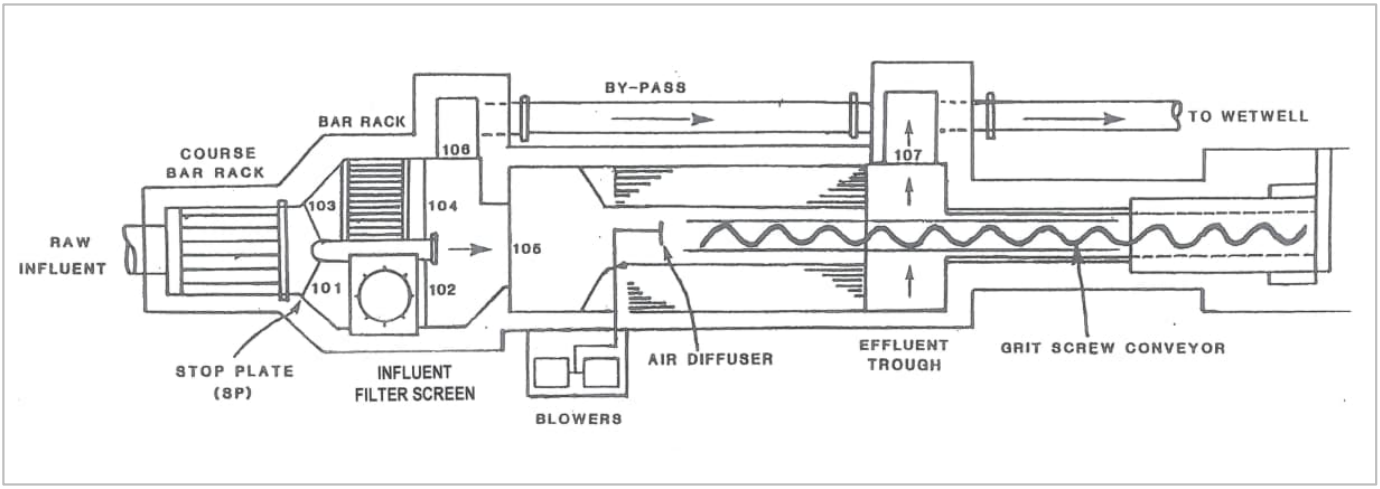
Figure 5-3 Process Flow Schematic



5.2.2 Preliminary Treatment

Wastewater enters the headworks facility and flows through a coarse bar rack, followed by a mechanically cleaned fine screen, and aerated grit chamber. The fine-screen is a mechanical self-cleaning type that removes materials larger than 0.25-inch in diameter. The fine-screen unit includes a screenings wash and cleaning comb. The screen has a capacity of 3.0 mgd. Flows in excess of 3.0 mgd are screened by a manually cleaned fine screen with 1-inch openings. After screening, flow continues through an aerated grit chamber, which has a capacity of 4.0 mgd. In the grit chamber, two blowers supply air through coarse bubble diffusers, allowing the settling of heavier particles and the passage of organic matter. The influent fine screen and aerated grit chamber can be bypassed through a 12-inch and 16-inch pipe.

Figure 5-4 Preliminary Treatment



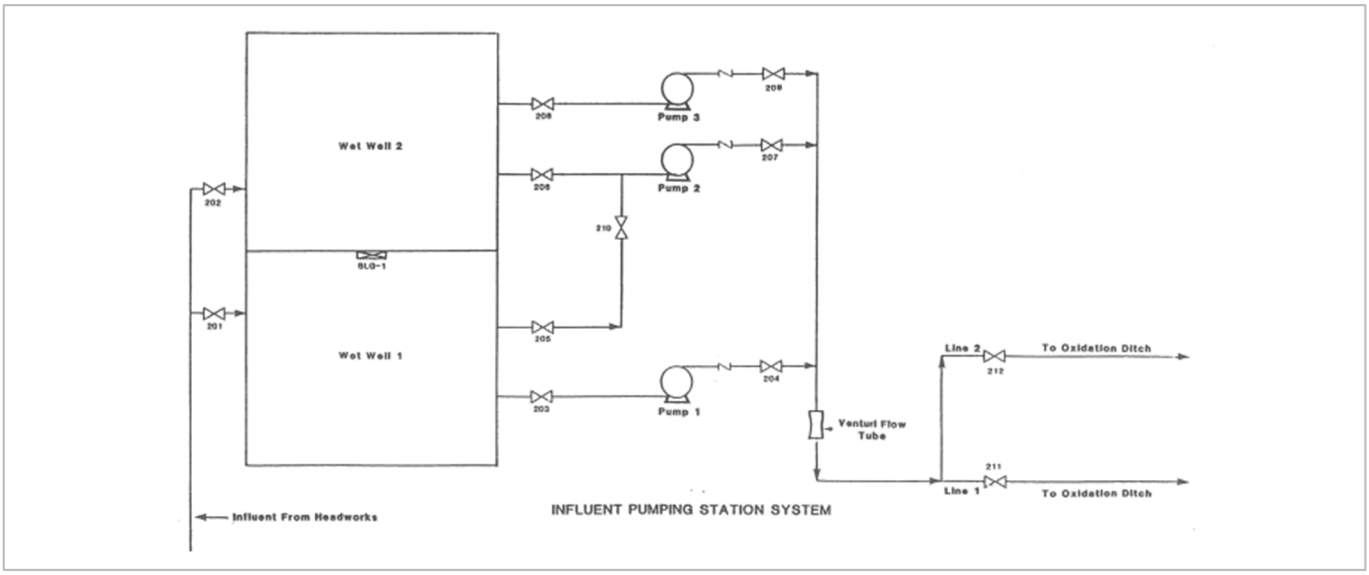
Preliminary Treatment Condition Assessment

The fine screen was replaced in 2020 and is in good condition. The aerated grit chamber and blowers were installed in 1983. The aerated grit chamber equipment, including blowers, and grit screw conveyor has reached the end of its useful life and should be upgraded or replaced. The concrete is in poor condition, with exposed aggregate at the waterline of the interior walls. Guards and toeplates should be installed around the structure to meet fall protection safety standards.

5.2.3 Influent Pump Station

Following preliminary treatment, wastewater flows to the influent pump station. The influent pump station has a dry pit design with three non-clog centrifugal pumps and two wet wells connected by a slide gate. One variable speed 25 hp pump (1600 gpm, 44 ft TDH) is connected to each wet well. One 20 hp pump (1200 gpm, 44 ft TDH) can pump from either wet well. All pumps are connected to variable frequency drives. Wet well level is monitored by pressure transducers with backup floats. The influent pump station lifts the flow to the oxidation ditch.

Figure 5-5 Influent Pump Station Schematic



Influent Pump Station Condition Assessment

The pumps were installed around 2010. They are in fair condition. Replacement of the pumps, piping, and valves should be considered during the planning period. Wetwell 2 contained a visible blanket of collected solids on the water surface. A mixing system should be considered. The pump room intake and exhaust fan appeared to be in poor condition and were not in operation at the time of W-P's observation. Without continuously operating ventilation in accordance with NFPA 820 the space would be classified Class I, Division 2 and would require explosion proof equipment and NEMA 7 electrical enclosures.

5.2.4 Secondary Treatment

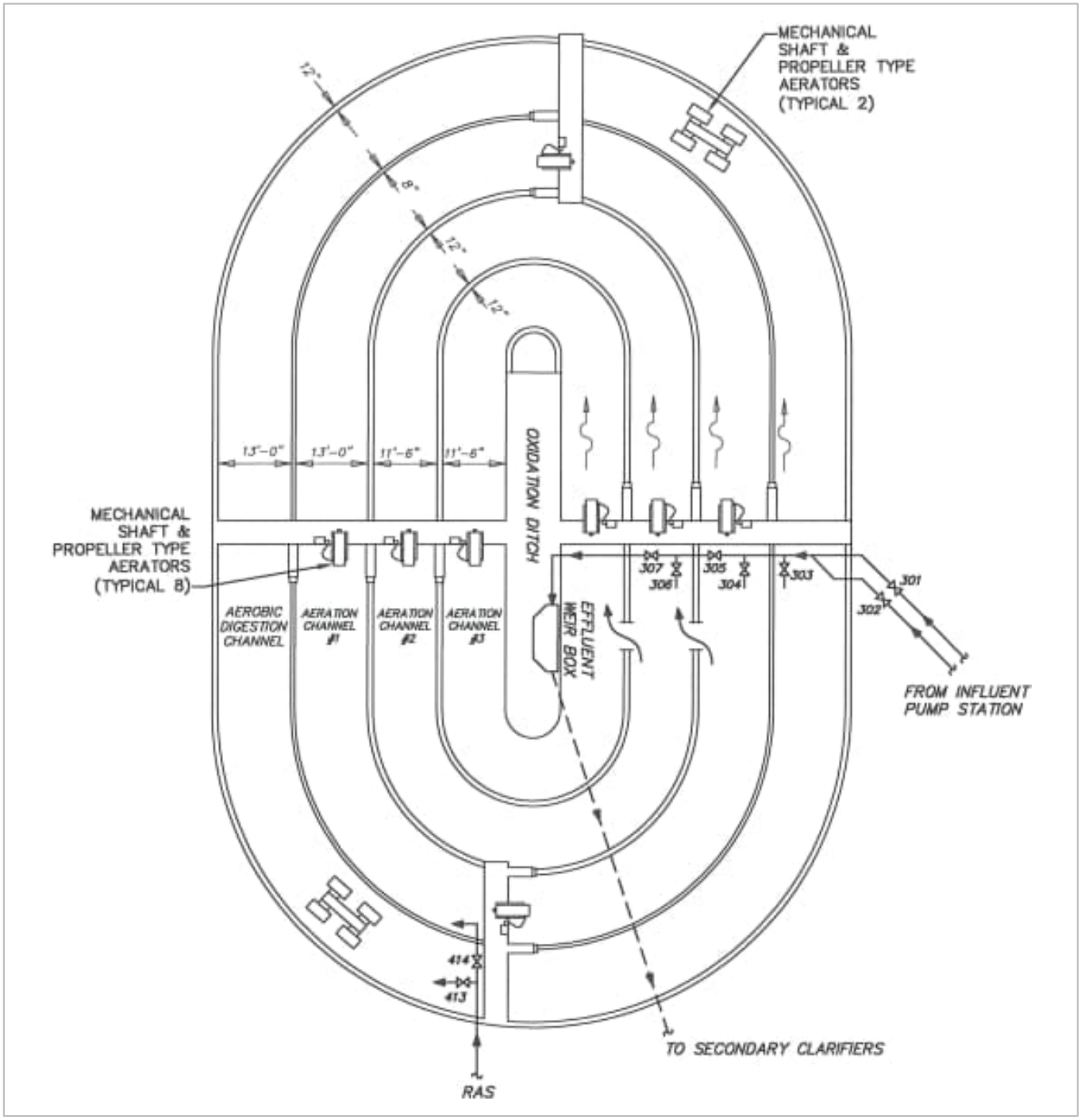
The secondary treatment process at the Scarborough WWTF is an activated sludge process consisting of one oxidation ditch followed by two secondary clarifiers.

5.2.4.1 Aeration System

The oxidation ditch includes four concentric channels. The outer channel is used for aerobic sludge digestion. The three inner channels are used for secondary treatment. Wastewater enters aeration channel 1, flows through aeration channels 2 and 3, into an effluent box where flow is conveyed to the secondary clarifiers. Return Activated Sludge (RAS) from the secondary clarifiers is returned to aeration channel 1, upstream of the influent discharge. The schematic of the oxidation ditch in Figure 5-6 shows the discharge locations. There are eight jet-style mixer-aerators that provide oxygen and mixing in the channels. There are 4 aerators in the first channel, and two each in channels 2 and 3. The aerator equipment has a dedicated blower and separate mixer that make up a single unit. The blower provides oxygen via a pipe that extends to the bottom of the channel where the oxygen exits beneath the bottom of the mixer body. The mixer body is a propeller with a shroud around it. As the oxygen travels up through the water column, the bubbles meet the mixer blades and the blades shear the bubbles into smaller bubbles, providing better oxygen transfer, and mix the oxygen with the wastewater. The eight aerators typically run the mixer at maximum speed. The blower speed is adjusted to maintain the desired DO concentration. The aerators are operated manually. There is no automation of blower or mixer speed, meaning there is limited process control in response to DO levels.

The aeration system has been designed for an influent BOD_5 concentration of 200 mg/l at a design flow of 1.4 mgd for an equivalent BOD_5 loading of 2,335 lbs/day. The aerators are designed to provide 29.5 lbs/hour of O_2. These values are based on clean water assumptions as supplied by the manufacturer. This translates to an aeration system capable of supporting a maximum process oxygen demand of 5,664 lbs O_2/day.

Figure 5-6 Oxidation Ditch Schematic



Aeration System Condition Assessment

The existing secondary treatment system was originally constructed in 1983. Secondary treatment system improvements have been conducted in 2006, 2010, and 2019. The most recent upgrade replaced paddlewheel-style aerators with submersible jet aerator/mixers.

The oxidation ditch has been in continuous operation for several decades. Some valves and gates are inoperable, others have exceeded their expected useful life. Notably, the splitter gate at the center of the tank is inoperable and needs replacement. Fats, oils, grease, and foam can build up and become a problem in the tank. The blower VFDs are not properly sized, when the VFDs ramp up to 100 percent operation an overcharge error occurs.

The tank structure is in poor condition. The concrete wall surfaces at the waterline exhibit moderate to severe exposed aggregate, vertical cracks, and spalling. The angle side supports and anchors for the metal slide gates are corroded. Some of the embedded painted steel guard posts are corroded, which results in the guard being loose in places. The guards are not adequate means of fall protection.

Many of the jet aerators have had issues with the anti-vortex shield assembly corroding and falling away from the main equipment.

The secondary system has had challenges in the past, typically around the July Fourth holiday, which has presented as gray/black mixed liquor, very high SVI values (bad settleability), TSS effluent violations, and disinfection upsets which have led to effluent bacteria violations. This time is the beginning of the peak tourism/summer season. After the initial spike in holiday influent loading to the facility (approximately 1 week), the mixed liquor begins to return to a brown color and SVI begins to reduce, which in turn leads to reduced effluent TSS and bacteria issues. However, the facility struggles with high SVIs and has experienced TSS and bacteria violations during the summer season for the last two years. WP engineers visited the plant in July 2023 to review one of these events. Based on visual inspection and data collected, it appeared there was not enough oxygen supplied to treat the influent BOD load.

Overall, maintenance and upgrades of the oxidation ditch are limited because there is no redundancy, the system must remain operational to maintain treatment.

5.2.4.2 Secondary Clarifiers

Effluent from the oxidation ditch is directed to Diversion Chamber 2 where flow is split evenly between two secondary clarifiers. In the clarifiers, biological floc formed in the aeration system is allowed to settle out. Solids are wasted to the aerobic digestion channel or the sludge holding tank. Return activated sludge is returned to the oxidation ditch to maintain treatment biomass.

The clarifiers are 40-foot diameter with 10.875-foot side water depth. Both secondary clarifiers are operated year-round. Typically, both clarifiers are online and the RAS rate is set at 100% pump speed, up to a maximum of 525,600 gallons per day each (1.05 mgd total) based on the maximum pump capacity at 18.5 TDH. The clarifiers are designed for an average surface overflow rate of 550 gpd/square foot and a peak rate of 1,652 gpd/sqft. At 50% RAS flow, the clarifiers are designed for an average solids loading rate of 17.09 lbs/day/sqft and a peak of 19.1 lbs/day/sqft. The facility operates with a very large range of sludge settleability (120-600 SVI) and typically averages a high value of 280.

Three centrifugal self-priming return sludge pumps are used to return secondary sludge to the oxidation ditch and the aerobic digestion channel. The pumps are located in the administration building pump room. The pumps can be valved to pump sludge to the sludge holding tank. Sludge is wasted to the aerobic digester channel of the oxidation ditch via a manual valve. An operator must open and close the valve to waste sludge from the return sludge line.

Figure 5-7 Secondary Clarifier Schematic

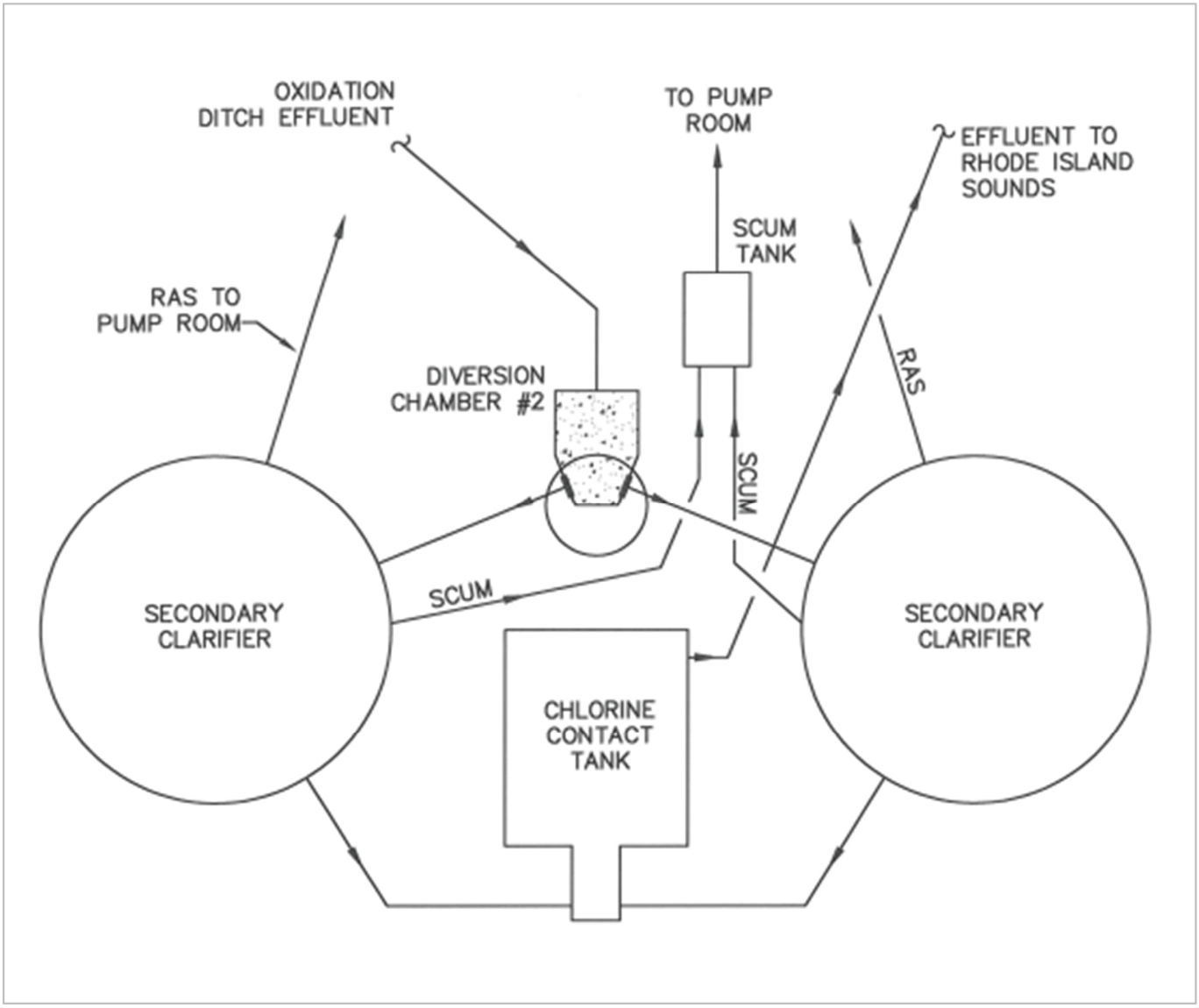
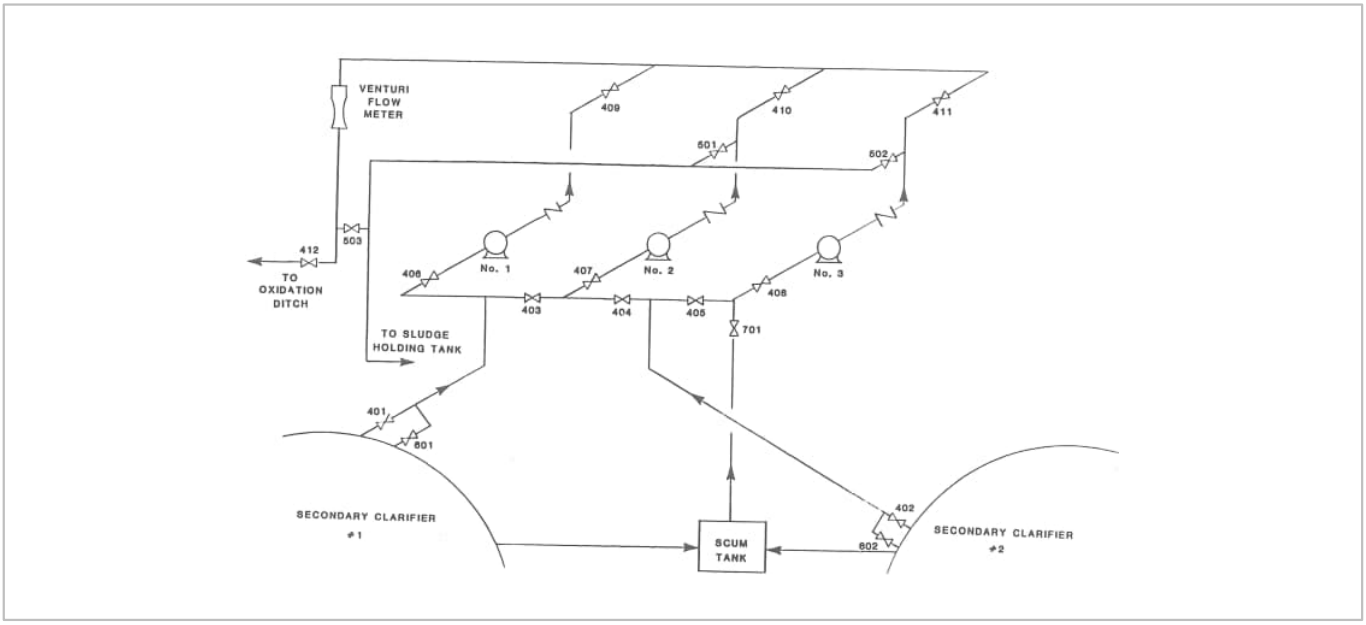


Figure 5-8 Secondary Sludge Pumping Schematic



Secondary Clarification Condition Assessment

The secondary clarifiers were installed in 1983, and the mechanisms last replaced in 2006. The mechanisms are in fair to poor condition and replacement should be considered within the planning period.

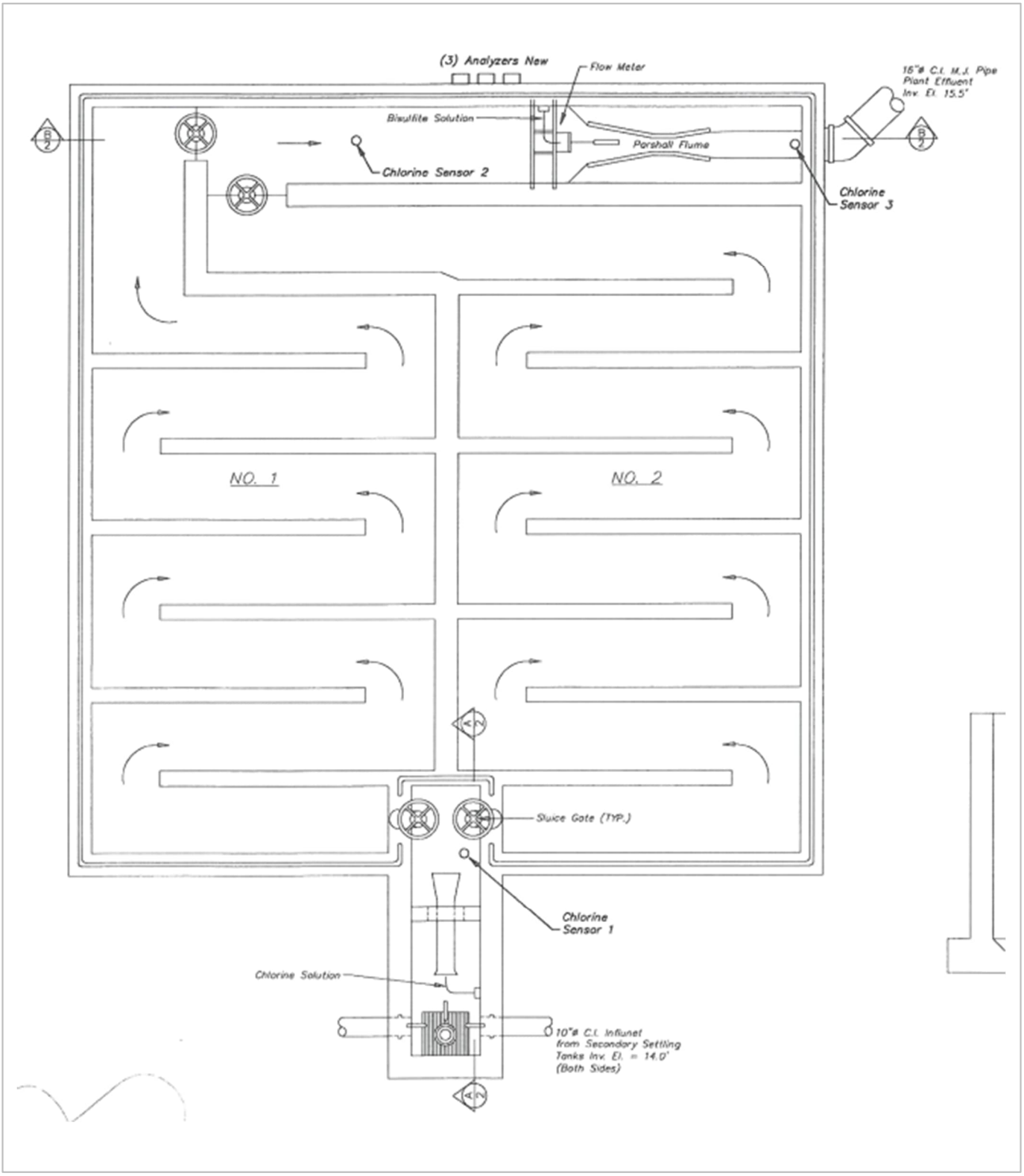
- There is some significant corrosion on the drive motors.
- The draft tubes and center ring on Tank 1 (west tank) do not work.
- Vertical cracks were observed in the exterior concrete wall. Some of the cracks were exhibiting efflorescence.
- The existing concrete coating on the weir/launder is starting to fail in some areas.
- The sidewater depth is shallower than recommended for a clarifier of this size

5.2.5 Disinfection

When wastewater overflows from the secondary clarifiers, it enters a diversion chamber where flow is split between the two chlorine contact tanks, where the wastewater is disinfected. Disinfection is accomplished with 15 percent solution of sodium hypochlorite, and dechlorination is achieved with 35 percent sodium bisulfite solution. Chlorine solution is injected at the head of the chlorine contact tanks. Chlorine is mixed using two sump pumps. Chlorine residuals are measured in three different locations: the influent end, effluent end, and downstream of the Parshall flume (after dechlorination). The residual analyzer is located in a small shed next to the chlorine contact tanks. The disinfection system was upgraded in 2013.

Chemical storage and chemical metering are located in a garage bay in the Administration Building. There are two pumping units for sodium hypochlorite (disinfection) and two pumping units for sodium bisulfite (dechlorination). The chemicals are stored in 3,000 gallon bulk tanks with double containment walls. During the summer months, when process upsets are occurring the plant (elevated TSS and SVI), the plant water used to carry chlorine to the disinfection plants can be cloudy, interfering with regulating the chlorine dose. During summer months, operators setup direct chlorine drip/injection (no plant carry water) to better regulate high demand chlorine dosing.

Figure 5-9 Chlorine Contact Tank Schematic



The existing chlorine contact tanks have contact times for the design average flow and the design peak flow of 47 minutes and 15 minutes, respectively. The chlorine contact time was calculated for current average and peak flows. The contact times for average and peak flow (98%) conditions are 90 minutes and 26 minutes respectively. Both tanks should be online during peak flows to meet the minimum contact time. The existing chlorine contact time has historically meet disinfection requirements. According to TR-16, a minimum contact time at peak flows should be 30 minutes for plants that do not have site-specific studies. TR-16 does allows for "grandfathering" of existing chlorine contact chambers which provide for less than 30 minutes of contact time at peak flow, as long as historical plant data justifies sufficient, reliable disinfection at lower contact times. Review of historical plant data and Notice of Violations from RIDEM indicate the plant meet disinfection requirements at peak flows under the current disinfection contact times.

Disinfection Condition Assessment

- Due to the plant's close proximity to Scarborough State Beach, effective disinfection is a priority for the plant operators. Operators report dosing generous amounts of chlorine to ensure bacteria kill, employing additional manual dosing stations around the tank during peak summer conditions, followed by dechlorination to meet permitted chlorine residual limits.
- Upgrades to the disinfection system were completed in 2013.
- The chemical feed pumps are in fair condition.
- The piping, valves, and chemical storage tanks are in fair condition. Operations staff would prefer hard pipe to replace chemical distribution tubing.
- Vertical cracks were observed on the chlorine contact tank walls, exhibiting efflorescence.
- The concrete wall surfaces at the waterline of the chlorine contact tanks showed minor exposed aggregate.
- The face mounted slide gate side supports showed signs of corrosion. Plywood was being used as a gate at two locations.
- There was a light accumulation of algae on the concrete surface of the weir that exhibited exposed aggregate.

5.2.6 Ocean Outfall

Flow from the chlorine contact tank is discharged through SWWTF ocean outfall. The ocean outfall, constructed in 1982, discharges about 2200 feet off the coast into Rhode Island Sound. The outfall is constructed with 20-inch diameter ductile iron pipe through the SWWTF yard, and 22-inch diameter polyethylene pipe in Rhode Island Sound. Portions of the pipe are armored with concrete or stone. Record drawings indicate the pipeline was installed with a minimum of four feet of cover Most of the pipe was designed to be buried. The discharge of the pipe has a ductile iron diffuser with three 12-inch outlets. In 2024, Narragansett completed a project to rebuild the rock groin structure protecting the outfall pipe along the shoreline.

5.2.7 Solids Handling

Solids handling at the SWWTF includes aerobic digestion, a sludge holding tank, and a sludge thickening operation. Excess activated sludge from the secondary clarifiers is wasted to the outer channel of the oxidation ditch. Valving allows the RAS pumps to waste sludge to the aerobic digestion channel. The aerobic digestion process reduces the volume of solids in the sludge. The microorganisms consume available food, and produce carbon dioxide, water and ammonia. Ammonia is reduced to nitrate. Warmer temperatures, higher dissolved oxygen concentrations, and longer detention times increase the reduction of solids. The aerobic digestion channel provides sludge storage to allow operators more flexibility in sludge thickening and hauling operations. Oxygen is provided via a floating jet-style mixer-aerator (similar to the fixed versions in the aeration channels).

From the aerobic digestion channel, waste solids are pumped to the sludge storage tank. The storage tank is regularly decanted to remove excess water before processing. Waste sludge is fed to the gravity belt thickener (GBT) using the gravity thickener feed pumps. Polymer and potassium permanganate are added to the sludge feed prior to the GBT. The GBT has a belt size of 2.0 meters. Thickened sludge is stored in the thickened sludge storage tank. Supernatant from the sludge storage tank and filtrate from the gravity belt thickener flow back to the SWWTF influent pump station wet well. Thickened sludge is hauled offsite for disposal. Generally, sludge is thickened once per week in winter months and twice per week in summer months. There are two polymer systems located in the Solids Handling building. Polymer is added to the sludge storage tank to improve decanting operations. A plant water system located in the solids handling building provides wash water for the gravity belt thickener.

Three progressive cavity pumps located in the Solids Handling Building are used to feed the gravity belt thickener and to transfer thickened sludge to a truck. Two double disc pumps are located in the Administration Building pump room for pumping waste aerobic digested sludge from the oxidation ditch to the sludge storage tank.

Solids Handling Condition Assessment

- The GBT was installed in 1992. It is outdated and spare parts are difficult to find. Operators noted the equipment is unreliable and should be replaced.
- The polymer system is not reliable and should be replaced.
- The permanganate system is not reliable and should be replaced.
- Gravity Belt Thickener Pump One is not functional and should be replaced. (Planned replacement in 2025).
- The Thickened Sludge Pump is failing and should be replaced.
- The plant water system was installed in 1992 and has reached the end of its useful life.
- The majority of the HVAC system appears original to the 1990 construction of the building. It is in poor condition and in need of replacement.
- Synagro has informed their liquid sludge clients that they will no longer receive liquid sludge in the near future, leaving a disposal location in question for the SWWTF. The Town is currently in negotiations with Veolia to dispose of liquid sludge at the Cranston WWTF.

5.2.8 Support Facilities

5.2.8.1 Operations Building

- The operations building was constructed in 1991, and contains a maintenance garage, laboratory, and administrative offices.
- The operations building is in reasonable condition for its age but will need maintenance and upgrades during the planning period.
- The laboratory facilities are adequate for current sampling and testing requirements. The laboratory and equipment will need maintenance and upgrade during the planning period, or if sampling and testing requirements change.
- The HVAC system has largely been replaced with split AC units. Ventilation and heating systems are not adequate for the space and should be replaced.

5.2.8.2 Maintenance Building

- The maintenance building contains disinfection chemical storage, RAS pumping, an electrical room, standby generator, and the sludge holding tank facilities.
- The maintenance building is in reasonable condition for its age but will need maintenance and upgrades during the planning period.

- Most of the HVAC equipment throughout the building appears to be part of a 1983 upgrade. Most of the equipment is in poor physical condition and should be replaced. Many spaces have changed use, and the mechanical systems are no longer suited to the function of the space.

5.2.9 SWWTF Performance Compared to RIPDES Permit

The monthly operating reports for the SWWTF were reviewed from 2020 to 2023. The SWWTF effluent quality has regularly been well under permit specifications. However, the SWWTF exceeded BOD and TSS permit limits several times during the month of July 2023 and August 2024. This time is the beginning of the peak tourism/summer season with strong influent loads. Table 5-4 shows average treatment performance compared to the current permit. Operation and process control is generally acceptable, but is capacity limited.

Table 5-4 Historical Treatment Performance

Data	Permit	2020-2023
Effluent BOD (mg/l) Effluent BOD (lbs/day)	30 350	6 39
Effluent TSS (mg/l) Effluent TSS (lbs/day)	30 350	3 29
Enterococci (cfu/100 ml)	35	2
Fecal Coliform (MPN/100 ml)	---	3

1. --- Signifies a parameter which must be monitored, and data must be reported; no limit has been established at this time.

5.2.10 Operating Staff

The SWWTF is staffed with five operators for one 8-hour shift on weekdays, and one operator for one 3-hour shift on weekends and holidays to collect samples and perform required laboratory analyses. A typical day may include one operator in the lab, one operating the solids handling facility, one floater, and two maintaining the collection system. This number of staff is adequate for current needs. If a treatment facility upgrade occurs, there might be a need for additional staff.

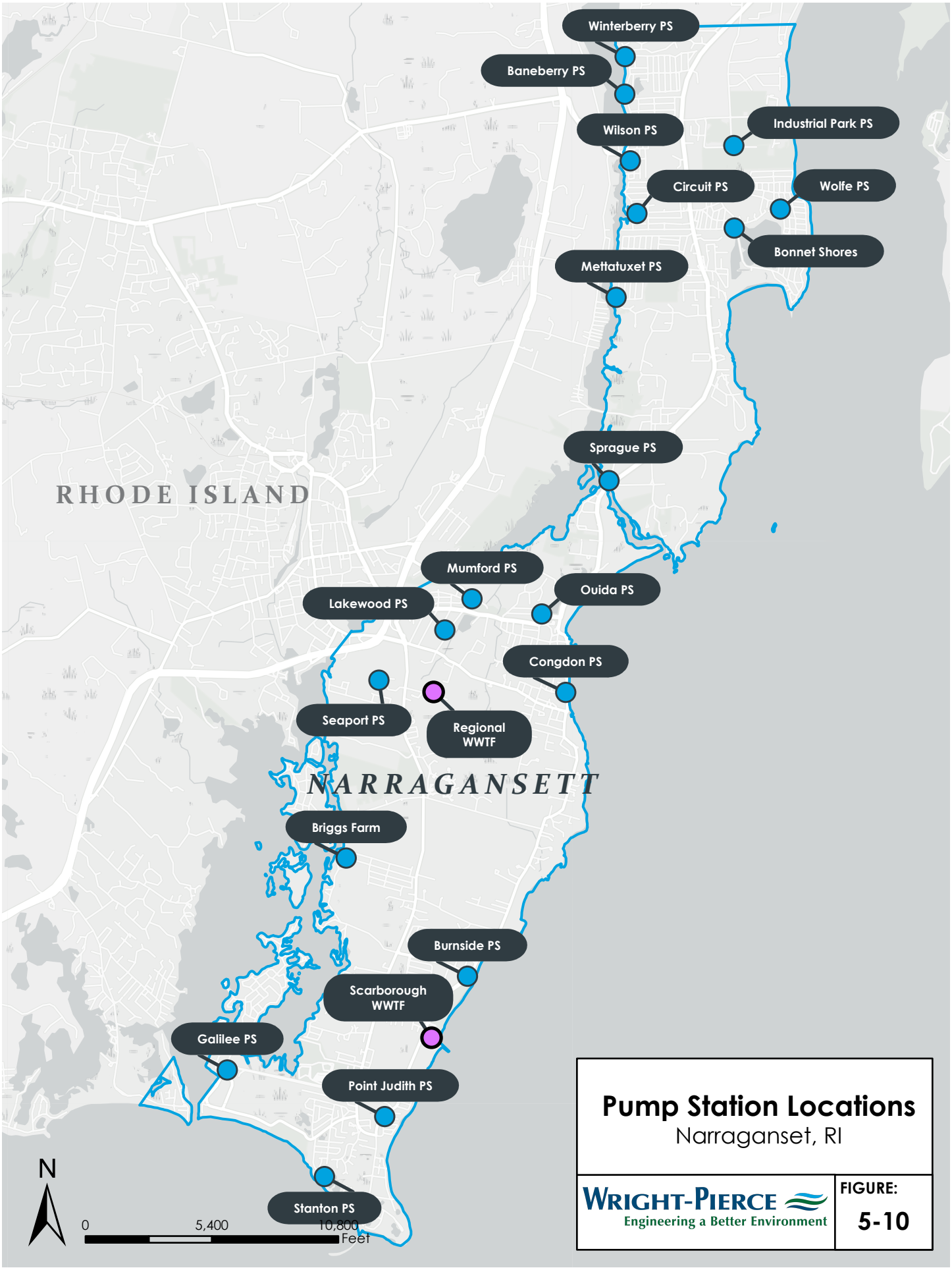
5.3 Wastewater Collection System

5.3.1 Introduction

The Narragansett collection system is divided into two parts. The north end of Town is served by the South Kingstown Regional Wastewater Treatment Facility on Westmoreland Street in Narragansett. The south end of Town is served by the Scarborough Wastewater Treatment Facility. The Town of Narragansett's wastewater collection system includes 100 miles of sanitary sewer and nineteen pump stations. The north end system includes 65 miles of sanitary sewer and 14 pump stations. The south end system includes 35 miles of sewer and 5 pump stations. An overview of the Narragansett wastewater system is shown in Figure 5-10. The collection system includes approximately 6,200 service connections serving a population of approximately 11,000. The North End collection system includes 4,000 service connections serving a population of approximately 7,000. The South End collection system includes 2,200 service connections serving a population of approximately 4,000.

The north end of Narragansett has a few, small-scale industries. According to the designation in water usage data, the largest industry is Dewal, which produces polymer films and tape. There are a few small industries on Dean Knaus Drive including ACS Scientific, which makes geological tools and equipment, a wedding/event service, and wooden boat builders. None of these enterprises contribute major flow or loading to the collection system.

The major industry in the south portion of Narragansett is fisheries. Before the mid-1990s, the industrial contribution from the fishing industry was responsible for approximately 80 percent of the organic loading (BOD_5 and TSS) while representing only 20 percent of the hydraulic loading to the SWWTF. In the mid-1990s the Town began enforcement of an industrial pretreatment program limiting the fish processing load to SWWTF. The largest fish processing facilities in operation today are Town Dock and SeaFreeze located in the port of Galilee. Typical operations at these facilities include unloading fishing boats, bulk freezing, and minimal processing. Due to the pretreatment requirements, these facilities do not currently discharge fish processing wastewater to the collection system. It is more efficient and cost effective to haul wastewater offsite than treat to the required levels for discharge to SWWTF.



Pump Station Locations

Narraganset, RI

WRIGHT-PIERCE
Engineering a Better Environment

FIGURE:
5-10

JA W:\GIS_Development\Projects\RI\Narragansett\21517_ComprehensiveWWFP\MXDs\ReportFigures.aprx - Fig5_10_PSLocations_8x11

5.3.2 Pump Stations

A field visit to each pump station was conducted in August 2023. Field visits included observations of visible equipment and structures, inspection of submersible pumps, and drawdown testing. Flood resiliency was assessed with minimum protection requirement of Base Flood Elevation plus three feet of freeboard for critical structures. Refer to Appendix C for additional information.

5.3.2.1 North Collection System Pump Stations

There are 14 Pumping Stations in Narragansett that are tributary to the Regional WWTF. Each station is detailed below with characteristics and observations from site visits that occurred in August 2023. Refer to the Pump Station Evaluation Report for detailed field observation details, equipment lists, and useful life estimates.

Baneberry Pump Station

- The capacity of the pumps and wet well are adequate for existing flows and estimated future flows.
- Electrical equipment is in an enclosed room open to the wet well. The electrical equipment does not have the NEMA rating recommended for this space per NFPA-820 guidelines.
- Operators report the single rail system makes it difficult to remove and reseat pumps.
- The station does not have a proper basket strainer for catching rags in the influent.
- The equipment is in fair condition, but process, mechanical, and electrical equipment is approaching the end of its useful life. Replacement should be considered.

Table 5-5 Baneberry Pump Station Characteristics

Category	Details	Category	Details
Location	Woodsia Road and Baneberry Trail	Year Built	1993 (Upgraded in 2015)
Station Type	Submersible	Pump (Qty)	Sulzer (2)
Motor	2 HP, 3400 RPM, 230 V, 1 Ph, 60 Hz	Pump Capacity	42 gpm @ 33 ft TDH
Existing Peak Flow[1]	5 gpm	Future Peak Flow	6 gpm
Wet Well Capacity	444 gal	Bypass Connection	3-in stub at FM
Force Main Size/Material/Length	2-inch / PVC	Ancillary Equipment	Basket strainer
Structure	Concrete Wet Well, Framed Wooden Structure w/ Shingle Roof	Generator	Portable Connection
SCADA	RTU	Level Control	Bubbler

[1]Estimated based on a rain event on 7/16/23, and the pump's rated capacity.

Bonnet Shores Pump Station

- The capacity of the pumps and wet well are adequate for existing flows and estimated future flows.
- The generator is nearing the end its useful life and it does not have proper clearances inside the building. Replacement of this generator is ongoing, scheduled to be completed in 2025.
- The station is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

Table 5-6 Bonnet Shores Pump Station Characteristics

Category	Details	Category	Details
Location	Bonnet Point Road and Allagash Trail	Year Built	1979 (Major Upgrade approx. 2014)
Station Type	Wet/Dry Pit	Pump (Qty)	Cornell (2)
Motor	75 HP, TEFC, 1780 RPM, 460 V, 3 Ph, 60 Hz, inverter duty rated	Pump Capacity	1600 gpm @ 115 TDH
Existing Peak Flow[1]	613 gpm	Future Peak Flow	747 gpm
Wet Well Capacity	10,771 Gal	Bypass Connection	Yes, Gorman-Rupp bypass pump
Force Main Size/Material/Length	12-inch / CI & AC / 2,400 ft	Ancillary Equipment	Grinder, Hoist and Monorail, Flowmeter
Structure	Concrete Wet Well, Framed Wooden Structure w/ Shingle Roof	Generator	175 kW Generator[2]
SCADA	RTU	Level Control	Transducer

[1]Estimated based on a rain event which occurred on 8/8/23, and the pump's rated capacity.

[2] Replacement of this generator is ongoing, scheduled to be completed in 2025.

Circuit Pump Station

- The capacity of the pumps and wet well are adequate for existing flows and estimated future flows.
- Pump rails are installed against the discharge pipe flange, making pump removal difficult. A pump rail broke off when the pump was being lowered.
- Electrical equipment is in an enclosed room open to the wet well. The electrical equipment does not have the NEMA rating recommended for this space per NFPA-820 guidelines.
- The pump station building is in poor condition. Deficiencies include unfinished interior surfaces, peeling paint, rotten exterior siding, damaged door frames, and rotten exterior steps at the entrance.
- The driveway access is too small. Access is difficult for snow plows and service trucks.
- The station is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

Table 5-7 Circuit Pump Station Characteristics

Category	Details	Category	Details
Location	Circuit Drive	Year Built	1992 (Pumps have been replaced)
Station Type	Submersible	Pump (Qty)	Sulzer (2)
Motor	5.4 HP, TEFC, 3544 RPM, 230 V, 1 Ph, 60 Hz	Pump Capacity	79 gpm @ 137 TDH
Existing Peak Flow[1]	15 gpm	Future Peak Flow	19 gpm
Wet Well Capacity	486 Gal	Bypass Connection	3-inch stub at FM
Force Main Size/Material/Length	3-inch / PVC / 500 ft	Ancillary Equipment	Hoist and monorail
Structure	Concrete Wet Well, Framed Wooden Structure w/ Shingle Roof	Generator	Portable Connection
SCADA	RTU	Level Control	Bubbler System

[1]Estimated based on a rain event which occurred on 8/8/23, and the pump's rated capacity.

Congdon Pump Station

- The pumps and wet well are adequate for existing flows and estimated future peak flows.
- Operations staff reports the pump station struggles to keep up with flow during wet weather events.
- In 2011, a relief sewer was constructed. During periods of high flow exceeding pumping capacity, wastewater enters the gravity relief sewer and flows downstream to another larger diameter gravity sewer to relieve surcharging and prevent a sanitary sewer overflow.
- The station is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

Table 5-8 Congdon Pump Station Characteristics

Category	Details	Category	Details
Location	Congdon Street and Ocean Road	Year Built	1975 (Major Upgrade in approx. 2006)
Station Type	Can Station	Pump (Qty)	Grundfos (2)
Motor	3 HP, TEFC, 1725 RPM, 230 V, 1 Ph, 60 Hz	Pump Capacity	225 gpm
Existing Peak Flow[1]	108 gpm	Future Peak Flow	191 gpm
Wet Well Capacity	901 Gal	Bypass Connection	No
Force Main Size/Material/Length	4-inch / CI / 600 ft	Ancillary Equipment	N/A
Structure	Concrete Wet Well, Steel Can	Generator	Portable Connection
SCADA	RTU	Level Control	Bubbler System

[1]Estimated based on a rain event which occurred on 7/16/23, and a pump drawdown test performed on 8/11/2023.

Industrial Park Pump Station

- The capacity of the pumps and wet well are adequate for existing flows and estimated future flows.
- Operations staff reports the pump station struggles to keep up with flow during wet weather events.
- The exhaust fan failed to run.
- The concrete around the wet well hatch is in poor condition.
- Process and electrical equipment are nearing the end of its useful life. Equipment appears to be in fair condition, with some defects and deterioration. Replacement should be considered.

Table 5-9 Industrial Park Pump Station Characteristics

Category	Details	Category	Details
Location	Old Boston Neck Road and Industrial Drive	Year Built	1971
Station Type	Can Station	Pump (Qty)	Cornell (2)
Motor	10 HP, TEFC, 1175 RPM, 200 V, 3 Ph, 60 Hz	Pump Capacity	200 gpm
Existing Peak Flow[1]	39 gpm	Future Peak Flow	45 gpm
Wet Well Capacity	528 Gal	Bypass Connection	No
Force Main Size/Material/Length	6-inch / CI / 1,200 ft	Ancillary Equipment	Hoist
Structure	Steel Can, Concrete Wet Well	Generator	Portable Connection
SCADA	RTU	Level Control	Transducer

[1]Estimated based on a rain event which occurred on 7/16/23, and a pump drawdown test performed on 8/11/23.

Lakewood Pump Station

- The pumps and wet well are adequate for existing flows but do not have adequate capacity for estimated future peak flows.
- Operations staff report the pump station struggles to keep up with flow during wet weather events.
- Process, mechanical, and electrical equipment is nearing the end of its useful life. Replacement should be considered.
- A 20 kW standby generator was installed in April 2025.

Table 5-10 Lakewood Pump Station Characteristics

Category	Details	Category	Details
Location	Lakewood Drive	Year Built	1970 (Major Upgrade in approx. 1992)
Station Type	Can Station	Pump (Qty)	Yeomans (2)
Motor	3 HP, TEFC, 460 V, 3 Ph, 60 Hz	Pump Capacity	200 gpm
Existing Peak Flow[1]	93 gpm	Future Peak Flow	219 gpm
Wet Well Capacity	1,395 Gal	Bypass Connection	Yes
Force Main Size/Material/Length	8-inch / CI, AC / 1,150 ft	Ancillary Equipment	N/A
Structure	Steel Can	Generator	20 kW Generator
SCADA	RTU	Level Control	Bubbler System

[1]Estimated based on a rain event which occurred on 7/16/23, and the pump's rated capacity.

Mettatuxet Pump Station

- The capacity of the pumps and wet well are adequate for existing flows and estimated future flows.
- Mechanical and electrical equipment is nearing the end of its useful life. Replacement should be considered.
- The station is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

Table 5-11 Mettatuxet Pump Station Characteristics

Category	Details	Category	Details
Location	South River Drive	Year Built	1981 (Upgrade in 2017)
Station Type	Wet/dry pit	Pump (Qty)	Cornell (2)
Motor	5 HP, TEFC, 1160 RPM, 208 V, 3 Ph, 60 Hz	Pump Capacity	400 gpm @ 22 TDH
Existing Peak Flow[1]	108 gpm	Future Peak Flow	112 gpm
Wet Well Capacity	778 Gal	Bypass Connection	Yes
Force Main Size/Material/Length	8-inch / AC / 1,000 ft	Ancillary Equipment	Grinder, Flowmeter, Hoist and monorail,
Structure	Concrete Structure	Generator	30 kW Generator
SCADA	RTU	Level Control	Transducer

[1]Estimated based on a rain event which occurred on 8/8/23, and a pump drawdown performed on 8/15/23.

Mumford Pump Station

- The capacity of the pumps and wet well are adequate for existing flows and estimated future flows.
- The building exterior is in poor condition. Trim paint is flaking and peeling. Shingle siding is in need of paint and replacement of degraded shingles. The exterior door has many dents and damage on the right door panel.

Table 5-12 Mumford Pump Station Characteristics

Category	Details	Category	Details
Location	Mumford Road	Year Built	1995 (Upgrade in 2005)
Station Type	Wet/Dry pit	Pump (Qty)	Gorman-Rupp (2)
Motor	10 HP, TEFC, 1745 RPM, 230/460 V, 3 Ph, 60 Hz	Pump Capacity	660 gpm
Existing Peak Flow	151 gpm	Future Peak Flow	184 gpm
Wet Well Capacity	2,178 Gal	Bypass Connection	Yes
Force Main Size/Material/Length	8-inch / DI, PVC / 1,000 ft	Ancillary Equipment	Slide Gates, Flowmeter
Structure	Concrete Wet Well, Framed Wooden Structure w/ Shingle Roof	Generator	60 kW Generator
SCADA	RTU	Level Control	Bubbler System

[1]Estimated based on a rain event which occurred on 8/8/23, and a pump drawdown performed on 8/9/23.

Ouida Pump Station

- The capacity of the pumps and wet well are adequate for existing flows and future flows.
- The pump station receives flow from South Kingstown's Middle Bridge PS via the Sprague Pump Station.
- The equipment in the grit room is in poor condition and should be replaced.
- Some process, mechanical, and electrical equipment is nearing the end of its useful life. Replacement should be considered.
- The station is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

Table 5-13 Ouida Pump Station Characteristics

Category	Details	Category	Details
Location	Wanda Street and Caswell Street	Year Built	1975 (Major Upgrade in 2007)
Station Type	Wet/Dry pit	Pump (Qty)	Flowserve (3)
Motor	150 HP, TEFC, 1760 RPM, 460 V, 3 Ph, 60 Hz, inverter duty rated	Pump Capacity	1,585 gpm
Existing Peak Flow[1]	2,621 gpm	Future Peak Flow	2,662 gpm
Wet Well Capacity	7,026 Gal	Bypass Connection	No
Force Main Size/Material/Length	16-inch / DI / 7,500 ft	Ancillary Equipment	Flowmeters, Hoist, Manual Bar Rack, Grinder, Odor Control, Bioxide
Structure	Concrete Wet Well, Concrete Structure, Membrane Roof	Generator	365 kW Generator
SCADA	RTU	Level Control	Ultrasonic

[1]Estimated based on a rain event which occurred on 7/16/23, and a pump drawdown performed on 8/15/23.

Seaport Pump Station

- The capacity of the pumps are adequate for existing flows and future flows.
- The wet well information was not available for capacity analysis.
- Operators report the pumps are clogged with rags on a regular basis.
- The generator is located too close to the building and regulator. The service is 240 volt, which does not match equipment requirements. Replacement of this generator is ongoing, scheduled to be completed in 2025.

Table 5-14 Seaport Pump Station Characteristics

Category	Details	Category	Details
Location	Seaport Drive	Year Built	1995 (Major Upgrade in 2008)
Station Type	Submersible	Pump (Qty)	Ebara (2)
Motor	3 HP, 230 V, 3 Ph, 60 Hz	Pump Capacity	73 gpm
Existing Peak Flow	16 gpm	Future Peak Flow	16 gpm
Wet Well Capacity	Unknown	Bypass Connection	No
Force Main Size/Material/Length	2-inch / PVC	Ancillary Equipment	Basket strainer, Davit Crane
Structure	Concrete Wet Well, Framed Wooden Structure w/ Shingle Roof	Generator	45 kW Generator[1]
SCADA	RTU	Level Control	Transducer

[1] Replacement of this generator was completed in April 2025.

Sprague Pump Station

- The capacity of the pumps and wet well are adequate for existing flows and estimated future flows.
- The pump station receives flow from South Kingstown's Middle Bridge Pump Station via the North Interceptor.
- The main disconnect does not have proper clearance per the NEC.
- The automatic transfer switch, generator, and electrical service equipment are nearing the end of their useful life.
- The exhaust fan ductwork is dripping condensation on the pumps causing premature corrosion.
- The concrete top slab of the wet well is deteriorating, likely due to hydrogen sulfide induced corrosion.
- The pump station building is in fair to poor condition. There is cracking in the concrete floor of the building near the passage to lower levels. Ceilings, walls, and doors are unfinished.
- The station is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

Table 5-15 Sprague Pump Station Characteristics

Category	Details	Category	Details
Location	Boston Neck Road and Old Boston Neck Road	Year Built	1979 (Major Upgrade in 2013)
Station Type	Wet/Dry Pit	Pump (Qty)	Yeomans (3)
Motor	40 HP, TEFC, 1190 RPM, 460 V, 3 Ph, 60 Hz, inverter duty rated	Pump Capacity	1,460 gpm @ 62 TDH
Existing Peak Flow[1]	1,460 gpm	Future Peak Flow	1,700 gpm
Wet Well Capacity	9,163 Gal	Bypass Connection	Yes
Force Main Size/Material/Length	12-inch, 16-inch / DI & CI / 6,800 ft	Ancillary Equipment	Grinder, Flowmeter, Hoist and Monorail, Bioxide system
Structure	Concrete Wet Well, Framed Wooden Structure w/ Shingle Roof	Generator	175 kW Generator[2]
SCADA	RTU	Level Control	Transducer

[1]Estimated based on a rain event which occurred on 8/8/23, and the pump's rated capacity.

[2] Replacement of this generator is ongoing, scheduled to be completed in 2025.

Wilson Pump Station

- The capacity of the pumps and wet well are adequate for existing flows and estimated future flows.
- The generator is installed in an enclosed space that is open to the wet well atmosphere.
- The slide gate pedestal base in the influent channel is catching rags.
- The main entrance door is broken. Pump station building walls, ceilings and some floors are unfinished.
- The station is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

Table 5-16 Wilson Pump Station Characteristics

Category	Details	Category	Details
Location	Wilson Drive and Pettaquamscutt Avenue	Year Built	1992
Station Type	Wet/Dry Pit	Pump (Qty)	Cornell (2)
Motor	40 HP, TEFC, 1765 RPM, 208 V, 3 Ph, 60 Hz	Pump Capacity	1100 gpm
Existing Peak Flow[1]	255 gpm	Future Peak Flow	277 gpm
Wet Well Capacity	4,201 Gal	Bypass Connection	Yes
Force Main Size/Material/Length	10-inch / DI / 3,000 ft	Ancillary Equipment	Manual Bar Rack, Slide Gate, Grinder
Structure	Concrete Wet Well, Framed Wooden Structure w/ Shingle Roof	Generator	125 kW Generator
SCADA	RTU	Level Control	Bubbler System

[1]Estimated based on a rain event which occurred on 7/16/23, and the pump's rated capacity.

Winterberry Pump Station

- The capacity of the pumps and wet well are adequate for existing flows and estimated future flows.
- Electrical equipment is in an enclosed room open to the wet well. The electrical equipment does not have the NEMA rating recommended for this space per NFPA-820 guidelines.
- The station is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

Table 5-17 Winterberry Pump Station Characteristics

Category	Details	Category	Details
Location	Winterberry Road and Woodsia Road	Year Built	1993
Station Type	Wet/Dry Pit	Pump (Qty)	Gorman-Rupp (2)
Motor	10 HP, TEFC, 1760 RPM, 460 V, 3 Ph, 60 Hz	Pump Capacity	265 gpm
Existing Peak Flow[1]	50 gpm	Future Peak Flow	58 gpm
Wet Well Capacity	2,477 Gal	Bypass Connection	Yes
Force Main Size/Material/Length	6-inch / DI / 1,000 ft	Ancillary Equipment	Manual Bar Rack, Grinder, Flowmeter, Slide Gate
Structure	Concrete Wet Well, Framed Wooden Structure w/ Shingle Roof	Generator	50 kW Generator
SCADA	RTU	Level Control	Bubbler System

[1]Estimated based on a rain event which occurred on 7/16/23, and a drawdown performed on 8/11/23.

Wolfe Pump Station

- The capacity of the pumps are adequate for existing flows and estimated future flows.
- The wet well information was not available for capacity analysis.
- The equipment is in poor condition. Process, mechanical, and electrical equipment shows heavy corrosion and other visible signs of wear. Equipment should be upgraded.
- The station is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

Table 5-18 Wolfe Pump Station Characteristics

Category	Details	Category	Details
Location	Wolfe Road north of Canopus Avenue	Year Built	1985
Station Type	Can Station	Pump (Qty)	Yeomans (2)
Motor	7.5 HP, TEFC, 1155 RPM, 460 V, 3 Ph, 60 Hz	Pump Capacity	500 gpm @ 33 TDH
Existing Peak Flow[1]	124 gpm	Future Peak Flow	230 gpm
Wet Well Capacity	Unknown	Bypass Connection	Yes
Force Main Size/Material/Length	6-inch / 300 ft	Ancillary Equipment	Hoist
Structure	Steel Can	Generator	Portable Connection
SCADA	RTU	Level Control	Transducer

[1]Estimated based on a rain event which occurred on 8/8/23, and a drawdown performed on 8/11/23.

5.3.2.2 South Pump Stations

There are five Pumping Stations in Narragansett that are tributary to the SWWTF. Each station is detailed below with characteristics and observations from site visits that occurred in August 2023. Refer to the Pump Station Evaluation Report for detailed equipment recommendations and useful life estimates.

Briggs Farm Pump Station

- The capacity of the pumps and wet well are adequate for existing flows and estimated future flows.
- The process, electrical, and mechanical equipment is in good condition.
- The station is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

Table 5-19 Briggs Farm Pump Station Characteristics

Category	Details	Category	Details
Location	Briggs Farm	Year Built	2005
Station Type	Wet/Dry Pit	Pump (Qty)	Gorman-Rupp (2)
Motor	25 HP, TEFC, 1770 RPM, 230/460 V, 3 Ph, 60 Hz	Pump Capacity	400 gpm
Existing Peak Flow[1]	53 gpm	Future Peak Flow	236 gpm
Wet Well Capacity	1,354 Gal	Bypass Connection	Yes
Force Main Size/Material/Length	8-inch / DI / 3,250 ft	Ancillary Equipment	Slide gate, Flowmeter, Hoist and Monorail
Structure	Concrete Wet Well, Framed Wooden Structure w/ Shingle Roof	Generator	100 kW Generator
SCADA	RTU	Level Control	Bubbler System

[1]Estimated based on a rain event which occurred on 7/16/23, and a drawdown performed on 8/9/23.

Burnside Pump Station

- The pumps and wetwell do not have adequate capacity for existing peak flows.
- Operations staff reports the pump station struggles to keep up with flow during wet weather events.
- The pumps and wet well do not have adequate capacity for estimated future peak flows.
- The generator breaker does not have proper clearance.
- The exterior door of the station has holes in it.
- Process, mechanical, and electrical equipment is nearing the end of its useful life. Replacement should be considered.
- The station is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

Table 5-20 Burnside Pump Station Characteristics

Category	Details	Category	Details
Location	Ocean Road and Burnside Avenue	Year Built	1980 (Major Upgrade in 2005)
Station Type	Wet/Dry Pit	Pump (Qty)	Cornell (2)
Motor	30 HP, TEFC, 885 RPM, 480 V, 3 Ph, 60 Hz	Pump Capacity	1,200 gpm
Existing Peak Flow[1]	1,200 gpm	Future Peak Flow	1,327 gpm
Wet Well Capacity	898 Gal	Bypass Connection	Yes
Force Main Size/Material/Length	8-inch / CI / 1540 ft	Ancillary Equipment	Grinder, Flowmeter
Structure	Concrete Wet Well, Framed Wooden Structure w/ Shingle Roof	Generator	125 kW Generator
SCADA	RTU	Level Control	Bubbler System

[1]Estimated based on a rain event which occurred on 8/8/23, and the pump's rated capacity.

Galilee Pump Station

- The capacity of the pumps and wet well are adequate for existing flows and estimated future flows.
- The check valve on Pump No. 1 is leaking.
- Process, electrical, and mechanical equipment is nearing the end of its useful life. Replacement should be considered. (Pump 1 replaced in 2024. Pump 2 planned replacement in 2025).
- The pump station structure is in poor condition. Groundwater intrusion and visible deterioration of the pump station structure was observed.
- The station is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

Table 5-21 Galilee Pump Station Characteristics

Category	Details	Category	Details
Location	Great Island Road and Galilee Escape Road	Year Built	1980 (Major upgrade in 1991)
Station Type	Can Station	Pump (Qty)	Cornell (2)
Motor	75 HP, TEFC, 230/460 V, 3 Ph, 60 Hz	Pump Capacity	1100 gpm
Existing Peak Flow[1]	187 gpm	Future Peak Flow	405 gpm
Wet Well Capacity	1206 Gal	Bypass Connection	Yes
Force Main Size/Material/Length	6-inch, 8-inch / DI, AC / 5,000 ft	Ancillary Equipment	Flowmeter, Bioxide[2]
Structure	Steel Can, Concrete Structure	Generator	175 kW Generator[3]
SCADA	RTU	Level Control	Bubbler System

[1] Estimated based on a rain event which occurred on 8/8/23, and a drawdown performed on 8/9/23.

[2] Bioxiode tank has been emptied and remains on site for possible future use; the bellows pumps and related pumping equipment have been removed or are being used for parts at Sprague or Ouida stations.

[3] Replacement of this generator was completed in April 2025

Point Judith Pump Station

- The pumps and wet well are adequate for existing flows and estimated future peak flows.
- The bubbler level system is not working properly.
- Equipment is generally in good to fair condition.
- The station is located just outside of the 100-year flood plain. Modifications and improvements to enhance flood resiliency should be considered if changes to the 100-year storm design or site conditions become apparent.

Table 5-22 Point Judith Pump Station Characteristics

Category	Details	Category	Details
Location	Woodsia Road and Baneberry Trail	Year Built	1995
Station Type	Wet/Dry Pit	Pump (Qty)	Gorman-Rupp (2)
Motor	15 HP, TEFC, 1775 RPM, 460 V, 3 Ph, 60 Hz, inverter duty rated	Pump Capacity	325 gpm
Existing Peak Flow[1]	239 gpm	Future Peak Flow	308 gpm
Wet Well Capacity	718 Gal	Bypass Connection	Yes
Force Main Size/Material/Length	8-inch / DI / 3,300 ft	Ancillary Equipment	Flowmeter, Monorail
Structure	Concrete Wet Well, Framed Wooden Structure w/ Shingle Roof	Generator	60 kW Generator
SCADA	RTU	Level Control	Bubbler System

[1]Estimated based on a rain event which occurred on 8/8/23, and a drawdown performed on 8/9/23.

Stanton Pump Station

- The pumps and wet well are adequate for existing flows but do not have adequate capacity for estimated future peak flows.
- Operations staff reports the pump station struggles to keep up with flow during wet weather events.
- Process, mechanical, and electrical equipment is nearing the end of its useful life and has corrosion from the marine environment. Replacement should be considered.
- The station is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

Table 5-23 Stanton Pump Station Characteristics

Category	Details	Category	Details
Location	Stanton Avenue	Year Built	1972 (Upgrade date not known)
Station Type	Wet/Dry Pit	Pump (Qty)	Gorman-Rupp (2)
Motor	TEFC, 460 V, 3 Ph, 60 Hz	Pump Capacity	250 gpm
Existing Peak Flow[1]	205 gpm	Future Peak Flow	271 gpm
Wet Well Capacity	1,052 Gal	Bypass Connection	Yes
Force Main Size/Material/Length	8-inch / DI & AC / 4,600 ft	Ancillary Equipment	
Structure	Concrete Structure	Generator	98 kW Generator
SCADA	RTU	Level Control	Transducer

[1]Estimated based on a rain event which occurred on 7/16/23, and the pump's rated capacity.

5.3.3 Interceptors

The northern interceptors include Bonnet Shores Interceptor, and the North Interceptor. The southern interceptors include Point Judith Interceptor, and Point Judith Road Interceptor. These are shown in Figure 5-11 and Figure 5-12.

5.3.3.1 Bonnet Shores Interceptor

The Bonnet Shores Interceptor is approximately 4,800 feet long and consists of 2,800 feet of 12-inch asbestos cement pipe and 2,000 feet of 18-inch asbestos cement pipe. It conveys wastewater flow from Industrial Park, URI's Bay Campus, and Wolfe Road to the Bonnet Shores Pump Station.

5.3.3.2 North Interceptor

The North Interceptor is approximately 14,200 feet long and consists of 1,800 feet of 15-inch asbestos cement pipe, 3,800 feet of 24-inch asbestos cement pipe, and 8,600 feet of 30-inch reinforced concrete pipe. It conveys wastewater flow from Bonnet Shores, Wilson Drive, Circuit Drive, and Mettatuxet Road to the Sprague Pump Station. The North Interceptor receives flow from South Kingstown's Middle Bridge Pump Station where the interceptor crosses Middle Bridge Road.

5.3.3.3 Point Judith Interceptor

The Point Judith interceptor is approximately 6,900 feet long and consists of 3,600 feet of 10-inch PVC pipe, and 3,300 feet of 12-inch PVC pipe. It conveys wastewater flow from Briggs Farm and Clarke Farm to the Burnside Avenue Pump Station.

5.3.3.4 Point Judith Road Interceptor

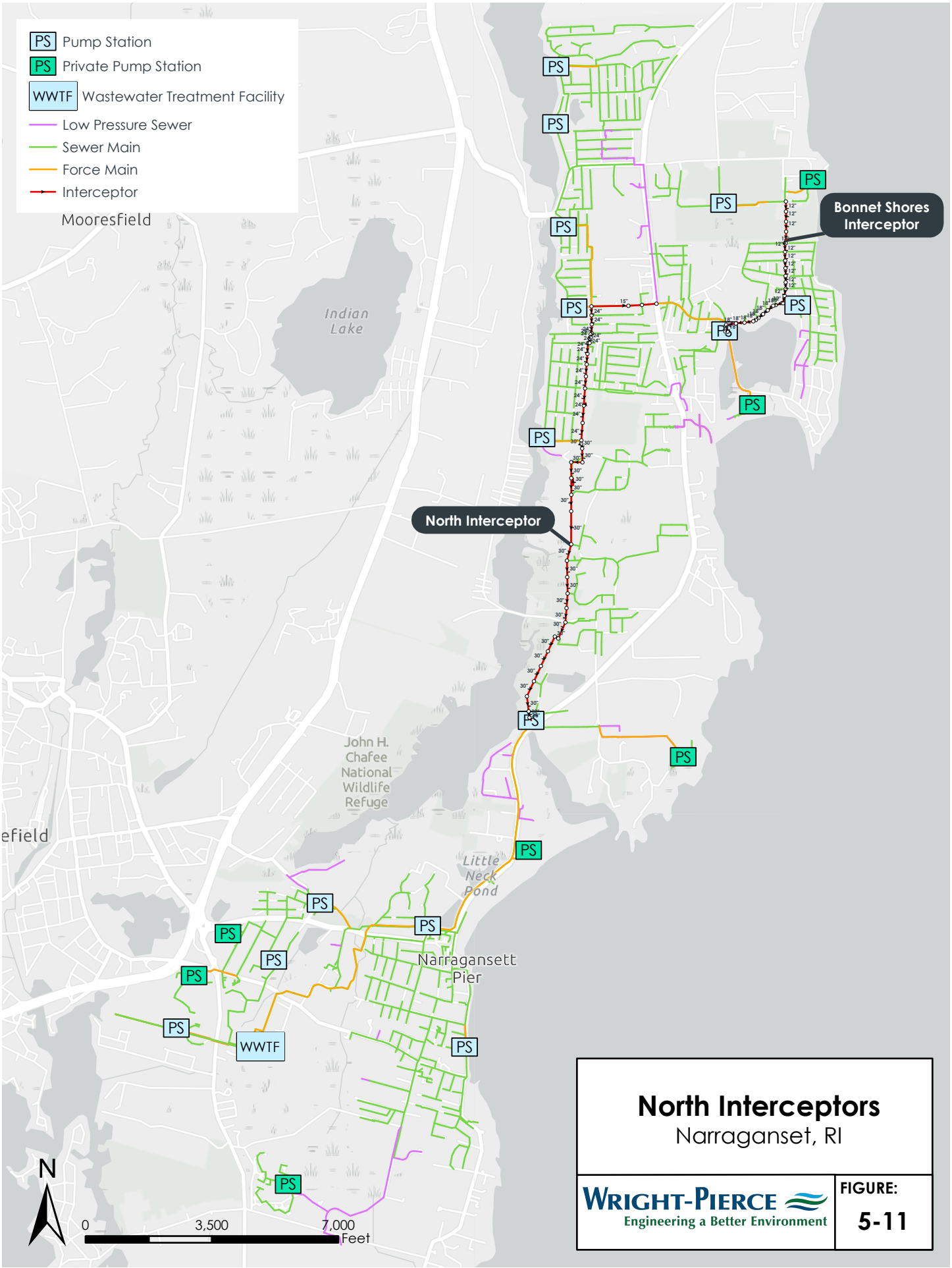
The Point Judith interceptor is approximately 6,000 feet long and consists of a 14-inch asbestos cement pipe. It was sliplined in the late 1990's. It conveys wastewater flow from Fisherman's Memorial State Park, Galilee, and Stanton Avenue to the SWWTF.

5.3.3.5 Interceptor Capacity

Table 5-24 shows the capacity and the projected peak flow of each interceptor. Bonnet Shores Interceptor and North interceptor have a range of diameters as pump stations feed into them, so the minimum capacity is shown as a range. The interceptors are adequate to handle existing flows.

Table 5-24 Interceptor Capacity

Interceptor	Capacity (cfs)	Existing Peak Discharge (cfs)	Adequacy
Bonnet Shores	2.4 – 3.7	0.1 – 0.5	Adequate
North Interceptor	4.6 – 7.5	1.7 – 2.6	Adequate
Point Judith Interceptor	1.3 – 3.0	0.5	Adequate
Point Judith Road	2.7	1.0	Adequate



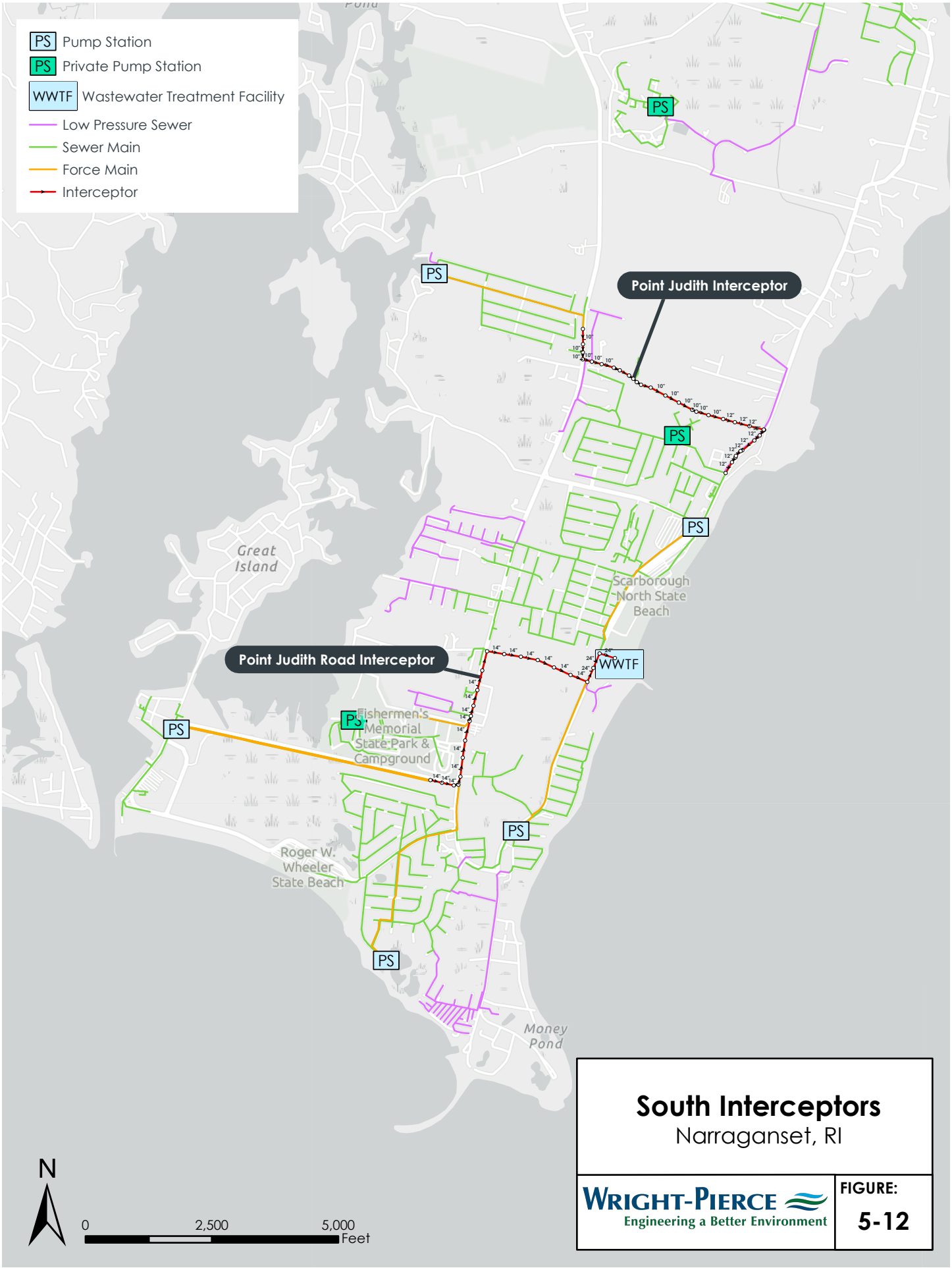
North Interceptors

Narraganset, RI

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FIGURE:
5-11

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South Interceptors

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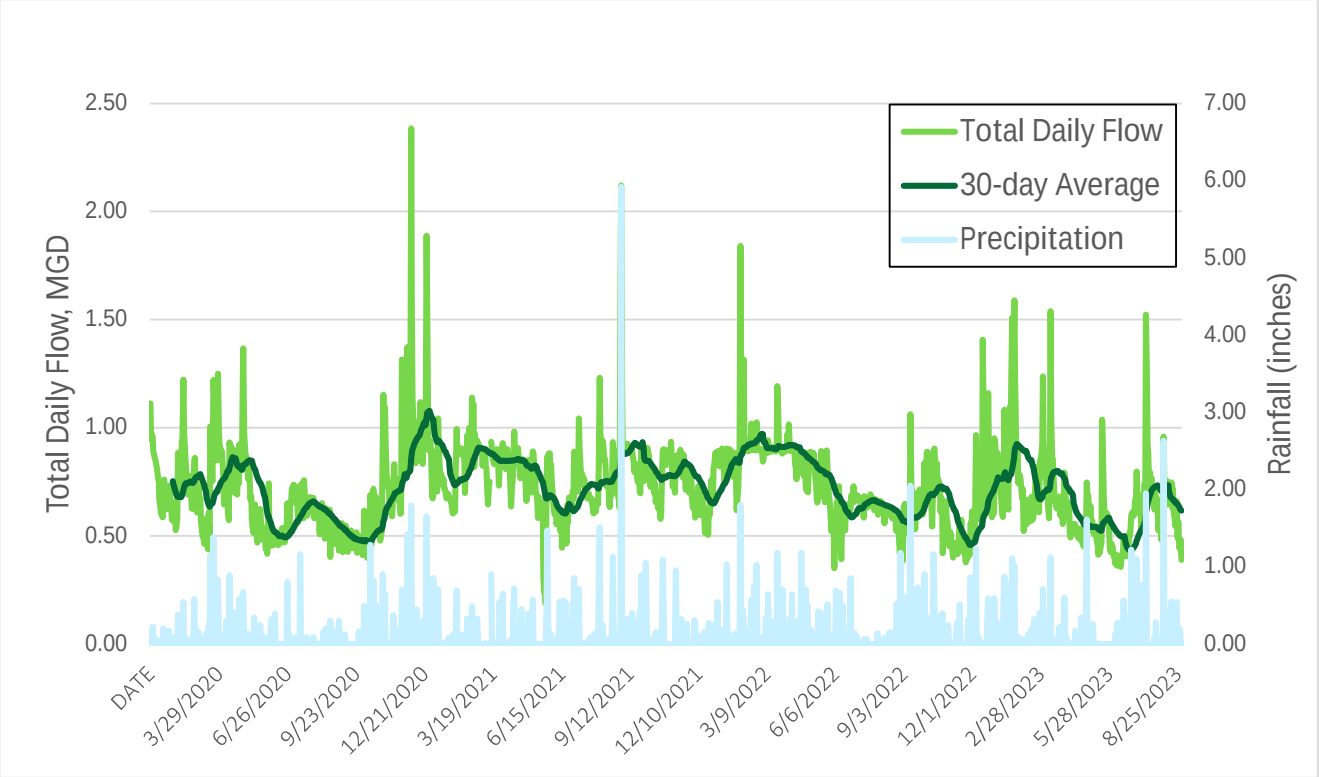
FIGURE:
5-12

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5.3.4 Infiltration and Inflow

A comprehensive infiltration and inflow (I/I) study performed on the SWWTF sewer system was not available for this analysis. A desktop investigation was performed to estimate infiltration and inflow for the SWWTF collection system. Infiltration is groundwater that leaks into pipes through cracks, faulty joints, or similar defects. Inflow is stormwater entering the collection system directly from direct connections (storm drain, roof drain downspouts, foundation drains). Figure 5-13 below shows the correlation between precipitation and high influent flows to the SWWTF.

Figure 5-13 Daily Influent Flow and Precipitation



Infiltration was estimated by finding the difference between the average influent flow at a time of high groundwater and the average influent dry weather flow. The high groundwater average influent flow is the average influent flow from March and April for the years 2020, 2021, and 2022. The dry weather influent flow is the average influent flow from November 2020, 2021, and 2022. Rain events were removed from the data to eliminate the influence of inflow from the calculation. Infiltration for the SWWTF is estimated to be 0.17 mgd, or approximately 30 gpcd. This value is below the RIDEM excessive infiltration criteria of 120 gpcd.

Table 5-25 Determination of Infiltration

Average High Groundwater Influent Flow (mgd)	0.80
Average Dry Weather Influent Flow (mgd)	0.64
Infiltration (mgd)	0.17
Infiltration (gpcd)	30

Inflow was estimated by finding the average of maximum influent flow to the SWWTF during significant rain events (above 1-inch) in the months of March and April (months of high groundwater). From that average, the average high groundwater influent flow is subtracted (March and April flow when there was no rain). Table 5-26 summarizes the significant rain events and corresponding influent flows. Inflow is estimated to be 0.96 mgd, or approximately 180 gpcd. This value does not exceed the RIDEM excessive inflow threshold of 275 gpcd.

Table 5-26 Significant Rain Events (2020-2023)

Date	Rain (in)	Max Flow (MGD)
3/19/2020	1.14	2.00
3/23/2020	1.38	2.47
3/24/2022	1.18	1.50
4/24/2022	1.18	0.96
3/14/2023	1.12	2.52
4/30/2023	1.61	1.11
Average		**1.76**

Table 5-27 Determination of Inflow

Wet weather flow (mgd)	1.76
High groundwater flow (mgd)	0.80
Inflow (mgd)	0.96
Inflow (gpcd)	180

In 2015, the Town of Narragansett conducted a Sewer System Evaluation Survey for the Congdon Street Pump Station service area (BETA, 2015). The purpose of the report was to locate and quantify infiltration and inflow sources and recommend methods of rehabilitation to alleviate high flows to the Congdon Street Pump Station immediately following rain events.

- The study used continuous flow monitoring, rain gauges, and groundwater gauges during a 10-week period in the Spring of 2013.
- The analysis showed infiltration rates were not excessively high during the study period, indicating infiltration is not a significant component of the I/I flow. Average Infiltration Flow Rate for the project area was 1,121 GPD per IN-Dia-Mile, below the 4,000 gpd/idm threshold.
- Inflow analysis confirmed there is an inflow component entering the system in this area. Investigations were conducted to identify sources of inflow. The report identified illegal sump pump connections, suspected downspout connections to sewer laterals, and unidentified sources of inflow (sewer laterals discharging clear water during rain event). Town staff performs additional inspections to identify and eliminate illegal connections when access to individual private properties is available.
- Town staff has observed increased flow in the Industrial Park pump station tributary area during wet weather events, indicating the possibility that inflow may be entering the system in this area.
- Additional investigation to identify inflow sources is recommended.

Flow reduction efforts in Narragansett include the following: an I/I evaluation was conducted in 2005 by National Water Main Cleaning Co. around Narragansett Pier area and Sand Hill Cove area. Most of the recommendations were addressed and repairs conducted. In 2015, another I/I evaluation was conducted around the Congdon Street Pump Station. This evaluation found illegal connections, and a significant amount of I/I from sewer laterals. In 2008, the Town implemented a program where I/I credits are “purchased” via new connection permit fees. The funds are earmarked for future sewer improvement projects. Projects include I/I removal projects.

5.4 Existing Flows and Wasteloads

Operational data from the SWWTF from 2020 through 2023 was reviewed to identify the current flow and loading to the SWWTF. The data was analyzed for the following conditions:

- Minimum Day - The minimum for flow and loadings that occurred in a single day during the analysis period.
- Average Day - The average of all daily data for the entire monitoring period.
- Maximum Week - The maximum 7-day rolling average during the monitoring period. The maximum week values for flow and loadings were calculated independently.
- Maximum Month - The maximum 30-day rolling average during the monitoring period. The maximum month values for flow and loadings were calculated independently.
- Maximum Day - The maximum for flow and loadings that occurred in a single day during the analysis period.

- Percentile - The 99th percentile for the maximum day flow and loading were considered in addition to the 100th percentile based on the distribution of data observed. The 99th percentile is analyzed to avoid over-designing equipment for data outliers.

Influent flow is measured through a flowmeter ahead of headworks. The flowmeter records total flow, daily maximum flow, and minimum flow entering the plant. Influent loading parameters for the SWWTF are biochemical oxygen demand (BOD), and total suspended solids (TSS). The facility does not monitor any other influent parameters, such as nutrients or volatile solids. The measured influent is a true "raw" sample, as the composite sampler is located upstream of any return streams (such as thickening filtrate).

5.4.1 Flow and Wasteload Summary

The existing influent flows and wasteloads to the SWWTF are detailed below in Table 5-28. The values presented in the first section of the table are specific to the parameter and can be independent of each other. For example, the Maximum Month flow of 1.08 mgd and the Maximum Month BOD of 2,577 lbs/day did not occur in the same month. The second section of the table has BOD-based values. These values are used to analyze the secondary system sizing and performance. They are based on the BOD load on a specific day and the associated flow and TSS values on time of occurrence.

Table 5-28 Summary of Influent Flows and Loadings

Parameter	Flow (mgd)	Peaking Factor	BOD (lbs/day)	TSS (lbs/day)
Minimum Day	0.19	0.3	200	300
Annual Average	0.72	1.0	1,250	1,400
Maximum Month	1.08	1.5	2,600	3,050
Maximum Day, 99th Percentile	1.39	1.9	3,100	3,450
Maximum Day	2.38	3.3	3,750	5,250
Peak Hour	4.56	6.3	-	-
Peak Hour (98th %)	2.50	3.48	-	-
BOD-Based				
Minimum Day[1]	0.85	0.4	200	1,700
Maximum Month[2]	0.63	2.1	2,600	3,050
Maximum Week[3]	0.61	2.5	3,000	2,500
Maximum Day[4]	0.64	3.0	3,750	5,250

1. Minimum Day influent load occurred on 4/22/2021
2. Maximum Month influent load occurred from 7/23/2022 to 8/21/2022
3. Maximum Week influent load occurred from 8/7/2022 to 8/13/2022
4. Maximum Day influent load occurred on 8/7/2022

5.4.2 Wastewater Flow

The influent flows to the SWWTF for the analysis period are shown in Table 5-28 above. The daily flows are shown in Figure 5-14, and the frequency distribution is shown in Figure 5-15.

The SWWTF sees flow variations throughout the year. During the pandemic shutdown, flows to the facility were generally low. Much of the higher flow is correlated with precipitation, as opposed to seasonal increase in tourism. This infiltration and inflow is further discussed in Section 5.3.4. There are a few outliers of high-flow events captured in the 99th percentile, indicated by the steep right-hand tail on the frequency distribution in Figure 5-15, with most of the flow entering the plant between 0.5 and 1 mgd.

Figure 5-14 Influent Daily and Average Flow

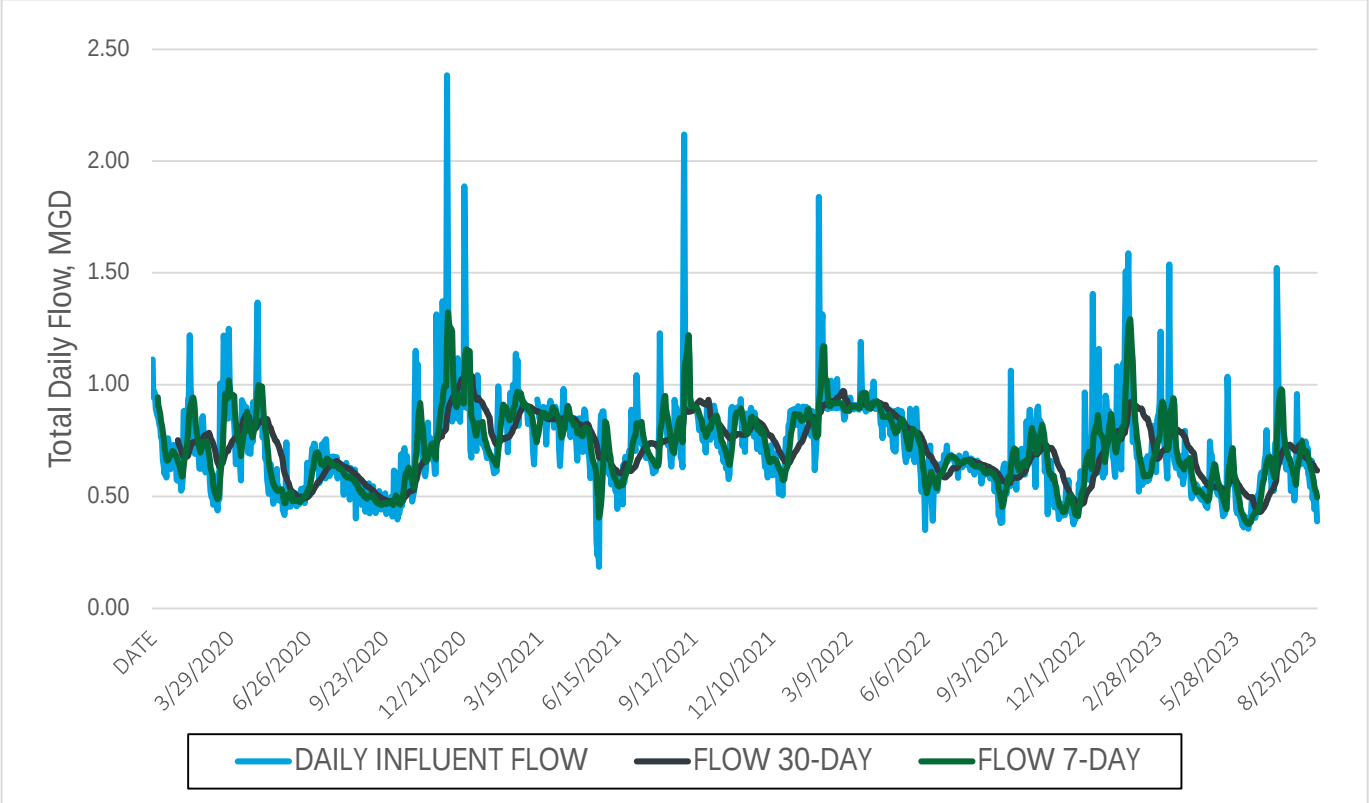
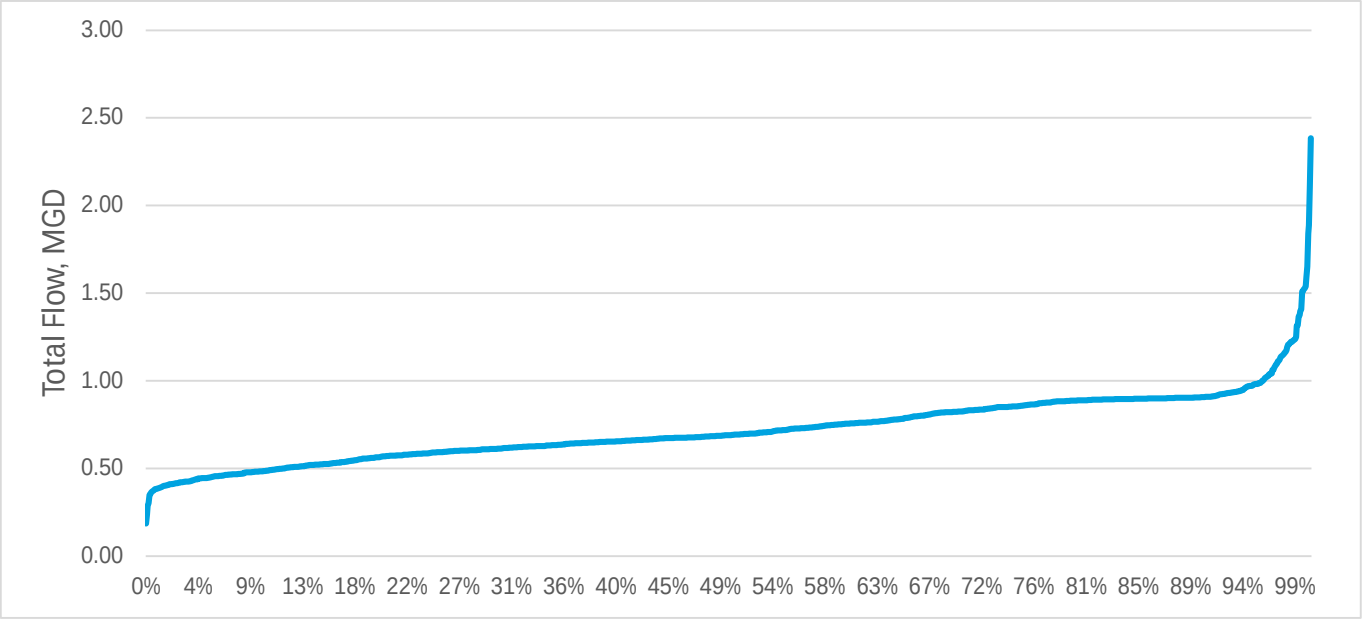


Figure 5-15 Frequency Distribution for Influent Flow



5.4.3 Wastewater Characteristics

5.4.3.1 Biochemical Oxygen Demand

The influent BOD loadings at the SWWTF for the analysis period are shown in Table 5-28 above. The daily influent BOD loadings are shown in Figure 5-16, and the frequency distribution is shown in Figure 5-17.

The SWWTF sees loading variations throughout the year. During the pandemic shutdown, loads to the facility were generally low. During the summer months, July and August, very large loads come to the facility. The spike in loads starts around the July 4th holiday each year and continues through the end of August. This is attributed to tourism and restaurant use. There are several outliers captured in the 99th percentile for BOD load, indicated by the steep right hand tail on the frequency distribution.

The facility has reported septic conditions in the treatment process occurring around the July 4th holiday. Based on this feedback, a 7-day trend was included to better view this spike in load Figure 5-16. Understanding the sustained loads to the facility will be critical when reviewing aeration equipment sizing.

Figure 5-16 Influent Daily and Average BOD Loadings

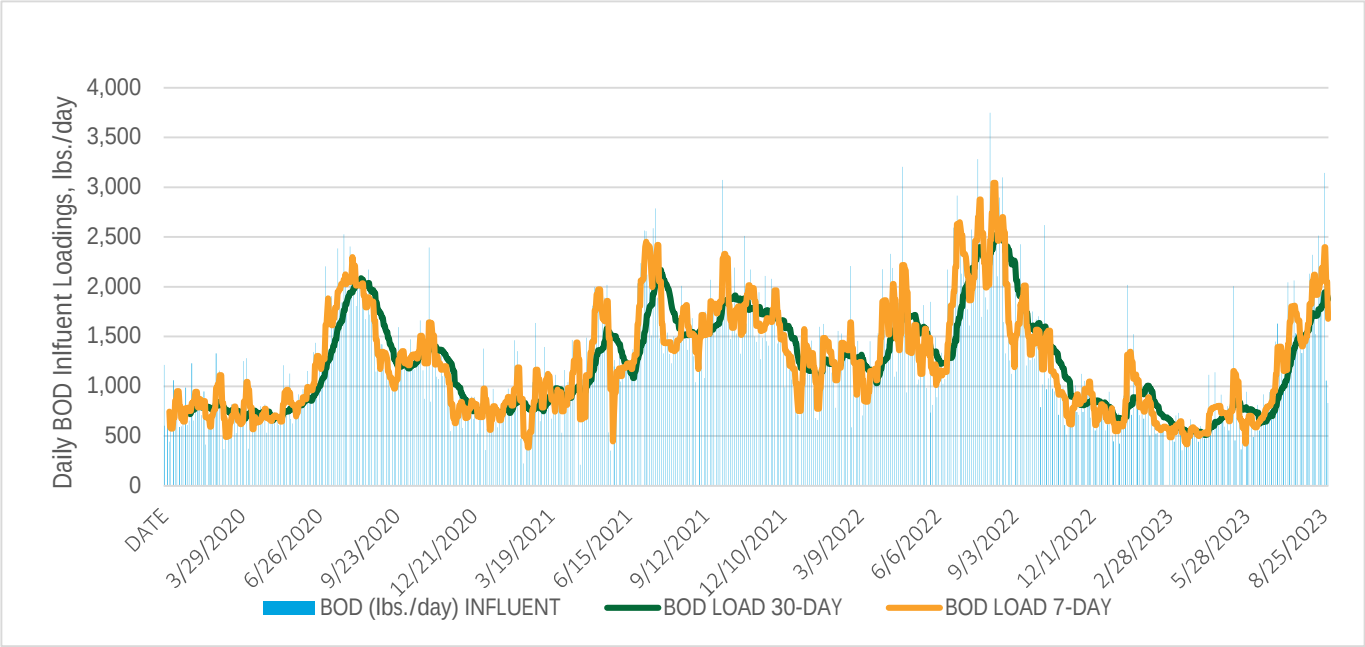
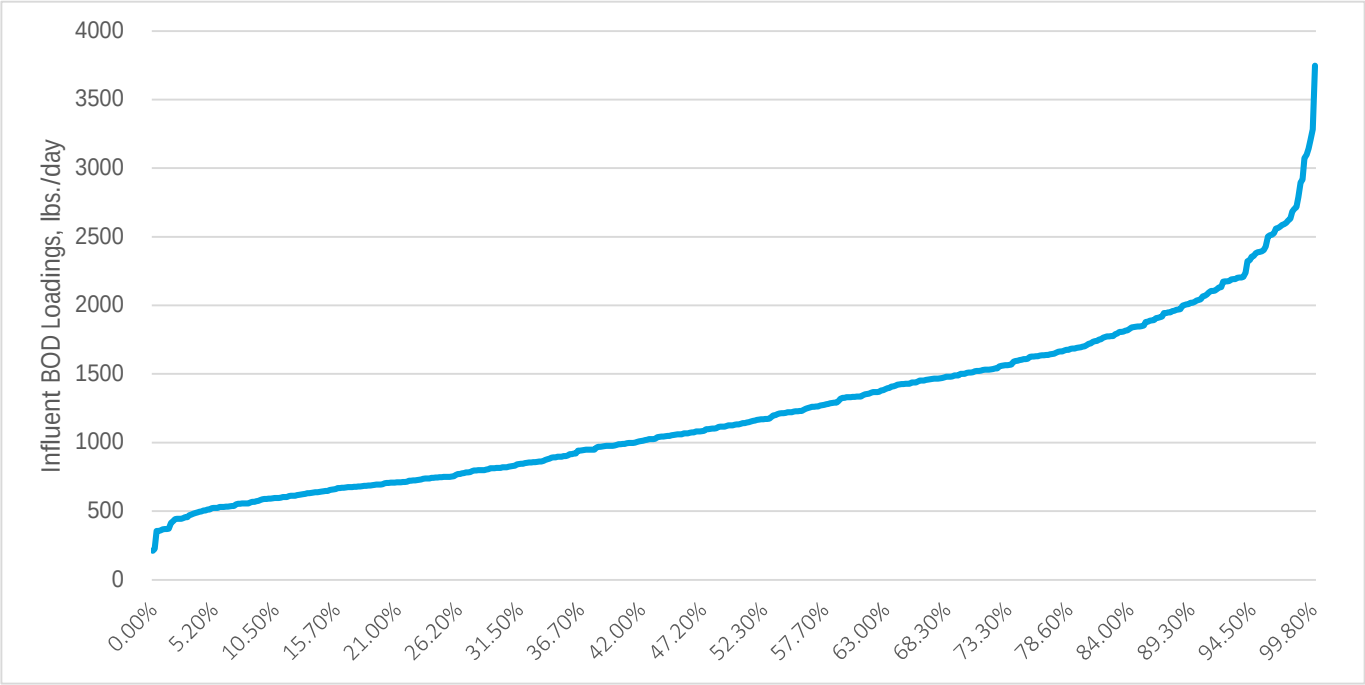


Figure 5-17 Frequency Distribution for Influent BOD Loading



5.4.3.2 Total Suspended Solids

The daily influent TSS loadings at the SWWTF for the analysis period is shown in Figure 5-18. The frequency distribution is shown in Figure 5-19.

In general, TSS loads to the facility vary similarly to BOD loadings. There is some correlation between precipitation events and first flush phenomenon in the collection system with TSS in the influent. However, the primary increase to TSS loads occurs during the summer months.

Figure 5-18 Influent Daily and Average TSS Loading

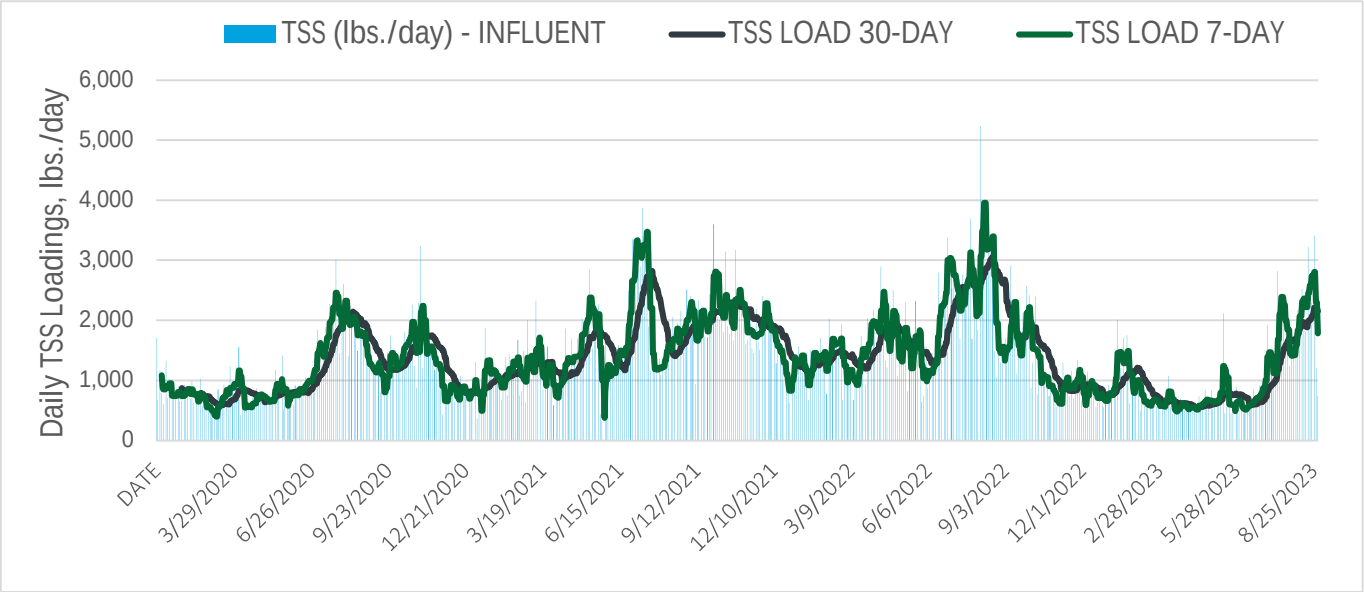
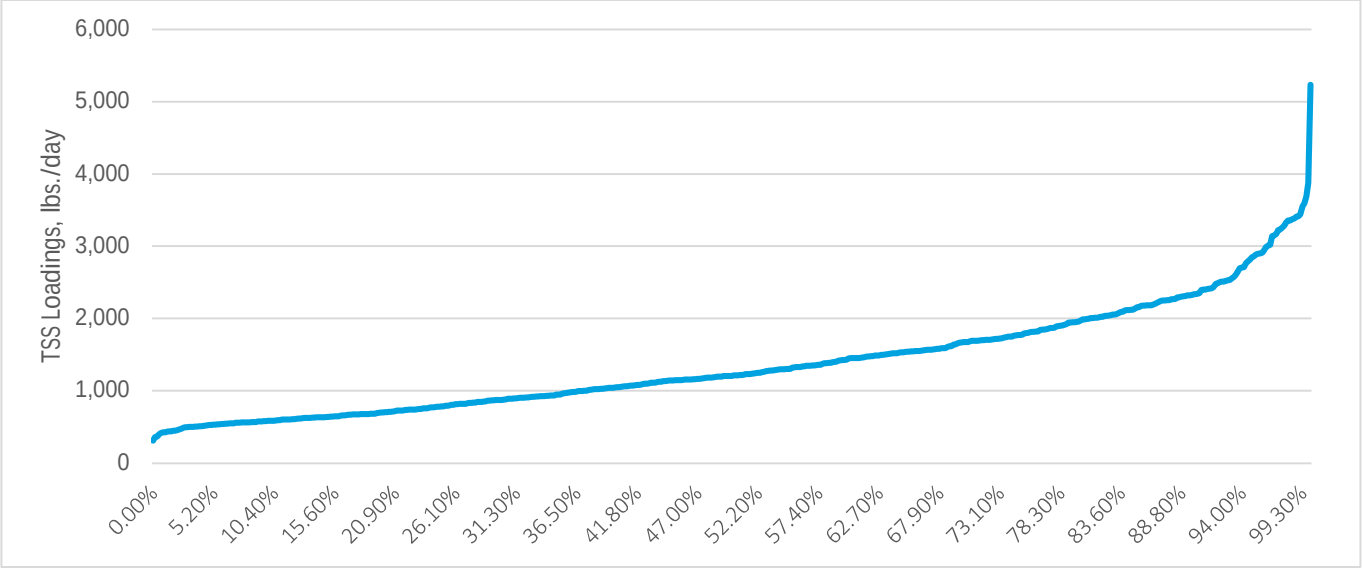


Figure 5-19 Frequency Distribution for Influent TSS Loading



5.4.4 Residential/Commercial/Industrial Flows

Narragansett is primarily a residential town. There are a few restaurants, shops, and hotels. Industries in Narragansett consist of the fish processing facilities. According to drinking water consumption, commercial properties use 8% of water, government uses 3% of water, industrial properties use 3% of water, and residential properties use the remaining 86%.

Industry in the south portion of Narragansett is primarily fishing related industry in the Port of Galilee. Before the mid-1990s, the industrial contribution from the fishing industry was responsible for approximately 80 percent of the organic loading (BOD_5 and TSS) while representing only 20 percent of the hydraulic loading to the SWWTF. This caused operational problems and permit violations for the SWWTF. In the mid-1990s the Town began enforcement of an industrial pretreatment program limiting the fish processing load to SWWTF. Today, the largest fisheries in operation are Town Dock and SeaFreeze. Typical operations at these facilities include unloading fishing boats, bulk freezing, and minimal processing. Due to the pretreatment requirements, these facilities do not currently discharge fish processing wastewater to the SWWTF. It is more cost effective to haul wastewater offsite than maintain a treatment system to meet the required pretreatment levels for discharge to SWWTF.

5.4.5 Septage

Septage is not accepted at Scarborough WWTF.

5.4.6 Sludge Treatment and Disposal

SWWTF is a secondary treatment only facility. The facility does not generate any primary sludge or receive septage or merchant sludge (sludge from outside facilities). Secondary sludge is digested, stored, and then thickened and hauled to the Synagro Facility in Woonsocket, Rhode Island for disposal. The facility doesn't have a flow meter on their wasting line, so waste sludge volumes are estimated based on valve turns and duration of opening. The operators do record these volumes for process control. The waste sludge (to digester channel) estimates for the monitoring period are summarized in Table 5-29. The facility thickens waste sludge using a gravity belt thickener. The facility only thickens once or twice a week, depending on the season. Sludge is stored in the digester channel and the storage tank before thickening. Thickened sludge received by Synagro during the monitoring period is summarized in Table 5-30. A graphical summary of sludge production during the monitoring period is shown in Figure 5-20.

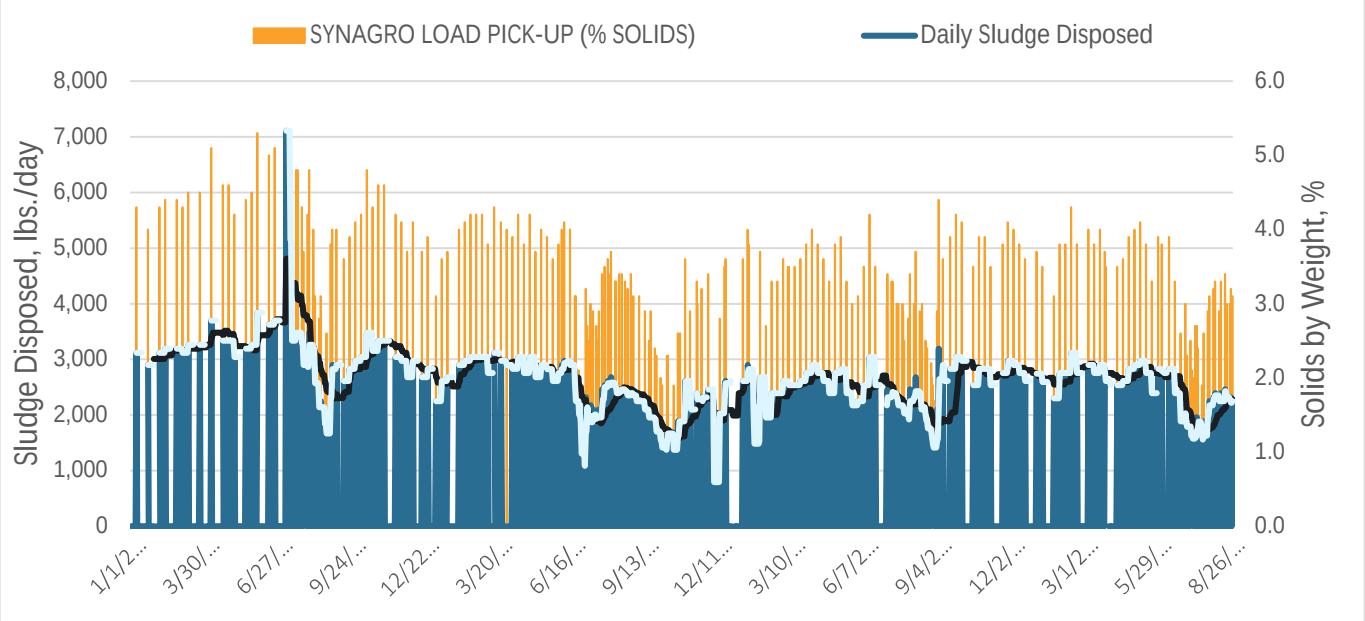
Table 5-29 Historical Sludge Generation Summary

Scenario	Sludge Wasted (gallons/day)	Sludge Concentration (mg/l)	Sludge Generated (lbs/day)
Average Day	26,000	2,300	530
Maximum Month	53,000	3,400	1,100
Maximum Week	87,000	4,300	1,800
Maximum Day	340,000	9,000	6,300

Table 5-30 Historical Thickened Sludge Disposal Summary

Scenario	Thickened Sludge Concentration (Percent Solids)	Sludge Disposed (lbs/load)	Sludge Disposed (lbs/week)
Average Day	3.44	2,500	3,000
Maximum Month	5.13	4,800	6,800
Maximum Week	5.30	7,100	10,300
Maximum Day	5.30	7,100	-

Figure 5-20 Historical Sludge Disposal



5.5 Regional WWTF Flows

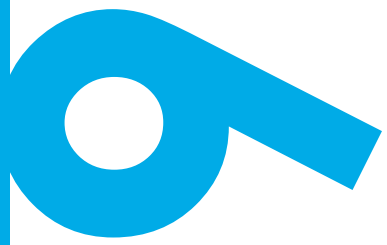
5.5.1 Flow Summary

The existing influent flows to the Regional Wastewater Treatment Facility (RWWTF) are shown in Table 5-31. Monthly totals of regional partner flow data for the period July 2020 through June 2023 were used to calculate flows. Regional partner flow data is included in Appendix G. Narragansett contributions to the RWWTF are measured using the flow meter located at the Ouida Street Pump Station. (South Kingstown's Middlebridge Pump Station flows through Ouida Street. These flows are subtracted to determine Narragansett's contribution to the RWWTF.)

Table 5-31 Existing Narragansett Contribution to Regional WWTF Flows

Parameter	Flow (mgd)	Peaking Factor
Minimum Monthly Average	0.75	0.66
Annual Average	1.14	1.0
Maximum Consecutive 3-month Average	1.44	1.26
Maximum Month Average	1.69	1.48

- Minimum monthly average flow is the average daily flow for the minimum monthly flow total (September 2020).
- Maximum Consecutive 3-month average flow is the maximum average daily flow average for three consecutive months (December 2021 through February 2022)
- Maximum monthly average flow is the average daily flow for the maximum monthly flow total (December 2020)



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Section 6 Assess Future Situation

6.1 Forecasted Flows and Wasteloads

Future wastewater flows and loads were estimated to determine the future needs of the wastewater collection system and SWWTF for the 20-year planning period. Future wastewater flows and wasteloads were projected using existing and future sewered population; projected residential and commercial growth; industry growth in the Port of Galilee; onsite wastewater treatment system (OWTS) to sewer conversions; and infiltration and inflow. The projected flows and wasteloads include current existing, projected future residential/commercial buildout, and projected future industrial. The existing and projected future flows and loadings are summarized in Table 6-1.

Table 6-1 Existing and Future Flows and Loadings

Parameter	Flow (mgd)	BOD (lbs/day)	TSS (lbs/day)
Existing			
Annual Average	0.72	1,250	1,400
Maximum Month	1.08	2,600	3,050
Maximum Day	2.38	3,750	5,250
Peak Hour (98th %)	2.50	-	-
Existing and Future Residential/Commercial			
Annual Average	1.04	1,800	2,000
Maximum Month	1.56	3,750	4,450
Maximum Day	3.44	5,400	7,550
Peak Hour (98th %)	3.62	-	-
Existing, Future Residential/Commercial, and Industrial (Fish Processing)			
Annual Average	1.06	2,300	2,350
Maximum Month	1.60	6,500	5,450
Maximum Day	3.53	9,000	9,000
Peak Hour (98th %)	3.69	-	-

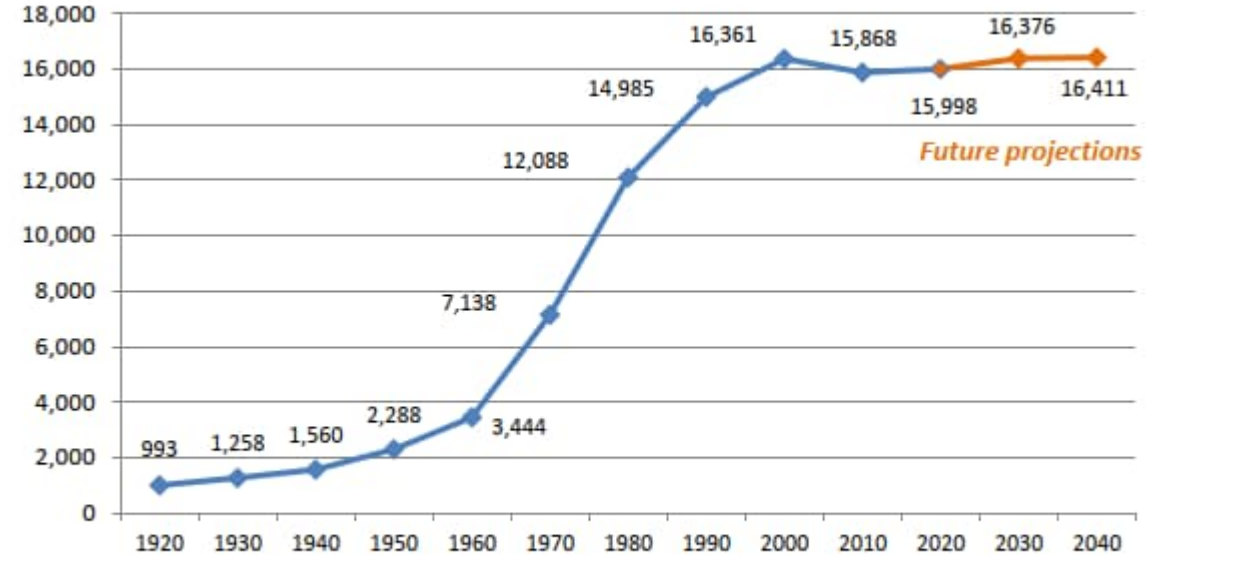
6.1.1 Forecasted Population and Buildout

According to the Rhode Island Division of Planning, the population of Narragansett has fallen from 16,361 in 2000, to 15,868 in 2010, to 14,532 in 2020. This decline in population marks the first population drop in Narragansett since 1920, shown in Figure 6-1.

As part of the 2016 Community Comprehensive Plan, the Town performed a buildout analysis to project the potential increase in housing units. The plan identified an additional 578 to 1,598 additional potential housing units. The low-end estimate, 578 units, includes development of buildable, conforming vacant lots. The high-end estimate, 1,578, includes an additional 1,020 under-utilized lots. Future buildout will depend on a multitude of regulatory and economic factors. Based on the current rate of building permit issuance by the Town, Town planners project a buildout of an additional 1,009 new housing units in the 20-year planning period.

In 2023, The Rhode Island General Assembly passed legislation (H-6059A), amending the State's land use/zoning standards. H-6059A made changes to the development of substandard lots to encourage higher density development and an increase in housing stock. Development of a substandard lot will no longer require zoning relief based solely on lot size. In 2024, the Town of Narragansett updated zoning regulations to meet the intent of H-059A and manage development within the Town. These changes may affect the population projections. Wastewater planning will need to address these changes in future community comprehensive plans.

Figure 6-1 Statewide Planning Population Projections, 1920 to 2040



Source: U.S. Census, 1920-2010; RI Division of Planning Statewide Planning Program, "Technical Paper 162: Rhode Island Population Projections 2010-2040," April 2013.

Table 6-2 Buildout Summary

		North/Central Planning Area Regional Plant WWTF	South Planning Area Scarborough WWTF
Vacant		365	211
Underutilized		542	187
Substandard, Vacant		471	174
Buildout Potential (Vacant Lots)	**(low end)**	**365**	**211**
(Underutilized and Substandard Vacant Lots)		1,013	361
Buildout Potential (Total)	**(high end)**	**1,378**	**572**

6.1.2 OWTS to Sewer Conversion

There are approximately 851 OWTS in the North area tributary to the Regional WWTF. It is assumed that within the 20-year planning period, all the OWTS in the north end will be connected to sewer, with the exception of the residences in the area east of Boston Neck Road and north of South Ferry Road. Table 6-3 and Figure 6-2 show the number of OWTS within each pump station sewershed. Conversion of OWTS to sewer would create about 0.26 MGD of additional flow to the Regional WWTF. To forecast flows to the Regional WWTF, multi-unit OWTS (e.g. multiple condominiums sharing an OWTS) were tabulated as equivalent residential units.

Table 6-3 North OWTS to Sewer Conversion

Pump Station	Number of OWTS
Baneberry Trail	0
Bonnet Shores	116
Circuit Dr	0
Congdon St	39
Industrial Park	9
Lakewood Dr	4
Mettatuxet Rd	0
Mumford Rd	13
Ouida St	42

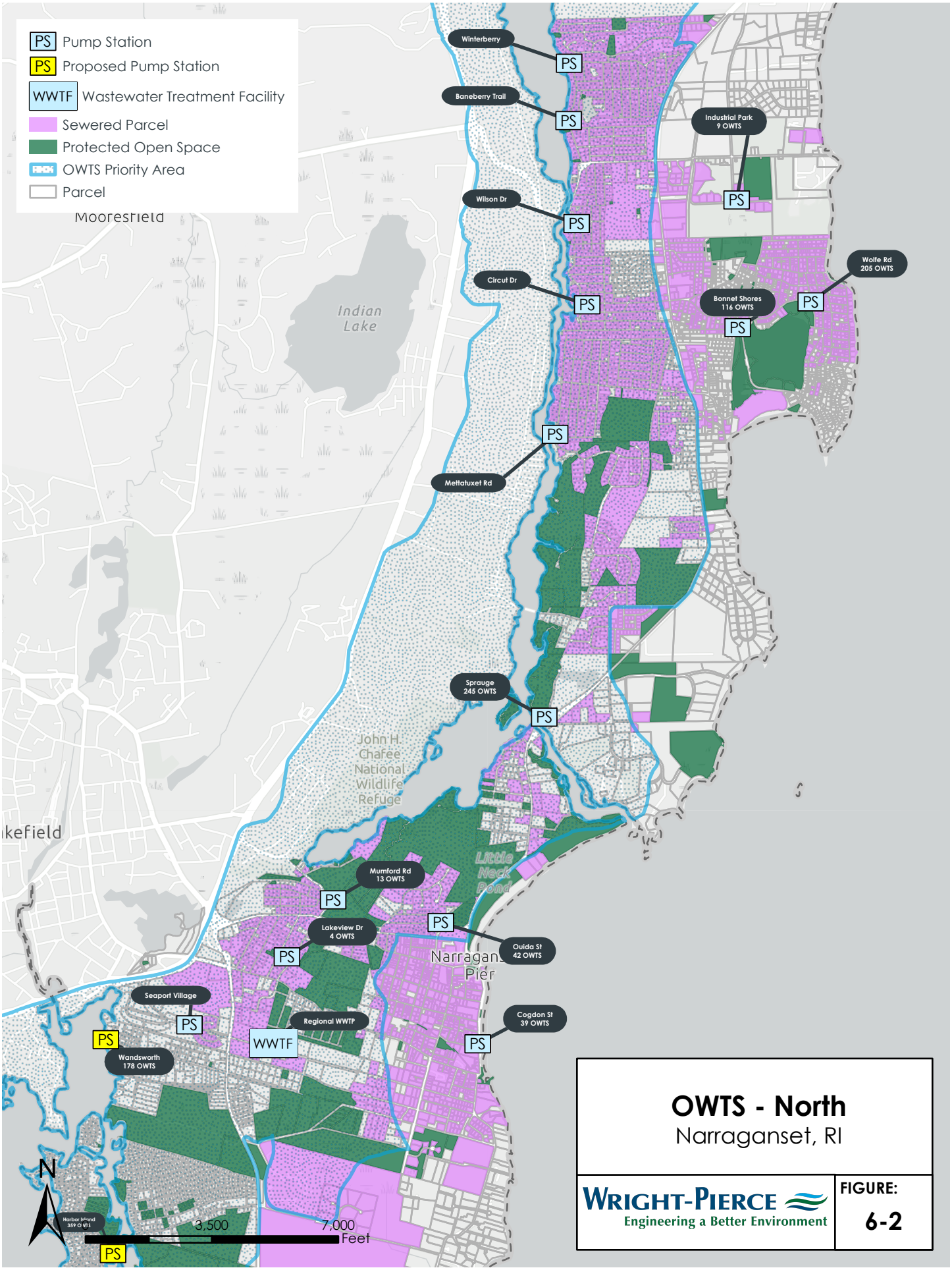
Pump Station	Number of OWTS
Wandsworth St (to connect to Lakewood PS)	178
Seaport	0
Sprague*	245
Wilson Dr	0
Winterberry Rd	0
Wolfe Rd	205

*Pump Station receives flow from South Kingstown's Middle Bridge Pump Station. OWTS conversions in the Middle Bridge sewer service area are unknown.

There are approximately 1,136 OWTS in the South area tributary to the SWWTF. It is assumed that within the 20-year planning period, all the OWTS in the south end will be connected to sewer. This assumes there is adequate capacity at the SWWTF (which requires an upgrade to current facilities). Table 6-4 and Figure 6-3 show the number of OWTS within each pump station sewershed. Conversion of OWTS to sewer would create about 0.34 MGD of additional flow to the SWWTF. To forecast flows to the SWWTF, multi-unit OWTS (e.g. multiple condominiums sharing an OWTS) were tabulated as equivalent residential units.

Table 6-4 South OWTS to Sewer Conversion

Pump Station	Number of OWTS
Briggs Farm PS	1
Burnside PS	129
Galilee PS	45
Great Island (to connect to Galilee PS)	375
Harbor Island (to connect to Briggs Farm PS)	359
Point Judith PS	75
Stanton PS	45
SWWTF (Sunset Blvd)	107



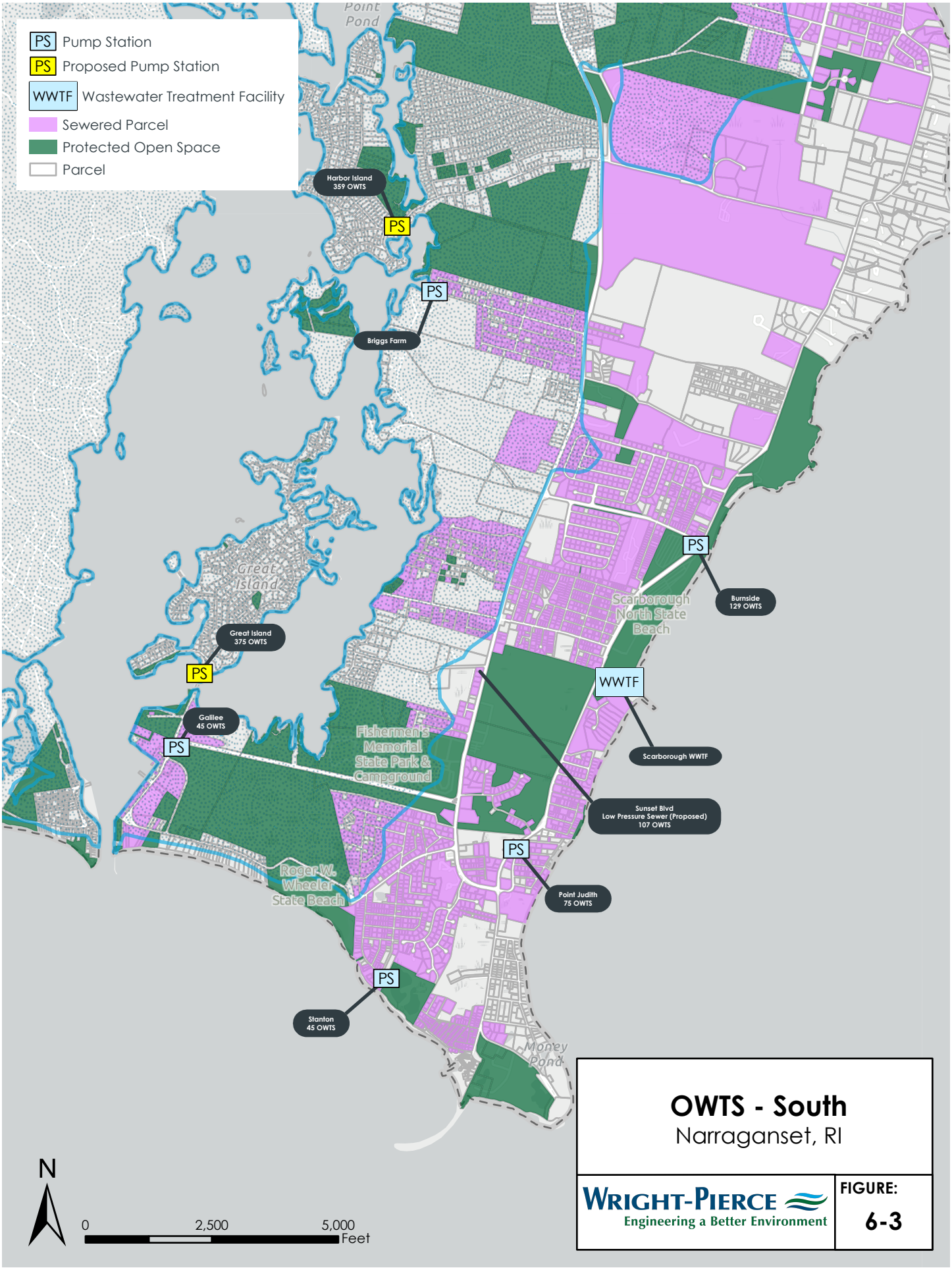
OWTS - North

Narragansett, RI

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FIGURE:
6-2

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OWTS - South

Narragansett, RI

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FIGURE:
6-3

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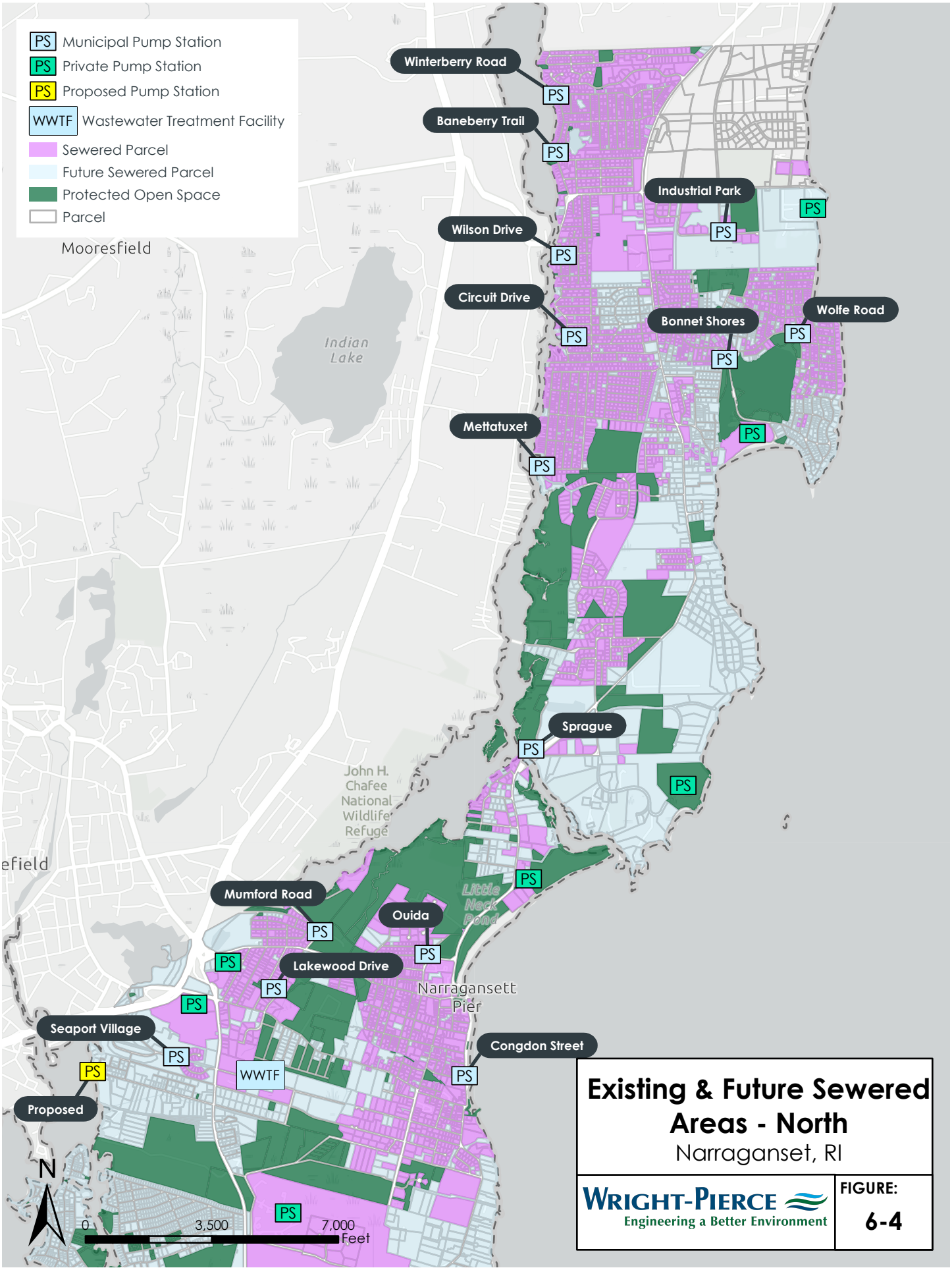
6.1.3 Residential and Commercial Projections

Forecasted residential flows will include OWTS to sewer conversions and residential development. The future sewer service area for the North collection system includes the entire north end with the exception of Plat N-B West Passage in the northeast corner of the Town. For the South collection system, the Town is planning to provide sewers for the entire south end with the exception of Jerusalem, located on the west side of Point Judith Pond across from the port of Galilee. Figure 6-4 and Figure 6-5 illustrate the existing and future sewered areas in the north and south sewer systems. Future residential flows were forecast based on the following. Future sewered parcels are summarized in Table 6-5.

- Forecasted residential flows were calculated using an estimate of 70 gallons per day per capita. 2020 census data identified 2.4 capita per household. 168 gallons per household per day was calculated to estimate additional residential flow per housing unit.
- The buildout analysis identified a range of residential development for the Town. The low-end estimate included vacant parcels. The high-end estimate included vacant parcels, substandard vacant parcels, and under-utilized parcels.
- The high-end residential development is unlikely to occur in the 20-year planning period. For this report, future residential wastewater flows will include flow from vacant parcels and substandard vacant parcels.
- Parcels designated as protected open space or wetlands were not included.
- Future residential housing units will include OWTS to sewer conversions.
- Five vacant, commercially zoned parcels were identified. A rate of 600 GPD per commercial property adds 0.003 MGD to the average flow.

Table 6-5 Future Sewered Parcels

	North/Central Planning Area Regional Plant WWTF	South Planning Area Scarborough WWTF
OWTS to Sewer Conversions	851	1,136
Future Residential Development	836	385
Total Future Sewered Parcels	1,687	1,521



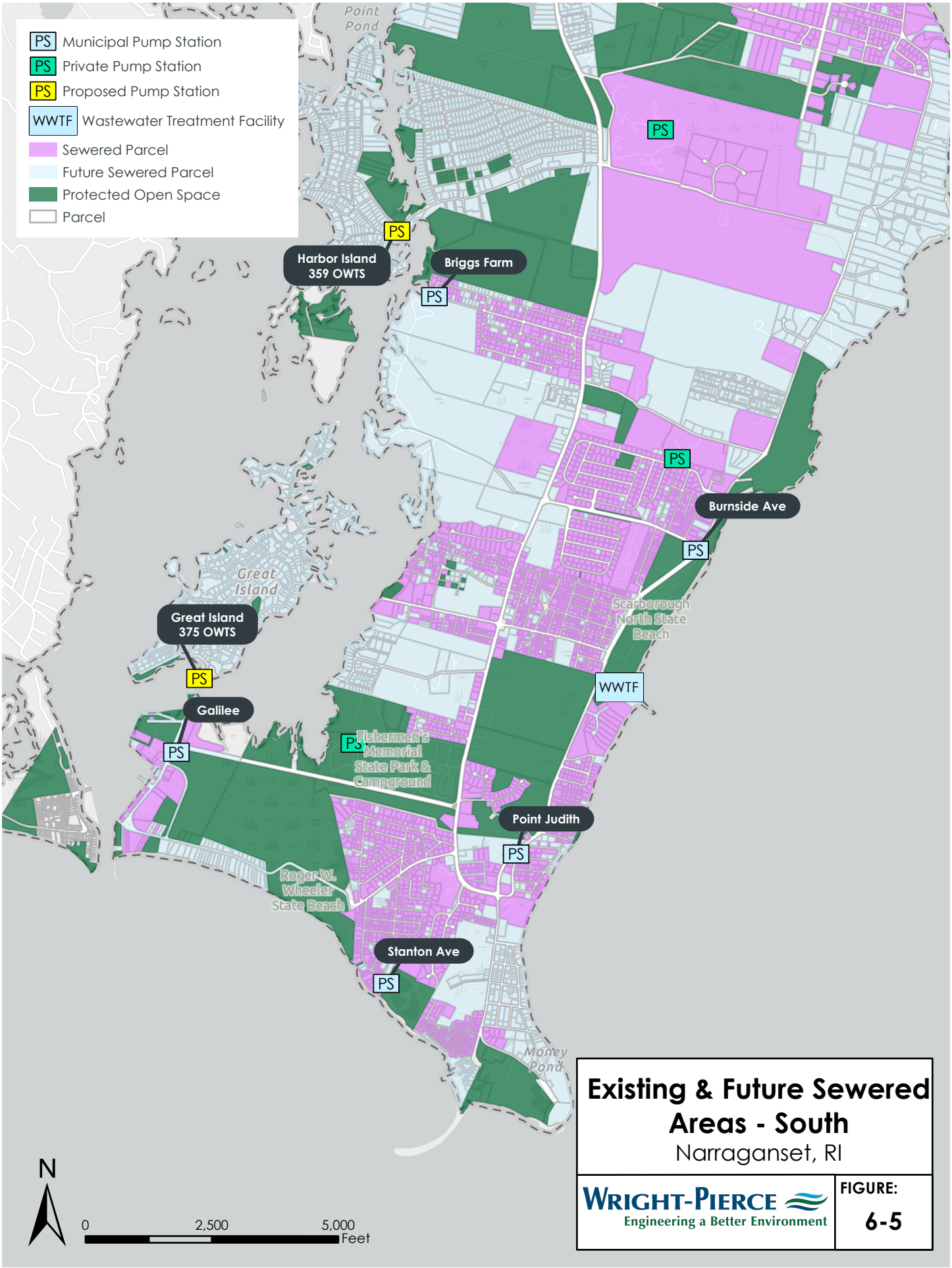
Existing & Future Sewered Areas - North

Narragansett, RI

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FIGURE: 6-4

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Existing & Future Sewered Areas - South

Narragansett, RI

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FIGURE: 6-5

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For the sewers tributary to the SWWTF, the additional flow and loading for future residential and commercial buildout is summarized in Table 6-6. Flow was calculated using 70 gpd per capita, with 2.4 persons per household (168 gpd per household). Peaking factors are based on current flow data to the SWWTF. Future loading from residential and commercial development was estimated using the BOD and TSS concentrations as currently measured at the SWWTF: 207 mg/l BOD and 229 mg/l TSS.

Table 6-6 Future Commercial/Residential Flows and Loadings

Parameter	Peaking Factor	OWTS to Sewer Conversion			Residential/Commercial Development			Total Residential/Commercial		
		Flow (mgd)	BOD (lbs/day)	TSS (lbs/day)	Flow (mgd)	BOD (lbs/day)	TSS (lbs/day)	Flow (mgd)	BOD (lbs/day)	TSS (lbs/day)
Annual Average	1	0.26*	443	490	0.06	112	124	0.32	555	614
Maximum Month	1.5	0.39	919	1,092	0.10	232	276	0.48	1,151	1,368
Maximum Day, 99th Percentile	1.9	0.50	1,098	1,236	0.12	278	313	0.62	1,376	1,549
Maximum Day	3.3	0.85	1,337	1,865	0.21	338	472	1.06	1,675	2,337

*Includes .07 mgd for future Inflow/Infiltration

6.1.4 Industrial Projections

The South End industrial activities center on the fishing industry in the port of Galilee. This includes commercial fishing, charter boats, and supporting industries. Much of the fishing infrastructure is located on state-owned land specifically designated for fisheries and port activities. State ownership ensures the long-term security of Galilee as a fishing port. The port of Galilee currently has two major fish processing facilities: Town Dock and SeaFreeze.

Growth of the fish processing industry is currently limited by the wastewater infrastructure. With expanded capacity at the SWTTF, both Town Dock and Seafreeze would be able to expand operations in their facilities. It is projected the port could support a third processing facility in the planning period. Expansion of fish processing in the port could include: a fillet line to fillet scup, second or third shift production at existing facilities, additional harvest and processing of imported and domestic species, and reshoring fish production/processing stateside from China and Vietnam.

Wright-Pierce reviewed current operating practices, wastewater characteristics, and potential industry expansion with representatives from Town Dock and SeaFreeze. Estimated flows and loads were provided by industry personnel. The information was based on production history and projected expansion capacity. Expansion capacity considered additional shifts (operating time) and space limitations at the facility. The range of wasteloads provided was consistent with the University of Rhode Island study “Pollution Prevention and Biochemical Oxygen Demand Reduction in a Squid Processing Facility” by Eugene Park, Richard Enander, Stanley M. Barnett, and Chong Lee. The researchers found BOD in a seafood processing facility ranged from 1,000 to 5,000 mg/l.

Based on information provided by Town Dock and SeaFreeze, and the available land in the port, we estimate three primary fish processing facilities could be supported in Galilee. We estimated an additional amount of fish processing waste would come from smaller businesses in the port. The estimated wastewater needs for fish processing in Galilee are summarized in Table 6-7.

Table 6-7 Estimated Fish Processing Requirements for Port of Galilee

Fisheries – Flows and Loadings				
	Avg Flow (MGD)	Peak Flow (MGD)	Avg. BOD (mg/l)	Avg. TSS (mg/l)
Town Dock	0.006	0.025	5,000	2,000
SeaFreeze	0.006	0.025	5,000	2,000
Third Large Entity	0.006	0.025	5,000	2,000
Others (estimated at 15%)	0.003	0.011	5,000	2,000
Total	0.021	0.086	5,000	2,000

6.1.5 Septage Flows and Wasteloads

The SWWTF does not accept septage and does not have plans to accept septage during this planning period.

6.1.6 Infiltration and Inflow

Future infiltration for the SWWTF catchment area was estimated using the standard from RIDEM Design of Sanitary Sewers, 500 gallons per day per inch diameter mile. Full buildout of the south sewer system will require an estimated 16 miles of new sewer. Proposed future sewers are assumed to be 8-inch diameter. The total additional future infiltration is 0.07 MGD. Future inflow is assumed to be 0 MGD, because direct connections to the proposed future sewer are not allowed. Future Infiltration and Inflow are summarized in Table 6-8.

Table 6-8 Future Infiltration and Inflow Summary

	Estimated Existing MGD	Estimated Future MGD	Estimated Future Total MGD
Infiltration	0.17	0.07	0.24
Inflow	0.96	0	0.96

6.1.7 Sludge Treatment and Disposal

The forecasted quantity of sludge production at the SWWTF is shown in Table 6-9. Sludge production for existing conditions was estimated using the BioWin model and compared against facility records (which are estimated). Future sludge quantities were estimated using the influent BOD load and a conversion factor to estimate secondary sludge generation (0.9). We have assumed a sludge retention time (SRT) of 10 days for maximum week and day conditions in the summer, when BOD load is the highest, which will be a worst-case scenario for sludge generation and sludge holding needs. We have assumed 0.7 percent solids for the waste sludge concentration to calculate

gallons generated. Sludge generation was forecast for the maximum week summer condition for existing conditions, existing plus residential buildout, and existing plus residential buildout plus industry expansion in the port of Galilee.

Table 6-9 Sludge Generation for Maximum Week

Parameter	BOD Load (lbs/day)	Sludge Generation (gallons/day)	Sludge Generation (lbs/day)
Existing Conditions	3,050	46,900	2,750
Existing + Buildout	4,400	67,900	3,950
Existing + Buildout + Industry	7,500	115,800	6,750

6.1.8 Forecasted Flows and Wasteload Summary

The design flows and loading for the 20-year planning period for the SWWTF are summarized in Table 6-10. The flows and loadings include the existing flows to the SWWTF, additional future residential and commercial flow from sewer expansion and buildout and projected industrial flows from fish processing in the port of Galilee.

Table 6-10 SWWTF Design Wastewater Flows and Loadings

Parameter	Current Flows and Loadings			OWTS Conversion			Future Residential Development			Industry Expansion		
	Flow (mgd)	BOD (lbs/day)	TSS (lbs/day)	Flow (mgd)	BOD (lbs/day)	TSS (lbs/day)	Flow (mgd)	BOD (lbs/day)	TSS (lbs/day)	Flow (mgd)	BOD (lbs/day)	TSS (lbs/day)
Minimum Month	0.43	512	537	0.15	183	191	0.04	46	48	0.01	259	173
Annual Average	0.72	1,242	1,375	0.26	443	490	0.06	112	124	0.02	518	345
Maximum Month	1.08	2,577	3,064	0.39	919	1,092	0.10	232	276	0.04	2,763	1,035
Maximum Week	1.32	3,045	3,958	0.47	1,086	1,410	0.12	275	357	0.07	3,108	1,208
Maximum Day, 99th Percentile	1.39	3,079	3,467	0.50	1,098	1,236	0.12	278	313	---	---	---
Maximum Day	2.38	3,748	5,234	0.85	1,337	1,865	0.21	338	472	0.09	3,597	1,438

6.1.9 Forecasted Regional WWTF Flows

The planning/design flows for the 20-year planning period for the RWWTF are summarized in Table 6-11. The flows include existing flows to the RWWTF, additional future residential and commercial flow from sewer expansion (new connections) and residential/commercial development. No industrial developments in the North Collection system are identified in the CCP. The forecasted annual average flow tributary to the RWWTF for the 20-year planning period is 1.5 mgd. Peaking factors to determine minimum monthly average, maximum consecutive 3-month average, and maximum month average are based on the existing flow data from July 2021 through June 2023.

Table 6-11 Forecasted Regional WWTF Flows

Parameter	Existing Flow	OWTS to Sewer Conversion	Residential/Commercial Development	Total
Minimum Monthly Average, mgd	0.75	0.15	0.09	0.99
Annual Average, mgd	1.14	0.22*	0.14	1.5
Maximum 90-day Average, mgd	1.44	0.28	0.17	1.89
Maximum Month Average, mgd	1.69	0.33	0.20	2.22

*Includes .07 mgd for future Infiltration

- The maximum 90-day average is based on the average of three consecutive months.
- Peaking factors are based on Narragansett's RWWTF flows from July 2021 through June 2023.
- Forecasted minimum monthly average is 0.99 mgd with a peaking factor of 0.66.
- Forecasted maximum 90-day average is 1.89 mgd with a peaking factor of 1.26.
- Forecasted maximum month average is 2.22 mgd with a peaking factor of 1.48.

6.2 Collection System

6.2.1 Pump Stations

The capacity of each pump station was compared to the projected design flows for the planning period. Future flows to the pump stations include the additional flow that would be received from development of vacant parcels and conversion of OWTS to sewer. A summary of future sewered parcels for the North Collection System and South Collection System is shown in Table 6-12 and Table 6-13. This table includes parcels directly tributary to the pump stations. The capacity of each pump station is determined using the peak hour flow. The capacity analysis is summarized in Table 6-14. The current peak hour flow and future peak hour flow is compared to the capacity of the existing pumps. The designation of "adequate" or "inadequate" is based on whether the pumps can handle the current or future peak flows. In the north, Lakewood pump station does not have capacity to handle projected future flows. In the south, Burnside and Stanton pump stations do not have capacity to handle projected future flows.

Table 6-12 Existing and Future Sewered Parcels - North

Pump Station	Current Sewered Parcels	Future Development Parcels	OWTS Conversions	Total Future Sewered Parcels
Baneberry Trail	39	2	0	41
Bonnet Shores	455	182	115	752
Circuit Dr	105	8	0	113
Congdon St	427	141	39	607
Industrial Park	27	3	9	39
Lakewood Dr	39	4	4	47
Mettatuxet Rd	315	8	0	323
Mumford Rd	201	14	13	226
Ouida St**	427	41	42	510
Wandsworth Pump Station*	-	90	178	278
Seaport	32	0	0	32
Sprague**	702	267	245	1,214
Wilson Dr	586	45	0	631
Winterberry Rd	287	16	0	303
Wolfe Rd	306	17	205	528

*Unsewered area near Regional WWTF, new pump station required

**Receives flow from South Kingstown's Middle Bridge Pump Station via North Interceptor. South Kingstown reports no significant development plans for the area.

Table 6-13 Existing and Future Sewered Parcels - South

Pump Station	Current Sewered Parcels	Future Development Parcels	OWTS Conversions	Total Future Sewered Parcels
Briggs Farm*	201	27	360	588
Burnside PS	375	136	129	640
Galilee PS**	36	15	420	471
Point Judith	255	64	75	394
Stanton	653	93	45	791
SWWTF	706	50	107	863

*Includes Harbor Island | **Includes Great Island

Table 6-14 Pump Station Capacity Analysis

	Pump Capacity (gpm)	Existing Peak Hour Flow (gpm)	Future Peak Hour Flow (gpm)	Adequacy for Future Peak Flow
North Pump Stations				
Baneberry Trail	92	5	6	Adequate
Bonnet Shores	1600	613	747	Adequate
Circuit Dr	79	15	19	Adequate
Congdon Street	225	108	191	Adequate*
Industrial Park	200	39	45	Adequate*
Lakewood Dr	200	93	219	Inadequate
Mettatuxet Rd	400	108	112	Adequate
Mumford Rd	660	151	184	Adequate
Ouida St	2700 (each, of 3)	2,621	2,662	Adequate
Sprague	1460 (each, of 3)	1,460	1,700	Adequate
Wilson Dr	1,100	255	277	Adequate
Winterberry Rd	265	50	58	Adequate
Wolfe Rd	500	124	230	Adequate
South Pump Stations				
Briggs Farm	400	53	236	Adequate
Burnside PS	1,200	1,200	1,327	Inadequate
Galilee PS	1,100	187	405	Adequate
Point Judith	325	239	308	Adequate
Stanton	250	205	271	Inadequate

*Further evaluation at this pump station is warranted based on operation staff comments

6.2.2 Collection System

The interceptors evaluated include Bonnet Shores Interceptor, North Interceptor, Point Judith Interceptor, and Point Judith Road Interceptor. Table 6-15 shows the capacity and the projected peak flow of each interceptor. Bonnet Shores Interceptor and North Interceptor have a range of diameters as pump stations feed into them, so the minimum capacity is shown as a range. The interceptors are adequate to handle future projected flows.

Table 6-15 Interceptor Capacity

Interceptor	Capacity (cfs)	Peak Discharge (cfs)	Adequacy
Bonnet Shores	2.4 – 3.7	0.1 – 0.3	0.1 – 0.5
North Interceptor	4.6 – 7.5	1.4 – 2.2	1.7 – 2.6
Point Judith Interceptor	1.3 – 3.0	0.1	0.5
Point Judith Road	2.7	0.9	1.0

6.3 Climate Change and Resiliency

The 2023 RIPDES permit requires the Town to submit a Resiliency Plan and schedule of short- and long-term actions that will be taken to maintain operation and protect key collection and treatment system assets. The Town completed a draft Wastewater Treatment Facilities Resiliency Plan in March 2025. The report is included in Appendix C. The Narragansett Municipal Resilience Program (MRP) prepared a Community Resilience Building Report in October 2022. The report is based on the Community Resilience Building Workshop with The Nature Conservancy and Rhode Island Infrastructure Bank. The hazards identified include coastal flooding, hurricanes and tropical storms, nor'easters and blizzards, extensive droughts, extended cold snaps, and heat waves. The Town of Narragansett prepared a Local Hazard Mitigation Plan, updated in 2024. These documents are consistent with RIDEM's Guidance for the Consideration of Climate Change Impacts in the Planning and Design of Municipal Wastewater Collection and Treatment Infrastructure. The pump stations prioritized for improvements are summarized in **Table 6-16**. The recommendations from the Climate Resiliency Plan have been incorporated into this Facility Plan.

Table 6-16 Climate Change Risk Associated with Narragansett Wastewater System

Recommended Action	Prioritization
Rising groundwater causes septic seasonal flooding	Low
Develop procedure to bypass sewer mains	High
Identify actions needed/cost estimates for all Pump Stations	High
Conduct Stormwater Infiltration Studies for Pump Stations	High
Modifications and improvements to enhance flood resiliency at pump stations subject to flood hazards associated with the 100-year flood condition	Medium

6.4 Regional WWTF Capacity Assessment

The Regional WWTF is owned and operated by the Town of South Kingstown, and serves the towns of South Kingston and Narragansett, and the University of Rhode Island. The current capacity allocations at the RWWTF are summarized in Table 6-17. The Town of Narragansett's North Collection System flows to the Ouida Pump Station where wastewater is pumped to the RWWTF A series of intermunicipal agreements and amendments have governed use of the facility by the regional partners.

- In 1972 the original agreement between the regional partners allocated 19 percent of the RWWTF capacity to the Town of Narragansett. The capacity of the plant at the time was 4.13 mgd average daily flow, Narragansett's allocation was 784,700 gallons per day.

- In the 1980s, Narragansett began to exceed its RWWTF allocation. In 1985, the three regional partners agreed to a letter of understanding governing future expansion at the RWWTF. Subsequently in 1997 they established a formal volumetric capacity agreement addressing conditions when the RWWTF reaches 80 percent of design flow and/or a regional partner flow reaches 80 percent of its allocated flow. When these situations occur, an engineering study to determine the size and scope of any planned expansion, which would be required per the RWWTF RIPDES permit, is to be completed.

- In 1991, plant capacity was expanded by 0.87 mgd, for a total RWWTF capacity of 5.0 mgd. The additional capacity was allocated equally between Narragansett (0.435 mgd) and South Kingstown (0.435 mgd). This agreement increased Narragansett's overall allocation to 24.4 percent (1.2197 mgd).

- In 1995, Narragansett began leasing 400,000 gpd of unused treatment capacity from the University of Rhode Island (URI). The agreement was for a five-year term.

- In 2001, Narragansett continued to lease 400,000 gpd of unused treatment capacity from the URI. The agreement was for a five-year term and was renewed for an additional 5-year term.

- In 2012, Narragansett reduced its leased capacity to 200,000 gpd. The agreement between URI and Narragansett was for a 5-year term, and was renewed for an additional 5-year term.

- In 2023, Narragansett continued to lease 200,000 gpd of unused treatment capacity from the URI for a 2-year term, with an option for an additional 1-year term.

- A new agreement to lease 200,000 gpd of unused treatment capacity from URI is currently being negotiated by Narragansett.

Table 6-17 Regional WWTF Flow Distribution

Partner	Original 1974 Capacity mgd (%)	1992 Expansion mgd	Current Owned Capacity mgd (%)	URI/Narragansett Lease Agreement mgd	Current Available Capacity mgd (%)
South Kingstown	1.6933 (41)	0.4350	2.1283 (42.6)	--	2.1283 (42.6)
Narragansett	0.7847 (19)	0.4350	1.2197 (24.4)	0.200	1.4197 (28.4)
University of Rhode Island	1.6520 (40)	0.00	1.652 (33.0)	(0.200)	1.452 (29.0)
Total	4.13 (100)	0.870	5.0 (100)	--	5.0 (100)

For this capacity analysis, three years of regional partner flow data was used. The data was presented in monthly flow totals to the RWWTF. The analysis period was fiscal years 2021, 2022, and 2023 (July 2021 through June 2023).

- The existing annual average flow to the RWWTF is 1.14 mgd. This accounts for 93 percent of Narragansett's owned treatment capacity. If we include capacity leased from URI, existing annual average flow accounts for 80 percent of Narragansett's available treatment capacity.

- During high flow periods, the Town exceeds its allocated capacity at the RWWTF. During the study period, the monthly average flow exceeded the Town's owned treatment capacity during 13 months. If we include capacity leased from URI, the monthly average flow exceeded available capacity 4 times.

- The existing maximum monthly average during the study period was 1.69 mgd. This exceeds the Town's owned treatment capacity by 0.471 mgd. If we include capacity leased from URI, this exceeds the Town's available treatment capacity by 0.271 mgd.

The forecasted wastewater needs for the Town of Narragansett exceed the Town's owned capacity at the RWWTF.

- The forecasted future annual average flow contribution to the RWWTF is 1.5 mgd. The projected annual average flow contribution will exceed the Town's owned treatment capacity by 0.280 mgd (23 percent). If we include capacity leased from URI, the annual average contribution will exceed the Town's available capacity by 0.080 mgd (6 percent).
- The forecasted future maximum monthly average is 2.2 mgd. The projected maximum month average flow exceeds the Town's owned treatment capacity by 0.980 mgd.

The capacity analysis is summarized in Table 6-18. To meet forecasted average day flow of 1.5 mgd, Narragansett will need an additional 0.280 mgd treatment capacity. To meet the maximum month average flow an additional 0.980 mgd capacity will be required. Additional capacity needs can be met by leasing flow from another regional partner, or by physical expansion of the RWWTF treatment capacity.

Table 6-18 Regional WWTF Capacity Analysis

Parameter	Existing Condition				Future Condition		
	Peaking Factor	Flow, mgd	Percent Capacity	Additional Capacity Required, mgd	Flow, mgd	Percent Capacity	Additional Capacity Required, mgd
Flow Allotment	--	1.2197	--	--	1.2197	--	--
Annual Average	--	1.14	93 %	--	1.5	123 %	0.2803
Maximum Monthly Average	1.48	1.69	139 %	0.4703	2.2	180%	0.9803

The three regional partners agreed to a letter of understanding governing future expansion at the RWWTF. When the RWWTF reaches 80 percent of design flow (4 mgd), an independent engineering study of the three regional partners' wastewater flow volumes will be conducted to determine the size and scope of any planned expansion. The RWWTF's RIPDES permit also includes a standard provision that, when the average daily flow exceeds 80 percent of the RWWTF's average design flow capacity for 90 consecutive days, additional evaluation must be conducted. The regional partner flow data shows the RWWTF is operating below the 80 percent (4 mgd) threshold.

- The average daily flow to the RWWTF is 2.6 mgd (52 percent capacity)
- The maximum monthly average is 3.413 mgd (68 percent capacity).

Based on this analysis it appears a RWWTF capacity expansion will be required in the 20-year planning period. In the short-term, extending the capacity lease agreement with URI could be an option. South Kingstown and URI are in the beginning stages of the wastewater facilities planning process.

7

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Section 7 Development and Evaluation of Alternatives

7.1 Introduction

This section evaluates and presents alternatives to meet the wastewater treatment and collection system needs for the Town of Narragansett and an expanded fish processing industry in the port of Galilee.

- Much of the equipment and facilities at the SWWTF are aged and require repair or replacement. Minimum baseline improvements to ensure reliable operation of the existing SWTTF for the planning period are identified.

- The existing secondary treatment process at SWWTF is evaluated. Three SWWTF alternatives are presented. Alternative 1 is to optimize the existing treatment facilities. Alternative 2 is the addition of a primary treatment process. Alternative 3 is to construct a new secondary treatment system. The alternatives were evaluated on their ability to meet the future flows and loadings in Table 7-1. Addition of a Primary treatment process was evaluated as an Alternative based on the 2007 Facilities Plan.

- Collection system alternatives include pump station upgrades and sewer expansion in areas with high concentrations of OWTS.

Table 7-1 Existing and Future Flows and Loadings

Parameter	Flow (mgd)	BOD (lbs/day)	TSS (lbs/day)
Existing			
Annual Average	0.72	1,200	1,400
Maximum Month	1.08	2,600	3,100
Maximum Day	2.38	3,700	5,200
Existing and Future Residential Build-Out			
Annual Average	1.24	2,100	2,400
Maximum Month	1.86	4,500	5,300
Maximum Day	4.11	6,400	9,000
Existing, Future Residential Build-Out, and Fish Processing			
Annual Average	1.26	2,600	2,700
Maximum Month	1.90	7,200	6,200
Maximum Day	4.19	9,900	10,300

Throughout this evaluation, several cost estimates are presented for each project/upgrade. The individual sections present total construction costs that would be reflective of the "bid value" for the project.

The conceptual design cost estimates have been developed for the work described in each section. Standard cost estimating procedures utilizing conceptual layouts, equipment quotations and unit cost information were performed. Construction factor items such as Contractor's overhead and profit, mark-up on sub-contractors, bonds and insurance, and unit price items were included using percentages. A design contingency of 20% was used for this stage of the evaluation. A 5% construction contingency is carried to cover items during construction, such as potential change orders. An annual inflation rate of 4% is carried for this evaluation. This factor could change between the date of this estimate and the actual mid-point of construction.

7.2 Baseline Improvements

Much of the equipment, tanks, and buildings at the SWWTF have aged and will be in need of repair or replacement during the planning period. Baseline improvements are the minimum recommended repairs and replacements to ensure reliable plant operation during the planning period. These baseline improvements will not expand capacity to meet projected future flows and loadings but will maintain reliable operation at existing levels. The baseline improvements include:

- Upgrade aerated grit chamber, including blowers, screw conveyor, and tank.
- Comprehensive upgrade of influent pump station, including pumps, piping, valves, HVAC systems, electrical systems, structural repairs, and an aeration/mixing system in wet well.
- Odor control system for headworks and influent pump station.
- Comprehensive rehabilitation of oxidation ditch, including new gates, valves, weirs and piping; concrete repairs; access platform guard rail repairs, and electrical systems. Clean and remove settled solids from oxidation ditch.
- Construct a third secondary clarifier. Upgrade secondary clarifier mechanisms and perform concrete repairs on secondary clarifiers.
- Upgrade chlorine contact tanks, including concrete repairs and new slide gates.
- Comprehensive upgrade to solids handling process including plant water system, sludge pumps, blowers, polymer system, permanganate system, replacement of the gravity belt thickener, HVAC systems, odor control, electrical and control systems, tank repairs, and architectural systems (doors, windows, finishes, roofing).
- Administration/Operations Building, upgrade HVAC systems, lab equipment, and architectural systems (doors, windows, finishes, roofing), and lighting and power systems.
- Maintenance/Control Building, upgrade HVAC and systems, upgrade electrical systems, replace WAS/RAS pumps, replace chemical feed pumps, piping, valves, chemical storage tanks, and architectural systems (doors, windows, finishes, roofing).

The opinion of probable project cost of baseline repairs at the SWWTF is $36.5 million.

7.3 SWWTF Secondary Treatment Process Evaluation

7.3.1 Introduction

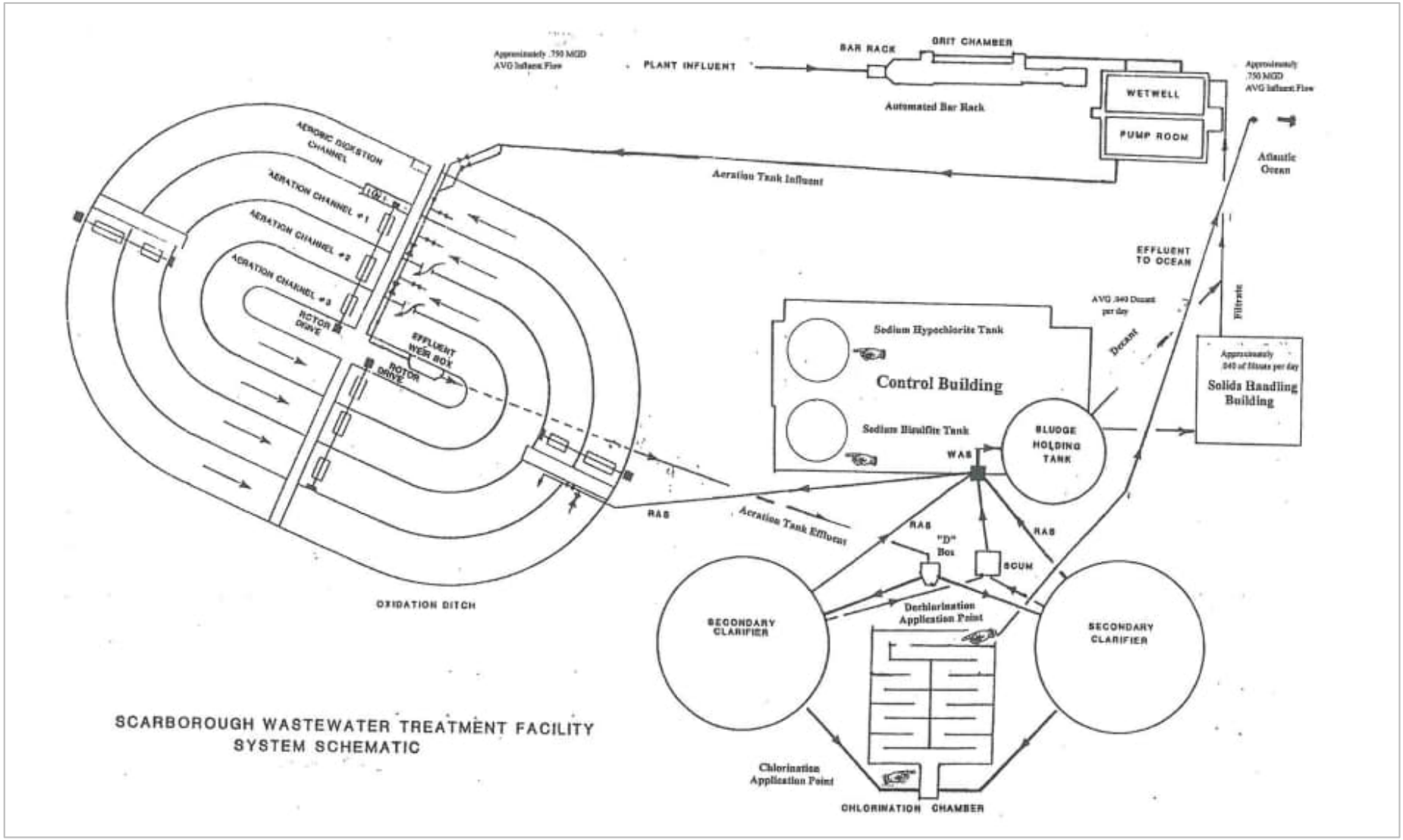
The secondary treatment process at the Scarborough WWTF is an activated sludge process with one oxidation ditch followed by two secondary clarifiers. The secondary treatment system was originally constructed in 1983. The most recent upgrade in 2019 replaced paddlewheel style aerators with submersible mixers with an air sparge (jet aerators). The oxidation ditch includes four concentric channels. The outer channel is used for aerobic sludge digestion. The three inner channels are used as aeration tanks for secondary treatment. The total volume available in the three aeration channels is approximately 480,000 gallons. The aerobic digestion channel is approximately 300,000 gallons. The SWWTF Process Flow Schematic is shown for reference in Figure 7-1.

7.3.2 Current Operation

Influent is pumped from the influent pump station into Aeration Channel 1. There is valving to introduce influent to the other channels, but these valves are typically closed and may be inoperable. Return Activated Sludge (RAS) from the secondary clarifiers is returned to Aeration Channel 1, upstream of the influent discharge. The schematic of the oxidation ditch shows the discharge locations. Typically, the target DO in the ditch is 0.2 mg/L, based on the original design and operation and maintenance manual for the facility. The eight aerators are typically run at maximum speed for the mixer. The blower is adjusted to maintain the desired DO concentration. A low DO concentration allows for simultaneous nitrification and denitrification, as oxygen is consumed rapidly near the aerators and then an anoxic zone is induced prior to the next aerator.

The RAS pump rate is typically run at 100% pump speed, or approximately 1.05 MGD of total RAS flow. Waste Activated Sludge (WAS) is discharged into the outer digester channel. The RAS flow is measured with flow meters. WAS flow is controlled by a valve on the RAS discharge line. The valve must be opened and closed manually. WAS flow is not measured, but estimated based on the RAS flowrate, valve opening and time opened.

Figure 7-1 SWWTF Process Flow Schematic



7.3.3 Oxidation Ditch Evaluation

There are several criteria to consider when evaluating secondary treatment system performance and capacity. We evaluated the influent BOD load, oxygen demand, dissolved oxygen (DO) concentration, wastewater temperature, mixed liquor concentration, return sludge concentration, waste sludge volume, effluent TSS, and solids retention time (SRT).

The current RIPDES discharge permit for the SWWTF does not have nitrogen-based effluent limits. The RIPDES permit does include monitoring requirements for TKN, Nitrate+Nitrite, and Total Nitrogen. RIDEM does not expect nitrogen-based limits to be included in Narragansett's RIPDES permits in the immediate future.

7.3.3.1 BOD Load and Aeration Demand

To oxidize and remove BOD from the wastewater, organisms present in the secondary treatment system require sufficient population, time, and oxygen. The oxidation ditch has eight TR10 model aerators in the three aeration channels. According to the manufacturer, each aerator has the capacity to provide 29.5 lbs/hour of oxygen (700 lbs/day), which is the rate at standard temperature and pressure in clean water. With eight aerators in total, the oxygen supply to the oxidation ditch is about 5,650 lbs O_2/day. Manufacturer's typically rate capacity with clean water tests and do not take into consideration site-specific criteria, wastewater temperature variation, or wastewater loading. These items can lead to lower oxygen supplied than the manufacturer's rated capacity.

To calculate oxygen demand, the following assumptions were made:

- The facility does not test for ammonia or TKN, so a standard assumption of a 20% TKN to BOD ratio was used.
- A 7-day SRT is assumed based on the wastewater temperature in July and August to achieve full nitrification and 4 days in the winter to ensure there is no nitrification occurring.
- Effluent TKN concentration of 5 mg/L.

The oxygen demand for various conditions are summarized in Table 7-2. These are presented as actual oxygen transfer rates, not standard transfer rates.

Table 7-2 Oxygen Demand, Current Conditions

Parameter	Oxygen Transfer Rate (lbs O_2/day)
Minimum Day	100
Average Day, Winter	400
Average Day, Summer	2,450
Maximum Month	3,800
Maximum Day	5,600

The current jet aerators are estimated to supply a maximum of 5,650 lbs O_2/day total oxygen, in clean water. The oxygen supply would be less in typical municipal wastewater. It appears the jet aerators will meet the existing minimum day, existing average day, and existing maximum month oxygen demand, but will not meet the existing maximum day condition. Insufficient air supply to meet the maximum day demand correlates with the treatment process issues at SWWTF that sometimes occur during peak demand during summer months.

7.3.3.2 Solids Retention Time Based Operation

Solids Retention Time, or SRT, is the time solids are present in a treatment unit. SRT uses the volume of the reactor and the mass of solids in and out of the reactor in the calculation. SRT is calculated with the following equation:

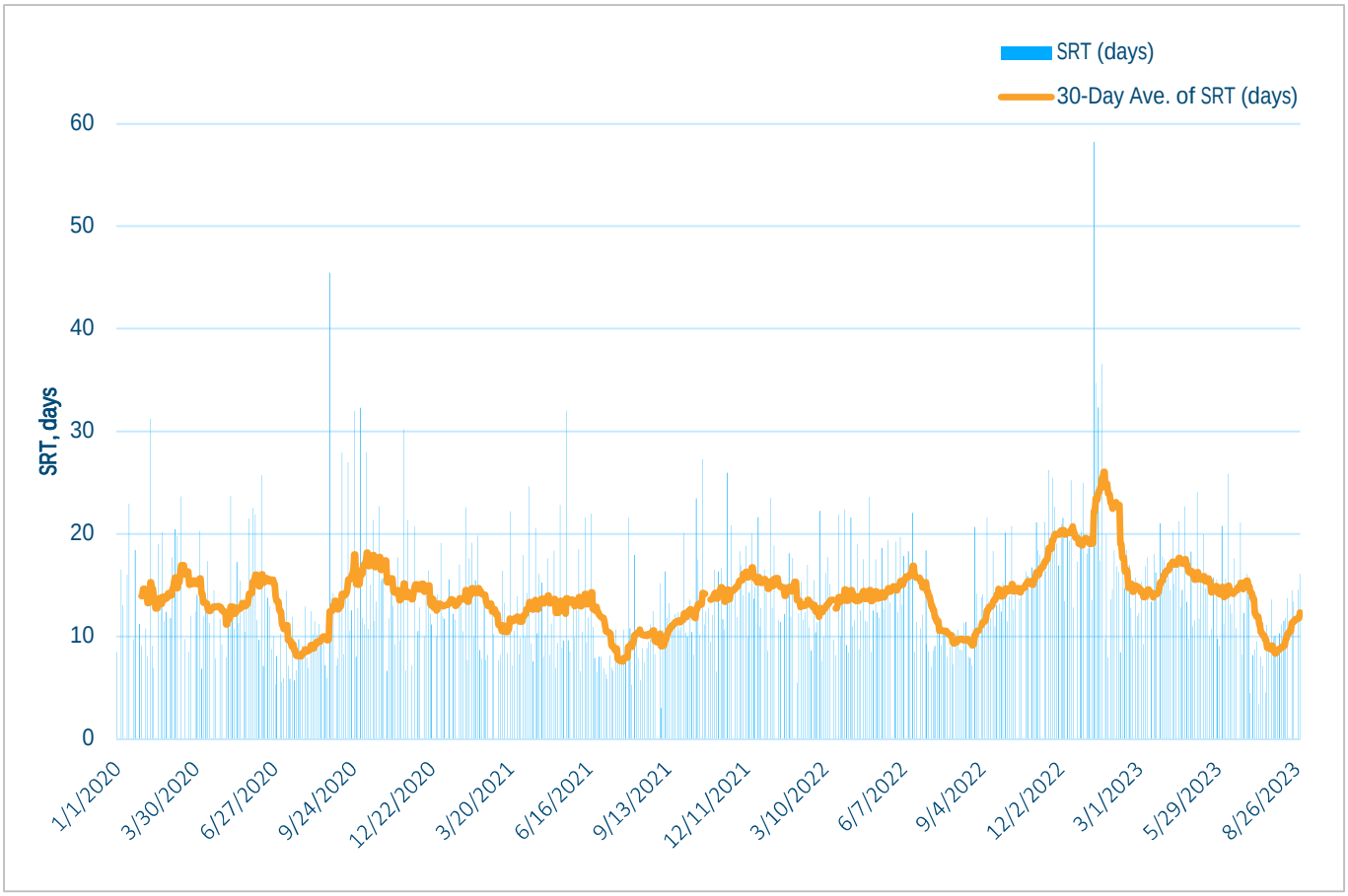
$$SRT = (V * MLSS)/((WAS\ Conc * WAS\ Q) + (Eff.TSS\ Conc * Eff.Q))$$

Where SRT, Solids Retention Time, Days
V, Volume Aeration Tank, MG
MLSS, Mixed Liquor Suspended Solids, mg/L
WAS Conc, Waste Activated Sludge Concentration, mg/L
WAS Q, Waste Activated Sludge Flow, MGD
Eff. TSS Conc, Effluent Total Suspended Solids Concentration, mg/L
Eff. Q, Effluent Flow, MGD

This equation calculates the aerobic SRT by taking the mass of solids in the aeration tank and dividing by the mass lost through sludge wasting and effluent TSS to determine the time solids spend in the aeration tank, expressed as days. It is important to note that the WAS flow at this facility is estimated, not accurately measured. As a result, there is some uncertainty in these calculations.

Figure 7-2 shows the historical SRT and 30-day average SRT at the SWWTF from January 2020 through the end of August 2023. Over the monitoring period, the average SRT at the facility was about 13.8 days, with a typical range between 10 and 20 days.

Figure 7-2 Solids Retention Time, August 2020 - August 2023



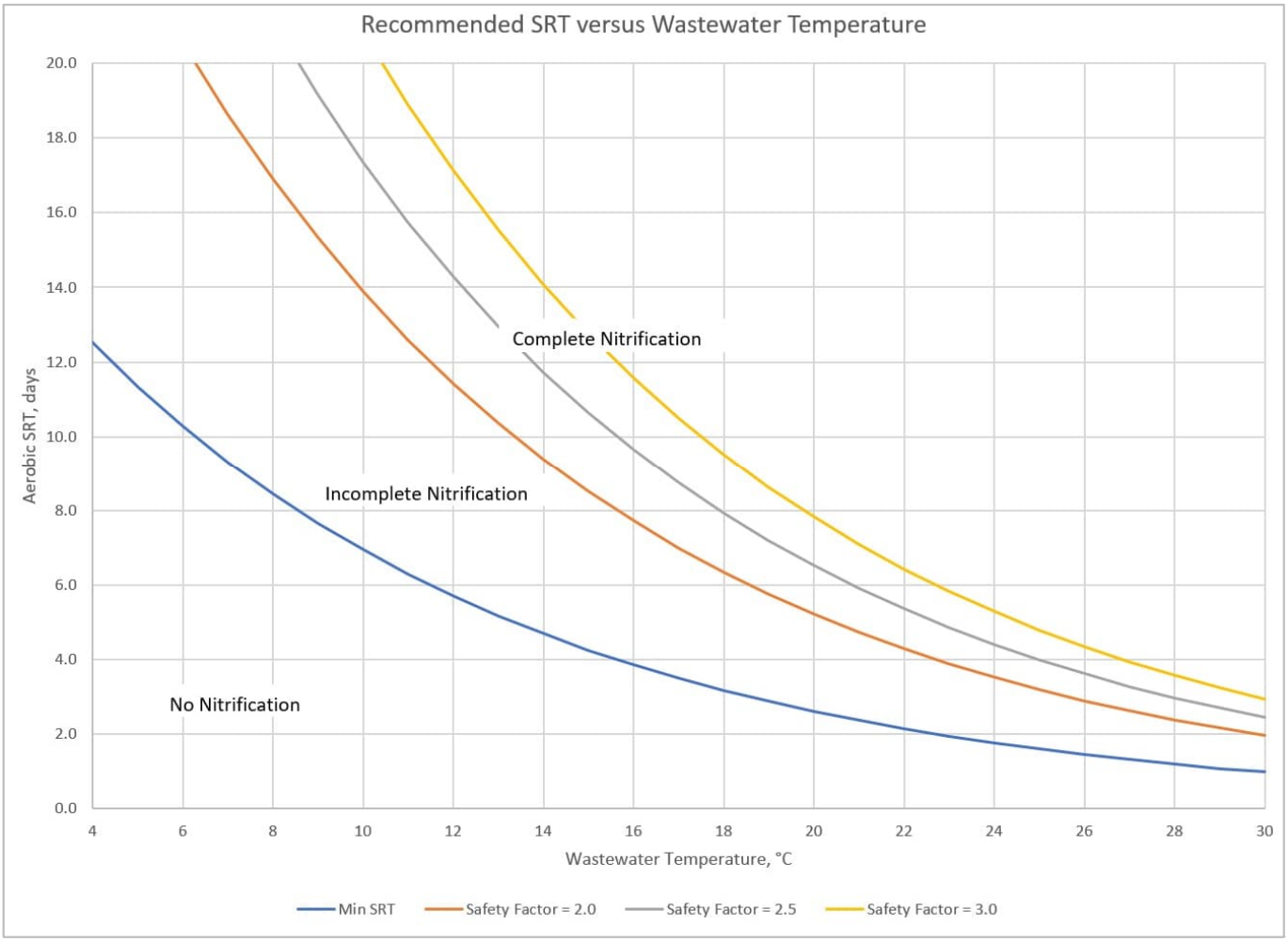
SRT can be used with wastewater temperature to approximate nitrification performance at the facility. Figure 7-3 shows a standard chart used for determining nitrification at a facility based on SRT and wastewater temperature. Facilities can operate with full nitrification, partial nitrification, or with no nitrification.

- Full nitrification is when ammonia-oxidizing bacteria convert ammonia to nitrite and nitrite-oxidizing bacteria convert nitrite to nitrate. When wastewater temperature increases, less SRT is required for full nitrification. When wastewater temperature is lower, more SRT is required for full nitrification. Operating under full nitrification results in more consistent operation and better performance but also increases oxygen demand. To ensure full nitrification, the facility should operate at or above the gray 2.5 factor of safety line in Figure 7-3.

- Incomplete nitrification occurs when ammonia is oxidized to nitrite, but nitrite is not fully oxidized to nitrate. Incomplete nitrification is not desirable in wastewater treatment processes. Nitrite will react with chlorine, which will reduce the effectiveness of disinfection and increase demand. Nitrite will also lead to less desirable populations of bacteria in the treatment process. Incomplete nitrification occurs when the process operates between the gray and blue lines in Figure 7-3.

- If a facility is not nitrifying, ammonia is not oxidized and remains as ammonia through to effluent discharge. No nitrification occurs when the process operates below the blue line in Figure 7-3. Typically, it is not possible to stop nitrification in warmer wastewater temperatures.

Figure 7-3 Nitrification Chart



During the summer months wastewater temperatures at SWWTF are about 22°C. With an SRT between ten and twenty days, SWWTF likely operates with full nitrification. During winter months wastewater temperatures are about 12°C. In this case, SWWTF likely operates with incomplete nitrification. Incomplete nitrification is not desired for operations. Nitrite will be present, which can increase chlorine demand and cause less desirable bacteria to be present in the mixed liquor. SWWTF should adjust the process to operate in full nitrification (over 14-day SRT) or operate with no nitrification (SRT less than 6-days). Full nitrification will require a higher oxygen demand and is not required by the SWWTF RIPDES permit. In the summer, the facility should operate above the gray line as nitrification will be impossible to prevent with the higher wastewater temperatures. Alkalinity should be monitored when fully nitrifying, as low pH will inhibit nitrification.

Using the chart above will allow the SWWTF operations team to select an SRT goal based on the wastewater temperature. The operations team can then calculate the required MLSS concentration to maintain the correct SRT (using the equation above). Wasting will be determined based on maintaining the MLSS concentration. Operating in this manner will result in less variation in effluent quality. However, operating in this manner will not change process issues that arise in the summer months when the aerator supply cannot keep up with oxygen demand or if insufficient alkalinity is present. Finally, operating at very high SRT values (i.e. above 25 days in the summer) is not recommended as process issues can arise.

7.3.4 Secondary Clarifier Evaluation

7.3.4.1 Introduction

The SWWTF has two secondary clarifiers. The tanks are 40-foot diameter with 10.875-foot sidewater depths. Both secondary clarifiers are operated year-round. The side water depth is below the recommended depth of 12-feet for clarifiers up to 40-feet in diameter (TR-16). Typically, both clarifiers are online and the RAS rate is set at 100 percent pump speed, up to a maximum of 525,600 gallons per day, each (1.05 mgd total), based on the maximum pump capacity at 18.5 TDH. The clarifiers are designed for an average surface overflow rate (SOR) of 550 gpd/square foot and a peak rate of 1,652 gpd/sqft. At 50% RAS pump flow, the clarifiers are designed for an average solids loading rate (SLR) of 17.09 lbs/day/sqft and a peak of 19.1 lbs/day/sqft. Recommended values for SOR and SLR are based on a flux analysis and depend on the MLSS concentration and settleability of the sludge, measured by SVI. The facility operates with a very large range of sludge settleability (120-600 SVI) and typically averages a high value of 280. Good settling sludge is typically considered to be 100-150 SVI. Clarifier performance and recommendations are discussed below. Table 7-3 summarizes the existing surface overflow and solids loading rates from the monitoring period reviewed.

Table 7-3 Secondary Clarifier Summary

Parameter	Surface Overflow Rate (gpd/sqft)	Solids Loading Rate (lbs/day/sqft)
Minimum	74	5
Average	286	10
Maximum	949	17

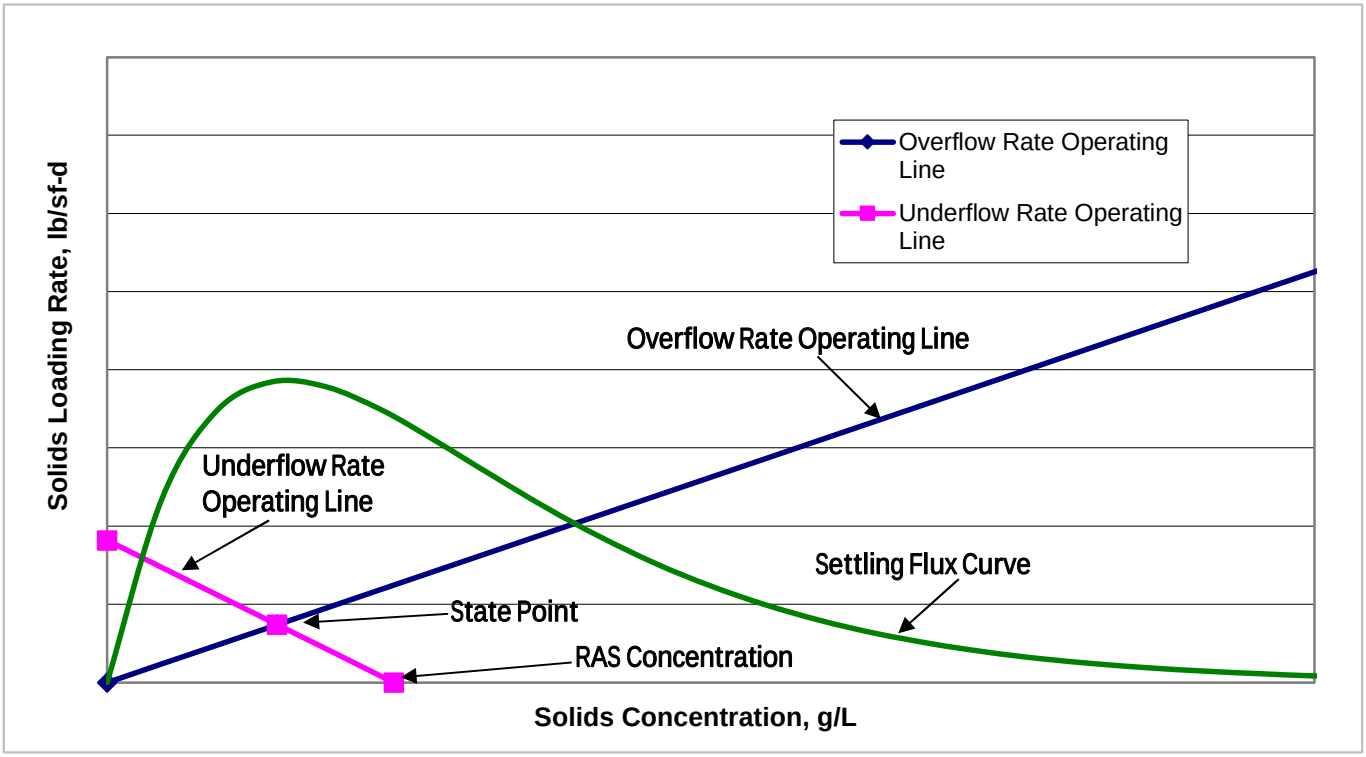
The current operation of the secondary clarifiers is within their original design values.

7.3.4.2 State Point Analysis

A state point analysis (SPA) was used to analyze secondary clarifier performance. SPA is a mathematical model used to evaluate the performance of secondary clarifiers under different flow conditions, MLSS concentrations, and SVIs. SPA can be used as an operational tool to estimate secondary system capacity for the given process conditions, and the impacts of changes in process parameters including mixed liquor concentration, sludge settling velocity, return sludge concentration, and return sludge pumping rate. The graphical model of the SPA is shown in Figure 7-4. The point of intersection of the clarifier overflow solids-flux rate (effluent over the weir, blue line) and underflow solids-flux rate (sludge withdrawn from the clarifier, pink line) is the State Point. The flux curve (green curve) can be tested and measured for a facility-specific value or a correlation can be used. The correlations available have been

developed from testing at many wastewater facilities across the country and are a good starting point for most facilities. The flux curve is dependent on SVI.

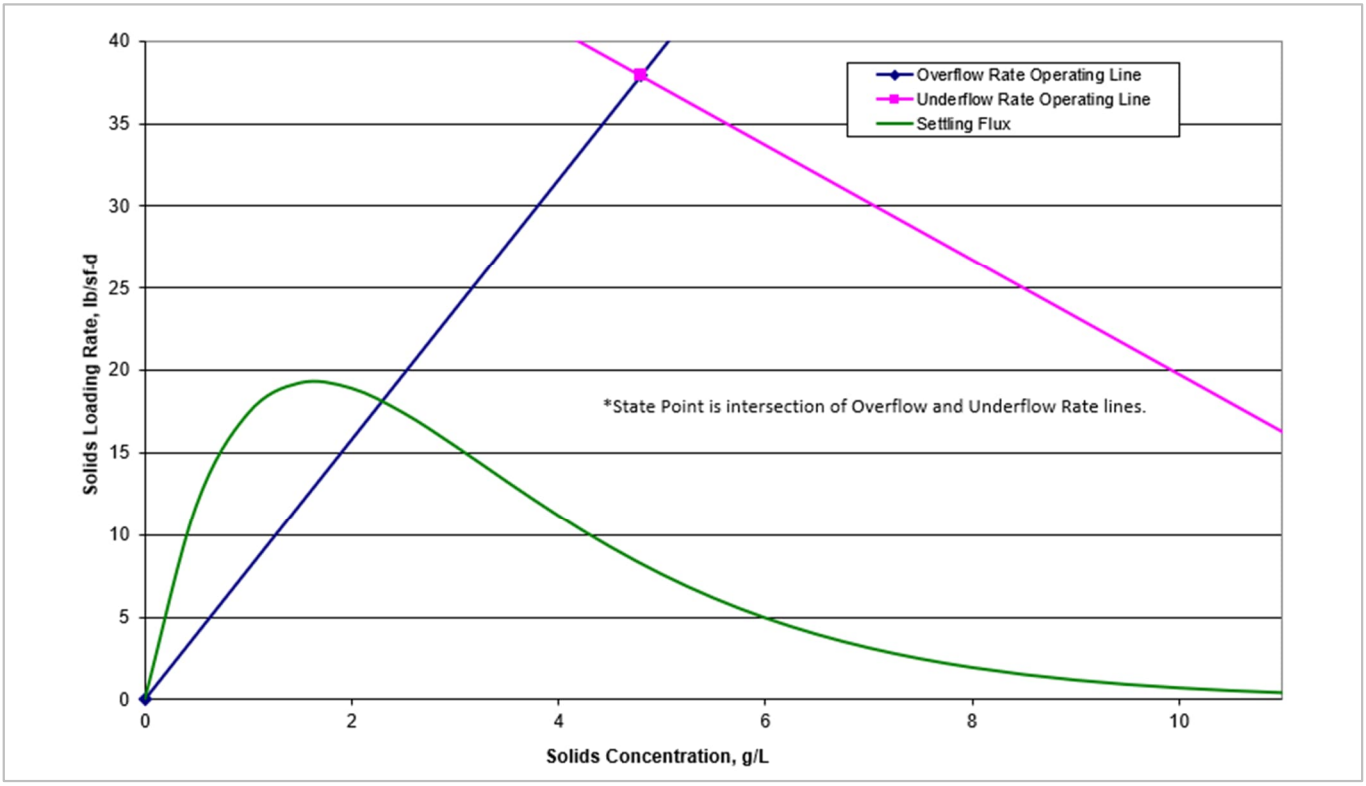
Figure 7-4 State-Point Analysis, Example



The location of the State Point in relation to the settling flux curve predicts the performance of the secondary clarifier. The State Point of a well operated clarifier should be located below the settling flux curve, with a safety factor of 1.3 or more. If the State Point is located above the settling flux curve in any condition, the mixed liquor solids will not fully settle and a portion will flow out of the clarifier via the effluent weir (high TSS being discharged). The underflow rate line should be operating below the descending limb of the settling flux curve. If the underflow rate operating line is shown above the settling flux curve in any condition, the sludge blanket is projected to rise and exit the clarifier via the effluent weir.

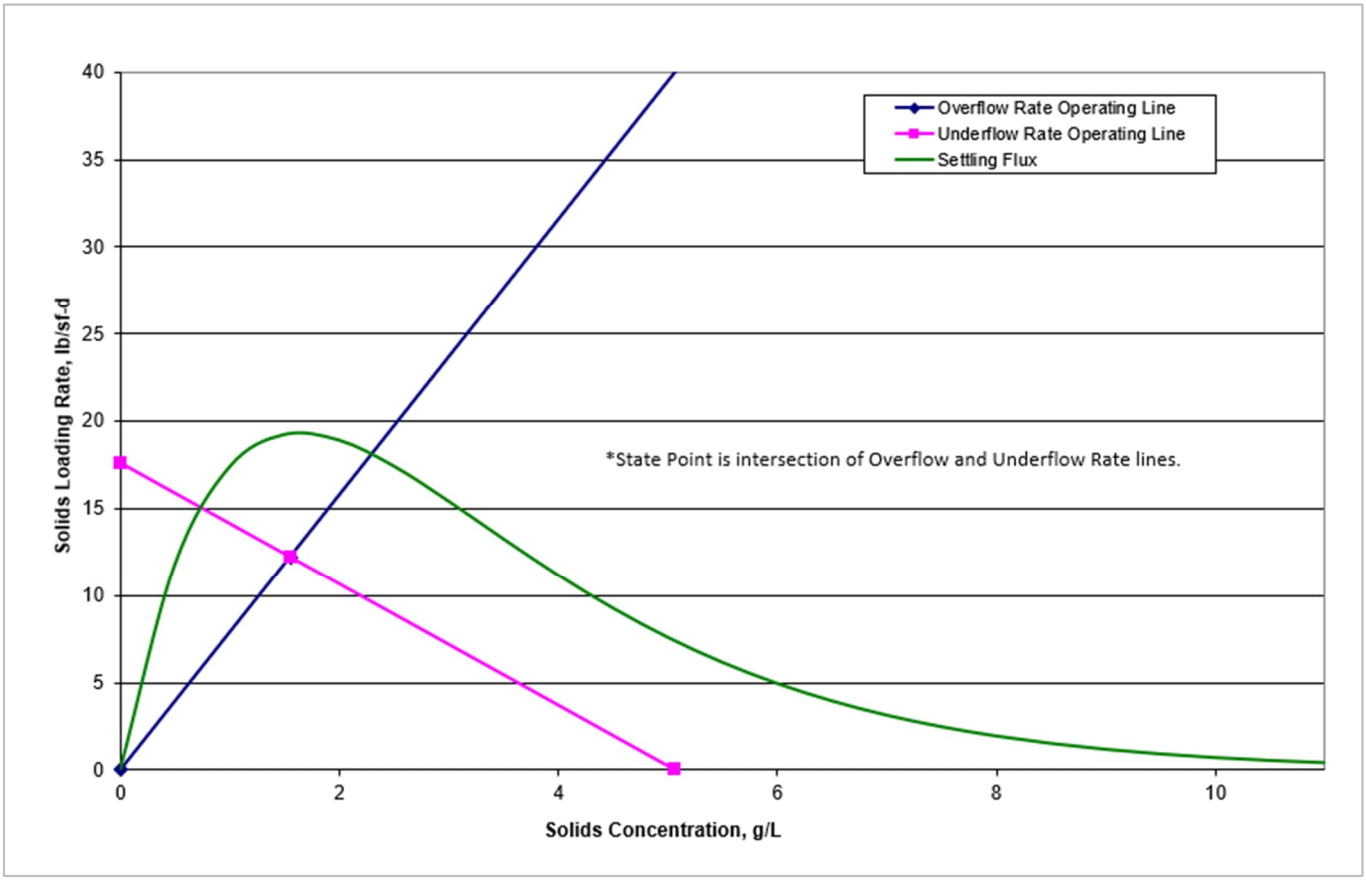
The original design of the facility assumed an MLSS value of 4,800 mg/L. An SPA is shown for the average SVI seen during the monitoring period (280) at the peak flow seen during the monitoring period (2.4 MGD) at the design MLSS concentration and a return rate of 1.05 MGD (100% pump speed with 2 pumps on). Figure 7-5 shows the results of the SPA graphically.

Figure 7-5 State-Point Analysis, Design MLSS



As can be seen in the figure above, the state point is far above the settling flux curve at these conditions, indicating the clarifiers would be far beyond their capacity. For comparison, the same conditions noted above are shown at the more typical MLSS concentration the facility currently operates at (1,550 mg/L). This is shown in Figure 7-6.

Figure 7-6 State-Point Analysis, Average MLSS



This figure indicates that at average MLSS and SVI values, the clarifiers would successfully treat the max day flow that was seen during the monitoring period. This will be reviewed based on modeling of the existing process and determining the MLSS concentration based on an SRT-based operation below.

The secondary clarifier flow capacity is higher if there is good settling and lower mixed liquor values. This is important when reviewing SRT-based operation and the operational strategy for the facility moving forward. If the facility is operating at a MLSS concentration of 1,500 mg/L and SVI of 280, the maximum flow that can be safely processed through the clarifiers is close to 3 MGD, however at the design MLSS concentration of 4,800 only 0.3 MGD can be processed through the clarifiers.

Understanding and utilizing these relationships can assist in the operation of the plant under different conditions and help determine when an additional clarifier is required for buildout conditions. It is important to note that the facility is not currently limited by the secondary clarifiers and return sludge pumping capacity for secondary treatment capacity based on their historical operation.

7.3.5 BioWin® Modeling

A process model of the facility was developed and calibrated using the BioWin® modeling software based on data collected at the facility. The process model was used to evaluate the capacity and performance of the activated sludge process. For current conditions, design criteria for the activated sludge process, specifically the aeration requirements and sludge production levels, will be reviewed against historical data and the previous sections of the report.

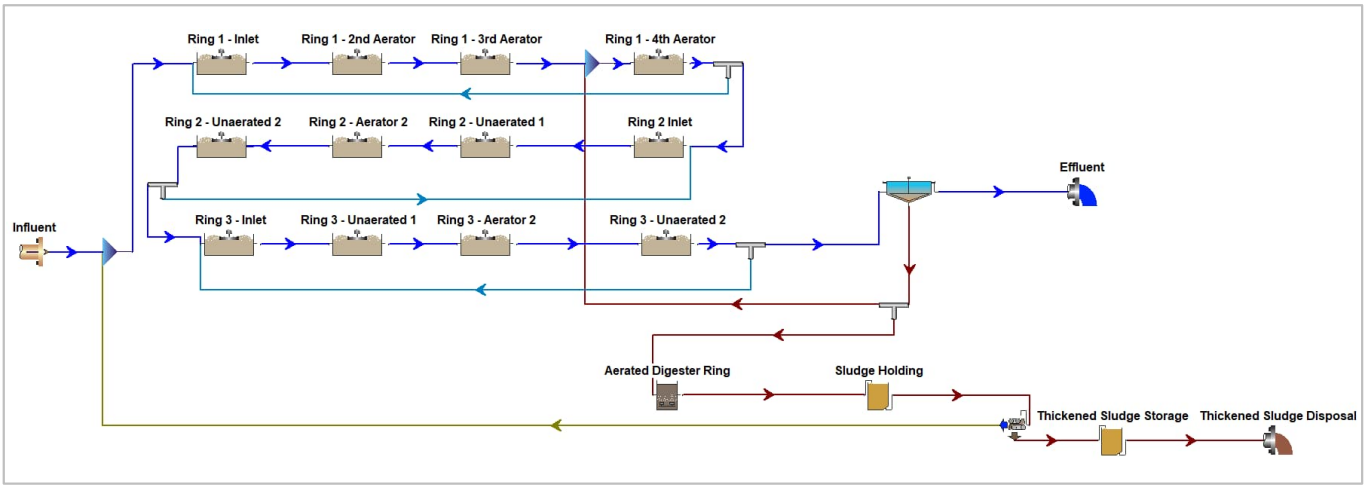
7.3.5.1 Calibration

Modeling of plant processes was developed using BioWIN® version 6.2. The model was calibrated using available WWTF operating data. Assumptions were made for the process and wastewater characteristics if the data was not available. For this process alternatives analysis, a steady-state model was developed and calibrated to an extended period (typically for a duration of several solids residence times) to simulate sustained process performance. Once the model was calibrated using available data, it was used to simulate the existing process and process alternatives under design conditions for mass balance. Of primary concern for this facility is aeration demand and solids generation.

The flow schematic of the model is shown in Figure 7-7. The three aeration channels were modeled separately. Each aeration channel was split to account for the aerated and unaerated portions of the channel. Since Aeration Channel 1 has 4 aerators, each subsection is shown as aerated. Aeration Channels 2 and 3 have two aerators and were modeled assuming a quarter of the channel length would be aerated and then a quarter would be unaerated (anoxic/anaerobic). The channels were modeled this way because the oxygen provided by the aerators is likely consumed rapidly and denitrification likely occurs in the unaerated portions of the tank. In addition, a "recycle" was added to mimic the velocity imparted by the mixers to maintain 1 foot per second in the ditch. The secondary clarifiers were consolidated into one representative unit for simplicity. SWWTF solids handling data was used to ensure the model was balanced by mass. The mass balance used some standard assumptions because the SWWTF WAS flow is estimated.

The model was calibrated for the monitoring period of February 2023. The key calibration criterion was to verify that the model accurately simulated the MLSS concentration and the amount of waste activated sludge (WAS) produced. MLSS concentrations, waste activated sludge flow volumes (estimate), and WAS concentrations are measured and recorded daily. The model was accurate to 10% for MLSS and 1% for WAS generation. In addition, final effluent quality was similar to facility data. There was an attempt to verify the model during summer months, but the model required higher WAS removal than facility data showed to match RAS and MLSS concentrations. This is likely due to the inaccuracies in WAS flow measurement.

Figure 7-7 BioWin Model Process Flow Diagram



7.3.5.2 Modeling Results

Modeling was completed based on flows and loads conditions observed during the monitoring period, previously summarized in Section 5 of this report. The model input is based on the BOD-based conditions, as this is critical for determining aeration demand for the system. The loading values in the winter are different than in the summer due to the seasonal variability at SWWTF. The models were planned to assume no nitrification in the winter because there is no ammonia limit for the facility. Full nitrification was assumed for the summer. The SRT for each scenario is 4 days for winter and 10 days for summer. However, model results indicated that partial nitrification was occurring in the winter months and could not be avoided. The models were changed to assume full nitrification in winter months to avoid operating in the partial nitrification zone. The revised cold weather SRT is 8 days.

Some influent characteristic values (such as VSS and TKN) were estimated as the facility does not measure them. A 2.0 mg/L value for DO in each aerated section of the oxidation ditch was used to determine oxygen demand for the system at a more typical operating point for an activated sludge system. Model results were compared against the original design DO level of 0.2 mg/L. A RAS flow ratio of 70% RAS flow to Influent flow was used, with the upper limit being 1.05 MGD based on total RAS pump capacity.

Key parameters reviewed were MLSS concentration, oxygen demand, sludge production, and final effluent quality.

7.3.5.2.1 Average Day Process Findings

For the cold condition for average day, the calculated MLSS is approximately 1,400 mg/L in order to maintain the 8-day SRT. WAS production is calculated to be approximately 700 lbs/day. The oxygen demand in the ditch is calculated to be approximately 1,450 lbs/day.

For the warm condition for average day, the calculated MLSS is approximately 2,800 mg/L in order to maintain the 10-day SRT. WAS production is calculated to be approximately 1,140 lbs/day. The oxygen demand in the ditch is calculated to be approximately 2,650 lbs/day.

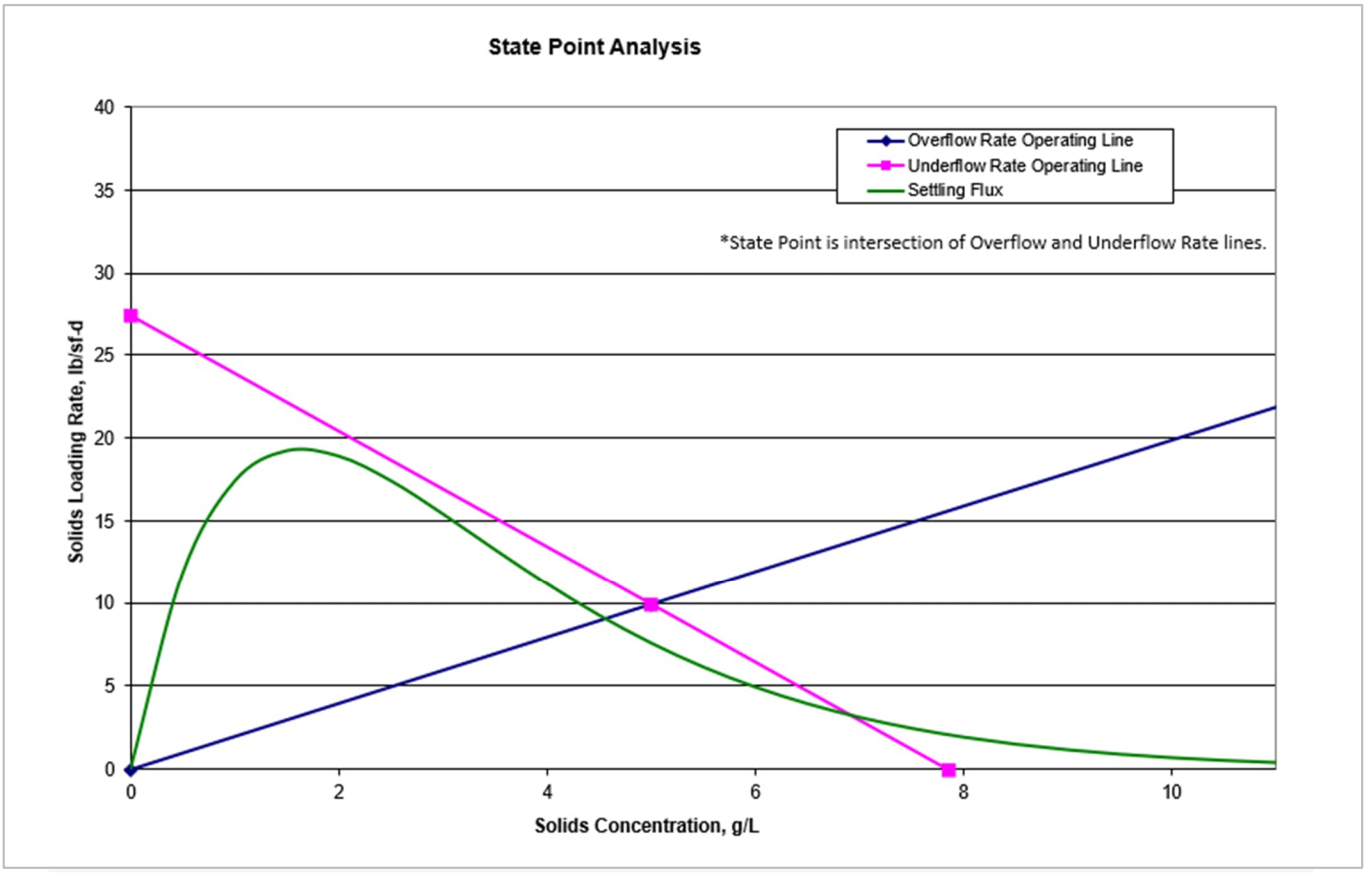
7.3.5.2.2 Maximum Month Process Findings

For the cold condition for maximum month, the calculated MLSS is approximately 2,200 mg/L in order to maintain the 8-day SRT. WAS production is calculated to be approximately 1,100 lbs/day. The oxygen demand in the ditch is calculated to be approximately 2,200 lbs/day.

For the warm condition for maximum month, the calculated MLSS is approximately 5,000 mg/L in order to maintain the 10-day SRT. WAS production is calculated to be approximately 2,000 lbs/day. The oxygen demand in the ditch is calculated to be approximately 3,700 lbs/day.

It is typically not recommended to operate with an MLSS concentration above 5,000 mg/L. The pH in the oxidation ditch was approximately 6.5, as nitrification consumed alkalinity. With no supplemental alkalinity source (i.e. caustic or another chemical), it appears that the maximum month load scenario during the monitoring period would be the most the facility could reliably treat. In addition, as shown in Figure 7-8, at this MLSS concentration and average SVIs seen during the monitoring period, 0.6 MGD results in clarifier failure. Flow would need to be reduced to 0.3 MGD to process through the clarifiers.

Figure 7-8 SPA Result, Max Month Process Findings



7.3.5.2.3 Maximum Day Process Findings

For the maximum day condition, a dynamic model was used. The model was set up to replicate a maximum month condition for 3 days before and after a maximum day event. Based on the influent loading, the oxidation ditch showed signs of pH inhibition (pH of 5.5), and nitrification stopped, leading to partial nitrification. The MLSS concentration was 5,500 mg/L (above recommended levels) and the oxidation demand was 4,500 lbs/day. The system was not fully nitrified, due to a lack of available alkalinity. If alkalinity had been available for full nitrification, we would expect a higher oxygen demand.

7.3.5.2.4 Process Findings Conclusions

The BioWin modeling shows that based on the existing equipment and unit processes, there is sufficient capacity to treat the existing flows and loads the facility sees up to the maximum month summer condition. Any loads above this result in higher than recommended mixed liquor values and show the need for supplemental alkalinity to ensure full nitrification can occur. The oxygen demand required to treat a maximum day event is likely close to the rated clean water capacity of the existing aerators.

At the high mixed liquor values required to fully nitrify and treat the influent loads, the secondary clarifier capacity is very limited (approximately 0.3 MGD) as shown in the SPA analysis. High SVIs have been seen at the facility, which decreases the amount of wastewater the facility can treat, especially at higher MLSS concentrations. Providing adequate oxygen and avoiding partial nitrification should bring down SVI values.

It appears that the facility should investigate additional aeration capacity, a supplemental alkalinity source, and review if an additional clarifier is required. The need for an additional clarifier may be alleviated if SVI values can be reliably reduced.

7.4 Secondary Treatment System Alternatives

This section presents and evaluates alternatives for the SWWTF to meet forecasted flows and wasteloads for the planning period. The alternatives presented are designed for the removal of TSS and BOD to the quantity-based limits identified in the SWWTF RIPDES permit. For ease of comparison, the maximum month condition for each loading scenario is presented and analyzed. The loading scenarios are summarized in Table 7-4. In addition, the approximate oxygen demand is shown for each scenario.

Table 7-4 Influent BOD Loads, Maximum Month

Parameter	BOD Load (lbs/day)	Oxygen Demand (lbs O2/day)
Existing Conditions	2,600	3,800
Existing + Buildout	3,600	5,200
Existing + Buildout + Industry	6,300	9,300

The alternatives reviewed include optimization of existing facilities (increased aeration to existing oxidation ditch); adding primary clarifiers to reduce the load to the aeration system; and constructing a new secondary treatment system to replace the oxidation ditch (new aeration tanks). Each alternative will be reviewed against their ability to treat expanded loading to the facility, potential sizing and layout of new tankage, implications to solids handling facilities (discussed further below) and an approximate capital cost for comparison.

7.4.1 Alternative 1: Optimization of Existing Facilities

To optimize the existing facilities, a blower retrofit to increase aeration capacity of the oxidation ditch was considered. Newterra, the manufacturer of the existing TR-10 aerator (26.5 lbs O_2/hr clean water capacity), provided information on the current comparable aerator model. The new model is the AIRE-O2 Triton 2.0. A brochure is included in Appendix D. The AIRE-O2 Triton 2.0 aerators have the same motor size as the TR-10 units but have a higher oxygen output capacity (32 lbs O_2/hour in clean water). This alternative includes the following:

- Replace the existing eight aerators with new higher capacity aerators, increasing the oxygen supply from 5,650 lbs/day to 6,144 lbs/day.
- Aeration channel 2 and aeration channel 3 both have space for two additional aerators. A conceptual layout is shown in Figure 7-9. Four additional aerators will supply 3,072 lbs/day of oxygen to the system, for a total of 9,216 lbs/day of oxygen.

This alternative would supply enough oxygen to meet the existing oxygen demand and forecasted future residential oxygen demand of 5,200 lbs O_2/day. This alternative would not meet the oxygen demand (9,300 lbs O_2/day) for the projected maximum month BOD load for projected expanded fishing industry.

Another way to optimize the existing oxidation ditch is to increase the treatment volume by using the aerobic digestion channel (outermost ring) as an additional aeration tank, shown in Figure 7-10. This would add about 280,000 gallons of treatment volume to the system. Aeration volume would increase by about 60 percent. The additional volume would treat up to an additional 1,700 lbs/day of BOD. The additional treatment volume will treat the existing and forecasted future residential buildout loads. It will not meet the needs of an expanded fishing industry. Using the aerobic digestion channel as an additional aeration channel will reduce the sludge storage capacity at the SWWTF and may require construction of additional sludge storage. Additional aerators would be required in the channel to provide adequate mixing and oxygen.

At the current maximum month load, the additional volume would reduce the required mixed liquor concentration from 5,000 mg/L to 3,000 mg/L, reducing the load to the secondary clarifiers. At the average facility SVI and a 3,000 mg/L mixed liquor concentration, the two existing clarifiers could treat flow up to 1.2 MGD.

Addition of a third clarifier is recommended for treatment of projected wastewater loads and to allow a clarifier to be taken offline for maintenance. At the current mixed liquor requirement of 5,000 mg/L and the average SVI of 280, a third clarifier would allow the facility to treat up to 0.5 MGD. At 3,000 mg/L, 1.8 MGD could be treated with 3 clarifiers.

This alternative does not address the lack of redundancy available for the oxidation ditch. However, methods can be implemented to more reliably take down one channel at a time to maintain and clean the channels.

Figure 7-9 Blower Retrofit

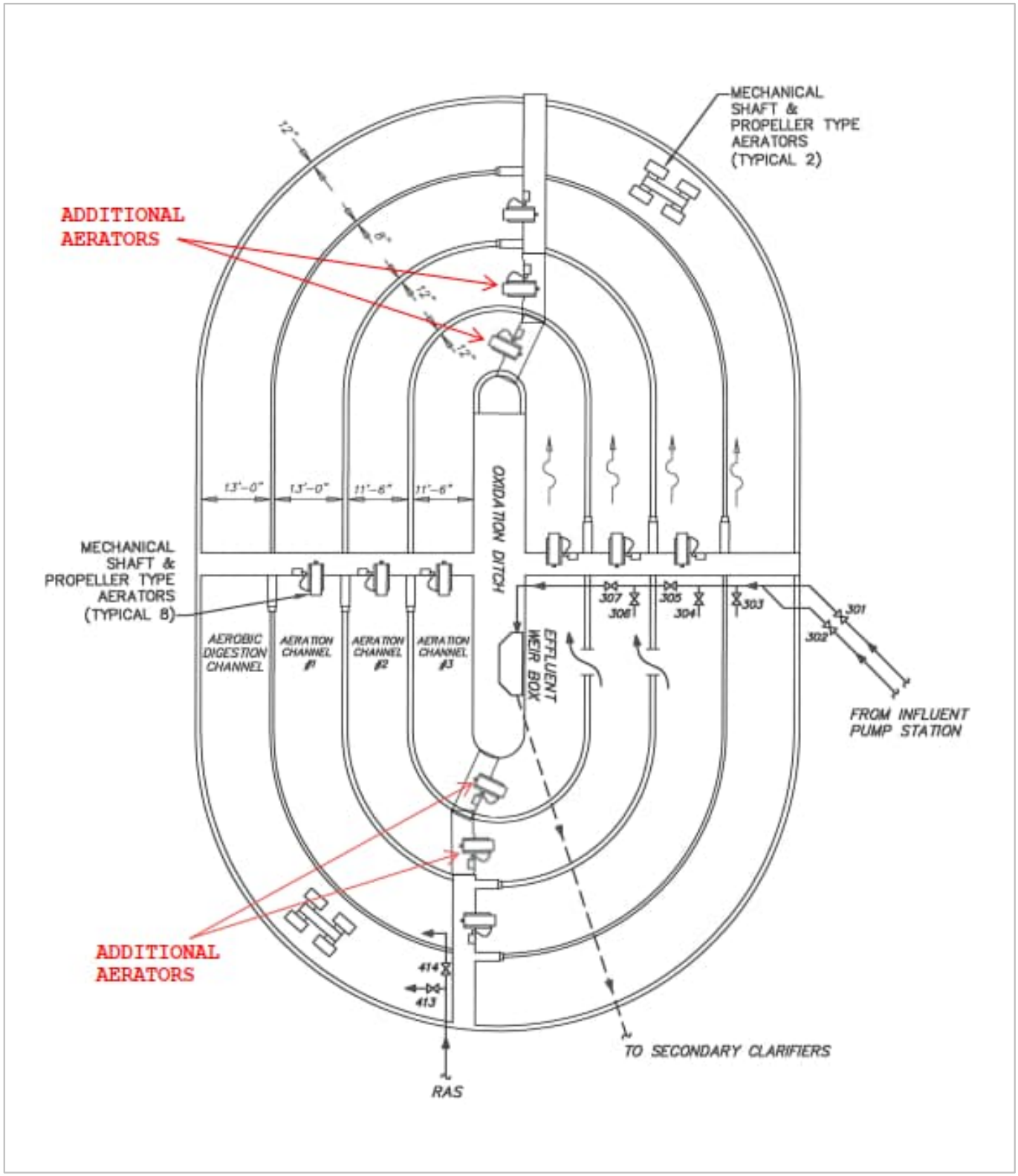
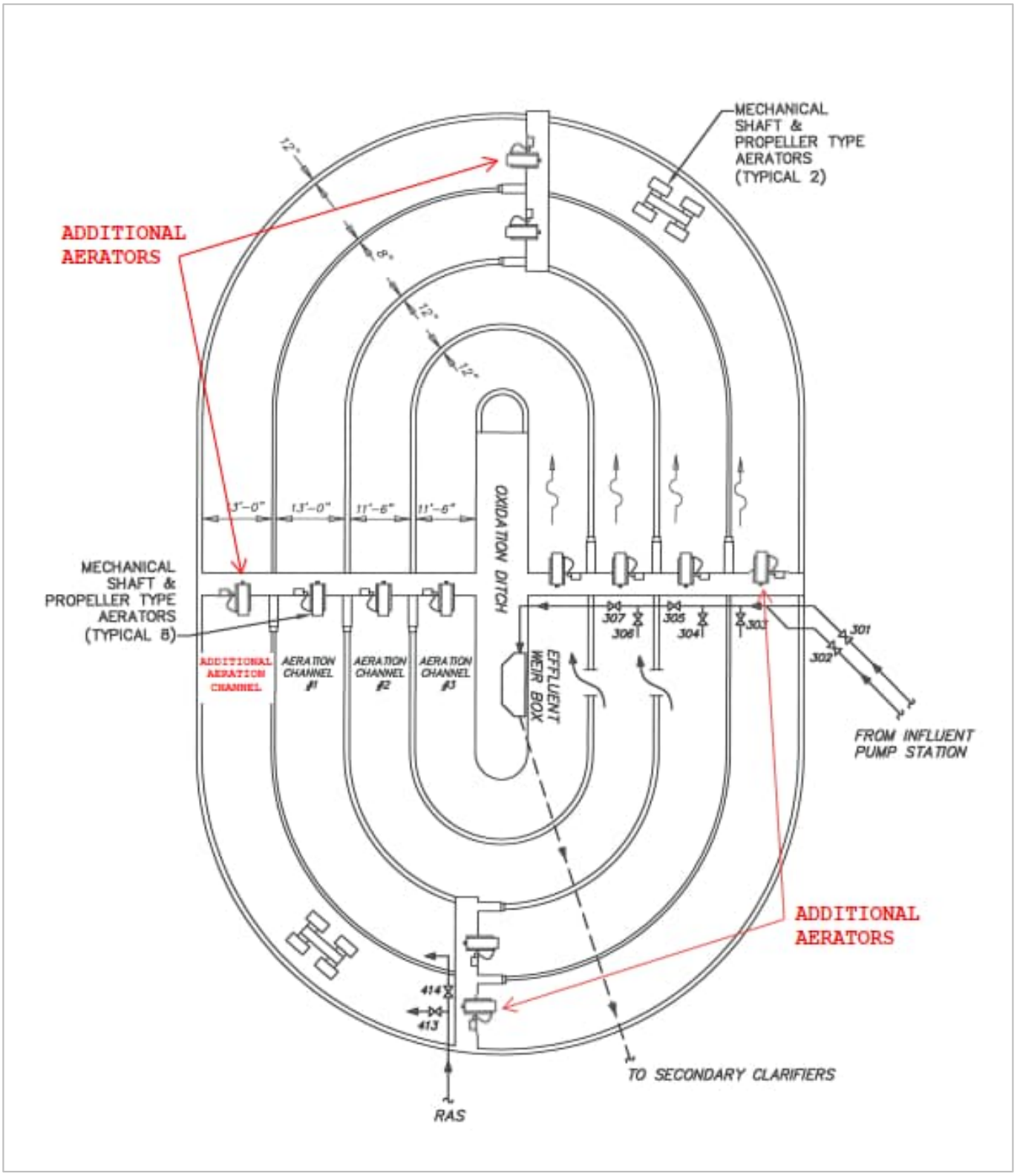


Figure 7-10 Additional Aeration Volume



7.4.1.1 Alternative 1 Conceptual Cost

The scope of Alternative 1 includes:

- Four new aerators, installed in aeration channels 2 and 3, including blowers, mixers, and control panels,
- Replace existing eight aerators with higher capacity model,
- Modify digester channel to be used for aeration channel, four new aerators and accompanying support, electrical, and instrumentation
- Four new aluminum support/access platforms over oxidation ditch,
- Conduit and wire to power the new units,
- Instrumentation support.

The opinion of probable project cost for this work is approximately $5.2 million.

7.4.2 Alternative 2: Primary Treatment with Optimized Aeration System

To reduce the BOD load entering the secondary treatment system, a primary treatment process was considered. Primary treatment typically removes approximately 30 percent of the BOD load and 50 percent TSS load from the influent flow. The reduced loading would reduce the oxygen demand in the secondary treatment system. The primary treatment system would include two rectangular clarifiers, a scum well, sludge holding tank, and associated equipment. A conceptual layout is shown in Figure 7-11. This option was considered based on previous studies completed for the facility.

- Preliminary sizing of the tanks was completed. The tank dimensions would be 65 feet long, 20 feet wide, with a side water depth of 10 feet.

- A new distribution box would be constructed on the influent side of the primary clarifiers. The influent pump station force main would be rerouted to the distribution box. Flow would be distributed between the clarifiers evenly through the distribution box and influent channel. Each tank would have an effluent channel that would combine into a pipe and flow by gravity to the oxidation ditch.

- Scum and sludge collected from the primary clarifiers would need to be stored, handled, and disposed of. The scum would be collected from each clarifier and stored in a common scum well. Pumps would be located in the scum well, pumping to the sludge holding tank. Collection of primary sludge would require a new sludge holding tank. It is best practice to store primary and secondary sludge separately. The sludge holding tank should have capacity to store three days of anticipated sludge at maximum week solids generation. Sludge tank dimensions would be approximately 35 feet long, 15 feet wide, and 15 feet deep.

- A primary sludge pump station would be required. Pumps would transfer sludge to the new holding tank. Pumps would also be required to transfer sludge to the solids handling facility for thickening.

Primary clarifiers reduce the BOD load by approximately 30 percent, which would reduce the oxygen demand by approximately the same amount. This would allow for adequate treatment of the existing loads the facility sees.

- Primary treatment with no changes to the aeration system will allow the plant to meet the existing flows and loads but will not meet the forecasted residential/commercial loads or the future needs of the fishing industry. The 30% reduction in load would "free up" 30% additional load (about 800 lbs/day) towards buildout, as the current system is considered at capacity.

- If primary treatment is constructed in conjunction with the aeration improvements detailed in Alternative 1, the SWWTF will meet the forecasted residential/commercial loads but will not meet the full forecasted needs of the fishing industry. Assuming the aerobic digestion channel is converted to an additional treatment channel, Alternative 2 would provide capacity to treat approximately 2,500 lbs/day of additional BOD.

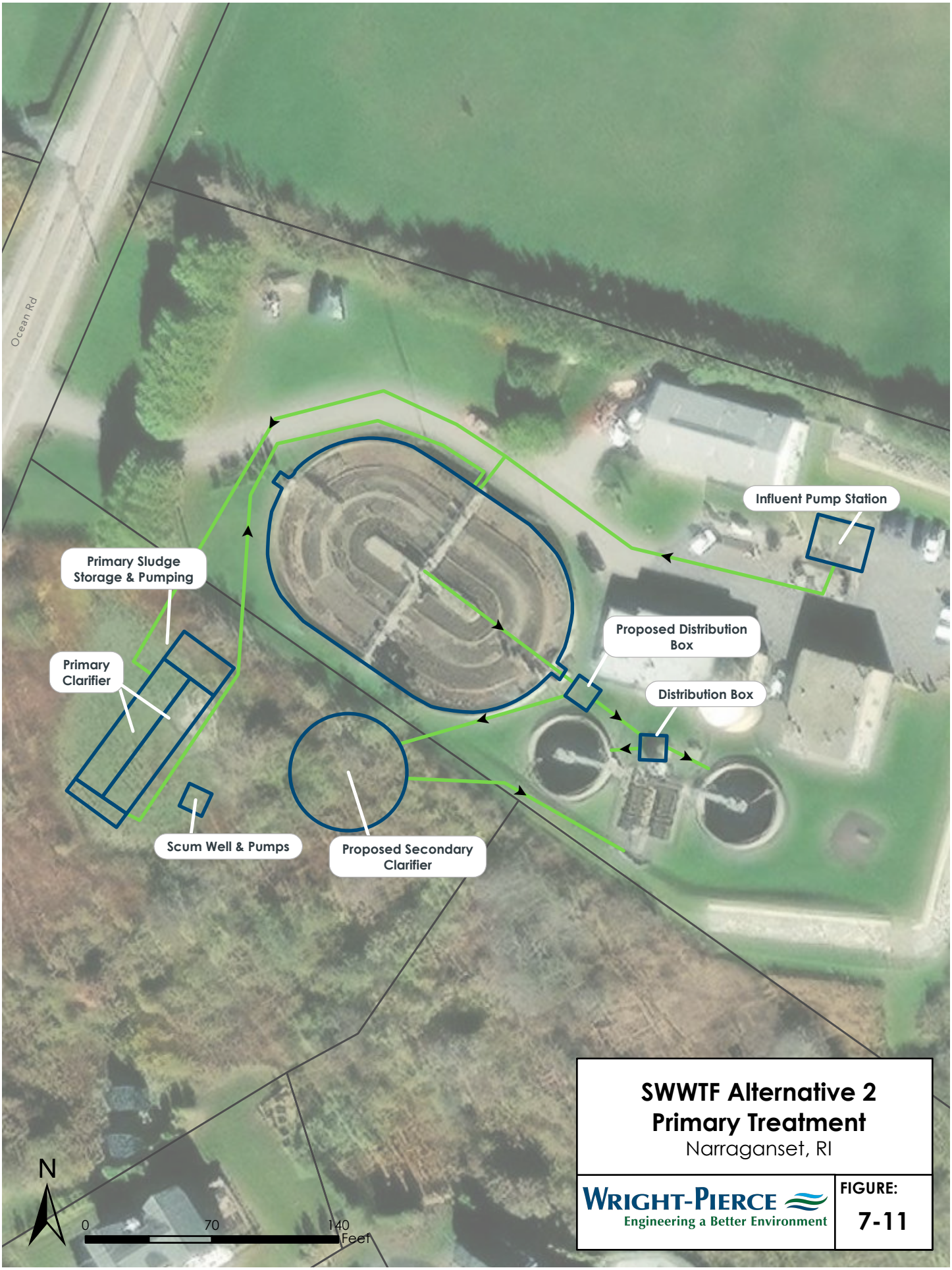
Primary treatment does not provide as much benefit as expanded secondary treatment volume, considering the added complexity and cost of an additional treatment process. Primary treatment will introduce an additional sludge stream and scum stream that will require additional facilities, structures, and equipment.

7.4.2.1 Alternative 2 Conceptual Cost

The scope of Alternative 2 will include the scope of Alternative 1 plus the following items:

- Two new rectangular primary clarifiers with influent and effluent channels,
- New influent pump station force main to primary clarifier influent channel,
- New site piping from primary clarifier effluent channel to oxidation ditch,
- Scum well and scum pumps,
- Primary sludge pump station,
- Solids holding tank and sludge transfer pumps,
- Electrical and instrumentation,
- Site piping and valves

The opinion of probable project cost for this work is approximately $15.7 million, including the scope of Alternative 1.



SWWTF Alternative 2
Primary Treatment
Narraganset, RI

WRIGHT-PIERCE
Engineering a Better Environment

FIGURE:
7-11

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7.4.3 Alternative 3: New Secondary Treatment System

The existing oxidation ditch at SWWTF will not meet the projected future flows and loads with expansion of the fishing industry. Alternative 3 is to construct a new aeration system to replace the oxidation ditch. The new aeration system would be an activated sludge treatment system with aeration tanks that have preceding anaerobic selector zones and aeration zones with fine bubble diffusers and blowers.

New aeration tanks would be constructed on the parcel adjacent to the existing SWWTF site. The influent pump station force main would be extended to a new distribution structure to feed the new aeration tanks. The distribution structure will include provisions for scum removal ahead of the proposed aeration system. Anaerobic selectors would be incorporated to increase the settleability of the sludge, which would increase the performance of the secondary clarifiers. Mixers would be required in the selector zones and fine bubble diffusers would be used in the new aerated zones. A new blower/electrical building and air piping would be constructed near the aeration tanks. To facilitate solids handling upgrades discussed below, which make use of the existing shallow clarifiers for sludge storage, three new secondary clarifiers would be located adjacent to the new aeration tanks. The clarifiers would have a deeper sidewater depth than existing clarifiers and could be larger diameter (50-feet) to handle the full buildout flows and have a tank offline for maintenance. New return activated sludge pumps and waste pumps would be installed, with increased pumping capacity. New piping to connect the new processes and existing processes and sludge systems would be required. The oxidation ditch and existing secondary clarifiers could be maintained as sludge storage or abandoned/demolished and new sludge storage/processing equipment could be installed in its location (discussed further below).

For existing and buildout flows and loads, two new aeration tanks are required. A third tank is required to meet the requirements of an expanded fishing industry.

The design MLSS concentration for this system would be 3,500 mg/L. This is based on the maximum month existing condition BOD load at 10 °C at the maximum day flow of 2.4 MGD. With a properly operating secondary treatment system with selectors, SVI values around 125 are expected.

7.4.3.1 Aeration Tanks

There are several important criteria to consider when sizing aeration tanks. The range of influent flows is important when considering the hydraulic residence time (HRT) within the tanks and the resulting volume required for the tanks. The influent BOD load is important when determining how much volume is required for treatment. The desired solids residence time (SRT) and resulting mixed liquor suspended solids (MLSS) is important when considering seasonal wastewater temperature variations and permit requirements. In addition, the number of tanks and geometry of the tanks are important. For this conceptual design, it is assumed that at existing and buildout conditions, the facility would construct two new aeration tanks. One tank could be used in the winter and two tanks in the summer. Key criteria for this conceptual design to meet the flows and loads summarized above for existing conditions are as follows:

- Target SRT of 10 days (to provide summer nitrification)
- MLSS target of 3,500 mg/L
- Approximate yield (lb VSS / lb BOD) of 0.8
- K_d of 0.06 1/days
- Approximate tank length to width ratio of 5:1
- Depth of approximately 16 feet

- Target HRT of 6 to 24 hours
- Effluent BOD of 5 mg/L at max month load and 10 mg/L at max day load

The required treatment volume was calculated in accordance with Metcalf & Eddy Chapter 7-6, Modeling Suspended Growth Treatment Processes (Wastewater Engineering Treatment and Resource Recovery, Metcalf & Eddy, fifth edition). Using the above criteria, the proposed aeration tanks will be approximately 145'x30'x16' (67,300 cft or 500,000 gallons) each. Three tanks will be required.

- For existing flow/loading conditions, HRT values range from 60 hours (minimum day) to 10 hours (maximum day). One tank will be required for maximum month conditions and two tanks are required for maximum day conditions.
- For buildout flows/loading conditions, HRT values range from 60 hours (minimum day)to 6 hours (maximum day). Two tanks are required for maximum month and maximum day conditions.
- For fish industry expansion (with buildout), HRT values range from 60 hours (minimum day) to 9 hours (maximum day). Two tanks are required for maximum month conditions and three tanks are required for maximum day conditions. One tank can be taken offline during the winter for maintenance. During summer months three tanks should remain online to account for maximum day flows.

The current effluent permit limits for BOD are 584 lbs/day (maximum day) and 350 lbs/day (average monthly). The concentration limits calculate to be 29 and 38 mg/L for existing flow conditions, 17 and 22 mg/L for buildout flow conditions, and 17 and 22 mg/L for buildout plus fishing industry flow conditions. With a target treatment performance of 5 mg/L and 10 mg/L for maximum month and maximum day conditions the calculated effluent loads are 46 and 200 lbs/day for existing flow conditions, 78 and 343 lbs/day for buildout flow conditions, and 79 and 350 lbs/day for buildout plus fishing industry flow conditions. These values are below the permitted load limits and the calculated concentration limits.

7.4.3.2 Blower Sizing

A conceptual design was completed to size blowers required for the new aeration tanks. The sizing is based on the aeration demand summarized above in Table 7-4. The blower system was sized to provide 1 spare offline blower for redundancy at maximum month summer conditions. This allows for an offline blower to be turned on during maximum day conditions, if needed. Based on the aeration demand, blowers sized for approximately 1,350 icfm would be required for existing conditions (2 installed). In order to meet future buildout conditions, an additional blower would be required (3 installed). To meet future buildout and fish industry expansion, an additional blower would be required (4 installed). A discharge pressure of 9 psi was assumed, for estimated motor horsepower of approximately 100 hp.

7.4.3.3 Secondary Clarifier Sizing

A state point analysis was used to complete a conceptual design of the secondary clarifiers. The state point analysis was run at the maximum day flow (2.4, 4.1, and 4.2 mgd) and maximum month design MLSS (3,500 mg/L) for future flows and loads to determine the size of the secondary clarifiers and RAS pumping capacity.

The following assumptions are used in the SPA analysis:

- SVI of 125, assuming selector zones in the aeration tanks
- 25 percent safety factor
- RAS pumping capacity increase to 650 gpm per clarifier

- MLSS of 3,500 mg/L
- 2 clarifiers for existing conditions, 3 clarifiers for future buildout

Figure 7-12 through 7-14 show the SPA results for existing conditions, buildout, and buildout plus fish.

Figure 7-12 Existing Conditions SPA Analysis, Future Design

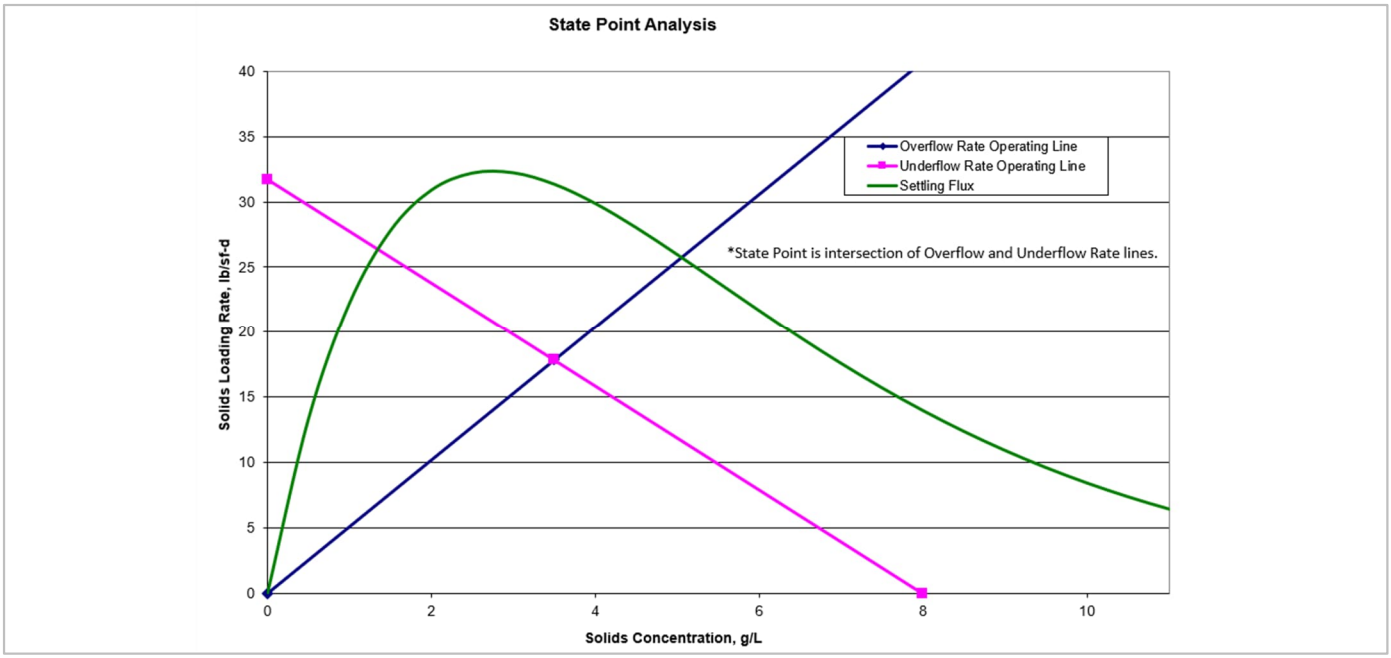


Figure 7-13 Buildout Conditions SPA Analysis, Future Design

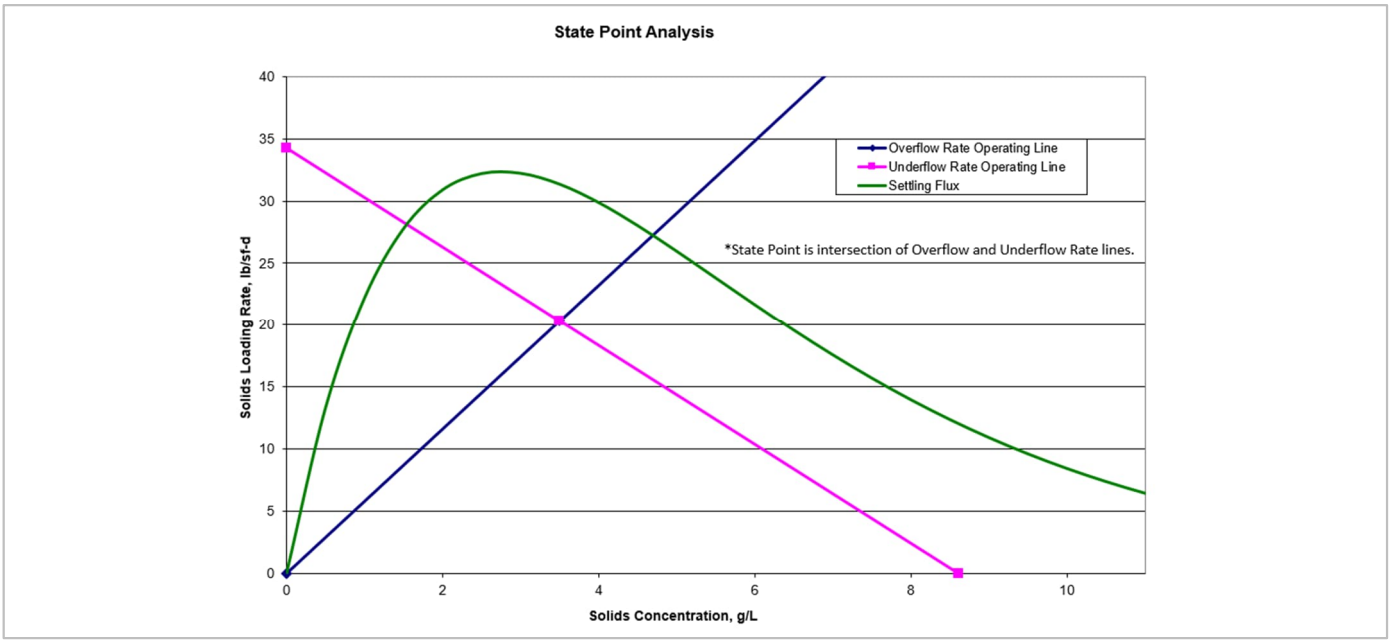
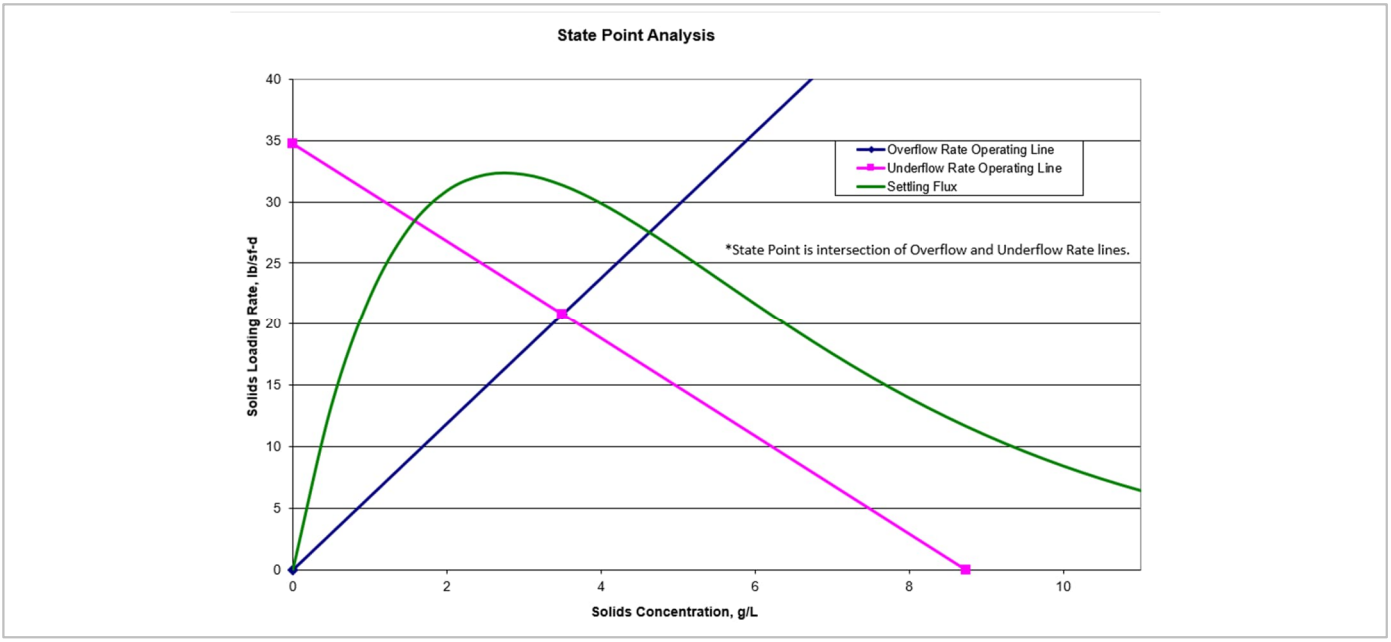


Figure 7-14 Buildout Plush Fish Conditions SPA Analysis, Future Design



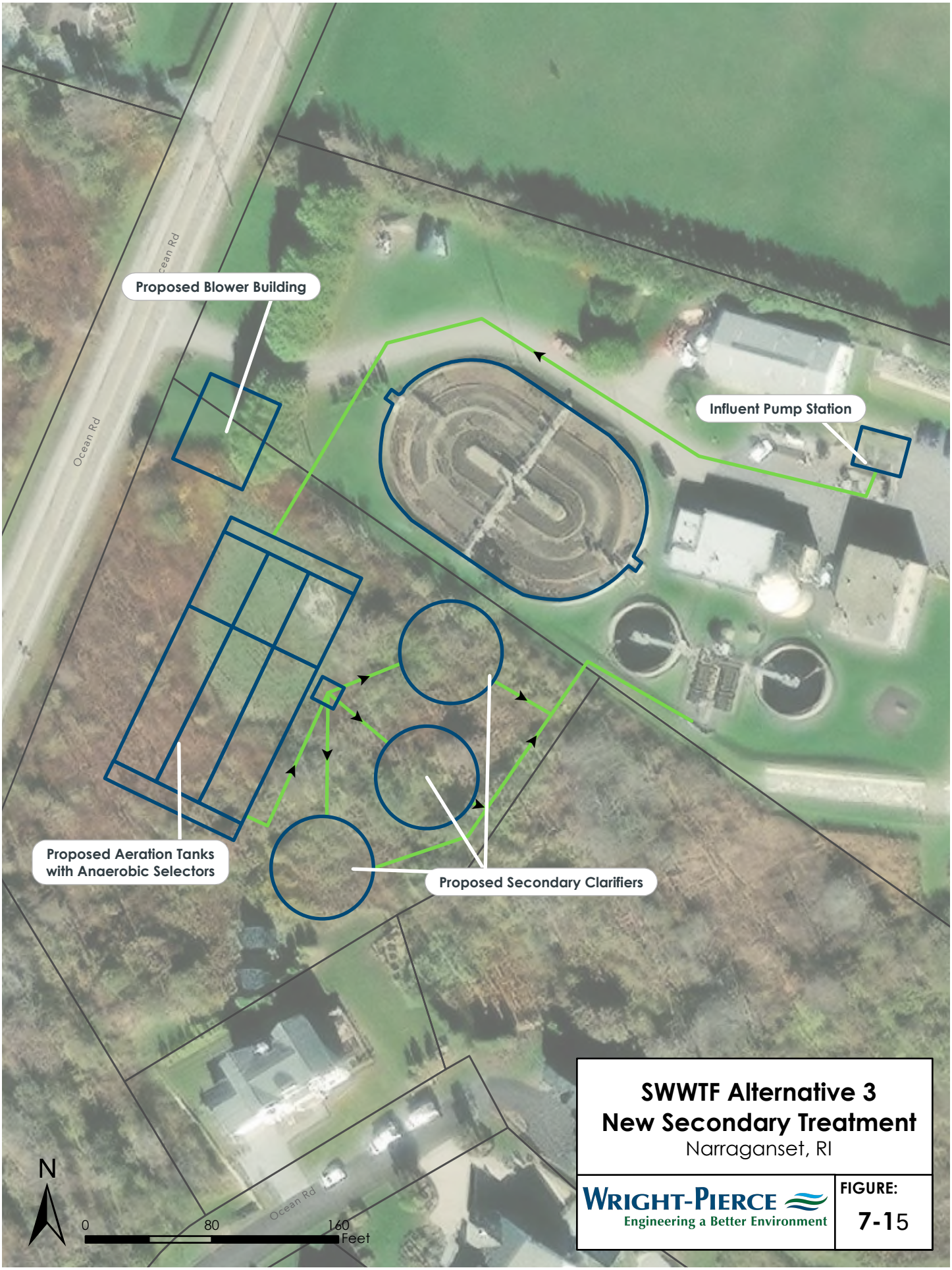
Three 50-ft diameter clarifiers will be required to meet buildout and fishing industry needs. The state point analysis indicates the secondary clarifiers will provide proper solids separation, ensuring the ability to meet the quantity- and quality-based permit limits for TSS. The clarifiers are designed conservatively based on the unknowns surrounding actual fishing industry expansion to ensure enough land is available and adequate costs are accounted for in the conceptual planning.

7.4.3.4 Alternative 3 Conceptual Cost

The scope of Alternative 3 includes the following items:

- Three rectangular aeration tanks with selector zones and fine bubble diffusers,
- New influent pump station force main to secondary distribution box,
- New RAS force mains to distribution box,
- New site piping to secondary clarifiers,
- New blowers and air piping,
- New building to house blowers and electrical equipment,
- Construct three new secondary clarifiers,
- Provide new RAS and WAS pumps,
- Electrical and Instrumentation,
- Piping and valves

The opinion of probable project cost for this work is approximately $33.2 million. A conceptual layout of this scenario is shown in Figure 7-15.



SWWTF Alternative 3
New Secondary Treatment
Narraganset, RI

WRIGHT-PIERCE
Engineering a Better Environment

FIGURE:
7-15

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7.5 Solids Handling System Evaluation

7.5.1 Introduction

The SWTTF solids handling operation currently includes thickening and hauling off for incineration. Solids from the secondary clarifiers are wasted to the aerobic digestion channel of the oxidation ditch. Sludge from the aerobic digestion channel is moved to the sludge holding tank attached to the Maintenance/Control Building. Supernatant from the sludge holding tank is drained back to the influent pump station. Sludge is transferred to the solids handling facility where it is thickened using the gravity belt thickener and stored in the thickened sludge holding tank. During winter months, sludge processing is done about once per week. During summer months, sludge processing is done about twice per week. Thickened sludge is then hauled by a tanker truck to the Synagro facility in Woonsocket for incineration.

Sludge disposal is one of the greatest challenges facing the municipal wastewater industry. The majority of Rhode Island wastewater facilities dispose of liquid sludge by incineration at the merchant sludge facilities in Cranston, RI (operated by Veolia Water) or Woonsocket, RI (operated by Synagro). These facilities currently accept liquid sludge. Recently, the Woonsocket facility notified customers that liquid sludge will not be accepted in the near future (1-2 years). Dewatered sludge cake will be accepted. An exact timetable has not been set for phasing out liquid sludge.

There are several options for processing and disposal of wastewater sludge biosolids. This report evaluates alternatives that produce thickened or dewatered sludge for off-site merchant disposal facilities. This is the most common practice in Rhode Island and neighboring states.

7.5.2 Future Sludge Loads

Based on the future flows and loads to the SWWTF, the following sludge generation is forecast. For the purpose of evaluating the solids system, it is assumed only secondary sludge is produced. The SWWTF does not currently produce primary sludge or accept septage. Sludge facilities are typically sized for the maximum week sludge generation, shown in Table 7-5. The table assumes a solids concentration of 0.7%.

Table 7-5 Waste Sludge Generation at Maximum Week

Influent Loads	Sludge Generation (lbs/day)	Sludge Generation (gallons/day)
Existing	2,750	46,900
Existing + Buildout	3,950	67,900
Existing + Buildout + Industry	6,750	115,800

Storage for three days of maximum week sludge generation is recommended. Three days of storage allows for employee downtime (i.e. holiday weekends) and equipment downtime (failed pumps or maintenance requirements). The existing sludge storage at the SWWTF includes the sludge storage tank, approximately 80,000 gallons, the aerobic digestion channel, approximately 285,000 gallons, and the thickened sludge storage tank, 20,000 gallons. Table 7-6 shows waste sludge storage needed for build-out conditions. With full build-out, 347,500 gallons are required. Assuming the aerobic digestion channel will be utilized for treatment and no longer available as storage, as recommended in the above alternatives, the available waste sludge storage is the 80,000-gallon

sludge storage tank. The secondary clarifiers could be utilized to buffer storage, as needed, by allowing the sludge blanket to rise for short durations of time. A new waste sludge storage tank is recommended at build-out conditions.

Table 7-6 Recommended Waste Sludge Storage Volumes

Influent Loads	3 Days of Waste Sludge (gallons)	Existing Storage Tank (gallons)	Secondary Sludge Blanket (gallons)[1]	Additional Required (gallons)
Existing	140,800	80,000	121,000	-
Existing + Buildout	203,800	80,000	121,000	2,800
Existing + Buildout + Industry	347,500	80,000	121,000	146,500[2]

[1]Assuming three secondary clarifiers in operation

[2] It is possible the storage volume could be reduced further by operational approaches such as by holding higher concentrations of mixed liquor in the secondary treatment system. This could be analyzed in a full solids handling evaluation and design.

7.6 Solids Handling System Alternatives

7.6.1 Alternative 4: Thickening

Alternative 4 is to continue thickening waste sludge. Examples of thickening technology include:

- Gravity belt thickener (GBT)
- Rotary drum thickener (RDT)
- Centrifuge

For this analysis, it was assumed that operational changes would increase waste sludge to 0.7% solids (current operations are 0.23% on average). The GBT currently thickens to 3.4% solids on average. Typically, disposal outlets desire a 5% solids thickened sludge for optimal incinerator feed. Thickening can result in approximately 5-7% solids with the proper equipment and ample polymer addition. Table 7-7 below describes the hours of operation for a thickener to process 600 gpm of sludge generated at each maximum week condition. This can be accomplished by any of the three above technologies. A smaller unit (200-400 gpm) could be installed if the SWWTF is willing to process more often. Some facilities thicken overnight and on weekends. It is recommended to install two thickeners to provide redundancy.

Table 7-7 Thickening Operation Requirements

Influent Loads	Operation Requirement
Existing	9 hours/week Operate thickener twice per week for five hours
Existing and Future Residential/Commercial	13 hours/week Operate thickener three times per week for four hours
Existing, Future Residential/Commercial, and Industrial (Fish Processing)	22 hours/week Operate thickener five times per week for four to five hours

Thickened sludge should have storage for three days at maximum week conditions. The existing thickened sludge storage tank is 20,000 gallons. Table 7-8 below shows storage volume needed based on thickening to 5% solids, and truck loads per week at maximum week conditions.

Table 7-8 Thickened Sludge Volumes

Influent Loads	3 Days of Thickened Sludge (gallons)	Existing Storage (gallons)	Additional Storage Required (gallons)	Truck loads/week[1]
Existing	19,000	20,000	-	5
Existing + Buildout	27,000	20,000	7,000	7
Existing + Buildout + Industry	46,000	20,000	26,000	12

Notes:

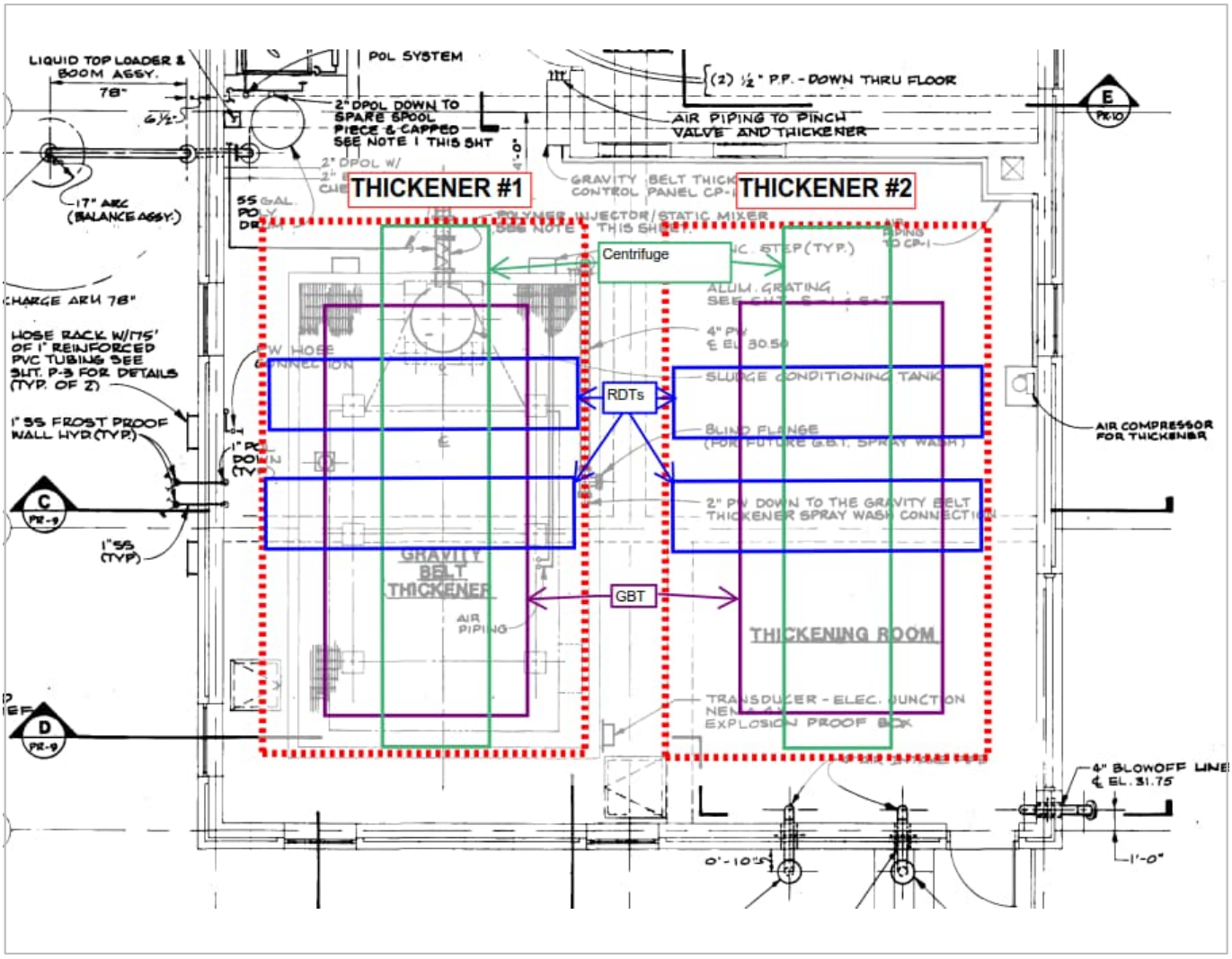
1. This estimate is based on the trucks currently used by SWWTF, which have 8,700-gallon capacity.

The scope of a thickening upgrade includes the following items:

- Install a second GBT,
- Install an additional sludge feed pump, with flow metering,
- Construct a thickened sludge storage tank, with mixer and level sensors,
- Install additional polymer feed pump and appurtenances,
- Associated electrical and instrumentation upgrades,
- Upgrade of odor control system.

The opinion of probable project cost for this work is approximately $3.8 million.

Figure 7-16 Thickener Layout



7.6.2 Alternative 5: Dewatering

Alternative 5 is to replace the GBT with a dewatering process. This can be accomplished by the following technology:

- RDT followed by a screw press
- Dewatering centrifuge
- Rotary Press

It was assumed that operational changes would increase waste sludge to 0.7% solids (current operations are 0.23% on average). As there is no primary sludge at this facility, dewatering technologies are not able to typically reach concentrations above 25% solids. An RDT could thicken to 5%, and a screw press could thicken to approximately 18%. A centrifuge would be expected to dewater to 20-23 percent solids, however this would have to be confirmed by pilot testing. Table 7-9 below describes the hours of operation needed for a dewatering unit to process 300 gpm of sludge generated at each maximum week condition.

Table 7-9 Maximum Week Dewatering Operation Requirements

Influent Loads	Peak Operation Requirement
Existing	18 hours/week
Existing + Buildout	25 hours/week
Existing + Buildout + Industry	43 hours/week

Dewatered sludge would be conveyed to a trailer for storage. This process eliminates the need for the existing 20,000-gallon thickened sludge storage tank, so it could be repurposed for additional waste sludge storage. Table 7-10 below shows dewatered sludge produced, and trailer loads per week at maximum week conditions to fill a 60-cy container to 75% full. It was assumed the dewatered sludge would have a bulk density of 45 lbs/cf.

Table 7-10 Dewatered Sludge Volumes

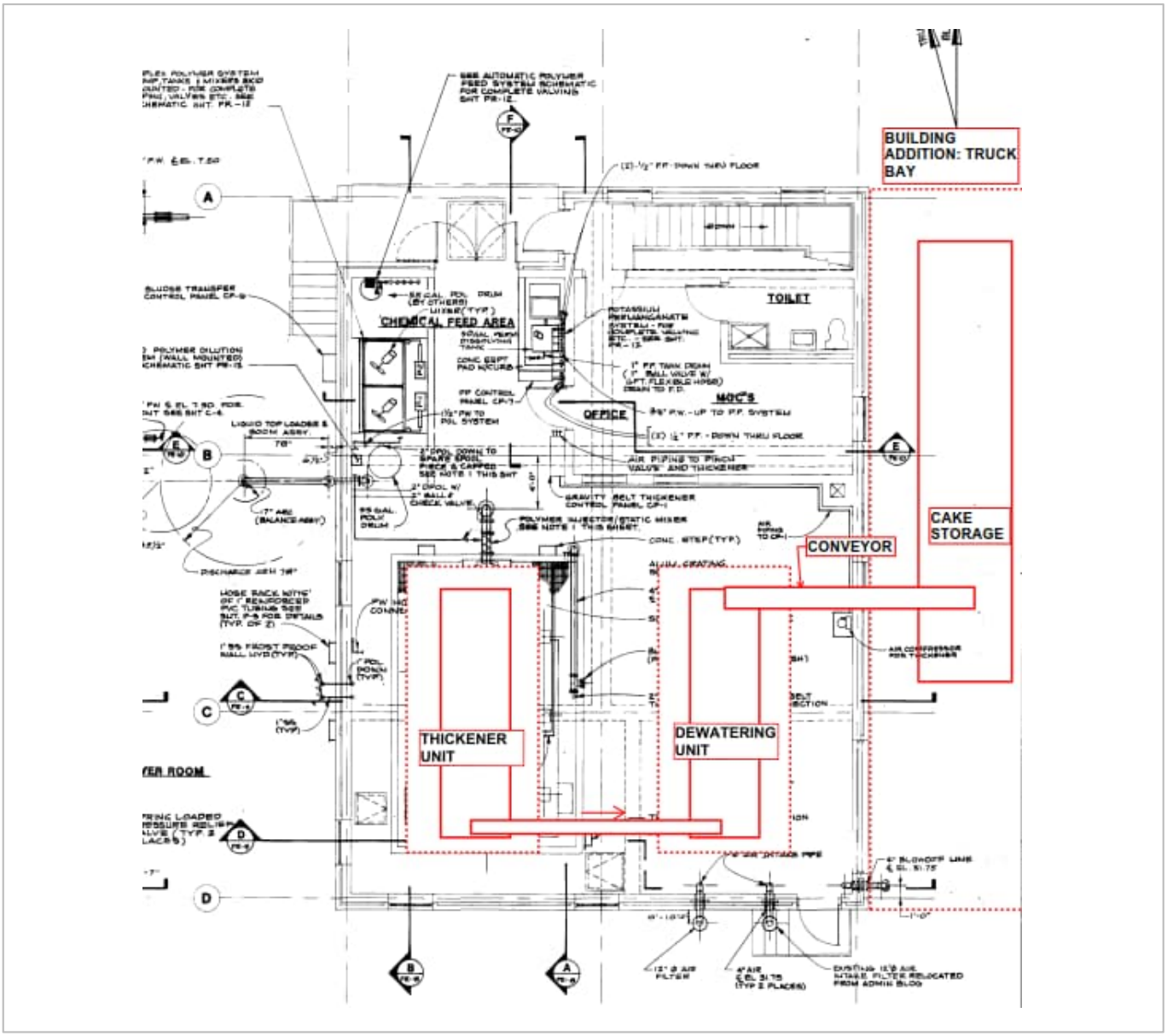
Influent Loads	Dewatered Sludge Produced (cf)	Trailer loads/week
Existing	83	2
Existing + Buildout	120	3
Existing + Buildout + Industry	206	5

The scope of a dewatering upgrade includes the following items:

- Install dewatering equipment, with building modifications for floor support as needed,
- Install an additional sludge feed pump, with flow metering,
- Install conveyors and a trailer loading bay (building addition),
- Install additional polymer feed pump and appurtenances,
- Associated electrical and instrumentation upgrades,
- Upgrade of odor control system.

The opinion of probable project cost for this work is approximately $6.1 million.

Figure 7-17 Dewatering Layout



7.7 Disinfection System Alternatives

Disinfection is the final stage of treatment at the SWWTF. There are several methods of disinfection used in wastewater treatment. Currently, sodium hypochlorite is used for disinfection at the SWWTF. Table 7-11 below summarizes alternative disinfection technologies to chlorination.

Table 7-11 Disinfection Alternate Treatments

Disinfection Method	Advantages	Disadvantages
Peracetic Acid Peracetic acid, a strong oxidant and virucide, is a mixture of acetic acid and hydrogen peroxide. Requires bulk storage tank and flow paced pump systems, Intermediate storage tanks and transfer pumps may be required. Good dispersion/mixing can improve effectiveness.	• Reduced by-product formation • Lower capital and energy cost compared to UV & Ozone • Short contact time • Dechlorination not required • Decomposed to harmless acetic acid, oxygen and water	• Limited installations / Emerging technology • Permitting agency may require modeling and studies to prove effectiveness of disinfection approach • Higher cost
Ozone Ozone is a very strong oxidant and virucide. Requires installation of ozone generating equipment onsite.	• Proven disinfection technology • Widely implemented for drinking water • No know by-product formation • Short contact time • More effective than chlorine • Elevates DO concentration in effluent	• Complex technology requiring complicated equipment and efficient contacting systems • Ozone is very reactive and corrosive, Ineffective at low doses • Safety concern. Need to control off-gas (dangerous) and the residual must be destroyed • High capital and energy costs
UV Disinfection Install banks of ultraviolet units which disinfect by destroying nucleic acids and disrupting the organisms' DNA leaving them unable to replicate thereby inactivating the microorganisms.	• Proven disinfection technology • No known by-product formation • Short contact time • Equipment is easy to operate and maintain	• High capital and energy costs • May not be compatible when certain coagulants, such as ferric chloride, are used in treatment process • No residual disinfectant following treatment • High TSS in effluent may render UV disinfection ineffective

The most common disinfection methods are chlorine and ultraviolet (UV) disinfection. The two options evaluated for upgrading the disinfection process at the SWWTF are continued use of sodium hypochlorite or installation of UV disinfection system.

7.7.1 Alternative 6 – Sodium Hypochlorite Disinfection

Alternative 6 is the continued use of sodium hypochlorite for chlorination, using the existing chlorine contact chambers. The disinfection process was originally constructed in 1975. The contact chambers were designed to treat a peak flow of 4.2-MGD which equates to a contact time of 15 minutes. Projected future flows will remain below the original design flows and therefore have contact times greater than original design values.

The chlorine contact time was calculated for current and future flows. According to TR-16, a minimum contact time at peak flows are recommended to be 30 minutes. The contact times at various conditions were calculated using the usable volume of the chlorine contact tanks and associated flow rate and are summarized in Table 7-12. A 30-minute contact time is not met by current design flow nor achievable for projected future peak flows using the existing chlorine contact tank. To achieve the 30 minutes of recommended contact time an extension of the

chlorine contact chamber would be needed. The required extension would be 4,300 cubic feet of additional channel volume. Advantages and disadvantages of sodium hypochlorite disinfection are summarized in Table 7-13.

Table 7-12 Chlorine Contact Times

Flow Condition	Detention/Contact Time
Future Average Day (1.06 mgd)	61 Minutes
Future Peak Hour (99th%) (3.69 mgd)	17.5 Minutes

Table 7-13 Sodium Hypochlorite Disinfection Advantages and Disadvantages

Advantages	Disadvantages
Chlorine residual prevents any regrowth of bacteria.	Residual chlorine is harmful to the aquatic ecosystem.
Operators are familiar with the process; no additional training would be required.	Sodium hypochlorite has potential to create trihalomethanes (THMs) which are known carcinogens.
Chlorine disinfection is already an established part of treatment operations.	The delivery and onsite storage of chemicals creates a safety risk.
It will comply with the current permit.	The cost associated with sodium hypochlorite has increased rapidly in recent years

If continuing sodium hypochlorite as the method of disinfection is selected, the following actions are recommended:

- Clean and inspect tanks during next scheduled maintenance when tanks are empty
- Repair all cracks in concrete by pressure injection of an epoxy resin as required
- Replace skimmer valves
- Replace Sodium Hypochlorite Shed and associated pumping equipment
- Relocate Sodium Hypochlorite dosing location to upstream location to gain additional contact time. New mixing
- Installation of baffles to minimize short circuiting
- Construct additional volume for the chlorine contact tanks to meet 30 minutes of detention time at peak flow, if determined to be necessary.

The opinion of probable project cost for this work is approximately $0.9 million.

7.7.2 Alternative 7 – UV Disinfection

UV disinfection is a process where wastewater passes through ultraviolet light. The exposure to UV radiation inactivates the genetic material of microorganisms. The light penetrates the cell wall and destroys the cell's ability to reproduce. The process is very effective if the bulbs are properly sized, and the TSS levels in the wastewater are

low. UV transmissivity (UVT) must be estimated or measured to size the system. The transmissivity is the ratio of light entering to light exiting the wastewater. With an activated sludge process, the typical value is 65%. Advantages and disadvantages of UV disinfection are summarized in Table 7-14.

Table 7-14 UV Advantages and Disadvantages

Advantages	Disadvantages
UV treatment has no byproducts. It would reduce SWWTF's impact on the environment.	Higher electrical usage is required.
It is impossible to overdose UV disinfection.	The new system would be an adjustment for operators.
UV is a safer disinfection method for operators as there is no handling of corrosive chemicals.	Additional O&M requirements: the bulbs require inspection and cleaning to ensure proper treatment is achieved.
Complies with the current permit.	If the transmissivity is low, some pathogens may not be inactivated.
The current Chlorine Contact Chambers can be used to install the UV banks.	Installation of the UV banks requires a construction phase including new electrical and controls systems.

If the UV Disinfection alternative were pursued, the UV banks would be installed in retrofitted Chlorine Contact Chambers. Construction would be sequenced so UV banks are constructed in one contact chamber while sodium hypochlorite remains in use in the second chamber, to allow disinfection to continue during construction, followed by UV bank installation in second chamber. Design parameters are shown in Table 7-15.

Table 7-15 UV Disinfection Sequencing

	Average Flow (MGD)	Peak Flow (MGD)	UVT (%)	UV Dose (mJ/cm^2)	Treatment
Flow Conditions	1.06	3.69	65	30	2 channels, 4 modules

The opinion of probable project cost for this work is approximately $1.2 million.

7.8 SWWTF Summary of Alternatives

A summary of alternatives considered for improvements to the SWWTF are listed in Table 7-16. The alternatives included baseline plant improvements for reliable plant operation, improvements to the secondary treatment process (Alternatives 1, 2, and 3), and improvements to the solids processing systems (Alternatives 4, and 5)

Table 7-16 Alternatives Summary – WWTF

Alternative	Description	Cost Estimate
B	Baseline Improvements	$37.0M
1	Optimizing of Existing Oxidation Ditch	$5.2M
2	Primary Treatment with Optimized Oxidation Ditch	$15.7M
3	New Secondary Treatment System	$33.2M
4	Solids Thickening System	$3.8M
5	Solids Dewatering System	$6.1M
6	Sodium Hypochlorite Disinfection	$0.9M
7	UV Disinfection	$1.3M

7.9 Collection System

7.9.1 Existing Pump Stations

The Town of Narragansett owns and manages 14 pump stations tributary to the Regional WWTF and five pump stations tributary to the SWWTF. The pump stations will require capital investments to provide sufficient capacity and reliable service during the 20-year planning period.

7.9.1.1 North Pump Stations

The following pump stations will require capital improvements and equipment replacement to maintain reliable service for the planning period. More detailed recommendations can be found in the Pump Station Asset Management Plan.

- Baneberry Pump Station - Upgrade the electrical system.
- Bonnet Shores Pump Station – Install flood proofing improvements at pump station.
- Circuit Pump Station – Comprehensive pump station upgrade due to age and condition of equipment.
- Congdon Pump Station – Replace equipment in-kind as needed. Further evaluate pump/wetwell capacity.
- Industrial Park Pump Station – Comprehensive pump station upgrade due to age and condition of equipment. Evaluate/upgrade wetwell capacity.
- Lakewood Pump Station – The Lakewood Pump Station has an existing peak flow of 93 gpm, and a future peak flow of 317 gpm. The existing pumps (200 gpm) are adequate for existing peak flows but not future peak flows. If full buildout/development occurs within the pump station's service area, the pumps and wet well will need to be upgraded to meet future peak flows
- Mettatuxet Pump Station – Perform mechanical, electrical, and flood proofing improvements to the pump station.
- Mumford Pump Station – Upgrade the building's exterior.
- Ouida Pump Station – Upgrade equipment in grit room, and replace process, mechanical, and electrical equipment as needed.
- Seaport Pump Station – Replace equipment in-kind as needed.

- Sprague Pump Station – Upgrade the electrical system, HVAC/mechanical upgrades, and building improvements.
- Wilson Pump Station – Upgrade the pump station building.
- Winterberry Pump Station – Upgrade the electrical system, and replace equipment in-kind as needed.
- Wolfe Pump Station – Comprehensive pump station upgrade due to age and condition of equipment.

7.9.1.2 South Pump Stations

- Briggs Farm Pump Station – Replace equipment in-kind as needed.
- Burnside Pump Station – The pump station has an existing peak flow of 1,200 gpm with a projected future peak flow of 1,327 gpm. The existing pumps (1,200 gpm) are barely adequate for existing flows and not adequate for future flows. A comprehensive pump station upgrade is recommended.
- Galilee Pump Station – The last major upgrade at the Galilee pump station was in 1991. A comprehensive upgrade for this pump station is recommended.
- Point Judith Pump Station – Conduct a pump station upgrade with flood proofing.
- Stanton Pump Station – Conduct a pump station upgrade with larger capacity pumps, a larger wet well, and flood proofing to accommodate future flows from sewer expansion.

7.9.2 Future Sewer Service Areas

7.9.2.1 Wandsworth Street

The Wandsworth Street service area is in the north collection system, located southwest of the Regional WWTF, along Point Judith Road. The proposed Wandsworth Street wastewater collection system includes approximately 268 residential units. The projected average sewer flow is 80,400 gpd, with an associated peak flow of 312,000 gpd. The proposed collection system would include 12,000 linear feet of sewer. A preliminary sewer design study is recommended. The final sewer design could include a combination of low-pressure sewer and 8-inch gravity sewer. A pump station is anticipated at the intersection of Wandsworth Street and Gull Road. Permanent or construction easements may be required. The pump station will discharge to the existing collection system tributary to the Lakewood Pump Station.

7.9.2.2 Bonnet Point

The southern end of Bonnet Point is in the north collection system, tributary to the Wolfe Road Pump Station. The service area includes approximately 205 residential units. The projected average annual sewer flow is 61,500 gpd, with an associated peak flow of 243,000 gpd. The proposed collection system would include approximately 10,000 linear feet of low pressure sewer. A preliminary design study is recommended.

7.9.2.3 Great Island

The Great Island service area is in the south collection system, located adjacent to the port of Galilee on Point Judith Pond. The proposed Great Island wastewater collection system includes approximately 375 residential units. The projected average sewer flow is 112,500 gpd, with an associated peak flow of 426,200 gpd. The proposed collection system would include 24,000 linear feet of sewer. A preliminary sewer design study is recommended. The final sewer design could include a combination of low-pressure sewer and 8-inch gravity sewer. A pump station is anticipated on the north side of the Great Island Road bridge. An easement or land acquisition may be required. The pump station will discharge to the existing collection system tributary to the Galilee Pump Station.

7.9.2.4 Harbor Island

The Harbor Island service area is in the south collection system, located on Upper Point Judith Pond, along Foddering Farm Road. The proposed Harbor Island wastewater collection system includes approximately 359 residential units, and 27 future development parcels. The average sewer flow for the area is 115,800 gpd, with an associated peak flow of 437,700 gpd. The proposed collection system would include 24,500 linear feet of sewer. A preliminary sewer design study is recommended. The final sewer design could include a combination of low-pressure sewer and 8-inch gravity sewer. A new pump station is anticipated near Foddering Farm Road and Brush Hill Road. An easement or land acquisition may be required. The proposed pump station will discharge to the existing collection system tributary to the Briggs Farm Pump Station.

7.9.2.5 Baltimore Avenue

The Baltimore Avenue service area is in the south collection system, located off Ocean Road, north of Clarke Road. The proposed Baltimore Avenue collection system will consist of an 8-inch gravity sewer serving 42 existing residential dwellings, and 55 future development parcels. The average sewer flow for the area is 29,000 gpd, with an associated peak flow of 120,000 gpd. The proposed collection system would include 4,100 linear feet of sewer that will connect to the existing sewer manhole located at the intersection of Ocean Road and Clarke Road, to flow to Burnside Pump Station.

7.9.2.6 Alexander Drive

The Alexander Drive service area is in the south collection system, located adjacent to Point Judith Road, north of Clarke Road. The proposed Alexander Drive collection system will consist of a gravity sewer serving 12 existing residential units and no future development parcels. The average sewer flow for the area is 3,600 gpd, with an associated peak flow of 15,700 gpd. The sewer system will consist of approximately 450 linear feet of sewers and will connect to the interceptor on Clarke Road, to flow to Burnside Pump Station.

7.9.2.7 Sunset Boulevard

The Sunset Boulevard service area is in the south collection system, located along the coast of Point Judith Pond, north of Fishermen's Memorial State Park. The proposed Sunset Boulevard collection system will consist of low-pressure sewers serving 58 existing residential units and six future development parcels. The average sewer flow for the area is 19,200 gpd, with an associated peak flow of 80,000 gpd. The sewer system will consist of approximately 4,900 linear feet of sewers and will connect to the interceptor on Point Judith Road.

7.9.2.8 Calef Avenue

The Calef Avenue area is in the south collection system, on the east side of Point Judith, south of Ocean Road. The proposed Calef Avenue collection system will consist of low-pressure sewers serving 75 existing residential units and 39 future development parcels. The average sewer flow for the area is 34,200 gpd, with an associated peak flow of 139,000 gpd. The sewer system will consist of approximately 6,700 linear feet of sewers and will connect to the Point Judith Pump Station.

7.9.2.9 Sand Hill Cove Road

The Sand Hill Cove Road area is in the south collection system, located between the port of Galilee and Roger Wheeler State Beach. The proposed Sand Hill Cove Road sewer will consist of a low-pressure sewer serving 30 existing residential units and no future development parcels. The average sewer flow for the area is 9,000 gpd, with an associated peak flow of 38,400 gpd. The sewer system will consist of approximately 3,000 linear feet of sewer and will discharge to the collection system for Galilee Pump Station.

7.9.3 Collection System Summary

Collection system improvements are summarized in Table 7-17, Table 7-18, and Table 7-19.

Table 7-17 Collection System Expansion

Service Area	Total Cost	Description
Wandsworth Street	$18.9M	Pump Station, gravity and low pressure sewers, tributary to Lakewood PS
Bonnet Point	$11.3M	Low pressure sewer, tributary to Wolfe PS
Great Island	$27M	Pump Station, gravity and low pressure sewers, tributary to Galilee PS
Harbor Island	$26M	Pump Station, gravity and low pressure sewers, tributary to Briggs Farm PS
Baltimore Avenue	$5.4M	Gravity sewer, tributary to Burnside PS
Alexander Drive	$943,000	Gravity sewer, tributary to Burnside PS
Sunset Boulevard	$4.8M	Low pressure sewer, tributary to SWWTF by Point Judith Road Interceptor
Calef Avenue	$7.2M	Low pressure sewer, tributary to Point Judith PS
Sand Hill Cove Road	$3.2M	Low pressure sewer tributary to Galilee PS

Table 7-18 Summary of Pump Station Recommendations North

Service Area	Total Cost	Description
Baneberry Pump Station	$550,000	Upgrade the electrical system.
Bonnet Shores Pump Station	$50,000	Replace equipment in-kind as needed. Install flood proofing improvements at pump station.
Circuit Pump Station	$1.5M	Comprehensive pump station upgrade due to age and condition of equipment.
Congdon Pump Station	$500,000	Upgrade pumps to meet future peak flows.
Industrial Park Pump Station	$640,000	Comprehensive pump station upgrade due to age and condition of equipment.
Lakewood Pump Station	$600,000	Comprehensive pump station upgrade due to age and condition of equipment.
Mettatuxet Pump Station	$200,000	Perform mechanical, electrical, and flood proofing improvements to the pump station.
Mumford Pump Station	$310,000	Upgrade the building's exterior.

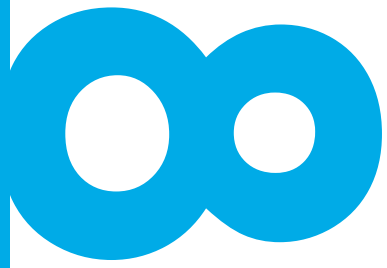
Service Area	Total Cost	Description
Ouida Pump Station	$2.7M	Upgrade equipment in grit room, and replace process, mechanical, and electrical equipment as needed.
Seaport Pump Station	$200,000	Replace equipment in-kind as needed.
Sprague Pump Station	$650,000	Upgrade the electrical system, HVAC/mechanical upgrades, and building improvements.
Wilson Pump Station	$3.0M	Upgrade the pump station building.
Winterberry Pump Station	$3.4M	Upgrade the electrical system, and replace equipment in-kind as needed.
Wolfe Pump Station	$500,000	Comprehensive pump station upgrade due to age and condition of equipment.

Table 7-19 Pump Station Recommendations South

Service Area	Total Cost	Description
Briggs Farm Pump Station	$325,000	Replace equipment in-kind as needed.
Burnside Pump Station	$2.0M	Upgrade pumps to meet peak flows.
Galilee Pump Station	$4.0M	Comprehensive pump station upgrade due to age and condition of structure and equipment.
Point Judith Pump Station	$1.0M	Replace equipment in-kind as needed.
Stanton Pump Station	$2.0M	Upgrade pumps to meet future peak flows, perform equipment upgrades and flood proofing improvements.

Table 7-20 Collection System Recommendations

Service Area	Total Cost
North Pump Stations	$14.8M
South Pump Stations	$9.3M
Collection System	$104.6M
Total	$130M



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Section 8 Plan Selection

8.1 Scarborough WWTF

This report considered improvements to the SWWTF secondary treatment systems and solids handling systems to meet the wastewater needs of the Town for the 20-year planning period. The report also identified minimum baseline improvements required to maintain reliable operation during the planning period. The baseline improvements are system repairs and replacements required due to aging equipment and facilities.

Three loading conditions were considered when reviewing SWWTF improvements.

- Existing Flow/Loading. Includes the current influent flows and loads at the SWWTFF.
- Existing and Future Residential Build-Out Flow/Loading. Includes current flows and loads at the SWWTF, projected flows and loads from future development, and future flows and loads from sewer expansion (OWTS to sewer conversions).
- Existing, Future Residential Buildout, and Fish Processing Flow/Loading. Includes current flows and loads, future residential flows and loads, and projected flow and loading from development of fish-processing industry in the Port of Galilee.

8.1.1 Baseline Improvements

Baseline improvements to the SWWTF are required to maintain reliable treatment and operations. Baseline improvements will address the needs of all major unit processes and building systems, but will not expand SWWTF plant capacity. The opinion of probable project cost of baseline improvements is $37.0 million.

8.1.2 Secondary Treatment System

Three secondary treatment system alternatives were considered. Each option meets a different flow/loading condition. Alternatives 1 and 2 re-used the existing oxidation ditch. Alternative 3 replaced the oxidation ditch with a new activated sludge process.

- Alternative 1: Optimize the existing oxidation ditch treatment process. The opinion of probable project cost is $5.2 million. This alternative will provide enough treatment capacity to process Existing and Future Residential Build-Out Flow/Loading.
- Alternative 2: Optimize the existing oxidation ditch treatment process and install a primary treatment system. The opinion of probable project cost is $15.7 million. This alternative will provide enough treatment capacity to process Existing and Future Residential Build-Out Flow/Loading.
- Alternative 3: Provide a new activated sludge secondary treatment system. The opinion of probable project cost for this Alternative is $33.2 million. Alternative 3 will provide treatment capacity to process Existing, Future Residential Build-Out, and Fish Processing Flow/Loading.

Based on the Town's goals of expanding the collection system tributary to the SWWTF and expanding the economic opportunities in the fishing port, installing a new activated sludge secondary treatment system (Alternative 3) is the recommended alternative. Optimization of the oxidation ditch (Alternative 1) will provide enough capacity for

current wastewater needs and some sewer expansion but will not allow economic development of the port. The addition of primary clarifiers (Alternative 2) would allow for more sewer expansion but would not meet the needs of the fishing industry. The addition of primary clarifiers would also add complexity to the solids handling process, as primary sludge would need to be disposed of.

8.1.3 Solids Handling System

Two solids handling system alternatives were considered.

- Alternative 4: Solids thickening system. The solids thickening system would produce thickened liquid sludge for disposal. The opinion of probable project cost of Alternative 4 is $3.8 million.

- Alternative 5: Solids Dewatering System. The solids dewatering system would produce dry sludge cake for disposal. The opinion of probable project cost of Alternative 5 is $6.1 million.

Alternative 5, Solids Dewatering System, is the recommended alternative for the following reasons.

- Most Rhode Island wastewater facilities dispose of liquid sludge by incineration at the merchant sludge facilities in Cranston, RI (operated by Veolia Water) or Woonsocket, RI (operated by Synagro). Narragansett currently disposes of liquid sludge at the Woonsocket facility. The Woonsocket facility notified customers that liquid sludge will not be accepted in the near future (1-2 years). Dewatered sludge cake will be accepted. If Woonsocket moves ahead with this change, local liquid sludge disposal options will be limited.

- The proposed sewer expansion, residential buildout, and fish industry expansion in this facilities plan will increase BOD load to the plant, thereby increasing waste sludge production. With higher sludge volumes, more capital investment is required for sludge storage. Construction of an additional 30,000 gallon thickened sludge storage tank would be required. Dewatered sludge cake would be processed and stored directly in trailers for hauling.

- Sludge dewatering will decrease the cost of transporting waste sludge for disposal. With residential buildout and fishing industry expansion, thickened liquid sludge hauling will require about 14 trucks per week. Hauling dewatered sludge cake will reduce this to about 5 trucks per week.

8.1.4 Disinfection Recommendation

Two disinfection system recommendations were considered.

- Alternative 6: Maintaining chlorine disinfection system. The existing chlorine contact tanks and sodium hypochlorite system will be maintained. Chlorine contact tank will be expanded to meet the TR-16 guideline of 30 minute contact time. The opinion of probable project cost of Alternative 5 is $0.9 million.

- Alternative 7: UV System. The UV disinfection system would be retrofitted to the existing chlorine contact tank. The opinion of probable project cost of Alternative 5 is $1.3 million.

It is recommended that the SWWTF maintain the chlorine disinfection system at this time. The town has had success in utilizing this disinfection method. While the current system does not meet the TR-16 recommendation

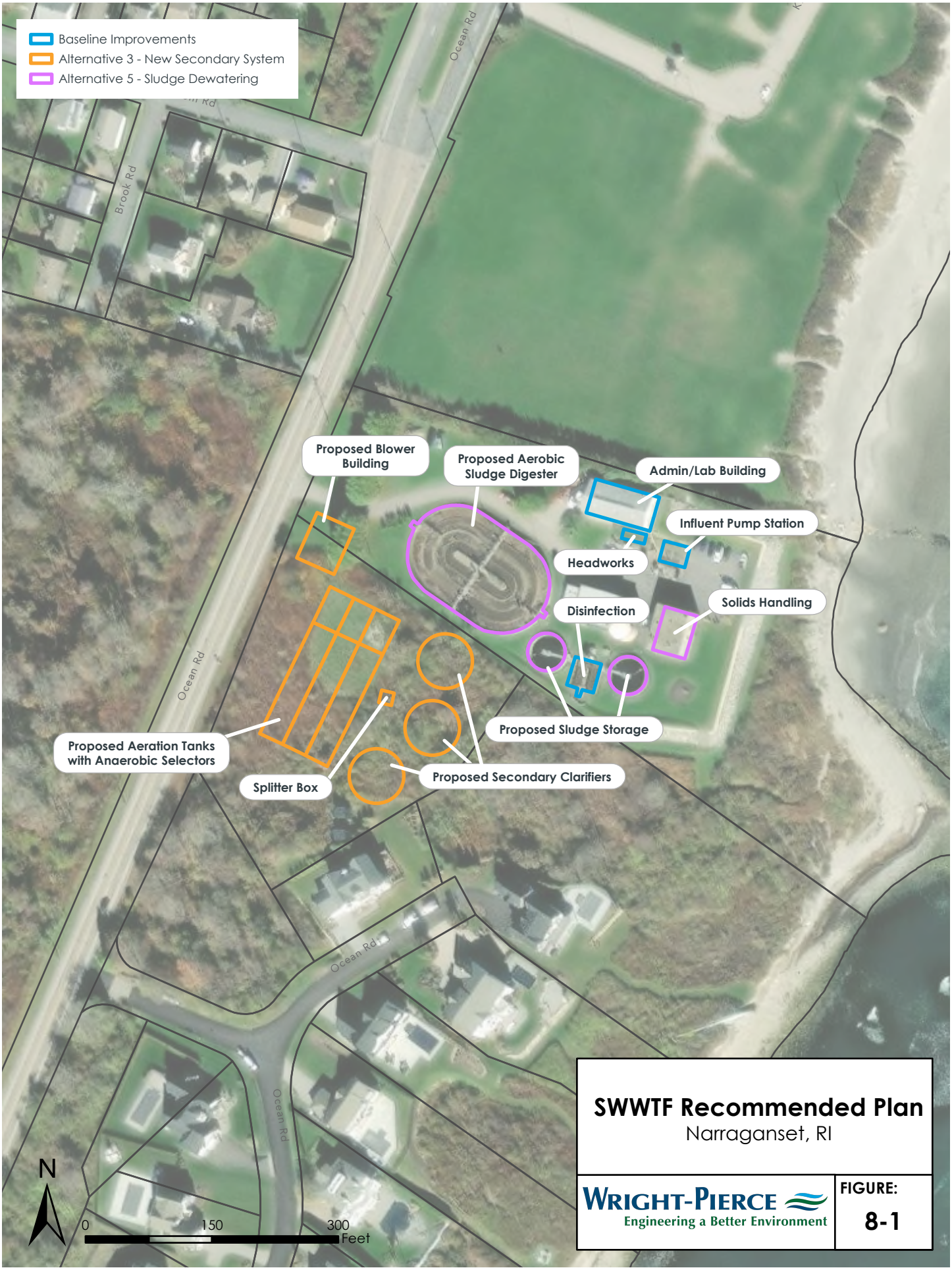
for 30 minutes of contact time at peak hourly flows, the 15 minutes of contact time under current peak hourly flows has historically met regulatory requirements for disinfection.

8.1.5 SWWTF Recommendation Summary

To meet existing, residential buildout/sewer expansion, and fishing industry flows and loads, a new secondary treatment and solids handling facility will be required. The recommended plan is to perform the baseline plant improvements, construct a new secondary treatment system to replace the oxidation ditch, and replace the solids handling process with a new solids dewatering system. Maintaining the existing disinfection system (no expansion) is recommended at this time. The Recommended Plan is shown in Figure 8-1.

Table 8-1 SWWTF Recommendation Opinion of Probably Project Cost Summary

Alternative	Description	Cost Estimate
B	Baseline Improvements	$37.0M
3	Secondary Treatment System	$33.2M
5	Solids Dewatering System	$6.1M
Total		$76.3M



SWWTF Recommended Plan

Narraganset, RI

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FIGURE:
8-1

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- The recommended plan is based on the goals of the Town. To provide treatment for expanded sewer system and the expanded fishing industry, a new secondary treatment system is required. If the Town wishes to reduce sewer expansion goals and funding for economic development of the fish industry is not available, the Town could consider optimization of the oxidation ditch (Alternative 1) as a lower cost alternative.

- The SWWTF RIPDES permit extended the monitoring requirement for total nitrogen (TN). Monitoring requirements have potential to become future limits. A new secondary treatment system would better position the Town to meet potential nutrient limits in the future.

- Construction of a new secondary treatment system will simplify sequencing of construction. The existing oxidation ditch can remain online while the new secondary treatment system is built. The new secondary system can be constructed in phases by increasing the number of treatment tanks as flow to the pant increases over the planning period.

- When taken offline as secondary treatment, the oxidation ditch could be used as additional sludge storage/aerobic digester. This would provide the treatment plant operations with sludge storage, which would allow some flexibility in solids processing operations.

- Sludge dewatering is recommended, especially if the Town is not able to secure a liquid sludge disposal outlet when Synagro stops accepting liquid sludge.

8.2 Collection System Recommendation

The recommended plan for the collection system includes sewer expansion projects and pump station upgrades. The recommended plan for the collection system expansion is summarized in Table 8-2. The recommended plan for pump station improvements are summarized in Table 8-3, and Table 8-4.

Table 8-2 Summary of Collection System Expansion

Service Area	Total Cost	Description
Wandsworth Street	$18.9M	Pump Station, gravity and low pressure sewers, tributary to Lakewood PS
Bonnet Point	$11.3M	Low pressure sewer, tributary to Wolfe PS
Great Island	$27M	Pump Station, gravity and low pressure sewers, tributary to Galilee PS
Harbor Island	$26M	Pump Station, gravity and low pressure sewers, tributary to Briggs Farm PS
Baltimore Avenue	$5.4M	Gravity sewer, tributary to Burnside PS
Alexander Drive	$943,000	Gravity sewer, tributary to Burnside PS
Sunset Boulevard	$4.8M	Low pressure sewer, tributary to SWWTF by Point Judith Road Interceptor
Calef Avenue	$7.2M	Low pressure sewer, tributary to Point Judith PS
Sand Hill Cove Road	$3.1M	Low pressure sewer, tributary to Galilee PS
Total	$104.6M	

Table 8-3 Summary of Pump Station Recommendations North

Service Area	Total Cost	Description
Baneberry Pump Station	$550,000	Upgrade the electrical system.
Bonnet Shores Pump Station	$50,000	Replace equipment in-kind as needed. Install flood proofing improvements at pump station.
Circuit Pump Station	$1.5M	Comprehensive pump station upgrade due to age and condition of equipment.
Congdon Pump Station	$500,000	Upgrade pumps to meet future peak flows.
Industrial Park Pump Station	$640,000	Comprehensive pump station upgrade due to age and condition of equipment.
Lakewood Pump Station	$600,000	Comprehensive pump station upgrade due to age and condition of equipment.
Mettatuxet Pump Station	$200,000	Perform mechanical, electrical, and flood proofing improvements to the pump station.
Mumford Pump Station	$310,000	Upgrade the building's exterior.
Ouida Pump Station	$2.7M	Upgrade equipment in grit room, and replace process, mechanical, and electrical equipment as needed.
Seaport Pump Station	$200,000	Replace equipment in-kind as needed.
Sprague Pump Station	$650,000	Upgrade the electrical system, HVAC/mechanical upgrades, and building improvements.
Wilson Pump Station	$3.0M	Upgrade the pump station building.
Winterberry Pump Station	$3.4M	Upgrade the electrical system, and replace equipment in-kind as needed.
Wolfe Pump Station	$500,000	Comprehensive pump station upgrade due to age and condition of equipment.
Total	$14.8M	

Table 8-4 Pump Station Recommendations South

Service Area	Total Cost	Description
Briggs Farm Pump Station	$325,000	Replace equipment in-kind as needed.
Burnside Pump Station	$2.0M	Upgrade pumps to meet peak flows.
Galilee Pump Station	$4.0M	Comprehensive pump station upgrade due to age and condition of structure and equipment.
Point Judith Pump Station	$1.0M	Perform flood proofing improvements. Replace equipment in-kind as needed.
Stanton Pump Station	$2.0M	Upgrade pumps to meet future peak flows, perform equipment upgrades and flood proofing improvements.
Total	$9.3M	

8.3 Environmental Impacts

Seventy-three percent of the soil in the Town of Narragansett present severe constraints for the efficient operation of septic systems (CCP, page 110). The Rhode Island Soil Survey provides comprehensive mapping and classification. The glacial till soils found in Narragansett are highly compacted, contain impermeable layers, are characterized by slow permeability, and seasonally high water-tables. The use of these soils is regulated by Narragansett's High Water Table District Zoning Ordinance (Refer to Appendix A, Map 13).

- High Water Table Limitations Overlay "A" district includes areas where the water table is zero to 18 inches from the surface. This district is typically wetlands.

- High Water Table Limitations Overlay "B" district includes areas where the water table is 18 to 36 inches from the surface. High water-table and low soil permeability can impair onsite wastewater treatment system functioning. Development in this area typically requires sewer or extensive drainage improvements.

The remainder of Narragansett's soils are a well sorted mixture of sand and gravel deposited by retreating glaciers (outwash), with high permeability rates. Outwash soils with high percolation rates may not treat septic system effluent adequately. Untreated nitrates in these soils can lead to eutrophication of estuarine waters and pathogenic bacteria and viruses that may impact human health. High permeable soils are not currently regulated by zoning ordinance. Narragansett's outwash soils are mainly located along the shores of Point Judith Pond and the Narrow River, in the CRMC Special Management Areas for Salt Pond and Narrow River. New or repaired septic systems are required by CRMC to be denitrifying systems. However, this requirement does not capture existing failing systems.

8.3.1 Soils

Due to the soil conditions in the proposed collection system service areas, sewer extensions will prevent poorly functioning septic systems from deteriorating the water quality of adjoining wetland and water bodies.

- Great Island Wastewater Collection System is located in Point Judith Pond. Soils are well drained. They include Canton Urban Complex (primary soil type), Canton-Charlton Fine Sandy Loam with 3 to 15 percent slopes and Sudbury Sandy Loam. OWTS in well drained soils, particularly with steep slopes have the potential to impact Point Judith Pond with nutrient loading.

- Harbor Island is located in Point Judith Pond. Soils are well drained. Soil types include Merrimac Urban Land Complex, Agawam Fine Sandy Loam and Sudbury Sandy Loam. The high permeability of these soils have potential to impact Point Judith Pond with nutrient loadings.

- Baltimore Avenue service area includes moderately well drained soils (Rainbow Silt Loam) and poorly drained soils (Stissing Silt Loam). The service area is located in the High Water Table District Overlay. Function of septic systems in this area are limited by the poor soils and high water table.

- Sunset Boulevard service area includes well drained soils (Rainbow silt loam) and poorly drained soils (Stissing Silt Loam, Swansea Muck). The service area is located in the High Water Table District Overlay. Function of septic systems in this area may be limited by the poorly drained soils and high water table.

- Calef Avenue service area includes well drained soils (Paxton-Urban land complex), poorly drained soils (Stissing silt loam), and very poorly drained soils (Matunick muck peat). The service area includes area in the High Water Table District "B" Overlay. Function of septic systems in this area may be limited by the poorly drained soils and high water table.

- Sand Hill Cove Road service area is adjacent to Wheeler State Beach, and includes excessively drained soils (Hooksan-Urban land complex) and moderately well drained soils (Fortress sand, Succotash sand, 0 to 3 percent slopes). The service area development is restricted by beach/dune areas, and is adjacent to wetlands in the High Water Table District "A". Excessively drained soils have the potential to impact the neighboring wetlands with nutrient loading.

Addition of sewer collection systems in the Point Judith Pond/Narrow river watershed will protect neighboring wetlands, including the CRMC Special Management Areas (Point Judith Pond, Narrow River) from nutrient loading from poorly functioning OWTS. The potential impact on human health from pathogenic bacteria and viruses will also be limited.

8.3.2 Direct Impacts

- Traffic & Daily Activities. Local disruption of traffic, business, and other daily activities can be expected during construction of sewer extensions. Sewer construction will largely be limited to the traveled right of way. Police details, detours, and industry standard traffic control equipment/barricades will be required throughout construction. Narrow roads in the Great Island and Harbor Island areas will not allow traffic during construction, detours will be required. In areas with a large number of seasonal homes, winter construction may be recommended. Permanent or temporary displacement of local business and residents is not expected.

- Historic, Archaeological, Cultural, Farmland, Recreational Resources. Historic/archeological could potentially interfere with sewer installation. A archeological survey prior to design/construction to determine the potential for archeological artifacts may be considered. Designated open space and recreational resources are shown on Maps 18, 19, and 20 in Appendix A. Sewer expansion will occur adjacent to these areas. Minimal

environmental impacts are expected, as construction will occur in already developed areas. Improvements to water quality will enhance the recreational resources for the Town's tourism industry and residents.

- Flood plains. Projects for Great Island, Harbor Island, Sand Hill Cove Road, and Calef Avenue are located in or adjacent to the FEMA Flood Plain. Infrastructure construction in these areas will require adherence to all federal, state, and town standards for building in the flood zone. Current standards of practice include protecting infrastructure to three feet above the FEMA flood elevation. The sewer extensions are adjacent to many wetland areas.

- Sensitive Ecosystems. Wetlands are located throughout the proposed sewer expansion areas. All construction, design, and permitting of these projects will need to follow RIDEM regulations that protect wetlands. The Narrow River/Salt Pond estuary is home to endangered species. Construction adjacent to these areas may require coordination with the Coastal Resource Management Council (CRMC).

- Erosion Control. Standard erosion control construction practices will be implemented. These include straw wattle, silt fence, mulch socks, and silt sacks. Mulch hay bales are not recommended due to the possibility of invasive species/seed transfer.

- WWTF Effluent Discharge Quality. Construction of improvements to the SWWTF will require planning/staging such that treatment is maintained throughout project.

- Land Use. No change to population or land use is anticipated.

- Coastal Zone Features. Construction in coastal areas will be designed to minimize impact. Construction and design will be coordinated with CRMC.

8.3.3 Indirect Impacts

- Urbanization/Sprawl. The proposed sewer service extensions are in already developed areas. Development of additional vacant or underutilized lots is anticipated. However, extensive suburban sprawl is not anticipated, as the areas are already developed. The Sunset Boulevard area is surrounded by protected open space. Residential expansion in this area will be limited.

- Federal, State, Local Laws. The recommended facilities plan will be implemented in accordance with federal, state, and local laws. Permitting and coordination throughout construction and design with appropriate state agencies will be completed.

8.4 Plan Implementation

- The projects identified in this wastewater facilities plan should be placed in a long-term capital improvement plan and move through planning, design, and construction as funding becomes available. There are no outside regulatory drivers setting an implementation schedule.

- Equipment replacement and upgrades (Baseline Improvements) throughout the plant should be a priority. Implementation of a long-term capital improvements plan will be critical for the reliability of the plant.

- The proposed secondary treatment facility (Alternative 3) is required for developing and expanding the fishing industry in the port of Galilee. These improvements should be implemented when funding becomes available. Economic development grants will be pursued by the Town.

- Pump Station recommendations are based on the adequacy of each pump station to meet the projected future flows in the expanding collection system. The rate of sewer expansion will determine when capacity upgrades are needed.

- Equipment replacement and upgrades at all pump stations should be a priority in the long-term capital plan for reliable conveyance back to the treatment plant.

- Several sewer expansion projects have been identified. Given the difficult soil conditions for construction and maintenance of OWTS in Narragansett, sewer expansion should be part of the long-term capital plan as funding becomes available. Areas with high failure rates of OWTS should be given priority. Sewer expansion is funded through assessments of residences that directly benefit from the expansion.

8.5 Financial Impacts

8.5.1 Operation and Maintenance Improvements

Small scale operational and maintenance improvement projects are funded through yearly sewer user fees. Portions of the Scarborough Baseline Improvements and Pump Station Improvements can be funded through the Sewer Division's operational budget. Projects are funded each fiscal year through the Town budget preparation process. These projects do not require municipal bonding. The user charge system is structured so that revenue is equal to expenses.

8.5.2 Collection System Improvements

The following policies are used when an existing developed neighborhood is being considered for sanitary sewers.

- The area in question must be recognized by the Town of Narragansett (Town Council) via the current Sewer Policy as being prioritized for future sewer availability, and sufficient capacity must exist in the conveyance and treatment systems for the proposed additional flow, and a petition (of at least the simple majority of the property owners) must be presented for to the Town Council for consideration, then

- The Town Council would authorize the Engineering Department to develop a preliminary plan and construction cost estimate for the neighborhood in question, then the Town would convey this information to the petitioners; if the petitioners are still in agreement with the project, the Town would include same in the annual Capital Improvement Plan budget request for the next fiscal year. If the project exceeds a certain value (based on Town's debt issuance limit each year) it would be submitted to General Assembly for approval of a voter referendum.

- The Engineering Department would present a repayment, or assessment plan to the Town Council for adoption. Historically, Narragansett has established assessment programs for sanitary sewer projects wherein the abutting property owners are responsible for the project costs. The costs are amortized over twenty years, with the interest rate directly tied to the rate that the Town borrows money at.

- A Town-wide voter referendum would be held for the necessary borrowing for the project. Although the repayment mechanism is a benefitting property owner assessment plan, the Town will pledge its credit to the borrowing. If the referendum passes, the Town will begin the process for the design and construction of the sewers in question. The Town's bond rating is Standard & Poor's AA+.

- When all project costs are tabulated, the assessment program amounts would be recalculated. Property owners are given the choice to pay the assessment in a lump sum or over twenty years with interest. The assessment runs with the land, when property is transferred, the assessment balance transfers with the property.

- Assessment programs have historically included a fixed time for connection, where every developed property has to connect to the new sewers within one year.

- Table 8-5 shows the total and annual cost for sewer expansion projects, assuming 20-year bonding at 3 percent interest. The total cost is divided among the number of households directly benefiting from the improvements.

Table 8-5 Collection System Expansion Cost per Dwelling

Project	Dwellings	Capital Cost	Total Financed Cost	Annual Cost per Dwelling
Wandsworth Street	268	$18,900,000	$25,407,537	$4,740
Bonnet Point	205	$11,300,000	$15,190,750	$3,705
Great Island	375	$27,000,000	$36,296,482	$4,840
Harbor Island	386	$26,000,000	$34,952,168	$4,527
Baltimore Avenue	97	$5,400,000	$7,259,296	$3,742
Alexander Drive	12	$950,000	$1,277,098	$5,321
Sunset Boulevard	64	$4,800,000	$6,452,708	$5,041
Calef Avenue	114	$7,200,000	$9,679,062	$4,245
Sand Hill Cove Road	30	$3,100,000	$4,167,374	$6,946

8.5.3 Capital Improvements

For projects that benefit the system as a whole, the cost is shared among all users. Regional WWTF expansion, Scarborough WWTF expansion, and pump station improvements are paid through sewer bonds. Yearly debt service for the infrastructure will be paid via the user charge system. Table 8-6 shows the system-wide capital improvement costs assuming 20-year bonding at 3 percent interest.

- Recommended pump station improvements greater than or equal to $500,000 have been included in the capital improvements plan. Pump station improvements worth less than $500,000 will be paid for through the annual operation and maintenance budget.

- Narragansett currently has 8,275 sewer accounts. With development and sewer expansion an additional 3,208 accounts are anticipated. The annual cost per dwelling is based on approximately 11,480 projected sewer user accounts.

- The upgrades will be built over the course of the 20-year planning period. The financial impacts to the users will also be phased in over the same period.

- The cost of the RWWTF expansion and capitalized improvements will be determined through the RWWTF Facilities Planning efforts that are currently ongoing. The scope of plant expansion will be based on the needs of the three regional partners.

Table 8-6 Capital Improvement Costs per Dwelling

Project	Capital Cost	Total Financed Cost	Annual Cost per Dwelling
Pump Station Improvements Subtotal	$22,040,000	$30,972,998	$135
Scarborough WWTF Improvements	$76,300,000	$102,571,170	$447
Regional WWTF Expansion (1 mgd)	TBD	TBD	TBD
Total	$98,790,000	$132,804,795	$582

8.5.4 Fiscal Sustainability Plan

The recipient of a loan for a project that involves the repair, replacement, or expansion of a publicly-owned treatment works must develop and implement a Fiscal Sustainability Plan that includes the following:

- Inventory of critical assets that are part of the treatment works.
- Evaluation of the condition and performance of inventoried assets.
- Certification that water and energy conservation efforts are part of the recommended plan
- A plan for maintaining, repairing, and replacing treatment works, with funding mechanism in place.
- The Fiscal Sustainability Plan is regularly updated as part of the operation/maintenance plan of the system.

An inventory and evaluation of critical assets are included in Appendix J of this report. Water and energy conservation efforts will be included in the design of improvements. Conservation efforts will include premium efficiency motors, VFDs, LED lighting, and energy/water efficient Standard Operating Procedures. The Towns sewer enterprise fund provides a dedicated revenue stream for the maintenance and operation of the system. The fiscal sustainability plan will be updated as required through the Town's standard budgeting process.

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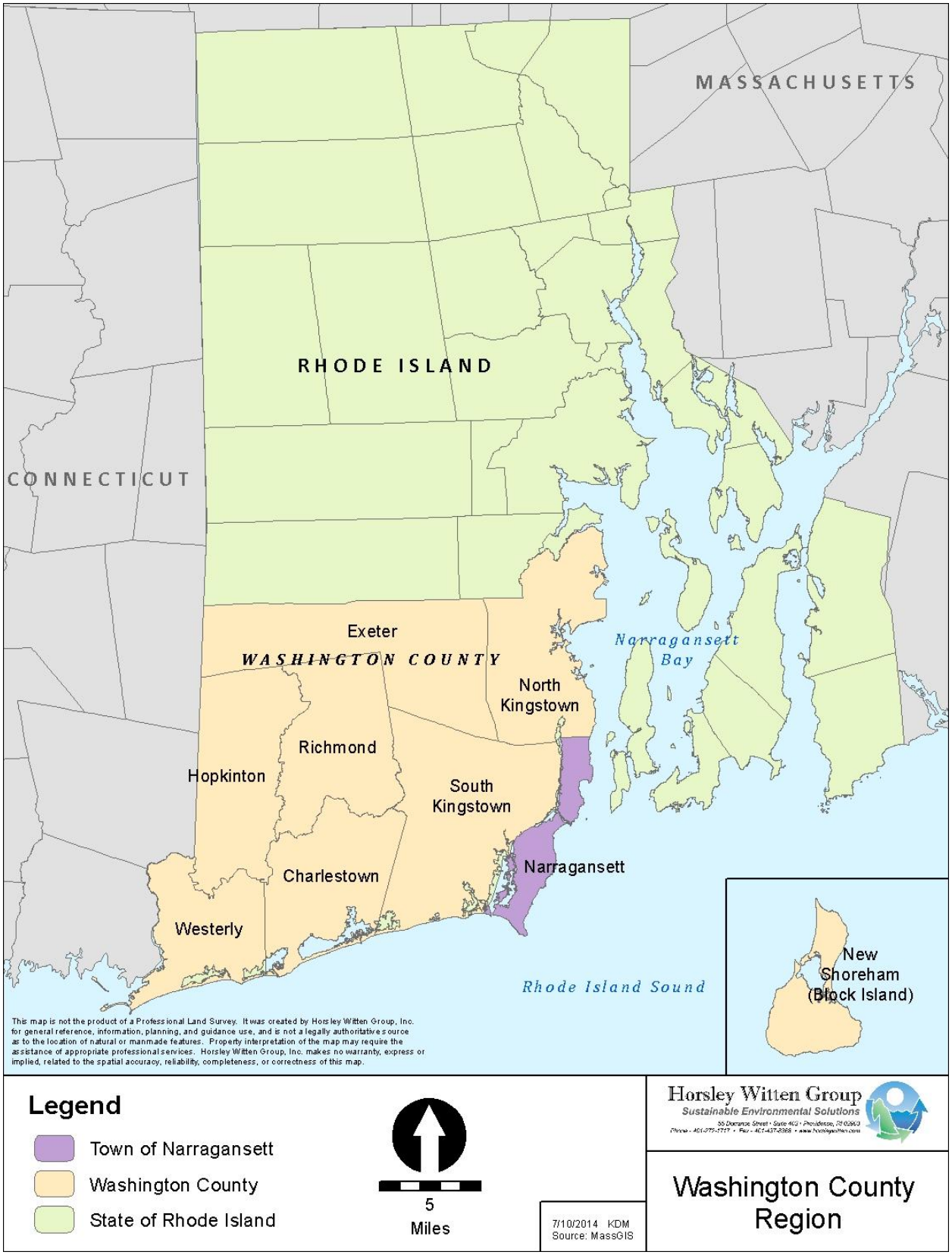
APPENDIX

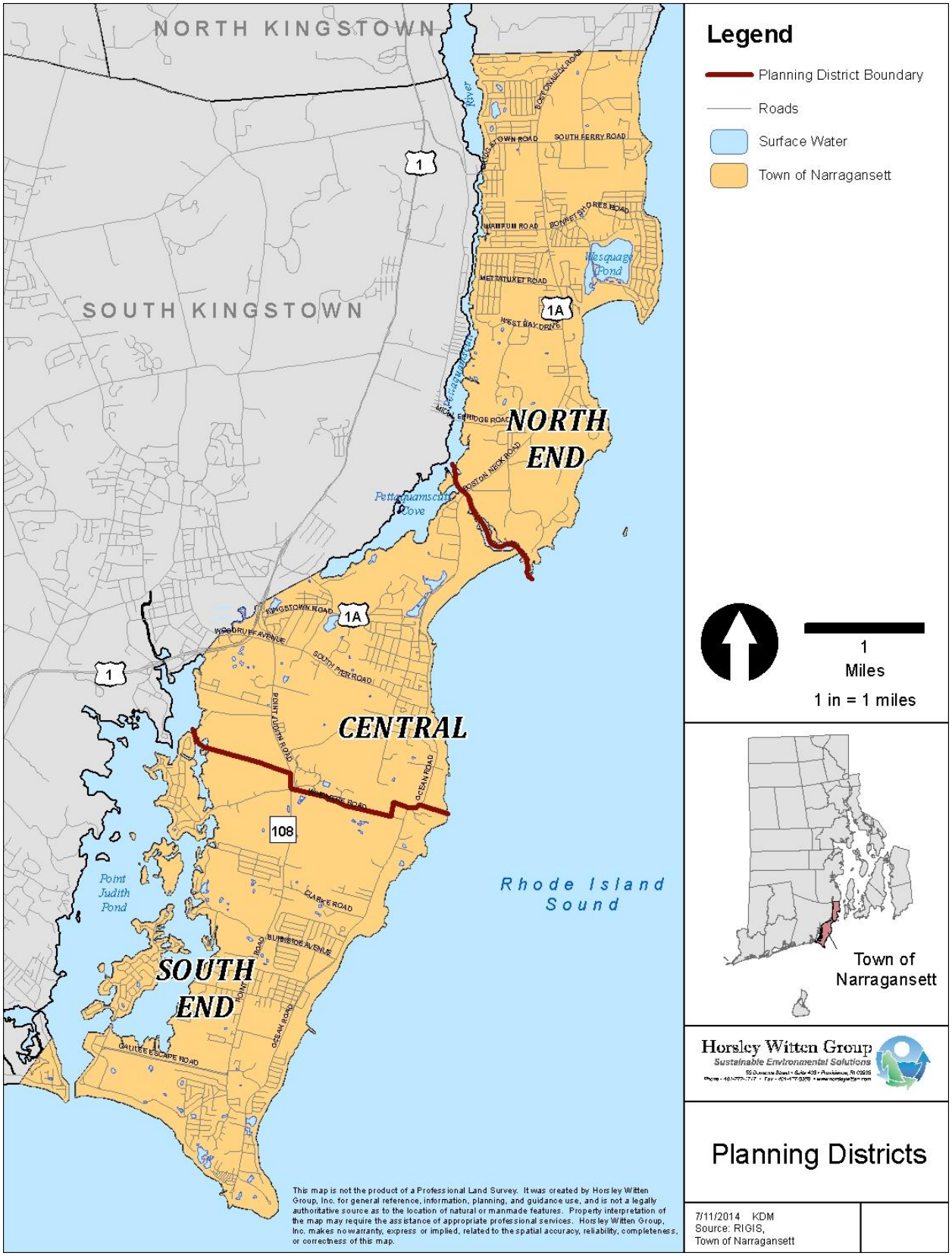
WRIGHT-PIERCE
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A

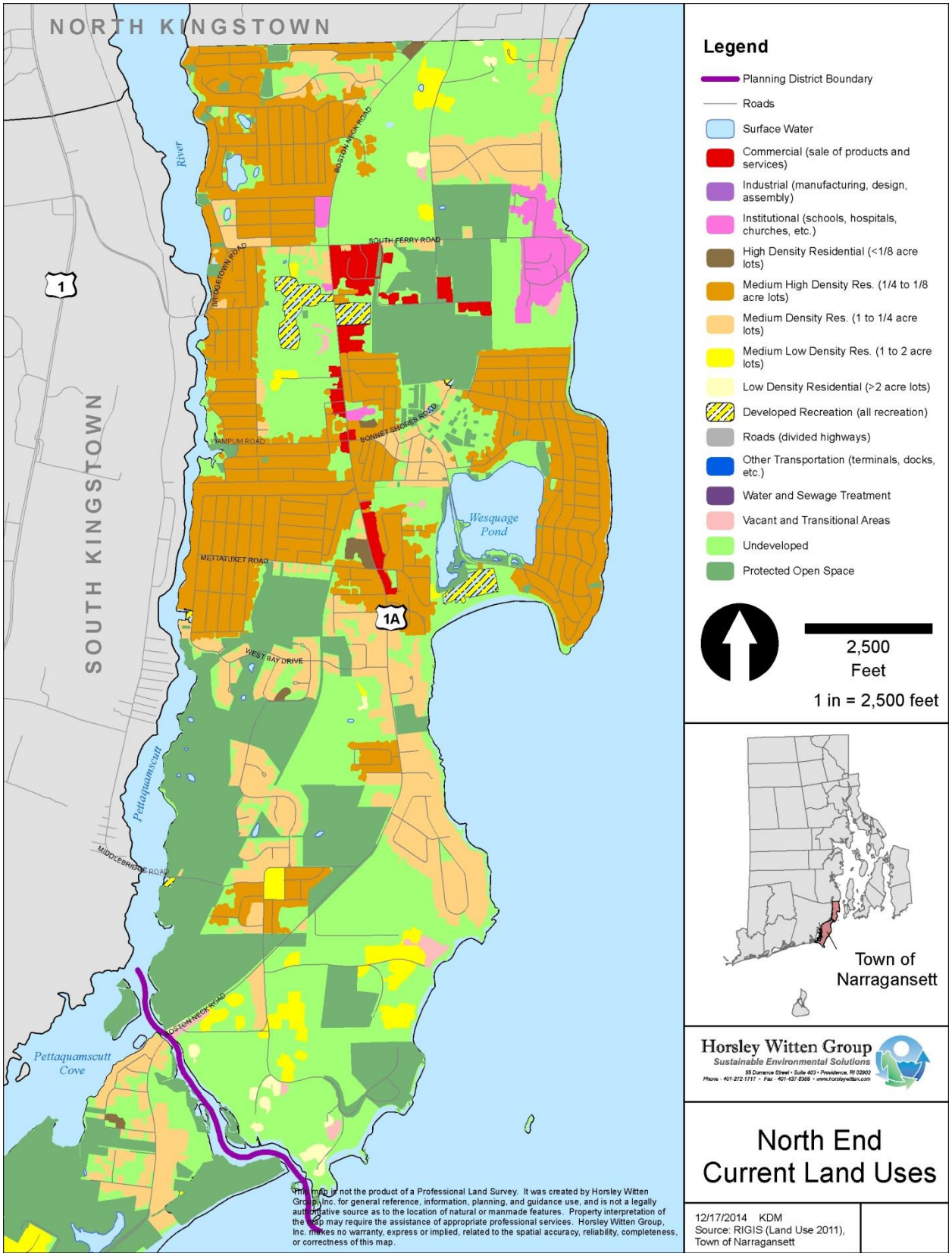
Appendix A
Narragansett CCP Planning Area Maps

Map	Title
Map 1	Washington County Region
Map 2	Planning Districts
Map 3	North End Current Land Uses
Map 4	Central Area Current Land Uses
Map 5	South End Current Land Uses
Map 6	Zoning Districts
Map 7	Community Facilities
Map 8	Areas of High Density Residential and Commercial/Industrial Areas
Map 9	Areas Vulnerable to Sea Level Rise
Map 11	Historic, Cultural and Scenic Resources
Map 12	Bedrock and Surficial Geology
Map 13	Soil Constraints to Development
Map 14	Hydrology
Map 15	Areas Prone to Flooding
Map16	CRMC Water Use Categories
Map 17	Inland Natural Resources
Map 18	North End Protected Open Space, Outdoor Recreation and Farm, Forest & Open Space Program
Map 19	Central Area Protected Open Space, Outdoor Recreation and Farm, Forest & Open Space Program
Map 20	South End Protected Open Space, Outdoor Recreation and Farm, Forest & Open Space Program

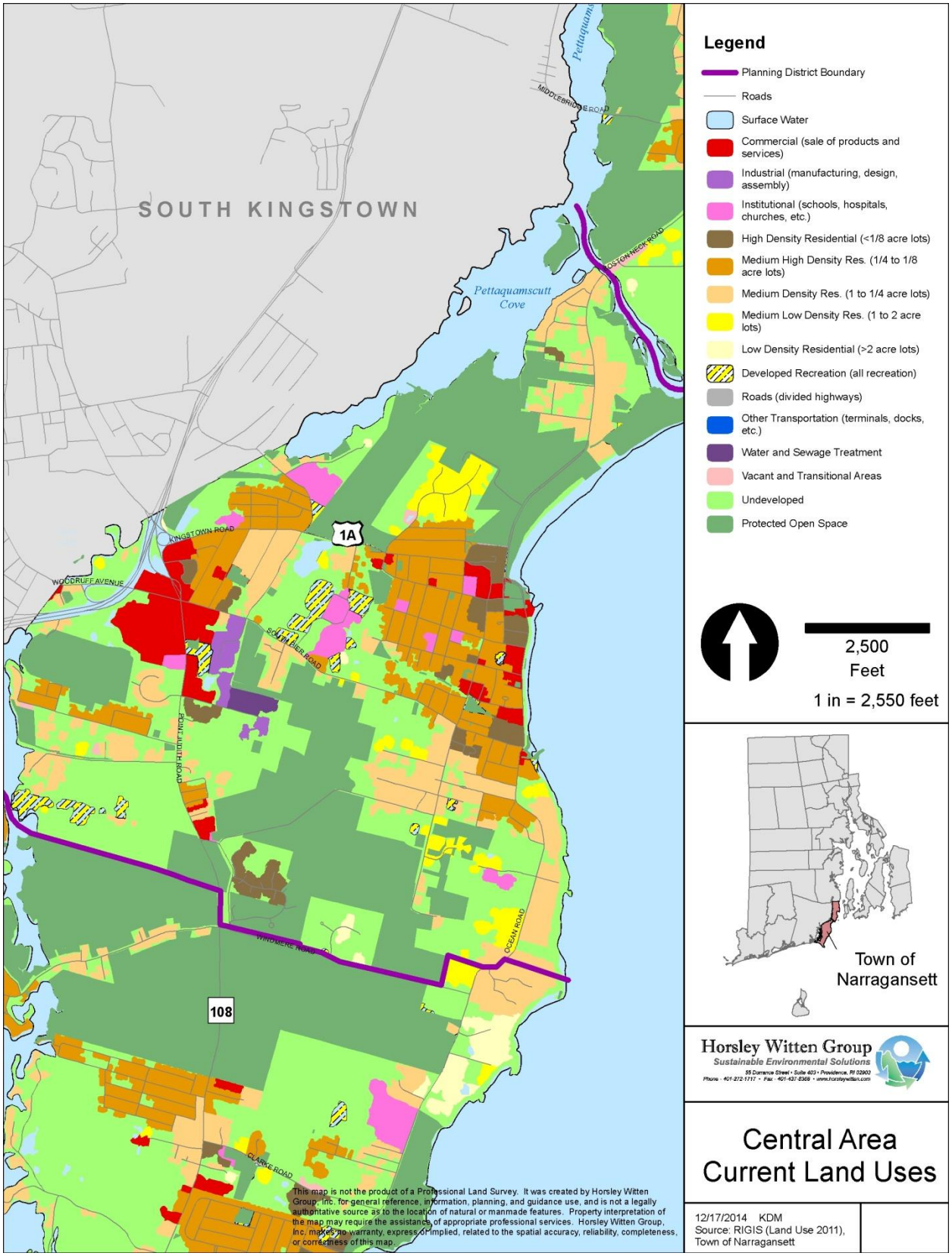

MASSACHUSETTS
RHODE ISLAND
CONNECTICUT
Exeter
WASHINGTON COUNTY
North Kingstown
Narragansett Bay
Richmond
Hopkinton
South Kingstown
Charlestown
Narragansett
Westerly
Rhode Island Sound
New Shoreham (Block Island)
This map is not the product of a Professional Land Survey. It was created by Horsley Witten Group, Inc. for general reference, information, planning, and guidance use, and is not a legally authoritative source as to the location of natural or manmade features. Property interpretation of the map may require the assistance of appropriate professional services. Horsley Witten Group, Inc. makes no warranty, express or implied, related to the spatial accuracy, reliability, completeness, or correctness of this map.
Legend
Town of Narragansett
Washington County
State of Rhode Island
5
Miles
7/10/2014 KDM
Source: MassGIS
Horsley Witten Group
Sustainable Environmental Solutions
Washington County Region



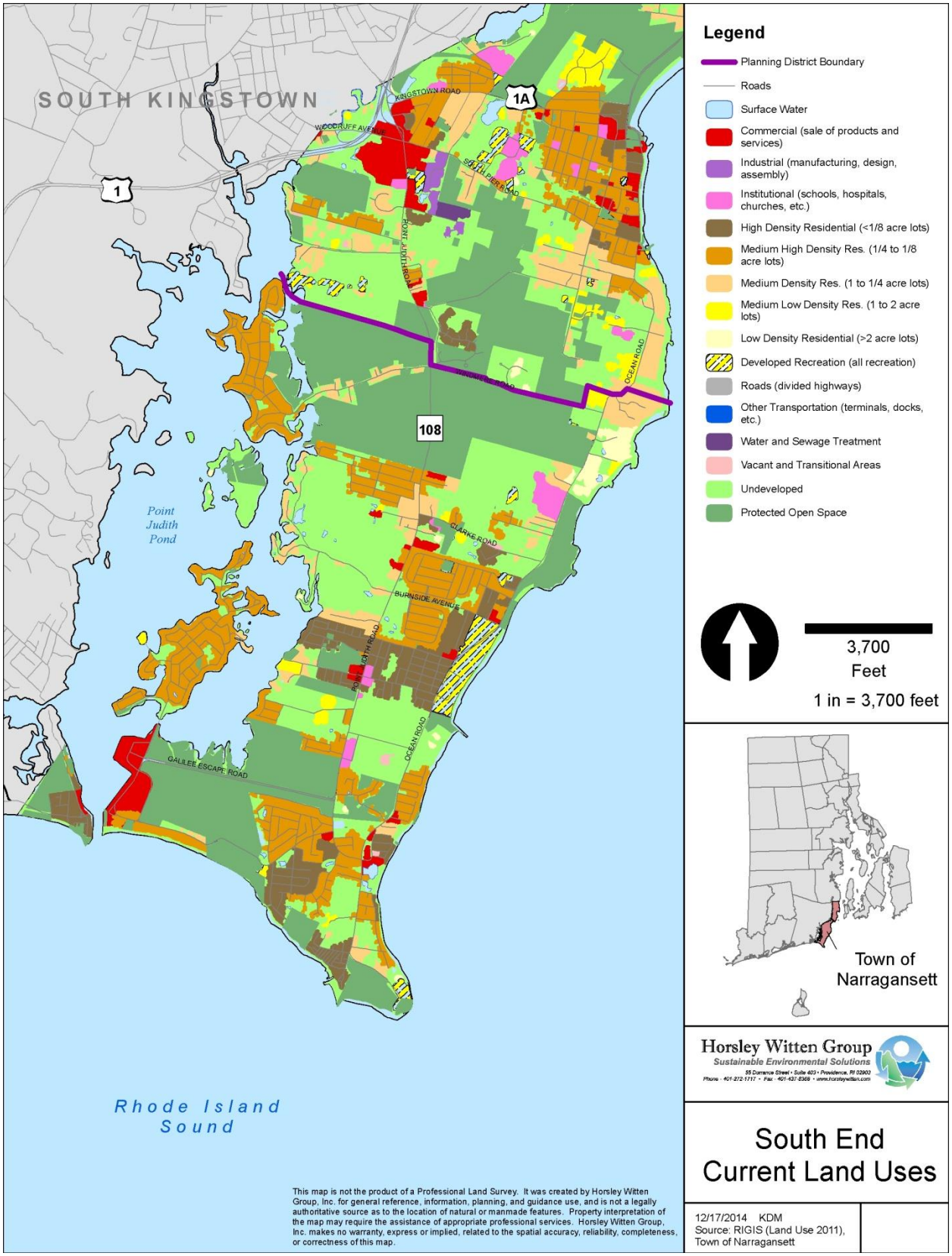
Map 2. Planning Districts



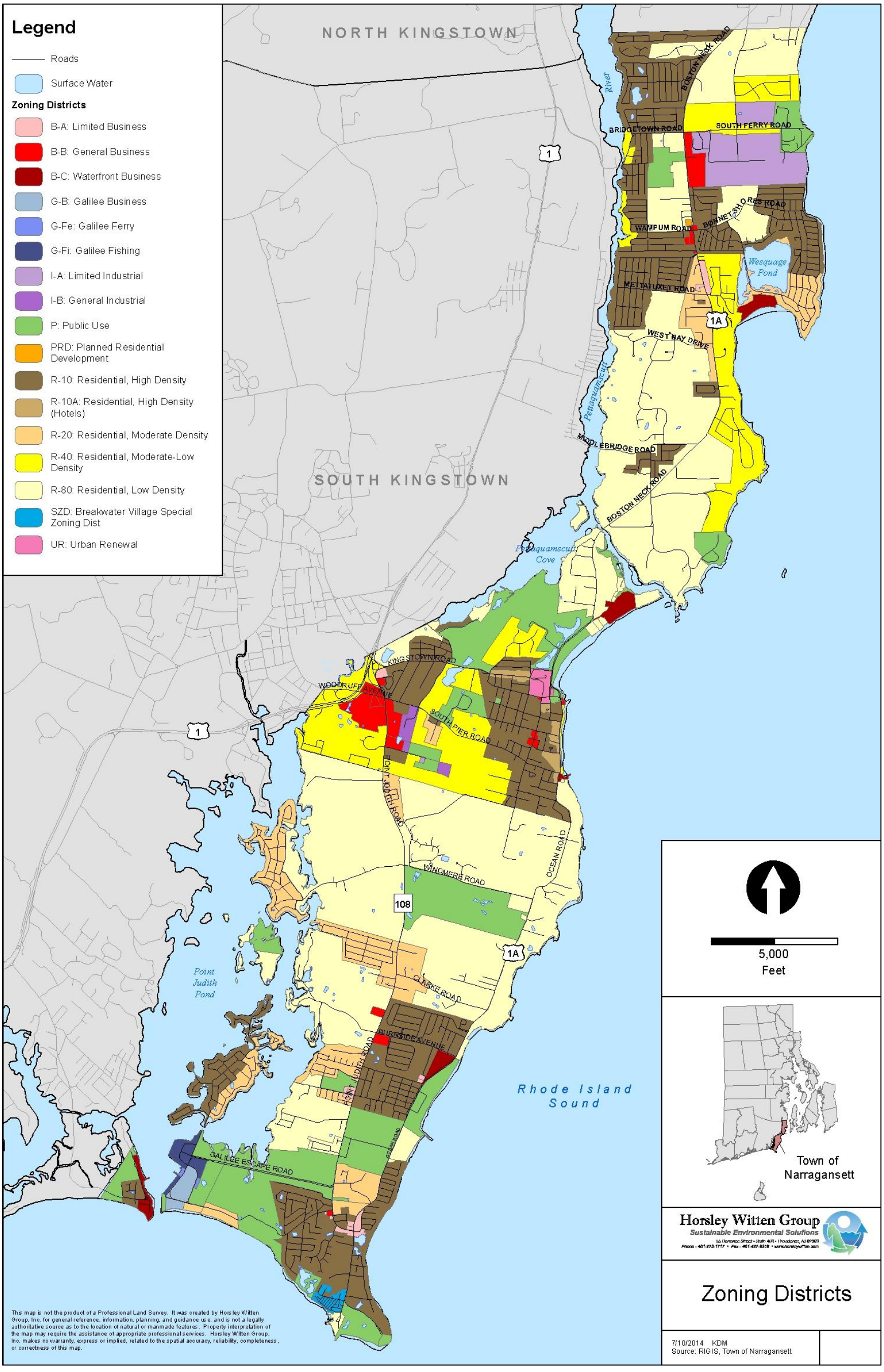
Map 3. North End Current Land Uses



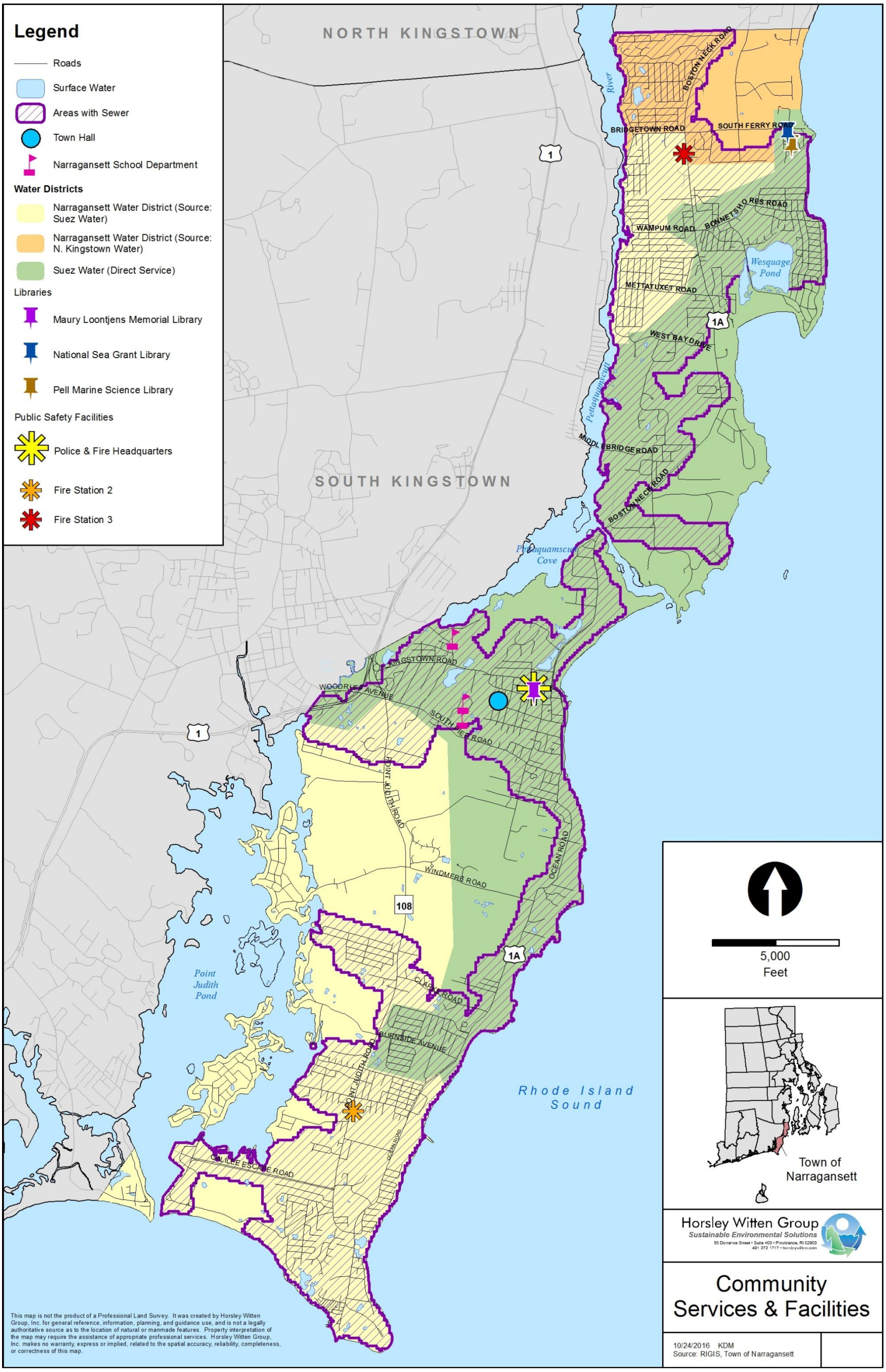
Map 4. Central Area Current Land Uses



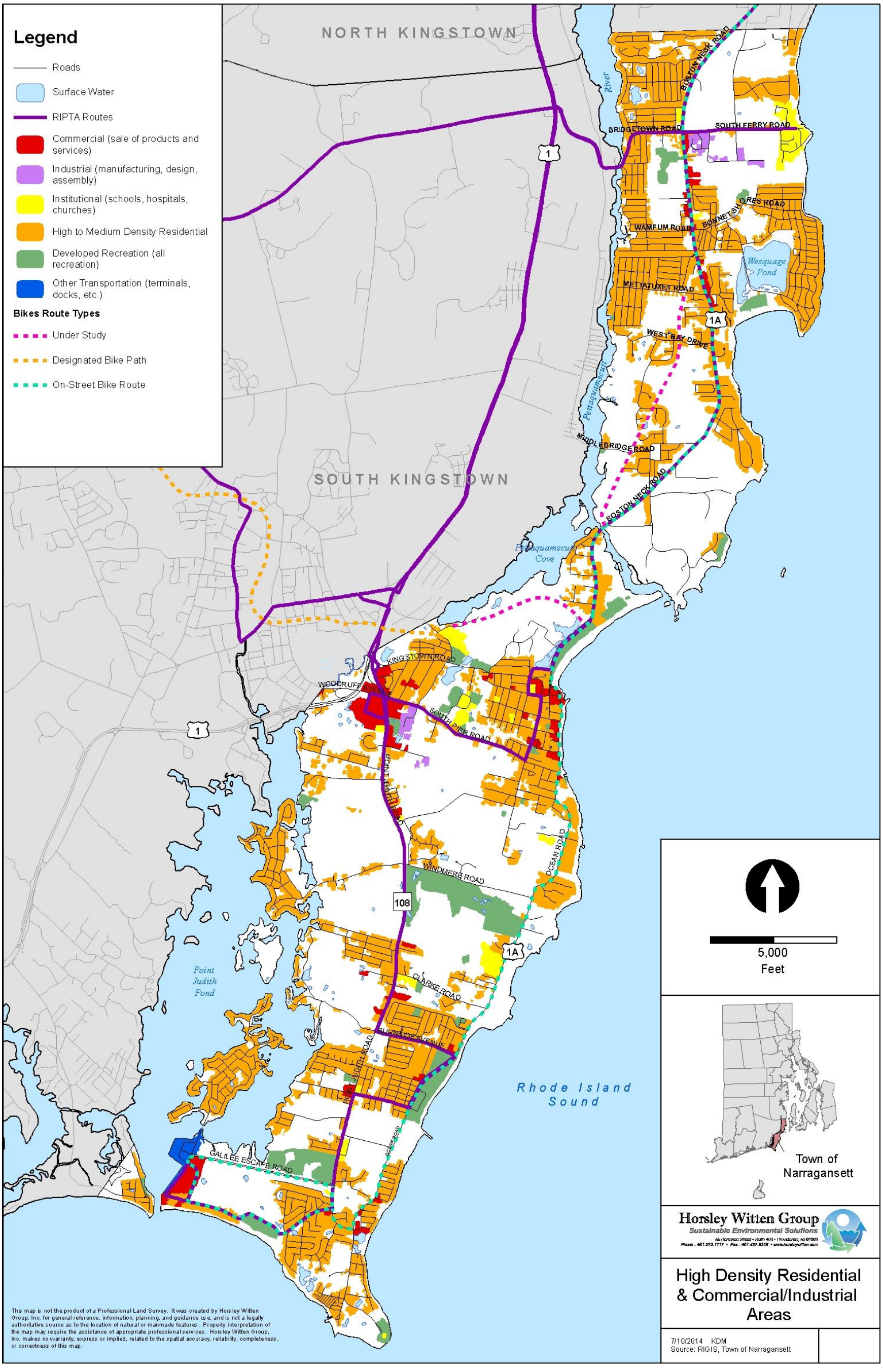
Map 5. South End Current Land Uses



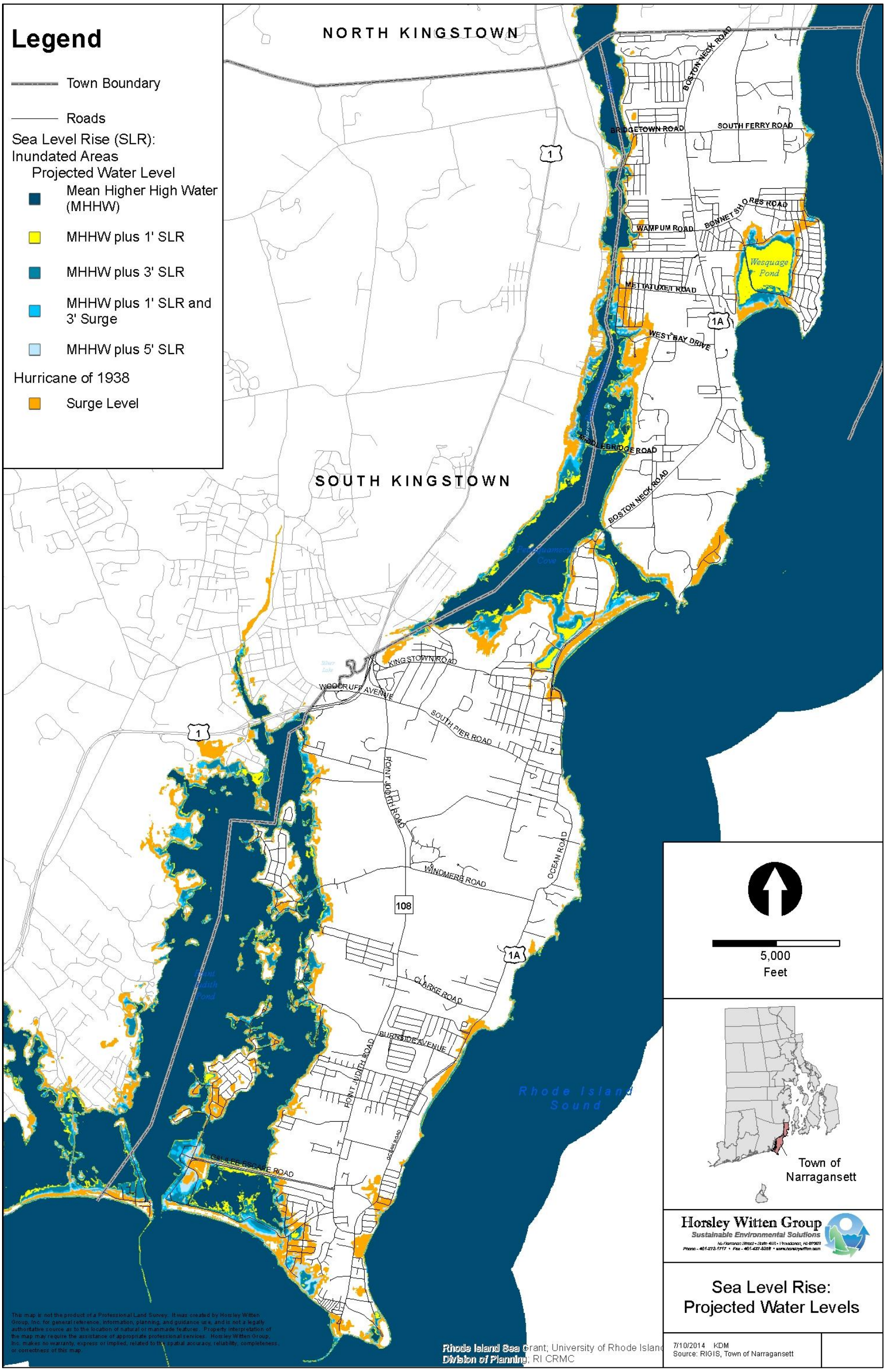
Map 6. Zoning Districts



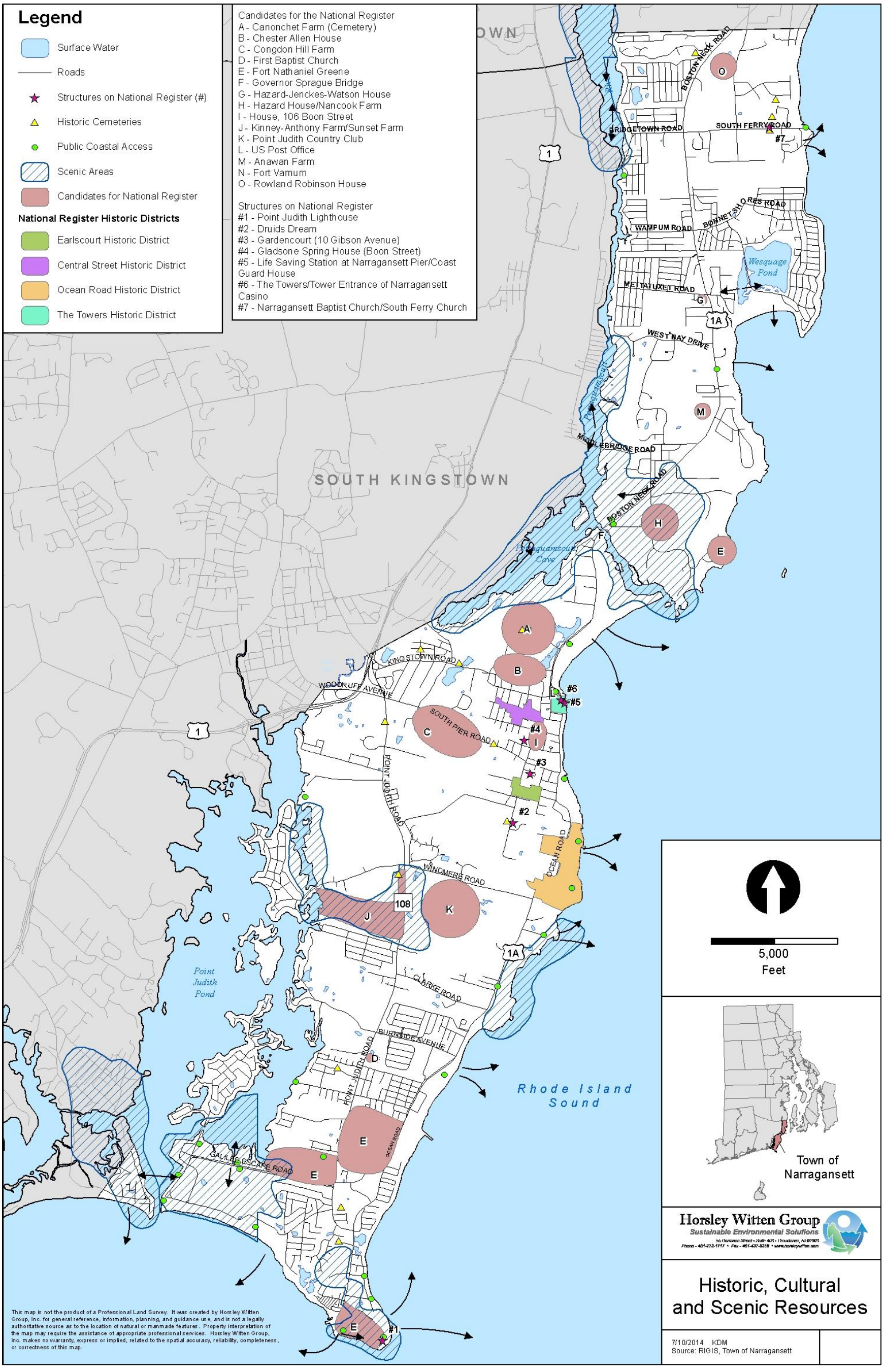
Map 7. Community Facilities



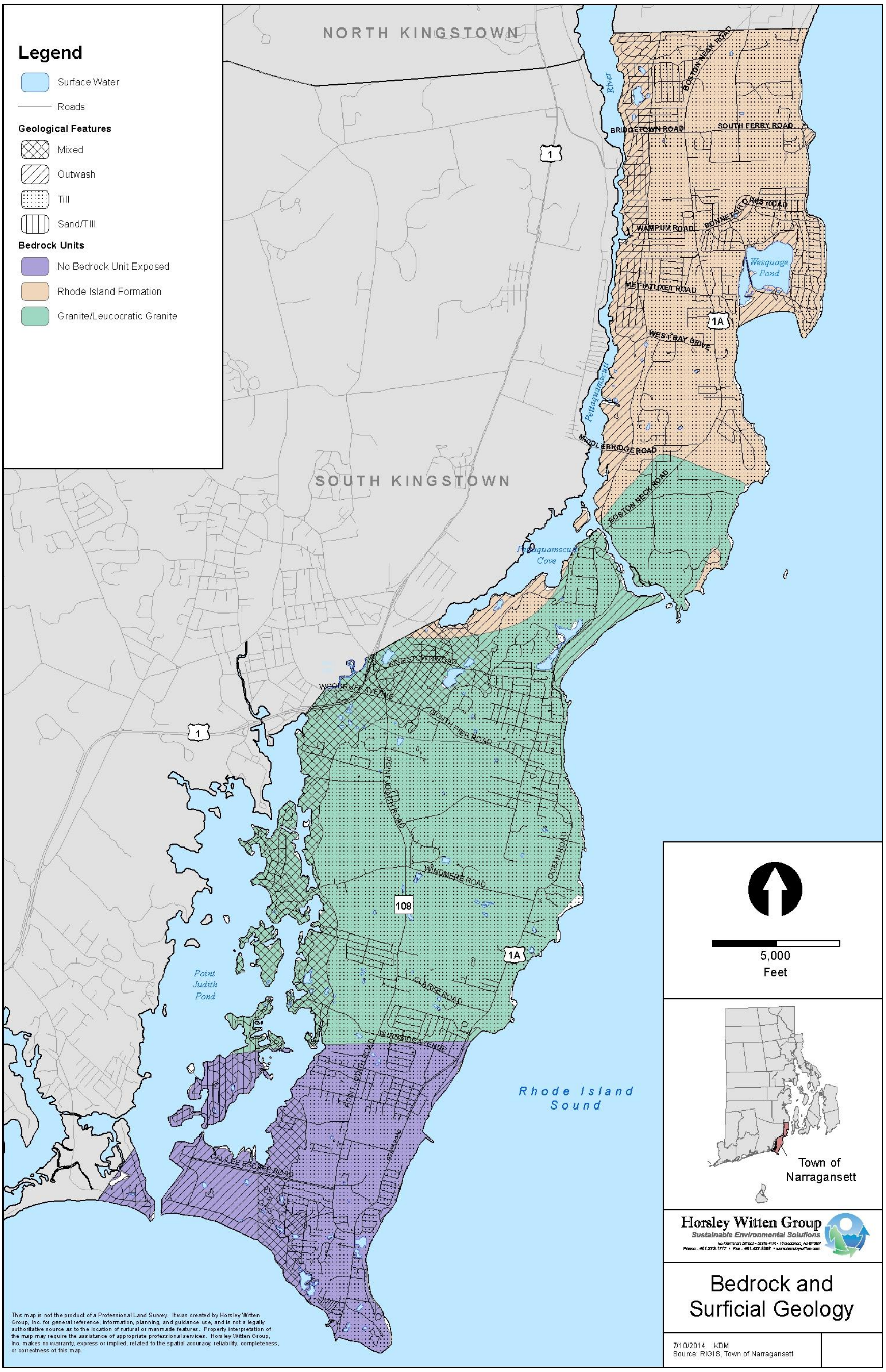
Map 8. Areas of High Density Residential and Commercial/Industrial Areas



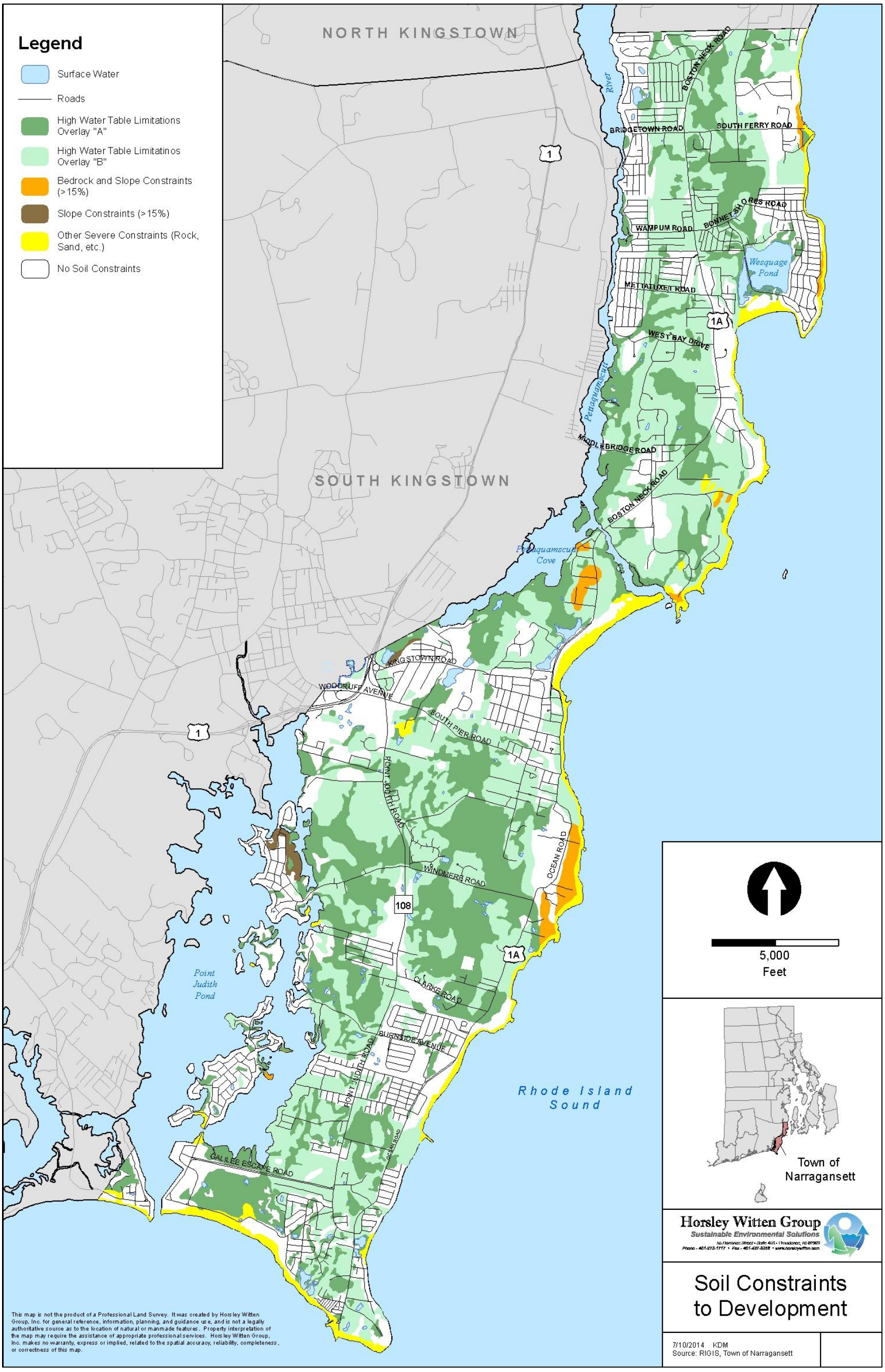
Map 9. Areas Vulnerable to Sea Level Rise



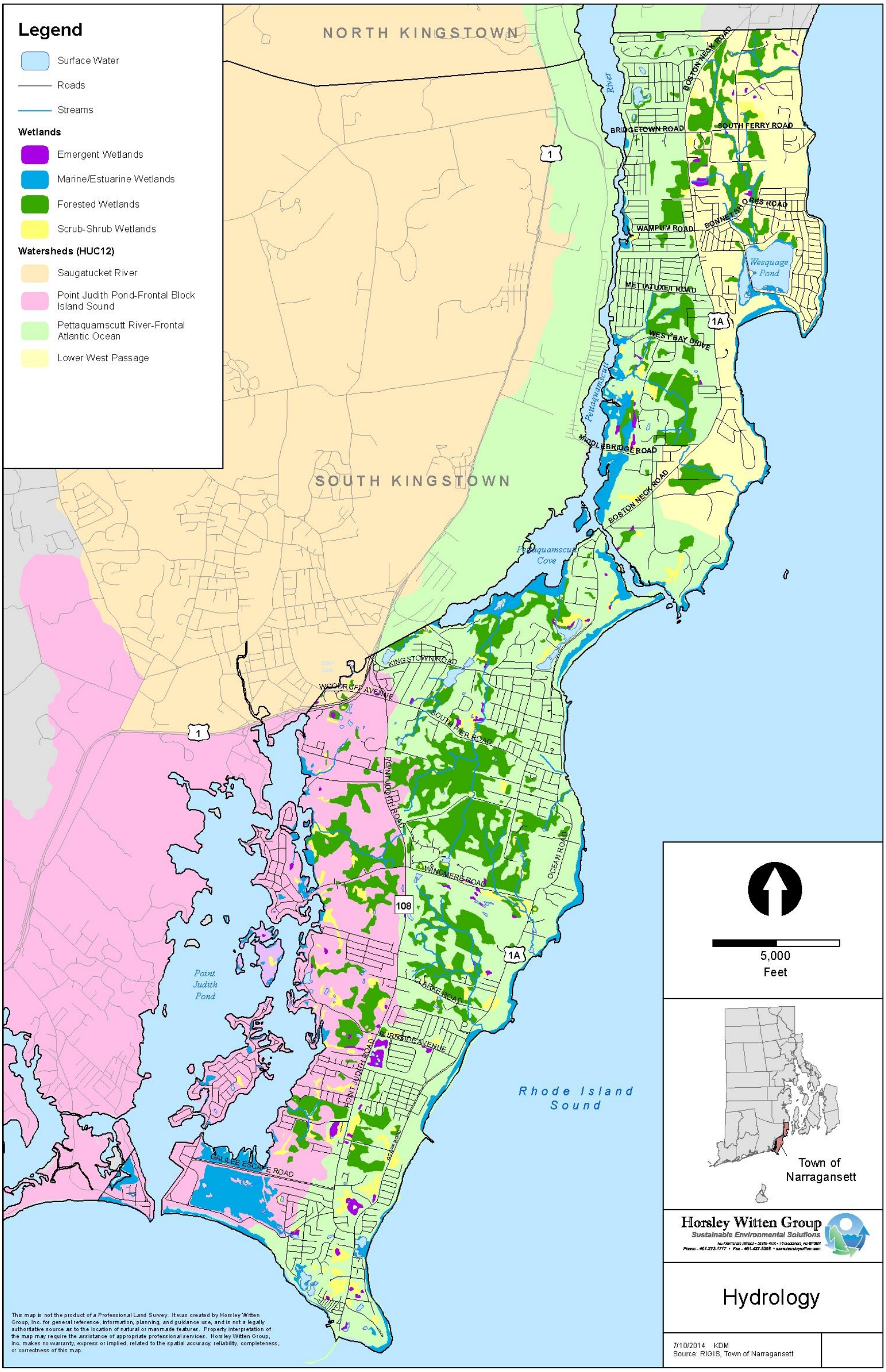
Map 11. Historic, Cultural and Scenic Resources



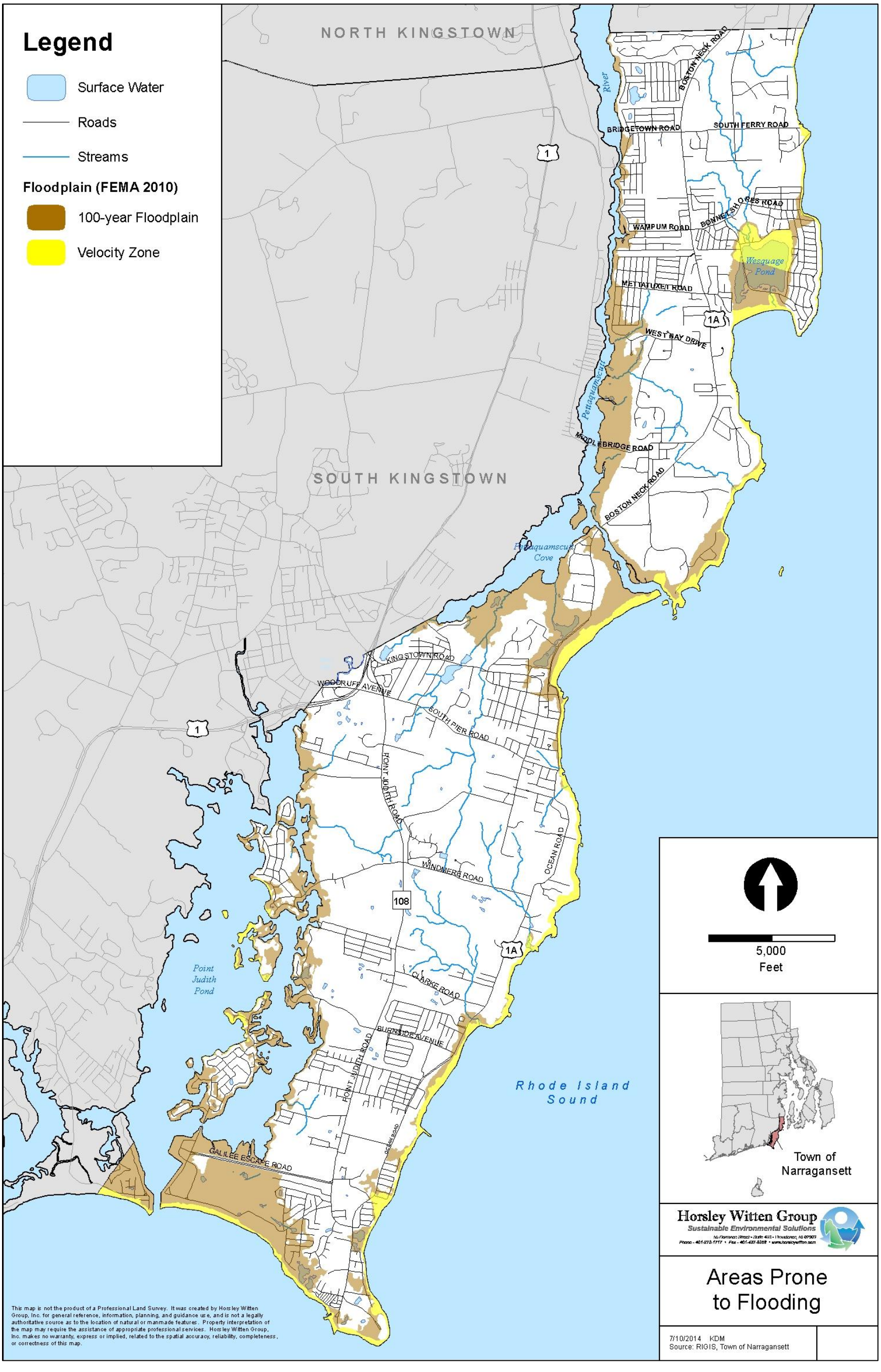
Map 12. Bedrock and Surficial Geology



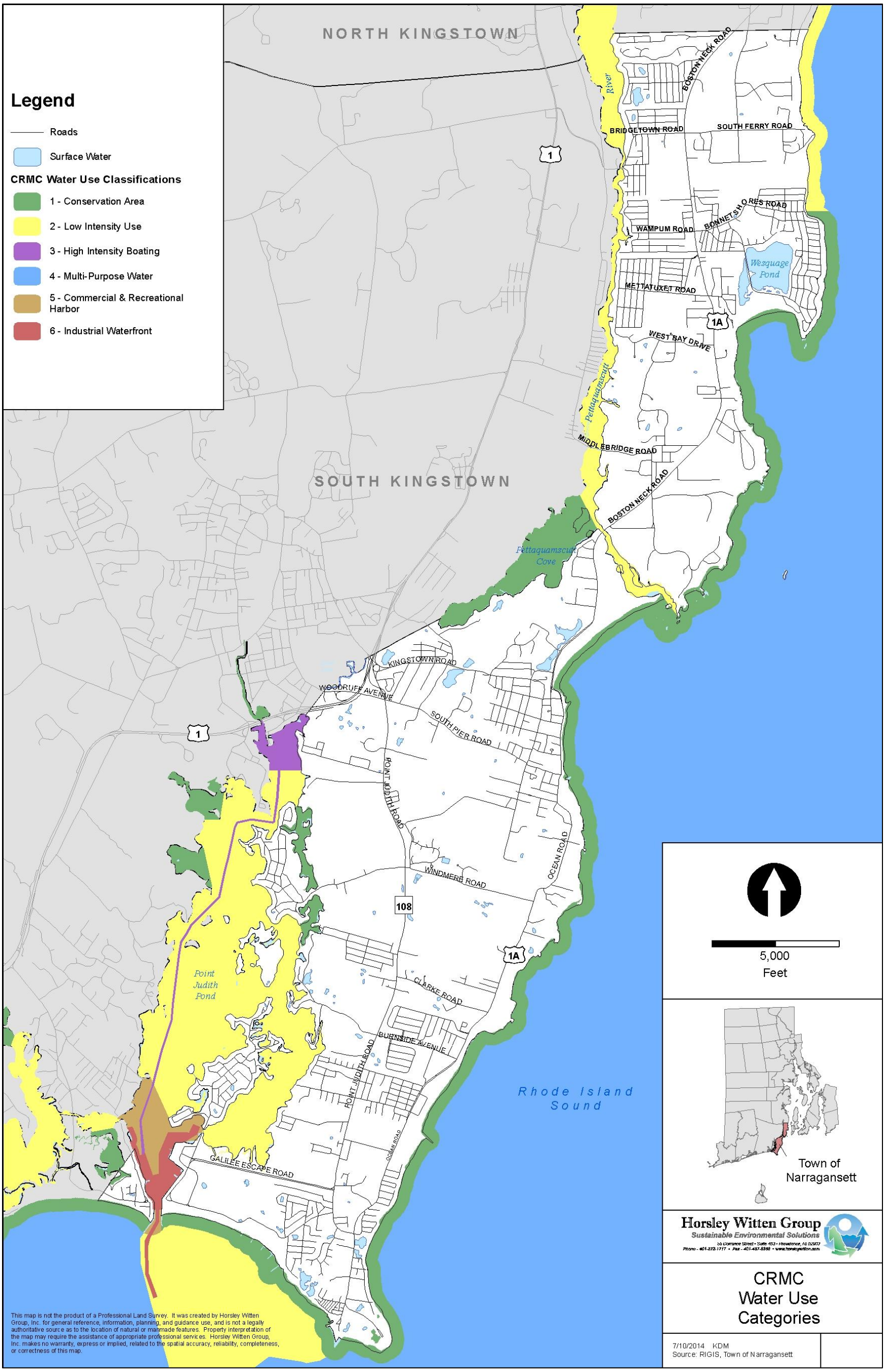
Map 13. Soil Constraints to Development



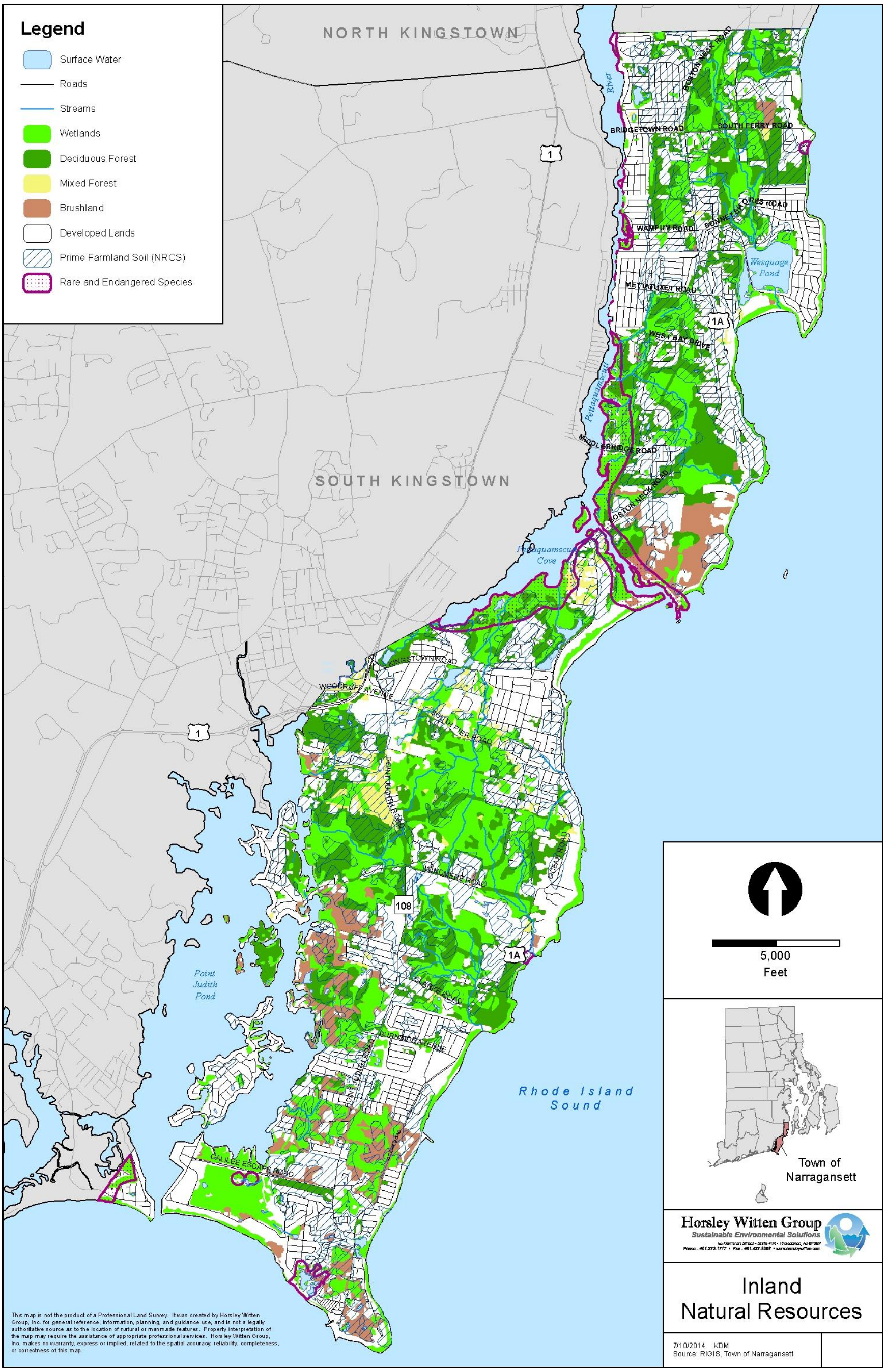
Map 14. Hydrology



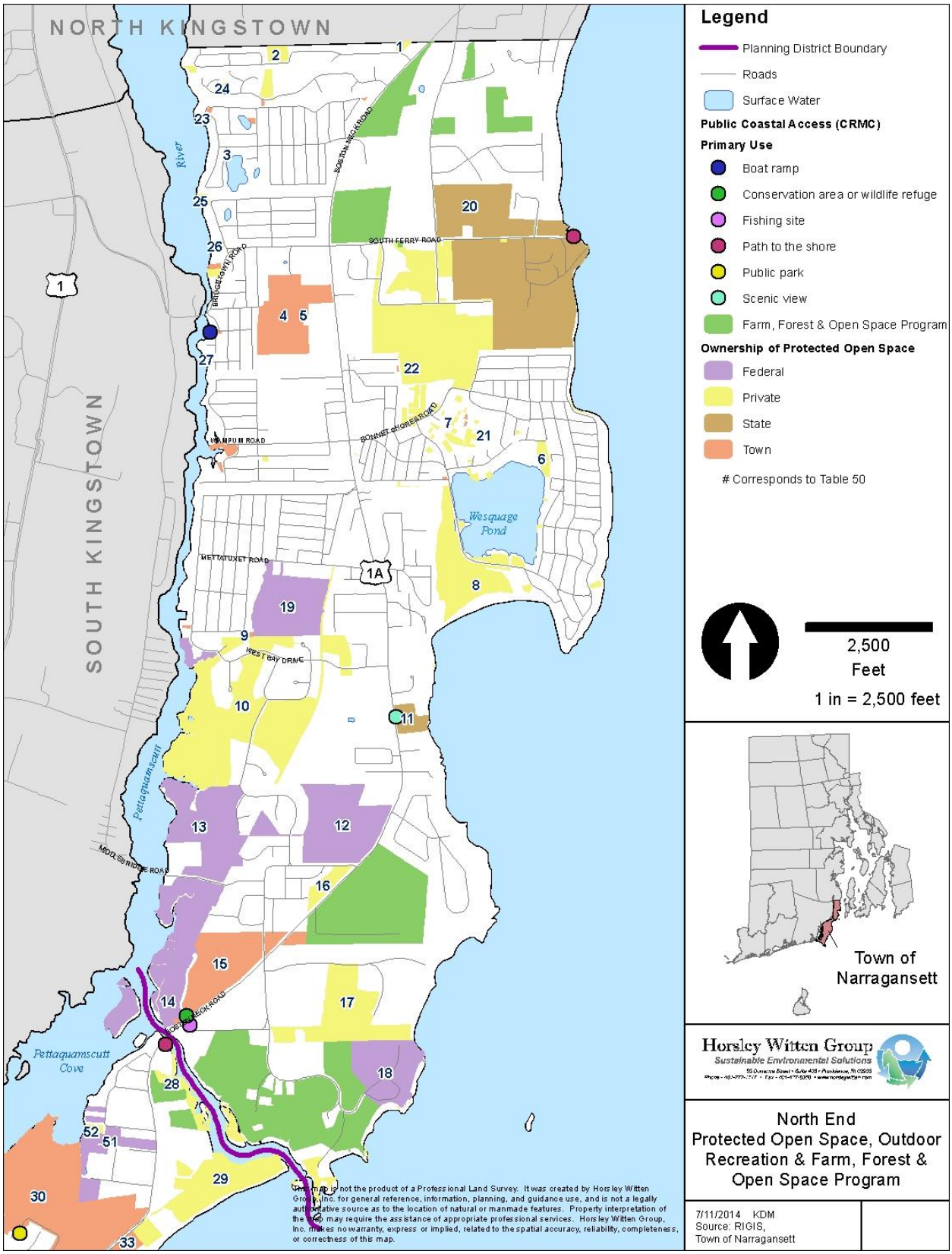
Map 15. Areas Prone to Flooding



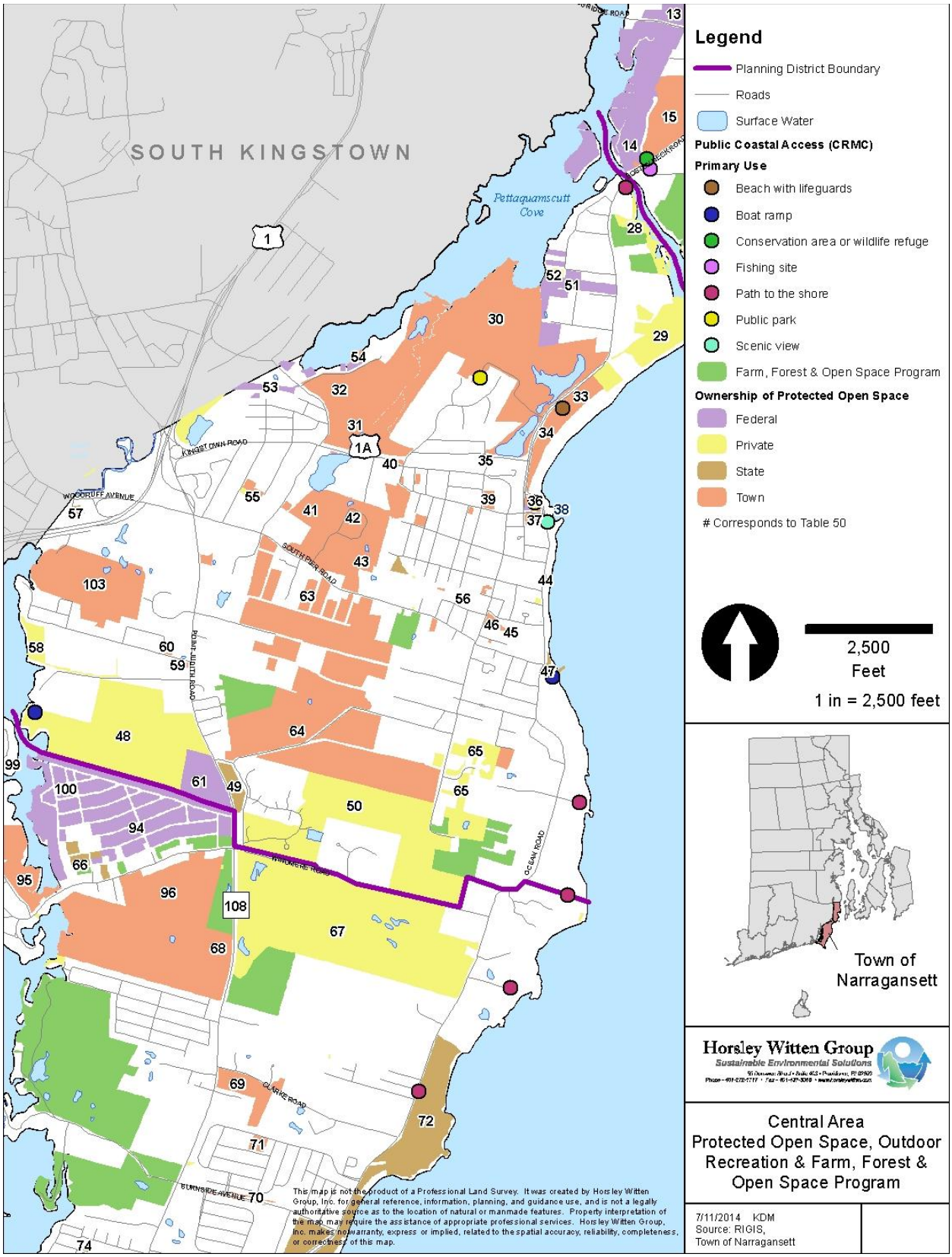
Map 16. CRMC Water Use Categories



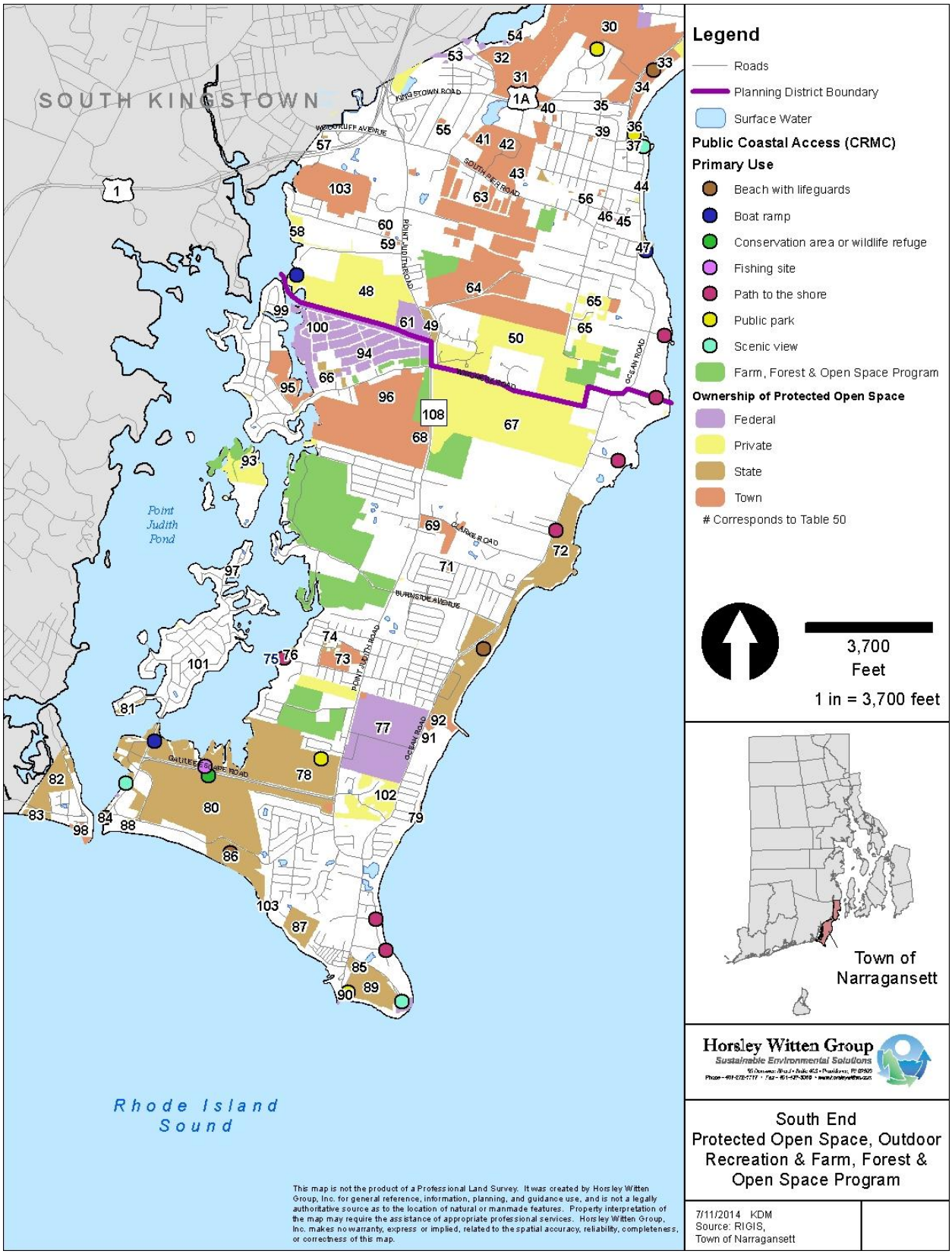
Map 17. Inland Natural Resources



Map 18. North End Protected Open Space, Outdoor Recreation and Farm, Forest & Open Space Program



Map 19. Central Area Protected Open Space, Outdoor Recreation, and Farm, Forest & Open Space Program



Map 20. South End Protected Open Space, Outdoor Recreation, and Farm, Forest & Open Space Program

B

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Appendix B
RIPDES Permit

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
235 Promenade Street, Providence, Rhode Island 02908

September 11, 2023

CERTIFIED MAIL

Mr. James Tierney
Town Manager
Town of Narragansett
25 Fifth Avenue
Narragansett, RI 02882

RE: Scarborough Wastewater Treatment Facility Final Permit
RIPDES Permit No. RI0100188

Dear Mr. Tierney:

Enclosed is your final Rhode Island Pollutant Discharge Elimination System (RIPDES) Permit issued pursuant to the referenced application. State regulations, promulgated under Chapter 46-12 of the Rhode Island General Laws of 1956, as amended, require this permit to become effective on the date specified in the attached permit.

Also enclosed is information relative to hearing requests and stays of RIPDES Permits.

We appreciate your cooperation throughout the development of this permit. Should you have any questions concerning this permit, feel free to contact Cameron Murray of the State Permits Staff at (401) 222-4700, extension 2777274.

Sincerely,

Heidi Travers

Heidi Travers, P.E.
Environmental Engineer IV

HET:CM

ecc: Scott Goodinson, Scarborough WWTF
Crystal Charbonneau, DEM
Sandy Mojica, EPA Region 1
Nathan Chien, EPA Region 1
Richard Carvalho, EPA Region 1

RESPONSE TO COMMENTS

NO SIGNIFICANT COMMENTS WERE RECEIVED ON THE DRAFT PERMIT FOR THIS FACILITY; THEREFORE, NO RESPONSE WAS PREPARED.

HEARING REQUESTS

If you wish to contest any of the provisions of this permit, you may request a formal hearing within thirty (30) days of receipt of this letter. The request should be submitted to the Administrative Adjudication Division at the following address:

Mary Dalton, Clerk
Department of Environmental Management
Office of Administrative Adjudication
235 Promenade Street
3rd Floor, Rm 350
Providence, RI 02908

Any request for a formal hearing must conform to the requirements of §1.50 of the Regulations for the Rhode Island Pollutant Discharge Elimination System (RI Code of Regulations; 250-RICR-150-10-1.50).

STAYS OF RIPDES PERMITS

Should the Department receive and grant a request for a formal hearing, the contested conditions of the permit will not automatically be stayed. However, the permittee, in accordance with Rule 50, may request a temporary stay for the duration of adjudicatory hearing proceedings. Requests for stays of permit conditions should be submitted to the Office of Water Resources at the following address:

Joseph B. Haberek, P.E.
Administrator of Surface Water Protection
Office of Water Resources
235 Promenade Street
Providence, Rhode Island 02908

All uncontested conditions of the permit will be effective and enforceable in accordance with the provisions of § 1.50 of the Regulations for the Rhode Island Pollutant Discharge Elimination System (RI Code of Regulations; 250-RICR-150-10-1.50).

AUTHORIZATION TO DISCHARGE UNDER THE
RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of Chapter 46-12 of the Rhode Island General Laws, as amended, the

Town of Narragansett
Narragansett Town Hall
25 Fifth Avenue
Narragansett, Rhode Island

is authorized to discharge from a facility located at the

Scarborough Wastewater Treatment Facility
990 Ocean Road
Narragansett, Rhode Island

to receiving waters named

Rhode Island Sound (Waterbody ID: RI0010042E-02A)

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on October 1, 2023.

This permit and the authorization to discharge expire at midnight, five (5) years from the effective date.

This permit supersedes the permit issued on August 30, 2017.

This permit consists of 20 pages in Part I including effluent limitations, monitoring requirements, etc. and 10 pages in Part II including General Conditions.

Signed this 11th day of September, 2023.

Joseph B. Haberek, P.E., Administrator for Surface Water Protection
Office of Water Resources
Rhode Island Department of Environmental Management
Providence, Rhode Island

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A. Outfall 001A is the final discharge after dechlorination. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity – lbs./day		Concentration – Specify Units				
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Average Weekly *(Average)	Maximum Daily *(Maximum)	Measurement Frequency	Sample Type
Flow[1]	1.4 MGD	-- MGD				Continuous	Recorder
BOD_5 [2]	350	584	30 mg/l	45 mg/l	50 mg/l	3/Week	24-Hr. Comp.
BOD_5 - % Removal[2]			≥85%			1/Month	Calculated
TSS	350	584	30 mg/l	45 mg/l	50 mg/l	3/Week	24-Hr. Comp.
TSS - % Removal			≥85%			1/Month	Calculated
Settleable Solids[1]				--- ml/l	--- ml/l	1/Day	Grab

--- Signifies a parameter which must be monitored, and data must be reported; no limit has been established at this time.

*Values in parentheses () are to be reported as Minimum/Maximum for the reporting period rather than Average Monthly/Maximum Daily.

[1]Sampling for Flow and Settleable Solids shall be performed Sunday-Saturday.

[2]Influent and effluent sampling is required for TSS and BOD_5. Sampling for TSS and BOD_5 influent and effluent shall be performed Sunday, Tuesday, and Thursday with appropriate allowances for hydraulic detention (flow-through) time.

PART I

A. **EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

2. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A. Outfall 001A is the final discharge after dechlorination. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity – lbs./day		Concentration – Specify Units				
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Average Weekly *(Average)	Maximum Daily *(Maximum)	Measurement Frequency	Sample Type
Enterococci			35 cfu/100 ml[1]		276 cfu/100 ml[1]	3/Week	Grab
Fecal Coliform			--- MPN/100 ml[1]		--- MPN/100 ml[1]	3/Week	Grab
Total Residual Chlorine (TRC)[3]			325 µg/l[2]		325 µg/l[2]	3/Day	Grab
pH[3]			(6.0 SU)		(9.0 SU)	2/Day	Grab

--- Signifies a parameter which must be monitored, and data must be reported; no limit has been established at this time.

*Values in parentheses () are to be reported as Minimum/Average/Maximum for the reporting period rather than Average Monthly/Average Weekly/Maximum Daily.

[1]Two (2) of the three (3) Enterococci samples are to be taken on Tuesday and Thursday at the same time as one of the TRC samples. The Fecal Coliform samples shall be taken at the same time as the Enterococci samples. The Geometric Mean shall be used to obtain the "monthly average" values. The facility shall immediately report to RIDEM, verbally, any fecal coliform sample result that exceeds 400 MPN/100 ml.

[2]The use of a continuous TRC recorder after chlorination and prior to dechlorination is required to provide a record that proper disinfection was achieved at all times. Compliance with these limitations shall be determined by taking three grab samples per day, Monday - Friday (except holidays), equally spaced over one (1) eight (8) hour shift with a minimum of three hours between grabs. On Saturdays, Sundays, and holidays by taking at least two (2) grab samples each day with a minimum of two (2) hours between grabs. The maximum daily and average monthly values are to be computed from the averaged grab sample results. The following methods may be used to analyze the grab samples**:** (1) DPD Spectrophotometric, EPA No. 330.5 or Standard Methods (18th Edition) No. 4500-Cl G; (2) DPD Titrimetric, EPA No. 330.4 or Standard Methods No. 4500-Cl F; (3) Amperometric Titration, EPA No. 330.1 or Standard Methods No. 4500-Cl D or ASTM No. D1253-86(92).

[3]Sampling for pH and Chlorine Residual shall be performed Sunday-Saturday.

PART I

A. **EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

3. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A (final discharge after dechlorination). Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity – lbs./day		Concentration – Specify Units				
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Average Weekly *(Average)	Maximum Daily *(Maximum)	Measurement Frequency	Sample Type
Copper, Total[1]			--- µg/l		--- µg/l	1/Quarter	24-Hr. Comp.
Cyanide, Free Available[1, 2]			--- µg/l		--- µg/l	1/Quarter	24-Hr. Comp.
Cadmium, Total[1]			--- µg/l		--- µg/l	1/Quarter	24-Hr. Comp.
Lead, Total[1]			--- µg/l		--- µg/l	1/Quarter	24-Hr. Comp.
Chromium, Total[1]			--- µg/l		--- µg/l	1/Quarter	24-Hr. Comp.
Zinc, Total[1]			--- µg/l		--- µg/l	1/Quarter	24-Hr. Comp.
Nickel, Total[1]			--- µg/l		--- µg/l	1/Quarter	24-Hr. Comp.
Aluminum, Total[1]			--- µg/l		--- µg/l	1/Quarter	24-Hr. Comp.

--- Signifies a parameter which must be monitored, and data must be reported; no limit has been established at this time.

*Values in parentheses () are to be reported as Minimum/Maximum for the reporting period rather than Average Monthly/Maximum Daily.

[1]Monitoring data may be obtained in conjunction with bioassay testing required in Part I.B of the permit.

[2]Composite shall be obtained by taking three (3) grab samples per day spaced over one (1) day, with a minimum of three (3) hours between grabs and preserved immediately upon collection. All three (3) samples shall be composited then analyzed for free available Cyanide.

Samples taken in compliance with the monitoring requirements specified above shall be taken Monday through Friday.

PART I
A. **EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

4. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A (final discharge after dechlorination). Such discharges shall be monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity – lbs./day		Concentration – Specify Units				
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Average Weekly *(Average)	Maximum Daily *(Maximum)	Measurement Frequency	Sample Type
Oil and Grease					--- mg/l	1/Month	3 Grabs[1]
TKN (as N)			--- mg/l		--- mg/l	1/Month	24-Hr. Comp.
Nitrate, Total (as N)			--- mg/l		--- mg/l	1/Month	24-Hr. Comp.
Nitrite, Total (as N)			--- mg/l		--- mg/l	1/Month	24-Hr. Comp.
Nitrogen, Total (TKN + Nitrate + Nitrite, as N)	-- lb/day		-- mg/l		--- mg/l	1/Month	Calculated

--- signifies a parameter which must be monitored, and data must be reported; no limit has been established at this time.

[1]Three (3) grab samples shall be equally spaced over the course of one (1) eight (8) hour shift with a minimum of three (3) hours between grab samples. Each grab sample must be analyzed individually, and the maximum values reported.

Samples taken in compliance with the monitoring requirements specified above shall be taken Monday through Friday.

PART I

A. **EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

5. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A. Outfall 001A is the final discharge after dechlorination. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity – lbs./day		Concentration – Specify Units				
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Average Weekly *(Average)	Maximum Daily *(Maximum)	Measurement Frequency	Sample Type
Mysidopsis bahia[1] LC50[2]					≥100%	1/Quarter	24-Hr. Comp.

[1]Testing may be conducted using *Americamysis bahia.*

[2] LC_{50} is defined as the concentration of wastewater that causes mortality to 50% of the test organisms. Therefore, a 100% limit means that a sample of 100% effluent (no dilution) shall cause no more than a 50% mortality rate.

Samples taken in compliance with the monitoring requirements in accordance with Part I.B. of the permit.

PART I

A. **EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

6. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A. Outfall 001A is the final discharge after dechlorination. Such discharges shall be monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity – lbs./day		Concentration – Specify Units				
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Average Weekly *(Average)	Maximum Daily *(Maximum)	Measurement Frequency	Sample Type
PFAS Analytes[1]					--- ng/L	1/Quarter	Grab [2]

--- signifies a parameter which must be monitored, and data must be reported; no limit has been established at this time.

[1]Influent and effluent sampling for the listed PFAS parameters listed in Attachment A shall begin on January 1 with the first sampling results are due on April 15, 2024. PFAS shall be analyzed using Clean Water Act wastewater draft analytical method 1633 until a 40 CFR Part 136 approved test method for wastewater is approved. Report in NetDMR the results of all PFAS analytes required to be tested as part of the method as shown in Attachment A.

[2]Influent samples taken in compliance with the monitoring requirements specified above shall be taken at the facility headworks at the same sampling location where influent BOD_5 and influent TSS are sampled. Effluent samples shall be taken after the chlorination contact tank.

7. Prior to acceptance, the permittee shall notify DEM of the following:
    a. Any new introduction of pollutants into the Permittee's treatment facility from an indirect discharger which would be subject to section 301 or 306 of CWA if it were directly discharging those pollutants; and

    b. Any substantial change in the volume or character of pollutants being introduced into the Permittee;s treatment facility by a source that was discharging pollutants into the facility at the time of permit issuance.

    c. Notice shall include information on:
    (i) the quality and quantity of effluent introduced into the Permittee's treatment facility, and
    (ii) any anticipated impact of the change on the quantity and quality of effluent to be discharged from the Permittee's treatment facility.

8.
    a. The pH of the effluent shall not be less than 6.0 nor greater than 9.0 standard units at any time unless these values are exceeded due to natural causes or as a result of the approved treatment processes.

    b. The discharge shall not cause visible discoloration of the receiving waters.

    c. The effluent shall contain neither a visible oil sheen, foam, nor floating solids at any time.

    d. The permittee's treatment facility shall maintain a minimum of 85 percent removal of both total suspended solids and 5-day biochemical oxygen demand. The percent removal shall be based on monthly average values.

    e. When the effluent discharged for a period of 90 consecutive days exceeds 80 percent of the designed flow, the permittee shall submit to the permitting authorities a projection of loadings up to the time when the design capacity of the treatment facility will be reached, and a program for maintaining satisfactory treatment levels consistent with approved water quality management plans.

    f. The permittee shall analyze its effluent annually for the EPA Priority Pollutants as listed in 40 CFR 122, Appendix D, Tables II and III. The results of these analyses shall be submitted to the Department of Environmental Management by October 15th of each year. All sampling and analysis shall be done in accordance with EPA Regulations, including 40 CFR, Part 136; grab and composite samples shall be taken as appropriate.

    g. This permit serves as the State's Water Quality Certificate for the discharges described herein.

B. BIOMONITORING REQUIREMENTS AND INTERPRETATION OF RESULTS

1. General

Beginning on the effective date of the permit, the permittee shall perform four (4) acute toxicity tests per year on dechlorinated effluent samples collected from discharge Outfall 001A. The permittee shall conduct the tests during dry weather periods (no rain within forty-eight (48) hours prior to or during sampling unless approved by RIDEM) according to the following test frequency and protocols. Acute data shall be reported as outlined in Section 9. The State may require additional screening, range finding, definitive acute or chronic bioassays as deemed necessary based on the results of the initial bioassays required herein. Indications of toxicity could result in requiring a Toxicity Reduction Evaluation (TRE) to investigate the causes and to identify corrective actions necessary to eliminate or reduce toxicity to an acceptable level.

2. Test Frequency
On four (4) sampling events, (one (1) each calendar quarter) the permittee will conduct forty-eight (48) hour acute definitive toxicity tests on the species listed below, for a total of four (4) acute toxicity tests per year.

Species	**Test Type** One (1) Species Test Four (4) Times Annually	**Frequency**
Mysids (*Mysidopsis bahia*)	Definitive 48-Hour Acute Static (LC_{50})	Quarterly

3. Testing Methods
Acute definitive toxicity tests shall be conducted in accordance with protocols listed in 40 CFR Part 136.

4. Sample Collection
For each sampling event a twenty-four (24) hour flow-proportioned composite effluent sample shall be collected at a location after dechlorination during a dry weather (no rain forty-eight (48) hours prior to or during sampling unless approved by RIDEM). This sample shall be kept cool (at 4°C), and testing shall begin within twenty-four (24) hours after the last sample of the composite is collected. In the laboratory, the sample will be split into two (2) subsamples, after thorough mixing, for the following:

A: Chemical Analysis
B: Acute Toxicity Testing

All samples held overnight shall be refrigerated at 4°C. Grab samples must be used for pH and temperature.

5. Salinity Adjustment
Prior to the initiation of testing, the effluent must be adjusted to make the salinity of the effluent equal to that of the marine dilution water. The test solution must be prepared by adding non-toxic dried ocean salts to a sufficient quantity of 100% effluent to raise the salinity to the desired level. After the addition of the dried salts, stir gently for thirty (30) to sixty (60) minutes, preferably with a magnetic stirrer, to ensure that the salts are in solution. It is important to check the final salinity with a refractometer or salinometer. Salinity adjustments following this procedure and in accordance with EPA protocol will ensure that the concentrations (% effluent) of each dilution are real and allow for an accurate evaluation with the acute permit limit and acute monitoring requirements.

6. Dilution Water
Dilution water used for marine acute toxicity analyses should be of sufficient quality to meet minimum acceptability of test results (Section 7). Natural seawater shall be used as the dilution water. This water shall be collected from Narragansett Bay off the dock at the URI's Graduate School of Oceanography on South Ferry Road, Narragansett. It is noted that the University claims no responsibility for the personal safety on this dock. The permittee shall observe the rules posted at the dock. If this natural seawater diluent is found to be, or suspected to be toxic or unreliable, an alternate source of natural seawater or, deionized water mixed with hypersaline brine or artificial sea salts of known quality with a salinity and pH similar to that of the receiving water may be substituted AFTER RECEIVING WRITTEN APPROVAL FROM RIDEM.

7. Effluent Toxicity Test Conditions for Mysids (*Mysidopsis bahia*)
Test conditions are required to be compliant with 40 CFR 136 using the following effluent concentrations:

Six (6) dilutions plus a control: 100%, 50%, 25%, 12.5%, 6.25%, and 0% effluent.

8. Chemical Analysis
The following chemical analysis shall be performed for every sampling event.

Parameter	Effluent	Saline Diluent	Detection Limit (mg/l)
pH	√	√	--
Specific Conductance	√	√	--
Total Solids and Suspended Solids	√	√	--
Total Ammonia	√		0.1
Total Organic Carbon	√		0.5
Free Available Cyanide	√		0.01
Total Phenols	√		0.05
Salinity	√	√	PPT (0/00)

During the first, second, and fourth calendar quarter bioassay sampling events the following chemical analyses shall be performed:

Total Metals	Effluent	Saline Diluent	Detection Limit (µg/l)
Total Cadmium	√	√	0.1
Hexavalent Chromium	√	√	20.0
Total Copper	√	√	1.0
Total Lead	√	√	1.0
Total Zinc	√	√	5.0
Total Nickel	√	√	1.0
Total Aluminum	√	√	5.0

The above analyses may be used to fulfill, in part or in whole, monitoring requirements in the permit for these specific metals.

During the third calendar quarter bioassay sampling event, the final effluent sample collected during the same twenty-four (24) hour period as the bioassay sample, shall be analyzed for priority pollutants (as listed in Tables II and III of Appendix D of 40 CFR 122). The bioassay priority pollutant scan shall be a full scan and may be coordinated with other permit conditions to fulfill any priority pollutant scan requirements.

9. Toxicity Test Report Elements
A report of results will include the following:
   - Description of sample collection procedures and site description.
   - Names of individuals collecting and transporting samples, times, and dates of sample collection and analysis.

- General description of tests: age of test organisms, origin, dates and results of standard toxicant tests (quality assurance); light and temperature regime; dilution water description; other information on test conditions if different than procedures recommended.

- The method used to adjust the salinity of the effluent must be reported.

- All chemical and physical data generated (include detection limits).

- Raw data and bench sheets.

- Any other observations or test conditions affecting test outcome.

Toxicity test data shall include the following:

- Survival for each concentration and replication at time twenty-four (24) and forty-eight (48) hours.

- LC_{50} and 95% confidence limits shall be calculated using one of the following methods in order of preference: Probit, Trimmed Spearman Karber, Moving Average Angle, or the graphical method. All printouts (along with the name of the program, the date, and the author(s)) and graphical displays must be submitted. When data is analyzed by hand, worksheets should be submitted. The report shall also include the No Observed Acute Effect Level (NOAEL), which is defined as the highest concentration of the effluent (in % effluent) in which 90% or more of the test animals survive.

- The Probit, Trimmed Spearman Karber, and Moving Average Angle methods of analyses can only be used when mortality of some of the test organisms are observed in at least two (2) of the (percent effluent) concentrations tested (i.e., partial mortality). If a test results in a 100% survival and 100% mortality in adjacent treatments ("all or nothing" effect), an LC_{50} may be estimated using the graphical method.

10. Special Condition
    Due to the fact that the suggested dilution water for this facility to use in conducting the bioassays is from the end of the dock at the URI's Narragansett Bay Campus, a Letter of Agreement must be signed and submitted to the Graduate School of Oceanography granting authorization to collect samples. Requests to use another source of dilution water will have to be approved by the Department of Environmental Management, Office of Water Resources.

11. Species Sensitivity Screening Report.
    For four (4) quarters of the permit beginning October 1, 2026, the permittee shall conduct a chronic species sensitivity screening for the discharge. Species sensitivity screening for chronic toxicity shall include, at minimum, chronic toxicity testing for four consecutive calendar quarters using 40 CFR Part 136 approved methods for mysid (*Mysidopsis bahia*), sea urchin (*Arbacia punctulate*), and fish (*Menidia beryllina*). Samples shall be obtained from the dechlorinated effluent collected from Outfall 001A during dry weather periods (no rain within forty-eight (48) hours prior to or during sampling unless approved by RIDEM).

    If only a single species in the species sensitivity screening testing exceeds 1 chronic Toxic Unit (TUc) (as 100/NOEC), then that species shall be established as the most sensitive species. If there are more than one species that exceed 1 TUc (as 100/NOEC), then the species with the highest TUc (as 100/NOEC) shall be established as the most sensitive species. DEM shall have final discretion to determine which species is the most sensitive considering the test results from the species sensitivity screening.

Test No.	Quarter Screening is to be Performed
1	October 1, 2026 – December 31, 2026
2	January 1, 2027 – March 31, 2027
3	April 1, 2027 – June 30, 2027
4	July 1, 2027 – September 30, 2027

The final Species Sensitivity Screening Report shall include all the elements required under Part I.B.9 for each quarterly test and shall be submitted to DEM December 31, 2027.

12. Reporting of Bioassay Testing
Bioassay Testing shall be conducted as follows:

Quarter Testing to be Performed	Report Due No Later Than	Results Submitted on DMR for
January 1 – March 31	April 15	March
April 1 – June 30	July 15	June
July 1 – September 30	October 15	September
October 1 – December 31	January 15	December

Reports shall be maintained by the permittee and shall be made available upon request by RIDEM.

C. Industrial Users

1. Within 90 days of the effective date of the permit, the Permittee shall submit an evaluation the name of any Industrial User (IU) subject to Categorical Pretreatment Standards under 40 CFR § 403.6 and 40 CFR chapter I, subchapter N (Parts 405-415, 417-430, 432, 447, 449-451, 454, 455, 457-461, 463-469, and 471 as amended) who discharge to the facility. New dischargers shall be submitted 30 days prior to discharge.

   This reporting requirement also applies to any other IU who is classified as a Significant Industrial User which discharges an average of 25,000 gallons per day or more of process wastewater into the facility (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastewater which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the facility; or is designated as such by the Control Authority as defined in 40 CFR § 403.3(f) on the basis that the industrial user has a reasonable potential to adversely affect the wastewater treatment facility's operation, or for violating any pretreatment standard or requirement (in accordance with 40 CFR § 403.8(f)(6)).

2. Monitoring and Reporting for Emerging Contaminants
   Starting January 1, 2024, the Permittee shall commence annual sampling of the below-listed types of industrial discharges into the POTW. PFAS shall be analyzed using Clean Water Act wastewater draft analytical method 1633 until a 40 CFR Part 136 approved test method for wastewater is made available to the public.
   - Platers/Metal Finishers
   - Paper and Packaging Manufacturers
   - Tanneries and Leather/Fabric/Carpet Treaters
   - Manufacturers of Parts with Polytetrafluorethylene (PTFE) or Teflon type coatings (i.e. bearings)
   - Landfill Leachate
   - Centralized Waste Treaters
   - Contaminated Sites
   - Fire Fighting Training Facilities

- Airports
- Any Other Known or Expected Sources of PFAS

Until there is an analytical method approved in 40 CFR Part 136 for PFAS, monitoring shall be conducted using Draft Method 1633. Sampling shall be for the PFAS analytes required to be tested in Method 1633, as shown in Attachment A.

The industrial discharges sampled, and the sampling results (including the full lab report) shall be summarized and submitted as an electronic attachment to the March discharge monitoring report due April 15th of the calendar year following the testing. In the case that there are no relevant dischargers, the annual submittal must include a description of the process used to determine that there were no relevant dischargers.

D. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

Operation and maintenance of the sewer system shall be in compliance with the General Requirements of Part II and the following terms and conditions:

1. Maintenance Staff
   The permittee shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit.

2. Infiltration/Inflow
   The permittee shall minimize infiltration/inflow to the sewer system. A summary report of all actions taken to minimize infiltration/inflow during the previous two (2) years shall be submitted to RIDEM, Office of Water Resources, by the 15th day of January every other year.

3. Resiliency Planning
   Within one year of the effective date of this permit, the Town shall submit a Resiliency Plan and schedule of short-term and long-term actions that will be taken to maintain, operate, and protect key collection and treatment system assets. The plan shall be consistent with the most recent version of DEM's Guidance for the Consideration of Climate Change Impacts in the Planning and Design of Municipal Wastewater Collection and Treatment Infrastructure and include consideration of the findings of the 2017 DEM report Implications of Climate Change for Rhode Island Wastewater Collection and Treatment Infrastructure. The Resiliency Plan shall include, but not be limited to: (i) an assessment of current and projected impacts from natural hazards on critical components within the Town's collection and treatment systems, as well as on the systems themselves; (ii) a plan to adapt and protect vulnerable components and systems; (iii) an analysis that provides justification for selected adaptation methods, including relevant cost-benefit analyses. The overall analysis must consider component and system design life and sea-level rise projections. For the purpose of this Resiliency Plan, critical components are considered those necessary to ensure the forward flow and treatment of wastewater in accordance with the limits set forth in this permit. The Resiliency Plan shall also consider impacts – such as debris carried on high winds – on the Town's treatment facility and wastewater collection system from neighboring facilities during high hazard events. This Plan shall be subject to DEM review and approval. If DEM determines that modifications need to be made to the Plan, DEM shall notify the permittee in writing which elements of the Plan need to be modified and the reason for the needed modification. This notification shall include a schedule for making required changes. After such notification from the DEM, the permittee shall make changes to the Plan and submit the revisions to the DEM for their approval.

4. Outfall Inspection
   a. The outfall pipe and associated effluent diffuser shall be maintained to ensure proper operation. Proper operation means that the outfall pipe be intact, operating as designed,

and have unobstructed flow. The plumes from each discharge port should be balanced relative to each other. Maintenance may include dredging in the vicinity of the diffuser, removal of solids and debris in the diffuser header pipe, and repair/replacement.

b. To determine if maintenance will be required, the Permittee shall inspect and videotape the operation of the outfall pipe/diffuser either remotely or using a qualified diver or marine contractor within one (1) year of the effective date of this Permit, the Permittee shall inspect and videotape the operation of the outfall pipe/diffuser and submit to the DEM a video of the diffuser/outfall pipe inspection along with copies of reports summarizing the results of the inspection. Where it is determined that maintenance will be necessary, the Permittee shall provide the proposed schedule for maintenance along with the results of the inspection.

c. Any necessary maintenance dredging must be performed only after receiving all necessary permits from DEM, Coastal Resources Management Council, U.S. Coast Guard, U.S. Army Corps of Engineers, and other appropriate agencies.

E. SLUDGE

The permittee shall conform and adhere to all conditions, practices and regulations as contained in the State of Rhode Island Rules and Regulations for Sewage Sludge Management (250-ICR-150-10-3). The permittee shall comply with its RIDEM Order of Approval for the disposal of sludge.

F. DETECTION LIMITS

All analyses of parameters under this permit must comply with the National Pollutant Discharge Elimination System (NPDES): *Use of Sufficiently Sensitive Test Methods for Permit Applications and Reporting* rule. Only sufficiently sensitive test methods may be used for analysis of parameters under this permit. The permittee shall assure that all wastewater testing required by this permit, is performed in conformance with the method detection limits listed below. All sludge testing required by this permit shall be in conformance with the method detection limits found in 40 CFR 503.8. In accordance with 40 CFR Part 136, EPA approved analysis techniques, quality assurance procedures and quality control procedures shall be followed for all reports required to be submitted under the RIPDES program. These procedures are described in "Methods for the Determination of Metals in Environmental Samples" (EPA/600/4-91/010) and "Methods for Chemical Analysis of Water and Wastes" (EPA/600/4-79/020).

The report entitled "Methods for the Determination of Metals in Environmental Samples" includes a test which must be performed in order to determine if matrix interferences are present, and a series of tests to enable reporting of sample results when interferences are identified. Each step of the series of tests becomes increasingly complex, concluding with the complete Method of Standard Additions analysis. The analysis need not continue once a result which meets the applicable quality control requirements has been obtained. Documentation of all steps conducted to identify and account for matrix interferences shall be submitted along with the monitoring reports.

If, after conducting the complete Method of Standard Additions analysis, the laboratory is unable to determine a valid result, the laboratory shall report "could not be analyzed". Documentation supporting this claim shall be submitted along with the monitoring report. If valid analytical results are repeatedly unobtainable, DEM may require that the permittee determine a method detection limit (MDL) for their effluent or sludge as outlined in 40 CFR Part 136, Appendix B.

Therefore, all sample results shall be reported as: an actual value, "could not be analyzed", less than the reagent water MDL, or less than an effluent or sludge specific MDL. The effluent or sludge specific MDL must be calculated using the methods outlined in 40 CFR Part 136, Appendix B. Samples which have been diluted to ensure that the sample concentration will be within the linear dynamic range shall not be diluted to the extent that the analyte is not detected. If this should occur the analysis shall be repeated using a lower degree of dilution.

When calculating sample averages for reporting on discharge monitoring reports (DMRs):

a. "could not be analyzed" data shall be excluded, and shall not be considered as failure to comply with the permit sampling requirements;
b. results reported as less than the MDL shall be included as zeros.

LIST OF TOXIC POLLUTANTS

The following list of toxic pollutants has been designated pursuant to Section 307(a)(1) of the Clean Water Act. The Method Detection Limits (MDLs) represent the required Rhode Island MDLs.

Volatiles - EPA Method 624		**MDLµg/l (ppb)**
1V	acrolein	10.0
2V	acrylonitrile	5.0
3V	benzene	1.0
5V	bromoform	1.0
6V	carbon tetrachloride	1.0
7V	chlorobenzene	1.0
8V	chlorodibromomethane	1.0
9V	chloroethane	1.0
10V	2-chloroethylvinyl ether	5.0
11V	chloroform	1.0
12V	dichlorobromomethane	1.0
14V	1,1-dichloroethane	1.0
15V	1,2-dichloroethane	1.0
16V	1,1-dichloroethylene	1.0
17V	1,2-dichloropropane	1.0
18V	1,3-dichloropropylene	1.0
19V	ethylbenzene	1.0
20V	methyl bromide	1.0
21V	methyl chloride	1.0
22V	methylene chloride	1.0
23V	1,1,2,2-tetrachloroethane	1.0
24V	tetrachloroethylene	1.0
25V	toluene	1.0
26V	1,2-trans-dichloroethylene	1.0
27V	1,1,1-trichloroethane	1.0
28V	1,1,2-trichloroethane	1.0
29V	trichloroethylene	1.0
31V	vinyl chloride	1.0

Acid Compounds - EPA Method 625		**MDL µg/l (ppb)**
1A	2-chlorophenol	1.0
2A	2,4-dichlorophenol	1.0
3A	2,4-dimethylphenol	1.0
4A	4,6-dinitro-o-cresol	1.0
5A	2,4-dinitrophenol	2.0
6A	2-nitrophenol	1.0
7A	4-nitrophenol	1.0
8A	p-chloro-m-cresol	2.0
9A	pentachlorophenol	1.0
10A	phenol	1.0
11A	2,4,6-trichlorophenol	1.0

Pesticides - EPA Method 608		**MDL µg/l (ppb)**
1P	aldrin	0.059
2P	alpha-BHC	0.058
3P	beta-BHC	0.043
4P	gamma-BHC	0.048
5P	delta-BHC	0.034
6P	chlordane	0.211
7P	4,4'-DDT	0.251
8P	4,4'-DDE	0.049
9P	4,4'-DDD	0.139
10P	dieldrin	0.082
11P	alpha-endosulfan	0.031
12P	beta-endosulfan	0.036
13P	endosulfan sulfate	0.109
14P	endrin	0.050
15P	endrin aldehyde	0.062
16P	heptachlor	0.029

Pesticides - EPA Method 608		**MDL µg/l (ppb)**
17P	heptachlor epoxide	0.040
18P	PCB-1242	0.289
19P	PCB-1254	0.298
20P	PCB-1221	0.723
21P	PCB-1232	0.387
22P	PCB-1248	0.283
23P	PCB-1260	0.222
24P	PCB-1016	0.494
25P	toxaphene	1.670

Base/Neutral - EPA Method 625		**MDL µg/l (ppb)**
1B	acenaphthene *	1.0
2B	acenaphthylene *	1.0
3B	anthracene *	1.0
4B	benzidine	4.0
5B	benzo(a)anthracene *	2.0
6B	benzo(a)pyrene *	2.0
7B	3,4-benzofluoranthene *	1.0
8B	benzo(ghi)perylene *	2.0
9B	benzo(k)fluoranthene *	2.0
10B	bis(2-chloroethoxy)methane	2.0
11B	bis(2-chloroethyl)ether	1.0
12B	bis(2-chloroisopropyl)ether	1.0
13B	bis(2-ethylhexyl)phthalate	1.0
14B	4-bromophenyl phenyl ether	1.0
15B	butylbenzyl phthalate	1.0
16B	2-chloronaphthalene	1.0
17B	4-chlorophenyl phenyl ether	1.0
18B	chrysene *	1.0
19B	dibenzo (a,h)anthracene *	2.0
20B	1,2-dichlorobenzene	1.0
21B	1,3-dichlorobenzene	1.0
22B	1,4-dichlorobenzene	1.0
23B	3,3'-dichlorobenzidine	2.0
24B	diethyl phthalate	1.0
25B	dimethyl phthalate	1.0
26B	di-n-butyl phthalate	1.0
27B	2,4-dinitrotoluene	2.0
28B	2,6-dinitrotoluene	2.0
29B	di-n-octyl phthalate	1.0
30B	1,2-diphenylhydrazine (as azobenzene)	1.0
31B	fluoranthene *	1.0
32B	fluorene *	1.0
33B	hexachlorobenzene	1.0
34B	hexachlorobutadiene	1.0
35B	hexachlorocyclopentadiene	2.0
36B	hexachloroethane	1.0
37B	indeno(1,2,3-cd)pyrene *	2.0
38B	isophorone	1.0
39B	naphthalene *	1.0
40B	nitrobenzene	1.0
41B	N-nitrosodimethylamine	1.0
42B	N-nitrosodi-n-propylamine	1.0
43B	N-nitrosodiphenylamine	1.0
44B	phenanthrene *	1.0
45B	pyrene *	1.0
46B	1,2,4-trichlorobenzene	1.0

* Polynuclear Aromatic Hydrocarbons

OTHER TOXIC POLLUTANTS

	MDL µg/l (ppb)
Antimony, Total	3.0
Arsenic, Total	1.0
Beryllium, Total	0.2
Cadmium, Total	0.1
Chromium, Total	1.0
Chromium, Hexavalent	20.0
Copper, Total	1.0
Lead, Total	1.0
Mercury, Total	0.2
Nickel, Total	1.0
Selenium, Total	2.0
Silver, Total	0.5
Thallium, Total	1.0
Zinc, Total	5.0
Asbestos	**
Cyanide, Free Available	10.0
Phenols, Total	50.0
TCDD	**
MTBE (Methyl Tert Butyl Ether)	1.0
Aluminum, Total	5.0

** No Rhode Island Department of Environmental Management (RIDEM) MDL

NOTE:
The MDL for a given analyte may vary with the type of sample. MDLs which are determined in reagent water may be lower than those determined in wastewater due to fewer matrix interferences. Wastewater is variable in composition and may therefore contain substances (interferents) that could affect MDLs for some analytes of interest. Variability in instrument performance can also lead to inconsistencies in determinations of MDLs.

To help verify the absence of matrix or chemical interference the analyst is required to complete specific quality control procedures. For the metals analyses listed above the analyst must withdraw from the sample two equal aliquots; to one aliquot add a known amount of analyte, and then dilute both to the same volume and analyze. The unspiked aliquot multiplied by the dilution factor should be compared to the original. Agreement of the results within 10% indicates the absence of interference. Comparison of the actual signal from the spiked aliquot to the expected response from the analyte in an aqueous standard should help confirm the finding from the dilution analysis. (Methods for Chemical Analysis of Water and Wastes EPA-600/4-79/020).

For Methods 624 and 625 the laboratory must on an ongoing basis, spike at least 5% of the samples from each sample site being monitored. For laboratories analyzing 1 to 20 samples per month, at least one spiked sample per month is required. The spike should be at the discharge permit limit or 1 to 5 times higher than the background concentration determined in Section 8.3.2, whichever concentration would be larger. (40 CFR Part 136 Appendix B Method 624 and 625 subparts 8.3.1 and 8.3.11).

G. **MONITORING AND REPORTING**

The monitoring program in the permit specifies sampling and analysis, which will provide continuous information on compliance and the reliability and effectiveness of the installed pollution abatement equipment. The approved analytical procedures found in 40 CFR Part 136 are required unless other procedures are explicitly required in the permit. The Permittee is obligated to monitor and report sampling results to the DEM within the time specified within the permit.

Unless otherwise specified in this permit, the permittee shall submit reports, requests, and information and provide notices in the manner described in this section.

1. Submittal of DMRs Using NetDMR
   The permittee shall continue to submit its monthly monitoring data in discharge monitoring reports (DMRs) to DEM no later than the 15th day of the month electronically using NetDMR. When the permittee submits DMRs using NetDMR, it is not required to submit hard copies of DMRs to DEM.

2. Submittal of Reports as NetDMR Attachments
   Unless otherwise specified in this permit, the permittee must submit electronic copies of documents in NetDMR that are directly related to the DMR. These include the following:
   - DMR Cover Letters
   - Below Detection Limit summary tables
   - Monthly Operating Reports

   All other reports (i.e. I/I reports, Priority Pollutant Scans, etc.) should be submitted to DEM hard copy via regular US mail (see Part I.F.4 below).

3. Submittal of Requests and Reports to DEM
   The following requests, reports, and information described in this permit shall be submitted to the DEM.

   A. Transfer of Permit notice
   B. Request for changes in sampling location
   C. Request for reduction in testing frequency
   D. Request for reduction in WET testing requirement
   E. Report on unacceptable dilution water / request for alternative dilution water for WET testing

   These reports, information, and requests shall be submitted to DEM by hard copy mail to the following address:

   Rhode Island Department of Environmental Management
   RIPDES Program
   235 Promenade Street
   Providence, Rhode Island 02908

4. Submittal of Reports in Hard Copy Form
   The following notifications and reports shall be submitted as hard copy with a cover letter describing the submission. These reports shall be signed and dated originals submitted to DEM.

   A. Written notification required under Part II (as needed)
   B. Notice of unauthorized discharges, including Sanitary Sewer Overflow (SSO) reporting (as needed)
   C. Priority Pollutant Scan results (October 15 each year)
   D. Species Sensitivity Report (December 31, 2027)
   E. Inflow/Infiltration Reports (January 15 every even year)
   F. Resiliency Plan (October 1, 2024)
   G. Outfall Inspection Report (October 1, 2024)
   H. PFAS Industrial Users Sampling Results (April 15 each year)

This information shall be submitted to DEM at the following address:

Rhode Island Department of Environmental Management
RIPDES Program
235 Promenade Street
Providence, RI 02908

5. Verbal Reports and Verbal Notifications
Any verbal reports or verbal notifications, if required in Parts I and/or II of this permit, shall be made to the DEM. This includes verbal reports and notifications which require reporting within 24 hours. (See Part II(l)(5) General Requirements for 24-hour reporting) Verbal reports and verbal notifications shall be made to DEM at (401) 222-4700 or (401) 222-3070 at night.

PART II

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DEFINITIONS

GENERAL REQUIREMENTS

(a) Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of Chapter 46-12 of the Rhode Island General Laws and the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

(1) The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

(2) The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA is subject to a civil penalty not to exceed $10,000 per day of such violation. Any person who willfully or negligently violates permit conditions implementing Sections 301, 302, 306, 307 or 308 of the Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment of not more than 1 year, or both.

(3) Chapter 46-12 of the Rhode Island General Laws provides that any person who violates a permit condition is subject to a civil penalty of not more than $5,000 per day of such violation. Any person who willfully or negligently violates a permit condition is subject to a criminal penalty of not more than $10,000 per day of such violation and imprisonment for not more than 30 days, or both. Any person who knowingly makes any false statement in connection with the permit is subject to a criminal penalty of not more than $5,000 for each instance of violation or by imprisonment for not more than 30 days, or both.

(b) Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The permittee shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Director. (The Director shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

(c) Need to Halt or Reduce Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(d) Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

(e) Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures, and, where applicable, compliance with DEM "Rules and Regulations Pertaining to the Operation and Maintenance of Wastewater Treatment Facilities" and "Rules and Regulations Pertaining to the Disposal and Utilization of Wastewater Treatment Facility Sludge." This provision requires the operation of back-up or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of the permit.

(f) Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause, including but not limited to: (1) Violation of any terms or conditions of this permit; (2) Obtaining this permit by misrepresentation or failure to disclose all relevant facts; or (3) A change in any conditions that requires either a temporary or permanent reduction or elimination of the authorized discharge. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

(g) Property Rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

(h) Duty to Provide Information

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

(i) Inspection and Entry

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

(2) Have access to and copy, at reasonable times any records that must be kept under the conditions of this permit;

(3) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this permit; and

(4) Sample or monitor any substances or parameters at any location, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA or Rhode Island law.

(j) Monitoring and Records

(1) Samples and measurements taken for the purpose of monitoring shall be representative of the volume and nature of the discharge over the sampling and reporting period.

(2) The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings from continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 5 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

(3) Records of monitoring information shall include:

(i) The date, exact place, and time of sampling or measurements;

(ii) The individual(s) who performed the sampling or measurements;

(iii) The date(s) analyses were performed;

(iv) The individual(s) who performed the analyses;

(v) The analytical techniques or methods used; and

(vi) The results of such analyses.

(4) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136 and applicable Rhode Island regulations, unless other test procedures have been specified in this permit.

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall upon conviction, be punished by a fine of not more than $10,000 per violation or by imprisonment for not more than 6 months per violation or by both. Chapter 46-12 of the Rhode Island General Laws also provides that such acts are subject to a fine of not more than $5,000 per violation, or by imprisonment for not more than 30 days per violation, or by both.

(6) Monitoring results must be reported on a Discharge Monitoring Report (DMR).

(7) If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR Part 136, applicable State regulations, or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

(k) Signatory Requirement

All applications, reports, or information submitted to the Director shall be signed and certified in accordance with 250-RICR-150-10-1.12 of the Rhode Island Pollutant Discharge Elimination System (RIPDES) Regulations. Rhode Island General Laws, Chapter 46-12 provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $5,000 per violation, or by imprisonment for not more than 30 days per violation, or by both.

(l) Reporting Requirements

(1) Planned changes. The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility.

(2) Anticipated noncompliance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with the permit requirements.

(3) Transfers. This permit is not transferable to any person except after written notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under State and Federal law.

(4) Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(5) Twenty-four hour reporting. The permittee shall immediately report any noncompliance which may endanger health or the environment by calling DEM at (401) 222-4700 or (401) 222-3070 at night.

A written submission shall also be provided within five (5) days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

The following information must be reported immediately:

(i) Any unanticipated bypass which causes a violation of any effluent limitation in the permit; or

(ii) Any upset which causes a violation of any effluent limitation in the permit; or

(iii) Any violation of a maximum daily discharge limitation for any of the pollutants specifically listed by the Director in the permit.

The Director may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

(6) Other noncompliance. The permittee shall report all instances of noncompliance not reported under paragraphs (1), (2), and (5), of this section, at the time monitoring reports are submitted. The reports shall contain the information required in paragraph (l)(5) of the section.

(7) Other information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, they shall promptly submit such facts or information.

(m) Bypass

"Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.

(1) Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (2) and (3) of this section.

(2) Notice.

(i) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten (10) days before the date of the bypass.

(ii) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in 250-RICR-150-10-1.14(R) of the RIPDES Regulations.

(3) Prohibition of bypass.

(i) Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:

(A) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage, where "severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production;

(B) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

(C) The permittee submitted notices as required under paragraph (2) of this section.

(ii) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in paragraph (3)(i) of this section.

(n) Upset

"Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

(1) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of paragraph (2) of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

(2) Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(a) An upset occurred and that the permittee can identify the cause(s) of the upset;

(b) The permitted facility was at the time being properly operated;

(c) The permittee submitted notice of the upset as required in 250-RICR-150-10-1.14(R) of the RIPDES Regulations; and

(d) The permittee complied with any remedial measures required under 250-RICR-150-10-1.14(E) of the RIPDES Regulations.

(3) Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

(o) Change in Discharge

All discharges authorized herein shall be consistent with the terms and conditions of this permit. Discharges which cause a violation of water quality standards are prohibited. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Any anticipated facility expansions, production increases, or process modifications which will result in new, different or increased discharges of pollutants must be reported by submission of a new NPDES application at least 180 days prior to commencement of such discharges, or if such changes will not violate the effluent limitations specified in this permit, by notice, in writing, to the Director of such changes. Following such notice, the permit may be modified to specify and limit any pollutants not previously limited.

Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by the permit constitutes a violation.

(p) Removed Substances

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in a manner consistent with applicable Federal and State laws and regulations including, but not limited to the CWA and the Federal Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq., Rhode Island General Laws, Chapters 46-12, 23-19.1 and regulations promulgated thereunder.

(q) Power Failures

In order to maintain compliance with the effluent limitation and prohibitions of this permit, the permittee shall either:

> In accordance with the Schedule of Compliance contained in Part I, provide an alternative power source sufficient to operate the wastewater control facilities;

or if such alternative power source is not in existence, and no date for its implementation appears in Part I,

> Halt reduce or otherwise control production and/or all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater control facilities.

(r) Availability of Reports

Except for data determined to be confidential under paragraph (w) below, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the DEM, 235 Promenade Street, Providence, Rhode Island 02908. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA and under Section 46-12-14 of the Rhode Island General Laws.

(s) State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law.

(t) Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, nor does it relieve the permittee of its obligation to comply with any other applicable Federal, State, and local laws and regulations.

(u) Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

(v) Reopener Clause

The Director reserves the right to make appropriate revisions to this permit in order to incorporate any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under the CWA or State law. In accordance with 250-RICR-150-10-1.16 and 250-RICR-150-10-1.24 of the RIPDES Regulations, if any effluent standard or prohibition, or water quality standard is promulgated under the CWA or under State law which is more stringent than any limitation on the pollutant in the permit, or controls a pollutant not limited in the permit, then the Director may promptly reopen the permit and modify or revoke and reissue the permit to conform to the applicable standard.

(w) Confidentiality of Information

(1) Any information submitted to DEM pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, DEM may make the information available to the pubic without further notice.

(2) Claims of confidentiality for the following information will be denied:

(i) The name and address of any permit applicant or permittee;

(ii) Permit applications, permits and any attachments thereto; and

(iii) NPDES effluent data.

(x) Best Management Practices

The permittee shall adopt Best Management Practices (BMP) to control or abate the discharge of toxic pollutants and hazardous substances associated with or ancillary to the industrial manufacturing or treatment process and the Director may request the submission of a BMP plan where the Director determines that a permittee's practices may contribute significant amounts of such pollutants to waters of the State.

(y) Right of Appeal

Within thirty (30) days of receipt of notice of a final permit decision, the permittee or any interested person may submit a request to the Director for an adjudicatory hearing to reconsider or contest that decision. The request for a hearing must conform to the requirements of 250-RICR-150-10-1.50 of the RIPDES Regulations.

DEFINITIONS

1. For purposes of this permit, those definitions contained in the RIPDES Regulations, and the Rhode Island Pretreatment Regulations shall apply.

2. The following abbreviations, when used, are defined below.

cu. M/day or M^3/day	cubic meters per day
mg/l	milligrams per liter
µg/l	micrograms per liter
lbs/day	pounds per day
kg/day	kilograms per day
Temp. °C	temperature in degrees Centigrade
Temp. °F	temperature in degrees Fahrenheit
Turb.	turbidity measured by the Nephelometric Method (NTU)
TNFR or TSS	total nonfilterable residue or total suspended solids
DO	dissolved oxygen
BOD	five-day biochemical oxygen demand unless otherwise specified
TKN	total Kjeldahl nitrogen as nitrogen
Total N	total nitrogen
NH_3-N	ammonia nitrogen as nitrogen
Total P	total phosphorus
COD	chemical oxygen demand
TOC	total organic carbon
Surfactant	surface-active agent
pH	a measure of the hydrogen ion concentration
PCB	polychlorinated biphenyl
CFS	cubic feet per second
MGD	million gallons per day
Oil & Grease	Freon extractable material
Total Coliform	total coliform bacteria
Fecal Coliform	total fecal coliform bacteria
ml/l	milliliter(s) per liter
NO_3-N	nitrate nitrogen as nitrogen
NO_2-N	nitrite nitrogen as nitrogen
NO_3-NO_2	combined nitrate and nitrite nitrogen as nitrogen
$C1_2$	total residual chlorine

Attachment A PFAS Analyte List

Target Analyte Name	Abbreviation	CAS Number
Perfluoroalkyl carboxylic acids		
Perfluorobutanoic acid	PFBA	375-22-4
Perfluoropentanoic acid	PFPeA	2706-90-3
Perfluorohexanoic acid	PFHxA	307-24-4
Perfluoroheptanoic acid	PFHpA	375-85-9
Perfluorooctanoic acid	PFOA	335-67-1
Perfluorononanoic acid	PFNA	375-95-1
Perfluorodecanoic acid	PFDA	335-76-2
Perfluoroundecanoic acid	PFUnA	2058-94-8
Perfluorododecanoic acid	PFDoA	307-55-1
Perfluorotridecanoic acid	PFTrDA	72629-94-8
Perfluorotetradecanoic acid	PFTeDA	376-06-7
Perfluoroalkyl sulfonic acids		
Acid Form		
Perfluorobutanesulfonic acid	PFBS	375-73-5
Perfluoropentansulfonic acid	PFPeS	2706-91-4
Perfluorohexanesulfonic acid	PFHxS	355-46-4
Perfluoroheptanesulfonic acid	PFHpS	375-92-8
Perfluorooctanesulfonic acid	PFOS	1763-23-1
Perfluorononanesulfonic acid	PFNS	68259-12-1
Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorododecanesulfonic acid	PFDoS	79780-39-5
Fluorotelomer sulfonic acids		
1H,1H, 2H, 2H-Perfluorohexane sulfonic acid	4:2FTS	757124-72-4
1H,1H, 2H, 2H-Perfluorooctane sulfonic acid	6:2FTS	27619-97-2
1H,1H, 2H, 2H-Perfluorodecane sulfonic acid	8:2FTS	39108-34-4
Perfluorooctane sulfonamides		
Perfluorooctanesulfonamide	PFOSA	754-91-6
N-methyl perfluorooctanesulfonamide	NMeFOSA	31506-32-8
N-ethyl perfluorooctanesulfonamide	NEtFOSA	4151-50-2
Perfluorooctane sulfonamidoacetic acids		
N-methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA	2355-31-9
N-ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA	2991-50-6
Perfluorooctane sulfonamide ethanols		
N-methyl perfluorooctanesulfonamidoethanol	NMeFOSE	24448-09-7
N-ethyl perfluorooctanesulfonamidoethanol	NEtFOSE	1691-99-2
Per- and Polyfluoroether carboxylic acids		
Hexafluoropropylene oxide dimer acid	HFPO-DA	13252-13-6
4,8-Dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4
Perfluoro-3-methoxypropanoic acid	PFMPA	377-73-1
Perfluoro-4-methoxybutanoic acid	PFMBA	863090-89-5
Nonafluoro-3,6-dioxaheptanoic acid	NFDHA	151772-58-6

Target Analyte Name	Abbreviation	CAS Number
Ether sulfonic acids		
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	9Cl-PF3ONS	756426-58-1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9
Perfluoro(2-ethoxyethane)sulfonic acid	PFEESA	113507-82-7
Fluorotelomer carboxylic acids		
3-Perfluoropropyl propanoic acid	3:3FTCA	356-02-5
2H,2H,3H,3H-Perfluorooctanoic acid	5:3FTCA	914637-49-3
3-Perfluoroheptyl propanoic acid	7:3FTCA	812-70-4

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
235 PROMENADE STREET
PROVIDENCE, RHODE ISLAND 02908-5767

FACT SHEET

RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM (RIPDES) PERMIT TO DISCHARGE TO WATERS OF THE STATE

RIPDES PERMIT NO. RI0100188

NAME AND ADDRESS OF APPLICANT:

Town of Narragansett
Narragansett Town Hall
25 Fifth Avenue
Narragansett, Rhode Island 02882

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Scarborough Wastewater Treatment Facility
990 Ocean Road
Narragansett, Rhode Island 02882

RECEIVING WATER: Rhode Island Sound
WBID: RI0010042E-02A
CLASSIFICATION: SB1

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I. PROPOSED ACTION, TYPE OF FACILITY, AND DISCHARGE LOCATION

The above-named applicant has applied to the Rhode Island Department of Environmental Management for reissuance of a Rhode Island Discharge Elimination System (RIPDES) Permit to discharge into the designated receiving water. The facility is engaged in the treatment of domestic, commercial, and industrial sewage. The discharge to Rhode Island Sound consists of treated effluent from the Scarborough Wastewater Treatment Plant (outfall 001A). The latitude / longitude coordinates of the outfall are 41.2247, -71.2812, which is approximately 2,200 feet from shore, and is located in water approximately 28 feet deep. The sampling location is after dechlorination. A layout/process diagram of the facility is shown in Attachment A-1.

II. DESCRIPTION OF DISCHARGE

A quantitative description of the discharge in terms of significant effluent parameters based on the facility's Discharge Monitoring Report (DMR) data from December 2017 to November 2022 is shown in Attachment A-2. A review of the historic discharge data demonstrate that the Scarborough WWTF can comply with all limitations given.

III. PERMIT LIMITATIONS AND CONDITIONS

The final effluent limitations and monitoring requirements may be found in the permit.

IV. PERMIT BASIS AND EXPLANATION OF EFFLUENT LIMITATION DERIVATION

Variances, Alternatives, and Justifications for Waivers of Application Requirements

No variances or alternatives to required standards were requested or granted. No waivers were requested or granted for any application requirements per 40 CFR §122.21(j) or (q).

Facility Description

The Town of Narragansett owns and operates the Wastewater Treatment Facility located on 990 Ocean Road in Narragansett, Rhode Island. The discharge to the Rhode Island Sound consists of treated sanitary sewage contributed by the municipality of Narragansett. The Scarborough WWTF does not have an industrial pretreatment program.

Treatment consists of Coarse Screening, Fine Screening, Aerated Grit Removal, Grit Removal via Screw Conveyer, Extended Aeration, Secondary Settling, Chlorination, and Dechlorination. A process flow diagram is attached as Attachment A-1.

Scarborough's most recent RIPDES permit, authorizing discharges from the above-mentioned facility, was issued on August 30, 2017. This permit became effective on October 1, 2017 and expired on October 1, 2022. The facility submitted an application for permit reissuance to the DEM on December 10, 2021. On January 18, 2022, the DEM issued an application complete letter to the facility. In accordance with 250-RICR-150-10-1 §13 of the Regulations for the Rhode Island Pollutant Discharge Elimination System, the facility's October 1, 2017, permit remains in effect since the DEM has determined that a timely and complete permit application was submitted. Once this permit is reissued, it will supersede the October 1, 2017, permit.

Receiving Water Description

The waterbody segment for the Rhode Island Sound is RI0010042E-02A and is located in Narragansett, Rhode Island. This segment is described as coastal waters in the vicinity of Scarborough within 500 feet of Narragansett-Scarborough WWTF outfall located approximately 2,000 feet from a point of land at the northern boundary of Fort Nathaniel Greene. This segment of the Rhode Island Sound has a Waterbody Classification of SB1. These waters are designated for primary and secondary contact recreational activities and fish and wildlife habitat. They shall be suitable for

aquaculture uses, navigation, and industrial cooling. These waters shall have good aesthetic value. Primary contact recreational activities may be impacted due to pathogens from approved wastewater discharges. However, all Class SB criteria must be met.

This segment is not listed as impaired on DEM's March 2022 Integrated Report. Impaired waters include those where TMDLs are required (i.e., Category 5 Waters or 303d List of Impaired Waters) and those where TMDLs are not required (i.e., Category 4 Waters).

Permit Limit Development

The requirements set forth in this permit are from the Rhode Island Water Quality Regulations (RICR 250-RICR-150-05-1) and the State's Regulations for the Rhode Island Pollutant Discharge Elimination System, both filed pursuant to RIGL Chapter 46-12, as amended. DEM's primary authority over the permit comes from EPA's delegation of the program in September 1984 under the Federal Clean Water Act (CWA).

Development of RIPDES permit limitations is a multi-step process consisting of: determining if Federal effluent guidelines apply; calculation of allowable water quality-based discharge levels based on background data and available dilution; assigning appropriate Best Professional Judgement (BPJ) based limits; comparing existing and proposed limits; comparing discharge data to proposed limits; performing an antidegradation/antibacksliding analysis to determine the final permit limits; and developing interim limits as appropriate.

Water quality criteria are comprised of numeric and narrative criteria. Numeric criteria are scientifically derived ambient concentrations developed by EPA or the State for various pollutants of concern to protect human health and aquatic life. Narrative criteria are statements that describe the desired water quality goal. A water quality-based permit limit protects receiving water quality by ensuring that water quality standards are met.

A technology-based limit is a numeric limit, which is determined by examining the capability of a treatment process to reduce or eliminate pollutants.

WWTF Conventional Pollutant Permit Limitations

Flow Limits

The basis for the facility's average monthly flow limit of 1.458 MGD is the facility's "Facilities Plan" dated October 11, 2007.

BOD_5, TSS, and pH

The biochemical oxygen demand (BOD_5) and total suspended solids TSS limitations as well as the pH limitations contained in this permit are based upon the secondary treatment requirements of Section 301 (b)(1)(B) of the CWA as defined in 40 CFR 133.102 (a) - (c). The "Maximum Daily" BOD_5 and TSS limits and the enterococci limits are based on Rhode Island requirements for Publicly Owned Treatment Works (POTW's) under Section 401 (a)(1) of the CWA and in 40 CFR 124.53 and 124.56. The "Percent Removal" requirements for BOD_5 and TSS are assigned in accordance with 40 CFR 133.102(a) and (b) respectively.

Settleable Solids

Settleable Solids monitoring has been included as a process-control parameter that can aid in the assessment of the operation of the plant but does not need to have an effluent limit.

Oil and Grease

Oil and Grease monitoring requirements have been maintained in this permit in order to serve as a process control parameter. Monitoring data will serve as a monitor of potential excessive levels of Oil and Grease in the collection system that may cause backups and blockages.

Bacteria

The RI Water Quality Regulations (RICR 250-RICR-150-05-1) include enterococci criteria for primary contact recreation / swimming of a geometric mean of 35 colonies/100 mL and a single sample maximum of 104 colonies/100mL (§ 1.10(E)(1)). The "single sample maximum" value is only used by the Rhode Island Department of Health to evaluate swimming advisories at public beaches and is not applied to the receiving water in the area of the Scarborough WWTF outfall. EPA's November 12, 2008, memorandum regarding "Initial Zones of Dilution for Bacteria in Rivers and Streams Designated for Primary Contact Recreation" specifies that it is not appropriate to use dilution for bacteria criteria in receiving waters that are designated for primary contact recreation. Therefore, because the receiving water is designated for primary contact recreation, the DEM has assigned a monthly geometric mean enterococci limit of 35 colonies/100mL. The daily maximum enterococci limit has been set at the 90% upper confidence level value for "lightly used full body contact recreation" of 276 colonies/100ml[1].

The DEM has maintained fecal coliform monitoring to ensure that the discharge from the WWTF will not have an impact in any areas designated for shellfish harvesting outside of the immediate vicinity of the outfall.

WWTF Toxic Pollutant Limits

Water Quality-Based Limit (WQBEL) Calculations

The allowable effluent limitations were established on the basis of acute and chronic aquatic life criteria and human health criteria using the following: available instream dilution; an allocation factor; and background concentrations when available and/or appropriate. The aquatic life and human health criteria are specified in the Rhode Island Water Quality Regulations (250-RICR-150-05-1). Aquatic life criteria have been established to ensure the protection and propagation of aquatic life while human health criteria represent the pollutant levels that would not result in a significant risk to public health from ingestion of aquatic organisms. The more stringent of the two criteria was then used in establishing allowable effluent limitations. Details concerning the calculation of potential permit limitations, selection of factors, which influence their calculation, and the selection of final permit limitations are included below or in the attached documents. The Scarborough WWTF's October 1, 2017, permit also contained WQBELs. The Town's first permit to contain WQBELs was issued on September 20, 1994.

Mixing Zones and Dilution Factors

In order to evaluate the need for water quality-based limits, it is necessary to determine the mixing which occurs in the immediate vicinity of the wastewater discharge (initial dilution). The Scarborough WWTF's effluent is discharged through a twenty-two (22) inch pipe which is approximately 2,000 feet offshore and fitted with a diffuser. The diffuser pipe diameter ranges from twenty (20) inches to sixteen (16) inches and consists of three (3) twelve (12) inch diameter ports, each of which is 4.5 feet above the ocean bottom. A diagram of the pipe diffuser is included in Attachment A-3 of this permit. As outlined in the fact sheet of Scarborough WWFT's September 30, 1994, permit, the DEM defined acute and chronic mixing zones in accordance with RI Water Quality Regulations and guidance provided by the U.S. EPA publication entitled "Technical Support Document for Water Quality-Based Toxics Control (1991)." The procedure used was to limit the acute mixing zone to a small area where rapid mixing occurs, and the chronic mixing zone to a larger area where ocean currents and diffusion provide additional mixing. Using the results of the EPA mixing zone guidance, the acute zone is defined as a circular region centered at the outfall with a radius of approximately 13.5 meters or 44 feet. The chronic zone is also circular, centered at diffuser midpoint, and has a radius of approximately 135 meters or 443 feet. In order to determine dilution factors for both mixing zones, the EPA computer

[1]United States Environmental Protection Agency. Ambient Water Quality Criteria for Bacteria – 1986. Publication 440-5-84002. https://www.epa.gov/sites/default/files/2019-03/documents/ambient-wqc-bacteria-1986.pdf. Accessed April 2023.

model, CORMIX2, was applied.

As also discussed in the fact sheet of the December 27, 2005, permit. Rule 17 of the RIPDES Regulations requires the use of the design flow when establishing limits for POTWs. Based upon the design flow of 1.4 MGD (as noted in Order of Approval No. 436), the mean low water depth at the discharge pipe of twenty (20) feet, and a conservative estimate of ambient current velocity (0.16 feet per second), an acute dilution of 25:1 and a chronic dilution of 45:1 were determined using CORMIX2. The Scarborough WWTF mixing zone is presented in Attachment A-4, and an aerial photograph of the mixing zone is presented in Attachment A-5.

The Rhode Island Water Quality Regulations at 250-RICR-150-05-1.18(N)(1) require in-stream concentrations of discharged pollutants to be determined by specific formulas, or other methods which may be found to be acceptable.

Using the above-mentioned dilution factors the allowable discharge limits were calculated as follows:

a) Background concentration unknown or available data is impacted by sources that have not yet achieved water quality-based limits.

   $Limit_1 = (DF) * (Criteria) * (80\%)$

   Where: DF = acute or chronic dilution factor, as appropriate

b) Using the available background concentration data[2].

   $Limit_1 = (DF) * (Criteria) * (90\%) – (Background) * (DF – 1)$

   Where: DF = acute or chronic dilution factor, as appropriate

Since specific background data was not available for this discharge, the DEM used the equation in part (a) above to calculate water quality-based limits. Attachment A-6 includes the calculations of allowable limits based on Aquatic Life and Human Health Criteria. A summary of Priority Pollutant Scan Data and RIPDES Permit Application Data for the years 2017 to 2022 can be found in Attachment A-7. A Comparison of Allowable Limits with Discharge Monitoring Report data and State User Fee Data can be found in Attachment A-8.

The formulas and data noted above were applied with the following exceptions:

a) Pollutants that, based on acute and chronic dilution factors, have a higher allowable chronic limit than allowable acute limit. For this situation, both the “Monthly Average” and “Daily Maximum” limits were set at the allowable acute limit.

b) Total residual chlorine. The limits for total residual chlorine (TRC) were established in accordance with the DEM Effluent Disinfection Policy. The “Monthly Average” and “Daily Maximum” were based on a 100% allocation, a zero-background data concentration, and the appropriate dilution factor(s). The 100% allocation factor for TRC was used due to the nonconservative nature of chlorine and the improbability of the receiving water having a detectable background TRC concentration.

c) Pollutants with water quality based monthly average limits in the previous RIPDES Permit. The relaxation of monthly average limits from the previous permit was restricted in accordance with the antibacksliding provisions of the Clean Water Act and the Policy on the Implementation of the Antidegradation Provisions of the Rhode Island Water Quality Regulations.

Wasteload Allocation

Based on the above dilution factors and the saltwater aquatic life and non-Class A human health criteria, from the Rhode Island Water Quality Regulations, allowable discharge concentrations were established using 80% allocation and 100% allocation of total residual chlorine (TRC) due to the fact that Chlorine is not expected to be found in ambient water and it is a non-conservative pollutant.

In accordance with 40 CFR Part 122.4(d)(1)(iii), it is only necessary to establish limitations for those pollutants in the discharge which have the reasonable potential to cause or contribute to the exceedance of the in-stream criteria. In order to evaluate the need for permit limitations, the allowable discharge levels (permit limits) were compared to Discharge Monitoring Report (DMR) data, Priority Pollutant Scan data, and data provided in the facility's December 10, 2021, permit application. An assessment was made to determine if limits were necessary, using the data collected during the previous five (5) years. Based on these comparisons, water quality limitations have been deemed necessary only for Total Residual Chlorine. In addition, monitoring for Copper, Cyanide, Cadmium, Hexavalent Chromium, Zinc, Nickel, Lead, and Aluminum have been maintained in the permit as part of the quarterly toxicity testing requirements.

Priority Pollutants

The required priority pollutants scans are to be performed annually for the EPA Priority Pollutants as listed in 40 CFR 122, Appendix D, Tables II and III. The priority pollutant scans are typically performed during the third calendar quarter bioassay sampling event.

WET Testing

The biomonitoring requirements are set forth in 40 CFR 131.11 and in the State's Water Quality Regulations (RICR 250-RICR-150-05-1), § 1.10(B)(1), containing narrative conditions that state, at a minimum, all waters shall be free of pollutants in concentrations or combinations or from anthropogenic activities subject to these regulations that: adversely affect the composition of fish and wildlife; adversely affect the physical, chemical, or biological integrity of the habitat; interfere with the propagation of fish and wildlife; adversely alter the life cycle functions, uses, processes, and activities of fish and wildlife; or adversely affect human health. In order to determine compliance with many of these conditions, WET testing is required.

DEM's toxicity permitting policy is based on past toxicity data and the level of available dilution. Scarborough's bioassay limit of ≥100% effluent for an LC_{50} value is based on is based upon 40 CFR 131.11. If recurrent toxicity is demonstrated, then toxicity identification and reduction will be required. The bioassay requirement (Whole Effluent Toxicity [WET Testing]) in the permit consists of an acute LC_{50} test, and an LC_{50} toxicity limit of ≥100% effluent. WET testing requirement can be found in Section I.B. of the permit. Section I.B.11 has been added to the permit, containing a requirement for a Species Sensitivity Screening Report to be submitted with the facility's next RIPDES Permit reapplication. Section I.B.11 of the permit has been added to be consistent with DEM's WET Policy in order to ensure the WET limits in the permit are evaluated using the most sensitive applicable marine species.

Nutrients

The effluent monitoring requirements have been specified in accordance with the RIPDES regulations as well as 40 CFR 122.41 (j), 122.44 (i), and 122.48 to yield data representative of the discharge. Summer (May through October) testing requirements for TKN, Nitrite, and Nitrate have been increased to twice per month while winter (November through April) monthly monitoring is now required.

Emerging Contaminants

Per-and polyfluoroalkyl substances (PFAS) are a group of synthetic chemicals that have been in use since the 1940s. They are found in a wide array of consumer and industrial products. PFAS manufacturing and processing facilities, facilities using PFAS in production of other products, airports, and military installations can be contributors of PFAS releases into the air, soil, and water. Due to their widespread use and persistence in the environment, most people in the United States have been exposed to PFAS. Exposure to some PFAS above certain levels may increase risk of adverse health

effects.[2] DEM is collecting information to evaluate the potential impacts that discharges of PFAS from wastewater treatment plants may have on downstream uses, which can include drinking water, recreational and aquatic life uses depending on the receiving water.

The Environmental Protection Agency (EPA) established a Drinking Water Health Advisory in 2016 for Perfluorooctanoic Acid (PFOA), Perfluorooctanesulfonic Acid (PFOS), or a combination of these chemicals at 70 parts per trillion (ppt) or 70 nanogram per liter (ng/l). This Drinking Water Health Advisory was established to protect against adverse health effects that studies have indicated can be caused by exposure to these chemicals. In 2017, the Rhode Island Department of Health (DOH) began the process of sampling public wells for these pollutants due to increasing public health concerns about their possible presence in drinking water. Also in 2017, DEM adopted the EPA health advisory as a groundwater quality standard.

In 2022, Rhode Island passed a law concerning PFAS in drinking water, groundwater and surface waters. The Rhode Island law establishes monitoring requirements for public water supplies as well as drinking water treatment requirements if the sum of the concentrations of the following six species of PFAS exceed 20 ppt.

Perfluorohexanesulfonic acid (PFHxS)
Perfluoroheptanoic acid (PFHpA)
Perfluorononanoic acid (PFNA)
Perfluorooctanesulfonic acid (PFOS)
Perfluorooctanoic acid (PFOA)
Perfluorodecanoic acid (PFDA)

The 2022 Rhode Island law is consistent with the Massachusetts Department of Environmental Protection (Mass DEP) public drinking water standard regarding allowable concentrations and PFAS species. In addition to drinking water requirements, the 2022 Rhode Island law also compels DEM to adopt a groundwater quality standard and a surface water action level by December 31, 2023.

Although the Rhode Island Water Quality Regulations (250-RICR-150-05-1) do not include numeric criteria for PFAS, the RI Water Quality Regulations § 1.10(E)(1)(saltwater) under Chemical Constituents have narrative requirements that prohibits the discharge of pollutants in concentration or combinations that could be harmful to humans or fish and wildlife for the most sensitive and governing water class use.

Since PFAS chemicals are persistent in the environment and may lead to adverse human health and environmental effects, the Permit requires that the facility conduct quarterly influent and effluent sampling for PFAS chemicals and annual sampling of certain industrial users using draft EPA Method 1633 until a 40 CFR Part 136 approved method is made available to the public.

The purpose of this monitoring and reporting requirement is to better understand potential discharges of PFAS from this facility and to inform future permitting decisions, including the potential development of water quality-based effluent limits on the facility-specific basis. DEM is authorized to require this monitoring and reporting by CWA § 308(a), which states:

> "SEC. 308. (a) Whenever required to carry out the objective of this Act, including but not limited to (1) developing or assisting in the development of any effluent limitation, or other limitation, prohibition, or effluent standard, pretreatment standard, or standard of performance under this Act; (2) determining whether any person is in violation of any such effluent limitation, or other limitation, prohibition or effluent standard, pretreatment standard, or standard of performance; (3) any requirement established under this section; or (4)

[2] EPA, *EPA's Per- and Polyfluoroalkyl Substances (PFAS) Action Plan,* EPA 823R18004, February 2019. http://www.epa.gov/sites/production/files/201902/documents/pfas_action_plan_021319_508compliant_1.pdf

carrying out sections 305, 311, 402, 404 (relating to State permit programs), 405, and 504 of this Act –

a. The Administrator shall require the owner or operator of any point source to (i) establish and maintain such records, (ii) make such reports, (iii) install, use, and maintain such monitoring equipment or methods (including where appropriate, biological monitoring methods), (iv) sample such effluents (in accordance with such methods, at such locations, at such intervals, and in such manner as the Administrator shall prescribe), and (v) provide such other information as he may reasonably require…"

Since an EPA method for sampling and analyzing PFAS in wastewater is not currently available, the permit requires that PFAS be analyzed using draft EPA method 1633 until a 40 CFR Part 136 approved test method for wastewater is made available to the public. This approach is consistent with 40 CFR § 122.44(i)(1)(iv)(b) which states that in the case of pollutants or pollutant parameters for which there are no approved methods under 40 CFR Part 136 or methods are not otherwise required under 40 CFR chapter I, subchapter N or O, monitoring shall be conducted according to a test procedure specified in the permit for such pollutants or pollutant parameters.

The reporting requirement for the listed PFAS parameter takes effect the first calendar quarter of 2024. The PFAS Analytes that are required to be reported are listed in Attachment A of the permit. Sampling requirements include influent, effluent, and any relevant industrial users.

Antibacksliding and Antidegradation

Provided below is a brief introduction to Antibacksliding and Antidegradation; as well as a discussion on how the two policies were used to calculate water quality-based limits.

Antibacksliding

Antibacksliding restricts the level of relaxation of water quality-based limits from the previous permit. Section 303(d)(4) of the Clean Water Act addresses antibacksliding as the following:

a) Standards not attained – For receiving waters that have not attained the applicable water quality standards, limits based on a TMDL or WLA can only be revised if the water quality standards will be met. This may be done by (i) determining that the cumulative effect of all such revised limits would assure the attainment of such water quality standards; or (ii) removing the designated use which is not being attained in accordance with regulations under Section 303.

b) Standards attained – For receiving waters achieving or exceeding applicable water quality standards, limits can be relaxed if the revision is consistent with the State's Antidegradation Policy.

Therefore, in order to determine whether backsliding is permissible, the first question that must be asked is whether or not the receiving water is attaining the water quality standard. The DEM has determined the most appropriate evaluation of existing water quality is by calculating pollutant levels, which would result after the consideration of all currently valid RIPDES permit limits or historic discharge data (whichever is greater), background data (when available), and any new information (i.e., dilution factors).

Antidegradation

The DEM's "*Policy on the Implementation of the Antidegradation Provisions of the Rhode Island Water Quality Regulations July 2006*" (the Policy) established four tiers of water quality protection:

Tier 1. In all surface waters, existing uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.

Tier 2. In waters where the existing water quality criteria exceeds the levels necessary to support the propagation of fish and wildlife and recreation in and on the water, that quality shall be maintained and protected except for insignificant changes in water quality as determined by the Director and in accordance with the Antidegradation Implementation Policy, as amended. In addition, the Director may allow significant degradation, which is determined to be necessary to achieve important economic or social benefits to the State in accordance with the Antidegradation Policy.

Tier 2½. Where high quality waters constitute Special Resource Protection Waters SRPWs[3], there shall be no measurable degradation of the existing water quality necessary to protect the characteristics which cause the waterbody to be designated a SRPW. Notwithstanding that all public drinking water supplies are SRPWs, public drinking water suppliers may undertake temporary and short-term activities within the boundary perimeter of a public drinking water supply impoundment for essential maintenance or to address emergency conditions in order to prevent adverse effect on public health or safety. These activities must comply with the requirements set forth in Tier 1 and Tier 2.

Tier 3. Where high quality waters constitute an Outstanding Natural Resource ONRWs[4], that water quality shall be maintained and protected. The State may allow some limited activities that result in temporary or short-term changes in the water quality of an ONRW. Such activities must not permanently degrade water quality or result in water quality lower than necessary to protect the existing uses in the ONRW.

The formulas previously presented ensure that permit limitations are based upon water quality criteria and methodologies established to ensure that all designated uses will be met.

In terms of the applicability of Tier 2 of the Policy, a waterbody is assessed as being high quality on a parameter-by-parameter basis. In accordance with Part II of the Policy, "Antidegradation applies to all new or increased projects or activities which may lower water quality or affect existing water uses, including but not limited to all 401 Water Quality Certification reviews and any new, reissued, or modified RIPDES permits." Part VI.A of the Policy indicates that it is not applicable to activities which result in insignificant (i.e., short-term minor) changes in water quality and that significant changes in water quality will only be allowed if it is necessary to accommodate important economic and social development in the area in which the receiving waters are located (important benefits demonstration). Part VI.B.4 of the Policy states that: "Theoretically, any new or increased discharge or activity could lower existing water quality and thus require the important benefits demonstration. However, DEM will: 1) evaluate applications on a case-by-case basis, using BPJ and all pertinent and available facts, including scientific and technical data and calculations as provided by the applicant; and 2) determine whether the incremental loss is significant enough to require the important benefits demonstration described below. [If not then as a general rule DEM will allocate no more than 20%.] Some of the considerations which will be made to determine if an impact is significant in each site-specific decision are: 1) percent change in water quality parameter value and their temporal distribution; 2) quality and value of the resource; 3) cumulative impact of discharges and activities on water quality to date; 4) measurability of the change; 5) visibility of the change; 6) impact on fish and wildlife habitat; and 7) impact on potential and existing uses. As a general guide, any discharge or activity which consumes greater than 20% of the remaining assimilative capacity may be deemed significant and invoke full requirements to demonstrate important economic or social benefits."

In terms of a RIPDES permit, an increased discharge is defined as an increase in any limitation, which would result in an increased mass loading to a receiving water. The baseline for this comparison would be the monthly average mass loading established in the previous permit. It would be

[3] SRPWs are surface waters identified by the Director as having significant recreational or ecological uses.

[4] ONRWs are a special subset of high-quality water bodies, identified by the State as having significant recreational or ecological water uses.

inappropriate to use the daily maximum mass loading since the Policy is not applicable to short-term changes in water quality.

For the purposes of ensuring that the revised limit is consistent with the requirements of antidegradation, existing water quality must be defined. As explained earlier, DEM evaluates existing water quality by determining the pollutant levels which would result under the design conditions appropriate for the particular criteria (i.e., background water quality, when available and/or appropriate, non-point source inputs; and existing RIPDES permit limitations or recent historical discharge data, whichever is higher). In general, available data would be used to make this determination.

Use the above-mentioned criteria, the present instream water quality C_p is defined as:

$$C_p = \frac{(DF - 1) \cdot C_B + (1 \cdot C_d)}{DF}$$

where: C_b = background concentration[5]
C_d = discharge data[6]
DF = dilution factor

In this permit, all monthly average limitations are either the same as or more stringent than the limits in the 2012 permit. Therefore, the limits contained in this permit are consistent with the Department's anti-degradation policy.

Operations and Maintenance

Resiliency Planning Requirements

The permit requires that, within one year of the effective date of this permit, the Town shall submit a Resiliency Plan and schedule of short- and long-term actions that will be taken to maintain, operate, and protect key collection and treatment system assets. The plan shall be consistent with the most current version of DEM's *Guidance for the Consideration of Climate Change Impacts in the Planning and Design of Municipal Wastewater Collection and Treatment Infrastructure* and include consideration of the findings of the 2017 DEM report Implications of Climate Change for Rhode Island Wastewater Collection and Treatment Infrastructure. The Resiliency Plan shall include, but not be limited to: (i) an assessment of current and projected impacts from natural hazards on critical components within the Town's collection and treatment systems, as well as on the system themselves; (ii) a plan to adapt and protect vulnerable components and systems; (iii) an analysis the provides justification for selected adaptation methods, including relevant cost-benefit analyses. The overall analysis must consider component and system design life and sea-level rise projections. For the purpose of this Resiliency Plan, critical components are considered those necessary to ensure the forward flow and treatment of wastewater in accordance with the limits set forth in this permit. The Resiliency Plan shall also consider impacts – such as debris carried in high winds – on the Town's treatment facility and wastewater collection system from neighboring facilities during high hazard events.

Sludge Requirements

The permit contains requirements for the permittee to comply with the State's Sludge Regulations and the DEM Order of Approval for sludge disposal in accordance with the requirements of Section 405(d) of the Clean Water Act (CWA). Permits must contain sludge conditions requiring compliance with limits, state laws, and applicable regulations as per Section 405(d) of the CWA and 40 CFR 503. The DEM Sludge Order of Approval sets forth the conditions to ensure this compliance.

[5] Data collected at a location that is unimpacted by significant point source discharges.
[6] Discharge data refers to the maximum of the permit limit or the historic discharge level. The historic discharge level is determined by calculating the upper 95th confidence interval for the monthly average reported data for the past five (5) years. For specific cases, changes in treatment efficiency or pretreatment limitations may support the use of an alternative period of time.

Other Conditions

The remaining general and specific conditions of the permit are based on the RIPDES regulations as well as 40 CFR Parts 122 through 125 and consist primarily of management requirements common to all permits.

Permit Limit Summary

Table I. Permit Limits - Outfall 001A (final discharge after dechlorination)

Effluent Characteristic	Monthly Average Permit Limit	Weekly Average Permit Limit	Daily Max Permit Limit	Sampling Frequency
Flow	1.4 MGD		--- MGD	Continuous
BOD_5 Load[1]	350 lbs/day		584 lbs/day	3/Week
BOD_5 Concentration[1]	30 mg/L	45 mg/L	50 mg/L	3/Week
BOD_5 - % Removal[1]	≥85%			1/Month
TSS Load[1]	350 lbs/day		584 lbs/day	3/Week
TSS Concentration[1]	30 mg/L	45 mg/L	50 mg/L	3/Week
TSS - % Removal[1]	≥85%			1/Month
Settleable Solids		--- ml/L	--- ml/L	Daily
Fecal Coliform	--- MPN/100 ml		--- MPN/100 ml	3/Week
Enterococci	35 cfu/100 ml		276 cfu/100 ml	3/Week
Total Residual Chlorine (TRC)	325 µg/L		325 µg/L	Daily
pH	(6.0 SU)		(9.0 SU)	2/Day
Oil and Grease			--- mg/L	1/Month
TKN (as N)			--- mg/L	1/Month
Nitrate, Total (as N)]			--- mg/L	1/Month
Nitrite, Total (as N)			--- mg/L	1/Month
Nitrogen, Total			--- mg/L	1/Month
Total Copper[2]	--- µg/L		--- µg/L	1/Quarter
Free Available Cyanide[2]	--- µg/L		--- µg/L	1/Quarter
Total Cadmium[2]	--- µg/L		--- µg/L	1/Quarter
Hexavalent Chromium[2]	--- µg/L		--- µg/L	1/Quarter
Total Lead[2]	--- µg/L		--- µg/L	1/Quarter
Total Zinc[2]	--- µg/L		--- µg/L	1/Quarter
Total Nickel[2]	--- µg/L		--- µg/L	1/Quarter
Total Aluminum[2]	--- µg/L		--- µg/L	1/Quarter
Mysidopsis bahia LC_{50}[3]			≥100%	1/Quarter
PFAS Analytes[1,4]			--- ng/L	1/Quarter

() Values in parentheses represent the minimum and maximum values.

--- Signifies a parameter which must be monitored, and data must be reported; no limit has been established at this time.

[1]Samples shall be taken on the influent and effluent with appropriate allowances for hydraulic detention (flow-through) time.

[2]Monitoring data may be obtained in conjunction with the bioassay testing required in Part I.B of the permit.

[3]LC_{50} is defined as the concentration of wastewater that causes mortality to 50% of the test organisms. Therefore, a 100% limit means that a samples of 100% effluent (no dilution) shall cause no more than a 50% mortality rate.

[4]Influent and effluent sampling requirements for the listed PFAS parameters takes effect the first calendar quarter of 2024. PFAS shall be analyzed using Clean Water Act wastewater draft analytical method 1633 until a 40 CFR Part 136 approved test method for wastewater is approved.

Additionally, report in NetDMR the results of all other PFAS analytes required to be tested as part of the method as shown in Attachment A of the permit.

V. Comment Period, Hearing Requests, and Procedures for Final Decisions

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the Rhode Island Department of Environmental Management, Office of Water Resources, 235 Promenade Street, Providence, Rhode Island, 02908-5767. In accordance with Chapter 46-17.4 of Rhode Island General Laws, a public hearing will be held prior to the close of the public comment period. In reaching a final decision on the draft permit the Director will respond to all significant comments and make these responses available to the public at DEM's Providence office.

Following the close of the comment period, and after a public hearing, the Director will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments, provided oral testimony, or requested notice. Within thirty (30) days following the notice of the final permit decision any interested person may submit a request for a formal hearing to reconsider or contest the final decision. Requests for formal hearings must satisfy the requirements of 250-RICR-150-10-1.50 of the Regulations for the Rhode Island Pollutant Discharge Elimination System.

VI. DEM Contact

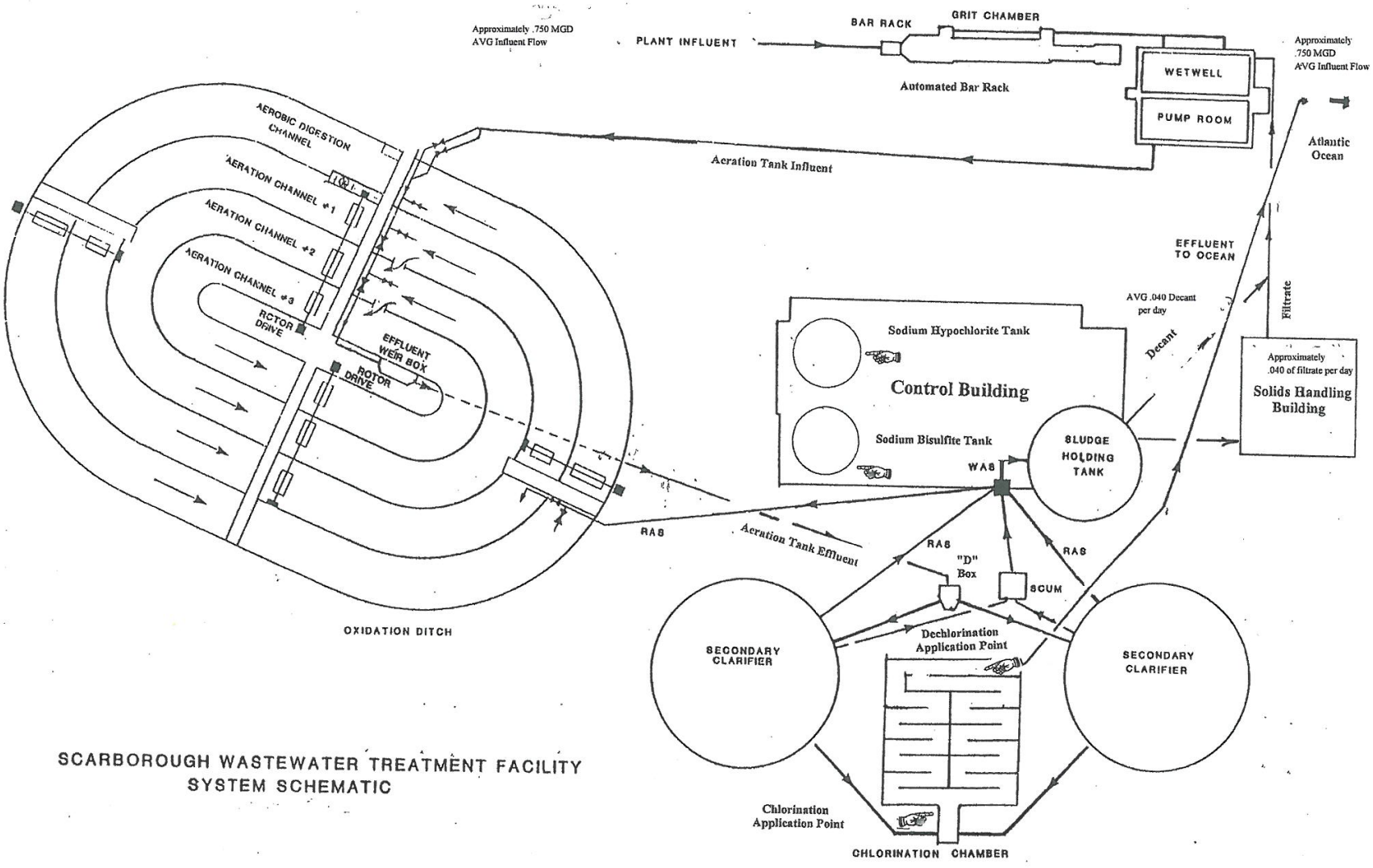
Additional information concerning the permit may be obtained between the hours of 8:30 a.m. and 4:00 p.m., Monday through Friday, excluding holidays from:

Cameron Murray
Environmental Engineering Associate
Department of Environmental Management/ Office of Water Resources
235 Promenade Street
Providence, Rhode Island 02908
Telephone: (401) 222-4700, ext: 1777174
Email: cameron.murray@dem.ri.gov

17 July 2023
Date

Heidi Travers
Heidi Travers, P.E.
Environmental Engineer IV
RIPDES Program
Office of Water Resources
Department of Environmental Management

ATTACHMENT A-1: SCARBOROUGH WWTF FACILITY PROCESS DIAGRAM



SCARBOROUGH WASTEWATER TREATMENT FACILITY
SYSTEM SCHEMATIC

ATTACHMENT A-2: HISTORICAL EFFLUENT DATA

DESCRIPTION OF DISCHARGE: Secondary treated domestic and industrial wastewater.

EFFLUENT CHARACTERISTICS AT POINT OF DISCHARGE

Parameter	Average[1]	Weekly Average[2]	Daily Maximum[3]
Flow, MGD	0.72		1.10[4]
BOD_5, mg/L	5.89	11.17	14.88
BOD_5, lbs/day	36.42		95.58
BOD_5, % removal	96.8617		
TSS, mg/L	2.61	5.20	7.99
TSS, lbs/day	21.13		58.68
TSS, % removal	98.3062		98.3062
Fecal Coliform, MPN/100 ml	2.35[5]		13.51
Enterococci, CFU/100 ml	1.52[5]		5.02
pH, S.U.	6.71		7.29
Chlorine, Total Residual, µg/L	15.90		33.07
Oil & Grease, mg/L			4.25
Nitrogen, Nitrite (Total as N), mg/L			0.19
Nitrogen, Nitrate (Total as N), mg/L			2.61
Nitrogen, Total Kjeldhal (Total as N), mg/L			22.73
Nitrogen, Total, mg/L			25.47
Settleable Solids, mL/L		0.279	0.280
Aluminum, Total, µg/L	27.545		27.545
Cadmium, Total, µg/L	0.2725		0.2725
Chromium, Total, µg/L	1.305		1.305
Copper, Total, µg/L	5.975		5.975
Cyanide, Free Available, µg/L	9.0909		9.0909
Cyanide, Total, µg/L	10		10
Lead, Total, µg/L	1.225		1.225
Nickel, Total, µg/L	2.11		2.11
Zinc, Total, µg/L	49.24		49.24

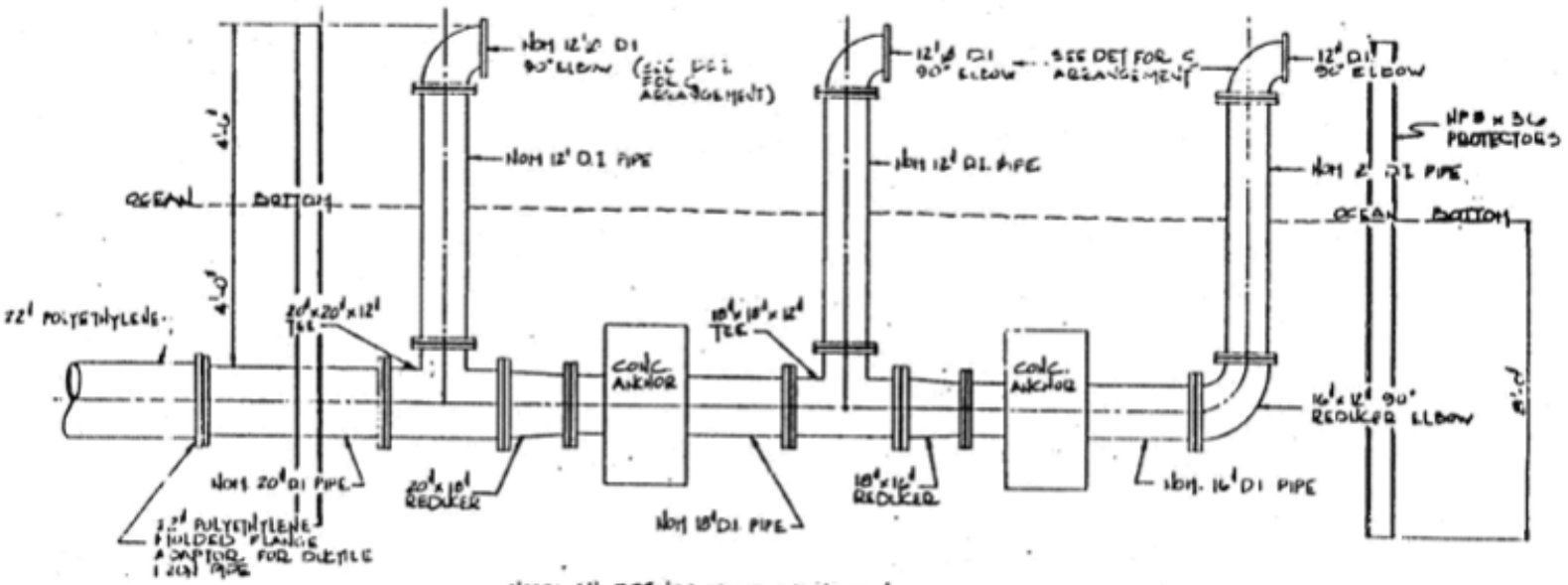
[1]Data represents the mean of the monthly average data from December 2017 – December 2022.
[2]Data represents the mean of the weekly average date from December 2017 - December 2022.
[3]Data represents the mean of the daily maximum data from December 2017 – December 2022.
[4]Maximum monthly value of maximum flow from December 2017 – December 2022
[5]Mean of the monthly geometric means from December 2017 – December 2022

Biotoxicity Data LC_{50} Values (in percent effluent) Pre-Cl_2 Mysid

Year	Quarter 1	Quarter 2	Quarter 3	Quarter 4
2017	=100	=100	=89.1	=100
2018	=100	=100	=100	=100
2019	=100	=100	=100	>100
2020	>100	>100	=73.5	>100
2021	>100	>100	>100	>100
2022	>100	>100	=70.7	>100

ATTACHMENT A-3: SCARBOROUGH WWTF DIFFUSER SCHEMATIC

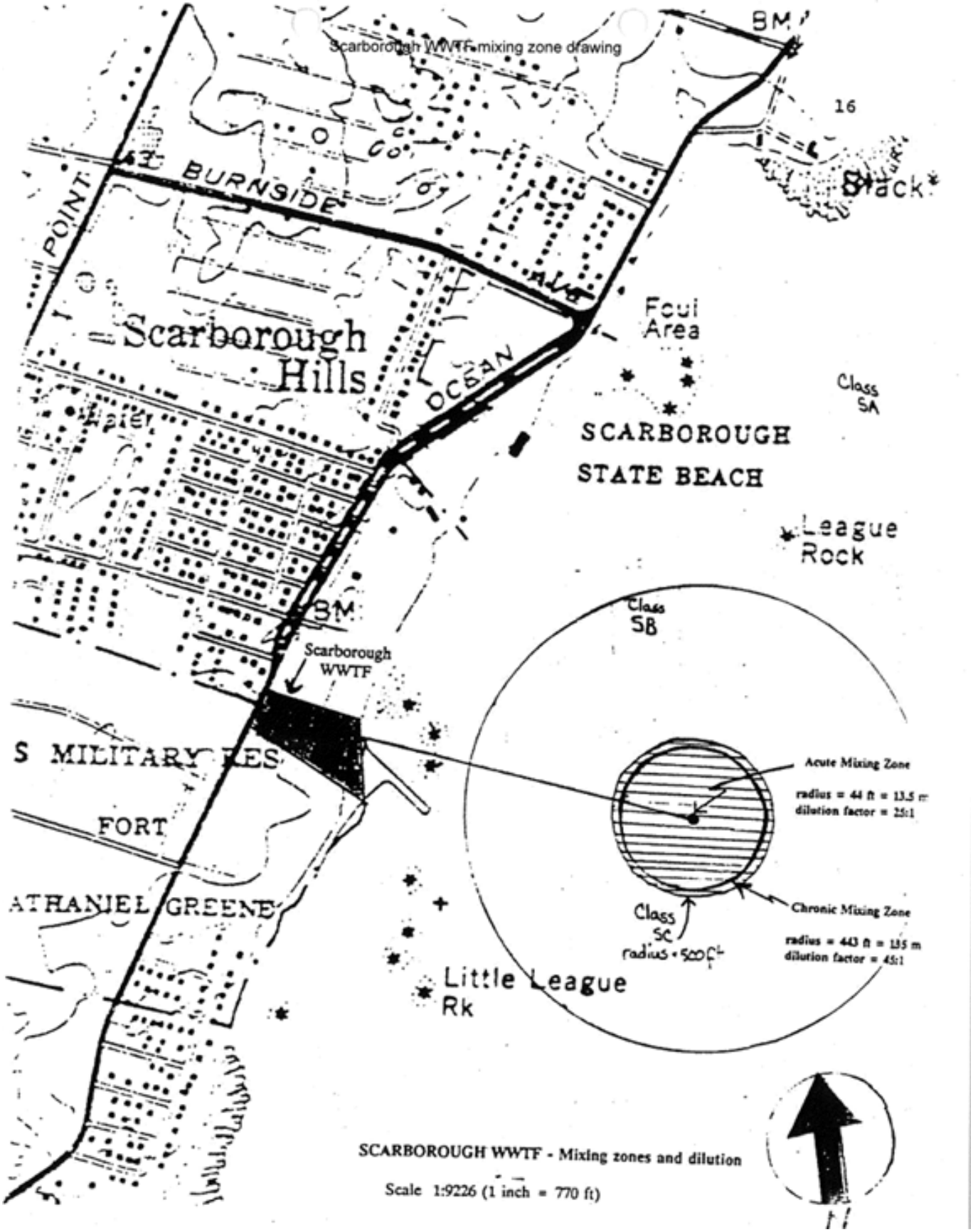
Scarborough WWTF diffuser schematic



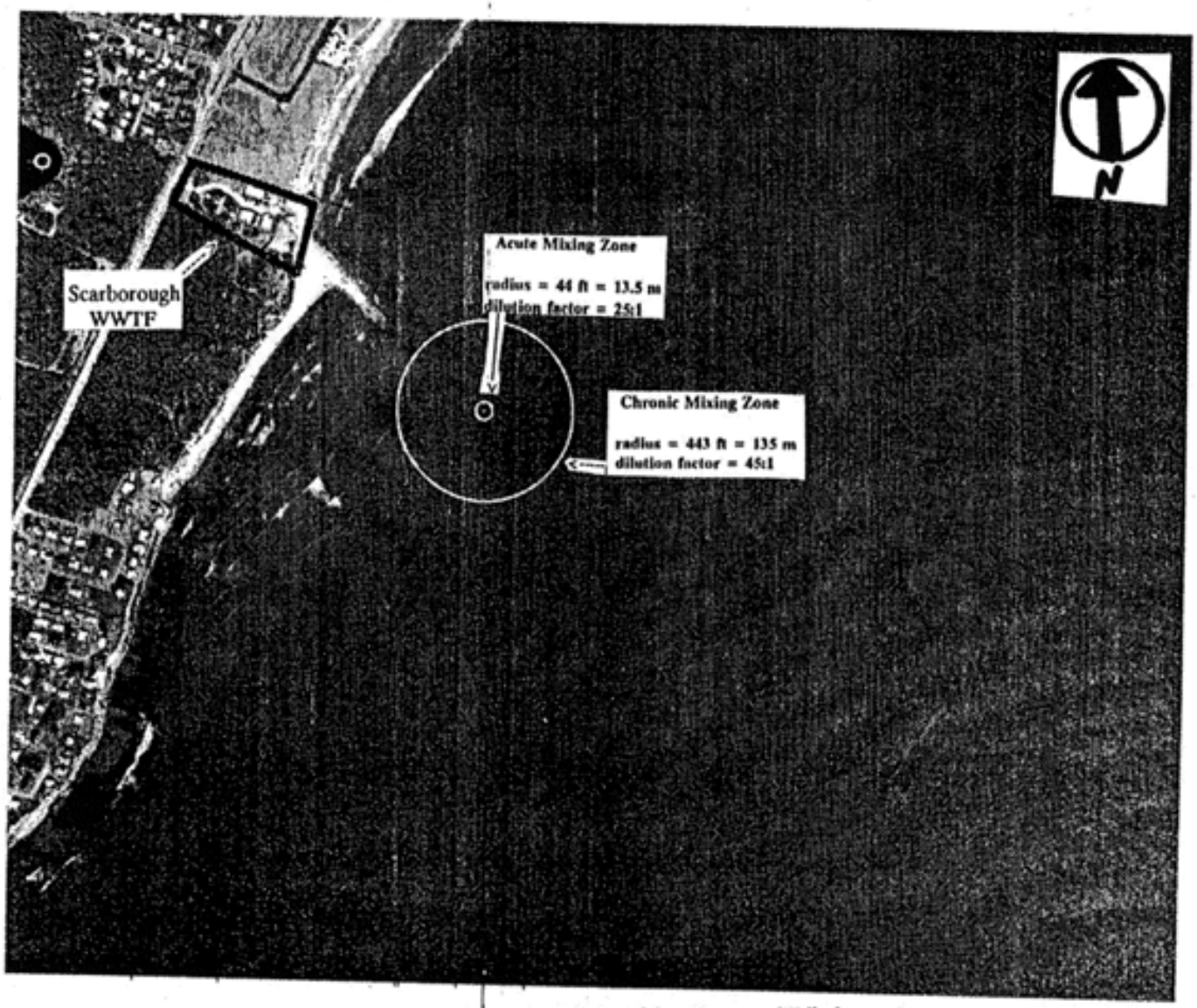
Scarborough WWTF Outfall Diffuser Diagram

ATTACHMENT A-4: SCARBOROUGH WWTF MIXING ZONE DRAWING[7]

[7] Scarborough Wastewater Treatment Facility Narragansett Rhode Island Permit Development Document RIPDES Permit No. RI0100188, May 2011


Scarborough WWTF mixing zone drawing
BM
16
Black
POINT
BURNSIDE
Scarborough Hills
OCEAN
Foul Area
Class SA
SCARBOROUGH STATE BEACH
League Rock
BM
Scarborough WWTF
Class SB
S MILITARY RES
FORT
ATHANIEL GREENE
Acute Mixing Zone
radius = 44 ft = 13.5 m
dilution factor = 25:1
Chronic Mixing Zone
radius = 443 ft = 135 m
dilution factor = 45:1
Class SC
radius = 500 ft
Little League Rk
SCARBOROUGH WWTF - Mixing zones and dilution
Scale 1:9226 (1 inch = 770 ft)

ATTACHMENT A-5: SCARBOROUGH WWTF AERIAL PHOTOGRAPH WITH MIXING ZONES



Scarborough WWTF Mixing Zones and Dilution

Scale 1:9000 (1 inch = 750 feet)

Scarborough WWTF aerial photograph with mixing zones

ATTACHMENT A-6: Water Quality CALCULATIONS

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY SPECIFIC DATA INPUT SHEET

NOTE: LIMITS BASED ON RI WATER QUALITY CRITERIA DATED JULY 2006

FACILITY NAME: **SCARBOROUGH WWTF**

RIPDES PERMIT #: **RI0100188**

	DISSOLVED BACKGROUND DATA (µg/L)	ACUTE METAL TRANSLATOR	CHRONIC METAL TRANSLATOR
ALUMINUM	NA	NA	NA
ARSENIC	NA	1	1
CADMIUM	NA	0.994	0.994
CHROMIUM III	NA	NA	NA
CHROMIUM VI	NA	0.993	0.993
COPPER	NA	0.83	0.83
LEAD	NA	0.951	0.951
MERCURY	NA	0.85	NA
NICKEL	NA	0.99	0.99
SELENIUM	NA	0.998	0.998
SILVER	NA	0.85	0.85
ZINC	NA	0.946	0.946

USE NA WHEN NO DATA IS AVAILABLE

NOTE 1: METAL TRANSLATORS FROM RI WATER QUALITY REGS.

DILUTION FACTORS			
	ACUTE	= 25	x
	CHRONIC	= 45	x
	HUMAN HEALTH	= 45	x

NOTE: TEST WWTF'S DILUTION FACTORS OBTAINED FROM A DYE STUDY.

TOTAL AMMONIA CRITERIA (µg/L)			
WINTER	ACUTE	=	21000
	CHRONIC	=	3100
SUMMER	ACUTE	=	7300
	CHRONIC	=	1100

NOTE 1: LIMITS ARE FROM TABLE 3 IN THE RI WATER QUALITY REGS. USING:
SALINITY = 30 g/Kg; pH = 8.0 s.u.
WINTER (NOV-APRIL) TEMP=5.0 C;
SUMMER (MAY-OCT) TEMP=20.0 C.

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: Scarborough WWTF RIPDES PERMIT #: RI0100188

NOTE: METALS CRITERIA ARE DISSOLVED, METALS LIMITS ARE TOTAL; AMMONIA CRITERIA AND LIMITS HAVE BEEN CONVERTED TO µg/L N

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (µg/L)	SALTWATER CRITERIA ACUTE (µg/L)	DAILY MAX LIMIT (µg/L)	SALTWATER CRITERIA CHRONIC (µg/L)	HUMAN HEALTH NON-CLASS A CRITERIA (µg/L)	MONTHLY AVE LIMIT (µg/L)
PRIORITY POLLUTANTS:							
TOXIC METALS AND CYANIDE							
ANTIMONY	7440360			No Criteria		640	23040
ARSENIC (limits are total recoverable)	7440382	NA	69	1380	36	1.4	50.4
ASBESTOS	1332214			No Criteria			No Criteria
BERYLLIUM	7440417			No Criteria			No Criteria
CADMIUM (limits are total recoverable)	7440439	NA	40	804.8289738	8.8		318.7122736
CHROMIUM III (limits are total recoverable)	16065831	NA		No Criteria			No Criteria
CHROMIUM VI (limits are total recoverable)	18540299	NA	1100	22155.0856	50		1812.688822
COPPER (limits are total recoverable)	7440508	NA	4.8	115.6626506	3.1		134.4578313
CYANIDE	57125		1	20.00	1	140	36
LEAD (limits are total recoverable)	7439921	NA	210	4416.403785	8.1		306.6246057
MERCURY (limits are total recoverable)	7439976	NA	1.8	42.35294118	0.94	0.15	5.4
NICKEL (limits are total recoverable)	7440020	NA	74	1494.949495	8.2	4600	298.1818182
SELENIUM (limits are total recoverable)	7782492	NA	290	5811.623246	71	4200	2561.122244
SILVER (limits are total recoverable)	7440224	NA	1.9	44.70588235			No Criteria
THALLIUM	7440280			No Criteria		0.47	16.92
ZINC (limits are total recoverable)	7440666	NA	90	1902.748414	81	26000	3082.452431
VOLATILE ORGANIC COMPOUNDS							
ACROLEIN	107028			No Criteria		290	10440
ACRYLONITRILE	107131			No Criteria		2.5	90
BENZENE	71432			No Criteria		510	18360
BROMOFORM	75252			No Criteria		1400	50400
CARBON TETRACHLORIDE	56235			No Criteria		16	576
CHLOROBENZENE	108907			No Criteria		1600	57600
CHLORODIBROMOMETHANE	124481			No Criteria		130	4680
CHLOROFORM	67663			No Criteria		4700	169200
DICHLOROBROMOMETHANE	75274			No Criteria		170	6120
1,2DICHLOROETHANE	107062			No Criteria		370	13320

1,1DICHLOROETHYLENE	75354			No Criteria		7100	255600
1,2DICHLOROPROPANE	78875			No Criteria		150	5400
1,3DICHLOROPROPYLENE	542756			No Criteria		21	756
ETHYLBENZENE	100414			No Criteria		2100	75600
BROMOMETHANE (methyl bromide)	74839			No Criteria		1500	54000
CHLOROMETHANE (methyl chloride)	74873			No Criteria			No Criteria
METHYLENE CHLORIDE	75092			No Criteria		5900	212400
1,1,2,2TETRACHLOROETHANE	79345			No Criteria		40	1440
TETRACHLOROETHYLENE	127184			No Criteria		33	1188
TOLUENE	108883			No Criteria		15000	540000
1,2TRANSDICHLOROETHYLENE	156605			No Criteria		10000	360000
1,1,1TRICHLOROETHANE	71556			No Criteria			No Criteria
1,1,2TRICHLOROETHANE	79005			No Criteria		160	5760
TRICHLOROETHYLENE	79016			No Criteria		300	10800
VINYL CHLORIDE	75014			No Criteria		2.4	86.4
ACID ORGANIC COMPOUNDS							
2CHLOROPHENOL	95578			No Criteria		150	5400
2,4DICHLOROPHENOL	120832			No Criteria		290	10440
2,4DIMETHYLPHENOL	105679			No Criteria		850	30600
4,6DINITRO2METHYL PHENOL	534521			No Criteria		280	10080
2,4DINITROPHENOL	51285			No Criteria		5300	190800
4NITROPHENOL	88755			No Criteria			No Criteria
PENTACHLOROPHENOL	87865		13	260	7.9	30	284.4
PHENOL	108952			No Criteria		1700000	61200000
2,4,6TRICHLOROPHENOL	88062			No Criteria		24	864
BASE NEUTRAL COMPUNDS							
ACENAPHTHENE	83329			No Criteria		990	35640
ANTHRACENE	120127			No Criteria		40000	1440000
BENZIDINE	92875			No Criteria		0.002	0.072
POLYCYCLIC AROMATIC HYDROCARBONS				No Criteria		0.18	6.48
BIS(2CHLOROETHYL)ETHER	111444			No Criteria		5.3	190.8
BIS(2CHLOROISOPROPYL)ETHER	108601			No Criteria		65000	2340000
BIS(2ETHYLHEXYL)PHTHALATE	117817			No Criteria		22	792
BUTYL BENZYL PHTHALATE	85687			No Criteria		1900	68400
2CHLORONAPHTHALENE	91587			No Criteria		1600	57600
1,2DICHLOROBENZENE	95501			No Criteria		1300	46800
1,3DICHLOROBENZENE	541731			No Criteria		960	34560

1,4DICHLOROBENZENE	106467			No Criteria		190	6840
3,3DICHLOROBENZIDENE	91941			No Criteria		0.28	10.08
DIETHYL PHTHALATE	84662			No Criteria		44000	1584000
DIMETHYL PHTHALATE	131113			No Criteria		1100000	39600000
DInBUTYL PHTHALATE	84742			No Criteria		4500	162000
2,4DINITROTOLUENE	121142			No Criteria		34	1224
1,2DIPHENYLHYDRAZINE	122667			No Criteria		2	72
FLUORANTHENE	206440			No Criteria		140	5040
FLUORENE	86737			No Criteria		5300	190800
HEXACHLOROBENZENE	118741			No Criteria		0.0029	0.1044
HEXACHLOROBUTADIENE	87683			No Criteria		180	6480
HEXACHLOROCYCLOPENTADIENE	77474			No Criteria		1100	39600
HEXACHLOROETHANE	67721			No Criteria		33	1188
ISOPHORONE	78591			No Criteria		9600	345600
NAPHTHALENE	91203			No Criteria			No Criteria
NITROBENZENE	98953			No Criteria		690	24840
NNITROSODIMETHYLAMINE	62759			No Criteria		30	1080
NNITROSODINPROPYLAMINE	621647			No Criteria		5.1	183.6
NNITROSODIPHENYLAMINE	86306			No Criteria		60	2160
PYRENE	129000			No Criteria		4000	144000
1,2,4trichlorobenzene	120821			No Criteria		70	2520
PESTICIDES/PCBs							
ALDRIN	309002		1.3	26		0.0005	0.018
Alpha BHC	319846			No Criteria		0.049	1.764
Beta BHC	319857			No Criteria		0.17	6.12
Gamma BHC (Lindane)	58899		0.16	3.2		1.8	64.8
CHLORDANE	57749		0.09	1.8	0.004	0.0081	0.144
4,4DDT	50293		0.13	2.6	0.001	0.0022	0.036
4,4DDE	72559			No Criteria		0.0022	0.0792
4,4DDD	72548			No Criteria		0.0031	0.1116
DIELDRIN	60571		0.71	14.2	0.0019	0.00054	0.01944
ENDOSULFAN (alpha)	959988		0.034	0.68	0.0087	89	0.3132
ENDOSULFAN (beta)	33213659		0.034	0.68	0.0087	89	0.3132
ENDOSULFAN (sulfate)	1031078			No Criteria		89	3204
ENDRIN	72208		0.037	0.74	0.0023	0.06	0.0828
ENDRIN ALDEHYDE	7421934			No Criteria		0.3	10.8
HEPTACHLOR	76448		0.053	1.06	0.0036	0.00079	0.02844
HEPTACHLOR EPOXIDE	1024573		0.053	1.06	0.0036	0.00039	0.01404

POLYCHLORINATED BIPHENYLS3	1336363			No Criteria	0.03	0.00064	0.02304
2,3,7,8TCDD (Dioxin)	1746016			No Criteria		0.000000051	0.000001836
TOXAPHENE	8001352		0.21	4.2	0.0002	0.0028	0.0072
TRIBUTYLTIN			0.42	8.4	0.0074		0.2664
NON PRIORITY POLLUTANTS:							
OTHER SUBSTANCES							
ALUMINUM (limits are total recoverable)	7429905	NA		No Criteria			No Criteria
AMMONIA (winter/summer)	7664417		17262 | 6001	345240 | 120012	2548 | 904		91735 | 32551
4BROMOPHENYL PHENYL ETHER				No Criteria			No Criteria
CHLORIDE	16887006			No Criteria			No Criteria
CHLORINE	7782505		13	325	7.5		337.5
4CHLORO2METHYLPHENOL				No Criteria			No Criteria
1CHLORONAPHTHALENE				No Criteria			No Criteria
4CHLOROPHENOL	106489			No Criteria			No Criteria
2,4DICHLORO6METHYLPHENOL				No Criteria			No Criteria
1,1DICHLOROPROPANE				No Criteria			No Criteria
1,3DICHLOROPROPANE	142289			No Criteria			No Criteria
2,3DINITROTOLUENE				No Criteria			No Criteria
2,4DINITRO6METHYL PHENOL				No Criteria			No Criteria
IRON	7439896			No Criteria			No Criteria
pentachlorobenzene	608935			No Criteria			No Criteria
PENTACHLOROETHANE				No Criteria			No Criteria
1,2,3,5tetrachlorobenzene				No Criteria			No Criteria
1,1,1,2TETRACHLOROETHANE	630206			No Criteria			No Criteria
2,3,4,6TETRACHLOROPHENOL	58902			No Criteria			No Criteria
2,3,5,6TETRACHLOROPHENOL				No Criteria			No Criteria
2,4,5TRICHLOROPHENOL	95954			No Criteria			No Criteria
2,4,6TRINITROPHENOL	88062			No Criteria			No Criteria
XYLENE	1330207			No Criteria			No Criteria

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: SCARBOROUGH WWTF RIPDES PERMIT #: RI0100188

CHEMICAL NAME	CAS#	DAILY MAX LIMIT (µg/L)	MONTHLY AVE LIMIT (µg/L)
PRIORITY POLLUTANTS:			
TOXIC METALS AND CYANIDE			
ANTIMONY	7440360	No Criteria	23040.00
ARSENIC, TOTAL	7440382	1380.00	50.40
ASBESTOS	1332214	No Criteria	No Criteria
BERYLLIUM	7440417	No Criteria	No Criteria
CADMIUM, TOTAL	7440439	804.83	318.71
CHROMIUM III, TOTAL	16065831	No Criteria	No Criteria
CHROMIUM VI, TOTAL	18540299	22155.09	1812.69
COPPER, TOTAL	7440508	115.66	115.66
CYANIDE	57125	20.00	20.00
LEAD, TOTAL	7439921	4416.40	306.62
MERCURY, TOTAL	7439976	42.35	5.40
NICKEL, TOTAL	7440020	1494.95	298.18
SELENIUM, TOTAL	7782492	5811.62	2561.12
SILVER, TOTAL	7440224	44.71	No Criteria
THALLIUM	7440280	No Criteria	16.92
ZINC, TOTAL	7440666	1902.75	1902.75
VOLATILE ORGANIC COMPOUNDS			
ACROLEIN	107028	No Criteria	10440.00
ACRYLONITRILE	107131	No Criteria	90.00
BENZENE	71432	No Criteria	18360.00
BROMOFORM	75252	No Criteria	50400.00
CARBON TETRACHLORIDE	56235	No Criteria	576.00
CHLOROBENZENE	108907	No Criteria	57600.00
CHLORODIBROMOMETHANE	124481	No Criteria	4680.00
CHLOROFORM	67663	No Criteria	169200.00
DICHLOROBROMOMETHANE	75274	No Criteria	6120.00
1,2DICHLOROETHANE	107062	No Criteria	13320.00
1,1DICHLOROETHYLENE	75354	No Criteria	255600.00
1,2DICHLOROPROPANE	78875	No Criteria	5400.00
1,3DICHLOROPROPYLENE	542756	No Criteria	756.00
ETHYLBENZENE	100414	No Criteria	75600.00
TETRACHLOROETHYLENE	127184	No Criteria	1188.00
TOLUENE	108883	No Criteria	540000.00
1,2TRANSDICHLOROETHYLENE	156605	No Criteria	360000.00
1,1,1TRICHLOROETHANE	71556	No Criteria	No Criteria
1,1,2TRICHLOROETHANE	79005	No Criteria	5760.00
TRICHLOROETHYLENE	79016	No Criteria	10800.00
VINYL CHLORIDE	75014	No Criteria	86.40
ACID ORGANIC COMPOUNDS			
2CHLOROPHENOL	95578	No Criteria	5400.00
2,4DICHLOROPHENOL	120832	No Criteria	10440.00
2,4DIMETHYLPHENOL	105679	No Criteria	30600.00
4,6DINITRO2METHYL PHENOL	534521	No Criteria	10080.00
2,4DINITROPHENOL	51285	No Criteria	190800.00
4NITROPHENOL	88755	No Criteria	No Criteria
PENTACHLOROPHENOL	87865	260.00	260.00
PHENOL	108952	No Criteria	61200000.00
2,4,6TRICHLOROPHENOL	88062	No Criteria	864.00
BASE NEUTRAL COMPUNDS			
ACENAPHTHENE	83329	No Criteria	35640.00
ANTHRACENE	120127	No Criteria	1440000.00
BENZIDINE	92875	No Criteria	0.07
PAHs		No Criteria	6.48
BIS(2CHLOROETHYL)ETHER	111444	No Criteria	190.80
BIS(2CHLOROISOPROPYL)ETHER	108601	No Criteria	2340000.00
BIS(2ETHYLHEXYL)PHTHALATE	117817	No Criteria	792.00
BUTYL BENZYL PHTHALATE	85687	No Criteria	68400.00
2CHLORONAPHTHALENE	91587	No Criteria	57600.00
1,2DICHLOROBENZENE	95501	No Criteria	46800.00
1,3DICHLOROBENZENE	541731	No Criteria	34560.00
1,4DICHLOROBENZENE	106467	No Criteria	6840.00
3,3DICHLOROBENZIDENE	91941	No Criteria	10.08
DIETHYL PHTHALATE	84662	No Criteria	1584000.00
DIMETHYL PHTHALATE	131113	No Criteria	39600000.00

BROMOMETHANE (methyl bromide)	74839	No Criteria	54000.00
CHLOROMETHANE (methyl chloride)	74873	No Criteria	No Criteria
METHYLENE CHLORIDE	75092	No Criteria	212400.00
1,1,2,2TETRACHLOROETHANE	79345	No Criteria	1440.00
FLUORENE	86737	No Criteria	190800.00
HEXACHLOROBENZENE	118741	No Criteria	0.10
HEXACHLOROBUTADIENE	87683	No Criteria	6480.00
HEXACHLOROCYCLOPENTADIENE	77474	No Criteria	39600.00
HEXACHLOROETHANE	67721	No Criteria	1188.00
ISOPHORONE	78591	No Criteria	345600.00
NAPHTHALENE	91203	No Criteria	No Criteria
NITROBENZENE	98953	No Criteria	24840.00
N-NITROSODIMETHYLAMINE	62759	No Criteria	1080.00
N-NITROSODI-N-PROPYLAMINE	621647	No Criteria	183.60
N-NITROSODIPHENYLAMINE	86306	No Criteria	2160.00
PYRENE	129000	No Criteria	144000.00
1,2,4trichlorobenzene	120821	No Criteria	2520.00
PESTICIDES/PCBs			
ALDRIN	309002	26.00	0.02
Alpha BHC	319846	No Criteria	1.76
Beta BHC	319857	No Criteria	6.12
Gamma BHC (Lindane)	58899	3.20	3.20
CHLORDANE	57749	1.80	0.14
4,4DDT	50293	2.60	0.04
4,4DDE	72559	No Criteria	0.08
4,4DDD	72548	No Criteria	0.11
DIELDRIN	60571	14.20	0.02
ENDOSULFAN (alpha)	959988	0.68	0.31
ENDOSULFAN (beta)	3321365 9	0.68	0.31
ENDOSULFAN (sulfate)	1031078	No Criteria	3204.00
ENDRIN	72208	0.74	0.08
ENDRIN ALDEHYDE	7421934	No Criteria	10.80
HEPTACHLOR	76448	1.06	0.03
HEPTACHLOR EPOXIDE	1024573	1.06	0.01
POLYCHLORINATED BIPHENYLS3	1336363	No Criteria	0.02
2,3,7,8TCDD (Dioxin)	1746016	No Criteria	0.00
TOXAPHENE	8001352	4.20	0.01
TRIBUTYLTIN		8.40	0.27

DI-n-BUTYL PHTHALATE	84742	No Criteria	162000.00
2,4DINITROTOLUENE	121142	No Criteria	1224.00
1,2DIPHENYLHYDRAZINE	122667	No Criteria	72.00
FLUORANTHENE	206440	No Criteria	5040.00
NON PRIORITY POLLUTANTS:			
OTHER SUBSTANCES			
ALUMINUM, TOTAL	7429905	No Criteria	No Criteria
AMMONIA (as N), WINTER (NOV-APR)	7664417	345240.00	91735.20
AMMONIA (as N), SUMMER (MAY-OCT)	7664417	120012.00	32551.20
4BROMOPHENYL PHENYL ETHER		No Criteria	No Criteria
CHLORIDE	16887006	No Criteria	No Criteria
CHLORINE	7782505	325.00	325.00
4CHLORO2METHYLPHENOL		No Criteria	No Criteria
1CHLORONAPHTHALENE		No Criteria	No Criteria
4CHLOROPHENOL	106489	No Criteria	No Criteria
2,4DICHLORO6METHYLPHENOL		No Criteria	No Criteria
1,1DICHLOROPROPANE		No Criteria	No Criteria
1,3DICHLOROPROPANE	142289	No Criteria	No Criteria
2,3DINITROTOLUENE		No Criteria	No Criteria
2,4DINITRO6METHYL PHENOL		No Criteria	No Criteria
IRON	7439896	No Criteria	No Criteria
pentachlorobenzene	608935	No Criteria	No Criteria
PENTACHLOROETHANE		No Criteria	No Criteria
1,2,3,5tetrachlorobenzene		No Criteria	No Criteria
1,1,1,2TETRACHLOROETHANE	630206	No Criteria	No Criteria
2,3,4,6TETRACHLOROPHENOL	58902	No Criteria	No Criteria
2,3,5,6TETRACHLOROPHENOL		No Criteria	No Criteria
2,4,5TRICHLOROPHENOL	95954	No Criteria	No Criteria
2,4,6TRINITROPHENOL	88062	No Criteria	No Criteria
XYLENE	1330207	No Criteria	No Criteria

ATTACHMENT A-7: SUMMARY OF PRIORITY POLLUTANT SCAN DATA 2017 THROUGH 2022

test source	test date or collection date	parameter	conc.	units	RL	ave.	max.
PPS	7/22/2020	Antimony	0.0036	mg/L	0.003	0.0057	0.0078
PPS	8/26/2021	Antimony	0.00776	mg/L	0.003		
PPS	7/31/2018	Arsenic	0.0017	mg/L	0.001	0.0016	0.0018
PPS	8/29/2019	Arsenic	0.0018	mg/L	0.001		
PPS	7/22/2020	Arsenic	0.0013	mg/L	0.001		
PPS	7/22/2020	Barium	0.0118	mg/L	0.01	0.0118	0.0118
PPS	8/26/2021	bis(2-Ethylhexyl)phthalate	0.6	µg/l	0.5	0.6	0.6
PPS	7/31/2018	BOD	4.05000	mg/L	2	5.80750	6.84000
PPS	8/29/2019	BOD	6.72	mg/L	6.00		
PPS	7/22/2020	BOD	5.62	mg/L	2.00		
PPS	8/3/2022	BOD	6.84	mg/L	4		
PPS	7/31/2018	Copper	0.0049	mg/L	0.001	0.00514	0.0108
PPS	8/29/2019	Copper	0.0108	mg/L	0.001		
PPS	7/22/2020	Copper	0.0035	mg/L	0.001		
PPS	8/26/2021	Copper	0.00265	mg/L	0.002		
PPS	8/3/2022	Copper	0.00385	mg/L	0.002		
PPS	8/26/2021	Di-n-butyl phthalate	7.65	µg/L	1	7.65	7.65
PPS	8/3/2022	Endosulfane I [2C]	0.0166	µg/L	0.004	0.0166	0.0166
PPS	7/31/2018	Nickel	0.0019	mg/L	0.001	0.00213	0.0027
PPS	8/29/2019	Nickel	0.0027	mg/L	0.001		
PPS	7/22/2020	Nickel	0.0018	mg/L	0.001		
PPS	7/31/2018	Phenols	0.103	mg/L	0.03	0.103	0.103
PPS	7/31/2018	Selenium	0.0041	mg/L	0.002	0.00313	0.0041
PPS	8/29/2019	Selenium	0.0032	mg/L	0.002		
PPS	7/22/2020	Selenium	0.0021	mg/L	0.002		
PPS	8/29/2019	TSS	11.2	mg/L	5.00	11.2	11.2
PPS	8/26/2021	TTO	8.25	µg/L		4.14	8.25
PPS	8/3/2022	TTO	0.02	µg/L			
PPS	7/31/2018	Zinc	0.0724	mg/L	0.005	0.053	0.0772
PPS	8/29/2019	Zinc	0.0772	mg/L	0.005		
PPS	7/22/2020	Zinc	0.0507	mg/L	0.005		
PPS	8/26/2021	Zinc	0.0326	mg/L	0.005		
PPS	8/3/2022	Zinc	0.0321	mg/L	0.005		

ATTACHMENT A-8: COMPARISON OF ALLOWABLE LIMITS WITH DISCHARGE MONITORING REPORT DATA AND STATE USER FEE DATA

Facility Name: ***Scarborough WWTF***
RIPDES
Permit #: ***RI0023868***

Outfall #: ***001A***

NOTE: METALS LIMITS ARE TOTAL METALS

Parameter	CAS #	Conc. Limits (µg/L) Based on WQ Criteria		Antideg. Limits (µg/L)	Ave UFP Data (µg/l) 9/11 - 7/16		Ave. DMR Data (µg/L) 7/11-6/16		Potential Permit Limits (µg/L)		Reasonable Potential?	
		Daily Max	Monthly Ave	Monthly Ave	Max	Ave	Daily Max	Monthly Ave	Daily Max	Monthly Ave	Daily Max	Monthly Ave
PRIORITY POLLUTANTS												
TOXIC METALS AND CYANIDE												
ANTIMONY	7440360	No Criteria	23040.00	---	5.7	7.8	---	---	---	23040		N
ARSENIC (limits are total recoverable)	7440382	1380.00	50.40	---	1.6	1.8	---	---	1380	50.4	N	N
ASBESTOS	1332214	No Criteria	No Criteria	---	---	---	---	---	---	---		
BERYLLIUM	7440417	No Criteria	No Criteria	---	---	---	---	---	---	---		
CADMIUM (limits are total recoverable)	7440439	804.83	318.71	---	---	---	0.2725	0.2725	804.83	318.71	N	N
CHROMIUM III (limits are total recoverable)	16065831	No Criteria	No Criteria	---	---	---	---	---	---	---		
CHROMIUM VI (limits are total recoverable)	18540299	22155.09	1812.69	---	-	-	1.305	1.305	22155.09	1812.69	N	N
COPPER (limits are total recoverable)	7440508	115.66	115.66	---	5.14	1.08	5.975	5.975	115.66	115.66	N	N
CYANIDE	57125	20.00	20.00	---	---	---	9.0909	9.0909	20.00	20.00	N	N
LEAD (limits are total recoverable)	7439921	4416.40	306.62	---	---	---	1.225	1.225	4416.40	306.62	N	N
MERCURY (limits are total recoverable)	7439976	42.35	5.40	---	---	---	---	---	42.35	5.40		
NICKEL (limits are total recoverable)	7440020	1494.95	298.18	---	2.13	2.13	2.11	2.11	1494.95	298.18	N	N
SELENIUM (limits are total recoverable)	7782492	5811.62	2561.12	---	3.13	4.1	---	---	5811.62	2561.12	N	N
SILVER (limits are total recoverable)	7440224	44.71	No Criteria	---	---	---	---	---	44.71	44.71		
THALLIUM	7440280	No Criteria	16.92	---	---	---	---	---	---	16.92		
ZINC (limits are total recoverable)	7440666	1902.75	1902.75	---	53	77.2	49.24	49.24	1902.75	1902.75	N	N
VOLATILE ORGANIC COMPOUNDS												
ACROLEIN	107028	No Criteria	10440.00	---	---	---	---	---	---	10440		
ACRYLONITRILE	107131	No Criteria	90.00	---	---	---	---	---	---	90		
BENZENE	71432	No Criteria	18360.00	---	---	---	---	---	---	18360		
BROMOFORM	75252	No Criteria	50400.00	---	-	-	---	---	---	50400		
CARBON TETRACHLORIDE	56235	No Criteria	576.00	---	---	---	---	---	---	576		
CHLOROBENZENE	108907	No Criteria	57600.00	---	---	---	---	---	---	57600		
CHLORODIBROMOMETHANE	124481	No Criteria	4680.00	---	-	-	---	---	---	4680		

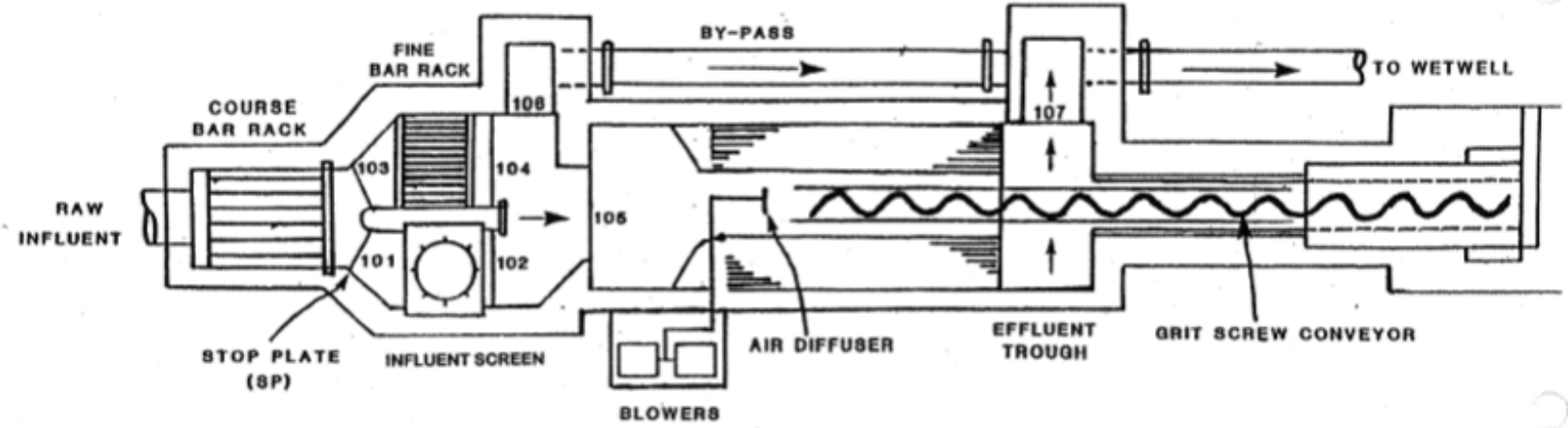
CHLOROFORM	67663	No Criteria	169200.00	---	---	---	---	---	---	169200		
DICHLOROBROMOMETHANE	75274	No Criteria	6120.00	---	---	---	---	---	---	6120		
1,2DICHLOROETHANE	107062	No Criteria	13320.00	---	---	---	---	---	---	13320		
1,1DICHLOROETHYLENE	75354	No Criteria	255600.00	---	---	---	---	---	---	255600		
1,2DICHLOROPROPANE	78875	No Criteria	5400.00	---	---	---	---	---	---	5400		
1,3DICHLOROPROPYLENE	542756	No Criteria	756.00	---	---	---	---	---	---	756		
ETHYLBENZENE	100414	No Criteria	75600.00	---	---	---	---	---	---	75600		
BROMOMETHANE (methyl bromide)	74839	No Criteria	54000.00	---	---	---	---	---	---	54000		
CHLOROMETHANE (methyl chloride)	74873	No Criteria	No Criteria	---	---	---	---	---	---	---		
METHYLENE CHLORIDE	75092	No Criteria	212400.00	---	---	---	---	---	---	212400		
1,1,2,2TETRACHLOROETHANE	79345	No Criteria	1440.00	---	---	---	---	---	---	1440		
TETRACHLOROETHYLENE	127184	No Criteria	1188.00	---	---	---	---	---	---	1188		
TOLUENE	108883	No Criteria	540000.00	---	-	-	---	---	---	540000		
1,2TRANSDICHLOROETHYLENE	156605	No Criteria	360000.00	---	---	---	---	---	---	360000		
1,1,1TRICHLOROETHANE	71556	No Criteria	No Criteria	---	---	---	---	---	---	---		
1,1,2TRICHLOROETHANE	79005	No Criteria	5760.00	---	---	---	---	---	---	5760		
TRICHLOROETHYLENE	79016	No Criteria	10800.00	---	---	---	---	---	---	10800		
VINYL CHLORIDE	75014	No Criteria	86.40	---	---	---	---	---	---	86.4		
ACID ORGANIC COMPOUNDS												
2CHLOROPHENOL	95578	No Criteria	5400.00	---	---	---	---	---	---	5400		
2,4DICHLOROPHENOL	120832	No Criteria	10440.00	---	---	---	---	---	---	10440		
2,4DIMETHYLPHENOL	105679	No Criteria	30600.00	---	---	---	---	---	---	30600		
4,6DINITRO2METHYL PHENOL	534521	No Criteria	10080.00	---	---	---	---	---	---	10080		
2,4DINITROPHENOL	51285	No Criteria	190800.00	---	---	---	---	---	---	190800		
4NITROPHENOL	88755	No Criteria	No Criteria	---	---	---	---	---	---	---		
PENTACHLOROPHENOL	87865	260.00	260.00	---	---	---	---	---	260	260		
PHENOL	108952	No Criteria	61200000.00	---	103	103	---	---	---	61200000		N
2,4,6TRICHLOROPHENOL	88062	No Criteria	864.00	---	---	---	---	---	---	864		
BASE NEUTRAL COMPOUNDS												
ACENAPHTHENE	83329	No Criteria	35640.00	---	---	---	---	---	---	35640		
ANTHRACENE	120127	No Criteria	1440000.00	---	---	---	---	---	---	1440000		
BENZIDINE	92875	No Criteria	0.07	---	---	---	---	---	---	0.072		
POLYCYCLIC AROMATIC HYDROCARBONS		No Criteria	6.48	---	---	---	---	---	---	6.48		
BIS(2CHLOROETHYL)ETHER	111444	No Criteria	190.80	---	---	---	---	---	---	190.8		
BIS(2CHLOROISOPROPYL)ETHER	108601	No Criteria	2340000.00	---	---	---	---	---	---	2340000		
BIS(2ETHYLHEXYL)PHTHALATE	117817	No Criteria	792.00	---	0.6	0.6	---	---	---	792	N	N
BUTYL BENZYL PHTHALATE	85687	No Criteria	68400.00	---	---	---	---	---	---	68400		

2CHLORONAPHTHALENE	91587	No Criteria	57600.00	---	---	---	---	---	---	57600		
1,2DICHLOROBENZENE	95501	No Criteria	46800.00	---	---	---	---	---	---	46800		
1,3DICHLOROBENZENE	541731	No Criteria	34560.00	---	---	---	---	---	---	34560		
1,4DICHLOROBENZENE	106467	No Criteria	6840.00	---	---	---	---	---	---	6840		
3,3DICHLOROBENZIDENE	91941	No Criteria	10.08	---	---	---	---	---	---	10.08		
DIETHYL PHTHALATE	84662	No Criteria	1584000.00	---	---	---	---	---	---	1584000		
DIMETHYL PHTHALATE	131113	No Criteria	39600000.00	---	---	---	---	---	---	39600000		
DInBUTYL PHTHALATE	84742	No Criteria	162000.00	---	7.65	7.65	---	---	---	162000	N	N
2,4DINITROTOLUENE	121142	No Criteria	1224.00	---	---	---	---	---	---	1224		
1,2DIPHENYLHYDRAZINE	122667	No Criteria	72.00	---	---	---	---	---	---	72		
FLUORANTHENE	206440	No Criteria	5040.00	---	---	---	---	---	---	5040		
FLUORENE	86737	No Criteria	190800.00	---	---	---	---	---	---	190800		
HEXACHLOROBENZENE	118741	No Criteria	0.10	---	---	---	---	---	---	0.1044		
HEXACHLOROBUTADIENE	87683	No Criteria	6480.00	---	---	---	---	---	---	6480		
HEXACHLOROCYCLOPENTADIENE	77474	No Criteria	39600.00	---	---	---	---	---	---	39600		
HEXACHLOROETHANE	67721	No Criteria	1188.00	---	---	---	---	---	---	1188		
ISOPHORONE	78591	No Criteria	345600.00	---	---	---	---	---	---	345600		
NAPHTHALENE	91203	No Criteria	No Criteria	---	---	---	---	---	---	---		
NITROBENZENE	98953	No Criteria	24840.00	---	---	---	---	---	---	24840		
NNITROSODIMETHYLAMINE	62759	No Criteria	1080.00	---	---	---	---	---	---	1080		
NNITROSODINPROPYLAMINE	621647	No Criteria	183.60	---	---	---	---	---	---	183.6		
NNITROSODIPHENYLAMINE	86306	No Criteria	2160.00	---	---	---	---	---	---	2160		
PYRENE	129000	No Criteria	144000.00	---	---	---	---	---	---	144000		
1,2,4trichlorobenzene	120821	No Criteria	2520.00	---	---	---	---	---	---	2520		
PESTICIDES/PCBs												
ALDRIN	309002	26.00	0.02	---	---	---	---	---	26	0.018		
Alpha BHC	319846	No Criteria	1.76	---	---	---	---	---	---	1.764		
Beta BHC	319857	No Criteria	6.12	---	---	---	---	---	---	6.12		
Gamma BHC (Lindane)	58899	3.20	3.20	---	---	---	---	---	3.2	3.2		
CHLORDANE	57749	1.80	0.14	---	---	---	---	---	1.8	0.144		
4,4DDT	50293	2.60	0.04	---	-	-	---	---	2.6	0.036		
4,4DDE	72559	No Criteria	0.08	---	-	-	---	---	---	0.0792		
4,4DDD	72548	No Criteria	0.11	---	---	---	---	---	---	0.1116		
DIELDRIN	60571	14.20	0.02	---	---	---	---	---	14.2	0.01944		
ENDOSULFAN (alpha)	959988	0.68	0.31	---	0.0166	0.0166	---	---	0.68	0.3132	N	N
ENDOSULFAN (beta)	33213659	0.68	0.31	---	---	---	---	---	0.68	0.3132		
ENDOSULFAN (sulfate)	1031078	No Criteria	3204.00	---	---	---	---	---	---	3204		

ENDRIN	72208	0.74	0.08	---	---	---	---	---	0.74	0.0828		
ENDRIN ALDEHYDE	7421934	No Criteria	10.80	---	---	---	---	---	---	10.8		
HEPTACHLOR	76448	1.06	0.03	---	---	---	---	---	1.06	0.02844		
HEPTACHLOR EPOXIDE	1024573	1.06	0.01	---	---	---	---	---	1.06	0.01404		
POLYCHLORINATED BIPHENYLS3	1336363	No Criteria	0.02	---	---	---	---	---	---	0.02304		
2,3,7,8TCDD (Dioxin)	1746016	No Criteria	0.00	---	---	---	---	---	---	0.000001836		
TOXAPHENE	8001352	4.20	0.01	---	---	---	---	---	4.2	0.0072		
TRIBUTYLTIN		8.40	0.27						8.4	0.2664		
NON PRIORITY POLLUTANTS:												
OTHER SUBSTANCES												
ALUMINUM (limits are total recoverable)	7429905	No Criteria	No Criteria	---	---	---	27.545	27.545	---	---	NA	NA
AMMONIA (winter)	7664417	345240.00	91735.20	---	---	---	---	---	345240	91735.2		
AMMONIA (summer)		120012.00	32551.20	---	---	---	---	---	120012	32551.2		
4BROMOPHENYL PHENYL ETHER	16887006	No Criteria	No Criteria	---	---	---	---	---	---	---		
CHLORIDE	7782505	No Criteria	No Criteria						---	---		
CHLORINE		325.00	325.00	---	---	---	15.9	33.06	325	325	N-WQ	N-WQ
4CHLORO2METHYLPHENOL		No Criteria	No Criteria	---	---	---	---	---	---	---		
1CHLORONAPHTHALENE	106489	No Criteria	No Criteria	---	---	---	---	---	---	---		
4CHLOROPHENOL		No Criteria	No Criteria	---	---	---	---	---	---	---		
2,4DICHLORO6METHYLPHENOL		No Criteria	No Criteria	---	---	---	---	---	---	---		
1,1DICHLOROPROPANE	142289	No Criteria	No Criteria	---	---	---	---	---	---	---		
1,3DICHLOROPROPANE		No Criteria	No Criteria	---	---	---	---	---	---	---		
2,3DINITROTOLUENE		No Criteria	No Criteria	---	---	---	---	---	---	---		
2,4DINITRO6METHYL PHENOL	7439896	No Criteria	No Criteria	---	---	---	---	---	---	---		
IRON	608935	No Criteria	No Criteria						---	---		
pentachlorobenzene		No Criteria	No Criteria	---	---	---	---	---	---	---		
PENTACHLOROETHANE		No Criteria	No Criteria	---	---	---	---	---	---	---		
1,2,3,5tetrachlorobenzene	630206	No Criteria	No Criteria	---	---	---	---	---	---	---		
1,1,1,2TETRACHLOROETHANE	58902	No Criteria	No Criteria	---	---	---	---	---	---	---		
2,3,4,6TETRACHLOROPHENOL		No Criteria	No Criteria	---	---	---	---	---	---	---		
2,3,5,6TETRACHLOROPHENOL	95954	No Criteria	No Criteria	---	---	---	---	---	---	---		
2,4,5TRICHLOROPHENOL	88062	No Criteria	No Criteria	---	---	---	---	---	---	---		
2,4,6TRINITROPHENOL	1330207	No Criteria	No Criteria	---	---	---	---	---	---	---		
XYLENE		No Criteria	No Criteria						---	---		

ATTACHMENT A-8: SCARBOROUGH HEADWORKS D

Scarborough WWTF headworks diagram



HEADWORKS TREATMENT SYSTEM
Figure 3-2

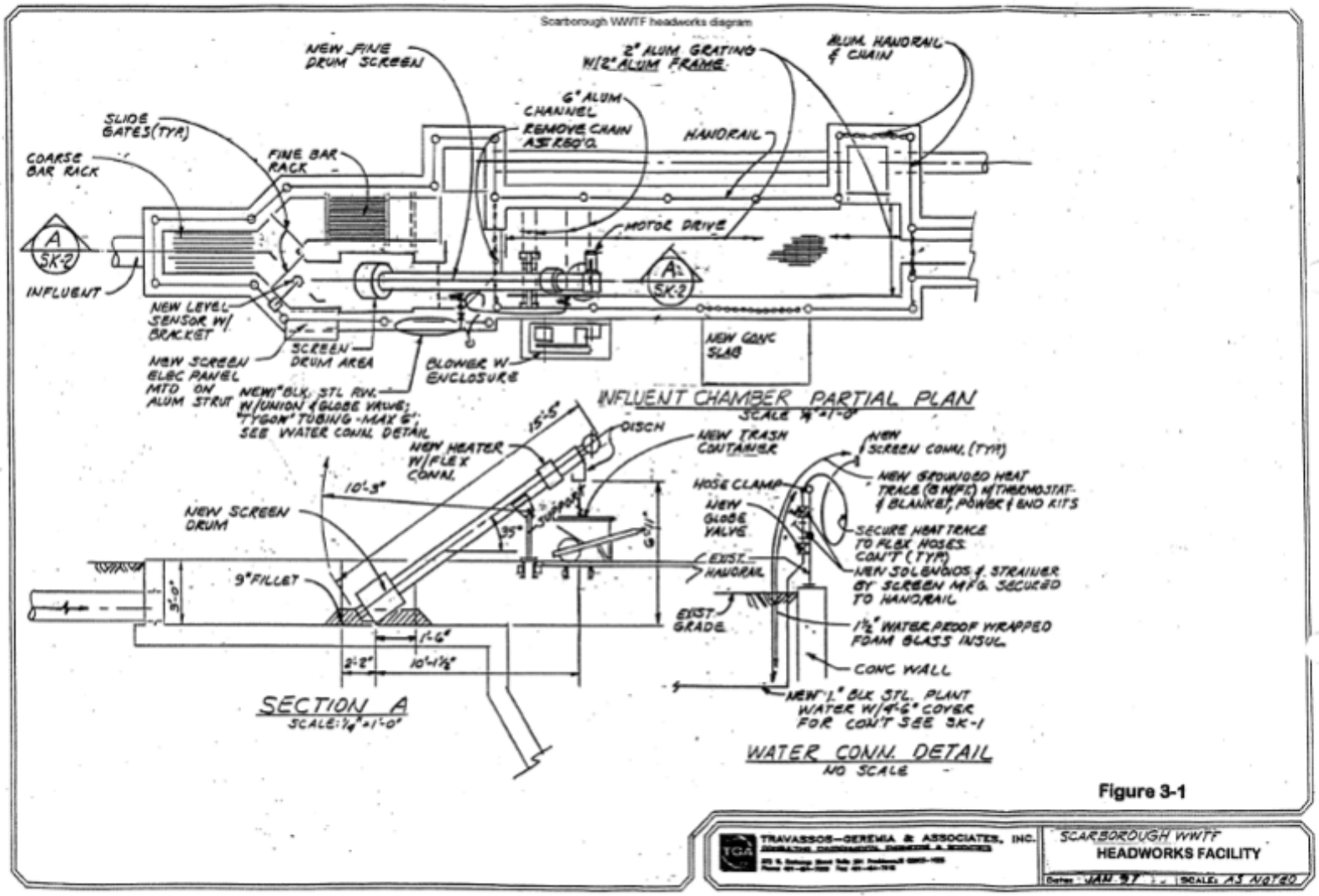

Scarborough WWTF headworks diagram
NEW FINE DRUM SCREEN
2" ALUM. GRATING W/2" ALUM FRAME
ALUM. HANDRAIL & CHAIN
6" ALUM CHANNEL
REMOVE CHAIN AS REQ'D.
HANDRAIL
SLIDE GATES (TYP.)
COARSE BAR RACK
FINE BAR RACK
MOTOR DRIVE
A SK-2
INFLUENT
NEW LEVEL SENSOR W/ BRACKET
NEW SCREEN ELEC PANEL MTD ON ALUM STRUT
SCREEN DRUM AREA
BLOWER W/ ENCLOSURE
NEW CONC SLAB
NEW 1" BLK. STL PIPE W/ UNION & GLOBE VALVE; "TYGON" TUBING - MAX 6'. SEE WATER CONN. DETAIL
INFLUENT CHAMBER PARTIAL PLAN
SCALE 1/4"=1'-0"
15'-5"
DISCH
NEW HEATER W/ FLEX CONN.
NEW TRASH CONTAINER
NEW SCREEN CONN. (TYP.)
NEW GROUNDED HEAT TRACE (BY MFR.) W/THERMOSTAT & BLANKET, POWER & END KITS
HOSE CLAMP
NEW GLOBE VALVE
10'-3"
NEW SCREEN DRUM
35°
SECURE HEAT TRACE TO FLEX HOSES CONT. (TYP.)
EXIST. HANDRAIL
NEW SOLENOID & STRAINER BY SCREEN MFG. SECURED TO HANDRAIL
9" FILLET
3'-0"
EXIST. GRADE
1½" WATERPROOF WRAPPED FOAM GLASS INSUL.
1'-6"
2'-2"
10'-1½"
CONC WALL
NEW 1" BLK. STL. PLANT WATER W/ 4'-6" COVER FOR CONT SEE SK-1
SECTION A
SCALE: 1/4"=1'-0"
WATER CONN. DETAIL
NO SCALE
TRAVASSOS-GEREMIA & ASSOCIATES, INC.
SCARBOROUGH WWTF
HEADWORKS FACILITY
Date: JAN 97
SCALE: AS NOTED

Figure 3-1



WRIGHT-PIERCE
Engineering a Better Environment

Appendix C
Wastewater Treatment Facilities Resiliency Plan, March 2025, Draft

Town Narragansett, Rhode Island

Wastewater Treatment Facilities

RIPDES Permit No. RI0100188

Resiliency Plan

March 2025

DRAFT

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Point Judith Pump Station
Stanton Avenue Pump Station
Galilee Pump Station
Seaport Pump Station
Briggs Farm Pump Station
Scarborough Wastewater Treatment Facility

1.0 INTRODUCTION

Narragansett is a coastal community located in Washington County, along the southern coast of Rhode Island. Regionally, it is a tourist destination known for its scenic beauty. Many public state beaches, miles of scenic vistas, and public access opportunities to the coast draw visitors to the area, particularly during the summer months. The Town population as estimated by the 2020 Census is 14,532. The Town owns and operates the Scarborough WWTF, nineteen (19) pump stations, and approximately seventy (70) miles of sewers. The Town also partners with the Town of South Kingstown and the University of Rhode Island (URI) at the Regional WWTF, also located in Narragansett. The Town services approximately 8,300 sewer accounts, approximately 3,700 are served by the Scarborough WWTF and 4,600 are served by the Regional WWTF.

Per TR-16 "*Guides for the Design of Wastewater Treatment Works",* the RIDEM "*Guidance for the Consideration of Climate Change Impacts in the Planning and Design of Municipal Wastewater Collection and Treatment Infrastructure*" establishes minimum protection goals to prevent interruptions in operations at Base Flood Elevations, or equivalent, and prevent damages to structural and electrical integrity at Base Flood Elevations, or equivalents, with an additional two feet of freeboard for non-critical structures and systems and three feet for critical structures and systems. The Town's wastewater facilities are primarily coastal, and the RI guide indicates that STORMTOOLS mapping should be used to establish Base Flood Elevations for coastal facilities.

In accordance with the Town's current RIPDES permit, the Town is required to produce a Resiliency Planning document, including an assessment of current and projected impacts from natural hazards on critical components within the collection and treatment systems, a plan to adapt and protect vulnerable components and systems, and an analysis that provides justification for selected adaptation methods. The analysis should consider the component and system design life and the practicality of implementation. Please note that the Town is preparing an update to its Wastewater Facilities Plan that is scheduled to be completed by September 2025. Additional details for improvements developed under the Facilities Plan will be incorporated into the overall resiliency plan as appropriate.

2.0 EXISTING CONDITIONS AND ASSESSMENT

The plan requires an assessment of current and projected impacts from natural hazards on critical components of the collection and treatment systems. Elevations of critical components were estimated at each pump station using available documentation including construction and record plans, survey data, FEMA floodplain mapping, and STORMTOOLS mapping. All features reference the North American Vertical Datum of 1988 (NAVD 88) unless noted otherwise. STORMTOOLS Design Elevation (SLR=0) and FEMA FIRM mapping were utilized to evaluate if the 100-year flood plain and 100-year flood +3-ft conditions would pose a flood hazard. The following summarizes our observations made for each facility:

2.1 Bonnet Shores (Allagash) Pump Station

The Bonnet Shores (aka Allagash) Pump Station is a wet well/dry well pump station that constructed ca. 1980 and had a major mechanical process and electrical upgrade completed in 2017. The station consists of below grade concrete wet well and dry well structures, and above grade wood framed building housing electrical and control equipment supported by a concrete base structure with a steel bulkhead door to allow replacement of the backup power generator. The top of the building concrete base and dry well access structures are approximately EL. 13.5. Existing grade at the building is approximately EL. 7.4. Wet well access manhole frame and cover are approximately EL. 8.1. The wet well ventilation pipe opening is approximately EL. 18.0. There is a convault fuel oil tank located outside of the building for generator fuel storage. The station is configured with pipe connections to accommodate temporary bypass pumping.

The site is located within Special Flood Hazard Zone AE, Base Flood Elevation 12 on FEMA Flood Hazard Map Panel 44009C0206J. The STORMTOOLS Storm Design Elevation is EL. 16.2. The existing concrete base structure is flood resistant to EL. 13.5. Minor infiltration is evident at in the below grade joints in the dry well access riser after sustained rain events and spring thaw. The bottom of the electric service disconnect switch and metering enclosures mounted on the building exterior are at EL. 10.4. The existing concrete wet well is flood resistant to approximately EL. 8.1. The fuel oil tank base is approximately EL. 8. The tank is equipped with tie-down brackets to resist floatation.

Assessment: The Bonnet Shores Pump Station site is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

2.2 Pettaquamscutt (Wilson Drive) Pump Station

The Pettaquamscutt (aka Wilson Drive) Pump Station is a wet well/dry well pump station constructed ca. 1996. The station consists of above/below grade concrete wet well and dry well structures, and above grade wood framed building to enhance the physical appearance of the station and house the backup power generator. The top of the concrete wet well and dry well structures are approximately EL. 11.1. Existing grade at the structure is approximately EL. 7.1. All electrical and mechanical equipment is located within the concrete structure with the exception of the backup generator unit, which is housed within the wood framed building and mounted on the wet well top slab. The generator has a self-contained fuel storage tank in the equipment mounting skid. The station is configured with pipe connections to accommodate temporary bypass pumping.

The site is located within SFH Zone AE, Base Flood Elevation 11 on FEMA Flood Hazard Map Panel 44009C0202K. The STORMTOOLS SDE is EL. 13.3. The existing concrete base structure is flood resistant to EL. 11.1. The bottom of the electric service metering enclosures mounted on the building exterior is at approximately EL. 10. The dry well and wet well access hatches are not watertight.

Assessment: The Pettaquamscutt Pump Station site is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

2.3 Circuit Drive Pump Station

The Circuit Drive Pump Station is a wet well/submersible pump station constructed ca. 1996. The station consists of above/below grade concrete wet well and above grade wood framed building to enhance the physical appearance of the station and house the electrical service/control panel enclosure. The top of the concrete wet well structure is approximately EL. 11.1. Existing grade at the structure is approximately EL. 7.1. All mechanical equipment is located within the below grade concrete wet well. The electrical service and control equipment enclosure is housed within the wood framed building above the wet well top slab. Finish floor elevation of the building is approximately EL. 11.8. The electric service meter box is mounted on the exterior of the building, bottom of box approximately EL. 10.5. There is no backup power generator. The station is not configured with temporary bypass piping.

The site is located within SFH Zone AE, Base Flood Elevation 11 on FEMA Flood Hazard Map Panel 44009C0202K. The STORMTOOLS SDE is EL. 13.0. The existing concrete base structure is flood resistant to EL. 11.1. The wet well access hatch is not watertight.

Assessment: The Circuit Drive Pump Station site is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

2.4 Mettatuxet Pump Station

The Mettatuxet Pump Station is a wet well/dry well pump station that was constructed ca. 1980 and had a major mechanical process and electrical upgrade completed in 2017. The station consists of below grade concrete wet well and above/below grade dry well structures. The top of the concrete wet well is EL. 8.5 and the top of the access manhole cover is EL. 9.0. The top of the concrete dry well structures is EL. 14.5. Existing grade at the station structures is approximately EL. 7.0. All electrical and mechanical equipment is located within the concrete structure with the exception of the backup generator unit, which is housed within the wood framed building and mounted to the wet well top slab. The station is configured with pipe connections to accommodate temporary bypass pumping.

The site is located within SFH Zone AE, Base Flood Elevation 11 on FEMA Flood Hazard Map Panel 44009C0202K. The STORMTOOLS SDE is EL. 16.7. The existing concrete base structure is flood resistant to EL. 14.0. The bottom of the electric service metering enclosures mounted on the dry well exterior is at approximately EL. 12.5. The dry well access hatch is not watertight. The wet well manhole entrance hatch is not watertight design. The top of the wet well ventilation tube / bottom of ventilation fan is EL. 15.0.

Assessment: The Mettatuxet Pump Station site is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

2.5 Sprague Bridge Pump Station

The Sprague Bridge Pump Station is a wet well/dry well pump station constructed ca. 1980 and had a major mechanical process and electrical upgrade completed in 2014. The station consists of below grade concrete wet well and dry well structures, and above grade wood framed building and housing the backup power generator. The top of the concrete wet well and dry well structures are below grade at approximately EL. -1.0. The top of the wet well access manholes are approximately EL. 17.3. The finish floor in the building is EL. 15.6. Existing grade at the structure is approximately EL. 15.0. All electrical and mechanical equipment is located within the below grade concrete structures with the exception of the backup generator unit and automatic transfer switch, which are located in the above grade wood framed building, the electric service meter, which is mounted to the exterior of the building approximately 3' above grade, and the wet well ventilation fans, which are pad mounted above grade at approximately EL. 16.0. There is a convault fuel oil tank located outside of the building for generator fuel storage. The station is configured with pipe connections to accommodate temporary bypass pumping.

The station is located outside SFH Zone AE, Base Flood Elevation 14 and within the area 0.2% annual chance flood area/0.1 % chance flood area with average depth less than 1' on FEMA Flood Hazard Map Panel 44009C0204K. The station is located outside of the STORMTOOLS 100-year flood area, the mapped STORMTOOLS SDE approximately 40' west of the station is EL. 14.0. The existing concrete dry well structure is flood resistant to EL. 15.7 (top of access risers), but the ventilation stacks are prone to infiltration. The concrete wet well structure is flood resistant to EL. 15.6. The bottom of the electric service meter enclosure mounted on the building exterior is approximately EL. 17.6. The wet well structure is flood resistant to approximately EL. 17.0. The wet well access hatches are not watertight.

Assessment: The Sprague Bridge Pump Station site is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

2.6 Baneberry Pump Station

The Baneberry Pump Station is a wet well/submersible pump station constructed ca. 1998. The station consists of below grade concrete wet well and above grade wood framed building to enhance the physical appearance of the station and house the electrical/control panel enclosure. The top of the concrete wet well structure is approximately EL. 23.3. Existing grade at the structure is approximately EL. 22.0. All mechanical equipment is located within the below grade concrete wet well. The electrical service and control equipment enclosure is housed within the wood framed building above the wet well top slab. Finish floor elevation of the building is approximately EL. 23.3. The electric service meter box is mounted on the exterior of the building, bottom of box approximately EL. 25.5. There is no backup power generator. The station is not configured with temporary bypass piping. The following vulnerabilities to natural hazards were observed:

The site is located within Area of Minimal Flood Hazard Zone X, no Base Flood Elevation established on FEMA Flood Hazard Map Panel 44009C0202K. The station is located outside of the STORMTOOLS 100-year flood area, the mapped STORMTOOLS SDE is EL 15.4 approximately 100' west of the station site.

Assessment: The Baneberry Pump Station site is not subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency are not necessary at this time. This assessment should be reconsidered if any changes in the 100-year storm design or site conditions become apparent.

2.7 Winterberry (Woodsia) Pump Station

The Winterberry Pump Station is a wet well/dry well pump station constructed ca. 1996. The station consists of above/below grade concrete wet well and dry well structures, and above grade wood framed building to enhance the physical appearance of the station and house the backup power generator. The top of the concrete wet well and dry well structures are approximately EL. 11.1. Existing grade at the structure is approximately EL. 7.1. All electrical and mechanical equipment is located within the concrete structure with the exception of the backup generator unit, which is housed within the wood framed building and mounted on the wet well top slab. The generator has a self-contained fuel storage tank in the equipment mounting skid. The station is configured with pipe connections to accommodate temporary bypass pumping. The following vulnerabilities to natural hazards were observed:

The site is located within SFH Zone AE, Base Flood Elevation 11 on FEMA Flood Hazard Map Panel 44009C0114K. The STORMTOOLS SDE is EL. 14.2. The existing concrete base structure is flood resistant to EL. 11.1. The electric service conduit enters the building at approximately EL. 12.0. The bottom of the electric service meter enclosures mounted on the building exterior is at approximately EL. 13.5. The dry well and wet well access hatches are not watertight.

Assessment: The Winterberry Pump Station site is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

2.8 Industrial Park Pump Station

The Industrial Park Pump Station is a wet well/dry well pump station constructed ca. 1971 and had a mechanical process upgrade completed in 2015. The station consists of a below grade concrete wet well and steel dry well structures. The top of the concrete wet well access riser and manhole cover are approximately EL. 40.0. The top of the dry well access tube is approximately EL. 41.5. Existing grade at the site is approximately EL.38.5. Electrical and mechanical equipment is located within the steel dry well structure and control equipment is located in a pad mounted electrical enclosure at grade level. There is no backup generator. The station is not configured with temporary bypass piping. The following vulnerabilities to natural hazards were observed:

The site is located within Area of Minimal Flood Hazard Zone X, no Base Flood Elevation established on FEMA Flood Hazard Map Panel 44009C0206J. 0.2% annual chance flood area/0.1 % chance flood area with average depth less than 1’ are mapped approximately 130’ west and 150’ south of the site. The station is located outside of the STORMTOOLS 100-year flood area and there are no mapped STORMTOOLS SDE in the vicinity of the site. The dry well cover and wet well access manhole are not watertight.

Assessment: The Industrial Park Pump Station site is not subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency are not necessary at this time. This assessment should be reconsidered if any changes in the 100-year storm design or site conditions become apparent.

2.9 Wolfe Road Pump Station

The Wolfe Road Pump Station is a wet well/dry well pump station constructed ca. 1982. The control system was upgraded in 2011. Existing grade at the site is approximately EL. 11.6. The station consists of a below grade concrete wet well and steel dry well structures. The top of the concrete wet well and access manhole cover are approximately EL. 13.0. The top of the dry well access tube is approximately EL. 14.5. Electrical and mechanical equipment is located within the steel dry well structure. The electric service meter is located on a utility pole on the site. There is no backup generator. The station is configured with pipe connections to accommodate temporary bypass pumping. The following vulnerabilities to natural hazards were observed:

The site is located within SFH Zone AE, Base Flood Elevation 12 on FEMA Flood Hazard Map Panel 44009C0206J. The STORMTOOLS SDE is EL. 14.6. The existing dry well structure is flood resistant to EL. 14.5. The concrete wet well structure is flood resistant to EL. 13.0. The existing concrete wet well cover is not watertight. The existing dry well access riser cover is not watertight. Electric conduit enters the access riser at approximately EL. 13.0. Dry well ventilation pipe openings are approximately EL. 14.0.

Assessment: The Wolfe Road Pump Station site is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

2.10 Mumford Road Pump Station

The Mumford Road Pump Station is a wet well/dry well pump station constructed ca. 1995. The station consists of below grade concrete wet well structure and above grade concrete dry well structure that is shingle sided and fitted with a wood framed roof. The mechanical process and electrical equipment is housed in the above grade dry well. The backup generator has a self-contained fuel storage tank in the equipment mounting skid. Existing grade at the structure is approximately EL. 30.5. The top of the concrete wet well structure is approximately EL. 30.6. The finish floor of the concrete dry well structure is approximately EL. 31.1. The wet well exhaust ventilation pipe opening is approximately EL. 32.5. The station is configured with pipe connections to accommodate temporary bypass pumping. The following vulnerabilities to natural hazards were observed:

The site is located within Area of Minimal Flood Hazard Zone X, no Base Flood Elevation established on FEMA Flood Hazard Map Panel 44009C0203K. 0.2% annual chance flood area/0.1 % chance flood area with average depth less than 1' are mapped approximately 530' east of the site, and SFH Zone AE, Base Flood Elevation 14 is mapped approximately 700' east of the site. The station is located outside of the STORMTOOLS 100-year flood area, the mapped STORMTOOLS SDE approximately 700' east of the station is EL. 14.0. The concrete wet well structure is flood resistant to EL. 30.6 and the concrete drywell structure is flood resistant to EL. 31.1. The wet well access hatches are not watertight.

Assessment: The Mumford Road Pump Station site is not subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency are not necessary at this time. This assessment should be reconsidered if any changes in the 100-year storm design or site conditions become apparent.

2.11 Congdon Street Pump Station

The Congdon Street Pump Station is a wet well/dry well pump station constructed ca. 1975. The control system and one pump were replaced in 2005, and one pump was replaced in 2020. Existing grade at the site is approximately EL. 11.7. The station consists of below grade concrete wet well and dry well structures. The top of the concrete wet well is an at grade access manhole at approximately EL. 11.7. The top of the dry well access riser is approximately EL. 15.1 and the top of the access hatch is approximately EL. 16.1 Electrical and mechanical equipment is located within the below grade dry well structure. The electric service meter is located on a utility pole near the site. The bottom of the utility meter box is approximately 2' above grade. There is no backup generator. The station is not configured with temporary bypass piping. A gravity relief sewer was constructed in 2011 to provide forward flow during periods of influent sewer surcharging. The following vulnerabilities to natural hazards were observed:

The site is located within SFH Zone AE, Base Flood Elevation 14 on FEMA Flood Hazard Map Panel 44009C0212J and SFH Zone VE, Base Flood Elevation 19 is mapped approximately 100' east of the site (east of Ocean Road seawall). The STORMTOOLS SDE at the site is EL. 12.5, EL. 15.1 approximately 15' east of the site, and EL. 20.2 approximately 100' east of the site (east of seawall). The existing dry well structure is flood resistant to EL. 15.1. The existing wet well is flood resistant to EL. 11.7. The existing concrete wet well does not have a watertight cover. The existing dry well access hatch cover is not watertight. Dry well ventilation pipe openings are approximately EL. 14.0.

Assessment: The Congdon Street Pump Station site is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

2.12 Lakewood Drive Pump Station

The Lakewood Drive Pump Station is a wet well/dry well pump station constructed prior to 1978 and had a mechanical process upgrade completed in 2014. The station consists of a below grade concrete wet well and steel dry well structures. Existing grade at the site is approximately EL. 45.0. The top of the concrete wet well manhole cover is approximately EL. 46.5. The top of the dry well access tube is approximately EL. 47.5. Electrical and mechanical equipment is located within the steel dry well structure. The electric service meter is post mounted approximately 3.5' above grade. A backup generator is being installed at the site and will be located on an at grade concrete pad. The station is configured with pipe connections to accommodate temporary bypass pumping. The following vulnerabilities to natural hazards were observed:

The site is located within Area of Minimal Flood Hazard Zone X, no Base Flood Elevation established on FEMA Flood Hazard Map Panel 44009C0206J. 0.2% annual chance flood area/0.1 % chance flood area with average depth less than 1' are mapped approximately 350' east of the site. The station is located outside of the STORMTOOLS 100-year flood area and there are no mapped STORMTOOLS SDE in the vicinity of the site. The dry well cover and wet well access manhole are not watertight.

Assessment: The Lakewood Drive Pump Station site is not subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency are not necessary at this time. This assessment should be reconsidered if any changes in the 100-year storm design or site conditions become apparent.

2.13 Ouida Street Pump Station

The Ouida Street Pump Station is a wet well/dry well pump station constructed ca. 1975. A complete mechanical process and electrical upgrade was completed in 2008. The station consists of below grade concrete wet well and dry well structure and above grade CMU structure. The mechanical process equipment is located in the below grade dry well and in the above grade CMU structure. The electrical and control equipment is primarily located in the above grade dry well. The backup generator is located in the above grade CMU structure. There is a convault fuel oil tank located outside of the building for generator fuel storage. Existing grade at the structure is approximately EL. 13.6. The top of the concrete wet well and dry well structure is the building finish floor and is approximately EL. 14.1. The station is configured with pipe connections to accommodate temporary bypass pumping. The following vulnerabilities to natural hazards were observed:

The site is located within SFH Zone AE, Base Flood Elevation 14 on FEMA Flood Hazard Map Panel 44009C0212J and SFH Zone AE, Base Flood Elevation 15 borders the site to the east. The STORMTOOLS SDE at the site is EL. 13.8. The building is flood resistant to EL. 14.1. Building ventilation louver openings are approximately EL. 16.8. The site is located on the western shore of Lake Canonchet.

Assessment: The Ouida Street Pump Station site is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

2.14 Burnside Avenue Pump Station

The Burnside Avenue Pump Station is a wet well/dry well pump station constructed ca. 1962. A complete mechanical process and electrical upgrade was completed in 2008. The station consists of below grade concrete wet well and dry well structure and above grade CMU structure that is shingle sided and fitted with a wood framed roof. The mechanical process equipment is located in the below grade dry well. The electrical and control equipment is primarily located in the above grade dry well. The backup generator is located in the above grade CMU structure. There is a convault fuel oil tank located outside of the building for generator fuel storage. The tank is equipped with tie-down brackets to resist floatation. Existing grade at the structure is approximately EL. 13.0. The top of the concrete wet well well structure is approximately EL. 13.1. The top of the concrete dry well is approximately EL. 15.4 and is the above grade building finish floor. The station is configured with pipe connections to accommodate temporary bypass piping, but the pipe connection is located inside the pump station. The following vulnerabilities to natural hazards were observed:

The site is located within SFH Zone AE, Base Flood Elevation 14 and the 0.2% annual chance flood area/0.1 % chance flood area with average depth less than 1' on FEMA Flood Hazard Map Panel 44009C0213J. SFH Zone VE, Base Flood Elevation 15 is mapped approximately 150' east if the station. The STORMTOOLS SDE at the site is EL. 13.3. SDE EL. 16.2 is mapped approximately 115' east of the station. The dry well is flood resistant to EL. 15.4 and the wet well is flood resistant to EL. 13.1. The wet well access hatch is not watertight. Building ventilation louver openings are approximately EL. 16.0. Wet well ventilation supply fan curb opening is approximately EL. 13.8.

Assessment: The Burnside Avenue Pump Station site is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

2.15 Point Judith Pump Station

The Point Judith Pump Station is a wet well/dry well pump station constructed ca. 1996. The station consists of below grade concrete wet well structure and above and below grade concrete dry well structure with the above grade section shingle sided and fitted with a wood framed roof. The electrical and control equipment is primarily located in the above grade dry well. The mechanical process equipment is located in the below grade dry well. The backup generator is located in the above grade dry well and has a self-contained fuel storage tank in the equipment mounting skid. Existing grade at the structure is approximately EL. 22.5. The top of the concrete wet well structure is approximately EL. 23.0. The finish floor of the concrete dry well structure is approximately EL. 23.5. The wet well exhaust ventilation opening is approximately EL. 23.0 and supply ventilation pipe openings are approximately EL. 25.5. The dry well ventilation pipe and louver openings are approximately EL. 25.5. The station is configured with pipe connections to accommodate temporary bypass pumping. The following vulnerabilities to natural hazards were observed:

The site is located within Area of Minimal Flood Hazard Zone X, no Base Flood Elevation established on FEMA Flood Hazard Map Panel 44009C0213J. 0.2% annual chance flood area/0.1 % chance flood area with average depth less than 1' are mapped to the west, north and east of the site, with the closest area approximately 100' from the station. The station is located outside of the STORMTOOLS 100-year flood area. STORMTOOLS maps SDE EL. 13.5 approximately 200' to the west and north of the station and SDE EL. 14.5 approximately 370' east of the station. The concrete wet well structure is flood resistant to EL. 23.0 and the concrete drywell structure is flood resistant to EL. 23.5. The wet well access hatches are not watertight.

Assessment: The Point Judith Pump Station site is not subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency are not necessary at this time. This assessment should be reconsidered if any changes in the 100-year storm design or site conditions become apparent.

2.16 Stanton Avenue Pump Station

The Stanton Avenue Pump Station is a wet well/dry well pump station constructed ca. 1972. The control systems were relocated to an above grade precast concrete structure to resist flooding in 1998 and a backup power generator was installed in 2016. The station consists of a below grade concrete wet well and fiberglass dry well structures, above grade concrete control building structure, and elevated steel structure supporting the generator. There is a propane fuel tank mounted at grade on a concrete pad with tie-down brackets to resist floatation. Existing grade at the site is approximately EL. 6.9. The top of the concrete wet well riser is approximately EL. 8.8 the access manhole cover is approximately EL. 9.4. The top of the dry well access tube is approximately EL. 9.8. The top of the control building and the generator support platform are approximately EL. 15.9. Electrical and control equipment is located in the above grade control building that is accessed via roof hatch. Mechanical equipment is located in the below grade dry well structure. The electric service meter is located on the control building exterior approximately 4' above grade. The backup generator is housed in a weather-resistant enclosure and mounted on the elevated steel support frame with ladder access to the equipment platform. The station is configured with pipe connections to accommodate temporary bypass pumping. The following vulnerabilities to natural hazards were observed:

The site is located within SFH Zone AE, Base Flood Elevation 12 and is bordered Zone VE, Base Flood Elevation 14 mapped on FEMA Flood Hazard Map Panel 44009C0326J. The station is located within the STORMTOOLS 100-year flood area and the SDE at the site is EL. 16.7. The site is prone to flooding due to the adjacent marsh and pond that border the site to the east and proximity to tidal waters to the south. Infiltration is evident at ventilation piping to the below grade dry well. Approximately 50% of the station tributary sewer is inundated under mapped 100-year flood conditions. The control building and backup generator are flood resistant to approximately EL. 15.9. The existing concrete wet well does not have a watertight cover. The existing dry well access riser cover is not watertight. There are conduit penetrations entering the dry well access riser at approximately EL. 9.0. Electric conduit enters the control building at approximately EL. 11.9. Dry well ventilation pipe openings are approximately EL. 9.5.

Assessment: The Stanton Avenue Pump Station site is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

2.17 Galilee Pump Station

The Galilee Pump Station is a wet well/dry well pump station constructed ca. 1970, with a complete mechanical and electrical rehabilitation including a major structural addition constructed ca. 1988. Pumps and motors have been replaced since the rehabilitation. The station consists of below grade concrete wet well and dry well structures, with the upper section extending approximately 5' above grade. Existing grade at the site is approximately EL. 9.4. The top of the concrete wet well and dry well structure is approximately EL. 14.6. Electrical and mechanical equipment is located within the below grade dry well structure. The electric service meter is located on a utility pole at the site. The backup generator is housed in a weather-resistant enclosure mounted on top of the concrete wet well / dry well structure along. Generator fuel supply is stored in a convault mounted on top of the wet well / dry well structure and equipped with tie-down brackets to prevent flotation. The station is configured with pipe connections to accommodate temporary bypass pumping. The following vulnerabilities to natural hazards were observed:

The site is located within SFH Zone AE, Base Flood Elevation 13 on FEMA Flood Hazard Map Panel 44009C0194J and SFH Zone VE, Base Flood Elevation 15 is mapped approximately 500' southwest of the station. The station is located within the STORMTOOLS 100-year flood area and the SDE at the site is EL. 14.6. The existing concrete wet well does not have a watertight cover. The existing dry well access hatch cover is not watertight. Dry well ventilation openings are approximately EL. 10.6. Temporary bypass pipe is located in a below grade valve pit with at grade access. The dry well is prone to rainwater intrusion at the top slab access hatches.

Assessment: The Galilee Pump Station site is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

2.18 Seaport Pump Station

The Seaport Pump Station is a wet well/submersible pump station constructed ca. 1994. The station consists of below grade concrete wet well and above grade wood framed building to enhance the physical appearance of the station and house the electrical/control panel enclosure. Existing grade at the structure

is approximately EL. 42.0. The top of the concrete wet well structure and finish floor of the building is approximately EL. 42.5. All mechanical equipment is located within the below grade concrete wet well. The electrical service and control equipment enclosure is housed within the wood framed building above the wet well top slab. There is a backup power generator on site next to the building with a self-contained fuel storage tank in the equipment mounting skid. The station is not configured with temporary bypass piping. The following vulnerabilities to natural hazards were observed:

The site is located within Area of Minimal Flood Hazard Zone X, no Base Flood Elevation established on FEMA Flood Hazard Map Panel 44009C0211J. The station is located outside of the STORMTOOLS 100-year flood area and there are no mapped STORMTOOLS SDE in the vicinity of the site. The wet well access hatch is not watertight.

Assessment: The Seaport Pump Station site is not subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency are not necessary at this time. This assessment should be reconsidered if any changes in the 100-year storm design or site conditions become apparent.

2.19 Briggs Farm Pump Station

The Briggs Farm Pump Station is a wet well/dry well pump station constructed ca. 2005. The station consists of below grade concrete wet well structure and above grade concrete dry well structure that is shingle sided and fitted with a wood framed roof. The mechanical process and electrical equipment is housed in the above grade dry well. The backup generator has a self-contained fuel storage tank in the equipment mounting skid. Existing grade at the structure is approximately EL. 11.8. The top of the concrete wet well structure is approximately EL. 12.7. The finish floor of the concrete dry well structure is approximately EL. 13.3. The wet well exhaust ventilation pipe opening is approximately EL. 13.7 and supply ventilation pipe openings approximately EL. 14.7. The station is configured with pipe connections to accommodate temporary bypass pumping. The following vulnerabilities to natural hazards were observed:

The site is located within SFH Zone AE, Base Flood Elevation 12 on FEMA Flood Hazard Map Panel 44009C0213J. The station is located outside of the STORMTOOLS 100-year flood area, mapped STORMTOOLS SDE is EL. 14.5 approximately 50’ west of the station and EL. 14.4 approximately 50’ north of the station. The concrete wet well structure is flood resistant to EL. 12.7 and the concrete drywell structure is flood resistant to EL. 13.3. The wet well access hatches are not watertight.

Assessment: The Briggs Farm Pump Station site is subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency should be developed.

2.20 Scarborough Wastewater Treatment Facility

The Scarborough WWTF is an activated sludge secondary wastewater treatment facility with preliminary screening, grit removal, oxidation ditch, secondary clarifiers, and disinfection treatment prior to ocean discharge. The plant has a permitted capacity of 1.4 MGD with average flow approximately 0.75 MGD. The facility was constructed ca. 1983 as currently configured, with expanded laboratory and administrative offices constructed in 1991, and additional solids handling facilities constructed in 1994.

Various equipment, systems, and components have been replaced or modified since the original construction. A flood proofing barrier was constructed in 2018 to protect the WWTF site and the breakwater jetty extending from the shoreline at the WWTF site was reconstructed in 2023. The top of the flood proofing barrier is EL. 20.0. The following vulnerabilities to natural hazards were observed:

The site is located within Other Areas of Flood Hazard - Area with Reduced Flood Fisk due to Levee *Zone X* and is bordered by Zone VE, Base Flood Elevation EL. 16 as mapped on FEMA flood Hazard Map Panel 44009C0213J. STORMTOOLS maps 100-year flood area SDE EL. 14.9, but depicts flood areas on the protected side of the flood proofing barrier. STORMTOOLS maps the 100-year SDE EL. 16.5 at the seaward side of the barrier. The site was breached during Hurricane Sandy in 2012, which led to construction of the flood proofing barrier completed in 2018. The WWTF is flood resistant to EL. 20.0.

Assessment: The Scarborough WWTF site is not subject to potential impacts from flood hazards associated with the 100-year flood conditions. Modifications and improvements to enhance flood resiliency are not necessary at this time. This assessment should be reconsidered if any changes in the 100-year storm design or site conditions become apparent.

3.0 PROPOSED Improvements

Several facilities were identified to have potential impacts from flood hazards associated with a 100-year storm, including: Bonett Shores (Allagash), Pettaquamscutt (Wilson Drive), Circuit Drive, Mettatuxet, Sprague Bridge, Winterberry (Woodsia), Wolfe Road, Congdon Street, Ouida Street, Burnside Avenue, Stanton Avenue, Galilee, and Briggs Farm Pump Stations. Critical components at these locations were determined to be less than 3-feet above the 100-year flood elevation and will need to be protected from flood hazards to ensure continued operation during a severe flooding event. The improvement options for these stations are provided below.

3.1 Bonnet Shores (Allagash) Pump Station

The STORMTOOLS Storm Design Elevation is EL. 16.2 at the site, SDE+3 is EL. 19.2. Potential improvements to protect the facility to SDE+3 include: extending dry well flood walls and/or retrofitting with watertight access hatches, relocating electrical equipment and enclosures to protected areas or elevation, retrofitting wet well access openings to watertight hatches or manhole covers, raising ventilation pipe openings and fuel tank atmospheric openings, and sealing miscellaneous infiltration. A cost range of $350,000 to $425,000 has been assigned to these improvements for preliminary planning purposes.

3.2 Pettaquamscutt (Wilson Drive) Pump Station

The STORMTOOLS Storm Design Elevation is EL. 13.3 at the site, SDE+3 is EL. 16.3. Potential improvements to protect the facility to SDE+3 include: constructing flood walls and/or retrofitting with watertight access hatches, replacing access doors with flood doors, relocating electrical equipment and enclosures to protected areas or elevation, raising ventilation pipe openings and fuel tank atmospheric openings, and sealing miscellaneous infiltration. A cost range of $250,000 to $325,000 has been assigned to these improvements for preliminary planning purposes.

3.3 Circuit Drive Pump Station

The STORMTOOLS Storm Design Elevation is EL. 13.0 at the site, SDE+3 is EL. 16.0. Potential improvements to protect the facility to SDE+3 include: retrofitting wet well with watertight access hatch, relocating electrical equipment and enclosures to protected elevation or new watertight enclosure. A cost range of $40,000 to $80,000 has been assigned to these improvements for preliminary planning purposes.

3.4 Mettatuxet Pump Station

The STORMTOOLS Storm Design Elevation is EL. 16.7 at the site, SDE+3 is EL. 19.7. Potential improvements to protect the facility to SDE+3 include: retrofitting with watertight access hatch and covers, raising electrical equipment, including backup generator, and enclosures to protected elevation or relocating to new watertight enclosure, raising utility gas meter. A cost range of $325,000 to $375,000 has been assigned to these improvements for preliminary planning purposes.

3.5 Sprague Bridge Pump Station

FEMA Zone AE EL. 14 borders the site to the west and the site lies within the area 0.2% annual chance flood area/0.1 % chance flood area with average depth less than 1'. The STORMTOOLS Storm Design Elevation is EL. 14.0 near the site to the west, SDE+3 is EL. 17.0. Potential improvements to protect the facility to BFE+3/SDE+3 include: constructing flood walls and replacing access doors with flood doors, raising wet well access and/or retrofitting with watertight hatches/covers, relocating electrical equipment and enclosures to protected areas or elevation, raising ventilation equipment, louvers, and pipe openings and fuel tank atmospheric openings, securing the fuel tank and bulk chemical storage tank against flotation, and sealing miscellaneous infiltration. A cost range of $250,000 to $375,000 has been assigned to these improvements for preliminary planning purposes.

3.6 Winterberry Pump Station

The STORMTOOLS Storm Design Elevation is EL. 14.2 at the site, SDE+3 is EL. 17.2. Potential improvements to protect the facility to SDE+3 include: constructing flood walls and/or retrofitting with watertight access hatches, replacing access doors with flood doors, relocating electrical equipment and enclosures to protected areas or elevation, raising ventilation pipe openings and fuel tank atmospheric openings, and sealing miscellaneous infiltration. A cost range of $250,000 to $325,000 has been assigned to these improvements for preliminary planning purposes.

3.7 Wolfe Road Pump Station

The STORMTOOLS Storm Design Elevation is EL. 14.6 at the site, SDE+3 is EL. 17.6. Potential improvements to protect the facility to SDE+3 include: retrofitting with watertight access hatches/covers, relocating electrical equipment and enclosures to protected elevation or new watertight enclosure, or complete replacement with submersible style station. A cost range of $25,000 to $50,000 has been assigned to the repair improvements and $1,500,000 to $1,750,000 to station replacement for preliminary planning purposes.

3.8 Congdon Street Pump Station

The STORMTOOLS Storm Design Elevation is EL. 12.5 at the site, SDE+3 is EL. 15.5. Potential improvements to protect the facility to SDE+3 include: retrofitting with watertight access hatches/covers, relocating electrical equipment and enclosures to protected elevation or new watertight enclosure, and raising ventilation pipe openings. A cost range of $25,000 to $50,000 has been assigned to these improvements for preliminary planning purposes.

3.9 Ouida Street Pump Station

The STORMTOOLS Storm Design Elevation is EL. 13.8 at the site, SDE+3 is EL. 16.8. Potential improvements to protect the facility to SDE+3 include: constructing flood walls and replacing access doors with flood doors, relocating electrical equipment and enclosures to protected areas or elevation, raising ventilation equipment, louvers, and pipe openings and fuel tank atmospheric openings, and securing the fuel tank

and bulk chemical storage tank against flotation. A cost range of $475,000 to $525,000 has been assigned to these improvements for preliminary planning purposes.

3.10 Burnside Avenue Pump Station

The STORMTOOLS Storm Design Elevation is EL. 13.3 at the site, SDE+3 is EL. 16.3. Potential improvements to protect the facility to SDE+3 include: constructing flood walls and replacing access doors with flood doors, retrofitting with watertight access hatches/covers, relocating electrical equipment and enclosures to protected areas or elevation, raising ventilation equipment, louvers, and pipe openings and fuel tank atmospheric openings, securing the fuel tank against flotation, and constructing external bypass pipe connection. A cost range of $400,000 to $450,000 has been assigned to these improvements for preliminary planning purposes.

3.11 Stanton Avenue Pump Station

The STORMTOOLS Storm Design Elevation is EL. 16.7 at the site, SDE+3 is EL. 20.7. Potential improvements to protect the facility to SDE+3 include: complete replacement with submersible style station. Due to the age of the station and significant change in flood hazard elevation (existing FEMA Zone AE EL. 12 to SDE+3 EL. 20.7) retrofitting the existing facility is considered infeasible. A cost range of $2,000,000 to $2,250,000 for been assigned to station replacement for preliminary planning purposes.

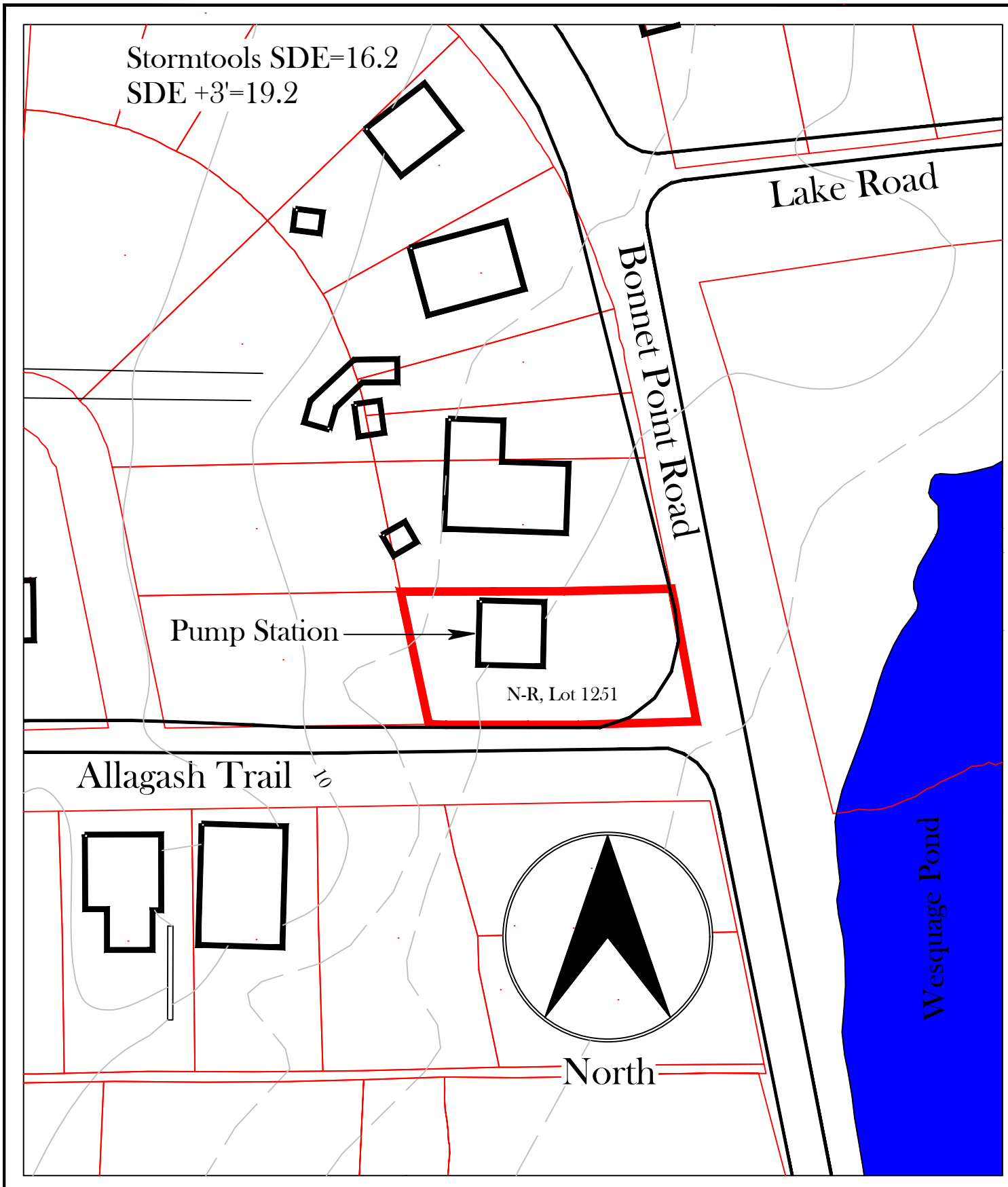
3.12 Galilee Pump Station

The STORMTOOLS Storm Design Elevation is EL. 14.6 at the site, SDE+3 is EL. 17.6. Potential improvements to protect the facility to SDE+3 include: complete replacement with full station upgrade. Due to the age and condition of the station retrofitting the existing facility is considered infeasible. A cost range of $3,500,000 to $4,000,000 for been assigned to station replacement for preliminary planning purposes.

3.13 Briggs Farm Pump Station

The site lies within FEMA Zone AE EL. 12. The STORMTOOLS Storm Design Elevation is EL. 14.4 near the site to the west and 14.5 near the site to the north, SDE+3 is EL. 17.5. Potential improvements to protect the facility to SDE+3 include: retrofitting with watertight access hatches/covers, replacing access doors with flood doors, raising electrical equipment and enclosures, and raising ventilation equipment and pipe openings. A cost range of $100,000 to $150,000 has been assigned to these improvements for preliminary planning purposes.

FIGURES



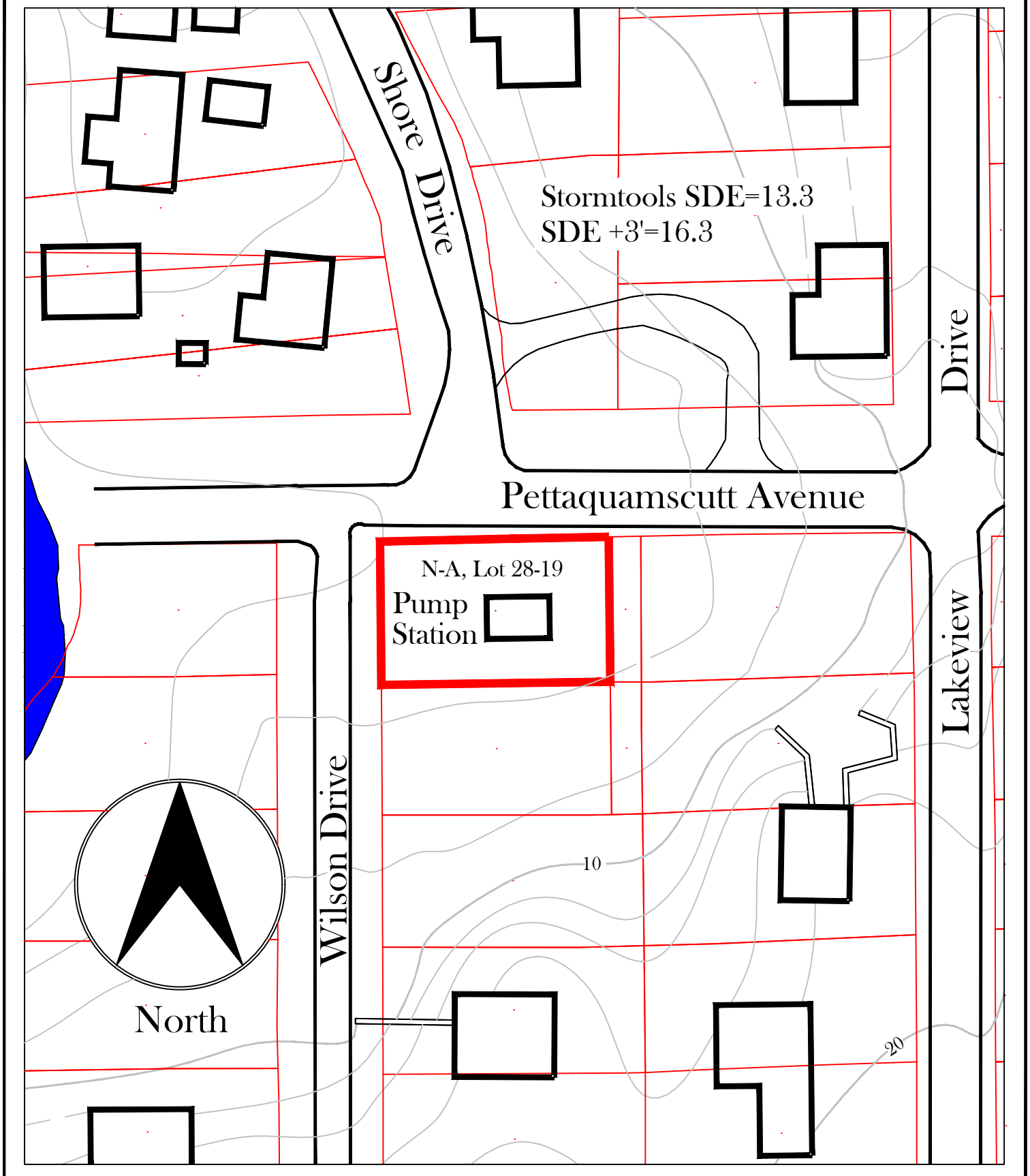
Allagash Trail Wastewater Pump Station
124 Allagash Trail
Plat N-R, Lot 1251

Revised: 03/25/2025

Drawn: M.E.L.

Date: 12/6/2000

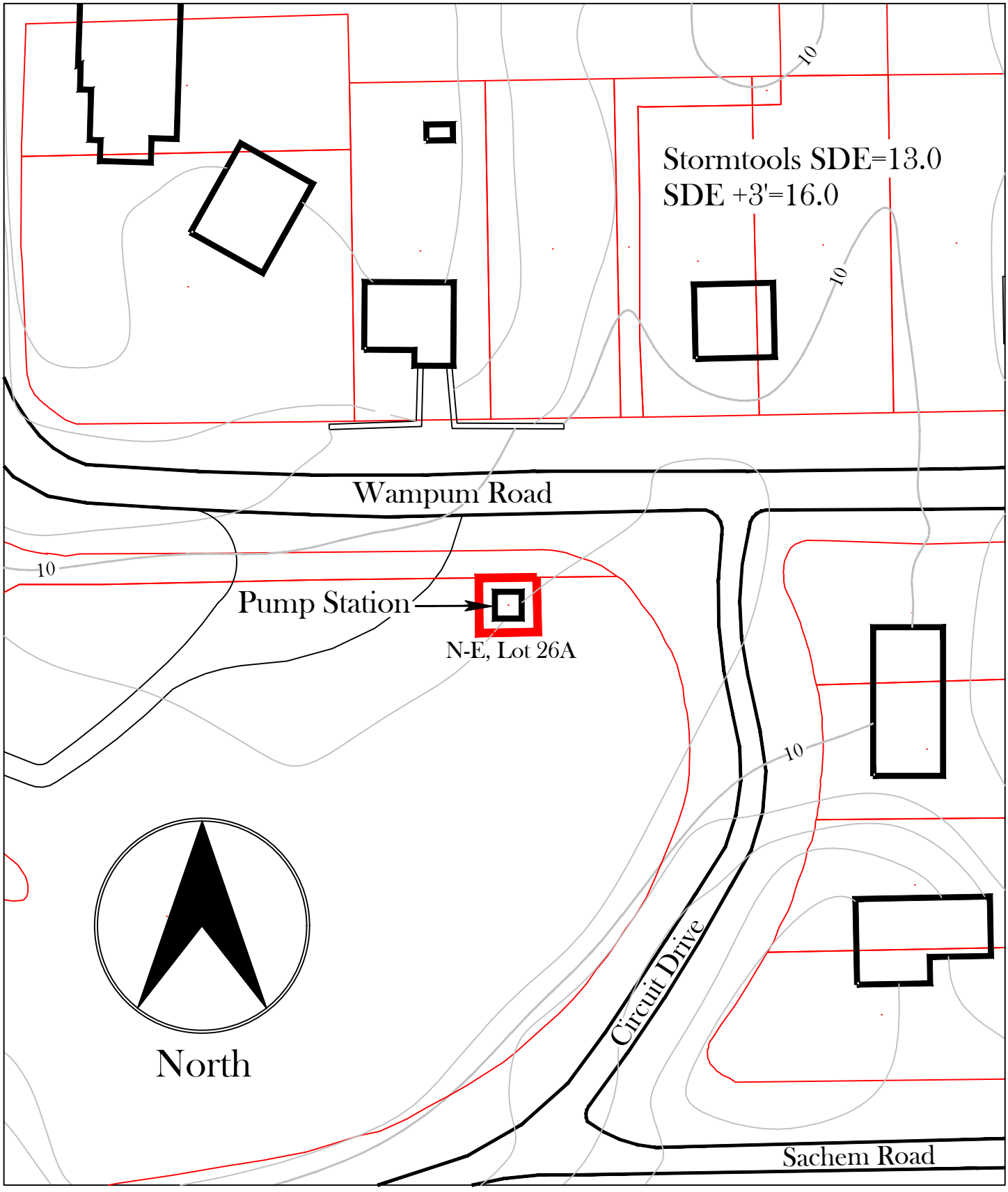
Scale: 1"=50'



Wilson Drive Wastewater Pump Station
37 Pettaquamscutt Avenue
Plat N-A, Lot 28-19

Revised: 03/25/2025

Drawn: M.E.L.
Date: 11/15/2000
Scale: 1"=50'



Circuit Drive Wastewater Pump Station

50 Circuit Drive

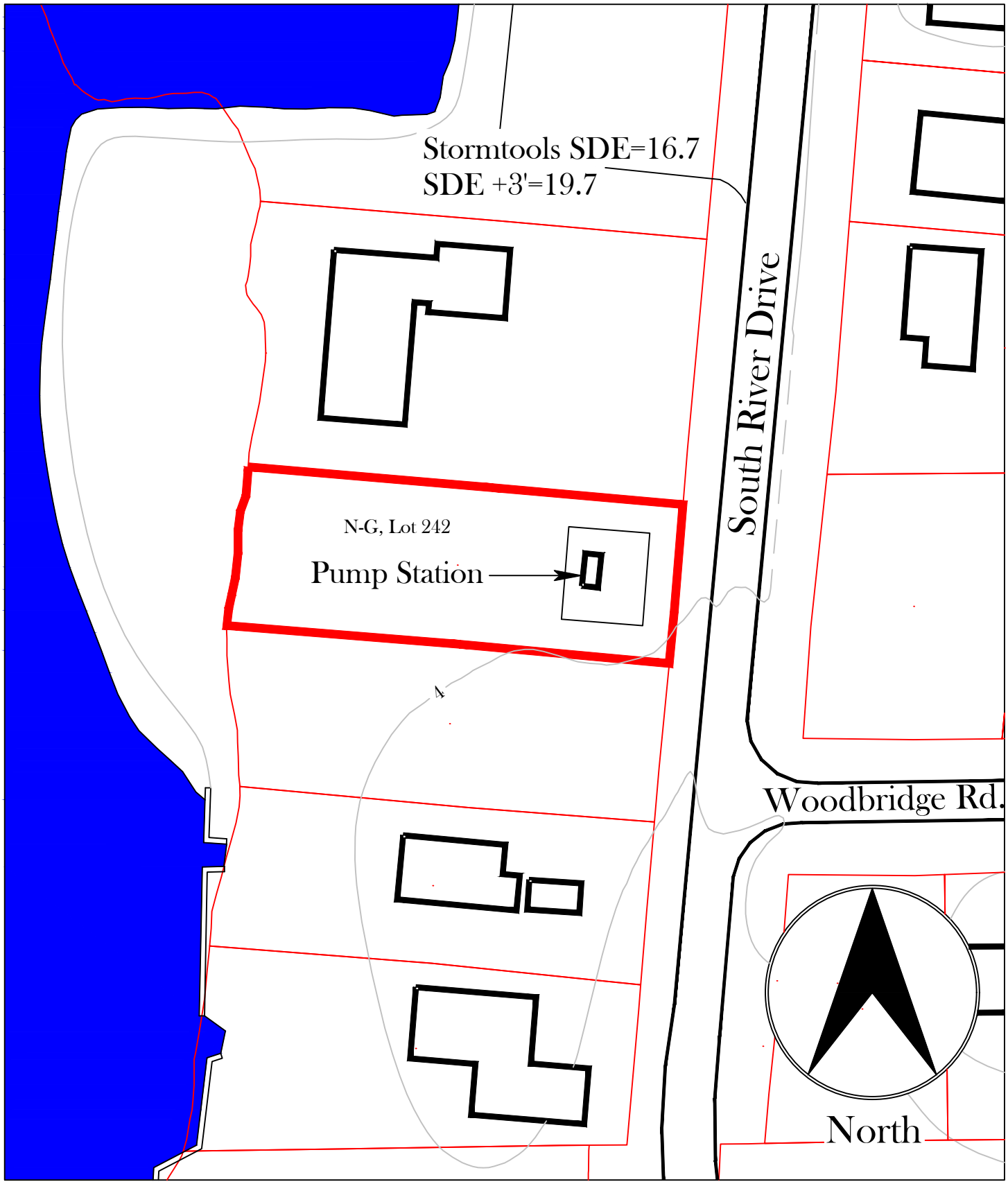
Plat N-E, Lot 26A

Drawn: M.E.L.

Date: 11/15/2000

Revised: 03/25/2025

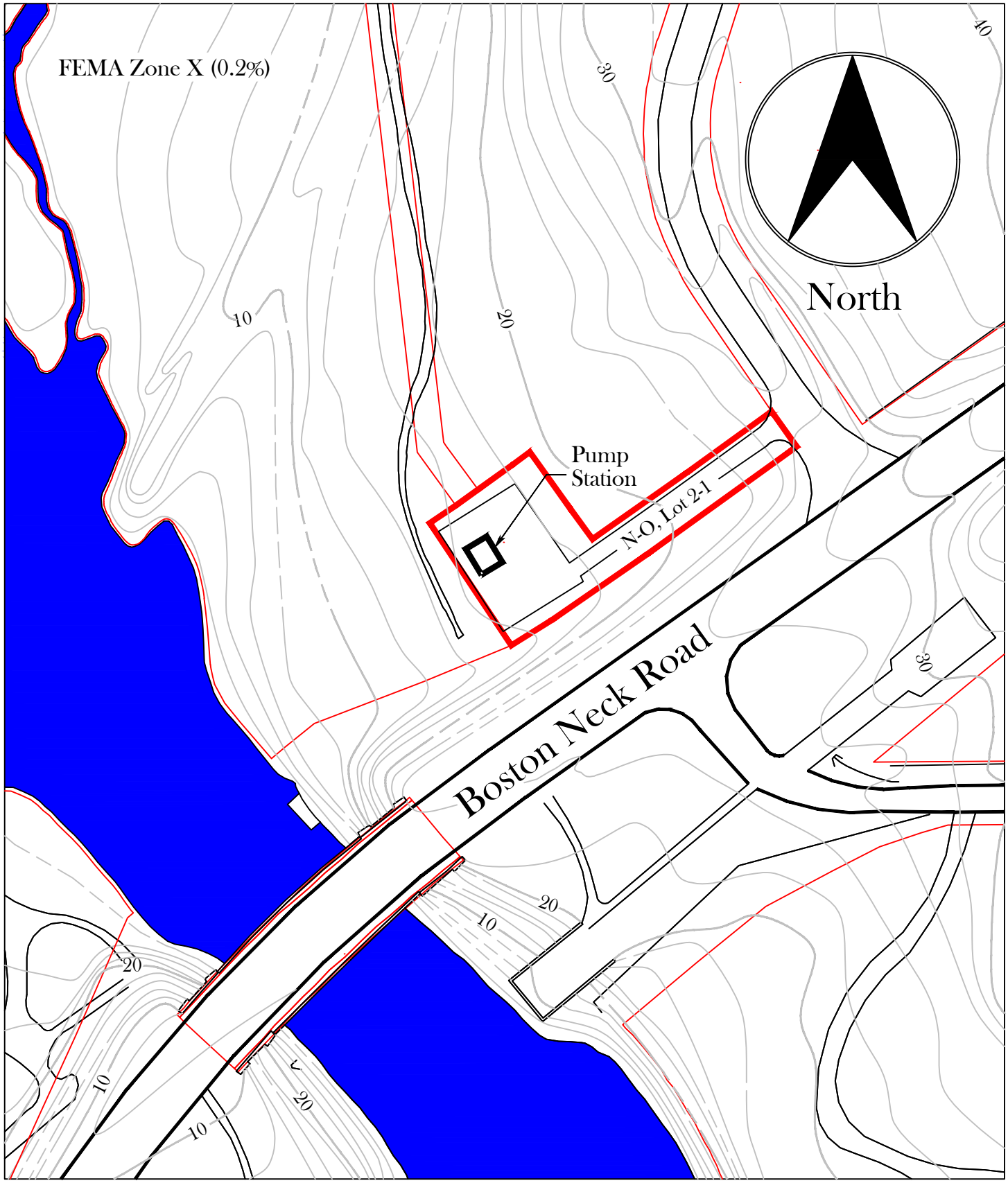
Scale: 1"=50'



Mettatuxet Wastewater Pump Station
10 South River Drive
Plat N-G, Lot 242

Revised: 03/25/2025

Drawn: M.E.L.
Date: 12/6/2000
Scale: 1"=50'



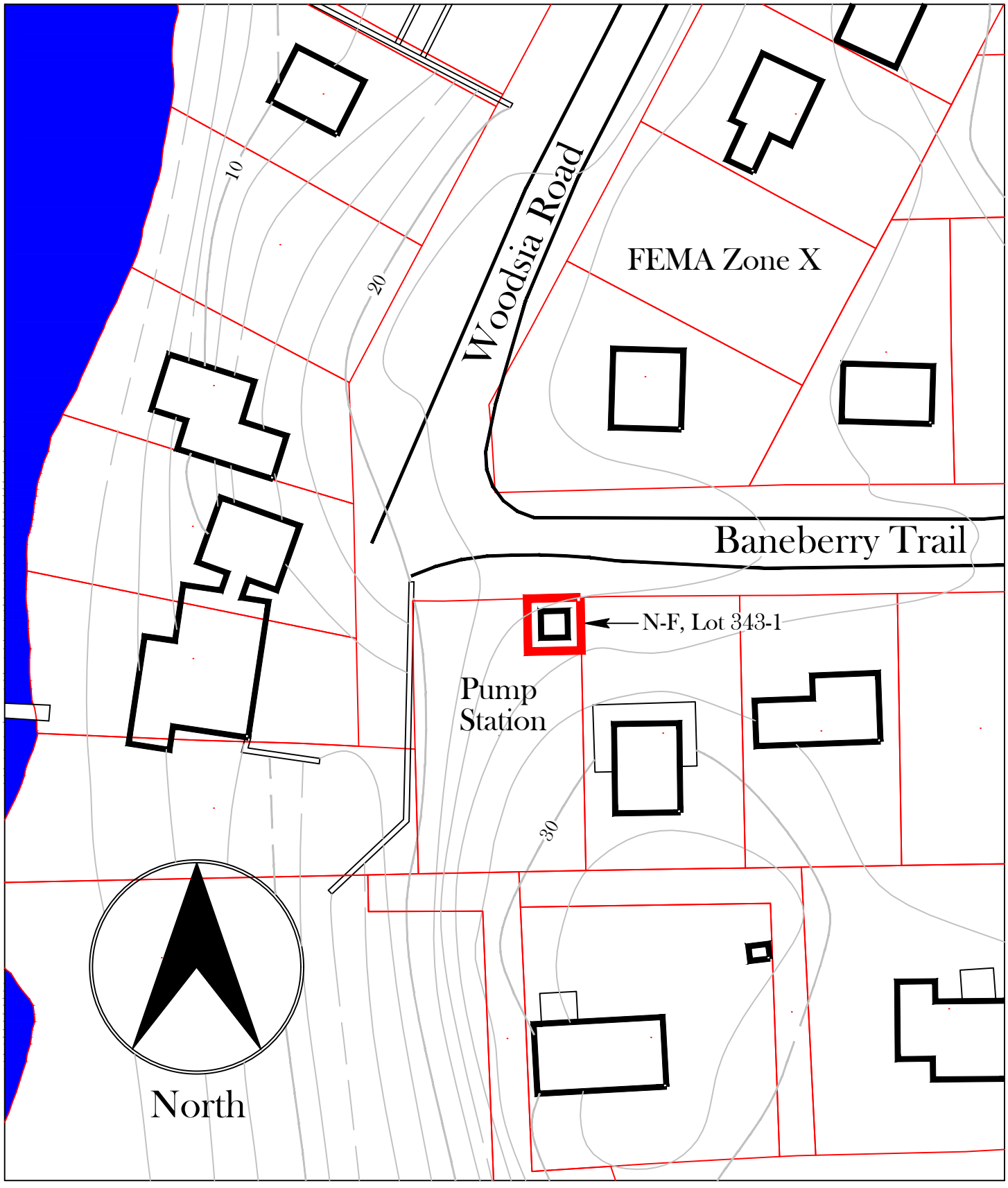
Sprague Bridge Wastewater Pump Station
316 Boston Neck Road
Plat N-O, Lot 2-1

Revised: 03/25/2025

Drawn: M.E.L.

Date: 12/8/2000

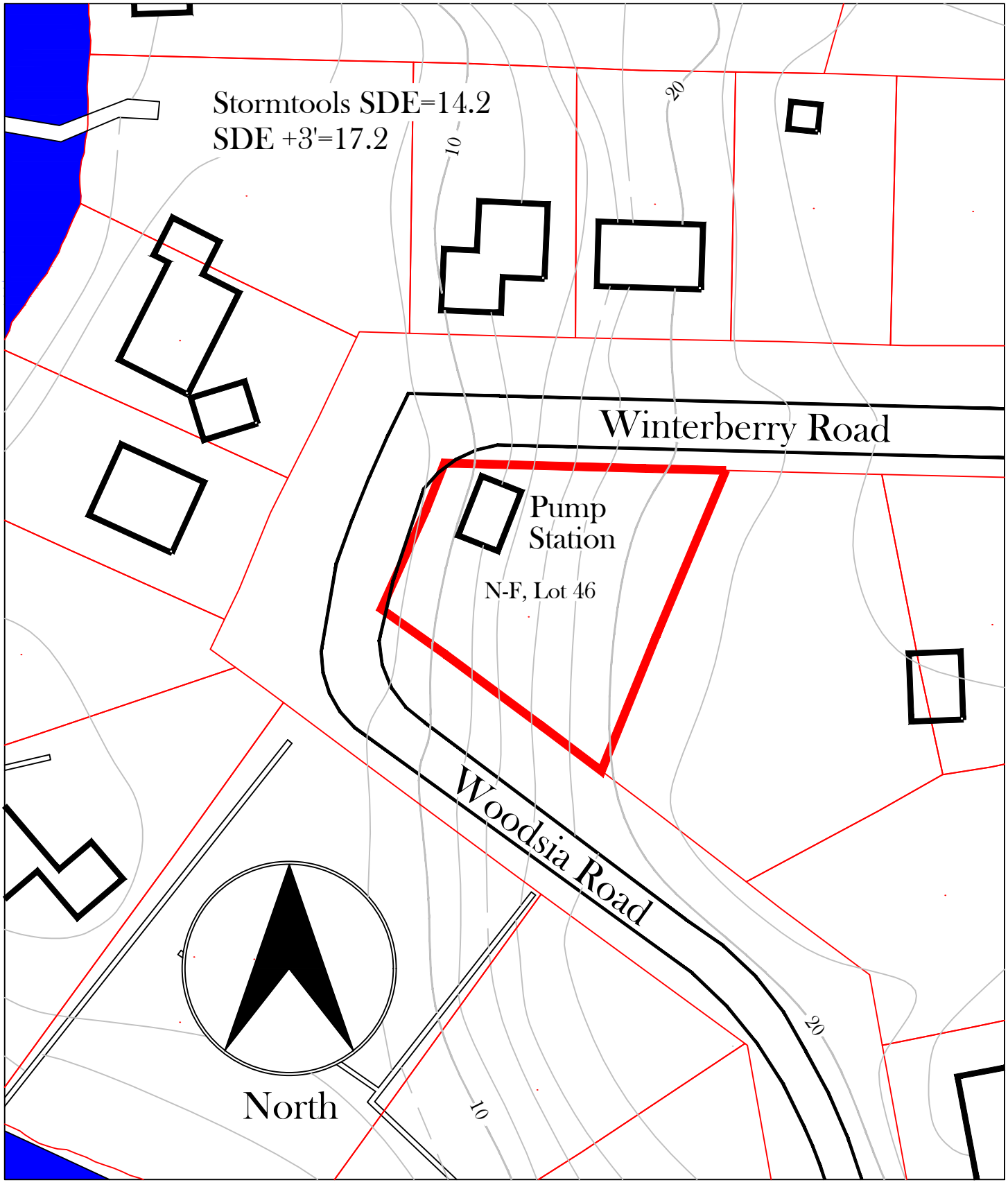
Scale: 1"=100'



Baneberry Road Wastewater Pump Station
22 Baneberry Trail
Plat N-F, Lot 343-1

Revised: 03/25/2025

Drawn: M.E.L.
Date: 11/15/2000
Scale: 1"=50'



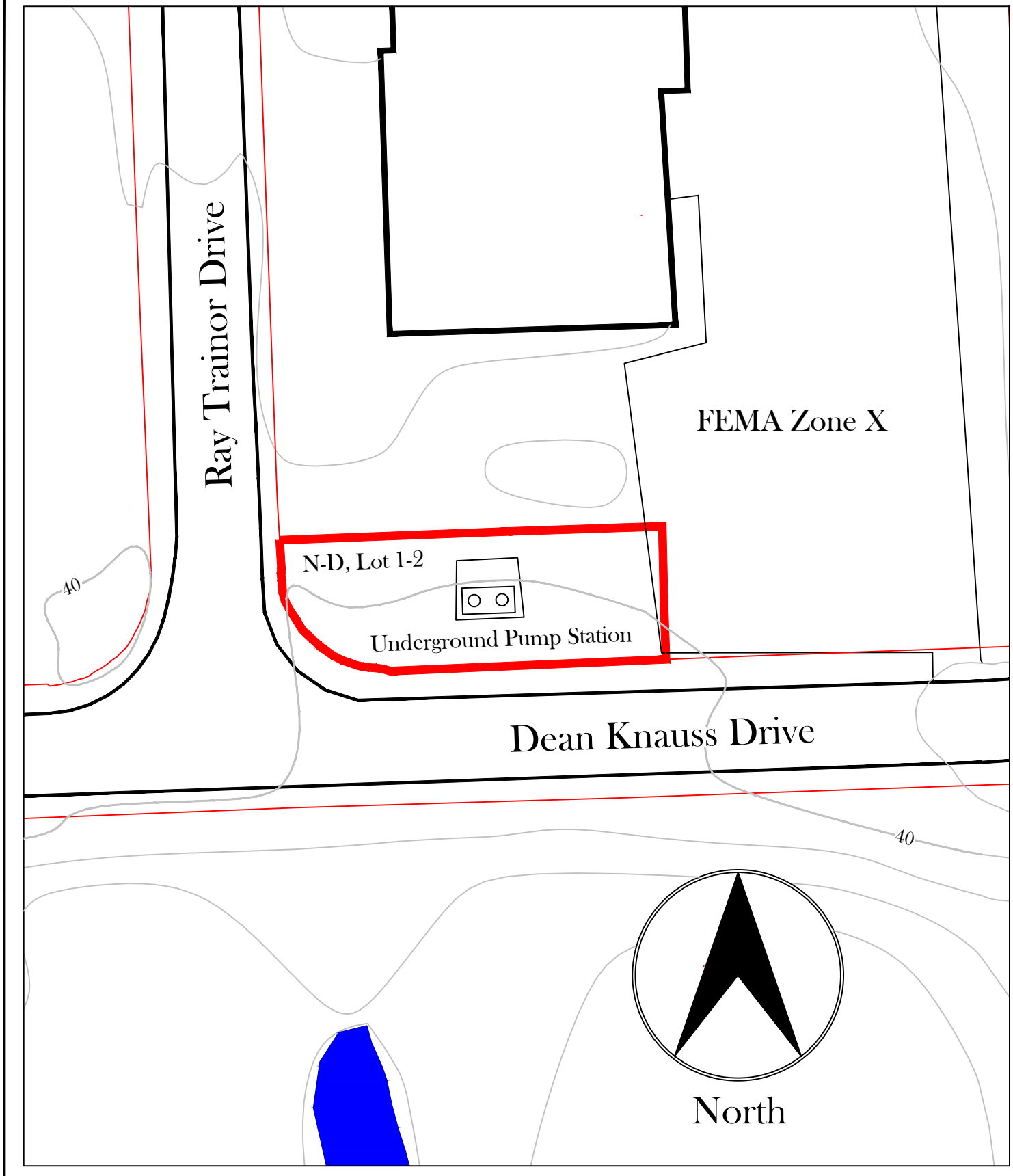
Winterberry Road Wastewater Pump Station
91 Woodsia Road
Plat N-F, Lot 46

Revised: 03/25/2025

Drawn: M.E.L.

Date: 11/15/2000

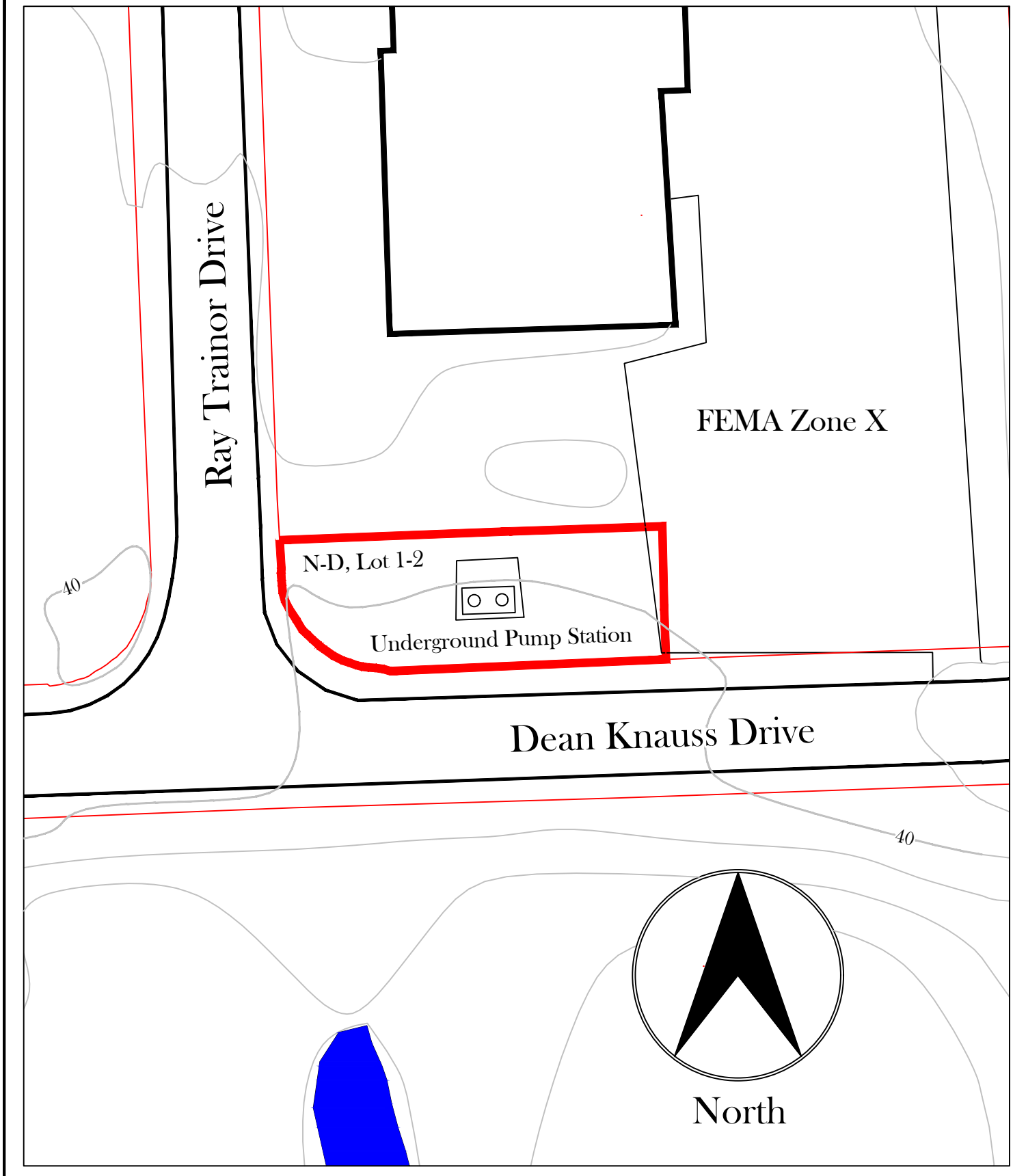
Scale: 1"=50'



Industrial Park Wastewater Pump Station
Dean Knauss Drive
Plat N-D, Lot 1-2

Revised: 03/25/2025

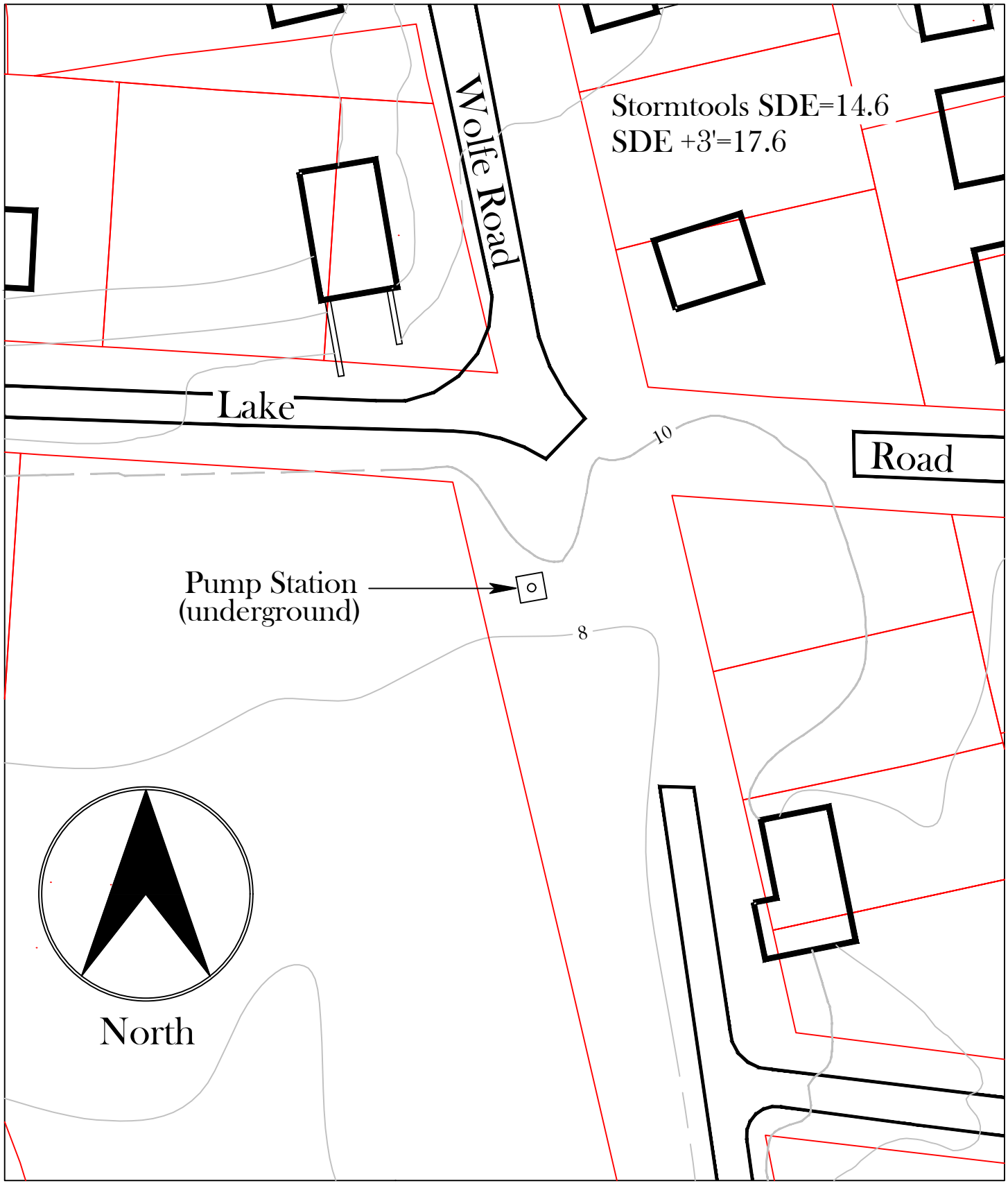
Drawn: M.E.L.
Date: 11/15/2000
Scale: 1"=50'



Industrial Park Wastewater Pump Station
Dean Knauss Drive
Plat N-D, Lot 1-2

Revised: 03/25/2025

Drawn: M.E.L.
Date: 11/15/2000
Scale: 1"=50'



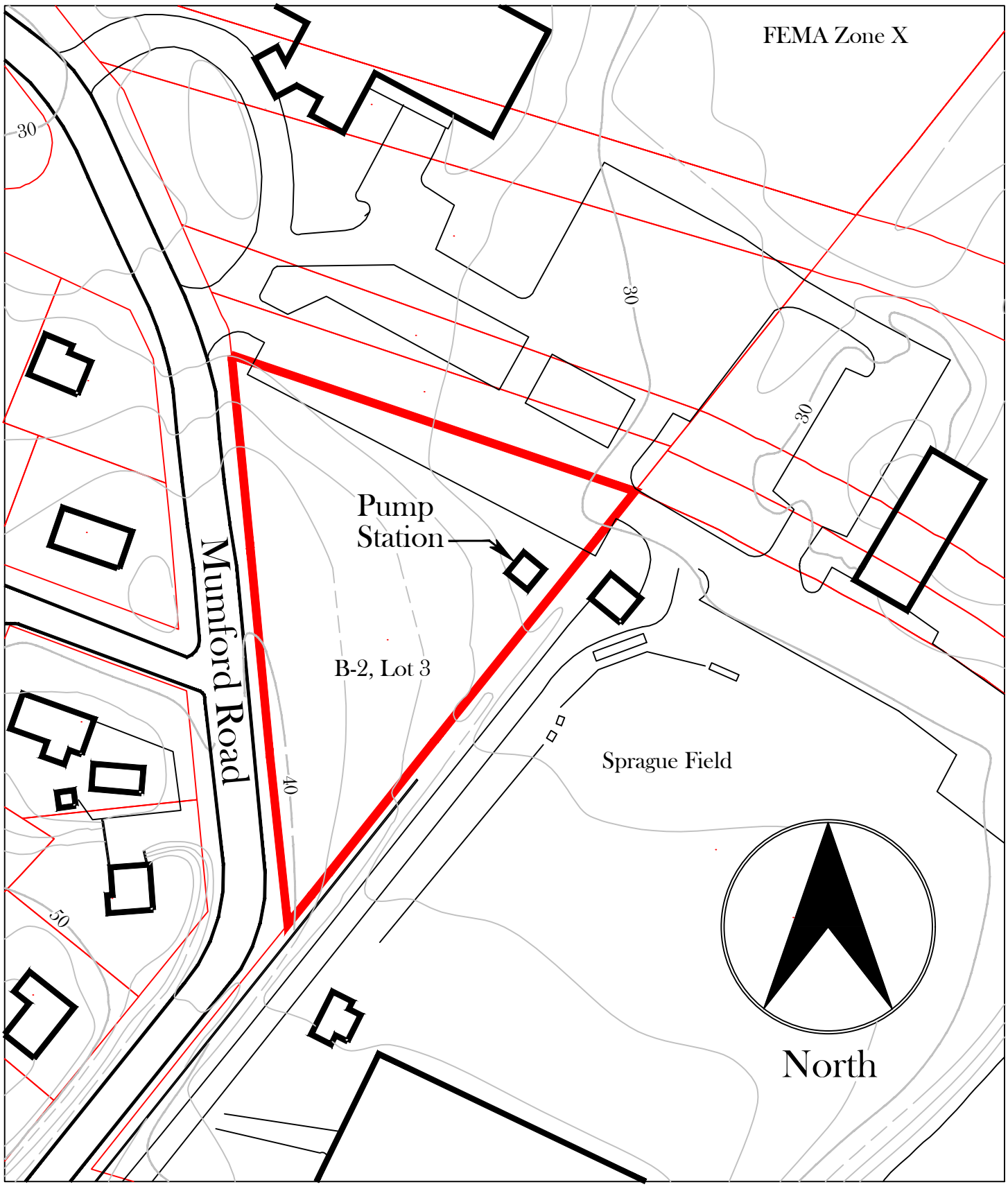
Wolfe Road Wastewater Pump Station
Wolfe Road @ Lake Road
Plat N-S, in R.O.W.

Revised: 03/25/2025

Drawn: M.E.L.

Date: 11/15/2000

Scale: 1"=50'



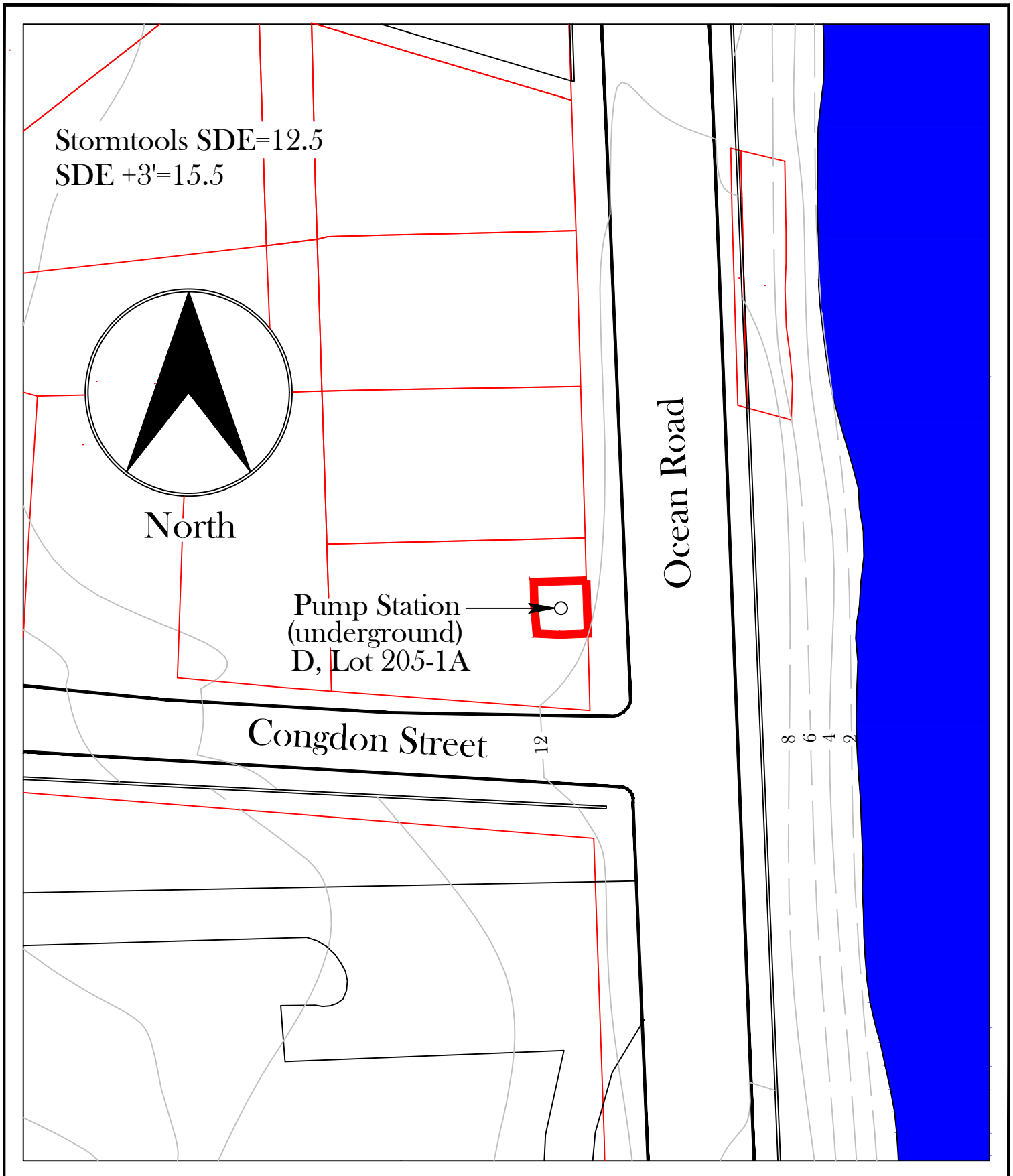
Mumford Road Wastewater Pump Station
55 Mumford Road
Plat B-2, Lot 3

Revised: 03/25/2025

Drawn: M.E.L.

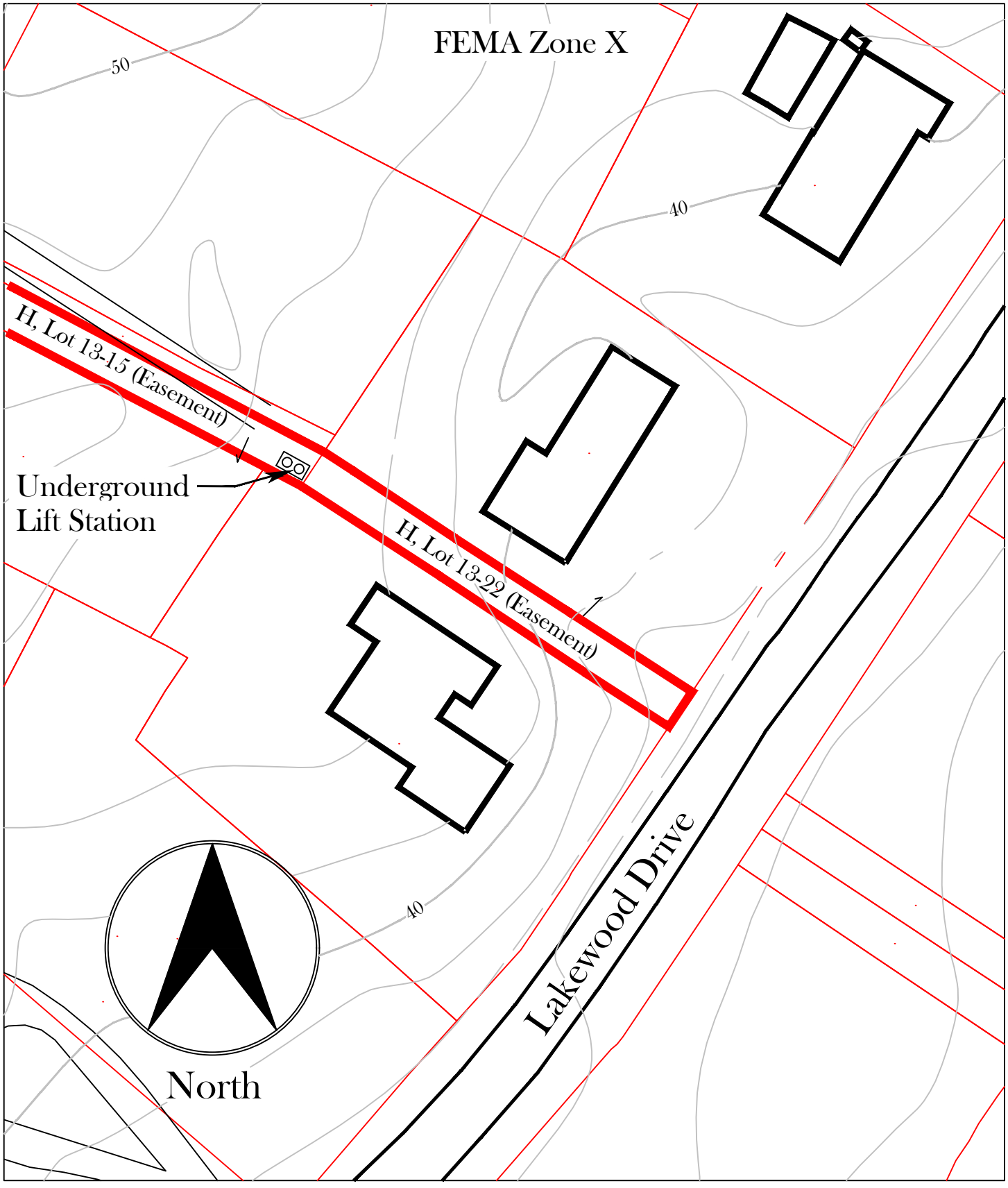
Date: 11/15/2000

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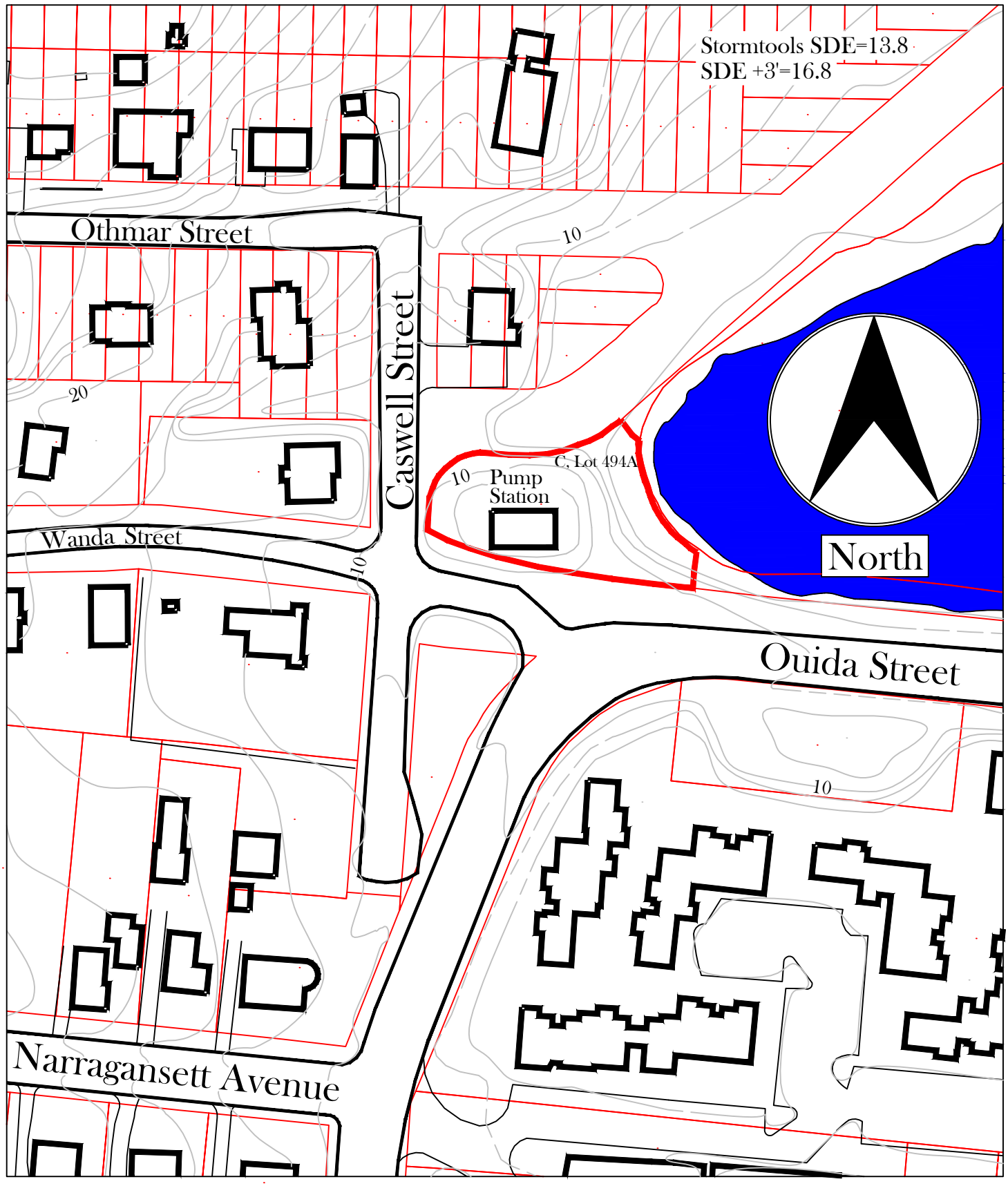


Congdon Street Wastewater Pump Station
141 Ocean Road
Plat D, Lot 205-1A

Drawn: M.E.L.
Date: 12/6/2000
Revised: 03/25/2025
Scale: 1"=50'



Lakewood Drive Wastewater Lift Station 34 Lakewood Drive Plat H, Lot 13-22 (Easement)	Drawn: M.E.L.
	Date: 11/15/2000
Revised: 03/25/2025	Scale: 1"=50'



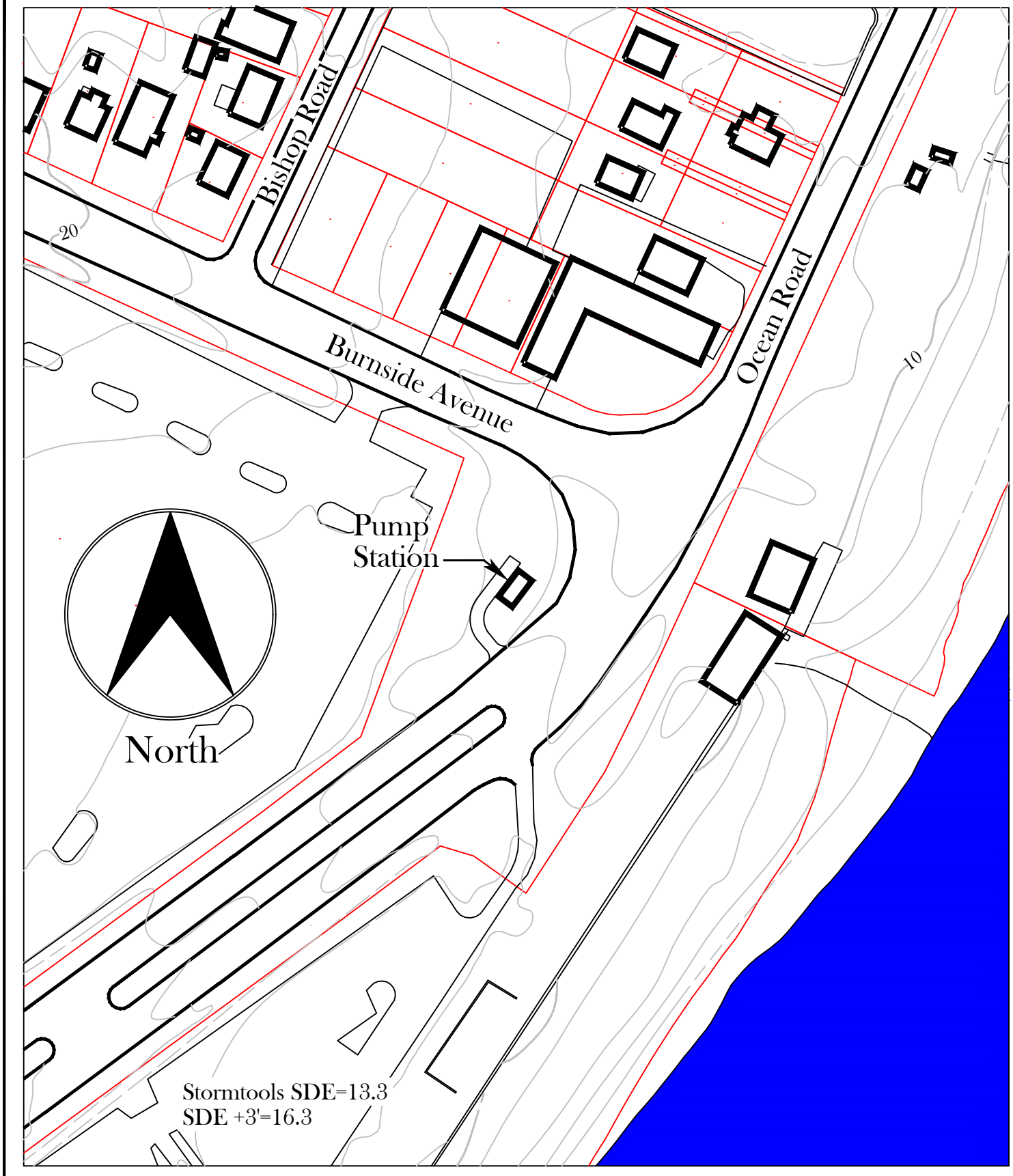
Ouida Street Wastewater Pump Station
4 Caswell Street (Ouida Street)
Plat C, Lot 494A

Revised: 03/25/2025

Drawn: M.E.L.

Date: 11/15/2000

Scale: 1"=100'



Burnside Avenue Wastewater Pump Station

835 Ocean Road

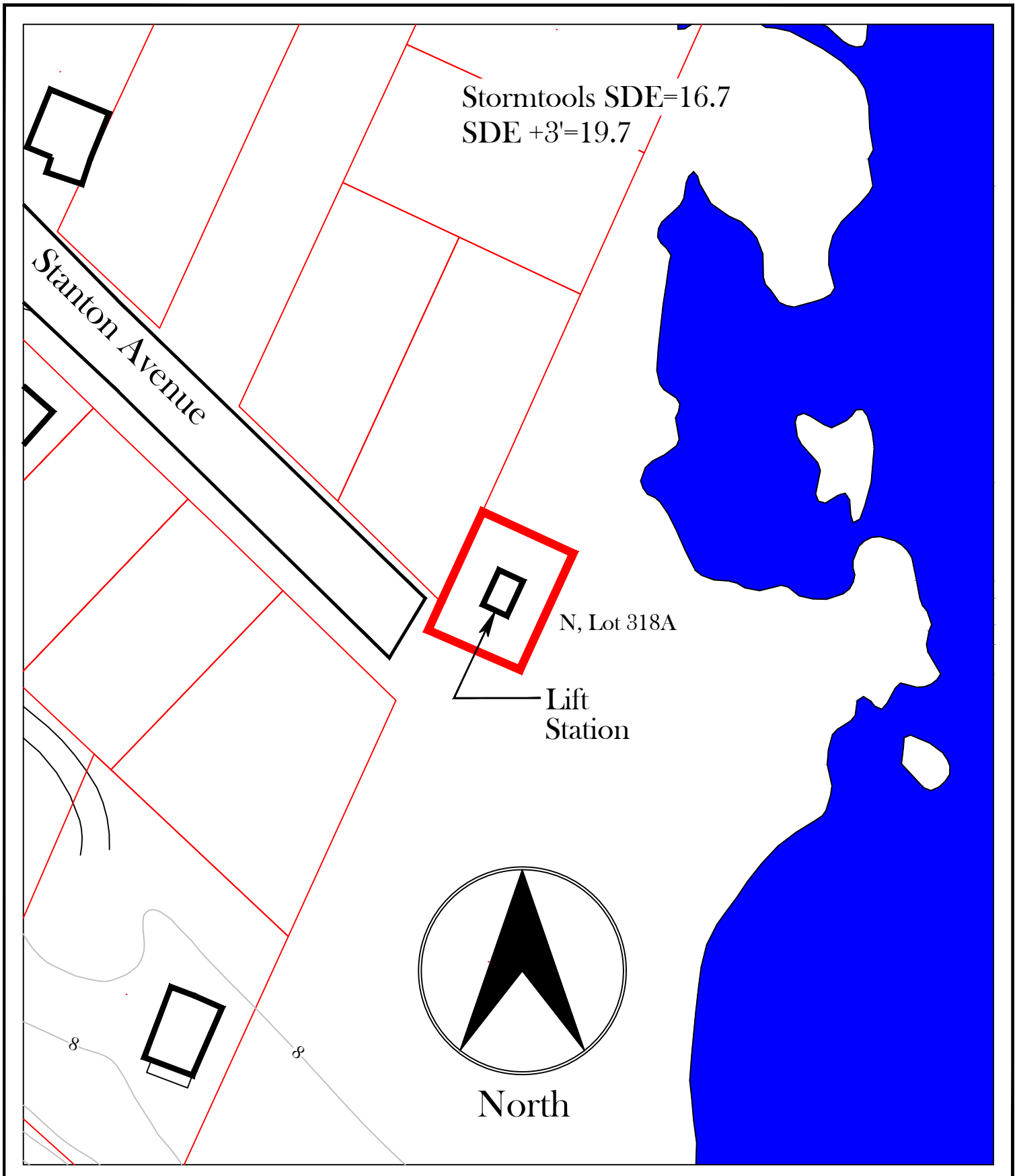
Plat S, (easement in state lot)

Revised: 03/25/2025

Drawn: M.E.L.

Date: 12/8/2000

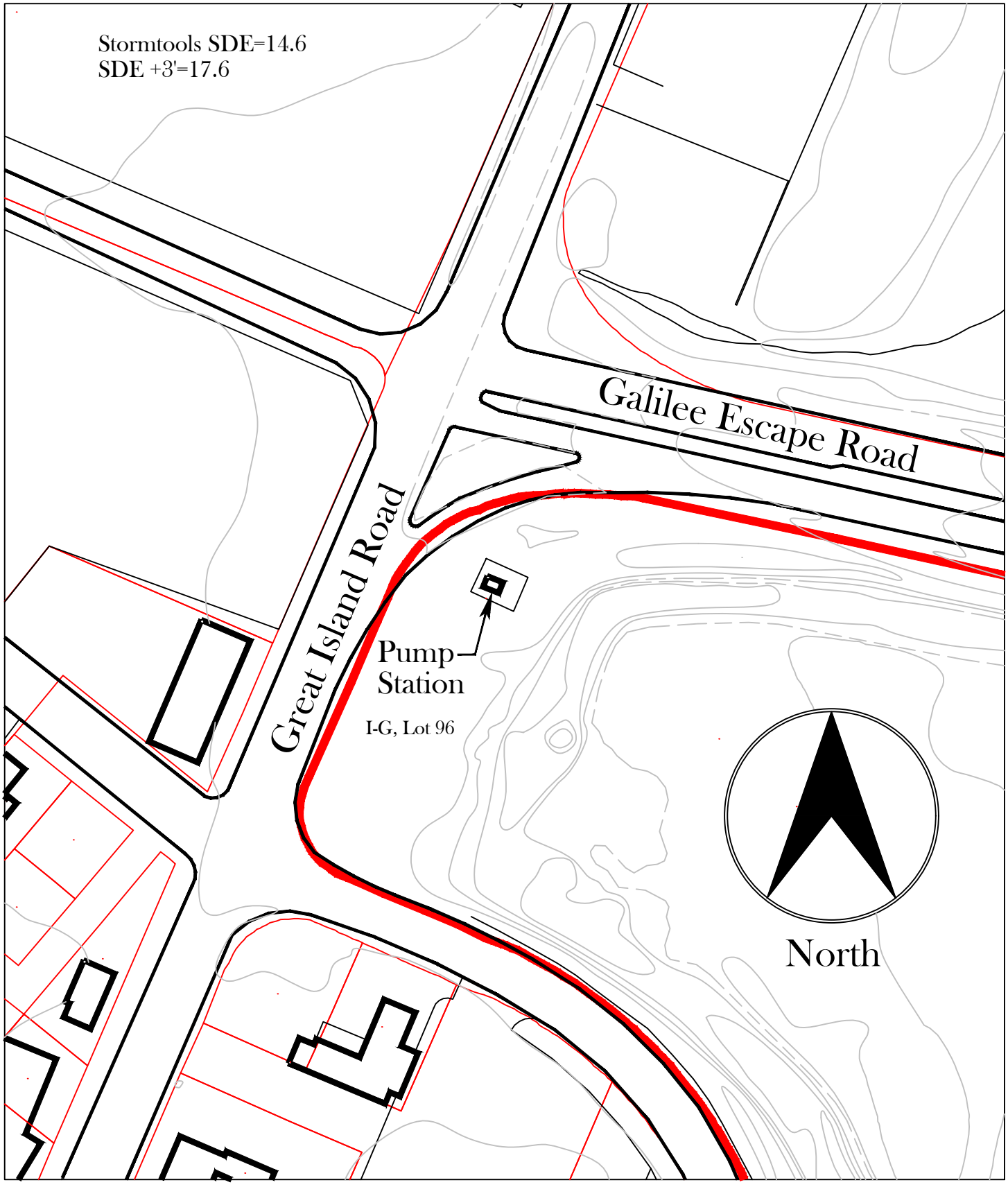
Scale: 1"=100'



Stanton Avenue Pump Station
90 Stanton Avenue
Plat N, Lot 318A

Revised: 03/25/2025

Drawn: M.E.L.
Date: 11/15/2000
Scale: 1"=50'



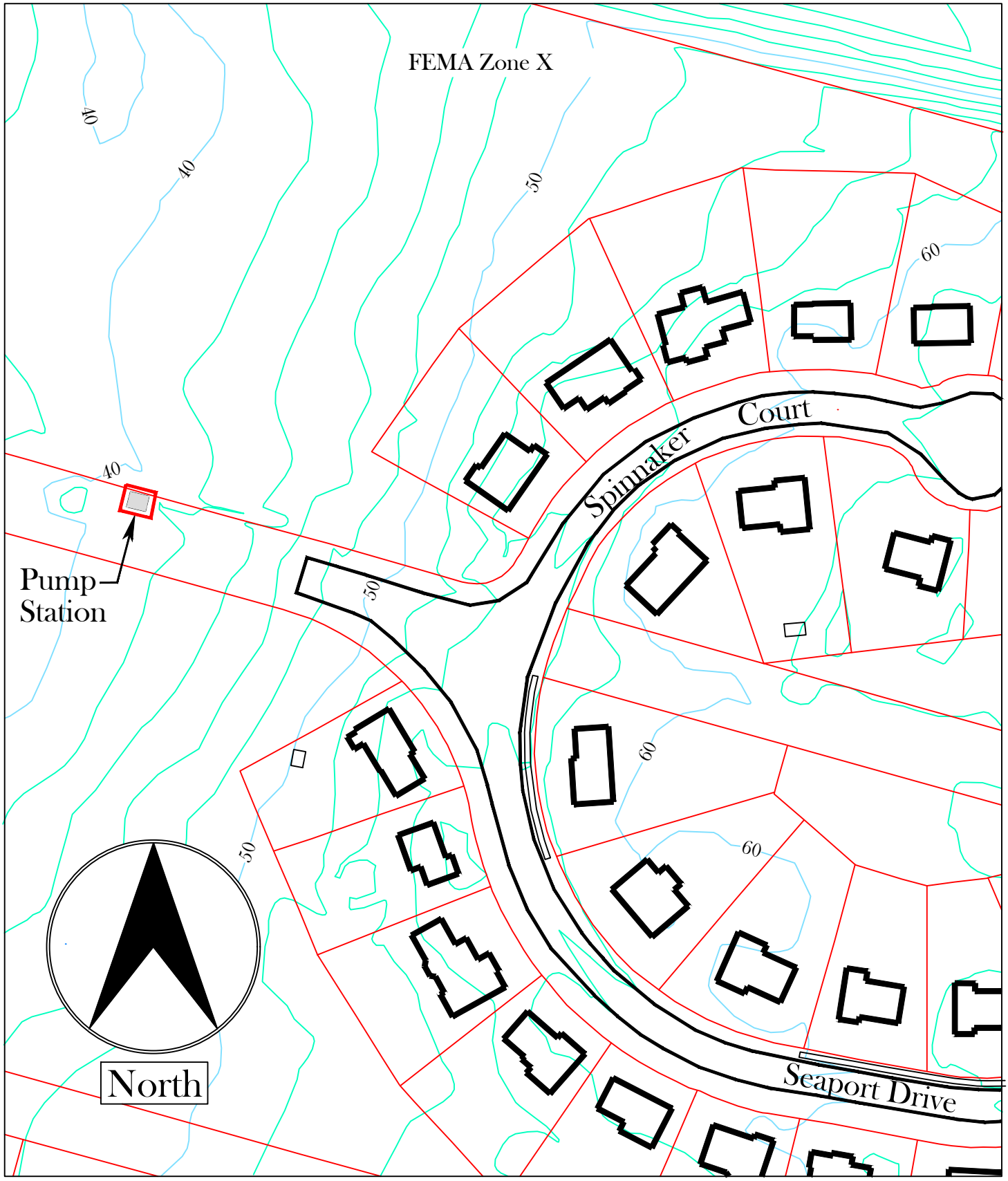
Galilee Wastewater Pump Station
335 Great Island Road
Plat I-G, Lot 96

Revised: 03/25/2025

Drawn: M.E.L.

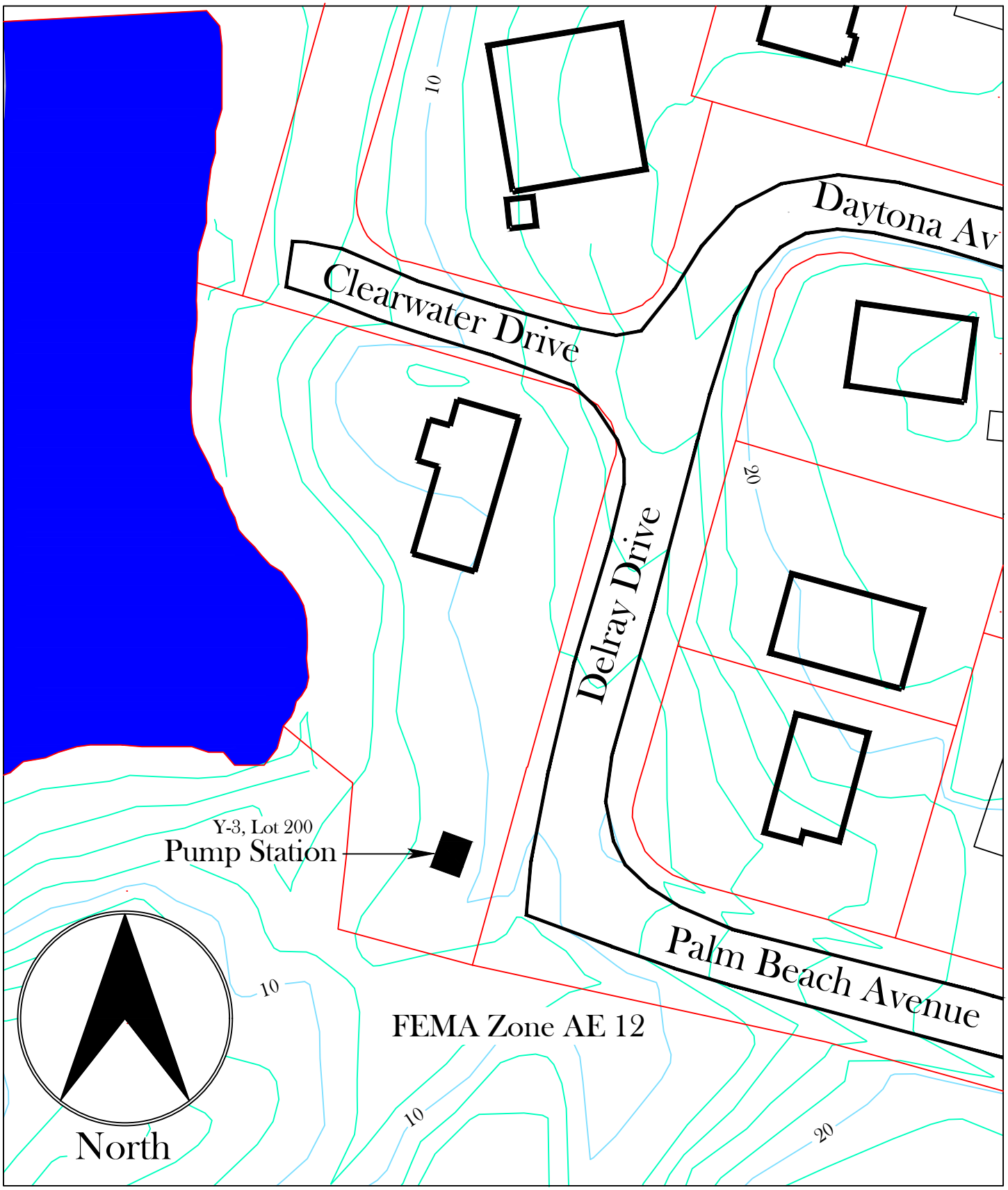
Date: 11/15/2000

Scale: 1"=100'



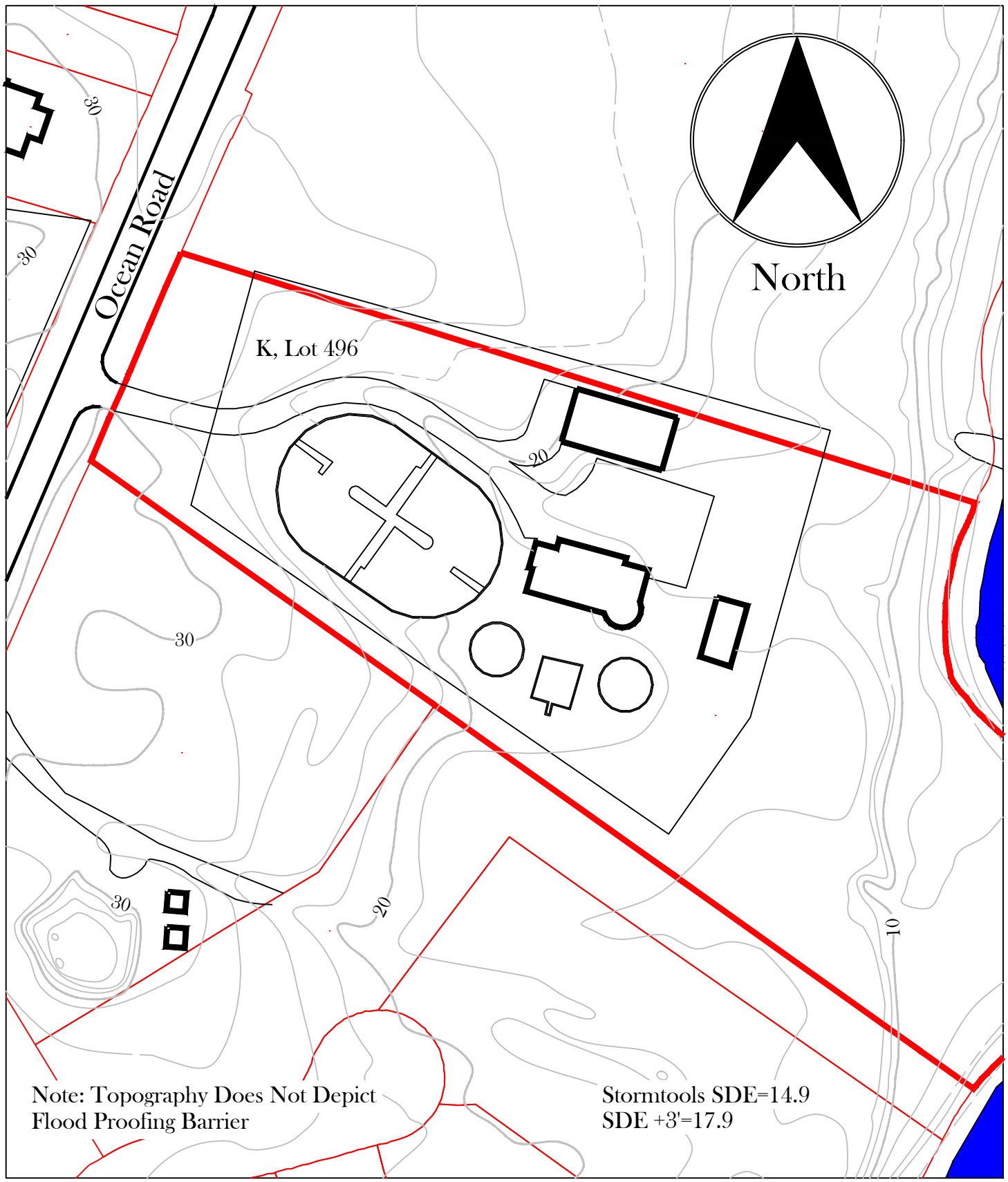
Seaport Village Wastewater Pump Station
57 Seaport Drive
Plat W, in R.O.W.

Drawn: G.B.	
Date: 03/25/2025	
Scale: 1"=100'	



Briggs Farm Wastewater Pump Station
15 Delray Drive
Plat Y-3, Lot 199

Drawn: G.B.
Date: 03/26/2025
Scale: 1"=50'



Wastewater Treatment Plant
990 Ocean Road
Plat K, Lot 496

Revised: 03/25/2025

Drawn: M.E.L.

Date: 11/15/2000

Scale: 1"=100'

WRIGHT-PIERCE
Engineering a Better Environment

D

Appendix D
AIRE-O2 Triton 2.0 Aerator Information Sheets

QUOTE NUMBER: 24-04790
DATE: 05/15/24

TO: Adam Higgins, PE Wright-Pierce 600 Federal Street, Suite 2151 Andover, MA 01810 978.416.8020 [o] adam.higgins@wright-pierce.com	**PROJECT NAME:** Narragansett, RI – Scarborough WWTP **SALES MANAGER:** Brad Sciulli / 412.607.7100 [m] **REPRESENTATIVE:** Wayne Bennett / 978.835.4202 [m] BAU/Hopkins **PREPARED BY:**

Newterra Corporation, Inc. is pleased to offer the following:

Four (4) AIRE-O2 Triton® 2.0 Aerators, consisting of:

- 10HP, 230/460 volt, 3-phase, 60Hz, 900 RPM, TEFC, premium efficiency motor
- 2HP regenerative blower
- Field replaceable, water-lubricated lower bearing
- Field replaceable, water-resistant sleeve
- 316 SS dual-blade primary PowerMix™ propeller
- 304 SS Saturn Ring diffuser
- 304 SS housing, mounting flange, and hollow shaft

Note: Aerators shall arrive fully assembled for immediate mounting

Four (4) Four-Float Assemblies, consisting of:

- Four (4) molded, LDPE, closed-cell foam filled pontoons
- 304 SS frame and mounting hardware
- Vortex shield attached to frame

Note: Flotation devices require field assembly

Four (4) 460V Outdoor Rated Manual On/Off Simplex Control Panels (Scope on following page)

200' 12/4 SEOOW Electrical Cable (460/60/3; 10HP Mixer Motor)
200' 14/4 SEOOW Electrical Cable (460/60/3; 2HP Blower Motor)

200' 3/8" Diameter 7x19 SS Mooring Cable

Eight (8) Cable End Assemblies, Wall Anchor Plates, and Four (4) Turnbuckles

Warranty - Three (3) Year on Tritons / One (1) Year on Control Panels

Startup/Installation Supervision is <u>NOT INCLUDED</u> with this proposal

Freight Delivered at Place (DAP) Narragansett, RI (Incoterms 2021)

BUDGETARY PRICE: $280,000 USD

EXCLUSIONS: Installation, duties, and taxes are not included. Cord grips, anchoring hardware, and all items not specifically listed above are excluded.

Triton 2.0 10HP Control Panel Scope

Hoffman Nema 4 wall mount Enclosure, 24 in L x 20 in W x 10 in D with mounting tabs
Main Incoming Power Distribution Block
350 VA 480/120 control transformer with primary and secondary fuse protection
One 2 hp FVNR Blower Starter
One 10hp FVNR Mixer Starter
Two 22MM Green Run Pilot Light
One 22mm Red, Blower Heater On
Two 22MM Selector Switches; (Mixer On/Off, Aerator Enable / Disable)
One 22mm selector switch (control power On/Off)
One 100-watt condensation heater
One 10 second on delay timer used to delay blower start/stop
One 10 second off delay timer used to delay mixer stop
One AB 1Amp single pole circuit breaker for blower motor heater circuit
Control Relays
Terminal blocks, etc.
Control Panel UL508A Listed

Control Panel Engineering Services

Electrical Circuit Diagrams with BOM
Control system factory test
As built electrical drawings

Control Panel Operation

Control Power On/Off selector switch- Main power for control circuit fail safe circuit
Mixer On/Off selector switch- Run Mixer, 10 sec off delay timer for mixer when blower selector enabled
Blower Enable/Disable selector switch- Enable position blower will start after 10 second delay.

Control Panel Clarifications

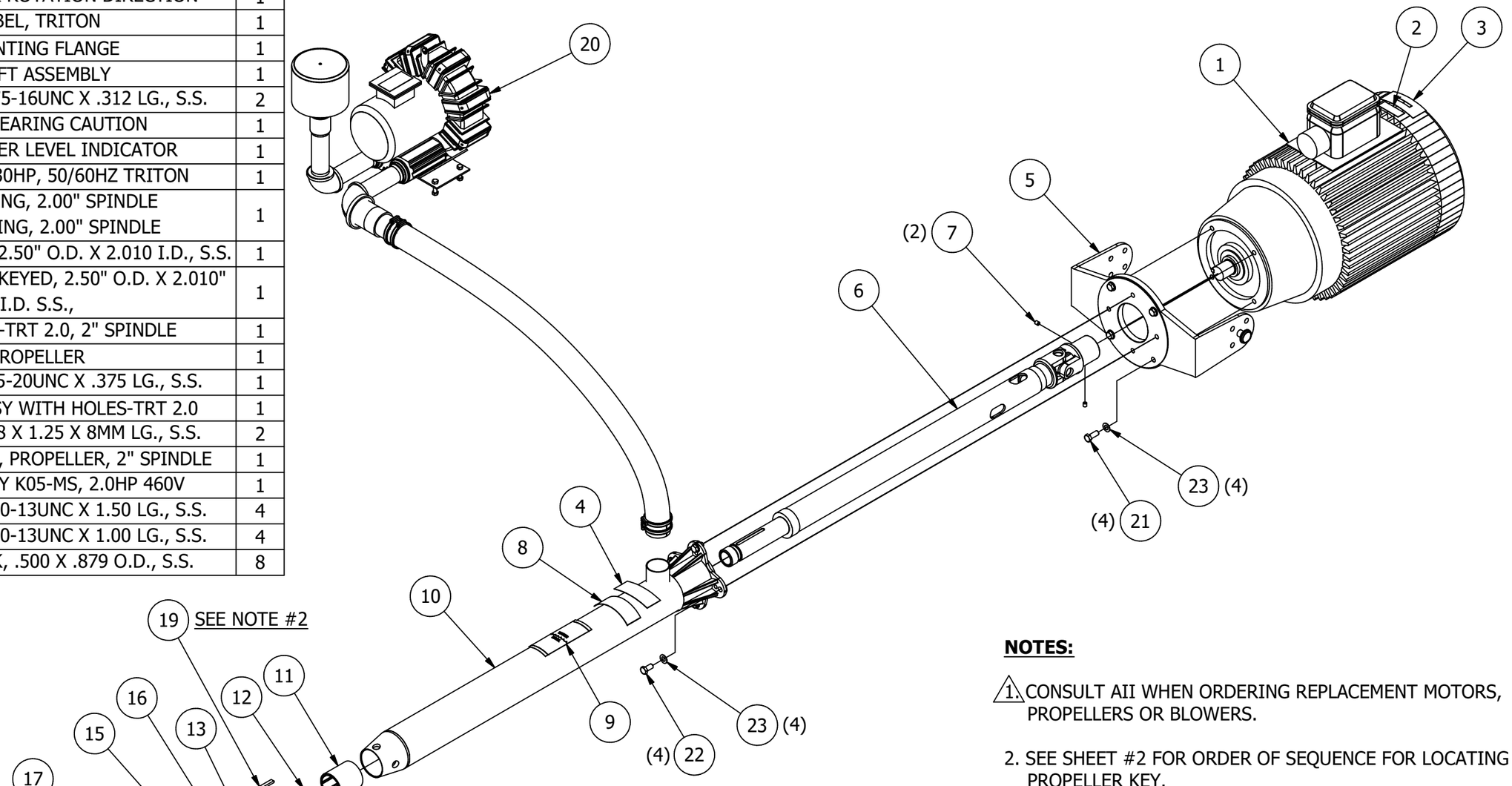
All equipment will be fully tested and functional
Documentation will be provided to clearly show customer connections

Control Panel Exclusions

Field Instruments
Field wiring
Equipment installation

BILL OF MATERIAL			
ITEM	PART NO.	DESCRIPTION	QTY.
1	△1	MOTOR 10HP 50/60HZ NEMA	1
2	224013	LABEL, SERIAL NO.	1
3	224152	LABEL, MOTOR ROTATION DIRECTION	1
4	224184	LABEL, TRITON	1
5	245030	MOUNTING FLANGE	1
6	239436	SHAFT ASSEMBLY	1
7	215127	SET SCREW, .375-16UNC X .312 LG., S.S.	2
8	224021	LABEL, BEARING CAUTION	1
9	224154	LABEL, WATER LEVEL INDICATOR	1
10	330099	HOUSING, 5-30HP, 50/60HZ TRITON	1
11	213053 213026	ARB BEARING, 2.00" SPINDLE CRB BEARING, 2.00" SPINDLE	1
12	215814	WASHER-TRT 2.0, 2.50" O.D. X 2.010 I.D., S.S.	1
13	215807	WASHER-TRT 2.0, KEYED, 2.50" O.D. X 2.010" I.D. S.S.,	1
14	247045	SDS SLEEVE-TRT 2.0, 2" SPINDLE	1
15	△1	PROPELLER	1
16	215076	SET SCREW, .25-20UNC X .375 LG., S.S.	1
17	223103	ATOMIZER ASSY WITH HOLES-TRT 2.0	1
18	215331	SET SCREW, M8 X 1.25 X 8MM LG., S.S.	2
19	215808	KEY-TRITON 2.0, PROPELLER, 2" SPINDLE	1
20	410718	BLOWER ASSY K05-MS, 2.0HP 460V	1
21	215099	BOLT HHCS, .500-13UNC X 1.50 LG., S.S.	4
22	215088	BOLT HHCS, .500-13UNC X 1.00 LG., S.S.	4
23	215100	WASHER LOCK, .500 X .879 O.D., S.S.	8

REVISION HISTORY				
REV	ECO NO.	DESCRIPTION	BY	DATE
-	19-3074	RELEASED FOR PRODUCTION	JFW	10-8-19
A	21-3186	ITEM #21 215099 WAS 215147	JFW	2-5-21



NOTES:

△1. CONSULT AII WHEN ORDERING REPLACEMENT MOTORS, PROPELLERS OR BLOWERS.

2. SEE SHEET #2 FOR ORDER OF SEQUENCE FOR LOCATING PROPELLER KEY.

Aeration Industries claims proprietary rights to the material disclosed herein. This drawing is issued for Engineering purposes only and may not be used to manufacture anything shown heron without written permission. C 2011 Aeration Industries Int'l, LLC. All Rights Reserved

DIMENSIONS AND TOLERANCES SHALL BE INTERPRETED IN ACCORDANCE WITH ANSI Y14.5-2009 STANDARDS

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED

BREAK ALL SHARP EDGES AND REMOVE BURRS

TOLERANCE & FINISH
-UNLESS NOTED OTHERWISE-
FRACTIONS ± 1/32
ANGLE ± 1°
FINISH 125
WELDMENTS
ONE PLACE ± 0.06 | 2 PLACE ± 0.03 | 3 PLACE ± 0.015
MACHINED PARTS
ONE PLACE ± 0.03 | 2 PLACE ± 0.01 | 3 PLACE ± 0.005

Aeration Industries International

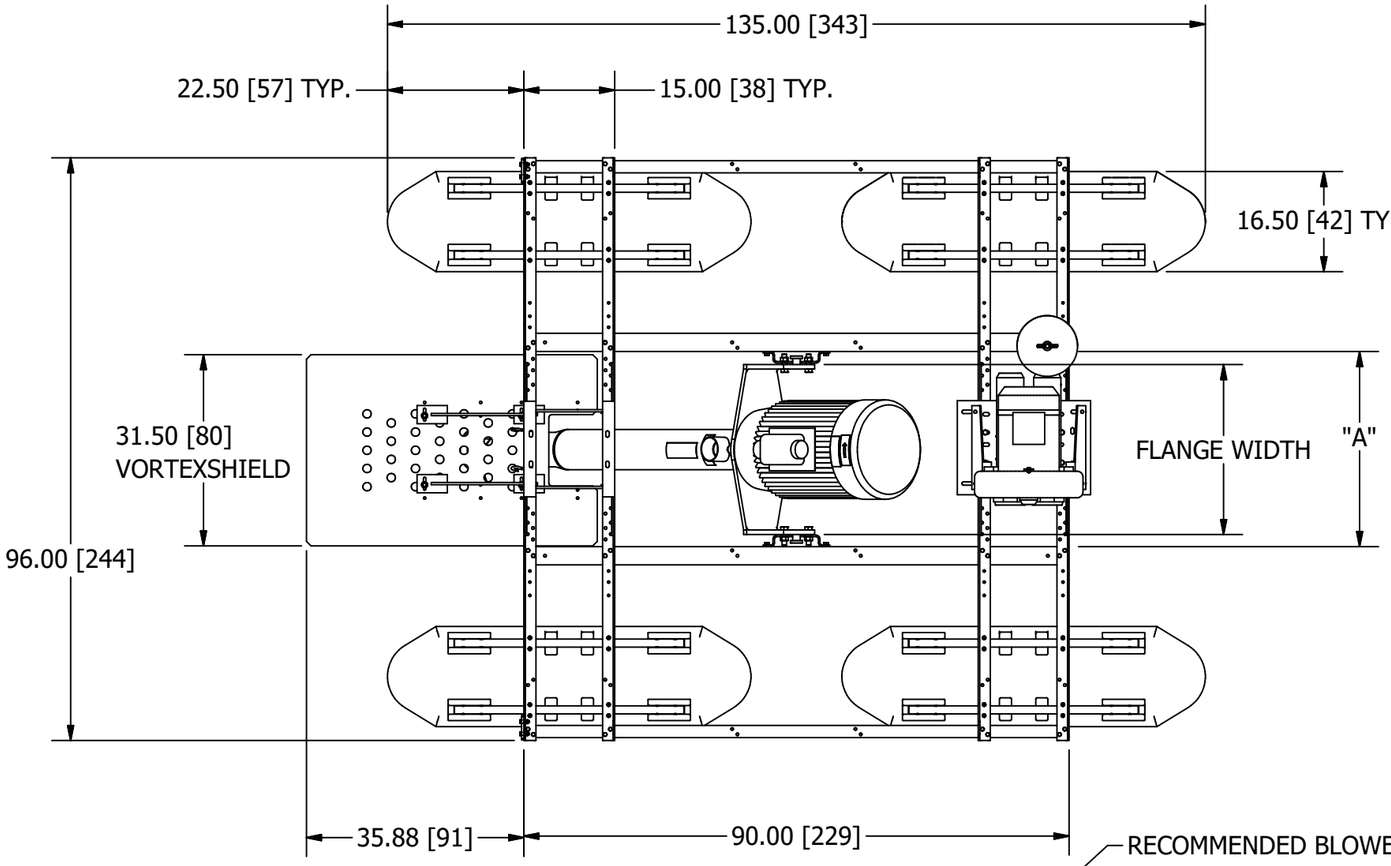
Aeration Industries International, LLC.
4100 Peavey Rd, Chaska MN 55318 USA. www.aireo2.com
Phone: +1-952-448-6789. Fax: +1-952-448-7293. aii@aireo2.com

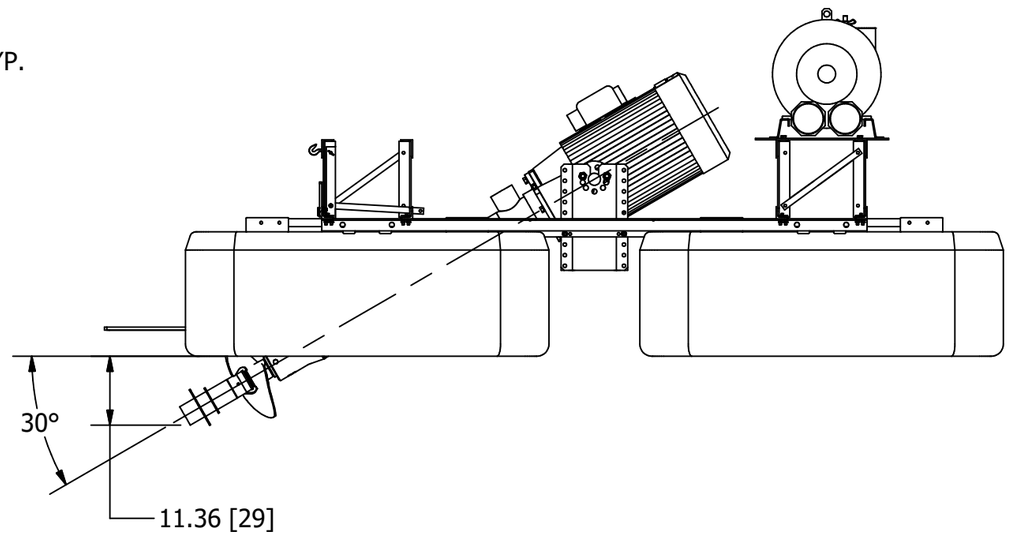
DRAWN	Joe.Widman
DATE	10/7/2019
REVISED	
DATE	

TITLE
TRITON 2.0 ASSEMBLY, 10HP 50/60HZ NEMA, SMALL HOUSING

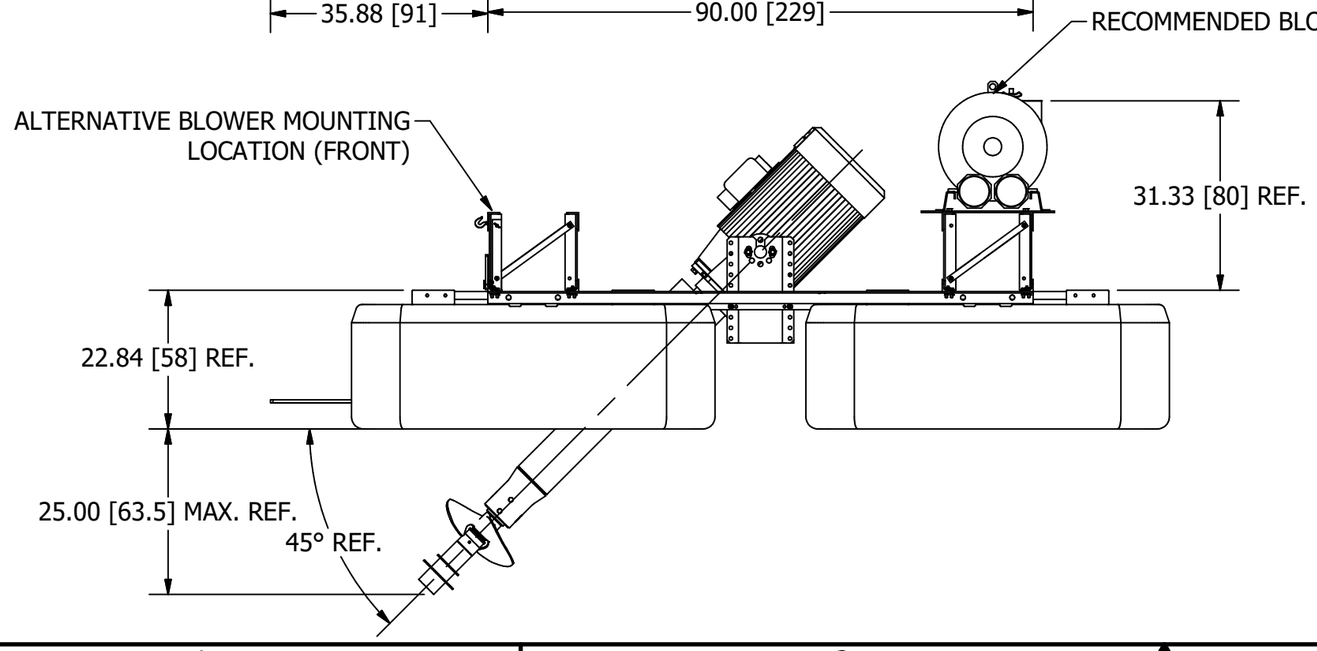
DRAWING NO.		REV.
360716		A
SCALE	SIZE	SHEET 1 OF 2
-	B 11" X 17"	

REVISION HISTORY				
REV	ECO NO.	DESCRIPTION	BY	DATE
-	15-2727	RELEASED FOR PRODUCTION	JFW	11-02-15
A	20-3157	ADDED SOLID VORTEX SHIELD ASSY	SS	10-21-20





AERATOR AT 30°



MAIN FRAME SPACING	
DIM "A"	FLANGE WIDTH
32.13 [82]	28.00" [71]
26.75 [68]	22.50" [57]
23.00 [58]	18.75" [48]

NOTE:

1. DIMENSIONS SHOWN IN [ ] ARE IN CENTIMETERS.

Aeration Industries claims proprietary rights to the material disclosed herein. This drawing is issued for Engineering purposes only and may not be used to manufacture anything shown heron without written permission. C 2011 Aeration Industries Int'l, LLC. All Rights Reserved

DIMENSIONS AND TOLERANCES SHALL BE INTERPRETED IN ACCORDANCE WITH ANSI Y14.5-2009 STANDARDS

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED

BREAK ALL SHARP EDGES AND REMOVE BURRS

TOLERANCE & FINISH
-UNLESS NOTED OTHERWISE-
FRACTIONS ± 1/32
ANGLE ± 1°
FINISH 125
WELDMENTS
ONE PLACE ± 0.06 | 2 PLACE ± 0.03 | 3 PLACE ± 0.015
MACHINED PARTS
ONE PLACE ± 0.03 | 2 PLACE ± 0.01 | 3 PLACE ± 0.005

DRAWN Joe.Widman — DATE 11/20/2015
REVISED — DATE

Aeration Industries International, LLC.
4100 Peavey Rd, Chaska MN 55318 USA. www.aireo2.com
Phone: +1-952-448-6789. Fax: +1-952-448-7293. all@aireo2.com

TITLE
OUTLINE DIMENSIONS - UNIVERSAL 4-FLOAT WITHOUT ROLLERS

DRAWING NO. 360-629 — REV. A
SCALE -
SIZE B 11" X 17"
SHEET 1 OF 1

Terms and Conditions

1. PURCHASE ORDER:
   Newterra ("Seller") will initiate work upon written acceptance of a complete order from a purchasing party ("Buyer"). A complete order includes a signed purchase order which includes the overall price of system and scope of supply, purchase order number, payment terms, billing and shipping addresses, Tax Identification Number.

2. APPLICABILITY / SCOPE:
   All goods and services provided shall be governed by the terms and conditions set forth herein. Any modifications to these terms or to the scope of any purchase order or project hereunder, shall be mutually agreed upon and set forth in writing executed by both parties. Such writing shall clearly set forth the nature and extent of the change, and, if applicable, any adjustment in price associated with such change.

3. SCHEDULE:
   The Seller's estimated delivery schedule is included in the proposal and may be affected by manufacturing loading at the time of order unless the proposal is based on a firm schedule as noted. If the approval to proceed with ordering material is not given within twenty-one (21) days of execution of this order, Seller reserves the right to adjust the sell price of this Purchase Order based on actual increases incurred from its Suppliers due to the delay in the project schedule.

   Upon receipt of Purchase Order, unless the proposal is based on a firm schedule as noted, Seller and Buyer shall agree to a schedule and timeline for provision of engineering documentation, unless otherwise agreed to in writing.
   In the event of Buyer caused delay, Seller shall be entitled to readjustment of schedule based on the impacts due to the delay. Seller shall advise Buyer, in writing, of the revised schedule. Seller shall be entitled to compensation from all costs associated with Buyer caused delay.

4. CREDIT APPROVAL:
   All new purchase orders are subject to mandatory credit approval for first time Seller Buyers and discretionary credit approval for repeat Seller Buyers (credit approval form available from Seller upon request). Should Seller learn of any information that causes Seller concern about Buyer's ability to perform any of its obligations owing to Seller under a Purchase Order, Seller has the right to request Buyer to provide Seller adequate assurance of due performance on such terms as are deemed reasonable by Seller when acting in good faith, including the right to demand full or partial payment from Buyer as demanded by Seller, or the right to adequate surety.

5. TELEMETRY SERVICES AGREEMENT:
   A Telemetry Services Agreement must be completed for all system orders that include a Seller Remote Telemetry and Communication Package. The Telemetry Services Agreement is required to activate the services listed in the proposal (Telemetry Service Agreement available from Seller upon request).

6. PRICING/TAXES:
   The price to be paid by Buyer shall be mutually agreed upon by the parties and set forth in writing. Unless otherwise agreed to, prices quoted do not include any State, Provincial or local sales or use tax, special fees, duties or custom fees, freight and handling charges, or export crating costs that may be added to the price at invoicing. The Buyer agrees to make payments as described herein. If Seller is subjected to any such tax in connection with this sale or the delivery; the same shall be added to the purchase price and Buyer shall be responsible for paying that tax or reimbursing Seller therefore within 30 days. If Buyer is Tax Exempt, valid documentation in the form of an applicable tax-exempt certificate or direct pay permit must be provided at time of Purchase Order to be considered.

7. PAYMENT CONDITIONS:
   All orders require payment in advance unless credit has been established. Payment shall be made in the currency quoted without discount. Minimum billing amount is $100. Shipments outside of the U.S.A. and Canada shall be prepaid or drawn from an irrevocable Letter of Credit.

   Processing fees may be assessed for additional costs incurred for credit card charges, returned checks, Letters of Credit, or other bank charges. Wire transfers should be initiated with all bank charges paid from the account of the Buyer. Seller reserves the right to specify the method and/or timing of payment (including prior to shipment).

   The Seller will be entitled to a late penalty calculated at a rate of 1.5% per month (18% per annum) or if lower, at the maximum rate permitted by law, for any payment not made by the date due. If legal proceedings are instituted for collection of overdue accounts unpaid after 30 days, the Buyer will be liable for all costs adjudged by the court, including court costs and reasonable attorney fees.

   If the Buyer disputes any portion of an invoice, they shall notify Seller in writing with specific details and pay the undisputed portion as per the executed purchase order. Buyer shall reimburse all costs incurred in collection of past due amounts including but not limited to attorney's fees, court costs and collection fees incurred by Seller.

   At Seller's option, Letters of Credit will be accepted by Seller when compliant with the following: The Letter of Credit must (a) Be IRREVOCABLE and CONFIRMED by a U.S.A. or Canadian bank; (b) Be in favor of Seller; (c) State payment is by site draft payable; (d) State that ALL bank charges, including those outside the country of origin, are to be applied to BUYER'S account; (e) Must state Ex-Works, point as factory unless terms of Pro Forma Invoice

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specify otherwise, (f) Be advised through a class A bank and show Buyer as applicant for the Letter of Credit.

8. SHIPPING & DELIVERY TERMS:
   Unless otherwise specified in the Seller Proposal, Incoterms® 2020 are:

   (a) EXW Seller Facility.

   (b) DAP <delivery location> (if freight is included as specified in Seller Proposal)

9. ACCEPTANCE:
   (a) Buyer shall inspect all shipments of equipment or other goods within 10 days of receipt and shall promptly notify Seller of any specific defects or non-conforming goods. The parties acknowledge that acceptance of any goods supplied hereunder shall be deemed to have occurred if Buyer fails to notify Seller of any such defects or non-conforming goods within 10 days of the date of receipt. The parties acknowledge that acceptance of any services provided hereunder shall be deemed to have occurred if Buyer fails to notify Seller of any defects or non-conformance in such services within 10 days of the date the services were completed;

   (b) For any order hereunder which requires Seller's involvement in the installation, start-up, check-out and/or commissioning of any Seller equipment or system, the parties acknowledge that system acceptance shall be deemed to have occurred upon completion of the startup and checkout of the system, or upon beneficial use of the system by Buyer, whichever occurs first.

10. OPERATIONAL AND MAINTENANCE PROCEDURES:
    Buyer acknowledges that any improper use, maintenance, or modification of the equipment provided hereunder, or use of unqualified maintenance or service technicians will severely impair the operational effectiveness of the entire system. Buyer hereby agrees to indemnify, defend and hold harmless Seller from and against any and all third-party claims arising, in any manner, out of: (a) Buyer's neglect of the equipment; (b) Buyer's use of technicians not authorized by Seller to service the equipment; or (c) Buyer's improper use or modification of the equipment or failure to follow the operational and maintenance procedures provided with the equipment.

11. SYSTEM STORAGE AFTER COMPLETION:
    If Buyer is unable to accept equipment at the time of readiness, or at the Buyer's request, storage of completed systems may be provided. If Seller has space at its facility, storage will be charged at a rate of 0.5% per month accruing after the initial 30 days. If off-site storage is required, the per month rate will be the greater of 0.5% or actual warehouse and transportation costs, +20% administration fee.

    The warranty period will start upon the original date of notice of readiness to ship. Any invoices due for payment that are subject to the shipment of the system will be initiated and subject to payment based on the date of notice of readiness to ship.

    If the system is stored, transfer of title will occur immediately to Buyer upon entry into storage. Risk of Loss will transfer as per Incoterms® of the original contract.

12. TECHNICAL ASSUMPTIONS:
    This proposal and pricing are based on Seller's interpretation of the sections of any RFP or specification that have been made available to Seller. Exceptions have been noted wherever possible. In the event of a conflict between the language in the specification or the proposal, Buyer agrees that the language in the proposal takes precedence and is the basis of the proposed pricing and scope.

13. HEALTH & SAFETY:
    Any health and safety requirements, training or certification needs for entering a project site must be communicated at the time of Order. It is the Buyer/Owner's responsibility to ensure that field technicians operating on live panels are informed and equipped with the appropriate PPE.

14. APROVALS, PERMITS & INSPECTIONS:
    Obtaining any required site permits (i.e. building) is the responsibility of the Buyer/Owner; the Seller is not responsible for any such items unless otherwise specified in the proposal.

    All required site inspections including, but not limited to electrical, building and fire are the responsibility of the Buyer/Owner; the Seller is not responsible for any such items.

15. WARRANTY:
    Refer to separate warranty document(s) attached hereto and incorporated herein as if set forth in full.

16. CONFIDENTIAL & PROPRIETARY INFORMATION:
    Buyer acknowledges that the information and processes utilized by Seller in the design, manufacture, and supply of its products and systems are confidential and proprietary to Seller. Buyer agrees to treat as confidential and proprietary any such information or processes, including, but not limited to, design information or data, proposals, software, schematics, drawings, operational and maintenance manuals, testing procedures or other similar technical information ("Confidential Information") provided by Seller in connection with the supply or installation of products or systems hereunder, and will, at a minimum, protect any such confidential Information in a manner commensurate with the measures taken to protect Buyer's own confidential or proprietary information. Seller retains all rights, titles and interests in all such Confidential Information and Buyer shall not use or otherwise disclose to any third party any such Confidential Information except to the extent authorized by Seller in writing.

17. INTELLECTUAL PROPERTY RIGHTS:

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Excepting for the benefit of air and/or water treatment as contemplated by the design of the equipment, all rights, benefits from any value received as a result of the use of intellectual property, equipment, information or advice provided by Seller remain the sole property of Seller, specifically, including, but not limited to, as it may relate to carbon or water credits, etc.

The Seller retains any and all intellectual property rights in and to the equipment, services, and/or information supplied hereunder (including, but not limited to, patents, copyrights, trademarks and trade secrets) ("Intellectual Property").

Buyer is not granted any interest, right, or license with respect to any such Intellectual Property, except to use the equipment, services and/or information for the purposes for which it is specifically provided to Buyer in accordance with the terms and conditions hereof.

Seller shall indemnify and hold Buyer harmless from and against all third-party claims of infringement or alleged infringement arising out of Buyer's use of any equipment, services, or information supplied by Seller hereunder. Provided, however, that Seller's indemnity obligation hereunder shall not apply to, and Seller shall not be responsible for, any claims to the extent arising out of Buyer's modification of Seller's equipment, services or information, or use of such equipment, services or information: (a) in combination with equipment, services or information not supplied by Seller, or (b) in the operation of any process or in any other manner inconsistent with the purpose for which Seller's equipment, services or information were intended.

Unless specified, programming for Seller's custom equipment and systems is proprietary and will remain the property of Seller and is not available for distribution to Buyer or others at any time.

18. INSURANCE:
Each party shall provide and maintain at its own expense, such policies of insurance in such amounts as are appropriate and commercially reasonable for parties engaging in the type of activities contemplated by the projects entered into hereunder. Upon request, each party shall furnish the other with certificates evidencing the required insurance coverage.

19. BUYER INDEMNIFICATION:
To the fullest extent permitted by law, Buyer hereby agrees to protect, defend, indemnify and hold harmless Seller and its affiliates, managers, shareholders, directors, officers and employees from and against all losses and damages incurred and all liability to others and all claims, causes of action and suits, for personal injury, including death or property damage arising out of the acts or omissions of Buyer or Buyer Parties. Buyer agrees to pay all costs and expenses paid or incurred by Seller in enforcing its rights hereunder, including without limitation, attorney's fees, and court costs.

20. SELLER INDEMNIFICATION:
To the fullest extent permitted by law, Seller hereby agrees to protect, defend, indemnify and hold harmless Buyer and its affiliates, managers, shareholders, directors, officers and employees from and against all losses and damages incurred and all liability to others and all claims, causes of action and suits, for personal injury, including death or property damage to the extent such is caused by the negligent acts or omissions of Seller or Seller Parties. Seller agrees to pay all costs and expenses paid or incurred by Buyer in enforcing its rights hereunder, including without limitation, attorney's fees, and court costs.

21. LIENS:
Seller shall promptly pay for all materials, supplies and labor employed by it in providing the goods and/or services hereunder, such that any equipment or system supplied to Buyer remains free of materialmen's, warehousemen's, mechanics', and any other similar liens. Seller reserves all rights hereunder to file notice and execute liens in the event Buyer breaches it obligations in the proposal, Purchase Order, or as set forth herein. Any executed lien waiver, release claim, or payment application executed and submitted by Seller shall not serve to waive Seller's right to pursue a lien claim for previously noticed, reserved, or filed claims.

Seller reserves all rights hereunder to file notice and execute liens in the event Buyer breaches it obligations in the proposal, purchase order, or as set forth herein. Any executed lien waiver, release claim, or payment application executed and submitted by Seller shall not serve to waive Seller's right to pursue a lien claim for previously noticed, reserved, or filed claims.

22. NON-WAIVER:
The parties' failure to demand strict performance or to otherwise enforce any rights hereunder shall not constitute a waiver of any rights hereunder. No claim arising out of a breach hereof may be discharged in whole or in part by a waiver of the claim unless supported by consideration and set forth in a writing signed by the waiving party. Any such waiver shall apply to the specifically identified claim only and shall in no way constitute a waiver or discharge of any other prior or subsequent claim.

23. BREACH/DEFAULT:
In addition to any failure to comply with any other term or condition as set forth herein, the occurrence of any of the following events shall constitute a breach/default on the part of Buyer: (a) If Buyer shall become insolvent or make a general assignment for the benefit of creditors; (b) If a petition for Bankruptcy is filed by or against Buyer; (c) If, at any time Buyer fails to fulfill its obligations under the terms and conditions hereof, or acts in such a manner as to endanger performance of such obligations; (d) If Seller shall reasonably believe that Buyer will not timely fulfill its obligations, including payment or otherwise perform hereunder, and Buyer is unable to provide reasonable assurances that such timely performance will occur.

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Upon breach/default by Buyer, Seller may terminate the contract or agreement by giving notice to the Buyer. Such termination may be effective immediately at the sole choice and discretion of Seller. In the event of a breach and contract termination, Buyer is still responsible for all costs incurred by Seller.

24. SUSPENSION: If any project or order, for which Seller is to supply goods and/or services hereunder, is requested to be suspended by Buyer for any reason other than a breach by Seller, Seller shall cooperate with Buyer in rescheduling any planned or ongoing work, and in otherwise complying with the suspension instructions. However, Buyer must provide reasonable written notice to Seller for any requested suspension. Seller shall reserve the right to adjust the scheduling, pricing, and/or billing due to any impact of the approved suspension. Provided, however, that in the event of any such suspension which continues for a period of 90 days, Seller shall be entitled to terminate that order, without any further liability or obligation of Seller thereunder.
    Seller, may by written notice to Buyer, suspend this order due to any of the following: (i) Buyer fails to perform in accordance with the delivery schedule; (ii) Buyer fails to properly pay Seller for any properly submitted invoices; (iii) Buyer has breached or otherwise failed to comply with any provision of this order that is capable of being cured and Buyer does not cure the same within a period of five (5) calendar days after receipt of written notice from Seller.

25. TERMINATION FOR CAUSE:
    Should Seller be in breach under this project or order, Buyer shall have the right, as well as all other rights per the applicable law to request to terminate all or part of any undelivered or unperformed portion of this Purchase Order by reasonable written notice to Seller. Upon receipt of such notice, Seller shall immediately stop delivery or work on the portion of the order terminated or canceled. In the event of such termination, Buyer shall be liable for the value of the work performed, materials received, and any materials not received that cannot be cancelled, prior to the time that notice of termination is given.

26. TERMINATION FOR CONVIENENCE:

    If any project or order, for which Seller is to supply goods and/or services hereunder, is terminated in agreement with the provisions of these terms and conditions, Seller shall be entitled to charge 25% of selling price if canceled prior to incurring related engineering, drafting, and production time. If engineering and/or drafting time has been incurred, 40% of the selling price will be charged to the Buyer. If materials have been received, or materials not received cannot be cancelled, and/or production time has been incurred, 100% of the selling price plus additional costs incurred will be charged to the Buyer who placed the order. Additional costs incurred as a direct result of termination may include, but are not limited to, freight and storage charges, costs of labor, transportation, travel and living expenses for support, overhead and profit, and reasonable attorney fees.

27. FORCE MAJEURE:
    Neither party shall be liable for any cost increase, failure or delay in its performance resulting from any cause beyond its reasonable control including, but not limited to, acts of God; acts or omissions of civil or military authority; fires; floods; unusually severe weather; strikes or other labor disputes; embargoes; wars; political strife; riots; epidemic; pandemic; changes in laws, delays in transportation; sabotage; or fuel, power, material or labor shortages.

28. LIMITATION OF LIAIBLITY:
    Under no circumstances whatsoever will Seller be responsible for liquidated, indirect, special, incidental or consequential damages including, but not limited to, lost business, overhead, loss of use of property, delay, damages, lost profits or third party claims, whether foreseeable or not, even if Seller has been advised of the possibility of such damages in connection with the delivery, installation, use or performance of the equipment or the provision of maintenance services by Seller regardless of whether such claims are alleged to have arisen out of breach of warranty, breach of contract, stricter absolute liability in tort, or other act, error or omission or any other cause whatsoever, or any combination of the foregoing.

    Under no circumstances whatsoever will Seller be responsible for direct damages in excess of 50% of the contract value.

29. ASSIGNMENT:
    The rights and responsibilities of the Buyer as set forth herein are personal to the Buyer and may not be assigned or delegated without the prior written consent of Seller.

30. APPLICABLE LAW / DISPUTES:
    Buyer acknowledges that the “Terms” from the Contract are deemed to be made in Pennsylvania for transactions in the U.S.A. and in Ontario for transactions in Canada, and that Buyer, in relation to this project, is deemed to be transacting business in Pennsylvania (U.S.A. transactions) and Ontario (Canadian transactions). It is the expectation of the parties that any disputes arising hereunder, whether in contract, tort or otherwise, will be amicably resolved by mutual agreement of the parties.

    Any dispute, involving the supply of goods or services within the U.S.A. or Canada, which cannot be amicably resolved by the parties, shall be submitted to binding arbitration in accordance with the applicable rules and regulations of the Canadian Arbitration Association for Canadian contracts or the American Arbitration Association for U.S.A. and all other contracts. The substantive law of Pennsylvania for U.S.A. contracts or Ontario for Canadian contracts shall apply to any such arbitration, which shall be conducted in Pittsburgh, Pennsylvania (U.S.A. contracts) or Ottawa, Ontario (Canadian contracts).

    Nothing herein shall be construed as preventing Seller from enforcing any claim or right to a mechanic's lien or any claim or right against a bond regardless of where such a claim must be filed or enforced.

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Appendix E
Engineer's Cost Estimates

Town of Narraganset
SWWTF Facilities Report
21517
AACE CLASS 4 ESTIMATE
ENR INDEX 13798, 04/2025
PROJECT COST SUMMARY

PROJECT COMPONENT		COST	COMMENTS
CONSTRUCTION		$60,005,000	Refer to Construction Summary
ENGINEERING SERVICES	20.0%	$12,001,000	Allowance
MATERIALS TESTING	1.00%	$600,000	Allowance
LEGAL/ ADMINISTRATIVE	4.0%	$2,400,000	Allowance
SUBTOTAL		$75,006,000	
FINANCING	1.0%	$750,000	Estimated interim interest
ENGINEER'S ESTIMATE OF PROJECT COST		$75,756,000	

Notes:
1) Cost estimate is based on ENR INDEX .

Town of Narraganset
SWWTF Facilities Report
21517
AACE CLASS 4 ESTIMATE
ENR INDEX 13798, 04/2025
CONSTRUCTION COST SUMMARY

DESCRIPTION	BID ALTERNATE	ESTIMATED COST
CIVIL		
GENERAL PAVING IMPROVEMENTS	BASE BID	$50,000
NEW SECONDARY SYSTEM SITE WORK (PAVING,EXCAVATION, BACKFILL, ETC.)	No. 3	$1,900,000
THIRD CLARIFIER SITE WORK	BASE BID	$500,000
DEWATERING TRAILER BAY	No. 5	$435,000
ARCHITECTURAL		
DOORS, WINDOWS, FINISHES, ROOFS EXTERIOR SIDING (3 BLDGS)	BASE BID	$900,000
NEW SECONDARY SYSTEM BLOWER+ELECTRICAL BUILDING	No. 3	$300,000
DEWATERING BUILDING MODS	No. 5	$50,000
STRUCTURAL		
SLUDGE HOLDING TANK INTERIOR REPAIR ALLOWANCE	BASE BID	$200,000
SLUDGE HOLDING TANK Alt 3	No. 3	$1,800,000
INFLUENT PUMP STATION REPAIR GRATING AND CONCRETE	BASE BID	$50,000
HEADWORKS CONCRETE REPAIR	BASE BID	$50,000
SECONDARY CLARIFIER CONCRETE REPAIR	BASE BID	$100,000
DISINFECTION CONCRETE REPAIR	BASE BID	$100,000
OXIDATION DITCH CONCRETE REPAIR	BASE BID	$750,000
OXIDATION DITCH PLATFORM/RAIL REPAIR	BASE BID	$100,000
NEW SECONDARY SYSTEM STRUCTURES (DISTRIBUTION, ATs, BUILDING SLAB)	No. 3	$5,000,000
THIRD SECONDARY CLARIFIER	BASE BID	$1,500,000
DEWATERING FLOOR SUPPORT	No. 5	$50,000
PROCESS		
DEMOLITION (base)	BASE BID	$90,000
DEMOLITION (Alt 5)	No. 5	$75,000
HEADWORKS (BASE)	BASE BID	$207,000
INFLUENT PUMPING SYSTEM (BASE)	BASE BID	$723,000
EXISTING SECONDARY TREATMENT FACILITIES (BASE)	BASE BID	$2,628,000
NEW SECONDARY TREATMENT FACILITIES (Alt 3)	No. 3	$2,052,750
DISINFECTION (BASE)	BASE BID	$150,000
PLANT WATER (BASE)	BASE BID	$409,500
SOLIDS HANDLING (base)	BASE BID	$955,500
SOLIDS HANDLING (Alt 5)	No. 5	$1,053,675
CHEMICAL FEED SYSTEMS (BASE)	BASE BID	$409,500
PROCESS EQUIPMENT AND PIPING FINISHES (BASE)	BASE BID	$91,350
PROCESS EQUIPMENT AND PIPING FINISHES (Alt 3)	No. 3	$33,600
PROCESS EQUIPMENT AND PIPING FINISHES (Alt 5)	No. 5	$18,270
MECHANICAL		
ADMIN BUILDING HVAC	BASE BID	$400,000
ADMIN BUILDING PLUMBING	BASE BID	$150,000
MAINTENANCE BUILDING HVAC	BASE BID	$400,000
MAINTENANCE BUILDING PLUMBING	BASE BID	$150,000
INFLUENT PUMP STATION HVAC	BASE BID	$50,000
INFLUENT PUMP STATION PLUMBING	BASE BID	$10,000
OPERATIONS BUILDING HVAC	BASE BID	$400,000
OPERATIONS BUILDING PLUMBING	BASE BID	$150,000
SECONDARY BUILDING HVAC	No. 3	$150,000
SECONDARY BUILDING PLUMBING	No. 3	$20,000
INSTRUMENTATION		
SCADA SYSTEM HARDWARE/ SOFTWARE	BASE BID	$460,000
NEW SECONDARY FACILITIES INSTR	No. 3	$500,000
NEW DEWATERING FACILITIES INSTR	No. 5	$100,000
ELECTRICAL		
HEADWORKS ELECTRICAL	BASE BID	$60,000
INFLUENT PUMP STATION ELECTRICAL	BASE BID	$320,000
SOLIDS BUILDING ELECTRICAL	BASE BID	$1,220,000
ADMIN/LAB ELECTRICAL	BASE BID	$160,000
MAINTENANCE/CONTROL ELECTRICAL	BASE BID	$240,000
SITE LIGHTING	BASE BID	$110,000
STANDBY POWER	BASE BID	$400,000
NEW SECONDARY FACILITIES ELECTRICAL	No. 3	$1,500,000
NEW DEWATERING FACILITIES ELECTRICAL	No. 5	$500,000
SPECIALS		
AERATION TANK, SECONDARY TANK, WAS TANK - DEWATERING, SOE	No. 3	$730,000
SOLIDS DEWATERING	No. 5	$230,000
SECONDARY CLARIFIER - DEWATERING, SOE	BASE BID	$200,000
OXIDATION DITCH SLUDGE REMOVAL	BASE BID	$400,000
GENERAL CONTRACTOR, SUBTOTAL		$10,457,145
GENERAL CONTRACTOR OH&P	10.0%	$1,046,000
SUBCONTRACTORS, SUBTOTAL		$21,285,000
GENERAL CONTRACTOR MARKUP	7.5%	$1,596,000
UNIT PRICE ITEMS	2.0%	$209,000
GENERAL CONDITIONS	12.0%	$4,151,000
SUBTOTAL, CONSTRUCTION COSTS		$38,744,145
PROJECT MULTIPLIER, DESIGN CONTINGENCY	25%	$9,686,000
CONSTRUCTION CONTINGENCY	5%	$2,422,000
PROJECT MULTIPLIER, INFLATION TO MIDPT CONST.	18%	$9,153,000
ENGINEERS ESTIMATE OF CONSTRUCTION COST		**$60,005,000**

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Appendix F
Intermunicipal Agreements

INTERMUNICIPAL AGREEMENTS
TOWN OF NARRAGANSETT/TOWN OF SOUTH KINGSTOWN/ UNIVERSITY OF RHODE ISLAND

1. Original Partners Agreement – January 1971
2. Original Sewerage Agreement - November 1972
3. Amendment/Interpretation Document - August 1974
4. Sludge Treatment & Disposal Agreement - June 1979
5. Letter of Understanding - January 1985
6. Cost-sharing Agreement (Solids Handling) - November 1989
7. Amendment re: Middlebridge Sewers Flow - June 1990
8. Cost-sharing Agreement (Aeration/Clarifiers) - Jan. 1991
9. Pretreatment Agreement - Sept. 1993
10. Lease of Flow Space (Narr./URI) - April 1995
11. Declor/Headworks Agreement - Feb. 1997 - 2/18/97 (97-02-50)
12. Capacity Agreement -Feb. 1997-2/18/97 (97-02-51)
13. Lease of Flow Space (Narr./URI) - July 2001 (2001-08-244)
14. Pretreatment Agreement (Narr./SK) March 2007 (07-02-55)
15. Lease of Flow Space (Narra-URI) June 2012
16. IM Agreement - 2015 CIP and OM Billing MOU
17. Lease of Flow Space (Narra-URI) July 2017
18. Lease of Flow Space (Narra-URI) July 2022
19. Lease of Flow Space (Narra-URI) July 2023

Sewerage

Exh. A

9/24/70

SEWERAGE AGREEMENT

THIS AGREEMENT is made this 21st day of January 1971, by the Towns of Narragansett and South Kingstown, Rhode Island, ("Narragansett" and "South Kingstown") and the Board of Regents (the "Board") under Chapters 116 and 171 of the Public Laws of 1969. This agreement is made by the Board for the benefit of the University of Rhode Island (the "University") and action to be taken by the Board under this agreement may be taken by the Board itself or by any board, officer or agency to which the power may have been delegated.

I. South Kingstown shall construct, operate and maintain a sewerage system composed of the following elements:

A. A primary sewage treatment plant with a design capacity of approximately 3.67 million gallons per day (average flow) in Narragansett at approximately the location shown in Figure 5 of the "Report on Waste Water Collection and Disposal Facilities for the Town of Narragansett, Rhode Island", dated September 1968, by Charles A. Maguire & Associates,

B. A marine outfall sewer to convey the treated sewage effluent to the Atlantic Ocean at a location near Tuckers Dock (State Pier No. 4);

C. A sewage pumping station and force main near Salt Pond and the South County Hospital to carry the University and South Kingstown flow to the treatment plant mentioned in A above;

D. An interceptor sewer along the Saugatucket River from the Salt Pond pumping station to Silver Lake Avenue;

E. An interceptor sewer along the Saugatucket River from Silver Lake Avenue to the Indian Run interceptor;

F. An interceptor sewer along the Saugatucket River and Kingstown Road from the Indian Run interceptor to the South Road interceptor;

G. An interceptor sewer along Kingstown Road from the South Road interceptor to Upper College Road; and

H. A pumping station and force main facilities located in the vicinity of Kingstown Road near White Horn Brook to pump the University sewage and portions of the Kingstown Village flow to the interceptor sewer mentioned in G above;

including in each of the foregoing all necessary appurtenances. The foregoing elements may be constructed under separate or combined contracts. In the event of combined contracts, appropriate cost allocations shall be made for the purpose of computing shares under IV below.

II. Narragansett hereby permits the location in Narragansett of the facilities mentioned in I (A) and (B) above and the major portion of the force main mentioned in I (C) above and South Kingstown may exercise the power of eminent domain in Narragansett for this purpose.

III. South Kingstown shall accept flow from Narragansett at the treatment plant described in I (A) above and from the University at the pumping station described in I (H) above, or at such other points as may be determined by Narragansett or the Board as the case may be, with

the approval of South Kingston, which approval shall not be unreasonably withheld. South Kingstown shall install and maintain devices at the treatment plant and at the pumping stations to measure the respective flows of the parties involved in determining their shares of operating costs hereunder.

IV. Narragansett and the Board shall pay to South Kingstown the following respective percentages of the net capital costs of the facilities described in I above, the letter headings below being cross-references to the respective subparagraphs of I above:

	Narragansett	The Board
A. Plant - Storage	19%	40%
B. outfall	19%	40%
C. Shady Lane Station	none	43%
D. — out	none	43%
E. main interceptor	none	45%
F.	none	64%
G.	none	87%
H. Kingston Station	none	87%

V. (A) Net capital costs shall include the costs of design, construction and equipment, engineering and supervisory costs, costs of acquiring real and personal property and all other costs of establishing a project and making it ready for operation (including the costs of borrowing in anticipation of federal and state aid), whether heretofore or hereafter incurred, less any federal and state grants which are received for the project. Without limiting the generality of the foregoing, net capital costs shall include the costs previously incurred by

Narragansett for the Charles A. Maguire & Associates survey and such costs shall be credited against the payments to be made by Narragansett under IV above. If any federal or state grant is received for a project under this agreement by Narragansett or the Board, the amount received shall be promptly remitted to South Kingstown. Any federal or state grant received by any party for its own collection system and not for a project described in this agreement shall be retained by such party. State appropriations to pay the Board's obligations hereunder shall not be considered state grants for the purposes of this paragraph.

(B) The net capital costs allocated to the Board shall be adjusted (a) by adding interest on bond anticipation notes issued by South Kingstown and expenses incurred by South Kingstown in issuing bonds and bond anticipation notes to the extent such interest and expenses are attributable to the Board's share of net capital costs and (b) by subtracting any earnings or net profits realized by South Kingstown from the investment of bond and bond anticipation note proceeds attributable to the Board's share.

VI. (A) Payments under IV above shall be made from time to time by Narragansett upon receipt of a written request from South Kingstown describing in general terms the costs for which payment is to be made, stating that such costs have been incurred and showing the computation of the payment to be made to South Kingstown, accompanied (if requested by Narragansett) by a confirmatory certificate of an independent engineer or engineering firm.

(B) In the case of the Board, payments of net capital costs shall be made from year to year as bonds fall due. South Kingstown shall certify

from time to time to the Board the costs incurred and the computation of the share of the Board therein, accompanied (if requested by the Board) by a confirmatory certificate of an independent engineer or engineering firm. The total net capital costs allocated to the Board shall be further allocated pro rata to the principal maturities of the bonds issued by South Kingstown to finance the system. The Board shall pay to South Kingstown in each fiscal year of South Kingstown the Board's allocated share of the principal amount of the bonds maturing in such year, together with the interest coming due in such year on the Board's allocated share of the bonds maturing in or after such year. Each annual payment shall be made in equal installments on the first days of July, October, January and April.

VII. Narragansett and the Board shall pay to South Kingstown their respective shares (as determined below) of the net operating costs incurred by South Kingstown in each fiscal year of South Kingstown on account of the facilities described in I above. These payments shall be made in equal installments on the first days of July, October, January and April on the basis of reasonable annual estimates submitted by South Kingstown. If the payment actually due for any fiscal year is greater or less than the estimate, the difference shall be paid to South Kingstown or repaid by South Kingstown, as the case may be, as soon after the close of the South Kingstown fiscal year as it can be determined.

VIII. Operating costs shall include maintenance, repairs, supplies, renewals and replacements, administration and all other costs of operating the facilities, but shall not include principal and interest coming due on the bonds or notes issued by any party. The operating costs shall be allocated to the respective elements of the system set forth in I above.

For the fiscal years of South Kingstown ending on or prior to June 30, 1978, the respective shares of the operating costs of each element to be paid by Narragansett and the Board shall be the same as their respective shares of net capital costs as set forth in IV above. For each fiscal year of South Kingstown thereafter, the respective shares of the net operating costs of each element to be paid by Narragansett and the Board shall be in proportion to their respective shares of the total flow into such element during the prior fiscal year of South Kingstown. Their shares of the flow into each element shall be determined by the measuring devices referred to in III above and such supplementary data as may be necessary to determine the portions of the metered flows entering the system at or within the several elements.

IX. All parties, in their use of the system, shall comply with such reasonable requirements as may be adopted by South Kingstown. No sewage shall be discharged into the system containing substances harmful to the system. The system shall be operated in such manner that the discharge into the ocean complies with all applicable state and federal standards and no sewage shall be discharged into the system which would prevent compliance with such standards or which would require unusual and unduly expensive procedures in order to comply.

X. South Kingstown shall maintain adequate records showing flows, capital costs, operating costs and the computation of the amounts due from Narragansett and the Board. Such records, the measuring devices mentioned in III above and all parts of the system which are not buried below ground shall be open to inspection by authorized representatives of Narragansett and the Board.

XI. Representatives of Narragansett, South Kingstown and the Board shall meet jointly from time to time at the request of any party to discuss

steps to be taken to implement this agreement.

XII. The obligations of the Board hereunder are subject to the appropriation and any required allocation of funds to meet the same. In the event that any payment is not made by the Board or Narragansett when due and remains unpaid for 60 days thereafter, South Kingstown may withhold service to the Board or Narragansett, as the case may be, until the deficiency is paid.

XIII. If the construction and operation of the system is not presently permitted by the zoning ordinances of Narragansett or South Kingstown, no liabilities shall be incurred by South Kingstown under this agreement except for engineering, land acquisition and other preliminary expenses until the ordinances are amended to permit the system.

XIV. This agreement shall terminate on June 30, 2010 but this shall not affect any remaining liability of any party to any other party with respect to any period ending on or prior to that date. It is the intention of the parties to negotiate an extension of this agreement prior to that date. If, however, such an extension is not negotiated, the parties hereto shall have an equitable ownership in the system proportionate to the principal amounts of their respective contributions to capital costs.

XV. Neither the system nor any part thereof shall be disposed of except in accordance with an amendment of this agreement. But during the term of this agreement South Kingstown may dispose of any equipment which is worn out, obsolete or no longer needed to operate the system. The proceeds of any such disposition shall be used as an offset against operating costs.

XVI. If any provision of this agreement is held invalid in any circumstance, such invalidity shall not affect any other provisions or circumstances.

XVII. Any controversy hereafter arising out of this agreement, or our of the refusal of any party to perform the whole or any part thereof, or the refusal of any party to negotiate an extension of this agreement pursuant to paragraph XIV, shall be settled by arbitration in South Kingstown, Rhode Island, pursuant to the rules then obtaining of the American Arbitration Association, subject in all respects to The Rhode Island Arbitration Act. Where an arbitration is initiated by one party, each of the other parties affected by the controversy shall have all of the procedural rights of a respondent party under said rules and Act.

TOWN OF NARRAGANSETT

By James J. O'Hearn
President, Town Council

TOWN OF SOUTH KINGSTOWN

By _____
President, Town Council

BOARD OF REGENTS

By _____
Chairman

Dennis Roberts

9/24/70

TOWN OF NARRAGANSETT

Certificate of Clerk

I, the Town Clerk of the Town of Narragansett, Rhode Island, certify that at a regular meeting of the Town Council duly called and held on October 21, 1970 at which a quorum was present, the following resolution was unanimously adopted, all of which appears in the official records of the Council in my custody:

> Resolved that the form of Sewerage Agreement with South Kingstown and the Board of Regents presented to this meeting is approved; that the Town Clerk is directed to file a copy of the approved form of agreement with the records of the meeting; and that the president of the Town Council is authorized to execute an agreement substantially in such form on behalf of the town.

I further certify that the agreement to which this certificate is attached is in the form presented to the aforesaid meeting, a copy of which is on file with the records of the meeting and that the foregoing resolution has not been amended or revoked.

Arlene B. Clegg-Smith
Town Clerk

Dated: January 25, 1971

(Town Seal)

9/24/70

TOWN OF SOUTH KINGSTOWN

Certificate of Clerk

I, the Town Clerk of the Town of South Kingstown, Rhode Island, certify that at a regular meeting of the Town Council duly called and held on October 14, 1970, at which a quorum was present, the following resolution was unanimously adopted, all of which appears in the official records of the Council in my custody:

> Resolved that the form of Sewerage Agreement with Narragansett and the Board of Regents presented to this meeting is approved; that the Town Clerk is directed to file a copy of the approved form of agreement with the records of this meeting; and that the President of the Town Council is authorized to execute an agreement substantially in such form on behalf of the town.

I further certify that the agreement to which this certificate is attached is in the form presented to the aforesaid meeting of the Town Council, a copy of which form is on file with the records of the meeting and that the foregoing resolution has not been amended or revoked.

Edith J. Sheldon
Town Clerk

Dated: January 22, 1971

(Town Seal)

9/24/70

BOARD OF REGENTS

Certificate of Secretary

I, the Secretary of the Board of Regents, Rhode Island, certify that at a meeting of the Board duly called and held and open to the public on January 14, 1971, at which a qourum was present, the following resolution was unanimously adopted, all of which appears in the official records of the Board in my custody:

> Resolved that the form of Sewerage Agreement with Narragansett and South Kingstown presented to this meeting is approved; that the Secretary is directed to file a copy of the approved form of agreement with the records of the meeting; and that the Chairman is authorized to execute an agreement substantially in such form on behalf of the Board.

I further certify that the agreement to which this certificate is attached is in the form presented to the aforesaid meeting, a copy of which form is on file with the records of the meeting, and that the foregoing resolution has not been amended or revoked.

Rae K. O'Dell
Secretary

Dated:

(Seal)

11/27/72

SEWERAGE AGREEMENT

THIS AGREEMENT is made this 27th day of November, 1972, by the Towns of Narragansett and South Kingstown, Rhode Island, ("Narragansett" and "South Kingstown") under Chapters 116 and 171 of the Public Laws of 1969 as amended by Chapters and of the public laws of 1971.

I. South Kingstown shall construct, operate and maintain a sewerage system composed of the following elements:

A. A secondary sewage treatment plant with a design capacity of approximately 3.67 million gallons per day (average flow) in Narragansett at approximately the location shown in Figure 5 of the "Report on Waste Water Collection and Disposal Facilities for the Town of Narragansett, Rhode Island", dated September, 1968, by C. E. Maguire, Inc.

B. A marine outfall sewer to convey the treated sewage effluent to the Atlantic Ocean at a location near Tuckers Dock (State Pier No. 4);

C. A sewage pumping station and force main near Salt Pond and the South County Hospital to carry the South Kingstown flow (including the University of Rhode Island flow) to the treatment plant mentioned in A above;

D. An interceptor sewer along the Saugatucket River from the Salt Pond pumping station to Silver Lake Avenue;

E. An interceptor sewer along the Saugatucket River from Silver Lake Avenue to the Indian Run interceptor;

F. An interceptor sewer along the Saugatucket River and Kingstown Road from the Indian Run interceptor to the South Road interceptor;

G. An interceptor sewer along Kingstown Road from the South Road interceptor to Upper College Road; and

H. A pumping station and force main facilities located in the vicinity of Kingstown Road near White Horn Brook to pump the University sewage and portions of the Kingstown Village flow to the interceptor sewer mentioned in G above;

including in each of the foregoing all necessary appurtenances. The foregoing elements may be constructed under separate or combined contracts. Appropriate cost allocations shall be made for the purpose of computing shares under IV below.

II. Narragansett hereby permits the location in Narragansett of the facilities mentioned in I (A) and (B) above and the major portion of the force main mentioned in I (C) above and South Kingstown may exercise the power of eminent domain in Narragansett for this purpose.

III. South Kingstown shall accept flow from Narragansett at the treatment plant described in I(A) above, or at such other points as may be determined by Narragansett with the approval of South Kingstown, which approval shall not be unreasonably withheld. South Kingstown shall install and maintain devices to measure the respective flows of the

parties involved in determining their shares of operating costs hereunder.

IV. Narragansett shall pay to South Kingstown nineteen (19) per cent of the net capital costs of the facilities described in I above through which Narragansett sewage is to flow in either treated or untreated form or in which Narragansett sewage is to be treated (hereinafter called the "common facilities").

V. Net capital costs shall include the costs of design, construction and equipment, engineering and supervisory costs, costs of acquiring real and personal property and all other costs of establishing a project and making it ready for operation (including the costs of borrowing in anticipation of federal and state aid), whether heretofore or hereafter incurred, less any federal and state grants which are received for the project. Without limiting the generality of the foregoing, net capital costs shall include the costs previously incurred by Narragansett for the C. E. Maguire, Inc., survey and such costs shall be credited against the payments to be made by Narragansett under IV above. If any federal or state grant is received for a project under this agreement by Narragansett, the amount received shall be promptly remitted to South Kingstown. Any federal or state grant received by either party for its own collection system and not for a project described in this agreement shall be retained by such party.

VI. Payments under IV above shall be made from time to time

by Narragansett upon receipt of a written request from South Kingstown describing in general terms the costs for which payment is to be made, stating that such costs have been incurred and showing the computation of the payment to be made to South Kingstown, accompanied (if requested by Narragansett) by a confirmatory certificate of an independent engineer or engineering firm.

VII. Narragansett shall pay to South Kingstown its share (as determined below) of the net operating costs incurred by South Kingstown in each fiscal year of South Kingstown on account of the common facilities. These payments shall be made in equal installments on the first days of July, October, January and April on the basis of reasonable annual estimates submitted by South Kingstown. If the payment actually due for any fiscal year is greater or less than the estimate, the difference shall be paid to South Kingstown or repaid by South Kingstown, as the case may be, as soon after the close of the South Kingstown fiscal year as it can be determined.

VIII. Operating costs shall include maintenance, repairs, supplies, renewals and replacements, administration and all other costs of operating the facilities, but shall not include principal and interest coming due on the bonds or notes issued by any party. Operating costs shall be appropriately allocated to the common facilities and the remainder of the system set forth in I above. For the fiscal years of South Kingstown

beginning before the system is completed and placed in regular operation, and for the fiscal year during which the system is completed and placed in regular operation, the share of the operating costs of the common facilities to be paid by Narragansett shall be nineteen (19) per cent. For each fiscal year of South Kingstown thereafter, the share of the net operating costs of the common facilities to be paid by Narragansett shall be in proportion to its share of the total flow into the common facilities during the prior fiscal year of South Kingstown. Its share of the flow shall be determined by the measuring devices referred to in III above.

IX. Both parties, in their use of the system, shall comply with such reasonable requirements as may be adopted by South Kingstown. No sewage shall be discharged into the system containing substances harmful to the system. The system shall be operated in such manner that the discharge into the ocean complies with all applicable state and federal standards and no sewage shall be discharged into the system which would prevent compliance with such standards or which would require unusual and unduly expensive procedures in order to comply.

X. South Kingstown shall maintain adequate records showing flows, capital costs, operating costs and the computation of the amounts due from Narragansett. Such records, the measuring devices mentioned in III above and all parts of the system which are not buried below ground shall be open to inspection by authorized representatives of Narragansett.

XI. Representatives of Narragansett and South Kingstown shall meet jointly from time to time at the request of either party to discuss steps to be taken to implement this agreement.

XII. In the event that any payment is not made by Narragansett when due and remains unpaid for 60 days thereafter, South Kingstown may withhold service to Narragansett until the deficiency is paid.

XIII. If the construction and operation of the system is not presently permitted by the zoning ordinances of Narragansett or South Kingstown, no liabilities shall be incurred by South Kingstown under this agreement except for engineering, land acquisition and other preliminary expenses until the required action is taken to permit the system.

XIV. This agreement shall be of permanent duration but its terms shall be subject to renegotiation as of July 1, 2008 and at thirty (30) year intervals thereafter. If the parties are unable to agree at least six (6) months prior to any such date, the terms of this agreement for the next interval shall be subject to arbitration under Paragraph XVIII.

XV. Neither the system nor any part thereof shall be disposed of except in accordance with an amendment of this agreement. But during the term of this agreement South Kingstown may dispose of any equipment which is worn out, obsolete or no longer needed to operate the system. The proceeds of any such disposition shall be used as an offset against operating costs.

XVI. If any provision of this agreement is held invalid in any circumstance, such invalidity shall not affect any other provisions or circumstances.

XVII. This agreement shall supersede the agreement previously made with regard to the same subject matter by Narragansett, South Kingstown and the Board of Regents for Education, which prior agreement is rescinded.

XVIII. Any controversy hereafter arising out of this agreement, or out of the refusal of any party to perform the whole or any part thereof, including a failure to agree under paragraph XIV, shall be settled by arbitration in South Kingstown, Rhode Island, pursuant to the rules then obtaining of the American Arbitration Association, subject in all respects to The Rhode Island Arbitration Act.

TOWN OF NARRAGANSETT

By _____
President, Town Council

TOWN OF SOUTH KINGSTOWN

By _____
President, Town Council

TELEPHONE 789-0217
AREA CODE 401

51 TOWER HILL ROAD
WAKEFIELD, RHODE ISLAND 02879

August 22, 1974

Mr. John E. Cullen
Narragansett Town Council
Rodman Street
Narragansett, Rhode Island

Dear Mr. Cullen:

As a result of a joint meeting between the Town Councils of Narragansett and South Kingstown on August 15, 1974, the Town Council of South Kingstown has agreed to adopt the following reasonable requirements in connection with the use of the system by the Town of South Kingstown and the Town of Narragansett and has agreed to accept the following as its interpretation of the rights and duties of the parties under the sewage agreement made the 27th day of November, 1972. The requirements and interpretation is as follows:

a. The Town of Narragansett will be guaranteed at least 19% of the treatment plant capacity and shall not be denied additional capacity if that capacity exists.

b. During the first year of operation of the plant, Narragansett will pay 19% of the operating cost. Until such time as the plant is operating to at least 50% capacity, Narragansett shall pay no more than 50% of the operating cost. Thereafter Narragansett shall pay in proportion to its use.

c. That South Kingstown shall not sub-lease capacity in the treatment plant to any other municipality without the consent of Narragansett.

d. The Town Managers and Town Councils of Narragansett and South Kingstown shall meet quarterly each year during the months of January, April, July, and October to discuss the operation of the sewage agreement made November 27, 1972, and its implementation. The Town of South Kingstown shall

report at said meetings on the construction and operation of the sewage treatment plant and marine outfall. Also, the representatives shall meet at such other times as requested by either party to discuss said matters.

If these regulations and interpretations are agreeable to the Town Council of Narragansett, please indicate your approval by signing the copy of this letter and returning it to us.

Very truly yours,

Town Council of South Kingstown

By _____
Walter Gray

The Town Council of the Town of Narragansett does hereby accept and agree to the regulations and interpretations herein above stated.

Town Council of Narragansett

By _____
John E. Cullen, President

SLUDGE TREATMENT AND DISPOSAL AGREEMENT

This agreement is made this 18th of June, 1979, between the Town of South Kingstown, Rhode Island, and the Town of Narragansett, Rhode Island.

I. The Town of South Kingstown agrees to:

A. Treat through its sludge treatment process primary and/or secondary sludge generated by the Scarborough Wastewater Treatment Plant of the Town of Narragansett and transported to the Wastewater Treatment Plant of South Kingstown located on Westmoreland Street, Narragansett, by the Town of Narragansett and deposited in its designated sludge holding tanks.

B. Develop, construct, maintain and operate a sludge disposal landfill site and/or dispose of treated sludge by other means acceptable to the State Dept. of Environmental Management, including transportation from the Town of South Kingstown Wastewater Treatment Plant.

C. Maintain records of capital and operating costs for the treatment and disposal of Wastewater Treatment Plant sludge and make them available to the Town of Narragansett authorized agents.

II. The Town of Narragansett agrees to:

A. Transport, in tank trucks or other approved means to meet standards of the State Dept. of Environmental Management, Div. of Pollution Control, primary and/or secondary sludge generated at its Scarborough Wastewater Treatment Plant and deposit in sludge holding tanks at the South Kingstown Wastewater Treatment Plant; such sludge to be free of screenings, rags and relatively free of grit.

B. Pay a proportionate share of the capital costs of developing a sludge disposal landfill and operating equipment, exclusive of Federal and State of Rhode Island participating funding; such proportionate share to be the ratio of the Scarborough Wastewater Treatment Plant design flow of 1.4 MGD to the total of the Scarborough and South Kingstown Wastewater Treatment Plant design flows for twenty (20) year life of (4.13 MGD plus 1.4 Mg) 5.53 MGD or 25.3 percent. The sludge disposal landfill design and costs shall be based on the report of C.E. Maguire, Inc. entitled Report on Design and Development of Sewage Sludge Landfill Operation, Rose Hill Rd., Town of South Kingstown, R.I., dated June, 1977, and approved by the State of Rhode Island Dept. of Environmental Management, Div. of Pollution Control including any alterations or modifications approved by the agency over the life of the sludge landfill.

The capital cost to be paid for shall include engineering, administration, interest, legal, contractual services, and construction cost not funded by State or Federal agencies.

The cost of initial development of the site through May 31, 1979 amounts to $65,196.39 and 25.3 percent of this amount or $16,494.69 shall be paid by the Town of Narragansett upon execution of this agreement. In subsequent years, capital costs shall be billed as expenditures occur and due within thirty (30) days of billing.

C. Pay a share of the operating costs for Scarborough Wastewater Treatment Plant primary and/or secondary sludge treatment processing and disposal, including lease of land, supplies, repairs, power, chemicals, transportation, operation of equipment, fuel, insurance, maintenance, depreciation and administration; such a share shall be based on the costs for sludge treatment processing and disposal less the cost of septic sludge treatment and disposal costs, charged per 1000 gallons of sludge multiplied by the sludge delivered from the Scarborough Wastewater Treatment Plant to the South Kingstown Wastewater Treatment Plant. Charges for sludge disposal shall be billed monthly on an estimated cost per 1000 gallons and adjusted at the end of each fiscal year. The initial charge shall be $8.75 per 1000 gallons delivered.

D. Maintain records and make available records of its Scarborough Wastewater Treatment Plant's total volume of sludge delivered to the Town of South Kingstown.

III. The Town of Narragansett in its use of the system shall comply with such reasonable requirements as may be adopted by South Kingstown. This shall include cleanup of any spillage at the holding tank dumping station occuring during delivery of sludge and coordinated as to time of delivery by the plant superintendents.

IV. This agreement shall be for a period, until July 1, 1997, but its term shall be subject to renegotiation or termination, except that either party to terminate this agreement must serve written notice to the other party two years prior to such termination.

V. Nothing in this agreement shall modify or have any effect on sewage agreement dated November 27, 1972, between the Towns of Narragansett and South Kingstown.

VI. If any provision of this agreement is held invalid in any circumstances, such invalidity shall not affect any other provision or circumstances.

VII. Any controversy hereafter arising out of this agreement or out of the refusal of any party to perform the whole or any part hereof, shall be settled by arbitration in South Kingstown, R.I., pursuant to the rules then pertaining of the American Arbitration Association, subject in all respects to the Rhode Island Arbitration Act.

TOWN OF NARRAGANSETT

by _____
President, Town Council

TOWN OF SOUTH KINGSTOWN

by _____
President, Town Council

Town of South Kingstown, R. I.

TOWN CLERK'S OFFICE

CLERK OF THE TOWN COUNCIL AND PROBATE COURT

Town Hall, 66 High Street

Wakefield, Rhode Island 02879

FOSTER R. SHELDON
own Clerk & Probate Clerk
401-789-9331

At a REGULAR SESSION of the Town Council of the Town of South Kingstown, County of Washington, in the State of Rhode Island, held at the Town Hall, in and for said Town, on the 12th day of September A. D. 1977 at 7:30 P.M.

PRESENT: Messrs. Alfred J. Coffin, President
Duncan H. Doolittle, Vice President
Alexander M. Cruickshank
Charles J. Hamilton, Jr.
Gilbert V. Indeglia MEMBERS

It was VOTED: to authorize the President of the South Kingstown Town Council to sign a Sludge Treatment and Disposal Agreement with the Town of Narragansett covering the treatment of sludge generated at the Scarborough Wastewater Treatment plant at the South Kingstown Regional Wastewater Treatment Plant.

A True Copy

ATTEST: Foster R. Sheldon
Town Clerk

TOWN OF SOUTH KINGSTOWN

Certificate of Clerk

I, the Town Clerk of the Town of South Kingstown, Rhode Island, certify that at a regular meeting of the Town Council duly called and held on Sept. 12, 1977, at which a quorum was present, the following resolution was unanimously adopted, all of which appears in the official records of the Council in my custody:

> Resolved that the form of Sludge Treatment and Disposal Agreement with Narragansett presented to this meeting is approved; that the Town Clerk is directed to file a copy of the approved form of agreement with the records of this meeting; and that the President of the Town Council is authorized to execute an agreement substantially in such form on behalf of the Town.

I further certify that the agreement to which this certificate is attached is in the form presented to the aforesaid meeting of the Town Council, a copy of which form is on file with the records of the meeting and that the foregoing resolution has not been amended or revoked.

Dated: June 15, 1979

Elizabeth M. Wilson
Town Clerk

(Town Seal)

TOWN OF NARRAGANSETT

Certificate of Clerk

I, the Town Clerk of the Town of Narragansett, Rhode Island, certify that at a regular meeting of the Town Council duly called and held on June 18, , 1979, at which a quorum was present, the following resolution was unanimously adopted, all of which appears in the official records of the Council in my custody:

> Resolved that the form of Sludge Treatment and Disposal Agreement with South Kingstown presented to this meeting is approved; that the Town Clerk is directed to file a copy of the approved form of agreement with the records of the meeting; and that the President of the Town Council is authorized to execute an agreement substantially in such form on behalf of the Town.

I further certify that the agreement to which this certificate is attached is in the form presented to the aforesaid meeting, a copy of which is on file with the records of the meeting and that the foregoing resolution has not been amended or revoked.

Eleanor M. Sayer
Town Clerk Deputy

(Town Seal)

Town of South Kingstown

Town Hall
66 High Street
Wakefield, Rhode Island 02879

Tel. 401-789-9331

January 29, 1985

Mr. Maurice J. Loontjens, Jr.
President
Narragansett Town Council
Town Hall
25 Fifth Avenue
Narragansett, RI 02882

Dear Mr. Loontjens:

The Town Council of the Town of South Kingstown herewith requests the Town Council of the Town of Narragansett to cosign this letter of understanding in regard to the Sewerage Agreement between the Towns of Narragansett and South Kingstown dated November 27, 1972, as modified by a letter of understanding dated August 22, 1974.

By way of background, the common components of the regional treatment plant were constructed and paid for based on the following percentage of total costs:

1.	South Kingstown	41%	1,693,300 gals. per day share
2.	URI	40%	1,652,000 gals. per day share
3.	Narragansett	19%	784,700 gals. per day share
		100%	4,130,000 gals. plant design

The University of Rhode Island, as a part of its payment agreement, has requested a reaffirmation of the original understanding that the university can increase its average flow to 1.652 million gallons per day (40% of 4.13 MGD) to the treatment plant without incurring additional capital expense.

In our letter agreement of August 22, 1974, it was agreed that Narragansett would be guaranteed at least 19% (.7847 million gallons per day) of the treatment plant capacity and shall not be denied additional capacity if that capacity exists.

During the 1983-84 fiscal year, the Town of Narragansett delivered an average of 905,000 gallons per day of wastewater to the regional treatment plant, or approximately 21.9% of total plant capacity. While sufficient excess space exists to accommodate Narragansett's excess flow over the short term, the adoption of a future plant expansion agreement is clearly warranted to protect the existing plant capacity ownership rights of South Kingstown and the university.

South Kingstown is proposing the adoption of a plant expansion agreement whereby:

1. When the regional treatment plant reaches 80% of design flow, or 3.3 MGD average flow, that an independent engineering study of the three regional partners' wastewater flow volumes, both present and future, be made to determine the size and scope of any planned expansion.

2. After determination of needed flow space and agreement by each regional partner, that a cost-sharing agreement be formally adopted whereby cost-sharing by regional partners would be based on the following:

$$\text{Regional Partner Share} = \frac{\text{(Needed Flow Space - Previously Purchased Space)}}{\text{Total New Flow Space}}$$

To illustrate the above, consider a theoretical example as follows:

	Proportion of Flows Initial Plant Construction	Actual Use 1983-84	Illustration Flows at 6.2 MGD Capacity	Added Capacity per Participant 3-4	%Cost For Added Plant per Participant
	MGD	MGD	MGD	MGD	%
Narragansett	.785	.905	2.200	1.415	63.7
South Kingstown	1.693	1.000	2.500	.807	36.3
URI	1.652	.532	1.500	(.152)	--
	4.130	2.437	6.200	2.07	100.0

If this future plant expansion proposal is agreeable to the Town Council of Narragansett, please indicate your approval by signing the copy of this letter and returning it to us.

Very truly yours,

Town Council of South Kingstown

By Charles P. Kelley
Charles P. Kelley, President

The Town Council of the Town of Narragansett does hereby accept and agree to the future plant expansion proposal herein above stated.

Town Council of Narragansett

By Maurice J. Loontjens, Jr.
Maurice J. Loontjens, Jr., President

REGIONAL WASTEWATER
TREATMENT PLANT (WWTP)

COST-SHARING AGREEMENT
BETWEEN THE
TOWN OF SOUTH KINGSTOWN
AND
TOWN OF NARRAGANSETT

WHEREAS: The Town Council of South Kingstown herewith requests the Town Council of the Town of Narragansett to cosign this letter of understanding in regard to the Sewerage Agreement between the Towns of Narragansett and South Kingstown relative to recent regional wastewater treatment plant operational equipment replacement.

WHEREAS: By way of background, the common original components of the regional treatment plant were constructed and paid for based on the following percentage of total costs:

1.	South Kingstown	41%	1,693,300 gals. per day share
2.	URI	40%	1,652,000 gals. per day share
3.	Narragansett	19%	784,700 gals. per day share
		100%	4,130,000 gals. plant design

The University of Rhode Island, as a part of its payment agreement, has requested a reaffirmation of the original understanding that the University can increase its average flow to 1.652 million gallons per day (40% of 4.13 MGD) to the treatment plant without incurring additional capital expense.

WHEREAS: The purchase and installation of a 2.0 meter belt filter press, polymer system and rotary reactor thickener are replacing the existing horizontal vacuum filters and polymer system which reached an ultimate equipment life based on actual flow volume from each of the individual regional partners.

WHEREAS: Each regional partner agrees to pay for said new equipment based on each user's average yearly flow volume percentage over the last three (3) year period as delineated below.

WHEREAS: Payment of solids handling improvements except rotary reactor thickener shall be billed to the Town of Narragansett on the normal quarterly invoice and is payable within fifteen (15) calendar days.

WHEREAS: Payment of the rotary reactor thickener and related services shall be billed to the Town of Narragansett on a separate invoice and shall be payable within fifteen (15) calendar days once the Town of South Kingstown's payment is made to the contractor.

TOTAL REGIONAL PARTNER WASTEWATER FLOWS

	1986-87 MGY	1987-88 MGY	1988-89 MGY	Average MGY	%
Narragansett	401.10	337.40	360.00	366.16	38.38
So. Kingstown	397.00	356.80	359.70	371.16	38.91
URI	205.60	213.00	231.30	216.63	22.71
	1003.70	907.20	951.00	953.95	100.0

Present project estimated costs are broken down as follows:

Belt Filter Press & Polymer System

Engineering Services		$ 42,300.00
Equipment Costs		$228,150.00
Construction Installation		$438,200.00
	TOTAL	$708,650.00

Rotary Thickener

Engineering Services	$ 16,600.00
Equip. & Construction Installation (Thickener was purchased by Contractor)	$134,900.00
	$151,500.00
TOTAL EQUIPMENT REPLACEMENT COST	$860,150.00*

*NOTE: These costs are actual contract costs and cost adjustments due to change orders may be encountered.

Respective cost-sharing would be as follows based on the past three (3) year flow history.

Narragansett

$860,150.00 X 38.38% = $330,125.57

South Kingstown

$860,150.00 X 38.91% = $334,684.37

University of Rhode Island

$860,150.00 X 22.71% = $195,340.07

The Town Council of the Town of South Kingstown does hereby accept and agree to the cost-sharing methodology as stated above for solids handling equipment replacement at the Regional Wastewater Treatment Plant.

Town Council of South Kingstown

By Barbara A. Hackey
Barbara A. Hackey, President

The Town Council of the Town of Narragansett does hereby accept and agree to the cost-sharing methodology as stated above for solids handling equipment replacement at the Regional Wastewater Treatment Plant.

Town Council of Narragansett

By _____
Timothy P. Haxton, President

TOWN COUNCIL APPROVED 11/20/89
AGENDA ITEM 89-436

AMENDMENT TO
SEWERAGE AGREEMENT

BETWEEN

THE TOWN OF NARRAGANSETT
AND
THE TOWN OF SOUTH KINGSTOWN

June, 1990

AMENDMENT TO SEWERAGE AGREEMENT

This AMENDMENT to the November 27, 1972 Sewerage Agreement, made and entered into this _____day of_____, 1990 by and between the Town of Narragansett (hereinafter referred to as NARRAGANSETT) and the Town of South Kingstown (hereinafter referred to as SOUTH KINGSTOWN) UNDER Chapters 116 and 171 of the Public Laws of 1969 as amended by the Public Laws of 1971.

WITNESSETH:

WHEREAS, it is deemed in the best interest of NARRAGANSETT and SOUTH KINGSTOWN, as well as the State of Rhode Island Department of Health and Department of Environmental Management and U.S.E.P.A. that each town dispose of its raw sewage and septage through existing public facilities at the Westmoreland Street Regional Wastewater Treatment Facility; and

WHEREAS, SOUTH KINGSTOWN intends to extend public sewerage facilities to serve the Middlebridge area of SOUTH KINGSTOWN, to mitigate pollution of the Narrow River resulting from failing and ineffective individual sewage disposal systems in the project area; and

WHEREAS, to provide sewer service to the Middlebridge area of SOUTH KINGSTOWN, transport of the project area's wastewater into and through the interceptor sewer system in NARRAGANSETT is required; and

WHEREAS, sufficient capacity was provided in the NARRAGANSETT Interceptor Sewer to accommodate peak flows from the Middlebridge area of SOUTH KINGSTOWN; and

WHEREAS, state and federal grant monies were allocated to, and paid for the NARRAGANSETT Interceptor Sewer and pertinent downstream transmission and treatment facilities in light of their 'regional' use, and the Towns must abide by the applicable state and federal laws, rules and regulations; and

WHEREAS, NARRAGANSETT deems it to be in the public interest to enter into an amendment to the 1972 Sewerage Agreement with SOUTH KINGSTOWN whereby NARRAGANSETT would receive and transport SOUTH KINGSTOWN's wastes from the Middlebridge area through the NARRAGANSETT Interceptor Sewer System.

NOW, THEREFORE, in consideration of the mutual covenants herein contained, it is agreed by and between the parties as follows:

TERMS OF CONTRACT

ARTICLE 1. DEFINITIONS AND REPRESENTATIONS:

The following are definitions and terms used in this Agreement together with representations and agreements pertaining thereto:

1.01 "Ammonia Nitrogen" shall mean the quantity of ammonia measured under standard laboratory procedure, expressed as nitrogen in milligrams per liter.

1.02 "Average Daily Flow" shall mean the total annual flow measured at a metering station divided by the number of days of the year.

1.03 "Biochemical Oxygen Demand" (denoted "BOD) shall mean the quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedure in five (5) days at 20ºC, expressed in milligrams per liter.

1.04 "Building Drain" shall mean that part of the lowest horizontal piping of a drainage system which receives the discharge from soil, and other drainage pipes inside the walls of the building. This drain connection to the municipal sewer is prohibited.

1.05 "Building Sewer" shall mean that extension from the internal dwelling sanitary plumbing commencing at a point five (5) feet (1.5 meters) outside the inner face of the building wall and extending to the public sewer or other place of disposal.

1.06 "Chloride Demand" shall mean the amount of chlorine expressed in mg/l required to be added to water, sewage or other liquid to achieve a combined chlorine residual after fifteen (15) minutes contact of one (1) mg/l.

1.07 "Combined Sewer" shall mean a public sewer receiving both surface water and wastewater.

1.08 "Conveyance" shall mean the transportation of wastewater by interceptor sewers owned and operated by NARRAGANSETT, from the points of delivery by SOUTH KINGSTOWN to the wastewater treatment plant.

1.09 "Daily Average" shall mean the sum of the measurements made over any given twenty-four (24) hour period divided by the number of measurements made.

1.10 "Disposal" shall mean the disposition of wastewater after treatment by the wastewater treatment plant.

1.11 "Domestic Wastewater" shall mean the wastewaters discharged from sanitary conveniences, such as toilets, sinks, urinals, showers, and laundries; and from kitchens and cafeterias essentially free from industrial wastewater or toxic materials.

1.12 "Easement" shall mean an acquired legal right for the specific use of land owned by others.

1.13 "Industrial User" shall mean any non-governmental user of either town's sewage works, which contributes industrial wastes, identified in the Standard Industrial Classification Manual, Office of Management and Budget, as amended and supplemented, under the following divisions:

Division A. Agriculture, Forestry and Fishing.
Division B. Mining.
Division D. Manufacturing.
Division E. Transportation, Communications, Electric, Gas and Sanitary Services.
Division I. Services.

1.14 "Industrial Wastewater" shall mean the liquid wastes from industrial manufacturing, processing, trade, or business, as distinct from domestic wastewater.

1.15 "Infiltration" shall mean water entering a sewer system from the ground through such means as defective pipe, pipe joints, connections, or manhole walls. Infiltration does not include and is distinguished from inflow.

1.16 "Inflow" shall mean water discharged to a sewer system (including service connections) from such sources as roof leaders, cellar, yard, and area drains; foundation drains; cooling water discharges; drains from springs and swampy areas; manhole covers; cross-connection from sewers and combined sewers; catch basins; stormwater runoff; street wash waters; and drainage in general. Infiltration/inflow is the total quantity of water entering a sewer system from both infiltration and inflow.

1.17 "Maximum Daily Flow" shall mean the highest total flow measured at a metering station over any given twenty-four (24) hour period.

1.18 "Middlebridge Flow" means the quantity of wastewater flowing into the NARRAGANSETT Interceptor Sewer from the Middlebridge area of SOUTH KINGSTOWN.

1.19 "Middlebridge Interceptor Sewer" for this agreement means an underground sewer pipe running in part under pressure from the SOUTH KINGSTOWN-NARRAGANSETT Town line through a small portion of NARRAGANSETT to an existing gravity interceptor sewer.

1.20 "Middlebridge Project" means the construction of sanitary sewer lines and other appurtenances located in SOUTH KINGSTOWN and NARRAGANSETT which are intended to convey wastewater from sources in SOUTH KINGSTOWN to the NARRAGANSETT Interceptor Sewer in Middlebridge Road, thereby to the Westmoreland Street Regional Wastewater Treatment Facility.

1.21 "Monthly Average" shall mean the sum of the measurements made over any given thirty (30) day period divided by the number of measurements made.

1.22 "Net Operating Cost" shall mean the total operation and maintenance cost incurred by NARRAGANSETT less payments received from (1) any grants from other sources; and (2) miscellaneous payments from other sources.

1.23 "Operation and Maintenance Expense" (O and M Expense) includes the total annual expenses actually incurred by SOUTH KINGSTOWN in the operation and maintenance of the regional treatment facility pursuant to a budget covering appropriate categories of annual operating and maintenance expense, which budget shall be adopted prior to the commencement of each Fiscal Year by means of established and acceptable procedures provided, however, that O and M Expense:

(a) Shall not exceed in the aggregate the total amount of the budget for each fiscal year; and
(b) shall not include any principal, interest or other charges in connection with any indebtedness incurred by SOUTH KINGSTOWN; and
(c) shall not include any SOUTH KINGSTOWN expenses not directly attributable to and included in such annual budget of the regional wastewater treatment and collection system.

1.24 "Peak Flow Rate" shall mean the maximum rate of flow and gallons recorded at flow metering stations during any calendar year.

1.25 "Person" shall mean any individual, firm, company, association, society, corporation or group.

1.26 "pH" shall mean the logarithm of the reciprocal of the weight of hydrogen ions in grams per liter of solution.

1.27 "Phosphorous" shall mean the quantity of phosphorus measured under standard laboratory procedures, expressed as phosphorous in milligrams per liter.

1.28 "Public Sewer" shall mean a pipe or conduit for carrying wastes which is owned, maintained, and controlled by public authority.

1.29 "Replacement Costs" shall mean expenditures for obtaining and installing equipment, accessories or appurtenances which are necessary during the service life of the sewage works to maintain the capacity and performance for which said works were designed and constructed.

1.30 "Reserved Capacity" shall mean the capacity in NARRAGANSETT's works that has been allocated for SOUTH KINGSTOWN to utilize.

1.31 "Sanitary Sewer" shall mean a public sewer which carries wastewater and to which storm, surface, and groundwaters are not intentionally admitted.

1.32 "Septage" shall mean the wastes from holding tanks, such as chemical toilets, campers, or trailers, and wastes from septic tanks and cesspools.

1.33 "Service Life" shall mean the period of time during which the sewage works or a component of a waste treatment management program will be capable of performing a function.

1.34 "Sewage Works" shall mean all facilities for collecting, pumping, treating and disposing of wastewater.

1.35 "Shall" is mandatory: "May" is permissive.

1.36 "Storm Drain" (sometimes termed "Storm Sewer") shall mean a public drainage system which carries storm and surface waters and drainage, but excludes wastewater, other than unpolluted cooling water.

1.37 "Suspended Solids" (denoted as "SS") shall mean solids that either float on the surface of, or are in suspension in, water, wastewater, or other liquids, and which are removable by laboratory filtering, expressed in milligrams per liter.

1.38 "Treatment" shall mean the processing by SOUTH KINGSTOWN at the regional wastewater treatment plant of wastewater so that it is suitable for disposal.

1.39 "User Charges" shall mean charges levied in proportion to the use of sewage works. As required by Section 204 (b) (1) (A) of Public Law 95-217, as amended, and by regulations promulgated by the U.S. Environmental Protection Agency, such charges must, to the extent possible, distribute operation and maintenance (including replacement) cost to each user in proportion to its contribution to the total loading of the sewage works, where construction of such works has been financed in part by a federal grant.

1.40 "Wastewater" shall mean spent water and may be a combination of the liquid and water-carried wastes from residences, commercial buildings, industrial plants, and institutions; and infiltration and inflow; but excluding unpolluted storm, surface and subsurface waters.

ARTICLE 2. GENERAL PROVISIONS

2.1 SOUTH KINGSTOWN understands and agrees to the following obligations, limitations, and commitments, made in return for NARRAGANSETT's Agreement to Permit Connection by SOUTH KINGSTOWN to NARRAGANSETT's Sewage Works.

2.1.1 "Limitations and Rights" Nothing in this Agreement shall be construed as a grant by NARRAGANSETT of any exclusive right or privilege. SOUTH KINGSTOWN agrees to comply in all respects with NARRAGANSETT's "Ordinances, Regulations, and Policies That May Govern Sewer Usage."

2.1.2 "Charges and Fees" SOUTH KINGSTOWN agrees to make prompt payment of all charges described in and pursuant to this Agreement.

2.1.3 "Sewer Use By-Law" SOUTH KINGSTOWN agrees to adopt and enforce a by-law that embodies rules related to sewer use that comply with the limitations set forth in NARRAGANSETT's "Ordinances, Regulations, and Policies That May Govern Sewer Usage."

2.1.4 "Interceptor Responsibilities" SOUTH KINGSTOWN shall be responsible for the design, construction, operation, maintenance, and costs incurred for the Middlebridge Project as defined herein. A wastewater flow meter shall be installed at the Middlebridge Road Pump Station to determine and allocate costs for operation and maintenance to SOUTH KINGSTOWN for its wastewater volume.

2.1.5 "Flow and Wastewater Strength Limitations" SOUTH KINGSTOWN agrees that the wastewater flows from the Middlebridge area shall be considered as part of its regional volume percentage of treatment plant capacity. Further, SOUTH KINGSTOWN agrees to the following limitations of the Middlebridge Project's usage of NARRAGANSETT's Interceptor Sewer, unless through additional written Amendment to this Agreement or other limits that are mutually agreed upon.

1. Wastewater Volume

Facility	SOUTH KINGSTOWN (Middlebridge) Reserved Capacity	
	Ave. Daily Flow, MGD	Peak Flow, MGD
North Interceptor	0.149	0.690
Pump Station	0.149	0.690

2. Wastewater Strength

	Monthly Average	Daily Maximum
BOD, mg/l	250	500
SS, mg/l	300	600
Ammonia Nitrogen, mg/l	40	80
Phosphorus, mg/l	10	20

SOUTH KINGSTOWN agrees that none of its reserved capacity shall be transferred to any party without prior concurrence of NARRAGANSETT included as an amendment to this Agreement. Likewise, NARRAGANSETT agrees not to permit the use of SOUTH KINGSTOWN reserved capacity by any other party without the prior written concurrence of SOUTH KINGSTOWN in an Amendment to this Agreement.

2.1.6 "Control of Infiltration and Inflow" SOUTH KINGSTOWN agrees that it will operate and maintain its sewage works for the Middlebridge Project in accordance with customary engineering practices and within guidelines set forth as follows:

The sewage works of SOUTH KINGSTOWN connecting to NARRAGANSETT's sewage works shall receive no stormwater or groundwaters directly or indirectly from surface drains, ditches, or streams; storm or combined sewers; roof, areaway or foundation drains; or from any other means, except that the minimum practicable amount of infiltration/inflow, as authorized by law, or mutually agreed upon, shall be permitted. For all sewers constructed by SOUTH KINGSTOWN in the Middlebridge area, the maximum permitted rate of infiltration of groundwater upon completion of sewer installation shall be 150 gallons per inch diameter per mile per 24 hours.

2.1.7 "Conformance to law" SOUTH KINGSTOWN agrees to abide by, and conform to, all applicable laws of the United States and the State of Rhode Island, together with such "Ordinances, Regulations, and Policies That May Govern Sewage Usage" which NARRAGANSETT may promulgate from time to time with regard to its sewage works.

2.1.8 "Control of Deleterious Wastes" SOUTH KINGSTOWN may transmit wastewater to NARRAGANSETT's sewage works upon the condition that it shall comply with the "Ordinances, Regulations, and Policies That May Govern Sewer Usage," as adopted and amended by NARRAGANSETT.

ARTICLE 3. OBLIGATIONS AND RESPONSIBILITIES

3.1 "Obligations of Narragansett" NARRAGANSETT agrees to the following obligations, limitations and commitments, in return for the timely payment by SOUTH KINGSTOWN of the charges specified in this Agreement.

A. "Contract Service Area" NARRAGANSETT agrees to accept (at the point of delivery shown in Exhibit A), and transport wastewater from the Middlebridge area, subject to the volumetric and strength limitations agreed to in Section 2.1.5 of this Agreement, and in accordance with "Ordinances, Regulations, and Policies That May Govern Sewage Usage" either existing or future in NARRAGANSETT, and all water quality standards, and orders and decrees of any governmental authority having jurisdiction over the transmission of said wastes; provided, however, that the treatment of Middlebridge wastes shall be of such a type and degree as may be necessary to provide for the application of Best Practicable Waste Treatment Technology. SOUTH KINGSTOWN shall conform to all appropriate industrial wastewater pretreatment rules and regulations as established by the appropriate State and Federal regulatory agencies.

B. "Measurement of Wastewater Flows and Strengths" NARRAGANSETT agrees and understands that the measurement of wastewater flows and strength from SOUTH KINGSTOWN is the responsibility of NARRAGANSETT. Such flow measurements shall be made by a sewage meter located at the Middlebridge Pump Station.

Since the meter structure is within the political boundaries of SOUTH KINGSTOWN, SOUTH KINGSTOWN agrees to provide unlimited right of entrance and egress to NARRAGANSETT during normal business upon reasonable notice, except in cases of emergency.

Costs of meter maintenance, operation and reading shall be included in the costs of maintaining, repairing, and operating the particular sewage works in which the meter is placed. All such meters shall be maintained, inspected and calibrated at least annually, both at SOUTH KINGSTOWN's expense, by qualified representatives of the meter manufacturer or similar concern.

A copy of the inspection and calibration reports shall be on file at the South Kingstown Regional Wastewater Treatment Plant and a copy shall be sent to NARRAGANSETT.

If determined by NARRAGANSETT, in its sole discretion, that it is necessary to sample the strength of wastewater from the Middlebridge area, NARRAGANSETT shall undertake to do so on a periodic basis and at such points as it may find appropriate. Such samples, if needed, shall be taken by NARRAGANSETT in such manner and with such frequency as to ensure collection of a fair representation of SOUTH KINGSTOWN's Middlebridge area wastewater.

In the case of missing or inaccurate flow records or wastewater sampling data, due to faulty meter operation or otherwise, an estimate of flow shall be made by NARRAGANSETT and agreed upon by SOUTH KINGSTOWN based upon representative past records and an estimate of wastewater characteristics, if needed, shall likewise be made by NARRAGANSETT. In such case, the said estimates shall be used by NARRAGANSETT to establish SOUTH KINGSTOWN's payments to NARRAGANSETT for the period of missing inaccurate data.

C. "Records, Accounts and Audits" NARRAGANSETT shall keep books of record and account, in which complete and correct entries shall be made of all its transactions with SOUTH KINGSTOWN which, together with all other books and papers dealing with the sewage works, shall at all reasonable times be subject to the inspection of any officer or agent of SOUTH KINGSTOWN. If requested and paid for by SOUTH KINGSTOWN, NARRAGANSETT's accounts shall be audited annually by an independent accountant selected by NARRAGANSETT. Each such audit, in addition to the customer matters, shall show the income and expenditures related to the costs of providing sewerage services to the Middlebridge area.

3.2 "Responsibilities of SOUTH KINGSTOWN" SOUTH KINGSTOWN will not connect any combined sewer or separate drains into NARRAGANSETT's sewerage system and will not discharge into said sewerage system any volume of sewage, substances or wastes which are outside pre-treatment parameters delineated in the Town of South Kingstown Wastewater Ordinance, and the Town of Narragansett "Ordinances, Regulations, and Policies That May Govern Sewage Usage" governing the same.

3.3 "Obligations of Both Parties" NARRAGANSETT and SOUTH KINGSTOWN agree to the following obligations, limitations and commitments.

A. "Assignment of Users" In general, all users of sewage works in Middlebridge shall be served by collector sewers owned, operated and maintained by SOUTH KINGSTOWN, unless there is written agreement to the contrary, included as an amendment to this Agreement executed with the same formality.

B. "Responsibility for System Operation and Maintenance" NARRAGANSETT assumes no responsibility for operation and maintenance of sewage works constructed and owned by SOUTH KINGSTOWN. NARRAGANSETT shall not be responsible or liable in any way for act or acts beyond its control which may, in any way, cause an interruption or discontinuance of the service provided for in this Agreement, and the Town of South Kingstown agrees to indemnify and hold harmless the Town of Narragansett from any and all claims for property damage or personal injury resulting from an interruption or discontinuance of sewage works.

ARTICLE 4. AGREEMENT TERM

4.1 This Agreement shall be of permanent duration but its provisions shall be subject to renegotiation as of July 1, 2008 and run for a minimum at thirty (30) year intervals thereafter.

ARTICLE 5. IMPLEMENTATION

5.1 NARRAGANSETT agrees to allow a physical connection to its sewerage conveyance system with a portion of the capacity allocated to handle wastes from Middlebridge.

ARTICLE 6. USER CHARGES

6.1 SOUTH KINGSTOWN shall develop, in accordance with the provisions of federal regulations ("Code of Federal Regulations, Subpart I, 40 CFR 35.2122 and 35.2140, et seq.") as amended, an equitable User Charge System to assure that each recipient of waste treatment services within Middlebridge's sewer service area will pay its proportionate share of the costs of operations and maintenance (including replacement) of all waste conveyance services provided by NARRAGANSETT.

6.2 SOUTH KINGSTOWN must obtain approval of the Rhode Island DEM and the Region I Office of the U.S. Environmental Protection Agency for its User charge System for the above costs.

6.3 SOUTH KINGSTOWN, upon approval of its User Charge System, must incorporate said System in one or more municipal legislative by-laws.

6.4 The by-law(s) must include provisions whereby the maintenance of said System and the collection of the revenues can be reviewed by any governmental authority having jurisdiction.

ARTICLE 7. OPERATION AND MAINTENANCE COST APPORTIONMENT

7.1 NARRAGANSETT shall maintain an adequate cost accounting system for its transmission facilities downstream of the Middlebridge connections which shall be the basis for the determination and allocation of operating costs. NARRAGANSETT shall maintain separate cost accounting records for the operation of those portions of their sewer works that are shared by NARRAGANSETT and SOUTH KINGSTOWN and any other participants. The annual cost of operating these sewage works shall be apportioned between users on the basis of their actual, annual flows, as determined from records at the respective metering stations.

7.2 The operating costs shall be apportioned against participants on the basis of average daily flows, providing that the established parameters from any participant are not exceeded.

7.3 Actual annual flows from the Middlebridge Project shall be determined for SOUTH KINGSTOWN from records at the Middlebridge Pump Station, actual total annual flow for NARRAGANSETT shall be determined at Ouida Street Pump Station.

7.4 Operating costs for the conveyance facilities shall include the cost accounting related to the distribution and invoicing of operating costs. Operating costs shall be payable monthly, on a fiscal year basis, upon receipt by SOUTH KINGSTOWN of NARRAGANSETT's invoice. Bills shall be paid within sixty (60) days. Operating costs for the first eleven (11) months shall be determined by using NARRAGANSETT's approved yearly operation budget for the appropriate conveyance facilities (reduced to a monthly cost) and apportioning SOUTH KINGSTOWN's share on the basis of actual total monthly flow, as measured.

The final monthly invoice for the fiscal year shall be rendered by NARRAGANSETT within thirty (30) days of the end of the fiscal year and shall be determined on the basis of actual flows and expenditures. All previous monthly invoices shall be subject to adjustment and correction at the time of this final billing for the fiscal year. NARRAGANSETT shall forward to SOUTH KINGSTOWN, on or before March first, the projected estimate of operating costs and other costs for such fiscal year, so that SOUTH KINGSTOWN may make necessary preparations for the final monthly invoice for the fiscal year.

ARTICLE 8. ANNUAL COST REVIEW

8.1 Both towns agree that the apportionment of costs set forth in Article 7 shall be subject to review annually. After a review of the annual costs, if an adjustment to the costs appear to be necessary, said adjustment shall be made by NARRAGANSETT in the forthcoming billing for services.

ARTICLE 9. TERMINATION CLAUSE

9.1 Any obligations under this Agreement are conditioned upon the Town of South Kingstown conveyance of waste flows to NARRAGANSETT's sewerage system via the Town of South Kingstown Middlebridge wastewater sewage system.

9.2 Either party may terminate this Agreement by giving notice thereof to the other party in writing three (3) years prior to the termination date. Upon receipt of said notice, both parties will enter into discussion within thirty (30) days to assure proper termination of the Agreement.

ARTICLE 10. WASTE ANALYSIS

10.1 Both Towns agree that the determination of character and concentration of wastes will be in accordance with the latest edition of "Standard Methods for the Examination of Water and Sewage," as proposed, approved and published jointly by the American Public Health Association, the American Water Works Association and the Water Pollution Control Federation, or any other method established further to the following:

10.1.1 Samples shall be collected at the Metering Station on Middlebridge Road or other locations in such a manner so as to be repre-sentative of the actual quality of the wastes. NARRAGANSETT shall have access to said station, as required, to conduct intermittent or continuous waste sampling.

10.1.2 Portions of waste samples collected by one (1) Town as part of a sampling and analytical program, will be made available to the other Town at no cost and in adequate quantities for analysis for characteristics and concentrations. In the event of discrepancy which cannot be satisfactorily resolved, the parties will submit the samples to a mutually acceptable, disinterested, qualified third party for determination of the waste characteristics and concentrations.

ARTICLE 11. FLOW MEASUREMENTS

11.1 SOUTH KINGSTOWN and NARRAGANSETT agree that flow measurements shall be made as follows:

11.1.1 The volume of flow used in computing SOUTH KINGSTOWN's share of the operating costs shall be based upon readings obtained by suitable metering equipment. Such metering equipment shall be installed and maintained by SOUTH KINGSTOWN. NARRAGANSETT shall have access to said meters during normal business hours upon reasonable notice, except in cases of emergency.

11.1.2 In the event the metering equipment is temporarily out of order or service for any reason, the Middlebridge area estimated flow will be based on the average daily flow of the previous three (3) months.

ARTICLE 12. CONFORMANCE TO LAW

12.1 SOUTH KINGSTOWN agrees to abide by, and conform to, all applicable laws of the United States and the State of Rhode Island, together, with such "Ordinances, Regulations and Policies That May Govern Sewage Usage" as NARRAGANSETT may promulgate from time to time with regard to its sewerage works.

ARTICLE 13

If any provision of this Agreement is held invalid in any circumstance, such invalidity shall not affect any other provisions or circumstances.

ARTICLE 14

Any controversy hereafter arising out of this Agreement, or out of the refusal of any party to perform the whole or any part thereof, shall be settled by arbitration in South Kingstown, Rhode Island, pursuant to the rules then obtaining of the American Arbitration Association, subject in all respects to the Rhode Island Arbitration Act.

IN WITNESS WHEREOF, NARRAGANSETT and SOUTH KINGSTOWN have caused their proper representatives on the day and year first written above.

AGENDA ITEM 90-06-297

TOWN COUNCIL APPROVED 6/18/90

APPROVED AS TO FORM

By:_____
Mark A. McSally, Esq.
Town Solicitor

FOR THE TOWN OF NARRAGANSETT

By:_____
Timothy P. Haxton
Town Council President

APPROVED AS TO FORM

By:_____
Robert B. Gates, Esq.
Town Solicitor

FOR THE TOWN OF SOUTH KINGSTOWN

By:_____
Barbara A. Hackey
Town Council President

9-28-90

REGIONAL WASTEWATER TREATMENT PLANT (WWTP)

PHASE 1 IMPROVEMENTS

COST-SHARING AGREEMENT BETWEEN THE TOWN OF SOUTH KINGSTOWN UNIVERSITY OF RHODE ISLAND AND TOWN OF NARRAGANSETT

WHEREAS: The Town Council of South Kingstown herewith requests the University of Rhode Island and the Town Council of the Town of Narragansett to co-sign this letter of understanding in regard to the Sewerage Agreement between the Towns of Narragansett and South Kingstown and the University of Rhode Island relative to recent regional wastewater treatment plant Phase I improvements.

WHEREAS: By way of background, the common original components of the regional treatment plant were constructed and paid for based on the following percentage of total costs:

1.	South Kingstown	41%	1,693,300 gals. per day share
2.	URI	40%	1,652,000 gals. per day share
3.	Narragansett	19%	784,700 gals. per day share
		100%	4,130,000 gals. plant design

The University of Rhode Island, as a part of its payment agreement, has requested a reaffirmation of the original understanding that the University can increase its average flow to 1.652 million gallons per day (40% of 4.13 MGD) to the treatment plant without incurring additional capital expense.

PHASE 1 COSTS FOR ORIGINAL 4.13 MGD

WHEREAS: The purchase and installation of fine bubble aeration diffuser panels, piping, and variable speed blower drives; two (2) eighty (80) foot diameter secondary clarifiers; treatment plant roof repair; and all associated engineering costs for said equipment and WWTP Engineering Facilities Plan which reached an ultimate equipment life based on actual flow volume from each of the individual regional partners.

WHEREAS: Each regional partner agrees to pay for 78.94% (.87 MGD) new capacity equipment related flow versus 4.13 MGD existing capacity equipment related flow) of said new equipment total cost based on each user's average yearly flow volume percentage over the last five (5) year period as delineated below.

WHEREAS: Payment of all proportionate Narragansett and University of Rhode Island Phase 1 Improvement costs shall be billed respectfully to the Town of Narragansett and the University of Rhode Island on an estimated cash flow schedule as provided by Keyes Associates, the project consultant engineering firm, payable within fifteen (15) calendar days.

PHASE 1 COSTS FOR ADDITIONAL .87 MGD

WHEREAS: The purchase and installation of fine bubble aeration diffuser panels, piping, and variable speed blower drives; two (2) eighty (80) foot diameter secondary clarifiers; and all associated engineering costs for said equipment which will accommodate an additional 0.87 MGD for two (2) of the three (3) individual regional partners as delineated below.

WHEREAS: The additional WWTP Phase I capacity of 0.87 MGD shall be split equally between the Town of South Kingstown and the Town of Narragansett. South Kingstown shall receive fifty (50) percent (0.435 MGD) and agrees to pay the associated proportionate cost.

WHEREAS: Narragansett shall receive fifty (50) percent (0.435 MGD) and agrees to pay the associated proportionate cost.

WHEREAS: In accordance with the Regional WWTP Facilities Plan generated by Keyes Associates in May, 1989, the University of Rhode Island has requested no additional WWTP capacity and consequently shall receive no additional volume and not pay any cost associated with the additional WWTP capacity expansion of 0.87 MGD.

WHEREAS: Payment of all proportionate Narragansett Phase 1 Improvement costs shall be billed to the Town of Narragansett on an estimated cash flow schedule as provided by Keyes Associates, the project consultant engineering firm, payable within fifteen (15) calendar days.

TOTAL REGIONAL PARTNER WASTEWATER FLOWS

	1984-85 MGY	1985-86 MGY	1986-87 MGY	1987-88 MGY	1988-89 MGY	Average MGY	%
Narragansett	266.4	369.2	401.1	337.4	360.0	347.22	38.44
S. Kingstown	311.3	335.4	397.0	356.8	359.7	352.04	38.97
URI	154.1	216.4	205.6	213.0	231.3	204.08	22.59
	733.8	922.1	1003.7	907.2	951.0	903.34	100.0

Estimated total cost-sharing would be as follows for each Regional WWTP Partner:

Narragansett

$ 524,845 (4.13 MGD) + $ 126,240 (0.435 MGD) = $ 651,085

South Kingstown

$ 532,131 (4.13 MGD) + $ 126,240 (0.435 MGD) = $ 658,371

University of Rhode Island

$ 308,480 (4.13 MGD) + $ 0 (0.0 MGD) = $ 308,480

TOTAL PHASE 1 COST = $ 1,617,935

NOTE: The above costs do not include change orders or additional work which may be encountered during actual construction.

The Town Council of the Town of South Kingstown does hereby accept and agree to the cost-sharing methodology as stated above for Phase I improvements at the Regional Wastewater Treatment Plant.

Town Council of South Kingstown

By Barbara A. Hackey
Barbara A. Hackey, President

The Town Council of the Town of Narragansett does hereby accept and agree to the cost-sharing methodology as stated above for Phase I improvements at the Regional Wastewater Treatment Plant.

TOWN COUNCIL APPROVED
1/7/91
AGENDA ITEM 90-12-596

Town Council of Narragansett

By
Timothy P. Haxton, President

O.U.Q.

The University of Rhode Island does hereby accept and agree to the cost-sharing methodology as stated above for Phase I improvements at the Regional Wastewater Treatment Plant.

By Richard Katzoff
Richard Katzoff
Assistant Vice President
Business Administration

REGIONAL WWTP PHASE I COST SHARING - 9-28-90

Expanded Facilities to 5.0 MGD
(equal to 21.06% of expanded unit process overall cost)

Item	T.S.K. 50.000%	U.R.I. 0.000%	Narr. 50.000%	Total 100.000%
Roof Repair	0	0	0	0
Aeration Panels	19,446	0	19,446	38,892
Clarifrs	103,025	0	103,025	206,051
Total Enginerng	14,677	0	14,677	29,354
NEL Rebate	10,908	0	10,908	21,817
Totals	126,240	0	126,240	252,480

Addt. .87 MGD

Cost Sharing for Existing 4.13 MGD

The cost proportioning below is based on average yearly partner wastewater flow over the last five year depreciation period (July 1984- June 1989)

Item	T.S.K. 38.97%	U.R.I. 22.59%	Narr. 38.43%	Total 99.98%
Roof Repairs	11,691	6,778	11,531	30,000
Aeration Panels	71,950	41,710	70,965	184,624
Clarifrs	381,194	220,981	375,975	978,149
Total Enginerng	54,306	31,481	53,562	139,349
NEL Rebate	40,361	23,398	39,808	103,567
Facilities Plan	14,380	8,336	14,183	36,900
Contingen	38,971	22,592	38,437	100,000
Totals	532,131	308,480	524,845	1,365,455

4.13 MGD

TOTAL	T.S.K.	U.R.I.	Narr.	
PHASE 1	658,371	308,480	651,085	1,617,935

Wastewater
Pretreatment
Interjurisdictional Agreement
between
South Kingstown
and
Narragansett

This Agreement is entered into this 9TH day of SEPTEMBER, 1993, between the Town of South Kingstown and the Town of Narragansett.

RECITALS

WHEREAS, South Kingstown, as managing regional partner, operates the Westmoreland Street Regional Wastewater Treatment Facility, and

WHEREAS, Narragansett as a regional partner utilizes the Westmoreland Street Regional Wastewater Treatment Facility, and

WHEREAS, Narragansett shall continue to utilize the wastewater treatment system in accordance with projected wastewater flows as delineated in the Regional WWTF Facilities Plan and the Town of Narragansett Wastewater Facilities Plan, and

WHEREAS, Narragansett currently contributes wastewater which includes industrial wastewater to the Westmoreland Street Regional Wastewater Treatment Facility, and

WHEREAS, both regional partners recognize South Kingstown is authorized to implement and enforce a pretreatment program to control industrial waste under 40 CFR Part 403 and Rhode Island General Laws 45-6-2.3.

WHEREAS, there are other sewage agreements between the parties which are to remain in effect,

The parties therefore agree to the following terms and conditions:

1. Narragansett agrees to adopt and diligently enforce a pretreatment ordinance which is no less stringent than the Wastewater Management Ordinance of South Kingstown currently in effect.

2. Whenever South Kingstown amends its Ordinance, it will immediately notify Narragansett. For purposes of this Agreement, immediate notification means forwarding a copy of any amendments within five (5) business days of enactment thereof. Narragansett agrees that, if said amendments are applicable to any of the wastewater conveyed to the wastewater treatment facility from Narragansett users, it will enact amendments at least as stringent as those adopted by South Kingstown.

3. South Kingstown and Narragansett agree to periodically review their respective ordinances and jointly draft and adopt equivalent amendments to their respective ordinances when deemed necessary for the effective administration and operation of the pretreatment program. Such a review shall be conducted no less than once every five (5) years. However, either party may request a joint review whenever deemed necessary. Such a request shall be forwarded b the requesting party to all other regional partners stating the reason for the request and the date on which the review is requested to take place. Within five (5) business days of receipt of the request, the receiving party shall respond to the request, stating that the proposed date is satisfactory or proposing alternate date(s) for the review. In any case, the joint review should take place within thirty (30) calendar days of the request.

4. For wastewater flow originating in Narragansett and tributary to the Westmoreland Street Regional Wastewater Treatment Facility, Narragansett agrees to adopt and diligently enforce within its Wastewater Management Ordinance local limits which address at least the same pollutant parameters and are at least as stringent as the local limits enacted by South Kingstown. If any revisions or additions are made to South Kingstown's local limits, the Town of South Kingstown shall immediately notify Narragansett. For purposes of this Agreement, immediate notification means forwarding a copy of any revisions or additions to the local limits within five (5) business days of enactment. Narragansett agrees to adopt any revisions or additions made to South Kingstown's local limits if those amendments are applicable to any of the wastewater conveyed to the wastewater treatment facility from Narragansett users.

5. Narragansett agrees to perform technical and administrative duties necessary to implement and enforce Narragansett's ordinance regulating industrial users located in its jurisdiction including, but not limited to the following: (1) updating industrial waste survey; (2) providing technical services such as sampling and analysis; (3) permitting; (4) inspection and compliance monitoring; and (5) enforcement.

6. Narragansett shall maintain current information on industrial users located in its jurisdiction. Every year, Narragansett shall update the industrial waste survey for users located in its jurisdiction. A copy of this survey shall be forwarded to South Kingstown. Additionally, every time a new user is located in Narragansett, or anytime an existing user increase or changes in its discharge, or anytime requested by South Kingstown, Narragansett will require said industrial user to respond to an industrial user questionnaire.

   A copy of this questionnaire will be forwarded to South Kingstown for review. Narragansett agrees to allow South Kingstown access to all records or documents relevant to the permitting program, or any industrial user located in Narragansett or discharging through Narragansett to South Kingstown.

7. Narragansett shall inspect industrial users located in its jurisdiction. Narragansett will provide a list to South Kingstown of industrial users scheduled for inspection during the following calendar year on or before January 1st of each year. South Kingstown may make additions to the list at its options, and will forward the amended list to Narragansett within thirty (30) calendar days of its receipt. In a situation where inspections not contained on the list of annual inspections take place, Narragansett shall provide at least five (5) business day notice to South Kingstown. If an inspection is in response to an emergency situation and such notice is not possible, Narragansett will make every effort to notify South Kingstown of the impending inspection and give South Kingstown the opportunity to attend the inspection. If, at any time, South Kingstown identifies any user located in Narragansett for which inspection is desired but not scheduled, it will notify Narragansett of the need to conduct an inspection of that user's facility. If South Kingstown determines that an inspection must be conducted immediately, it shall make every effort to notify Narragansett of this need, and an opportunity to conduct this inspection.

8. All industrial users within Narragansett shall obtain an Industrial User Permit from the Town of Narragansett. All industrial users, regardless of status as significant or categorical, shall be issued permits prior to any discharge. Such permits shall contain effluent limitations, monitoring requirements and reporting requirements and shall also contain a statement of duration, a statement of nontransferability, a statement of applicable civil and criminal penalties, and any other reasonable conditions requested to be included in the permit by South Kingstown.

After Narragansett drafts the permit, it shall forward a copy thereof to South Kingstown for review and comment at least thirty (30) calendar days prior to expected date of issuance.

Within ten (10) calendar days of receipt of the proposed permit, South Kingstown shall either approve the permit or request Narragansett to make additions, deletions, or changes to the proposed permit. No permit shall be issued without the consent of both parties, which consent shall not be unreasonably withheld.

9. Narragansett shall sample and conduct other compliance monitoring. Narragansett will submit to South Kingstown its procedures for sampling and analyses, including all procedures in place for QA/QC. All procedures will conform to 40 CFR Part 136. South Kingstown reserves the right to both sample an industry itself or split a sample with Narragansett. In addition, within two (2) weeks of discovering a violation of its ordinance or any other pretreatment standard or requirement, Narragansett will notify South Kingstown of those violations and the response taken or anticipated (including a timeframe for such action).

10. Narragansett is required to enforce the provisions of its sewer use ordinance and all pretreatment standards and requirements.

11. South Kingstown, in consultation and with agreement of Narragansett, is authorized to take emergency action, whenever necessary, to stop or prevent any discharge which presents or may present an imminent danger to health or welfare of humans, or which reasonably appears to threaten the environment or threatens to interfere with the operations of the treatment plant. If such action is to protect public health, South Kingstown will provide informal notice (i.e., telephone call) to the industrial user and Narragansett of its intent to take emergency action. If the action is to protect the environment or the treatment works, notice shall be given to the industrial user and Narragansett. These parties shall have the opportunity to respond to South Kingstown's action, however such response may be limited to a hearing after the emergency powers of South Kingstown have been exercised.

12. The terms of this Agreement may be amended only by written agreement of the parties. In any event, this Agreement shall be reviewed and revised, as necessary, at least every five (5) years.

13. All other sewage agreements to the extent not inconsistent with this agreement shall remain in full force and effect.

Agreed to this 9/7/93 day of _____, 19____.

Charles "Ted" Wright
Town Council President
Town of Narragansett

Barbara A. Hackey
Town Council President
Town of South Kingstown

NARRAGANSETT TOWN COUNCIL
APPROVAL 9/7/93 #93-09-284

9-9-93

AGREEMENT

AGREEMENT, made and entered this 19 day of APRIL, 199~~5~~ between the UNIVERSITY OF RHODE ISLAND (the "University") and the TOWN OF NARRAGANSETT (the "Town"):

WHEREAS, by agreement between the Town of South Kingstown, Town of Narragansett and the University of Rhode Island, each has the right to deliver a specific number of gallons per day of its wastewater to the South Kingstown Regional Wastewater Treatment Facility (the "treatment facility") representing a portion of the total capacity of the said treatment facility; and

WHEREAS, the Town desires to obtain the right to use a portion of the University's unused capacity in the treatment facility upon the terms and conditions hereinafter set forth; and

WHEREAS, the University is willing to authorize the Town to use a portion of its unused capacity in the treatment facility upon the terms and conditions hereinafter set forth;

NOW THEREFORE, in consideration of the above, the mutual promises and covenants contained herein and for other good and valuable consideration, the parties agree as follows:

1.0 The University hereby authorizes, and to the extent necessary, assigns to the Town the exclusive right to use the portion of its unused capacity in the treatment facility, not to exceed 400,000 gallons per day ("excess capacity"), during the initial or any extended term of this agreement, subject to the terms and conditions hereinafter set forth.

2.0 The Town shall pay to the University the contract price of $425,000.00 for the initial term of this agreement in accordance with the schedule of payments set forth on

Exhibit A attached hereto and made a part hereof. If any payment is made more than fifteen (15) days beyond its due date, interest shall be charged at the rate of 12% per annum until said payment is made in full.

3.0 The initial term of this agreement shall be for the period of five years beginning on April 19, 1995 and ending April 19, 2000 unless further extended or earlier terminated in accordance with this agreement. The Town shall have the right to renew or extend this agreement for an additional five (5) year period (the "extended term") by providing the University with written notice of its intention to renew no later than three months prior to the expiration of the initial term of this agreement. The extended term shall provide for a new contract price to be negotiated by parties but shall otherwise be on the same terms and conditions. Additional extensions to this agreement may be granted thereafter upon such terms and conditions as the parties may further agree.

4.0 During any term of this agreement, the Town shall pay all user fees and other costs and expenses related to its actual use or right to the use of the excess capacity as well as any and all costs and expenses based upon the percentage usage of the total capacity of the treatment facility.

5.0 Except as otherwise provided, this agreement shall be terminated and be of no further force and effect upon the expiration of the initial or extended term. This agreement may be sooner terminated by the University for an event of default by the Town. If at any time during the initial or extended term of this agreement, the University reaches ninety (90%) percent use of its remaining capacity in the treatment facility, it may so notify the Town in writing together with a request to renegotiate the portion of its excess capacity to be used by the Town for the remainder of the then term of this agreement. If after a good faith effort, the University and the Town fail to successfully renegotiate the said portion of the excess capacity to be used by the Town within thirty (30) days from the date of its request to renegotiate, then this agreement shall terminate and be of no further force and effect.

6.0 The Town shall be in default of this agreement for any of the following events of default: (i) failure to pay the contract price in accordance with the schedule of payments; (ii) failure to pay any user fees or other costs and expenses as set forth in this agreement; (iii) failure to perform any other provision of this agreement.

7.0 The Town agrees that its continued use of the University's excess capacity in violation of or after expiration of any term of this agreement may be permanently enjoined by any court of competent jurisdiction, hereby acknowledging that money damages alone are an inadequate remedy. This remedy, however, shall be in addition to, and not in lieu of, any other right or remedy that the University may have against the Town for damages or equitable relief resulting from the Town's breach of this agreement.

8.0 Any notice required to be provided under the terms of this agreement shall be valid if in writing and mailed, postage prepaid, and addressed to either party as follows:

To the University:

Attn: Facilities and Operations
University of Rhode Island
Sherman Building
Kingston, Rhode Island 02881-0801

with a copy to:

Vice President for Business and Finance
University of Rhode Island
Carlotti Administration Building
Kingston, Rhode Island 02881-0801

To the Town of Narragansett:

Attn: Scott A. Hancock, Town Manager
Town of Narragansett
Town Hall, 25 Fifth Avenue
Narragansett, Rhode Island 02882-0727

with a copy to:

Attn: Jeffrey Ceasrine, Town Engineer
Town of Narragansett
Town Hall, 25 Fifth Avenue
Narragansett, Rhode Island 02882-0727

Either party may, from time to time, change the name of the person or office to which notice shall be provided by giving notice of said change in compliance with this provision.

9.0 No modification or alteration to this agreement, or any of its terms, shall be valid unless it is in writing and signed by both the Town and the University.

10.0 This instrument contains the entire agreement of the parties and is not subject to any prior or simultaneous terms, conditions, representations, understandings or agreements not expressly set forth herein.

11.0 This agreement has been reviewed by both parties with their own counsel or with the opportunity to seek the advice of counsel and shall not be construed against the drafter of this instrument.

12.0 This agreement shall be binding upon the parties hereto, their successors and assigns, and shall be governed by the laws of the State of Rhode Island.

IN WITNESS WHEREOF, the parties have caused this agreement and a duplicate copy hereof to be executed on the day and date first above written.

University of Rhode Island

Donna M. Williams
Witness

By: Kenneth N. Kermes
Kenneth N. Kermes, Vice President
Business & Finance

Town of Narragansett

Mary M. Beck
Witness

By: Judy P. Huston
(Name and Title)

Approved: [illegible]

td922-2

EXHIBIT A

Schedule of Payments

The five payments by the Town of Narragansett to the University of Rhode Island for the contract price referenced in Paragraph 2. of this Agreement will be due and payable in accordance with the following schedule:

First business day of July 1995.....$ 50,000.00

First business day of July 1996.....$ 75,000.00

First business day of July 1997.....$100,000.00

First business day of July 1998.....$100,000.00

First business day of July 1999.....$100,000.00

The Town of Narragansett is responsible directly to the Town of South Kingstown for any and all user fees and other costs and expenses associated with their actual percentage use of the waste water discharge capacity of the Regional Waste water Treatment Facility.

Costs and expenses described in Paragraph 4.0 of this Agreement that are associated with the Town of Narragansett's right to use the excess capacity described in Paragraph 1.0 of the Agreement will be identified and documented by the University and billed to the Town of Narragansett subsequent to their being billed to the University during the initial term and extended term of the Agreement. In the event of early termination of the Agreement, all amounts due and owing to the University as of the date of termination as defined herein will become due.

REGIONAL WASTEWATER TREATMENT FACILITY (WWTF)

VOLUMETRIC CAPACITY AGREEMENT BETWEEN THE TOWN OF SOUTH KINGSTOWN UNIVERSITY OF RHODE ISLAND AND TOWN OF NARRAGANSETT

Agreement made this 15th day of July, 1997, by and among the Town of South Kingstown (hereinafter referred to as "South Kingstown"), the Town of Narragansett (hereinafter referred to as "Narragansett") and the University of Rhode Island (hereinafter referred to as the "University").

RECITALS

WHEREAS: South Kingstown acting as the managing regional partner of the South Kingstown Regional Wastewater Treatment Facility (hereinafter referred to as "Regional WWTF") on behalf of Narragansett and the University is responsible for all operations of the Regional WWTF; and,

WHEREAS: South Kingstown as permit holder of the Regional WWTF Rhode Island Pollutant Discharge Elimination System Permit (RIPDES) No. RI 0100374, is ultimately responsible for meeting the compliance requirements of said permit for the Regional WWTF and continuously monitoring such compliance; and,

WHEREAS: Item 5, e., of the Regional WWTF Rhode Island Pollutant Discharge Elimination System Permit (RIPDES) No. RI 0100374, requires that "when the effluent discharged for a period of 90 consecutive days exceeds 80 percent of the designed flow, the permittee shall submit to the permitting authorities a projection of loadings up to the time when the design capacity of the treatment facility will be reached, and a program for maintaining satisfactory treatment levels consistent with approved water quality management plans."; and

WHEREAS: For purposes of this agreement, the Regional WWTF shall be considered to have an average daily design flow of 5.0 MGD; and

WHEREAS: Narragansett, the University and/or South Kingstown may be desirous of sub-leasing regional wastewater volumetric capacity from another regional partner, should unused capacity so exist; and

WHEREAS: The Rhode Island Department of Environmental Management (RIDEM) requires that South Kingstown, as RIPDES permit holder of the Regional WWTF, co-sign RIDEM Order of Approval(s) for projects within South Kingstown, Narragansett and the University, certifying that sufficient volumetric capacity exists at the Regional WWTF to receive new additional wastewater flow from said projects; and

WHEREAS: Table 1 attached hereto as Appendix A delineates regional partner Regional WWTF flow allocation for a 5.0 MGD WWTF,

NOW THEREFORE, in consideration of the above, the mutual promises and covenants contained herein and for other good and valuable consideration, the parties agree as follows:

1.0 Should any partner be desirous of purchasing and/or leasing unused volumetric capacity at the Regional WWTF from another partner, said partners shall be free to discuss and negotiate said purchase and/or lease. In the event a volumetric capacity lease (hereinafter referred to as "**VCL**") of available capacity at the Regional WWTF is agreed upon by the two (2) partners, Table 1 attached hereto shall be amended accordingly, and the other terms and conditions herein shall remain in full force and in effect. It is further agreed that Table 1 shall be amended should any VCL be terminated.

2.0 During the term of any VCL, and/or for the life of this agreement, unless modified by RIDEM, should any partner's volumetric wastewater contribution exceed eighty (80) percent of that partner's combined purchase and leased capacity for a period of ninety (90) consecutive days, and the overall Regional WWTF flow does not exceed eighty (80) percent of the permitted limit for that same ninety (90) day period, then all three (3) partners shall meet within thirty (30) days to review each partners' flow projections. If said review indicates that said partner's flow will continue to exceed eighty (80) percent of their combined purchased and leased capacity for the foreseeable future, and the flow projections from all partners still indicate that the Regional WWTF will remain within eighty (80) percent of it's permitted capacity, then said partner's flow will continue to be accepted in accordance with any existing operation and maintenance cost-sharing agreement(s). This paragraph shall also apply in the event that more than one (1) partner's volumetric wastewater contribution exceeds eighty (80) percent of each such partner's combined purchased and leased capacity.

3.0 During the term of this agreement, should any partner's volumetric wastewater contribution exceed eighty (80) percent of that partner's combined purchased and leased capacity for a period of ninety (90) consecutive days and the overall Regional WWTF flow exceed eighty (80) percent of the permitted limit for that same ninety (90) day period, then said partner will be responsible for financing the required engineering studies pursuant to Item 5,e, of the Regional WWTF RIPDES permit in effect at that time.

Should more than one (1) partner's volumetric contribution exceed eighty (80) percent of each such partner's combined purchased and leased capacity for a period of ninety (90) consecutive days and the overall Regional WWTF flow exceeds eighty (80) percent of the permitted limit for that same ninety (90) day period, then each said partner shall share the cost liability associated with financing the required engineering studies referenced above on a percentage basis according to each such partner's capacity needs. South Kingstown as managing partner shall administer the required professional services contracts; provided however that the scope of work thereunder shall be approved by the partner(s) who is/ are fiscally responsible.

4.0 Upon the completion of the engineering studies and subsequent approval by RIDEM of the engineering studies, should any partner's volumetric wastewater contribution exceed eighty (80) percent of that partner's combined purchased and leased capacity for a ninety (90) consecutive day period and during that same period the Regional WWTF flow exceed eighty (80) percent of the permitted limit, then said partner will be responsible for financing the physical expansion resulting from said approved engineering studies. Should more than one (1) partner's volumetric contribution exceed eighty (80) percent of each such partner's combined purchased and leased capacity for a period of ninety (90) consecutive days and the overall Regional WWTF flow exceeds eighty (80) percent of the permitted limit for that same ninety (90) day period, then each said partner shall share the cost liability associated with financing the required engineering studies referenced above and physical WWTF expansion on a percentage basis according to each such partner's capacity needs.

5.0 At such time as any other partner's volumetric wastewater contribution exceeds eighty (80) percent of that partner's combined purchased and leased capacity for a ninety (90) consecutive day period, said partner shall reimburse the original fiscally responsible partner(s) for its/ their pro-rated share of the cost of all engineering studies, design, construction, and other related services as required.

6.0 South Kingstown will not unreasonably withhold and agrees to execute RIDEM Division Water Resources, Order of Approval applications for Narragansett and/or University wastewater projects which contribute flow to the Regional WWTF, provided the *combined* total Regional WWTF estimated flow for 90 consecutive days and committed capacity for new wastewater projects from all regional partners does not exceed eighty (80) percent of the Regional WWTF design capacity.

7.0 No modification or alteration to this agreement, or any of its terms, shall be valid unless it is in writing and signed by Narragansett, the University and South Kingstown.

8.0 This instrument contains the entire agreement of the parties as to the specific subject matter of this instrument and is not subject to any prior or simultaneous terms, conditions, representations, understandings or agreements not expressly set forth herein.

9.0 This agreement has been reviewed by both parties with their own counsel or with the opportunity to seek the advise of counsel and shall not be construed against the drafter of this instrument.

10.0 This agreement shall be binding upon the parties hereto, their successors and assigns, and shall be governed by the laws of the State of Rhode Island.

IN WITNESS WHEREOF, the parties have caused this agreement and duplicate copy hereof to be executed on this 15th day of July, 1997.

Town of South Kingstown

Barbara A. Hackey, President
South Kingstown Town Council

July 15, 1997
Date

Witness

Town of Narragansett

T. Brian Handrigan, President
Narragansett Town Council

6/11/97
Date

Witness
AGENDA ITEM 97-02-5b
2/18/97

University of Rhode Island

Kenneth N. Kermes, Vice President
Business & Finance

6/5/97
Date

Witness

APPENDIX A

TABLE 1

5.0 MGD WWTF REGIONAL PARTNER ALLOCATION

5.0 MGD WITHOUT URI/ NARRAGANSETT LEASED CAPACITY

	Original Capacity	Percent	5.0 MGD Increase	5.0 MGD Purchased Capacity	5.0 MGD Percent	80% ADF for 5.0 MGD	1995-96 Highest 3 Month Consecutive Average
South Kingstown	1.6933	41.000%	0.435	2.1283	42.566%	1.70264	1.111
University of RI	1.652	40.000%	0	1.652	33.040%	1.3216	0.762
Narragansett	0.7847	19.000%	0.435	1.2197	24.394%	0.97576	1.442
Totals	4.13	100.000%	0.87	5.00	100.000%	4.00	3.316

5.0 MGD WITH URI/ NARRAGANSETT LEASED CAPACITY

	Original Capacity	Percent	5.0 MGD Increase	5.0 MGD Leased Capacity	5.0 MGD Percent	80% ADF for 5.0 MGD	1995-96 Highest 3 Month Consecutive Average
South Kingstown	1.6933	41.000%	0.435	2.1283	42.566%	1.70264	1.111
University of RI	1.652	40.000%	0	1.252	25.040%	1.0016	0.762
Narragansett	0.7847	19.000%	0.435	1.6197	32.394%	1.29576	1.442
Totals	4.13	100.000%	0.87	5.00	100.000%	4.00	3.316

REGIONAL WASTEWATER TREATMENT FACILITY (WWTF)

DECHLORINATION/CHLORINATION AND HEADWORKS FACILITY IMPROVEMENTS

COST-SHARING AGREEMENT BETWEEN THE TOWN OF SOUTH KINGSTOWN UNIVERSITY OF RHODE ISLAND AND TOWN OF NARRAGANSETT

AGREEMENT made this 15TH day of July, 1997, by and among the Town of South Kingstown (hereinafter " South Kingstown"), the University of Rhode Island (hereinafter "URI"), and the Town of Narragansett (hereinafter "Narragansett").

WHEREAS, the parties hereof agree to enter into this Cost-Sharing Agreement relative to the proposed Regional Wastewater Treatment Facility (hereinafter "WWTF") dechlorination and headworks improvements.

NOW , THEREFORE, in consideration of the mutual covenants and agreements hereinafter set forth, the parties hereto acknowledge and agree to the following:

1. Reaffirmation of URI Flowage

(a) Pursuant to the original sewerage agreement dated November 27, 1972, URI may increase its average flow to 1.652 million gallons per day (40% of 4.13 MGD) to the treatment plant without incurring additional capital expense.

2. Dechlorination Improvements and Costs

(a) Dechlorination improvements have been mandated by the RI Department of Environmental Management, Division of Water Resources (hereinafter referred to as RIDEM) in accordance with Compliance Order No.RIO - 116 and dated May 1991, and;

(b) Said dechlorination improvements must be completed in accordance with a project schedule (attached hereto as Exhibit 1) as mandated by RIDEM and, and;

(c) Each regional partner agrees to pay for their proportional share of dechlorination improvements based upon their respective 5.0 MGD WWTF capacity allotment as further described in Exhibit 2 (attached hereto), and;

(d) Project costs as further described in Exhibit 2 are estimates only, and shall require reconciliation at the completion of project construction based upon actual costs, and;

(e) Payment of all proportionate Narragansett and URI dechlorination improvement costs shall be billed respectfully to Narragansett and URI as follows: 50% upon 25% of construction completion and the remaining 50% balance upon 75% of construction completion; both payable to the Town of South Kingstown within fifteen (15) calendar days of billing date.

(f) An Aqua Fund grant award in the amount of $50,000 for dechlorination improvements has been awarded to South Kingstown and will be proportionately distributed to each regional partner based upon their respective 5.0 MGD WWTF capacity allotment as further described in Exhibit 2 (attached hereto), and;

3. Headworks Improvements and Costs

(a) Headworks improvements to the WWTF are proposed to enhance influent non-biodegradable particulate matter removal and provide odor abatement facilities, and;

(b) Each regional partner agrees to pay for their proportional share of headworks improvements based upon their respective 5.0 MGD WWTF capacity allotment as further described in Exhibit 2, and;

(c) Project costs as further described in Exhibit 2 are estimates only, and shall require reconciliation at the completion of project construction based upon actual costs, and;

(d) Payment of all proportionate Narragansett and URI headworks improvement costs shall be billed respectfully to Narragansett and URI as follows: 50% upon 25% of construction completion and the remaining 50% balance upon 75% of construction completion; both payable to the Town of South Kingstown within fifteen (15) calendar days of billing date.

(e) An Aqua Fund grant award in the amount of $160,000 for headworks improvements has been awarded to South Kingstown and will be proportionately distributed to each regional partner based upon their respective 5.0 MGD WWTF capacity allotment as further described in Exhibit 2, and;

4. Storage Facility Improvements and Costs

(a) The operation and maintenance of the South Kingstown collection system continues to increase due to the age of the pumping and collection system infrastructure, and;

(b) New storage facilities are necessary to store rolling stock equipment needed to maintain the South Kingstown collection system in proper operating condition, and;

(c) The South Kingstown pumping and collection system services only the regional partners of South Kingstown and URI, and Narragansett receives no benefit of said collection system, and;

(d) Costs associated with the proposed storage facility will be apportioned between South Kingstown and URI based upon the respective flow contribution of South Kingstown and URI for the Silver Lake Pumping facility, and;

(e) Narragansett shall pay no costs associated with the proposed storage facility.

(f) Payment of all proportionate URI storage facility costs shall be billed to URI as follows: 50% upon 25% of construction completion and the remaining 50% balance upon 75% of construction completion; both payable to the Town South Kingstown within fifteen (15) calendar days of billing date.

(g) Project costs as further described in Exhibit 2 are estimates only, and shall require reconciliation at the completion of project construction based upon actual costs.

5. Narragansett FY 1995-96 Credit

(a) Narragansett agrees to apply its 1995-96 Fiscal Year Wastewater Operating credit in an amount of $23,588 to its prorated share of dechlorination and headworks improvement costs as further described in Exhibit 2.

IN WITNESS WHEREOF, the parties have hereunto set theirs hands and seals the day and year first above.

Town of South Kingstown

Barbara A. Hackey

Barbara A. Hackey, President
South Kingstown Town Council

July 15, 1997
Date

Witness

Town of Narragansett

T. Brian Handrigan, President
Narragansett Town Council

6/11/97
Date

Witness

AGENDA ITEM 97-02-50
2/18/97

University of Rhode Island

Kenneth N. Kermes

Kenneth N. Kermes, Vice President
Business & Finance

6/5/97
Date

Donna M. Williams
Witness

EXHIBIT 2

REGIONAL WWTF DECHLORINATION/ HEADWORKS COST SHARING
Expanded Facilities to 5.0 MGD
DECHLORINATION/ HEADWORKS UPGRADE

REGIONAL PARTNER COST SHARING

	South Kingstown	Narragansett	University of RI	Total
Head/Dechlor. %	42.566%	24.394%	33.040%	100.000%
Headworks	159,623	91,478	123,900	375,000
Dechlor.	125,570	71,962	97,468	295,000
Total	285,192	163,440	221,368	670,000
Aqua Fund Grants	89,389	51,227	69,384	210,000
Headwrk/Dechlor Less Grants	195,804	112,212	151,984	460,000
Garage %	65.590%	0.000%	34.410%	100.000%
Garage	19,677	0	10,323	30,000
Total w/o Engineering	215,481	112,212	162,307	490,000
Percentage	43.976%	22.900%	33.124%	100.000%
Engineering	20,009	10,420	15,071	45,500
Grand Total	235,490	122,632	177,378	535,500

NOTE: The above costs do not include change orders or additional work which may be encountered during actual construction.

AGREEMENT

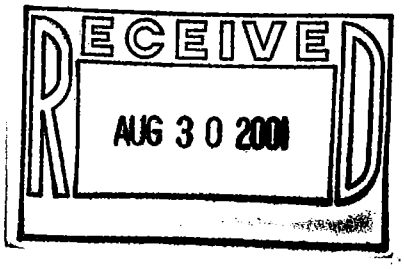
BETWEEN THE

UNIVERSITY OF RHODE ISLAND

AND

THE TOWN OF NARRAGANSETT

JULY 1, 2001



AGREEMENT

THIS AGREEMENT made and entered this first day of July, 2001, between the UNIVERSITY OF RHODE ISLAND (the "University") and the TOWN OF NARRAGANSETT (the "Town"):

WHEREAS, by agreement between the Town of South Kingstown, Town of Narragansett and the University of Rhode Island, each has the right to deliver a specific number of gallons per day of its wastewater to the South Kingstown Regional Wastewater Treatment Facility (the "treatment facility") representing a portion of the total capacity at of said treatment facility; and

WHEREAS, the Town desires to obtain the right to use a portion of the University's unused capacity in the treatment facility upon the terms and conditions hereinafter set forth; and

WHEREAS, the University is willing to authorize, the Town to use a portion of its unused capacity in the treatment facility upon the terms and conditions hereinafter set forth;

NOW THEREFORE, in consideration of the above; the mutual promises and covenants contained herein and for other good and valuable consideration, the parties agree as follows:

1.0 The University hereby authorizes, and to the extent necessary, assigns to the Town the exclusive right, to use the portion of its unused capacity in the treatment facility, not to exceed 400,000 gallons per day ("excess capacity"), during the initial or any extended term at this agreement, subject to the terms and conditions hereinafter set forth.

2.0 The Town shall pay to the University the contract price of ($100,000.00) for the initial term of this agreement in accordance with the schedule of payments set forth on Exhibit A attached hereto and made a part hereof. If any payment is made more than fifteen (15) days beyond its due date, interest shall be charged at the rate of 12% per annum until said payment is made in full.

3.0 The initial term of this agreement shall be for the period of five years beginning on July 1, 2001 and ending June 30, 2006 unless further extended or earlier terminated in accordance this agreement. The Town shall have the right to renew or extend this agreement for an additional five (5) year period (the "extended term") by providing the University with written notice at its intention to renew no later than three months prior to the expiration of the initial term of this agreement. The extended term shall provide for a new contract price to be negotiated by parties but shall otherwise be on the same terms and conditions. Additional extensions to this agreement may be granted thereafter upon such terms and conditions as the parties may further agree.

4.0 During any term of this agreement, the Town shall pay all user fees and other costs and expenses related to its actual use or right to the use of the excess capacity as well as any and all costs and expenses based upon the percentage usage of the total capacity of the treatment facility.

5.0 Except as otherwise provided, this agreement shall be terminated and be of no further force and effect upon the expiration of the initial or extended term. This agreement may be sooner terminated by the University for an event of default by the Town. If at any time during the initial or extended term at this agreement, the University reaches ninety (90%) percent use of its remaining capacity in the treatment facility, it may so notify the Town in writing together with a request to renegotiate the portion of its excess capacity to be used by the Town for the

remainder of the then term of this agreement. If after a good faith effort, the University and the Town fail to successfully renegotiate the said portion of the excess capacity to be used by the Town within thirty (30) days from the date of its request to renegotiate, then this agreement shall terminate and be of no further force and effect.

6.0 The Town shall be in default of this agreement for any of the following events of default: (i) failure to pay the contract price in accordance with the schedule of payments; (ii) failure to pay any user fees or other costs and expenses as set forth in this agreement; (iii) failure to perform any other provision of this agreement.

7.0 The Town agrees that its continued use of the University's excess capacity in violation of or after expiration of any term of this agreement may be permanently enjoined by any court of competent jurisdiction, hereby acknowledging that money damages alone are an inadequate remedy. This remedy, however, shall be in addition to, and not in lieu of, any other right or remedy that the University may have against the Town for damages or equitable relief resulting from the Town's breach of this agreement.

8.0 Any notice required to be provided under the terms of this agreement shall be valid if in writing and mailed, postage prepaid and addressed to either party as follows:

To the University:

Attn: Facilities Services
Sherman Building
University of Rhode Island
523 Plains Road
Kingston, Rhode Island 02881-0801

with (2) copies to:

Asst. Vice President for
Business Services
Carlotti Administration Bldg., Room 119
University of Rhode Island
75 Lower College Road
Kingston, Rhode Island 02881-0801

To the Town of Narragansett:

Attn: Town Manager
Town of Narragansett
Town Hall, 25 Fifth Avenue
Narragansett, Rhode Island 02882-0727

with (1) copy to:

Attn: Town Engineer
Town of Narragansett
Town Hall, 25 Fifth Avenue
Narragansett, Rhode Island 02882-0727

Either party may, from time to time, change the name or the person or office to which notice shall be provided by giving notice at said change in compliance with this provision.

9.0 No modification or alteration to this agreement, or any of its terms, shall be valid unless it is in writing and signed by both the Town and the University.

10.0 This instrument contains the entire agreement of the parties and is not subject to any prior or simultaneous terms, conditions, representations, understandings or agreements not expressly set forth herein.

11.0 This agreement has been reviewed by both parties with their own counsel or with the opportunity to seek the advice of counsel and shall not be construed against the drafter of this instrument.

12.0 This agreement shall be binding upon the parties hereto, their successors and assigns, and shall be governed by the laws of the State of Rhode Island.

IN WITNESS WHEREOF, the parties have caused this agreement and a duplicate copy hereof to be executed on the day and date first above written.

University of Rhode Island

Witness

By: _____
Assistant Vice President for Business Services

Town of Narragansett

Witness

By: _____

Approved as to form and legality
Mark A McSally
Town Solicitor

Town Council Authorization
Agenda Item 2001-08-244
August 6, 2001

EXHIBIT A

Schedule of Payments

Th. five payments by the Town of Narragansett to the University of Rhode Island for the contract price referenced in Paragraph 2.0. of this Agreement will be due and payable in accordance with the following schedule:

Fifteenth day of July, 2001	$100,000.00
Fifteenth day of July, 2002	$110,000.00
Fifteenth day of July, 2003	$110,000.00
Fifteenth day of July, 2004	$120,000.00
Fifteenth day of July, 2005	$120,000.00

Checks should be made payable to: **The University of Rhode Island.**

Payments should be sent to: **The University of Rhode Island, % Mr. Peyton Gibson, Coordinator, Facilities Services, 523 Plains Road, Kingston, Rhode Island 02881.** 874-4788

The Town of Narragansett is responsible directly to the Town of South Kingstown for any and all user fees and other costs and expenses associated with their actual percentage use of the waste water discharge capacity of the Regional Waste Water Treatment Facility.

Costs and expenses described in Paragraph 4.0. of this Agreement that are associated with the Town of Narragansett's right to use the excess capacity described in Paragraph 1.0. of the Agreement will be identified and documented by the University and billed to the Town of Narragansett subsequent to their being billed to the University during the initial term and extended term of the Agreement. In the event of early termination of the Agreement, all amounts due and owing to the University as of the date of termination as defined herein will become due.

Wastewater Pretreatment
Interjurisdictional Agreement
Between
South Kingstown
And
Narragansett

This agreement is entered into this 22 ND day of MARCH, 2007 between the Town of South Kingstown and the Town of Narragansett.

WHEREAS, South Kingstown, as managing regional partner, operates the Westmoreland Street Regional Wastewater Treatment Facility, and

WHEREAS, Narragansett as a regional partner utilizes the Westmoreland Street Regional Wastewater Treatment Facility, and

WHEREAS, Narragansett shall continue to utilize the wastewater treatment system in accordance with projected wastewater flows as delineated in the Regional WWTF Facilities Plan and the Town of Narragansett Wastewater Facilities Plan, and

WHEREAS, Narragansett currently contributes wastewater which includes industrial wastewater to the Westmoreland Street Regional Wastewater Treatment Facility, and

WHEREAS, both regional partners recognize South Kingstown is authorized to implement and enforce a pretreatment program to control industrial waste under 40 CFR Part 403 and Rhode Island General Laws 45-6-2.3.

WHEREAS, there are other sewage agreements between the parties which are to remain in effect,

WHEREAS, for the purposes of this agreement, the terms herein will only apply to the wastewater flow originating in Narragansett and tributary to the Westmoreland Street Regional Wastewater Treatment Facility.

The parties therefore agree to the following terms and conditions:

1. Narragansett agrees to adopt and diligently enforce a pretreatment ordinance which is no less stringent than the wastewater Management Ordinance of South Kingstown currently in effect.

2. Whenever South Kingstown amends its Ordinance, it will immediately notify Narragansett. For purposes of this agreement, immediate notification means forwarding a copy of any amendments within five (5) business days of enactment thereof. Narragansett agrees that, if said amendments are applicable to any of the wastewater conveyed to the wastewater treatment facility from Narragansett users, it will enact amendments at least as stringent as those adopted by South Kingstown.

3. South Kingstown and Narragansett agree to periodically review their respective ordinances and jointly draft and adopt equivalent amendments to their ordinances when deemed necessary for the effective administration and operation of the pretreatment program. Such a review shall be conducted no less than once every five (5) years. However, either party may request a joint review whenever deemed necessary. Such a request shall be forwarded by the requesting party to all other regional partners stating the reason for the request and the date on which the review is requested to take place. Within five (5) business days of the receipt of the request, the receiving party shall respond to the request, stating that the proposed date is satisfactory or proposing alternative date(s) for the review. In any case, the joint review should take place within thirty (30) calendar days of the request.

4. For wastewater flow originating in Narragansett and tributary to the Westmoreland Street Regional Wastewater Treatment Facility, Narragansett agrees to adopt and diligently enforce within its Wastewater Management Ordinance local limits which address at least the same pollutant parameters and are at least as stringent as the local limits enacted by South Kingstown. If any revisions or additions are made to South Kingstown's local limits, the Town of South Kingstown shall immediately notify Narragansett. For the purposes of this Agreement, immediate notification means forwarding a copy of any revisions or additions to the local limits within five (5) business days of enactment. Narragansett agrees to adopt any revisions or additions made by South Kingstown's local limits if those amendments are applicable to any of the wastewater conveyed to the wastewater treatment facility from Narragansett user.

5. Narragansett agrees to perform technical and administrative duties necessary to implement and enforce Narragansett's ordinance regulating Narragansett Category 1 and 2 industrial users located in its jurisdiction including, but not limited to the following: (1) updating industrial waste survey; (2) providing technical services such as sampling and analysis; (3) permitting; (4) inspection and compliance monitoring; and (5) enforcement.

6. Narragansett shall maintain current information on Category 1 and 2 industrial users located in its jurisdiction. Every year, Narragansett shall update the industrial waste survey for users located in its jurisdiction. A copy of this survey shall be forwarded to South Kingstown. Additionally, every time a new user is located in Narragansett, or anytime an existing user increases or changes in its discharge, or anytime requested by South Kingstown, Narragansett will require said Category 1 or 2 industrial user to respond to an industrial user questionnaire.

   A copy of this questionnaire will be forwarded to South Kingstown for review. Narragansett agrees to allow South Kingstown access to all records or documents relevant to the permitting program, of any Category 1 or 2 industrial user located in Narragansett or discharging through Narragansett to South Kingstown. In addition, Narragansett shall provide South Kingstown copies of Industrial User Permits, inspections, reports, sampling documentation and applicable enforcement documents.

7. Narragansett shall annually inspect all Category 1 and 2 industrial users located in its jurisdiction. In a situation where inspections not contained on the list of annual inspections takes place, Narragansett shall provide at least five (5) business days notice to South Kingstown. If an inspection is in response to an emergency situation and such notice is not possible, Narragansett will make every effort to notify South Kingstown of the impending inspection and give South Kingstown the opportunity to attend the inspection. If, at any time, South Kingstown identifies any user located in Narragansett for which inspection is desired but not scheduled, it will notify Narragansett of the need to conduct an inspection of that user's facility. If South Kingstown determines that an inspection must be conducted immediately, it shall make every effort to notify Narragansett of this need, and an opportunity to conduct this inspection.

8. All Category 1 and 2 industrial users within Narragansett shall obtain an Industrial Wastewater Permit from the Town of Narragansett. All Category 1 and 2 industrial users, regardless of status as categorical users, shall be issued an Industrial Wastewater Permit prior to any discharge. Such Industrial Wastewater Permit shall contain effluent limitations, monitoring requirements and reporting requirements and shall also contain a statement of duration, a statement of non-transferability, a statement of applicable civil and criminal penalties, and any other reasonable conditions requested to be included in the permit by South Kingstown.

   After Narragansett drafts the Industrial Wastewater Permit, it shall forward a copy thereof to South Kingstown for review and comment at least thirty (30) calendar days prior to expected date of issuance.

   Within ten (10) calendar days of receipt of the proposed Industrial Wastewater Permit, South Kingstown shall either approve the permit or request Narragansett to make additions, deletions, or changes to the proposed permit. No Industrial Wastewater Permit shall be issued without the consent of both parties, which consent shall not be unreasonably withheld.

9. Narragansett shall conduct compliance monitoring of all Category 1 and 2 industrial users located in its jurisdiction. In the event Narragansett QA/QC procedures are altered or modified, Narragansett shall provide a revised copy to the Town of South Kingstown. All sampling procedures will conform to 40 CFR 136. South Kingstown reserves the right to both sample an industry itself or split a sample with Narragansett. In addition, within two (2) weeks of discovering a violation of its ordinance or any other pretreatment standard or requirement, Narragansett will notify South Kingstown of these violations and the response taken or anticipated (including a timeframe for such action).

10. Narragansett is required to enforce the provisions of its sewer use ordinance and all pretreatment standards and requirements.

11. South Kingstown, in consultation and with agreement of Narragansett, is authorized to take emergency action, whenever necessary, to stop or prevent ant discharge which, presents or may present an imminent danger to health or welfare of humans, or which reasonably appears to threaten the environment or threatens to interfere with the operations of the treatment plant. If such action is to protect public health, South Kingstown will provide informal notice (i.e., telephone call) to the Narragansett Category 1 or 2 industrial user and Narragansett of its intent to take emergency action. If the action is to protect the environment or the treatment works, notice shall be given to the Narragansett Category 1 or 2 industrial user and Narragansett. These parties shall have the opportunity to respond to South Kingstown's action; however such response may be limited to a hearing after the emergency powers of South Kingstown have been exercised.

12. The terms of this Agreement may be amended only by written agreement of the parties. In any event, this Agreement shall be revised, as necessary, at least every five (5) years.

13. All other sewage agreements to the extent not inconsistent with this agreement shall remain in full force and effect.

Agree to this 22 nd day of March, 2007

Town of Narragansett

T. Brian Handrigan, President
Narragansett Town Council
TOWN COUNCIL AUTHORIZATION
2/12/07 # 07-02-55

Town of South Kingstown

Mary S. Eddy
Mary S. Eddy, President
South Kingstown Town Council

BK: 799 PG: 367
INST: 3235

RECEIVED
2012 JUL 23 P 2:12
RECORDED

AGREEMENT

BETWEEN THE

UNIVERSITY OF RHODE ISLAND

AND

THE TOWN OF NARRAGANSETT

JUNE 1, 2012

BK: 799 PG: 368
INST: 3235

AGREEMENT

THIS AGREEMENT made and entered this first day of June, 2012 between the UNIVERSITY OF RHODE ISLAND (the "University") and the TOWN OF NARRAGANSETT (the "Town"):

WHEREAS, by agreement between the Town of South Kingstown, Town of Narragansett and the University of Rhode Island, each has the right to deliver a specific number of gallons per day of its wastewater to the South Kingstown Regional Wastewater Treatment Facility (the "treatment facility") representing a portion of the total capacity at of said treatment facility; and

WHEREAS, the Town desires to obtain the right to use a portion of the University's unused capacity in the treatment facility upon the terms and conditions hereinafter set forth; and

WHEREAS, the University is willing to authorize the Town to use a portion of its unused capacity in the treatment facility upon the terms and conditions hereinafter set forth;

NOW THEREFORE, in consideration of the above, the mutual promises and covenants contained herein and for other good and valuable considerations, the parties agree as follows:

1.0 The University hereby authorizes, and to the extent necessary, assigns to the Town the exclusive right, to use the portion of its unused capacity in the treatment facility, not to exceed 200,000 gallons per day ("excess capacity"), during the initial or any extended term at this agreement, subject to the terms and conditions hereinafter set forth.

2.0 The Town shall pay to the University the contact price of ($60,000.000) for the initial term of this agreement in accordance with the schedule of payments set forth on Exhibit A attached hereto and made a part hereof. If any payment is made more than fifteen (15) days beyond its due date, interest shall be charged at the rate of 12% per annum until said payment is made in full.

3.0 The initial term of this agreement shall be for the period of five years beginning on July 1, 2012 and ending June 30, 2017 unless further extended or earlier terminated in accordance this agreement. The Town shall have the right to renew or extend this agreement for an additional five (5) year period (the "extended term") by providing the University with written notice as its intention to renew no later than three months prior to the expiration of the initial term of this agreement. The extended term shall provide for a new contract price to be negotiated by the parties but shall otherwise be on the same terms and conditions. Additional extensions to this agreement may be granted thereafter upon such terms and conditions as the parties may further agree.

BK: 799 PG: 369
INST: 3235

4.0 During any term of this agreement, the Town shall pay all user fee and other costs and expenses related to its actual use or right to the use of the excess capacity as well as any and all costs and expenses based upon the percentage usage of the total capacity of the treatment facility.

5.0 Except as otherwise provided, this agreement shall be terminated and be of no further force and effect upon the expiration of the initial or extended term. This agreement may be sooner terminated by the University for an Event of default by the Town. If at any time during the initial or extended term at this agreement, the University reaches ninety (90%) percent use of its remaining capacity in the treatment facility, it may so notify the Town in writing together with a request to renegotiate the portion of its excess capacity to be used by the Town for the remainder of the then term of this agreement. If after a good faith effort, the University and the Town fail to successfully renegotiate the said portion of the excess capacity to be used by the Town within thirty (30) days from the date of it requested to renegotiate, then this agreement shall terminate and be of no further force and effect.

6.0 The Town shall be in default of this agreement for any of the following events of default: (i) failure to pay the contract price in accordance with the schedule of payments: (ii) failure to pay any user fees or other costs and expenses as set forth in this agreement; (iii) failure to perform any other provision of this agreement.

7.0 The Town agrees that its continued use of the University's excess capacity in violation of or after expiration of any term of this agreement may be permanently enjoined by any court of competent jurisdiction, hereby acknowledging that money damages alone are an inadequate remedy. This remedy, however, shall be in addition to, and not in lieu of, any other right or remedy that the University may have against the Town for damages or equitable relief resulting from the Town's breach of this agreement.

8.0 Any notice required to be provided under the terms of this agreement shall be valid if in writing and mailed, postage prepaid and addressed to either party as follows:

To the University:

Attn: Facilities Services
Sherman Building
University of Rhode Island
523 Plains Road
Kingston, Rhode Island 02881-0801

BK: 799 PG: 370
INST: 3235

With (2) copies to:

Asst. Vice President for
Business Services
University of Rhode Island
210 Flagg Road Room 208
Kingston, Rhode Island 02881-0801

To the Town of Narragansett:

Attn: Town Manager
Town of Narragansett
Town Hall, 25 Fifth Avenue
Narragansett, Rhode Island 02882-0727

With (1) copy to:

Attn: Town Engineer
Town of Narragansett
Town Hall, 25 Fifth Avenue
Narragansett, Rhode Island 02882-0727

Either party may, from time to time, change the name or the person or office to which notice shall be provided by giving notice at said change in compliance with this provision.

9.0 No modification or alteration to this agreement, or any of its terms, shall be valid unless it is in writing and signed by both the Town and the University.

10.0 This instrument contains the entire agreement of the parties and is not subject to any prior or simultaneous terms, conditions, representations, understandings or agreements not expressly set forth herein.

11.0 This agreement has been reviewed by both parties with their own counsel or with the opportunity to seek the advice of counsel and shall not be construed against the drafter of this instrument.

12.0 This agreement shall be binding upon the parties hereto, their successors and assigns, and shall be governed by the laws of the State of Rhode Island.

BK: 799 PG: 371
INST: 3235

IN WITNESS WHEREOF, the parties have caused this agreement and a duplicate copy hereof to be executed on the day and date first above written.

Witness

University of Rhode Island

By: _____

Assistant Vice President for Business Services

7/2/12

Witness

Town of Narragansett

By: _____

TOWN COUNCIL APPROVED 6/18/12

EXHIBIT A

Schedule of Payments

The five payments by the Town of Narragansett to the University of Rhode Island for the contract price referenced in Paragraph 2.0 of this Agreement will be due and payable in accordance with the following schedule:

Fifteenth day of July 2012	$60,000.00
Fifteenth day of July 2013	$65,000.00
Fifteenth day of July 2014	$65,000.00
Fifteenth day of July 2015	$70,000.00
Fifteenth day of July 2016	$70,000.00

Checks should be made payable to: **The University of Rhode Island**

Payments should be sent to: **The University of Rhode Island, c/o Mr. Peyton Gibson, Financial Director, Facilities Services, 523 Plains Road, Kingston, Rhode Island, 02881.**

The Town of Narragansett is responsible directly to the Town of South Kingstown for any and all user fees and other costs and expenses associated with their actual percentage use of the waste water discharge capacity of the Regional Waste Water Treatment Facility.

BK: 799 PG: 372
INST: 3235

Costs and expenses described in Paragraph 4.0 of this Agreement that are associated with the Town of Narragansett's right to use the excess capacity described in Paragraph 1.0 of the Agreement will be identified and documented by the University and billed to the Town of Narragansett subsequent to their being billed to the University during the initial term and extended term of the Agreement. In the event of early termination of the Agreement, all amounts due and owing to the University as of the date of termination as defined herein will become due.

RECEIVED FOR RECORD
Jul 13,2012 08:42:45A
ANNE M. IRONS
TOWN CLERK
NARRAGANSETT, RI

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE TOWN OF SOUTH KINGSTOWN
AND
WASTEWATER REGIONAL PARTNERS

This MEMORANDUM OF UNDERSTANDING (MOU) is hereby made and entered into by and between the Town of South Kingstown (hereinafter known as the "Town") and the Wastewater Regional Partners, whereby known as the Town of Narragansett and the University of Rhode Island.

BACKGROUND:
The initial agreement was entered into on November 27, 1972. Since that time many changes and improvements have been made in the accounting, the method of billing, auditing, and procedures related to the control and classification of costs; changes are warranted to Section VII. and VIII. of the original agreement and revisions to the current billing memorandum of understanding is hereby executed.

PURPOSE:
The purpose of this revision is to introduce a new billing methodology for Operation & Maintenance (O&M) related expenses separately from regional partner related Capital Improvement Projects (CIP) as follows:

- Operation & Maintenance Billing
    - Equal Installments on the first days of July, October, January and April
    - Calculated as follows:
        - Annual FY Budget x Regional Partner actual flows from prior fiscal year
    - Due and Payable within 30 days after the billing date
    - After the close of the Town's fiscal year, an adjustment will be made to the 2nd quarter billing (October) based upon actual expenses and actual flows recorded during the prior fiscal year.

- Capital Improvement Projects Billing (other than WWTF Expansion Related Projects)
    - Separate from Operation & Maintenance (O&M) Billing
    - Once a capital project construction contract is awarded by the South Kingstown Town Council and a PO encumbered, a bill will be calculated as follows:
        - South Kingstown will bill Narragansett and URI the total amount of the Town Council award x Regional Partner actual flows from prior fiscal year
    - Due and Payable within 30 days after the billing date
    - At the completion of the CIP project, a final billing adjustment will be made based upon the final project cost x the actual wastewater flow for each regional partner at project completion.
    - Said billing adjustment will be due and payable 30 days after the billing reconciliation date.

Agreed to this 16th day of April, 2015.

Town of Narragansett
Pamela T. Nolan
Pamela T. Nolan
Town Manager
Town Council Approved
5/4/15 #12

University of Rhode Island
J. Vernon Wyman
J. Vernon Wyman
Assistant Vice-President

Town of South Kingstown
Stephen A. Alfred
Stephen A. Alfred
Town Manager

AGREEMENT

BETWEEN THE

UNIVERSITY OF RHODE ISLAND

AND

THE TOWN OF NARRAGANSETT

JULY 1, 2017

AGREEMENT

THIS AGREEMENT made and entered as of the first day of July, 2017 between the UNIVERSITY OF RHODE ISLAND (the "University") and the TOWN OF NARRAGANSETT (the "Town"):

WHEREAS, by agreement between the Town of South Kingstown, Town of Narragansett and the University of Rhode Island, each has the right to deliver a specific number of gallons per day of its wastewater to the South Kingstown Regional Wastewater Treatment Facility (the "treatment facility") representing a portion of the total capacity at of said treatment facility; and

WHEREAS, the Town desires to obtain the right to use a portion of the University's unused capacity in the treatment facility upon the terms and conditions hereinafter set forth; and

WHEREAS, the University is willing to authorize the Town to use a portion of its unused capacity in the treatment facility upon the terms and conditions hereinafter set forth;

NOW THEREFORE, in consideration of the above, the mutual promises and covenants contained herein and for other good and valuable considerations, the parties agree as follows:

1.0 The University hereby authorizes, and to the extent necessary, assigns to the Town the exclusive right, to use the portion of its unused capacity in the treatment facility, not to exceed 200,000 gallons per day ("excess capacity"), during the term at this agreement; subject to the terms and conditions hereinafter set forth.

2.0 The Town shall pay to the University the contact price of ($70,000.000)/yr for the term of this agreement in accordance with the schedule of payments set forth on Exhibit A attached hereto and made a part hereof. If any payment is made more than fifteen (15) days beyond its due date, interest shall be charged at the rate of 12% per annum until said payment is made in full.

3.0 The term of this agreement shall be for the period of five years beginning on July 1, 2017 and ending June 30, 2022 unless further extended or earlier terminated in accordance with this agreement. The Town shall have the right to renew or extend this agreement for an additional five (5) year period (the "extended term") by providing the University with written notice as its intention to renew no later than three months prior to the expiration of the term of this agreement. The extended term shall provide for a new contract price to be negotiated by the parties, but shall otherwise be on the same terms and conditions. Additional extensions to this agreement may be granted thereafter upon such terms and conditions as the parties may further agree.

4.0 During any term of this agreement, the Town shall pay all user fee and other costs and expenses related to its actual use or right to the use of the excess capacity as well as any and all costs and expenses based upon the percentage usage of the total capacity of the treatment facility.

5.0 Except as otherwise provided, this agreement shall be terminated and be of no further force and effect upon the expiration of the term. This agreement may be sooner terminated by the University for an Event of default by the Town. If at any time during the term at this agreement, the University reaches ninety (90%) percent use of its remaining capacity in the treatment facility, it may so notify the Town in writing together with a request to renegotiate the portion of its excess capacity to be used by the Town for the remainder of the then term of this agreement. If after a good faith effort, the University and the Town fail to successfully renegotiate the said portion of the excess capacity to be used by the Town within thirty (30) days from the date of it requested to renegotiate, then this agreement shall terminate and be of no further force and effect.

6.0 The Town shall be in default of this agreement for any of the following events of default: (i) failure to pay the contract price in accordance with the schedule of payments: (ii) failure to pay any user fees or other costs and expenses as set forth in this agreement; (iii) failure to perform any other provision of this agreement.

7.0 The Town agrees that its continued use of the University's excess capacity in violation of or after expiration of any term of this agreement may be permanently enjoined by any court of competent jurisdiction, hereby acknowledging that money damages alone are an inadequate remedy. This remedy, however, shall be in addition to, and not in lieu of, any other right or remedy that the University may have against the Town for damages or equitable relief resulting from the Town's breach of this agreement.

8.0 Any notice required to be provided under the terms of this agreement shall be valid if in writing and mailed, postage prepaid and addressed to either party as follows:

To the University:

Attn: Facilities Services
Sherman Building
University of Rhode Island
523 Plains Road
Kingston, Rhode Island 02881-0801

With (2) copies to:

Asst. Vice President for
Business Services
University of Rhode Island
210 Flagg Road Room 208
Kingston, Rhode Island 02881-0801

To the Town of Narragansett:

Attn: Town Manager
Town of Narragansett
Town Hall, 25 Fifth Avenue
Narragansett, Rhode Island 02882-0727

With (1) copy to:

Attn: Town Engineer
Town of Narragansett
Town Hall, 25 Fifth Avenue
Narragansett, Rhode Island 02882-0727

Either party may, from time to time, change the name or the person or office to which notice shall be provided by giving notice at said change in compliance with this provision.

9.0 No modification or alteration to this agreement, or any of its terms, shall be valid unless it is in writing and signed by both the Town and the University.

10.0 This instrument contains the entire agreement of the parties and is not subject to any prior or simultaneous terms, conditions, representations, understandings or agreements not expressly set forth herein.

11.0 This agreement has been reviewed by both parties with their own counsel or with the opportunity to seek the advice of counsel and shall not be construed against the drafter of this instrument.

12.0 This agreement shall be binding upon the parties hereto, their successors and assigns, and shall be governed by the laws of the State of Rhode Island.

IN WITNESS WHEREOF, the parties have caused this agreement and a duplicate copy hereof to be executed on the day and date first above written.

Witness

University of Rhode Island

By: _____
Assistant Vice President for Business Services

Witness

Town of Narragansett

By: _____ – Town Manager
TOWN COUNCIL AUTHORIZED
SEPT 18, 2017 #6

EXHBIT A

Schedule of Payments

The five payments by the Town of Narragansett to the University of Rhode Island for the contract price referenced in Paragraph 2.0 of this Agreement will be due and payable in accordance with the following schedule:

Fifteenth day of July 2017	$70,000.00
Fifteenth day of July 2018	$70,000.00
Fifteenth day of July 2019	$70,000.00
Fifteenth day of July 2020	$70,000.00
Fifteenth day of July 2021	$70,000.00

Checks should be made payable to: **The University of Rhode Island**

Payments should be sent to: **The University of Rhode Island, c/o Mr. Peyton Gibson, Financial Director, Facilities Services, 523 Plains Road, Kingston, Rhode Island, 02881.**

The Town of Narragansett is responsible directly to the Town of South Kingstown for any and all user fees and other costs and expenses associated with their actual percentage use of the waste water discharge capacity of the Regional Waste Water Treatment Facility.

Costs and expenses described in Paragraph 4.0 of this Agreement that are associated with the Town of Narragansett's right to use the excess capacity described in Paragraph 1.0 of the Agreement will be identified and documented by the University and billed to the Town of Narragansett subsequent to their being billed to the University during the term and any extended term of the Agreement. In the event of early termination of the Agreement, all amounts due and owing to the University as of the date of termination as defined herein will become due.

AGREEMENT

BETWEEN THE

UNIVERSITY OF RHODE ISLAND

AND

THE TOWN OF NARRAGANSETT

JULY 1, 2022

AGREEMENT

THIS AGREEMENT made and entered as of the first day of July, 2022 between the UNIVERSITY OF RHODE ISLAND (the "University") and the TOWN OF NARRAGANSETT (the "Town"):

WHEREAS, by agreement between the Town of South Kingstown, Town of Narragansett and the University of Rhode Island, each has the right to deliver a specific number of gallons per day of its wastewater to the South Kingstown Regional Wastewater Treatment Facility (the "treatment facility") representing a portion of the total capacity at of said treatment facility; and

WHEREAS, the Town desires to obtain the right to use a portion of the University's unused capacity in the treatment facility upon the terms and conditions hereinafter set forth; and

WHEREAS, the University is willing to authorize the Town to use a portion of its unused capacity in the treatment facility upon the terms and conditions hereinafter set forth;

NOW THEREFORE, in consideration of the above, the mutual promises and covenants contained herein and for other good and valuable considerations, the parties agree as follows:

1.0 The University hereby authorizes, and to the extent necessary, assigns to the Town the exclusive right, to use the portion of its unused capacity in the treatment facility, not to exceed 200,000 gallons per day ("excess capacity"), during the term at this agreement, subject to the terms and conditions hereinafter set forth.

2.0 The Town shall pay to the University the contact price of ($70,000.00)/yr for the term of this agreement in accordance with the schedule of payments set forth on Exhibit A attached hereto and made a part hereof. If any payment is made more than fifteen (15) days beyond its due date, interest shall be charged at the rate of 12% per annum until said payment is made in full.

3.0 The term of this agreement shall be for the period of one year beginning on July 1, 2022 and ending June 30, 2023 unless further extended or earlier terminated in accordance with this agreement. The Town shall have the right to renew or extend this agreement for an additional one-year period (the "extended term") by providing the University with written notice as its intention to renew no later than three months prior to the expiration of the term of this agreement. The extended term shall provide for a new contract price to be negotiated by the parties, but shall otherwise be on the same terms and conditions. Additional extensions to this agreement may be granted thereafter upon such terms and conditions as the parties may further agree.

4.0 During any term of this agreement, the Town shall pay all user fee and other costs and expenses related to its actual use or right to the use of the excess capacity as well as any and all costs and expenses based upon the percentage usage of the total capacity of the treatment facility.

5.0 Except as otherwise provided, this agreement shall be terminated and be of no further force and effect upon the expiration of the term. This agreement may be sooner terminated by the University for an Event of default by the Town. If at any time during the term at this agreement, the University reaches ninety (90%) percent use of its remaining capacity in the treatment facility, it may so notify the Town in writing together with a request to renegotiate the portion of its excess capacity to be used by the Town for the remainder of the then term of this agreement. If after a good faith effort, the University and the Town fail to successfully renegotiate the said portion of the excess capacity to be used by the Town within thirty (30) days from the date of it requested to renegotiate, then this agreement shall terminate and be of no further force and effect.

6.0 The Town shall be in default of this agreement for any of the following events of default: (i) failure to pay the contract price in accordance with the schedule of payments: (ii) failure to pay any user fees or other costs and expenses as set forth in this agreement; (iii) failure to perform any other provision of this agreement.

7.0 The Town agrees that its continued use of the University's excess capacity in violation of or after expiration of any term of this agreement may be permanently enjoined by any court of competent jurisdiction, hereby acknowledging that money damages alone are an inadequate remedy. This remedy, however, shall be in addition to, and not in lieu of, any other right or remedy that the University may have against the Town for damages or equitable relief resulting from the Town's breach of this agreement.

8.0 Any notice required to be provided under the terms of this agreement shall be valid if in writing and mailed, postage prepaid and addressed to either party as follows:

To the University:

Attn: Facilities Operations
Sherman Building
University of Rhode Island
60 Tootell Road
Kingston, Rhode Island 02881-0801

With (2) copies to:

Vice President for Administration & Finance
The University of Rhode Island
75 Lower College Road
Kingston, RI 02881

To the Town of Narragansett:

Attn: Town Manager
Town of Narragansett
Town Hall, 25 Fifth Avenue
Narragansett, Rhode Island 02882-0727

With (1) copy to:

Attn: Town Engineer
Town of Narragansett
Town Hall, 25 Fifth Avenue
Narragansett, Rhode Island 02882-0727

Either party may, from time to time, change the name or the person or office to which notice shall be provided by giving notice at said change in compliance with this provision.

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11.0 This agreement has been reviewed by both parties with their own counsel or with the opportunity to seek the advice of counsel and shall not be construed against the drafter of this instrument.

12.0 This agreement shall be binding upon the parties hereto, their successors and assigns, and shall be governed by the laws of the State of Rhode Island.

IN WITNESS WHEREOF, the parties have caused this agreement and a duplicate copy hereof to be executed on the day and date first above written.

Witness

Witness

University of Rhode Island

By: _____

Vice President for Administration & Finance

Town of Narragansett

By: _____

JAMES R. TIERNEY
TOWN MANAGER

APPROVED BY TOWN COUNCIL
6/20/22 AGENDA ITEM #14

EXHBIT A

Schedule of Payments

The payment by the Town of Narragansett to the University of Rhode Island for the contract price referenced in Paragraph 2.0 of this Agreement will be due and payable in accordance with the following schedule:

Fifteenth day of July 2022	$70,000.00

Checks should be made payable to: **The University of Rhode Island**

Payments should be sent to: **The University of Rhode Island, c/o Mr. Peyton Gibson, Assistant Director, Facilities Operations, 60 Tootell Road, Kingston, Rhode Island, 02881.**

The Town of Narragansett is responsible directly to the Town of South Kingstown for any and all user fees and other costs and expenses associated with their actual percentage use of the waste water discharge capacity of the Regional Waste Water Treatment Facility.

Costs and expenses described in Paragraph 4.0 of this Agreement that are associated with the Town of Narragansett's right to use the excess capacity described in Paragraph 1.0 of the Agreement will be identified and documented by the University and billed to the Town of Narragansett subsequent to their being billed to the University during the term and any extended term of the Agreement. In the event of early termination of the Agreement, all amounts due and owing to the University as of the date of termination as defined herein will become due.

AGREEMENT

BETWEEN THE

UNIVERSITY OF RHODE ISLAND

AND

THE TOWN OF NARRAGANSETT

JULY 1, 2023

AGREEMENT

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2.0 The Town shall pay to the University the contact price of ($70,000.00)/yr for the term of this agreement in accordance with the schedule of payments set forth on Exhibit A attached hereto and made a part hereof. If any payment is made more than fifteen (15) days beyond its due date, interest shall be charged at the rate of 12% per annum until said payment is made in full.

3.0 The term of this agreement shall be for the period of two years beginning on July 1, 2023 and ending June 30, 2025 unless further extended or earlier terminated in accordance with this agreement. The Town shall have the right to renew or extend this agreement for an additional one year period (the "extended term") by providing the University with written notice as its intention to renew no later than three months prior to the expiration of the term of this agreement. The extended term shall provide for a new contract price to be negotiated by the parties, but shall otherwise be on the same terms and conditions. Additional extensions to this agreement may be granted thereafter upon such terms and conditions as the parties may further agree.

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With (2) copies to:

Vice President for Administration & Finance
The University of Rhode Island
75 Lower College Road
Kingston, RI 02881

To the Town of Narragansett:

Attn: Town Manager
Town of Narragansett
Town Hall, 25 Fifth Avenue
Narragansett, Rhode Island 02882-0727

With (1) copy to:

Attn: Town Engineer
Town of Narragansett
Town Hall, 25 Fifth Avenue
Narragansett, Rhode Island 02882-0727

Either party may, from time to time, change the name or the person or office to which notice shall be provided by giving notice at said change in compliance with this provision.

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12.0 This agreement shall be binding upon the parties hereto, their successors and assigns, and shall be governed by the laws of the State of Rhode Island.

IN WITNESS WHEREOF, the parties have caused this agreement and a duplicate copy hereof to be executed on the day and date first above written.

Witness

University of Rhode Island

By: _____

Vice President for Administration & Finance

Witness

Town of Narragansett

By: _____

James R. Tierney, Town Manager

EXHBIT A

Schedule of Payments

The payment by the Town of Narragansett to the University of Rhode Island for the contract price referenced in Paragraph 2.0 of this Agreement will be due and payable in accordance with the following schedule:

Fifteenth day of July 2023	$70,000.00
Fifteenth day of July 2024	$70,000.00

Checks should be made payable to: **The University of Rhode Island**

Payments should be sent to: **The University of Rhode Island, c/o Mr. Peyton Gibson, Assistant Director, Facilities Operations, 60 Tootell Road, Kingston, Rhode Island, 02881.**

The Town of Narragansett is responsible directly to the Town of South Kingstown for any and all user fees and other costs and expenses associated with their actual percentage use of the waste water discharge capacity of the Regional Waste Water Treatment Facility.

Costs and expenses described in Paragraph 4.0 of this Agreement that are associated with the Town of Narragansett's right to use the excess capacity described in Paragraph 1.0 of the Agreement will be identified and documented by the University and billed to the Town of

Narragansett subsequent to their being billed to the University during the term and any extended term of the Agreement. In the event of early termination of the Agreement, all amounts due and owing to the University as of the date of termination as defined herein will become due.



WRIGHT-PIERCE
Engineering a Better Environment

Appendix G
Regional Partner Flow Data

Town of South Kingstown Regional Wastewater Treatment Facility

Fiscal Year: 2020-2021

Month	Middlebrid SK	WWTF Flows* Narr.	U.R.I.	S.K.	Total Flows	Adjusted WWTF Flows w./ Middlebridge Flows* Narr.	U.R.I.	S.K.	Total Flows	Kingston Pump Sta.* U.R.I.	S.K.	Total	Silver Lake Pump Sta.* U.R.I.	S.K.	Total	Rain **
July,20	0.58	28.88	7.63	27.51	64.02	28.31	7.63	28.08	64.02	7.63	1.41	9.03	7.63	27.51	35.13	2.95
August	0.63	26.04	7.21	25.59	58.84	25.41	7.21	26.22	58.84	7.21	0.87	8.08	7.21	25.59	32.80	1.04
Sept	0.60	23.03	10.41	22.94	56.38	22.43	10.41	23.54	56.38	10.41	1.37	11.78	10.41	22.94	33.35	0.99
Oct	0.56	25.74	11.40	24.87	62.01	25.18	11.40	25.43	62.01	11.40	2.06	13.46	11.40	24.87	36.27	5.04
Nov	0.56	31.81	11.66	25.21	68.68	31.25	11.66	25.77	68.68	11.66	1.85	13.51	11.66	25.21	36.87	4.20
Dec	0.97	53.39	14.62	36.11	104.11	52.42	14.62	37.08	104.11	14.62	2.25	16.87	14.62	36.11	50.72	4.96
Jan,21	0.87	40.61	13.77	34.36	88.74	39.74	13.77	35.23	88.74	13.77	1.72	15.49	13.77	34.36	48.13	1.33
Feb	0.73	38.85	14.75	29.66	83.26	38.12	14.75	30.39	83.26	14.75	2.30	17.05	14.75	29.66	44.41	2.62
March	0.73	39.49	15.30	34.27	89.06	38.76	15.30	35.00	89.06	15.30	2.95	18.25	15.30	34.27	49.57	2.03
April	0.72	38.20	13.24	32.95	84.39	37.48	13.24	33.67	84.39	13.24	3.02	16.26	13.24	32.95	46.19	2.53
May	0.59	35.37	8.65	31.67	75.68	34.78	8.65	32.25	75.68	8.65	2.24	10.89	8.65	31.67	40.31	3.62
June,21	0.49	33.94	7.31	29.03	70.28	33.45	7.31	29.52	70.28	7.31	2.14	9.45	7.31	29.03	36.34	2.25
Total Flow	8.014	415.35	135.94	354.16	905.441	407.34	135.94	362.17	905.441	135.94	24.18	160.116	135.94	354.16	490.092	33.56
Act.Flow %		45.87%	15.01%	39.11%	100.00%	44.99%	15.01%	40.00%	100.00%	84.90%	15.10%	100.00%	27.74%	72.26%	100.00%	
100% Design		22.759	7.4485	19.406	49.6132											

* Flow in MG

** Rain in inches

Town of South Kingstown Regional Wastewater Treatment Facility

Fiscal Year: 2021-2022

Month	Middlebrid SK	WWTF Flows* Narr.	U.R.I.	S.K.	Total Flows	Adjusted WWTF Flows w./ Middlebridge Flows* Narr.	U.R.I.	S.K.	Total Flows	Kingston Pump Sta.* U.R.I.	S.K.	Total	Silver Lake Pump Sta.* U.R.I.	S.K.	Total	Rain **
July,21	0.55	37.14	10.09	28.76	75.99	36.59	10.09	29.31	75.99	10.09	1.43	11.52	10.09	28.76	38.85	2.77
August	0.56	37.21	14.26	25.74	77.21	36.65	14.26	26.30	77.21	14.26	2.86	17.12	14.26	25.74	40.00	4.34
Sept	0.86	46.19	20.36	31.78	98.33	45.33	20.36	32.64	98.33	20.36	4.22	24.58	20.36	31.78	52.14	7.75
Oct	0.53	35.18	14.55	32.79	82.52	34.65	14.55	33.32	82.52	14.55	5.18	19.73	14.55	32.79	47.34	4.07
Nov	0.55	33.21	17.31	25.01	75.53	32.66	17.31	25.56	75.53	17.31	2.88	20.19	17.31	25.01	42.32	1.38
Dec	0.51	29.70	15.39	24.41	69.50	29.19	15.39	24.92	69.50	15.39	0.90	16.29	15.39	24.41	39.80	1.28
Jan,22	0.48	33.48	13.33	24.54	71.35	33.00	13.33	25.02	71.35	13.33	2.33	15.66	13.33	24.54	37.87	2.36
Feb	0.76	43.74	20.54	31.29	95.57	42.98	20.54	32.05	95.57	20.54	4.29	24.83	20.54	31.29	51.83	4.07
Mar	0.71	44.44	21.40	38.08	103.92	43.73	21.40	38.79	103.92	21.40	4.35	25.75	21.40	38.08	59.48	4.06
April	0.65	40.07	20.62	33.63	94.32	39.42	20.62	34.28	94.32	20.62	3.70	24.32	20.62	33.63	54.25	2.77
May	0.49	35.23	13.46	31.51	80.20	34.74	13.46	32.00	80.20	13.46	2.48	15.94	13.46	31.51	44.97	3.66
June,22	0.43	30.80	8.54	25.50	64.84	30.37	8.54	25.93	64.84	8.54	2.10	10.64	8.54	25.50	34.04	3.46
Total Flow	7.075	446.38	189.85	353.04	989.266	439.31	189.85	360.11	989.266	189.85	36.72	226.565	189.85	353.04	542.886	41.97
Act.Flow %		45.12%	19.19%	35.69%	100.00%	44.41%	19.19%	36.40%	100.00%	83.79%	16.21%	100.00%	34.97%	65.03%	100.00%	
100% Design		24.459	10.403	19.345	54.2064											

* Flow in MG

** Rain in inches

Town of South Kingstown Regional Wastewater Treatment Facility

Fiscal Year: 2022-2023

Month	Middlebrid SK	WWTF Flows* Narr.	U.R.I.	S.K.	Total Flows	Adjusted WWTF Flows w./ Middlebridge Flows* Narr.	U.R.I.	S.K.	Total Flows	Kingston Pump Sta.* U.R.I.	S.K.	Total	Silver Lake Pump Sta.* U.R.I.	S.K.	Total	Rain **
July,22	0.49	30.38	8.28	28.79	67.45	29.89	8.28	29.28	67.45	8.28	1.81	10.09	8.28	28.79	37.07	0.39
August	0.43	26.68	8.53	27.77	62.98	26.25	8.53	28.20	62.98	8.53	1.59	10.12	8.53	27.77	36.30	2.32
Sept	0.46	26.16	14.87	30.63	71.66	25.70	14.87	31.09	71.66	14.87	2.36	17.23	14.87	30.63	45.50	6.54
Oct	0.48	28.22	16.50	28.70	73.42	27.74	16.50	29.18	73.42	16.50	2.40	18.90	16.50	28.70	45.20	4.53
Nov	0.50	26.05	15.71	25.26	67.02	25.55	15.71	25.76	67.02	15.71	1.76	17.47	15.71	25.26	40.97	2.72
Dec	0.67	40.71	16.55	32.67	89.93	40.04	16.55	33.34	89.93	16.55	3.45	20.00	16.55	32.67	49.22	5.66
Jan,23	0.94	50.05	17.17	34.42	101.64	49.11	17.17	35.36	101.64	17.17	3.84	21.01	17.17	34.42	51.59	6.01
Feb	0.68	34.04	16.81	32.56	83.41	33.36	16.81	33.24	83.41	16.81	2.47	19.28	16.81	32.56	49.37	1.88
Mar	0.97	44.88	19.61	36.41	100.90	43.91	19.61	37.38	100.90	19.61	3.30	22.91	19.61	36.41	56.02	3.92
April	0.65	33.25	17.89	29.43	80.57	32.60	17.89	30.08	80.57	17.89	2.23	20.12	17.89	29.43	47.32	3.70
May	0.49	38.44	14.55	33.24	86.23	37.95	14.55	33.73	86.23	14.55	1.59	16.14	14.55	33.24	47.79	4.24
June,23	0.34	30.09	10.33	28.81	69.23	29.75	10.33	29.15	69.23	10.33	1.09	11.42	10.33	28.81	39.14	2.19
Total Flow	7.092	408.95	176.8	368.69	954.443	401.86	176.8	375.78	954.443	176.8	27.89	204.692	176.8	368.69	545.494	44.10
Act.Flow %		42.85%	18.52%	38.63%	100.00%	42.10%	18.52%	39.37%	100.00%	86.37%	13.63%	100.00%	32.41%	67.59%	100.00%	
100% Design		22.408	9.6878	20.202	52.2982											

* Flow in MG

** Rain in inches



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Appendix H
Intergovernmental Review

Intergovernmental Review Contacts for Facilities Plans & Environmental Assessments

Review requests and copies of digital documents can be sent via email, when available.

Archeological and Historic Preservation Act
National Historic Preservation Act &
Native American Graves Protection and Repatriation Act

Jeffrey Emidy, Executive Director
State Historic Preservation Officer
RI Historical Preservation & Heritage Commission
1 Capitol Hill, Suite 201
Providence, RI 02908
(401) 222-4134
Jeffrey.Emidy@preservation.ri.gov

John Brown
Historic Preservation Officer
Narragansett Tribal Historic Preservation Office
4425 South County Trail
Charlestown, RI 02813

Coastal Zone Management Act &
Coastal Barriers Resources Act

Jeffery Willis, Executive Director
Coastal Resources Management Council
Stedman Government Center, Suite 3
4808 Tower Hill Road
Wakefield, RI 02879-1900
(401) 783-3370
jwillis@crmc.ri.gov

Endangered Species Act &
Fish and Wildlife Coordination Act

US Fish & Wildlife Service*
New England Field Office
70 Commercial Street, Suite 3
Wakefield, RI 02879-1900
newengland@fws.gov

Phillip Edwards, Chief
RI Department of
Environmental Management
Division of Fish and Wildlife
Great Swamp Field HQ
277 Great Neck Road
West Kingston, RI 02892
(401) 789-0281
Phillip.Edwards@dem.ri.gov

David W. Gregg, Executive Director
RI Natural History Survey
P.O. Box 1858
URI East Farm Building 14
Kingston, RI 02881
(401) 874-5800
dgregg@rinhs.org

*The Fish and Wildlife Service no longer wishes to receive intergovernmental review requests. They ask that you visit their website to follow their NEFO Endangered Species Act project review and consultation guide to access step-by-step instructions on how to complete this portion of the intergovernmental review. The link is:

https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review

Last updated 8/9/2024

Intergovernmental Review Contacts for Facilities Plans & Environmental Assessments

Essential Fish Habitat

Sabrina Pereira
Marine Resources Management Specialist
Greater Atlantic Regional Fisheries Office
55 Great Republic Drive
Gloucester, MA 01930
(978) 675-2178
Sabrina.Pereira@noaa.gov

Farmland Protection Policy Act

Jim Turenne
Assistant State Soil Scientist
Natural Resources Conservation District
60 Quaker Ln, Suite 40
Warwick, RI 02886
(401) 822-8830
Jim.turenne@usda.gov

Protection of Wetlands
Floodplain and Flood Risk Management
Clean Air Act Conformity &
Protection of Sole Source Aquifers

Joseph Antonio
Senior Environmental Scientist
RI Department of Environmental Management
Office of Customer & Technical Assistance
235 Promenade Street
Providence, RI 02908
(401) 537-4008
Joseph.Antonio@dem.ri.gov

Last updated 8/9/2024

Intergovernmental Review Contacts for Facilities Plans & Environmental Assessments

State Guide Plan Consistency

Nancy Hess
Interdepartmental Project Manager
RI Statewide Planning Program
235 Promenade Street, Suite 230
Providence, RI 02908
(401) 222-6480
Nancy.Hess@doa.ri.gov

Transportation Impacts

Robert Rocchio, P.E.
Chief Engineer for Infrastructure
Office of the Director
RI Department of Transportation, Room 366
Providence, RI 02903
(401) 563-4008
Robert.Rocchio@dot.ri.gov

Wild and Scenic Rivers Act

Lauren Bonatakis
Natural Resource Specialist
Partnership Wild and Scenic Rivers Program
National Park Service
Interior Region 1 – North Atlantic-Appalachian
(617) 599-6802
Lauren_Bonatakis@nps.gov

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40 Westminster Street, Suite 950
Providence, RI 02903
401.383.2276 | wright-pierce.com

Date

Example
Address 1
Address 2
City, State, Zip
email address

SUBJECT: Intergovernmental Review
Town of Narraganset, RI Wastewater Facility Plan

Dear Recipient,

On behalf of the Town of Narragansett, Wright-Pierce is submitting a summary of our ongoing Wastewater Facility Planning efforts for your agency's review and comment. The project consists of planning upgrades for the Scarborough Wastewater Treatment Facility. Specifically, the facility requires upgrades to reliably meet its Rhode Island Pollution Discharge Elimination System (RIPDES) Permit due to the age of the facility. This planning project also considers the wastewater infrastructure requirements to support and develop the fishing industry in the Port of Galilee and address future town-wide wastewater treatment and conveyance needs.

We trust the information provided will be sufficient for your review. We will assume your agency has no questions or comments regarding the project if not received by this office after June 25, 2025. Should you have any questions or comments, please contact me at 401-808-8307 or andrew.smith@wright-pierce.com.

Sincerely,
WRIGHT-PIERCE

Andrew R. Smith, PE
Project Manager
andrew.smith@wright-pierce.com

cc: Jonathan Gerhard, PE
Scott Goodinson

DRAFT FOR
REGULATORY REVIEW

TOWN OF NARRAGANSETT, RHODE ISLAND

Wastewater Facilities Plan

MAY 2025

Wastewater Planning & Design
Facilities Plan Report



WRIGHT-PIERCE
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Section 1 Executive Summary

1.1 Project Need and Planning Area

The purpose of this Wastewater Facilities Plan is to evaluate the Town of Narragansett's wastewater needs for the next 20-year planning period. This includes review and analysis of the Scarborough Wastewater Treatment Facility and Narragansett's collection system. This report considers residential and commercial development in Town, sewer expansion needs to replace onsite wastewater treatment systems, and the wastewater needs for the fishing industry in the Port of Galilee.

The Town of Narragansett owns and operates the Scarborough Wastewater Treatment Facility, and the wastewater collection system serving the Town of Narragansett, Rhode Island. The Scarborough Wastewater Treatment Facility is located at 990 Ocean Road, Narraganset. It serves the southern end of Narragansett, including the port of Galilee. It is an activated sludge process, and was originally constructed in 1983. The Narragansett collection system is divided into two parts. The north end of Town is served by the South Kingstown Regional Wastewater Treatment Facility on Westmoreland Street in Narragansett, and the south end of Town is served by the Scarborough Wastewater Treatment Facility.

1.2 Effluent Limitations

The Scarborough Wastewater Treatment effluent limits are governed by the Rhode Island Pollutant Discharge Elimination System (RIPDES) Permit No. RI0100188. The permit effective date is October 1, 2023. The key effluent limits for the Scarborough WWTF include: 1.4 MGD average monthly flow, 30 mg/l BOD5, 30 mg/l TSS, and 35 cfu/100 ml.

1.3 Flows and Loads Summary

1.3.1 Current Flows and Wasteloads

Operational data from the SWWTF from 2020 through 2023 was reviewed to identify the current flow and loading to the SWWTF. The current flows and loads are shown below in **Table 1-1**.

Table 1-1 Current Flows and Wasteloads

Parameter	Flow (mgd)	BOD (lbs/day)	TSS (lbs/day)
Annual Average	0.72	1,200	1,400
Maximum Month	1.08	2,600	3,100
Maximum Day	2.38	3,700	5,200

1.3.2 Future Flows and Wasteloads

Future wastewater flows and loads were projected to determine the future needs of the wastewater collection system and SWWTF for the 20-year planning period. Future wastewater flows and wasteloads were projected using existing and future sewered population; projected residential and commercial growth; industry growth in the Port of Galilee; onsite wastewater treatment system (OWTS) to sewer conversions; and infiltration and inflow. The

projected flows and wasteloads include current existing, projected future residential/commercial buildout, and projected future industrial. The projected future flows and loadings are summarized in **Table 1-2**.

Table 1-2 Future Wastewater Flows and Wasteloads

Parameter	Flow (mgd)	BOD (lbs/day)	TSS (lbs/day)
Future Residential/Commercial			
Annual Average	1.24	2,100	2,400
Maximum Month	1.86	4,500	5,300
Maximum Day	4.11	6,400	9,000
Future Residential/Commercial, and Industrial (Fish Processing)			
Annual Average	1.26	2,600	2,700
Maximum Month	1.90	7,200	6,200
Maximum Day	4.19	9,900	10,300

1.4 Assess Current Situation

The Scarborough WWTF and Town's collection system were evaluated on their ability to reliably meet the projected future flows and wasteloads.

1.4.1 Scarborough WWTF

The SWWTF is an activated sludge treatment plant designed to remove biochemical oxygen demand (BOD_5) and total suspended solids (TSS) using an oxidation ditch followed by secondary clarification. Disinfection and dechlorination using sodium hypochlorite and sodium bisulfite follow secondary treatment before discharging treated effluent to Rhode Island Sound. Upstream of the secondary process influent wastewater is goes through screening and grit removal. Secondary sludge is stored in the sludge holding tank and the outer ring of the oxidation ditch. Waste sludge is thickened with a gravity belt thickener and hauled offsite for incineration.

The SWWTF is designed for 85% (minimum) removal of raw BOD_5 and TSS at an influent loading of 2,335 pounds (200 mg/l) of BOD_5 and TSS at a daily average flow of 1.4 mgd. Peak hydraulic capacity of the plant is designed for 4.2 mgd with three inner channels of the oxidation ditch in operation. The plant was designed to meet the discharge permit limits requiring a monthly average effluent BOD_5 and TSS not to exceed a concentration of 30 mg/l. Each unit process has adequate capacity for peak flow, but capacity in the secondary process is not sufficient for peak BOD and TSS loading.

Much of the equipment, buildings, and treatment units at the SWWTF have reached the end of their useful life. Some unit processes will require repair or replacement during the 20-year planning period, including:

- Aerated Grit
- Influent Pump Station
- Oxidation Ditch (Secondary Treatment)

- Secondary Clarifiers
- Disinfection and Dechlorination
- Solids Handling

1.4.2 Collection System

The collection system was evaluated on the ability to meet current peak flows and future peak flows for the 20-year planning period.

- The Burnside Pump Station was found to not have enough capacity for current peak flows. The remaining pump stations and interceptors are adequately sized for current peak flows.
- Operations staff reports Burnside Pump Station, Congdon Pump Station, Industrial Pump Station, Stanton Pump Station, and Lakewood Pump Station struggle to keep up with flow during wet weather events.
- Some pump stations have antiquated equipment and will require upgrades within the planning period. These include Circuit, Industrial Park, Wolfe, and Galilee Pump Stations.
- In the north collection system, Congdon Street pump station does not have capacity to handle projected future flows.
- In the south collection system, Burnside, Point Judith, and Stanton pump stations do not have capacity to handle projected future flows.
- The sewer interceptors are adequate for future flows.

1.5 Alternatives Evaluation

1.5.1 Scarborough WWTF

Much of the equipment, tanks, and buildings at the SWWTF have reached the end of their projected service life and will need repair or replacement during the planning period. Baseline improvements are the minimum recommended repairs and replacements to ensure reliable plant operation. These baseline improvements will not expand capacity to meet projected future flows and loadings but are required to maintain reliable operation at existing levels. Baseline improvements include:

- Upgrades to aerated grit chamber, influent pump station, oxidation ditch, secondary clarifiers, chlorine contact tanks, solids handling process, Administration/Operations Building, and Maintenance/Control Building
- Construct a third secondary clarifier to provide capacity and redundancy.

Three alternatives were considered for expanding secondary treatment system capacity. Two alternatives were considered for the solids handling process. The opinion of probable project cost for the baseline improvements is $36.5 Million, which is included in the secondary treatment alternatives (One through Three).

1.5.1.1 Alternative 1: Optimization of Existing Facility

Alternative 1 aims to increase capacity in the secondary treatment system by maximizing the oxidation ditch. Alternative 1 includes the following:

- Baseline Improvements
- Replace existing aerators with new higher capacity aerators. Install additional aerators in Aeration Channel 2 and 3.
- Convert the Aerobic Digestion Channel, the outermost ring of the oxidation ditch, to an aeration tank for additional treatment volume.

- Construct a new waste sludge storage tank. (Aerobic Digestion Channel is no longer available for sludge storage).

Optimization of the existing oxidation ditch will provide capacity to treat the existing and forecasted future residential/commercial loads, but will not meet the needs of an expanded fishing industry.

The opinion of probable project cost for this alternative is: $41.7 Million.

1.5.1.2 Alternative 2: Primary Treatment, and Alternative 1 Improvements

Alternative 2 aims to increase capacity in the secondary treatment system by maximizing the oxidation ditch and adding a primary treatment process. Alternative 2 includes the following

In addition to the baseline alternatives recommended, Alternative 2 includes the following:

- Baseline Improvements.
- Construct two primary clarifiers, with associated scum and sludge storage, pump station, piping, and equipment.
- Modify influent pump station and force main to discharge to the primary treatment process.
- Optimize the existing oxidation ditch treatment, detailed in Alternative 1.
- Construct primary and secondary waste sludge storage tanks

Primary treatment and optimization of the existing oxidation ditch will provide capacity to treat the existing and forecasted future residential/commercial loads, but will not meet the needs of an expanded fishing industry.

The opinion of probable project cost for this alternative is: $52.2 Million.

1.5.1.3 Alternative 3: New Secondary Treatment System

Alternative 3 is to replace the existing oxidation ditch with a new diffused air activated sludge treatment process. This process can be constructed in phases as the SWWTF requirements increase over the 20-year planning period. Alternative 3 includes the following:

- Baseline Improvements.
- Construct four rectangular aeration tanks with fine bubble diffusers, with associated piping and blowers. Construction of aeration tanks can be phased.
- Construct a new building to house blowers and electrical equipment.
- Construct three new secondary clarifiers.
- Construct a new waste sludge storage tank.

This alternative can be constructed to meet the current and future needs of the SWWTF including flows and loads from the expanded fishing industry in the Port of Galilee.

The opinion of probable project cost for this alternative is: $69.7 Million

1.5.1.4 Alternative 4: Solids Thickening Alternative

Alternative 4 is to upgrade the solids handling process with a new sludge thickening process. This alternative cost is additive to the selected Alternative 1, 2 or 3 which also include the Baseline improvement. This alternative includes:

- Install new Gravity Belt Thickeners (2 units), with additional sludge feed pumps and flow metering.
- Construct additional thickened sludge storage tank, with mixer and level sensors.
- Install additional polymer feed system with pump and appurtenances.

This alternative will treat the existing and forecasted future residential, commercial, and industrial (fish processing) loads. Future peak thickener operation will be 25 hours per week, and future peak sludge production will require 14 truckloads of thickened liquid sludge per week. Alternative sludge thickening technologies could also be considered.

The opinion of probable project cost for this alternative is: $3.8 Million

1.5.1.5 Alternative 5: Solids Dewatering Alternative

Alternative 5 is to replace the existing sludge thickening process with a sludge dewatering process. This alternative cost is additive to the selected Alternative 1, 2 or 3 which also include the Baseline improvement. his alternative will produce dry sludge cake for disposal rather than liquid sludge. This alternative includes:

- Install new dewatering equipment (Rotary drum thickener followed by a screw press, dewatering centrifuge or a rotary press) with additional sludge feed pump and flow metering
- Install conveyors and a trailer loading bay to handle dry sludge cake.
- Install additional polymer feed pump and appurtenances.

This alternative will treat the existing and forecasted future residential, commercial, and industrial (fish processing) loads. Future peak dewatering operation will be 50 hours per week, and future peak sludge production will require five trailer loads of sludge cake per week.

The opinion of probable project cost for this alternative is: $6.1 Million

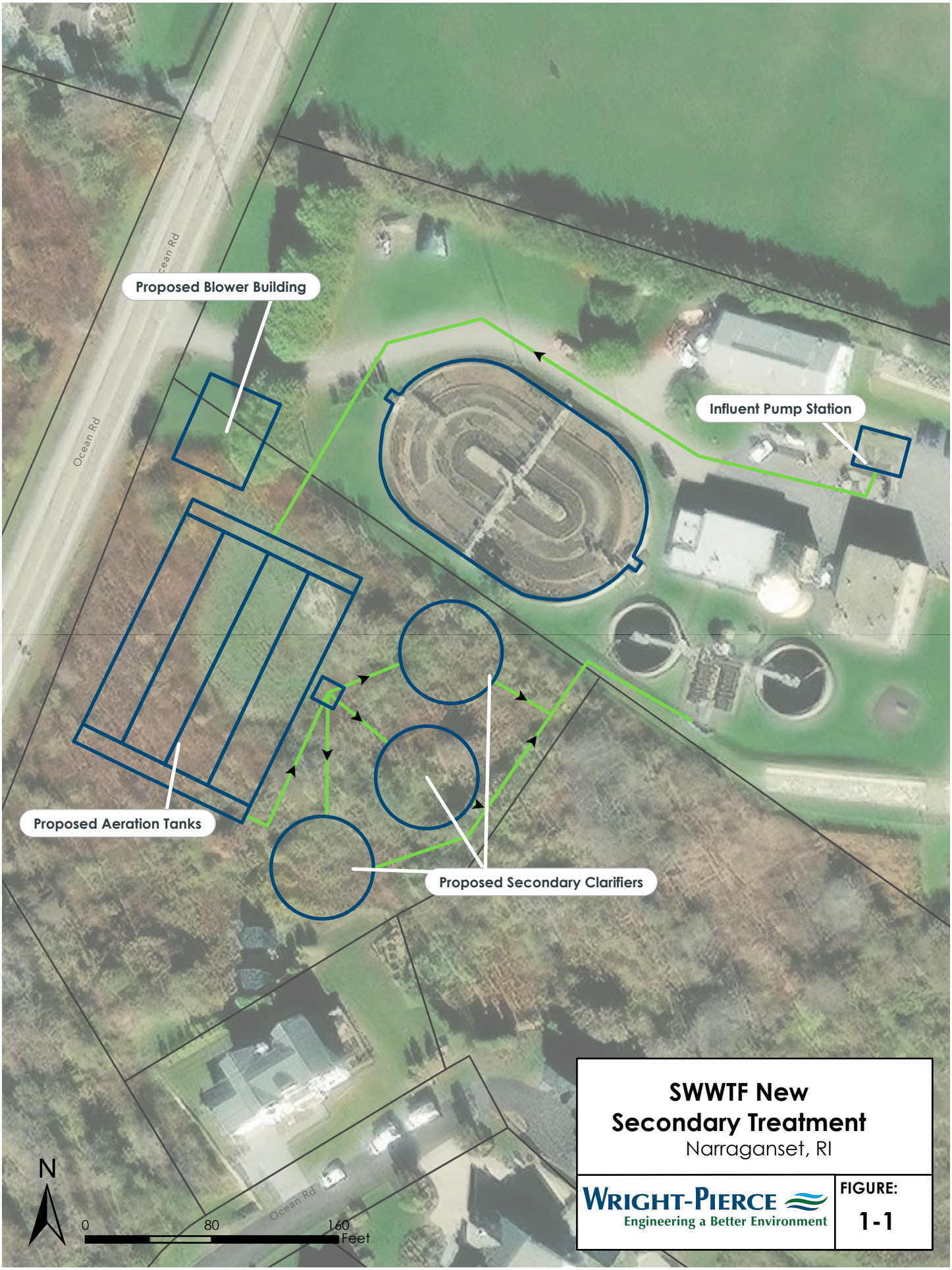
1.5.1.6 SWWTF Recommended Alternative

To meet existing, residential buildout/sewer expansion, and fishing industry flows and loads, a new secondary treatment and solids handling facility is recommended. The recommended plan is to construct the baseline plant improvements, construct a new secondary treatment system to replace the oxidation ditch, and replace the solids handling process with a new solids dewatering system.

- A new secondary treatment system is the only alternative that will provide enough treatment capacity to support economic development of the fishing industry in the port of Galilee. The new secondary treatment process will allow the oxidation ditch and to be repurposed for aerobic sludge digestion and storage. The existing plant can operate uninterrupted while the new plant is constructed.
- Sludge dewatering is the recommended solids handling alternative because of the uncertainty of liquid sludge disposal at the Woonsocket Synagro facility. Sludge dewatering will also minimize the number of trucks required for sludge hauling and disposal.

Table 1-3 SWWTF Recommendation Opinion of Probable Cost Summary

Alternative	Description	Cost
B	Baseline Improvements	$36.5M
3	Secondary Treatment System	$33.2M
5	Solids Dewatering System	$6.1M
Total		$75.8M

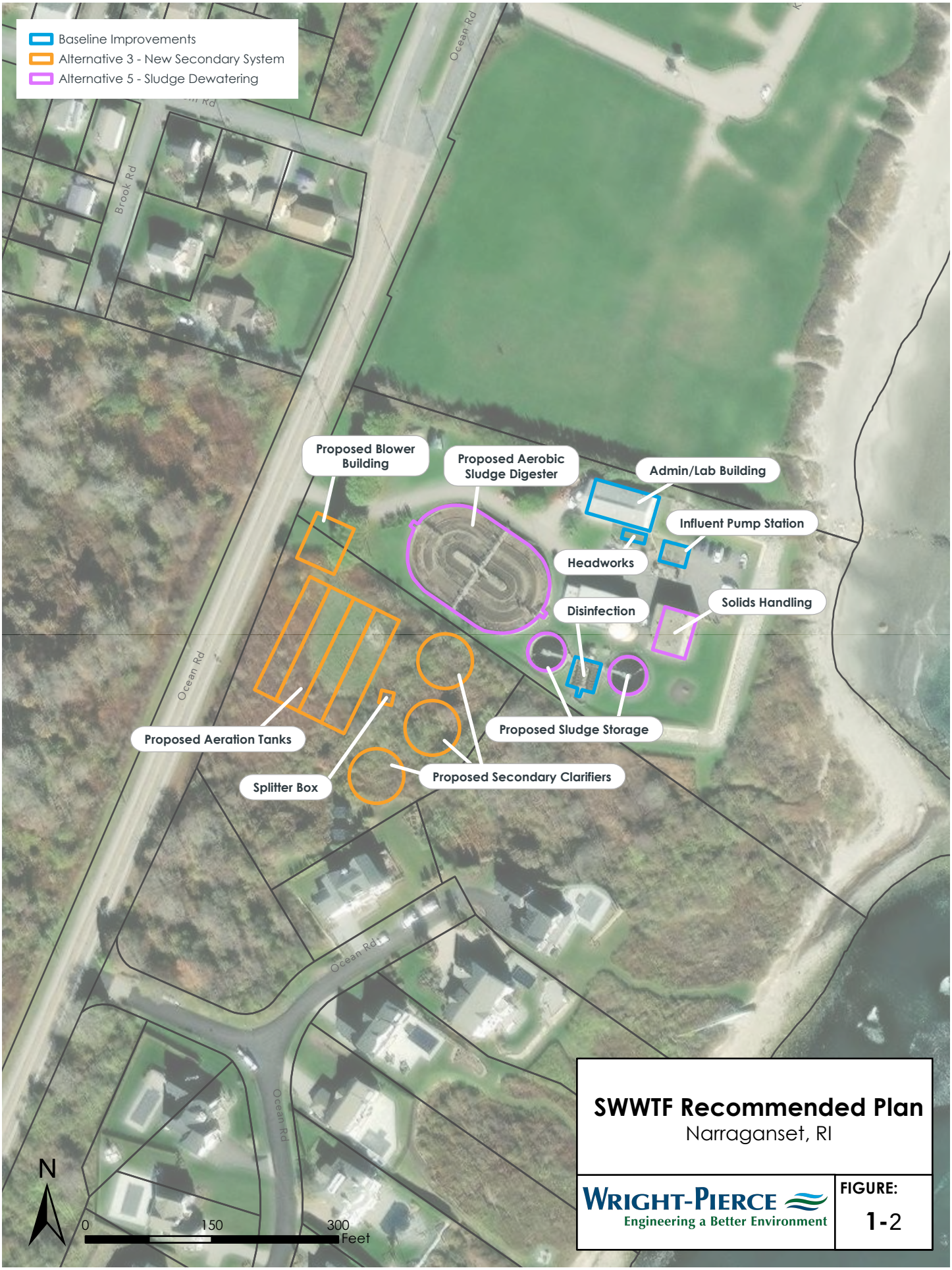


SWWTF New Secondary Treatment
Narraganset, RI

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FIGURE: 1-1

JA W:\GIS_Development\Projects\RI\Narragansett\21517_ComprehensiveWWFP\MXDs\ReportFigures.aprx - SWWTFRecommendation_Alt3_8x11



SWWTF Recommended Plan

Narraganset, RI

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FIGURE: 1-2

JA W:\GIS_Development\Projects\RI\Narragansett\21517_ComprehensiveWWFP\MXDs\ReportFigures.aprx - SWWTFRecommendation_8x11

1.5.2 Collection System

The recommended plan for the collection system includes sewer expansion in areas with high concentrations of onsite wastewater treatment systems in areas with less than ideal soil conditions for proper OWTS functioning. Pump station improvements include capacity upgrades to meet future flow projections, and upgrades due to age/condition of equipment. The recommended plan for the collection system and pump stations are summarized in **Table 1-4**, **Table 1-5**, and **Table 1-6**.

Table 1-4 Summary of Collection System Expansion

Service Area	Cost	Description
Wandsworth Street	$18.9M	Pump Station, gravity and low pressure sewers, tributary to Lakewood PS
Bonnet Point	$11.3M	Low pressure sewer, tributary to Wolfe PS
Great Island	$27M	Pump Station, gravity and low pressure sewers, tributary to Galilee PS
Harbor Island	$26M	Pump Station, gravity and low pressure sewers, tributary to Briggs Farm PS
Baltimore Avenue	$5.4M	Gravity sewer, tributary to Burnside PS
Alexander Drive	$950,000	Gravity sewer, tributary to Burnside PS
Sunset Boulevard	$4.8M	Low pressure sewer, tributary to SWWTF by Point Judith Road Interceptor
Calef Avenue	$7.2M	Low pressure sewer, tributary to Point Judith PS
Sand Hill Cove Road	$3.1M	Low pressure sewer, tributary to Galilee PS
Total	$104.6M	

Table 1-5 Summary of Pump Station Recommendations North

Service Area	Cost	Description
Baneberry Pump Station	$550,000	Upgrade the electrical system.
Bonnet Shores Pump Station	$50,000	Replace equipment in-kind as needed. Install flood proofing improvements at pump station.
Circuit Pump Station	$1.5M	Comprehensive pump station upgrade due to age and condition of equipment.
Congdon Pump Station	$500,000	Upgrade pumps to meet future peak flows when required.
Industrial Park Pump Station	$640,000	Comprehensive pump station upgrade due to age and condition of equipment.
Lakewood Pump Station	$600,000	Comprehensive pump station upgrade due to age and condition of equipment.
Mettatuxet Pump Station	$200,000	Perform mechanical, electrical, and flood proofing improvements to the pump station.
Mumford Pump Station	$310,000	Upgrade the building's exterior.
Ouida Pump Station	$2.7M	Upgrade equipment in grit room, and replace process, mechanical, and electrical equipment as needed.
Seaport Pump Station	$200,000	Replace equipment in-kind as needed.
Sprague Pump Station	$650,000	Upgrade the electrical system, HVAC/mechanical upgrades, and building improvements.
Wilson Pump Station	$3.0M	Upgrade the pump station building.
Winterberry Pump Station	$3.4M	Upgrade the electrical system, and replace equipment in-kind as needed.
Wolfe Pump Station	$500,000	Comprehensive pump station upgrade due to age and condition of equipment.
Total	$14.8M	

Table 1-6 Pump Station Recommendations South

Service Area	Total Cost	Description
Briggs Farm Pump Station	$325,000	Replace equipment in-kind as needed.
Burnside Pump Station	$2.0M	Upgrade pumps to meet peak flows.
Galilee Pump Station	$4.0M	Comprehensive pump station upgrade due to age and condition of structure and equipment.
Point Judith Pump Station	$1.5M	Upgrade pumps to meet future peak flows when required. Perform flood proofing improvements.
Stanton Pump Station	$2.0M	Upgrade pumps to meet future peak flows when required, perform equipment upgrades and flood proofing improvements.
Total	$9.8M	

Andrew Smith

From:	Andrew Smith
Sent:	Wednesday, June 4, 2025 1:34 PM
To:	Jeffrey.Emidy@preservation.ri.gov
Cc:	Jonathan Gerhard; Scott Goodinson
Subject:	Intergovernmental Review, Narragansett Wastewater Facilities Plan
Attachments:	Narragansett WWFP Jeffrey Emidy, Executive Director.pdf

Mr. Emidy,

On behalf of the Town of Narragansett, Wright-Pierce is submitting a summary of our ongoing Wastewater Facility Planning efforts for your agency's review and comment. The project consists of planning upgrades for the Scarborough Wastewater Treatment Facility. Specifically, the facility requires upgrades to reliably meet its Rhode Island Pollution Discharge Elimination System (RIPDES) Permit due to the age of the facility. This planning project also considers the wastewater infrastructure requirements to support and develop the fishing industry in the Port of Galilee and address future town-wide wastewater treatment and conveyance needs.

We trust the information provided will be sufficient for your review. We will assume your agency has no questions or comments regarding the project if not received by this office after June 25, 2025. Should you have any questions or comments, please contact me at 401-808-8307 or andrew.smith@wright-pierce.com.

Sincerely,

Andrew

Andrew Smith, PE
Wright-Pierce | Project Manager
direct 401.808.8307 | **office** 401.383.2276

WRIGHT-PIERCE
Engineering a Better Environment

Andrew Smith

From: Totten, Elizabeth (HPHC) <Elizabeth.Totten@preservation.ri.gov>
Sent: Thursday, July 3, 2025 3:12 PM
To: Andrew Smith
Subject: RE: Intergovernmental Review, Narragansett Wastewater Facilities Plan
Attachments: 250703.02_RIDEM_SWTF 990 Ocean Rd Narragansett.pdf

This message was sent from outside your organization.

Good afternoon,

Please see the attached letter.

Thank you,

Elizabeth

From: Andrew Smith <andrew.smith@wright-pierce.com>
Sent: Tuesday, June 10, 2025 9:13 AM
To: Totten, Elizabeth (HPHC) <Elizabeth.Totten@preservation.ri.gov>
Subject: RE: Intergovernmental Review, Narragansett Wastewater Facilities Plan

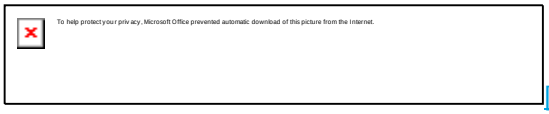
Elizabeth, thank you. I will look for any comments by July 3.

We are running up against some funding deadlines to complete this project, so if you can return comments sooner it would be greatly appreciated.

Thanks,

Andrew

Andrew Smith, PE
Wright-Pierce | Project Manager
direct 401.808.8307 | **office** 401.383.2276



[wright-pierce.com]

From: Totten, Elizabeth (HPHC) <Elizabeth.Totten@preservation.ri.gov>
Sent: Tuesday, June 10, 2025 8:52 AM
To: Andrew Smith <andrew.smith@wright-pierce.com>
Subject: RE: Intergovernmental Review, Narragansett Wastewater Facilities Plan

Good day Andrew,

Thank you for submitting this, please note that per federal statute we have 30 days to review and provide comments.

Best,

Elizabeth

From: Andrew Smith <andrew.smith@wright-pierce.com>
Sent: Wednesday, June 4, 2025 1:34 PM
To: Emidy, Jeffrey (HPHC) <Jeffrey.Emidy@preservation.ri.gov>
Cc: Jonathan Gerhard <jgerhard@narragansettri.gov>; Scott Goodinson <sgoodinson@narragansettri.gov>
Subject: Intergovernmental Review, Narragansett Wastewater Facilities Plan

Mr. Emidy,

On behalf of the Town of Narragansett, Wright-Pierce is submitting a summary of our ongoing Wastewater Facility Planning efforts for your agency's review and comment. The project consists of planning upgrades for the Scarborough Wastewater Treatment Facility. Specifically, the facility requires upgrades to reliably meet its Rhode Island Pollution Discharge Elimination System (RIPDES) Permit due to the age of the facility. This planning project also considers the wastewater infrastructure requirements to support and develop the fishing industry in the Port of Galilee and address future town-wide wastewater treatment and conveyance needs.

We trust the information provided will be sufficient for your review. We will assume your agency has no questions or comments regarding the project if not received by this office after June 25, 2025. Should you have any questions or comments, please contact me at 401-808-8307 or andrew.smith@wright-pierce.com.

Sincerely,

Andrew

Andrew Smith, PE
Wright-Pierce | Project Manager
direct 401.808.8307 | **office** 401.383.2276


[wright-pierce.com] [us-west-2.protection.sophos.com]

STATE OF RHODE ISLAND

HISTORICAL PRESERVATION & HERITAGE COMMISSION

Old State House 150 Benefit Street Providence, RI 02903

Telephone 401-222-2678 Fax 401-222-2968
TTY 401-222-3700 www.preservation.ri.gov

July 3, 2025

Via email: andrew.smith@wright-pierce.com

Andrew R. Smith, PE
Project Manager
Wright-Pierce
40 Westminster Street, Suite950
Providence, RI 02903

Re: RIHPHC Project No. 18942
Scarborough Wastewater Treatment Facility
990 Ocean Road
Narraganset, Ri

Dear Mr. Smith:

The Rhode Island Historical Preservation and Heritage Commission (RIHPHC) staff has reviewed the information that you provided for the above-referenced project. The Town of Narragansett is proposing to upgrade the Scarborough Wastewater Treatment Facility at 990 Ocean Road in Narragansett.

Wright-Pierce has examined multiple alternatives for upgrading the existing facility – all proposed alternatives are improvements and/or additions to the existing facility. There are no previously identified historic properties in the immediate area. Based on our review of available information, it is the opinion of the RIHPHC that no historic properties will be affected by the project.

These comments are provided in accordance with Section 106 of the National Historic Preservation Act. If you have any questions, please contact RIHPHC Project Review Coordinator Elizabeth Totten at 401-222-2671 or elizabeth.totten@preservation.ri.gov.

Sincerely,

Elizabeth Totten
FOR

Jeffrey Emidy
Executive Director
State Historic Preservation Officer

250703.02est

WRIGHT-PIERCE
Engineering a Better Environment

40 Westminster Street, Suite 950
Providence, RI 02903
401.383.2276 | wright-pierce.com

June 4, 2025

John Brown
Historic Preservation Officer
Narragansett Tribal Historic Preservation Office
4425 South County Trail
Charlestown, RI 02813

SUBJECT: Intergovernmental Review
Town of Narraganset, RI Wastewater Facility Plan

Dear Recipient,

On behalf of the Town of Narragansett, Wright-Pierce is submitting a summary of our ongoing Wastewater Facility Planning efforts for your agency's review and comment. The project consists of planning upgrades for the Scarborough Wastewater Treatment Facility. Specifically, the facility requires upgrades to reliably meet its Rhode Island Pollution Discharge Elimination System (RIPDES) Permit due to the age of the facility. This planning project also considers the wastewater infrastructure requirements to support and develop the fishing industry in the Port of Galilee and address future town-wide wastewater treatment and conveyance needs.

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Sincerely,
WRIGHT-PIERCE

Andrew R. Smith, PE
Project Manager
andrew.smith@wright-pierce.com

cc: Jonathan Gerhard, PE
Scott Goodinson

DRAFT FOR
REGULATORY REVIEW

TOWN OF NARRAGANSETT, RHODE ISLAND

Wastewater Facilities Plan

MAY 2025

Wastewater Planning & Design
Facilities Plan Report



WRIGHT-PIERCE
Engineering a Better Environment

Section 1 Executive Summary

1.1 Project Need and Planning Area

The purpose of this Wastewater Facilities Plan is to evaluate the Town of Narragansett's wastewater needs for the next 20-year planning period. This includes review and analysis of the Scarborough Wastewater Treatment Facility and Narragansett's collection system. This report considers residential and commercial development in Town, sewer expansion needs to replace onsite wastewater treatment systems, and the wastewater needs for the fishing industry in the Port of Galilee.

The Town of Narragansett owns and operates the Scarborough Wastewater Treatment Facility, and the wastewater collection system serving the Town of Narragansett, Rhode Island. The Scarborough Wastewater Treatment Facility is located at 990 Ocean Road, Narraganset. It serves the southern end of Narragansett, including the port of Galilee. It is an activated sludge process, and was originally constructed in 1983. The Narragansett collection system is divided into two parts. The north end of Town is served by the South Kingstown Regional Wastewater Treatment Facility on Westmoreland Street in Narragansett, and the south end of Town is served by the Scarborough Wastewater Treatment Facility.

1.2 Effluent Limitations

The Scarborough Wastewater Treatment effluent limits are governed by the Rhode Island Pollutant Discharge Elimination System (RIPDES) Permit No. RI0100188. The permit effective date is October 1, 2023. The key effluent limits for the Scarborough WWTF include: 1.4 MGD average monthly flow, 30 mg/l BOD5, 30 mg/l TSS, and 35 cfu/100 ml.

1.3 Flows and Loads Summary

1.3.1 Current Flows and Wasteloads

Operational data from the SWWTF from 2020 through 2023 was reviewed to identify the current flow and loading to the SWWTF. The current flows and loads are shown below in **Table 1-1**.

Table 1-1 Current Flows and Wasteloads

Parameter	Flow (mgd)	BOD (lbs/day)	TSS (lbs/day)
Annual Average	0.72	1,200	1,400
Maximum Month	1.08	2,600	3,100
Maximum Day	2.38	3,700	5,200

1.3.2 Future Flows and Wasteloads

Future wastewater flows and loads were projected to determine the future needs of the wastewater collection system and SWWTF for the 20-year planning period. Future wastewater flows and wasteloads were projected using existing and future sewered population; projected residential and commercial growth; industry growth in the Port of Galilee; onsite wastewater treatment system (OWTS) to sewer conversions; and infiltration and inflow. The

projected flows and wasteloads include current existing, projected future residential/commercial buildout, and projected future industrial. The projected future flows and loadings are summarized in **Table 1-2**.

Table 1-2 Future Wastewater Flows and Wasteloads

Parameter	Flow (mgd)	BOD (lbs/day)	TSS (lbs/day)
Future Residential/Commercial			
Annual Average	1.24	2,100	2,400
Maximum Month	1.86	4,500	5,300
Maximum Day	4.11	6,400	9,000
Future Residential/Commercial, and Industrial (Fish Processing)			
Annual Average	1.26	2,600	2,700
Maximum Month	1.90	7,200	6,200
Maximum Day	4.19	9,900	10,300

1.4 Assess Current Situation

The Scarborough WWTF and Town's collection system were evaluated on their ability to reliably meet the projected future flows and wasteloads.

1.4.1 Scarborough WWTF

The SWWTF is an activated sludge treatment plant designed to remove biochemical oxygen demand (BOD_5) and total suspended solids (TSS) using an oxidation ditch followed by secondary clarification. Disinfection and dechlorination using sodium hypochlorite and sodium bisulfite follow secondary treatment before discharging treated effluent to Rhode Island Sound. Upstream of the secondary process influent wastewater is goes through screening and grit removal. Secondary sludge is stored in the sludge holding tank and the outer ring of the oxidation ditch. Waste sludge is thickened with a gravity belt thickener and hauled offsite for incineration.

The SWWTF is designed for 85% (minimum) removal of raw BOD_5 and TSS at an influent loading of 2,335 pounds (200 mg/l) of BOD_5 and TSS at a daily average flow of 1.4 mgd. Peak hydraulic capacity of the plant is designed for 4.2 mgd with three inner channels of the oxidation ditch in operation. The plant was designed to meet the discharge permit limits requiring a monthly average effluent BOD_5 and TSS not to exceed a concentration of 30 mg/l. Each unit process has adequate capacity for peak flow, but capacity in the secondary process is not sufficient for peak BOD and TSS loading.

Much of the equipment, buildings, and treatment units at the SWWTF have reached the end of their useful life. Some unit processes will require repair or replacement during the 20-year planning period, including:

- Aerated Grit
- Influent Pump Station
- Oxidation Ditch (Secondary Treatment)

- Secondary Clarifiers
- Disinfection and Dechlorination
- Solids Handling

1.4.2 Collection System

The collection system was evaluated on the ability to meet current peak flows and future peak flows for the 20-year planning period.

- The Burnside Pump Station was found to not have enough capacity for current peak flows. The remaining pump stations and interceptors are adequately sized for current peak flows.
- Operations staff reports Burnside Pump Station, Congdon Pump Station, Industrial Pump Station, Stanton Pump Station, and Lakewood Pump Station struggle to keep up with flow during wet weather events.
- Some pump stations have antiquated equipment and will require upgrades within the planning period. These include Circuit, Industrial Park, Wolfe, and Galilee Pump Stations.
- In the north collection system, Congdon Street pump station does not have capacity to handle projected future flows.
- In the south collection system, Burnside, Point Judith, and Stanton pump stations do not have capacity to handle projected future flows.
- The sewer interceptors are adequate for future flows.

1.5 Alternatives Evaluation

1.5.1 Scarborough WWTF

Much of the equipment, tanks, and buildings at the SWWTF have reached the end of their projected service life and will need repair or replacement during the planning period. Baseline improvements are the minimum recommended repairs and replacements to ensure reliable plant operation. These baseline improvements will not expand capacity to meet projected future flows and loadings but are required to maintain reliable operation at existing levels. Baseline improvements include:

- Upgrades to aerated grit chamber, influent pump station, oxidation ditch, secondary clarifiers, chlorine contact tanks, solids handling process, Administration/Operations Building, and Maintenance/Control Building
- Construct a third secondary clarifier to provide capacity and redundancy.

Three alternatives were considered for expanding secondary treatment system capacity. Two alternatives were considered for the solids handling process. The opinion of probable project cost for the baseline improvements is $36.5 Million, which is included in the secondary treatment alternatives (One through Three).

1.5.1.1 Alternative 1: Optimization of Existing Facility

Alternative 1 aims to increase capacity in the secondary treatment system by maximizing the oxidation ditch. Alternative 1 includes the following:

- Baseline Improvements
- Replace existing aerators with new higher capacity aerators. Install additional aerators in Aeration Channel 2 and 3.
- Convert the Aerobic Digestion Channel, the outermost ring of the oxidation ditch, to an aeration tank for additional treatment volume.

- Construct a new waste sludge storage tank. (Aerobic Digestion Channel is no longer available for sludge storage).

Optimization of the existing oxidation ditch will provide capacity to treat the existing and forecasted future residential/commercial loads, but will not meet the needs of an expanded fishing industry.

The opinion of probable project cost for this alternative is: $41.7 Million.

1.5.1.2 Alternative 2: Primary Treatment, and Alternative 1 Improvements

Alternative 2 aims to increase capacity in the secondary treatment system by maximizing the oxidation ditch and adding a primary treatment process. Alternative 2 includes the following

In addition to the baseline alternatives recommended, Alternative 2 includes the following:

- Baseline Improvements.
- Construct two primary clarifiers, with associated scum and sludge storage, pump station, piping, and equipment.
- Modify influent pump station and force main to discharge to the primary treatment process.
- Optimize the existing oxidation ditch treatment, detailed in Alternative 1.
- Construct primary and secondary waste sludge storage tanks

Primary treatment and optimization of the existing oxidation ditch will provide capacity to treat the existing and forecasted future residential/commercial loads, but will not meet the needs of an expanded fishing industry.

The opinion of probable project cost for this alternative is: $52.2 Million.

1.5.1.3 Alternative 3: New Secondary Treatment System

Alternative 3 is to replace the existing oxidation ditch with a new diffused air activated sludge treatment process. This process can be constructed in phases as the SWWTF requirements increase over the 20-year planning period. Alternative 3 includes the following:

- Baseline Improvements.
- Construct four rectangular aeration tanks with fine bubble diffusers, with associated piping and blowers. Construction of aeration tanks can be phased.
- Construct a new building to house blowers and electrical equipment.
- Construct three new secondary clarifiers.
- Construct a new waste sludge storage tank.

This alternative can be constructed to meet the current and future needs of the SWWTF including flows and loads from the expanded fishing industry in the Port of Galilee.

The opinion of probable project cost for this alternative is: $69.7 Million

1.5.1.4 Alternative 4: Solids Thickening Alternative

Alternative 4 is to upgrade the solids handling process with a new sludge thickening process. This alternative cost is additive to the selected Alternative 1, 2 or 3 which also include the Baseline improvement. This alternative includes:

- Install new Gravity Belt Thickeners (2 units), with additional sludge feed pumps and flow metering.
- Construct additional thickened sludge storage tank, with mixer and level sensors.
- Install additional polymer feed system with pump and appurtenances.

This alternative will treat the existing and forecasted future residential, commercial, and industrial (fish processing) loads. Future peak thickener operation will be 25 hours per week, and future peak sludge production will require 14 truckloads of thickened liquid sludge per week. Alternative sludge thickening technologies could also be considered.

The opinion of probable project cost for this alternative is: $3.8 Million

1.5.1.5 Alternative 5: Solids Dewatering Alternative

Alternative 5 is to replace the existing sludge thickening process with a sludge dewatering process. This alternative cost is additive to the selected Alternative 1, 2 or 3 which also include the Baseline improvement. his alternative will produce dry sludge cake for disposal rather than liquid sludge. This alternative includes:

- Install new dewatering equipment (Rotary drum thickener followed by a screw press, dewatering centrifuge or a rotary press) with additional sludge feed pump and flow metering
- Install conveyors and a trailer loading bay to handle dry sludge cake.
- Install additional polymer feed pump and appurtenances.

This alternative will treat the existing and forecasted future residential, commercial, and industrial (fish processing) loads. Future peak dewatering operation will be 50 hours per week, and future peak sludge production will require five trailer loads of sludge cake per week.

The opinion of probable project cost for this alternative is: $6.1 Million

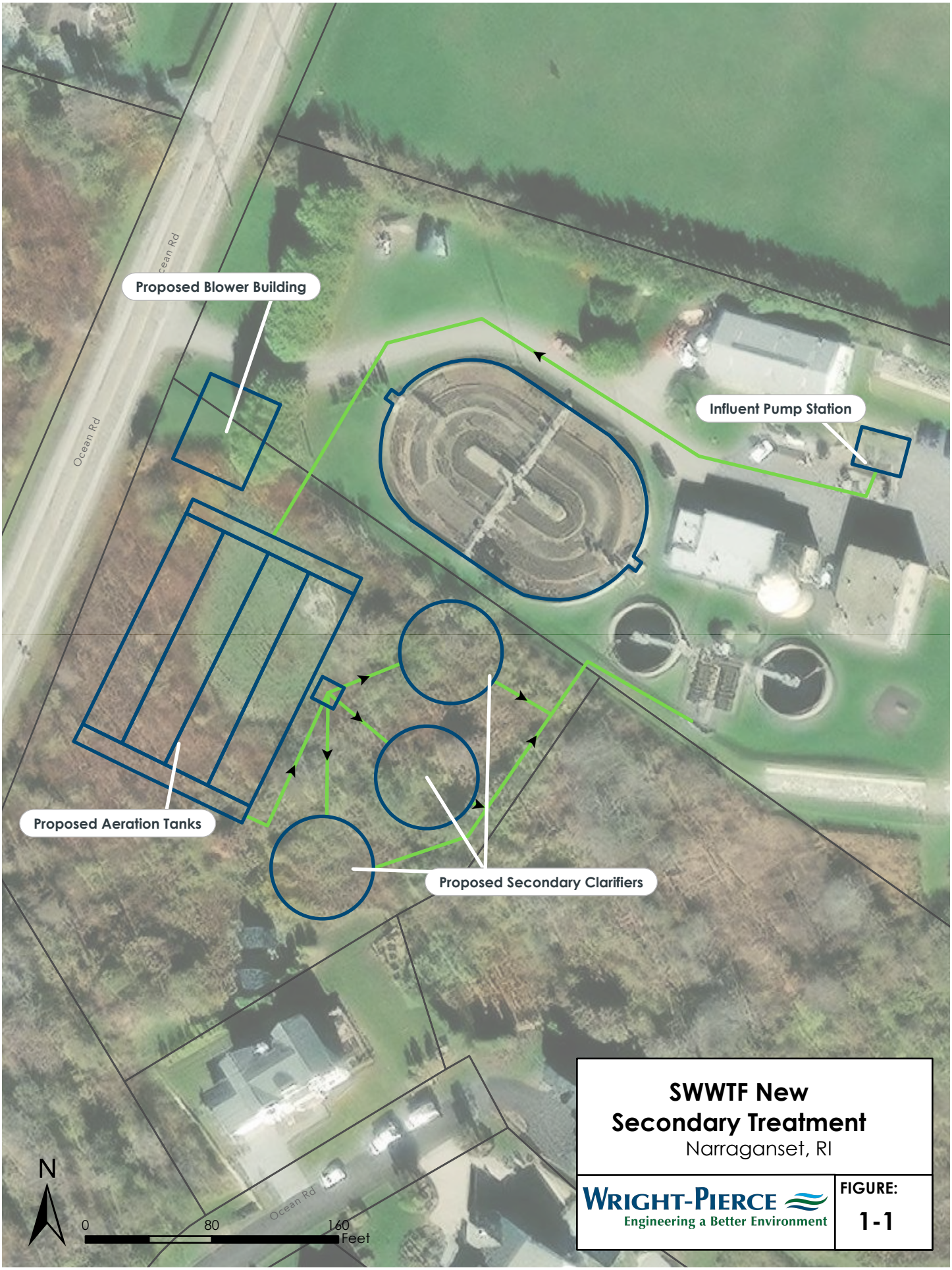
1.5.1.6 SWWTF Recommended Alternative

To meet existing, residential buildout/sewer expansion, and fishing industry flows and loads, a new secondary treatment and solids handling facility is recommended. The recommended plan is to construct the baseline plant improvements, construct a new secondary treatment system to replace the oxidation ditch, and replace the solids handling process with a new solids dewatering system.

- A new secondary treatment system is the only alternative that will provide enough treatment capacity to support economic development of the fishing industry in the port of Galilee. The new secondary treatment process will allow the oxidation ditch and to be repurposed for aerobic sludge digestion and storage. The existing plant can operate uninterrupted while the new plant is constructed.
- Sludge dewatering is the recommended solids handling alternative because of the uncertainty of liquid sludge disposal at the Woonsocket Synagro facility. Sludge dewatering will also minimize the number of trucks required for sludge hauling and disposal.

Table 1-3 SWWTF Recommendation Opinion of Probable Cost Summary

Alternative	Description	Cost
B	Baseline Improvements	$36.5M
3	Secondary Treatment System	$33.2M
5	Solids Dewatering System	$6.1M
Total		$75.8M

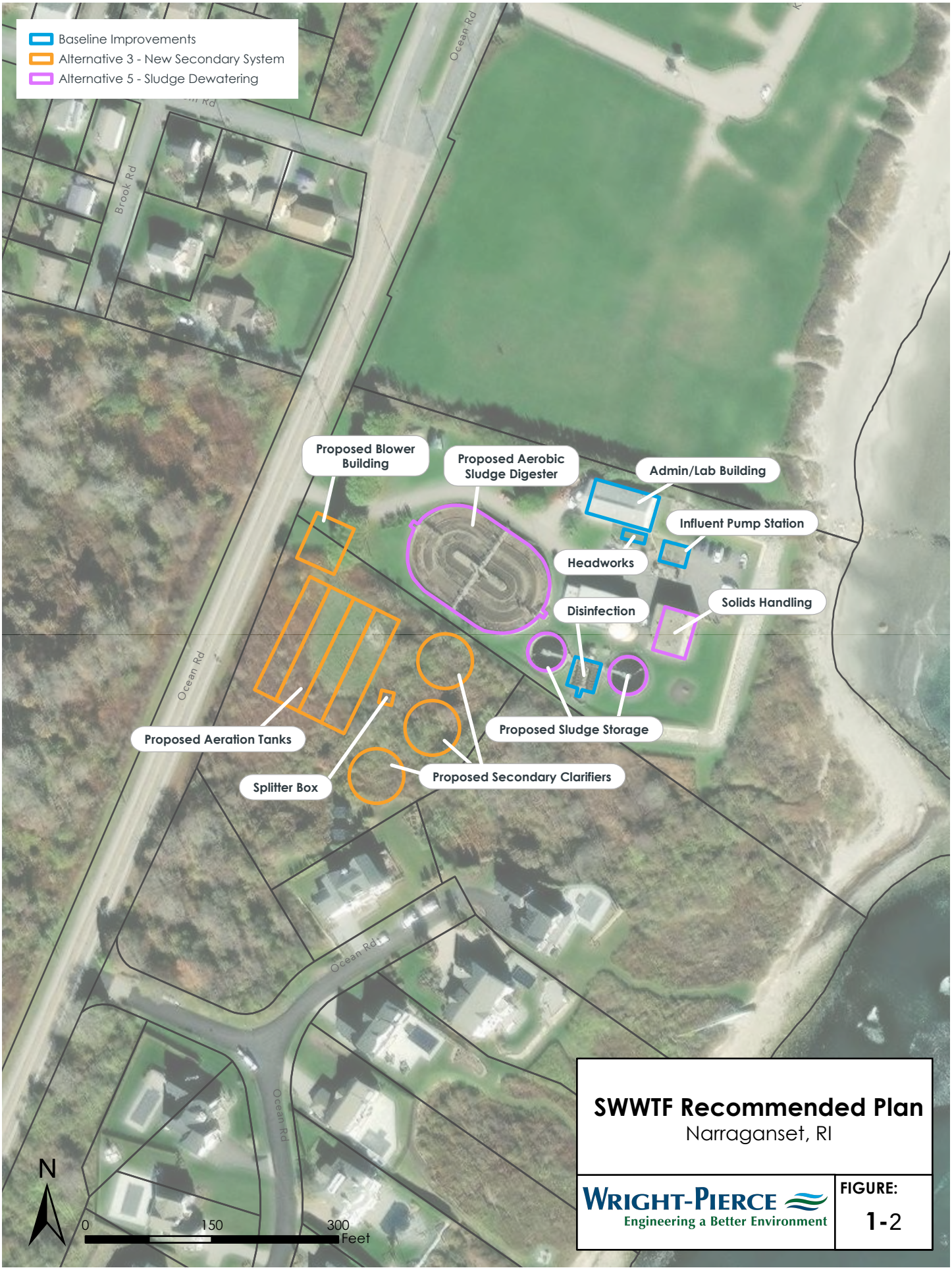


SWWTF New Secondary Treatment
Narraganset, RI

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FIGURE: 1-1

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SWWTF Recommended Plan

Narraganset, RI

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FIGURE: 1-2

JA W:\GIS_Development\Projects\RI\Narragansett\21517_ComprehensiveWWFP\MXDs\ReportFigures.aprx - SWWTFRecommendation_8x11

1.5.2 Collection System

The recommended plan for the collection system includes sewer expansion in areas with high concentrations of onsite wastewater treatment systems in areas with less than ideal soil conditions for proper OWTS functioning. Pump station improvements include capacity upgrades to meet future flow projections, and upgrades due to age/condition of equipment. The recommended plan for the collection system and pump stations are summarized in **Table 1-4**, **Table 1-5**, and **Table 1-6**.

Table 1-4 Summary of Collection System Expansion

Service Area	Cost	Description
Wandsworth Street	$18.9M	Pump Station, gravity and low pressure sewers, tributary to Lakewood PS
Bonnet Point	$11.3M	Low pressure sewer, tributary to Wolfe PS
Great Island	$27M	Pump Station, gravity and low pressure sewers, tributary to Galilee PS
Harbor Island	$26M	Pump Station, gravity and low pressure sewers, tributary to Briggs Farm PS
Baltimore Avenue	$5.4M	Gravity sewer, tributary to Burnside PS
Alexander Drive	$950,000	Gravity sewer, tributary to Burnside PS
Sunset Boulevard	$4.8M	Low pressure sewer, tributary to SWWTF by Point Judith Road Interceptor
Calef Avenue	$7.2M	Low pressure sewer, tributary to Point Judith PS
Sand Hill Cove Road	$3.1M	Low pressure sewer, tributary to Galilee PS
Total	$104.6M	

Table 1-5 Summary of Pump Station Recommendations North

Service Area	Cost	Description
Baneberry Pump Station	$550,000	Upgrade the electrical system.
Bonnet Shores Pump Station	$50,000	Replace equipment in-kind as needed. Install flood proofing improvements at pump station.
Circuit Pump Station	$1.5M	Comprehensive pump station upgrade due to age and condition of equipment.
Congdon Pump Station	$500,000	Upgrade pumps to meet future peak flows when required.
Industrial Park Pump Station	$640,000	Comprehensive pump station upgrade due to age and condition of equipment.
Lakewood Pump Station	$600,000	Comprehensive pump station upgrade due to age and condition of equipment.
Mettatuxet Pump Station	$200,000	Perform mechanical, electrical, and flood proofing improvements to the pump station.
Mumford Pump Station	$310,000	Upgrade the building's exterior.
Ouida Pump Station	$2.7M	Upgrade equipment in grit room, and replace process, mechanical, and electrical equipment as needed.
Seaport Pump Station	$200,000	Replace equipment in-kind as needed.
Sprague Pump Station	$650,000	Upgrade the electrical system, HVAC/mechanical upgrades, and building improvements.
Wilson Pump Station	$3.0M	Upgrade the pump station building.
Winterberry Pump Station	$3.4M	Upgrade the electrical system, and replace equipment in-kind as needed.
Wolfe Pump Station	$500,000	Comprehensive pump station upgrade due to age and condition of equipment.
Total	$14.8M	

Table 1-6 Pump Station Recommendations South

Service Area	Total Cost	Description
Briggs Farm Pump Station	$325,000	Replace equipment in-kind as needed.
Burnside Pump Station	$2.0M	Upgrade pumps to meet peak flows.
Galilee Pump Station	$4.0M	Comprehensive pump station upgrade due to age and condition of structure and equipment.
Point Judith Pump Station	$1.5M	Upgrade pumps to meet future peak flows when required. Perform flood proofing improvements.
Stanton Pump Station	$2.0M	Upgrade pumps to meet future peak flows when required, perform equipment upgrades and flood proofing improvements.
Total	$9.8M	

History

Shipments | Batch Shipments | USPS Stamps | Shipping Label Refunds | Postage | USPS Stamps Refunds

Export | Job Status | All Carriers | All Shipments | Year to Date

DATE	RECIPIENT	SERVICE	TRACKING NUMBER	STATUS	AMOUNT	USER	COST
6/4/25	John Brown	First-Class Mail®	Tracking Number Unavailable	Label Printed	$2.87	brenda.strohm@wright-pierce.com	

Recipient Address
John Brown
Narrangansett Tribal Historic Preserv.
4425 S County Trl
Charlestown, RI 02813-3655, US

Sender Address
Brenda Strohm
Wright-Pierce
40 Westminster St, Ste 950
Providence, RI 02903-2525, US

Carrier Account
Sender: 2000234935 - USPS

Tracking Number
Tracking Number Unavailable

User
brenda.strohm@wright-pierce.com

Purchased On
6/4/25, 2:36 PM

Shipped On
6/4/25

Shipment Information
My Envelope
6 oz

Total Billable Weight
6 oz

Accounting and Reference
Memo/Reference: 21517/B.20/WWRI

Service	Extra Service	Amount
☐ First-Class Mail® - $2.87		$2.87

Andrew Smith

From:	Andrew Smith
Sent:	Wednesday, June 4, 2025 1:42 PM
To:	jwillis@crmc.ri.gov
Cc:	Scott Goodinson; Jonathan Gerhard
Subject:	Intergovernmental Review, Narragansett Wastewater Facilities Plan
Attachments:	Narragansett WWFP Jeffery Willis, Executive Director.pdf

Dear Mr. Willis,

On behalf of the Town of Narragansett, Wright-Pierce is submitting a summary of our ongoing Wastewater Facility Planning efforts for your agency's review and comment. The project consists of planning upgrades for the Scarborough Wastewater Treatment Facility. Specifically, the facility requires upgrades to reliably meet its Rhode Island Pollution Discharge Elimination System (RIPDES) Permit due to the age of the facility. This planning project also considers the wastewater infrastructure requirements to support and develop the fishing industry in the Port of Galilee and address future town-wide wastewater treatment and conveyance needs.

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Sincerely,

Andrew

Andrew Smith, PE
Wright-Pierce | Project Manager
direct 401.808.8307 | **office** 401.383.2276

WRIGHT-PIERCE
Engineering a Better Environment

Andrew Smith

From:	Lisa Turner <lturner@crmc.ri.gov>
Sent:	Monday, June 16, 2025 3:07 PM
To:	Andrew Smith
Cc:	jgerhard@narragansettri.gov
Subject:	CRMC Information Req - CRMC File 2025-06-020 Town of Narragansett WWTF
Attachments:	CRMC Information Req - 2025-06-020 Town of Narragansett WWTF.pdf

This message was sent from outside your organization.

Good Afternoon Mr. Smith and Mr. Gehard: The attached is being sent on behalf of CRMC reviewing staff – Amy Silva and Rich Lucia.

Thank you!

Cordially,

Lisa Turner

Lisa A. Turner, Programming Services Officer
aka Office Manager and Record Keeper
Coastal Resources Management Council
Oliver Stedman Government Center
4808 Tower Hill Road; Room 116
Wakefield, RI 02879
401-783-3370

State of Rhode Island
Coastal Resources Management Council
Oliver H. Stedman Government Center
4808 Tower Hill Road, Suite 3
Wakefield, RI 02879-1900

(401) 783-3370
Email: cstaff1@crmc.ri.gov

June 11, 2025

Town of Narragansett
25 Fifth Avenue
Narragansett, RI 02882

RE:		
	File Number:	A2025-06-020
	Owner:	Town of Narragansett
	Site Address:	990 Ocean Road, Narragansett; Plat: K Lot: 496
	Project Desc:	Wastewater Treatment Facility

To Whom it May Concern:

The CRMC is currently reviewing your application and has concerns that need to be addressed before further review can proceed. Please address the following issues so staff can complete review of your application:

Please note that there are freshwater wetlands regulated by the CRMC on or in close proximity to the subject property. The recent changes to the Freshwater Wetlands classifications, Jurisdictional Areas, Buffers and Setbacks must be addressed, as it is likely that this proposal at a minimum falls within the Jurisdictional Area of nearby wetlands, and possibly falls within the required Buffer Zone. (Ref 650-RICR-20-00-9).

Prior to any future action, Staff recommends the delineation and classification of all nearby wetlands and confirmation by CRMC through a Freshwater Wetlands "Request to Verify Wetlands Edge" Application (https://www.crmc.ri.gov/applicationforms/FWW_Application.pdf).

If you have any questions regarding this letter, please contact the office.

Sincerely,

Amy Silva
Permitting Staff
Coastal Resources Management Council

CC: Andrew Smith, Wright-Pierce (andrew.smith@wright-pierce.com)

Andrew Smith

From:	Andrew Smith
Sent:	Wednesday, June 4, 2025 1:44 PM
To:	Phillip.Edwards@dem.ri.gov
Cc:	Scott Goodinson; Jonathan Gerhard
Subject:	Intergovernmental Review, Narragansett Wastewater Facilities Plan
Attachments:	Narragansett WWFP Phillip Edwards.pdf

Mr. Edwards,

On behalf of the Town of Narragansett, Wright-Pierce is submitting a summary of our ongoing Wastewater Facility Planning efforts for your agency's review and comment. The project consists of planning upgrades for the Scarborough Wastewater Treatment Facility. Specifically, the facility requires upgrades to reliably meet its Rhode Island Pollution Discharge Elimination System (RIPDES) Permit due to the age of the facility. This planning project also considers the wastewater infrastructure requirements to support and develop the fishing industry in the Port of Galilee and address future town-wide wastewater treatment and conveyance needs.

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Sincerely,

Andrew

Andrew Smith, PE
Wright-Pierce | Project Manager
direct 401.808.8307 | **office** 401.383.2276

WRIGHT-PIERCE
Engineering a Better Environment

Andrew Smith

From:	Andrew Smith
Sent:	Wednesday, June 4, 2025 1:47 PM
To:	dgregg@rinhs.org
Cc:	Scott Goodinson; Jonathan Gerhard
Subject:	Intergovernmental Review, Narragansett Wastewater Facilities Plan
Attachments:	Narragansett WWFP David W. Gregg.pdf

Mr. Gregg,

On behalf of the Town of Narragansett, Wright-Pierce is submitting a summary of our ongoing Wastewater Facility Planning efforts for your agency's review and comment. The project consists of planning upgrades for the Scarborough Wastewater Treatment Facility. Specifically, the facility requires upgrades to reliably meet its Rhode Island Pollution Discharge Elimination System (RIPDES) Permit due to the age of the facility. This planning project also considers the wastewater infrastructure requirements to support and develop the fishing industry in the Port of Galilee and address future town-wide wastewater treatment and conveyance needs.

We trust the information provided will be sufficient for your review. We will assume your agency has no questions or comments regarding the project if not received by this office after June 25, 2025. Should you have any questions or comments, please contact me at 401-808-8307 or andrew.smith@wright-pierce.com.

Sincerely,

Andrew

Andrew Smith, PE
Wright-Pierce | Project Manager
direct 401.808.8307 | **office** 401.383.2276

WRIGHT-PIERCE
Engineering a Better Environment

Andrew Smith

From:	Andrew Smith
Sent:	Wednesday, June 4, 2025 1:50 PM
To:	Sabrina.Pereira@noaa.gov
Cc:	Jonathan Gerhard; Scott Goodinson
Subject:	Intergovernmental Review, Narragansett Wastewater Facilities Plan
Attachments:	Narragansett WWFP Sabrina Pereira.pdf

Dear Ms. Pereira,

On behalf of the Town of Narragansett, Wright-Pierce is submitting a summary of our ongoing Wastewater Facility Planning efforts for your agency's review and comment. The project consists of planning upgrades for the Scarborough Wastewater Treatment Facility. Specifically, the facility requires upgrades to reliably meet its Rhode Island Pollution Discharge Elimination System (RIPDES) Permit due to the age of the facility. This planning project also considers the wastewater infrastructure requirements to support and develop the fishing industry in the Port of Galilee and address future town-wide wastewater treatment and conveyance needs.

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Sincerely,

Andrew

Andrew Smith, PE
Wright-Pierce | Project Manager
direct 401.808.8307 | **office** 401.383.2276

WRIGHT-PIERCE
Engineering a Better Environment

Andrew Smith

From: Sabrina Pereira - NOAA Federal <sabrina.pereira@noaa.gov>
Sent: Monday, June 23, 2025 12:49 PM
To: Andrew Smith
Cc: Jonathan Gerhard; Scott Goodinson
Subject: Re: Intergovernmental Review, Narragansett Wastewater Facilities Plan

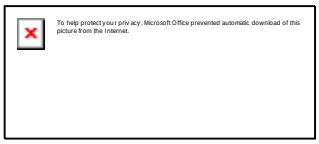
This message was sent from outside your organization.

Hi Andrew,

Thanks for sharing this wastewater facility plan. I don't have any comments or questions at this time. If any in-water work that may adversely affect Essential Fish Habitat (EFH) is proposed for the chosen alternative, then the Federal action agency issuing the permit (likely EPA or USACE) would need to complete an EFH consultation with us.

Thanks again, and please let me know if you have any questions.

Sabrina Pereira
Marine Habitat Resource Specialist
Greater Atlantic Regional Fisheries Office (GARFO)
NOAA Fisheries | U.S. Department of Commerce
Narragansett, RI
Office: (978)-675-2178
www.fisheries.noaa.gov





On Wed, Jun 4, 2025 at 1:52 PM Andrew Smith <andrew.smith@wright-pierce.com> wrote:

> Dear Ms. Pereira,
>
> On behalf of the Town of Narragansett, Wright-Pierce is submitting a summary of our ongoing Wastewater
>
> Facility Planning efforts for your agency's review and comment. The project consists of planning upgrades for

the Scarborough Wastewater Treatment Facility. Specifically, the facility requires upgrades to reliably meet its

Rhode Island Pollution Discharge Elimination System (RIPDES) Permit due to the age of the facility. This

planning project also considers the wastewater infrastructure requirements to support and develop the fishing

industry in the Port of Galilee and address future town-wide wastewater treatment and conveyance needs.

We trust the information provided will be sufficient for your review. We will assume your agency has no

questions or comments regarding the project if not received by this office after June 25, 2025. Should you

have any questions or comments, please contact me at 401-808-8307 or andrew.smith@wright-pierce.com.

Sincerely,

Andrew

Andrew Smith, PE

Wright-Pierce | Project Manager
direct 401.808.8307 | **office** 401.383.2276



Andrew Smith

From:	Andrew Smith
Sent:	Wednesday, June 4, 2025 1:52 PM
To:	Jim.turenne@usda.gov
Cc:	Scott Goodinson; Jonathan Gerhard
Subject:	Intergovernmental Review, Narragansett Wastewater Facilities Plan
Attachments:	Narragansett WWFP Jim Turenne.pdf

Mr. Turenne,

On behalf of the Town of Narragansett, Wright-Pierce is submitting a summary of our ongoing Wastewater Facility Planning efforts for your agency's review and comment. The project consists of planning upgrades for the Scarborough Wastewater Treatment Facility. Specifically, the facility requires upgrades to reliably meet its Rhode Island Pollution Discharge Elimination System (RIPDES) Permit due to the age of the facility. This planning project also considers the wastewater infrastructure requirements to support and develop the fishing industry in the Port of Galilee and address future town-wide wastewater treatment and conveyance needs.

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Sincerely,

Andrew

Andrew Smith, PE
Wright-Pierce | Project Manager
direct 401.808.8307 | **office** 401.383.2276

WRIGHT-PIERCE
Engineering a Better Environment

Andrew Smith

From: Turenne, Jim - FPAC-NRCS, RI <jim.turenne@usda.gov>
Sent: Thursday, June 5, 2025 7:49 AM
To: Andrew Smith
Cc: Scott Goodinson; Jonathan Gerhard; Spears, Cassius - FPAC-NRCS, RI
Subject: RE: [EXTERNAL: Suspicious Link]Intergovernmental Review, Narragansett Wastewater Facilities Plan

This message was sent from outside your organization.

Hi Folks – I sent this to other members of our resources team, but I do not think there are any concerns for the NRCS on this project. The only act we are responsible for if the Farmland Protection Policy Act - https://www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/land/cropland/farmland-protection-policy-act

The funding federal agency would submit to us an AD-1006 form with their sections filled out if their funds impacted prime farmland soils. Since this site is already committed to urban uses and does not impact prime farmlands the form is not needed.

Thanks for sending us the request.

From: Andrew Smith <andrew.smith@wright-pierce.com>
Sent: Wednesday, June 4, 2025 1:52 PM
To: Turenne, Jim - FPAC-NRCS, RI <jim.turenne@usda.gov>
Cc: Scott Goodinson <sgoodinson@narragansettri.gov>; Jonathan Gerhard <jgerhard@narragansettri.gov>
Subject: [EXTERNAL: Suspicious Link]Intergovernmental Review, Narragansett Wastewater Facilities Plan

You don't often get email from andrew.smith@wright-pierce.com. Learn why this is important

CAUTION: This message triggered warnings of **potentially** malicious web content. Consider whether you are expecting the message, along with inspection for suspicious links, prior to clicking. Any concerns with known senders, use a good contact method to verify.
Send Questions or Suspicious messages to: Spam.Abuse@usda.gov

Mr. Turenne,

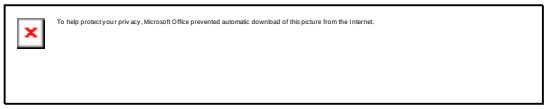
On behalf of the Town of Narragansett, Wright-Pierce is submitting a summary of our ongoing Wastewater Facility Planning efforts for your agency's review and comment. The project consists of planning upgrades for the Scarborough Wastewater Treatment Facility. Specifically, the facility requires upgrades to reliably meet its Rhode Island Pollution Discharge Elimination System (RIPDES) Permit due to the age of the facility. This planning project also considers the wastewater infrastructure requirements to support and develop the fishing industry in the Port of Galilee and address future town-wide wastewater treatment and conveyance needs.

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Sincerely,

Andrew

Andrew Smith, PE
Wright-Pierce | Project Manager
direct 401.808.8307 | **office** 401.383.2276



This electronic message contains information generated by the USDA solely for the intended recipients. Any unauthorized interception of this message or the use or disclosure of the information it contains may violate the law and subject the violator to civil or criminal penalties. If you believe you have received this message in error, please notify the sender and delete the email immediately.

Andrew Smith

From:	Andrew Smith
Sent:	Wednesday, June 4, 2025 1:54 PM
To:	Joseph.Antonio@dem.ri.gov
Cc:	Scott Goodinson; Jonathan Gerhard
Subject:	Intergovernmental Review, Narragansett Wastewater Facilities Plan
Attachments:	Narragansett WWFP Joseph Antonio.pdf

Mr. Antonio,

On behalf of the Town of Narragansett, Wright-Pierce is submitting a summary of our ongoing Wastewater Facility Planning efforts for your agency's review and comment. The project consists of planning upgrades for the Scarborough Wastewater Treatment Facility. Specifically, the facility requires upgrades to reliably meet its Rhode Island Pollution Discharge Elimination System (RIPDES) Permit due to the age of the facility. This planning project also considers the wastewater infrastructure requirements to support and develop the fishing industry in the Port of Galilee and address future town-wide wastewater treatment and conveyance needs.

We trust the information provided will be sufficient for your review. We will assume your agency has no questions or comments regarding the project if not received by this office after June 25, 2025. Should you have any questions or comments, please contact me at 401-808-8307 or andrew.smith@wright-pierce.com.

Sincerely,

Andrew

Andrew Smith, PE
Wright-Pierce | Project Manager
direct 401.808.8307 | **office** 401.383.2276

WRIGHT-PIERCE
Engineering a Better Environment

Andrew Smith

From:	Andrew Smith
Sent:	Wednesday, June 4, 2025 1:56 PM
To:	Nancy.Hess@doa.ri.gov
Cc:	Scott Goodinson; Jonathan Gerhard
Subject:	Intergovernmental Review, Narragansett Wastewater Facilities Plan
Attachments:	Narragansett WWFP Nancy Hess.pdf

Ms. Hess,

On behalf of the Town of Narragansett, Wright-Pierce is submitting a summary of our ongoing Wastewater Facility Planning efforts for your agency's review and comment. The project consists of planning upgrades for the Scarborough Wastewater Treatment Facility. Specifically, the facility requires upgrades to reliably meet its Rhode Island Pollution Discharge Elimination System (RIPDES) Permit due to the age of the facility. This planning project also considers the wastewater infrastructure requirements to support and develop the fishing industry in the Port of Galilee and address future town-wide wastewater treatment and conveyance needs.

We trust the information provided will be sufficient for your review. We will assume your agency has no questions or comments regarding the project if not received by this office after June 25, 2025. Should you have any questions or comments, please contact me at 401-808-8307 or andrew.smith@wright-pierce.com.

Sincerely,

Andrew

Andrew Smith, PE
Wright-Pierce | Project Manager
direct 401.808.8307 | **office** 401.383.2276

WRIGHT-PIERCE
Engineering a Better Environment

Andrew Smith

From: Hess, Nancy (DOA) <Nancy.Hess@doa.ri.gov>
Sent: Monday, July 7, 2025 10:40 AM
To: Andrew Smith
Cc: Scott Goodinson; Jonathan Gerhard
Subject: RE: Intergovernmental Review, Narragansett Wastewater Facilities Plan

This message was sent from outside your organization.

Andrew

Pursuant to a request from Wright-Pierce received by email, June 4, 2025, I am pleased to notify you that the Division of Statewide Planning Land Use and Education Unit has completed its review of the above referenced project. The purpose of the Update is to evaluate the Town of Narragansett's wastewater needs for the next 20-year planning period. The Plant serves the southern end of Narragansett, and the Port of Galilee. It is understood from the materials submitted, that the Plant's effluent limits are governed by the Rhode Island Pollutant Discharge Elimination System (RIPDES) Permit No. RI0100188 and these limits will essentially drive the capacity of the Plant to handle future needs. The Update identified numerous facility and collection infrastructure upgrades/ and alternatives that will not expand the overall capacity of the Plant/system but are needed for maintaining reliable operation in the 20-year planning horizon for continued compliance with the RIDES permit.

Based upon the materials in the materials provided by Wright-Pierce, we have determined that the Facility Plan Update to for the existing Scarborough Wastewater Treatment Plant operated by the Town of Narragansett is consistent with the applicable land use and natural resource elements of the State Guide Plan (SGP) addressing water quality concerns.

Thank you for the opportunity to comment on the project. Should you have any questions, please feel free to contact me.
Nancy

Nancy Hess
Interdepartmental Project Manager
State of RI - Division of Statewide Planning
235 Promenade Street, Suite 230
Providence, RI 02908
www.planning.ri.gov

From: Andrew Smith <andrew.smith@wright-pierce.com>
Sent: Thursday, June 5, 2025 8:35 AM
To: Hess, Nancy (DOA) <Nancy.Hess@doa.ri.gov>
Cc: Scott Goodinson <sgoodinson@narragansettri.gov>; Jonathan Gerhard <jgerhard@narragansettri.gov>
Subject: RE: Intergovernmental Review, Narragansett Wastewater Facilities Plan

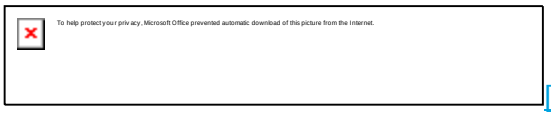
Nancy, thank you. I will look for any comments by July 3 as is your practice with DEM.

We are running up against some funding deadlines to complete this project, so if you can return comments sooner it would be greatly appreciated.

Thanks,

Andrew

Andrew Smith, PE
Wright-Pierce | Project Manager
direct 401.808.8307 | **office** 401.383.2276



[wright-pierce.com]

From: Hess, Nancy (DOA) <Nancy.Hess@doa.ri.gov>
Sent: Thursday, June 5, 2025 7:58 AM
To: Andrew Smith <andrew.smith@wright-pierce.com>
Cc: Scott Goodinson <sgoodinson@narragansettri.gov>; Jonathan Gerhard <jgerhard@narragansettri.gov>
Subject: RE: Intergovernmental Review, Narragansett Wastewater Facilities Plan

Hello Andrew
Thank for the materials. We by agreement /past practices with DEM have 30 days from receipt of the ask for these reviews. We will get back to you on or before July 3, 2025.

Nancy

Nancy Hess
Interdepartmental Project Manager
State of RI - Division of Statewide Planning
235 Promenade Street, Suite 230
Providence, RI 02908
www.planning.ri.gov

From: Andrew Smith <andrew.smith@wright-pierce.com>
Sent: Wednesday, June 4, 2025 1:56 PM
To: Hess, Nancy (DOA) <Nancy.Hess@doa.ri.gov>
Cc: Scott Goodinson <sgoodinson@narragansettri.gov>; Jonathan Gerhard <jgerhard@narragansettri.gov>
Subject: Intergovernmental Review, Narragansett Wastewater Facilities Plan

Ms. Hess,

On behalf of the Town of Narragansett, Wright-Pierce is submitting a summary of our ongoing Wastewater Facility Planning efforts for your agency's review and comment. The project consists of planning upgrades for the Scarborough Wastewater Treatment Facility. Specifically, the facility requires upgrades to reliably meet its Rhode Island Pollution Discharge Elimination System (RIPDES) Permit due to the age of the facility. This planning project also considers the wastewater infrastructure requirements to support and develop the fishing industry in the Port of Galilee and address future town-wide wastewater treatment and conveyance needs.

We trust the information provided will be sufficient for your review. We will assume your agency has no

questions or comments regarding the project if not received by this office after June 25, 2025. Should you have any questions or comments, please contact me at 401-808-8307 or andrew.smith@wright-pierce.com.

Sincerely,

Andrew

Andrew Smith, PE
Wright-Pierce | Project Manager
direct 401.808.8307 | **office** 401.383.2276


[wright-pierce.com] [us-west-2.protection.sophos.com]

Andrew Smith

From:	Andrew Smith
Sent:	Wednesday, June 4, 2025 1:59 PM
To:	Robert.Rocchio@dot.ri.gov
Cc:	Jonathan Gerhard; Scott Goodinson
Subject:	Intergovernmental Review, Narragansett Wastewater Facilities Plan
Attachments:	Narragansett WWFP Robert Rocchio, P.E..pdf

Mr. Rocchio,

On behalf of the Town of Narragansett, Wright-Pierce is submitting a summary of our ongoing Wastewater Facility Planning efforts for your agency's review and comment. The project consists of planning upgrades for the Scarborough Wastewater Treatment Facility. Specifically, the facility requires upgrades to reliably meet its Rhode Island Pollution Discharge Elimination System (RIPDES) Permit due to the age of the facility. This planning project also considers the wastewater infrastructure requirements to support and develop the fishing industry in the Port of Galilee and address future town-wide wastewater treatment and conveyance needs.

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Sincerely,

Andrew

Andrew Smith, PE
Wright-Pierce | Project Manager
direct 401.808.8307 | **office** 401.383.2276

WRIGHT-PIERCE
Engineering a Better Environment

Andrew Smith

From:	Andrew Smith
Sent:	Wednesday, June 4, 2025 2:01 PM
To:	Lauren_Bonatakis@nps.gov
Cc:	Jonathan Gerhard; Scott Goodinson
Subject:	Intergovernmental Review, Narragansett Wastewater Facilities Plan
Attachments:	Narragansett WWFP Lauren Bonatakis.pdf

Ms. Bonatakis,

On behalf of the Town of Narragansett, Wright-Pierce is submitting a summary of our ongoing Wastewater Facility Planning efforts for your agency's review and comment. The project consists of planning upgrades for the Scarborough Wastewater Treatment Facility. Specifically, the facility requires upgrades to reliably meet its Rhode Island Pollution Discharge Elimination System (RIPDES) Permit due to the age of the facility. This planning project also considers the wastewater infrastructure requirements to support and develop the fishing industry in the Port of Galilee and address future town-wide wastewater treatment and conveyance needs.

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Sincerely,

Andrew

Andrew Smith, PE
Wright-Pierce | Project Manager
direct 401.808.8307 | **office** 401.383.2276

WRIGHT-PIERCE
Engineering a Better Environment

Andrew Smith

From: Bonatakis, Lauren E <lauren_bonatakis@nps.gov>
Sent: Friday, June 13, 2025 2:21 PM
To: Andrew Smith
Cc: Jonathan Gerhard; Scott Goodinson
Subject: Re: [EXTERNAL] Intergovernmental Review, Narragansett Wastewater Facilities Plan

This message was sent from outside your organization.

Hi Andrew,

Thank you for reaching out. This project is located outside the boundaries of designated Wild and Scenic Rivers and therefore is not under the purview of the National Park Service. I appreciate your due diligence and wish you luck with continued planning for this project.

Please let me know if you have any additional questions.

Thanks,
Lauren

Lauren Bonatakis
Natural Resource Specialist / River Manager
Partnership Wild and Scenic Rivers Program
National Park Service
Interior Region 1 - North Atlantic-Appalachian
617-599-6802 | lauren_bonatakis@nps.gov
Hours: Monday-Friday 7:30a - 4:00p

PARTNERSHIP
WILD & SCENIC RIVERS
www.nps.gov/pwsr

From: Andrew Smith <andrew.smith@wright-pierce.com>
Sent: Wednesday, June 4, 2025 2:00 PM
To: Bonatakis, Lauren E <lauren_bonatakis@nps.gov>
Cc: Jonathan Gerhard <jgerhard@narragansettri.gov>; Scott Goodinson <sgoodinson@narragansettri.gov>
Subject: [EXTERNAL] Intergovernmental Review, Narragansett Wastewater Facilities Plan

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Ms. Bonatakis,

On behalf of the Town of Narragansett, Wright-Pierce is submitting a summary of our ongoing Wastewater Facility Planning efforts for your agency's review and comment. The project consists of planning upgrades for the Scarborough Wastewater Treatment Facility. Specifically, the facility requires upgrades to reliably meet its Rhode Island Pollution Discharge Elimination System (RIPDES) Permit due to the age of the facility. This planning project also considers the wastewater infrastructure requirements to support and develop the fishing industry in the Port of Galilee and address future town-wide wastewater treatment and conveyance needs.

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Sincerely,

Andrew

Andrew Smith, PE
Wright-Pierce | Project Manager
direct 401.808.8307 | **office** 401.383.2276



WRIGHT-PIERCE
Engineering a Better Environment

Appendix I
Public Hearing

Board Members
Rupert Friday, Secretary
Stephen R. DeSimone, Member
Thomas Callahan, Member
Joseph O'Neill, Vice Chair
Mark Brady, Chair

Assistant Solicitor
Robert E. Craven, Esq.
Nicholas A. Solitro, Esq.

PLANNING BOARD

MEETING NOTICE AND AGENDA
TUESDAY, JULY 15, 2025
6:00 PM
ASSEMBLY ROOM*

www.narragansettri.gov

Community Development Director
Jill Sabo
Environmental Planning Specialist
Ryan DiPanni
Planning Technician
Amanda Aywas
Board Clerk
Heidi Petrone

This meeting is streamed live on YouTube on the Narragansett Boards channel https://www.youtube.com/@narragansettboards. There will be no remote participation.

Posted: July 9, 2025
*PLEASE NOTE LOCATION CHANGE

CALL TO ORDER
ROLL CALL

A. ADMINISTRATIVE MATTERS
A.1 **Chairman Announcements**

B. RECOMMENDATION TO TOWN COUNCIL
B.1 **Wastewater Facilities Plan**

C. APPROVAL OF MINUTES
C.1 **June 17, 2025**

D. REPORTS FROM STAFF/COUNCIL/BOARD
D.1 **2025 Legislative Updates**
D.2 **Town Council Work Session with Planning Board**: Scheduled for August 6, 2025
D.3 **Urban Renewal Plan Ordinance Update**
D.4 **Planning Board Liaisons Updates:**
- Coastal Access Improvement Committee (CAIC)
- Land Conservancy Trust (LCT)

ADJOURNMENT

Note: Interpreters for the hearing impaired can be made available at any meeting provided a request is received a minimum of three (3) business days prior to said meeting.

From: Jennifer Beck <jbeck@narragansettri.gov>
Sent: Wednesday, July 09, 2025 3:52 PM
To: Heidi Petrone <hpetrone@narragansettri.gov>; Jill Sabo <JSabo@narragansettri.gov>; Amanda Aywas <aaywas@narragansettri.gov>; Ryan DiPanni <rdipanni@narragansettri.gov>
Cc: Katie Campanini <kcampanini@narragansettri.gov>; Sarah Masson <smasson@narragansettri.gov>
Subject: Planning Open Meetings Public Meeting Notice-Posting/Filing Confirmation

SOS confirmation for PB agenda is below.

-Jen

From: Open Government Admin <opengovernment@sos.ri.gov>
Sent: Wednesday, July 9, 2025 3:48 PM
To: Jennifer Beck <jbeck@narragansettri.gov>
Cc: sdicola@sos.ri.gov; swstest2014@gmail.com; tjackson@sos.ri.gov
Subject: [EXTERNAL] Open Meetings Public Meeting Notice-Posting/Filing Confirmation

CAUTION: This email originated from outside of the Town of Narragansett. Do not click links or open attachments unless you know the content is safe.



Dear Jennifer Beck,

This is your electronic confirmation for public meeting notice for the Narragansett Planning Board. This meeting has been scheduled for 07/15/2025 at 06:00 PM.

This notice was electronically filed on the Secretary of State Open Meetings Website on: 07/09/2025 03:47 PM.

Please retain this message as your official proof of electronic filing.

Thank you,

Open Meetings Team
Office of Public Information
RI Department of State | Secretary of State Gregg M. Amore
Email: openmeetings@sos.ri.gov | Website: www.sos.ri.gov | Twitter: @RISecState
82 Smith Street, State House, Room 38, Providence RI | 401-222-3983

Disclaimer

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This email has been scanned for viruses and malware, and may have been automatically archived by Mimecast Ltd, an innovator in Software as a Service (SaaS) for business. Providing a safer and more useful place for your human generated data. Specializing in; Security, archiving and compliance. To find out more Click Here.

Wastewater Facilities Plan Update

Town of Narragansett, Rhode Island

July 15, 2025

Ryan Bodnaruk, PE
Andrew Smith, PE

WRIGHT-PIERCE
Engineering a Better Environment

Presentation Overview

Wastewater Facilities Plan Overview
Collection System
Scarborough WWTF
Regional WWTF
Recommended Plan
Summary and Next Steps
Questions & Discussion

Wastewater Facilities Plan Overview

Town-Wide Planning

- 20-year period
- Unsewered areas
- Economic development
- Key areas of protection and environmental concern

Wastewater Collection System

- Existing pipes
- Pump stations
- Capacity
- I/I Control

Wastewater Treatment Plant

- RIPDES Permit
- Aging equipment
- Capacity

Regional Wastewater Planning

- Regional WWTF
- South Kingstown
- University of Rhode Island
- Capacity

Wastewater Planning is a RIDEM requirement

Wastewater Facilities Plan Process

1. Evaluate Existing Conditions and Identify Future Needs

2. Alternatives Identification and Screening

3. Recommended Plan for 20-Year Planning Period

Wastewater Facilities Plan

1 **Evaluate Existing Conditions and Identify Future Needs**

2 Alternatives Identification and Screening

3 Recommended Plan for 20-year Planning Period

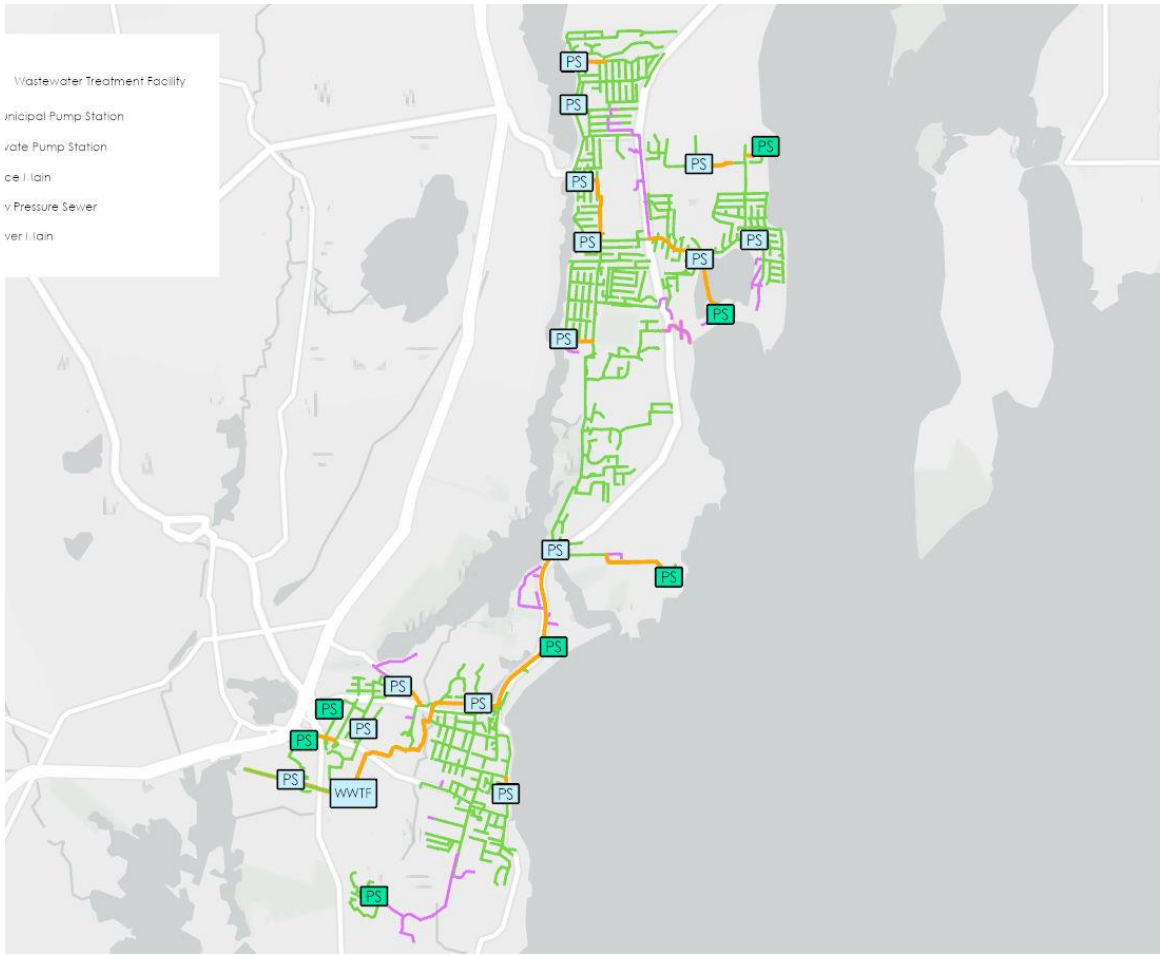
Evaluate Existing Conditions



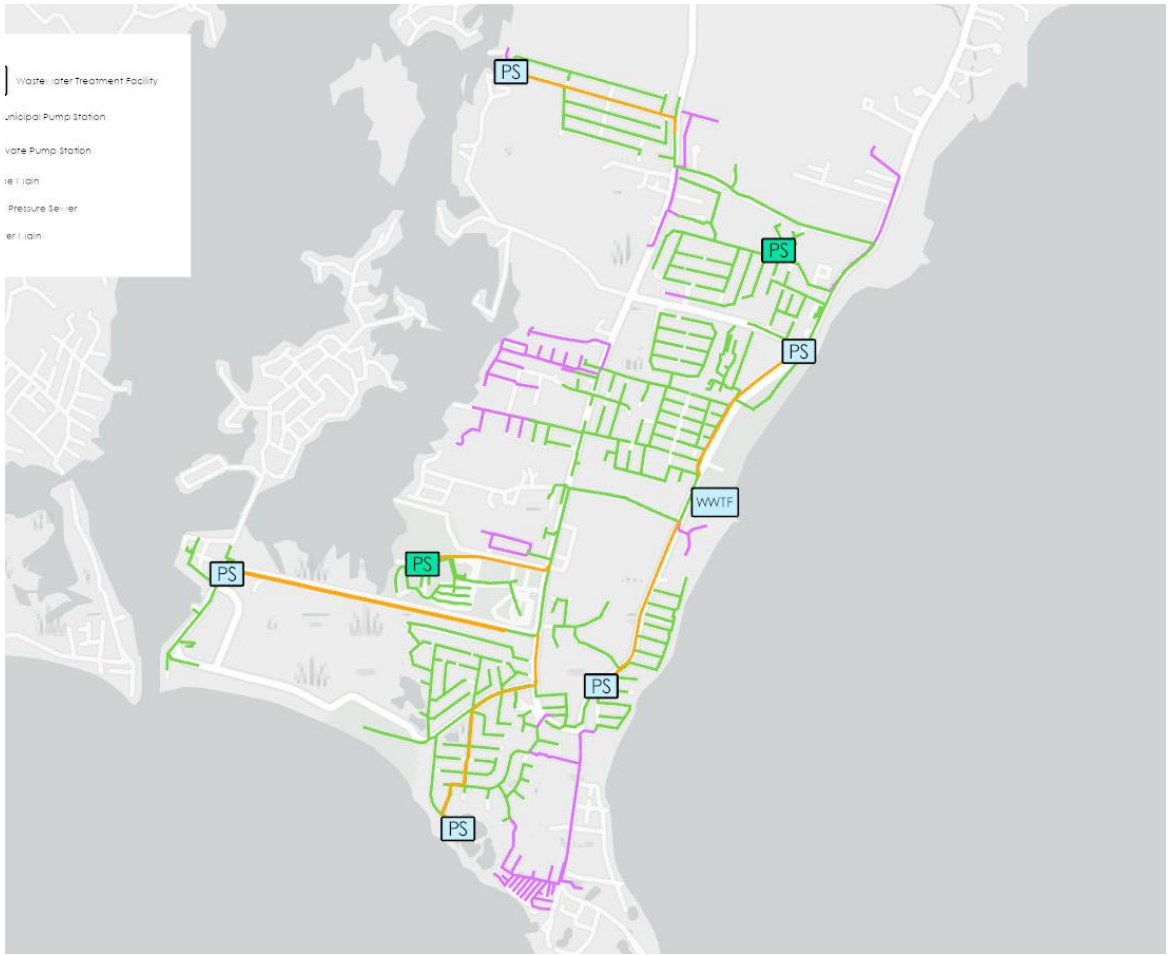
- Planning Area
- Town Demographics
- Environmental Factors
- Community Comprehensive Plan
- Economic Development
- Flows, wasteloads, sewer data
- Condition Assessment of Infrastructure
- Perform wastewater needs assessment

Collection System

North, flows to Regional Plant



South, flows to Scarborough Plant



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Pump Stations Evaluation







Scarborough WWTF Evaluation



Scarborough WWTF Evaluation





Scarborough WWTF Evaluation





Scarborough WWTF Evaluation





Regional WWTF

- 1972 – Original Sewerage Agreement with Regional Partners
- 1991 – Treatment Capacity Expansion
- 1995 - Narragansett begins leasing unused treatment capacity from URI

- Owned Capacity: 1.2197 mgd
- Leased Capacity: 0.200 mgd
- Available Capacity 1.4197 mgd
- Average Daily Flow: 0.750 mgd
- Max 90-Day Avg: 1.44 mgd
- Max Monthly Avg: 1.69 mgd

Partner	1974 Original Capacity mgd	Original Percentage	1991 Expansion Capacity mgd	Total Owned Capacity mgd	Current Owned Percentage
South Kingstown	1.6933	41	0.4350	2.1283	42.6
Narragansett*	0.7847	19	0.4350	1.2197	24.4
University of Rhode Island	1.6520	40	0.00	1.652	33.0
Total	4.13	100	0.870	5.0	100

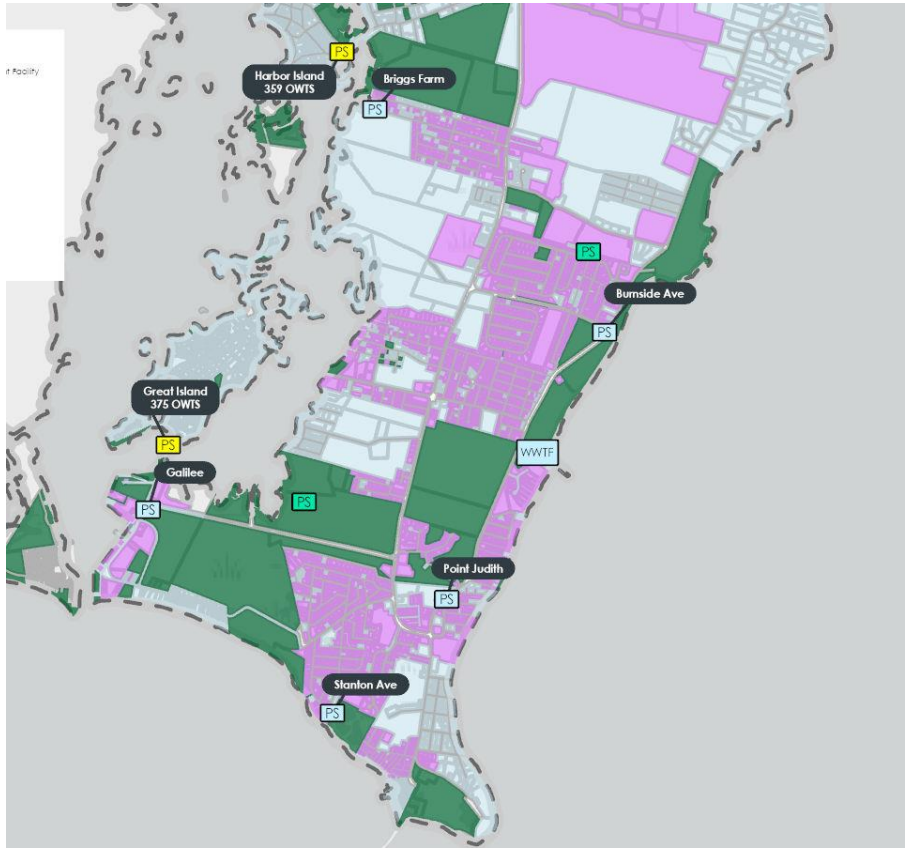
Wastewater Facilities Plan

1 Evaluate Existing Conditions and Identify Future Needs

2 **Alternatives Identification and Screening**

3 Recommended Plan for 20-year Planning Period

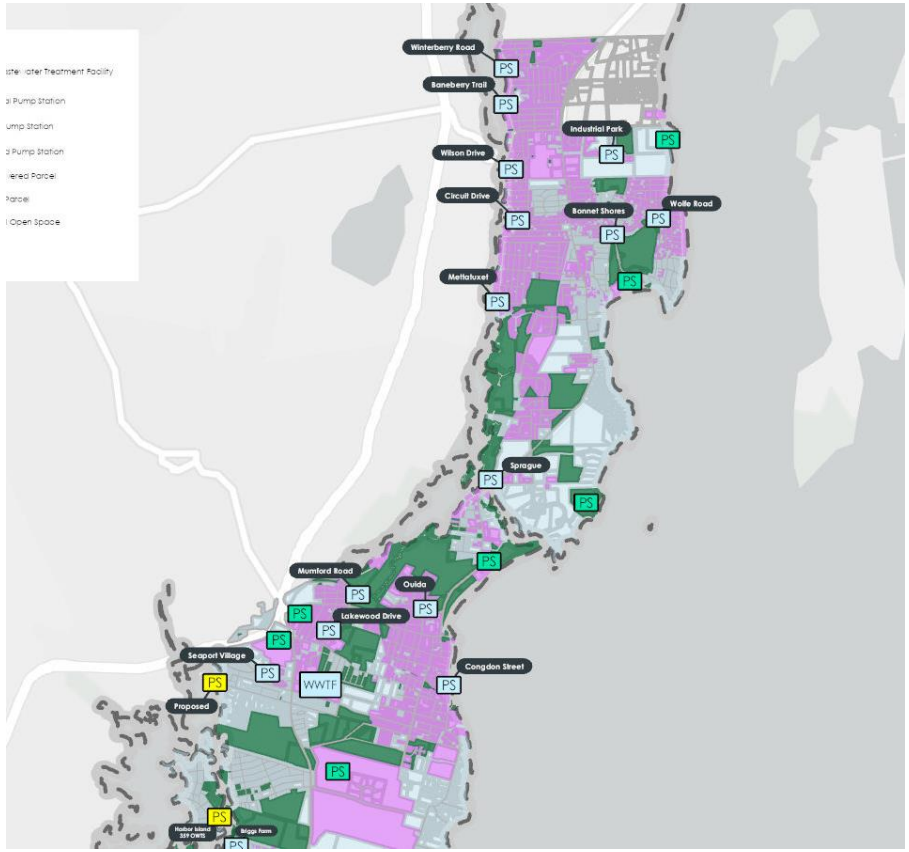
South Collection System



- Sewer System Expansion
- OWTS to Sewer Conversions

- Great Island (375 units), new pump station
- Harbor Island (360 units) , new pump station
- Calef Avenue(75 units)
- Sunset Boulevard (58 units)
- Baltimore Avenue (42 units)
- Sand Hill Cove Road (30 units)

North Collection System



- Sewer System Expansion
- OWTS to Sewer Conversions

- Bonnet Point (205 units)
- Wandsworth Street (268 units)

Pump Stations

Capacity Upgrade Required:

- Burnside Pump Station
- Congdon Pump Station
- Industrial Pump Station
- Stanton Pump Station
- Lakewood Pump Station

Aged Equipment, Upgrade Required:

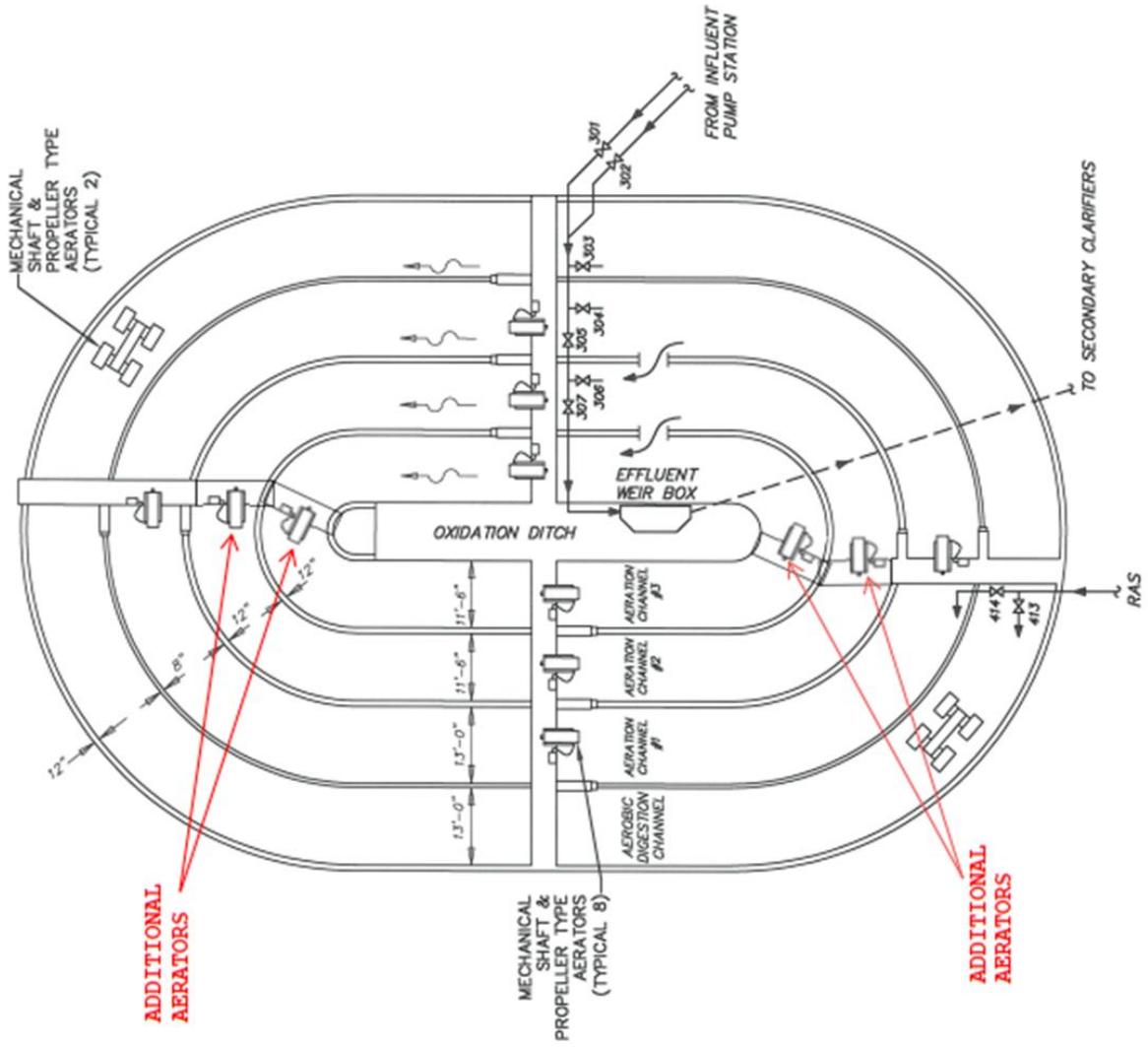
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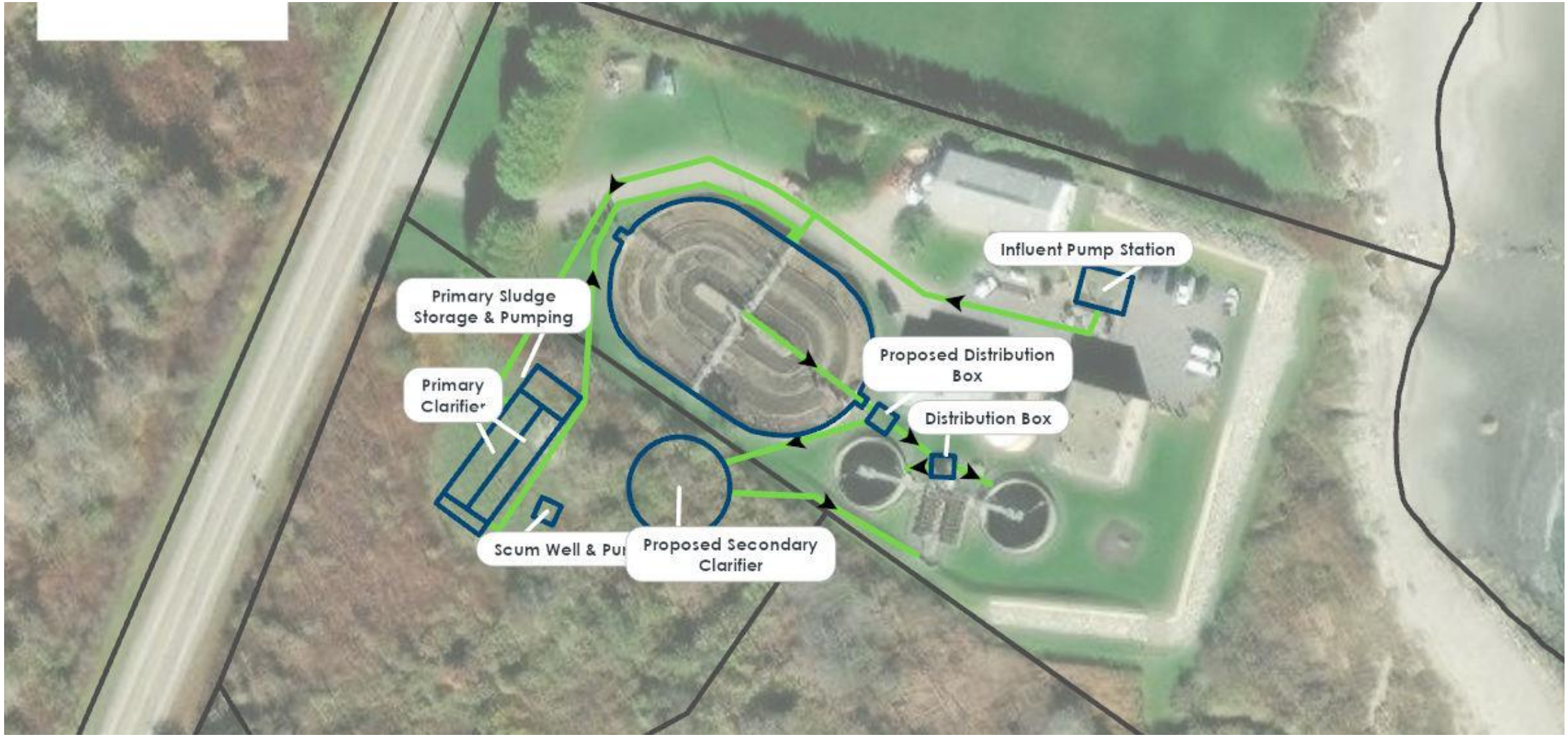
Scarborough Projected Flow and BOD Loading

Parameter	Flow (mgd)	BOD (lbs/day)	TSS (lbs/day)
Future Residential/Commercial (Existing Plus Buildout)			
Annual Average	1.04	1,700	2,000
Maximum Month	1.56	3,600	4,400
Maximum Day	3.44	5,200	7,500
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Maximum Month	1.60	6,300	5,300
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Scarborough WWTF Alternative 1

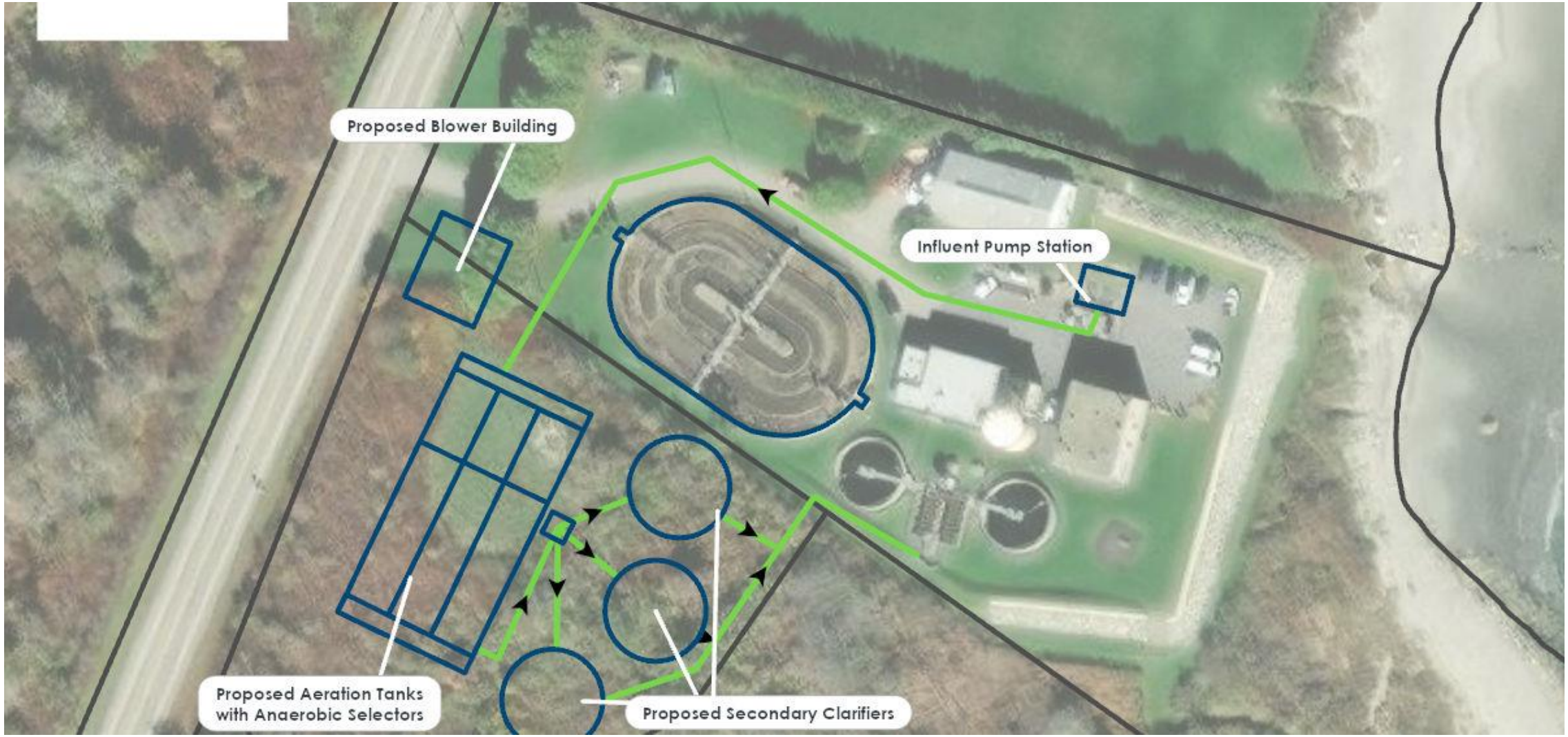


Scarborough WWTF Alternative 2



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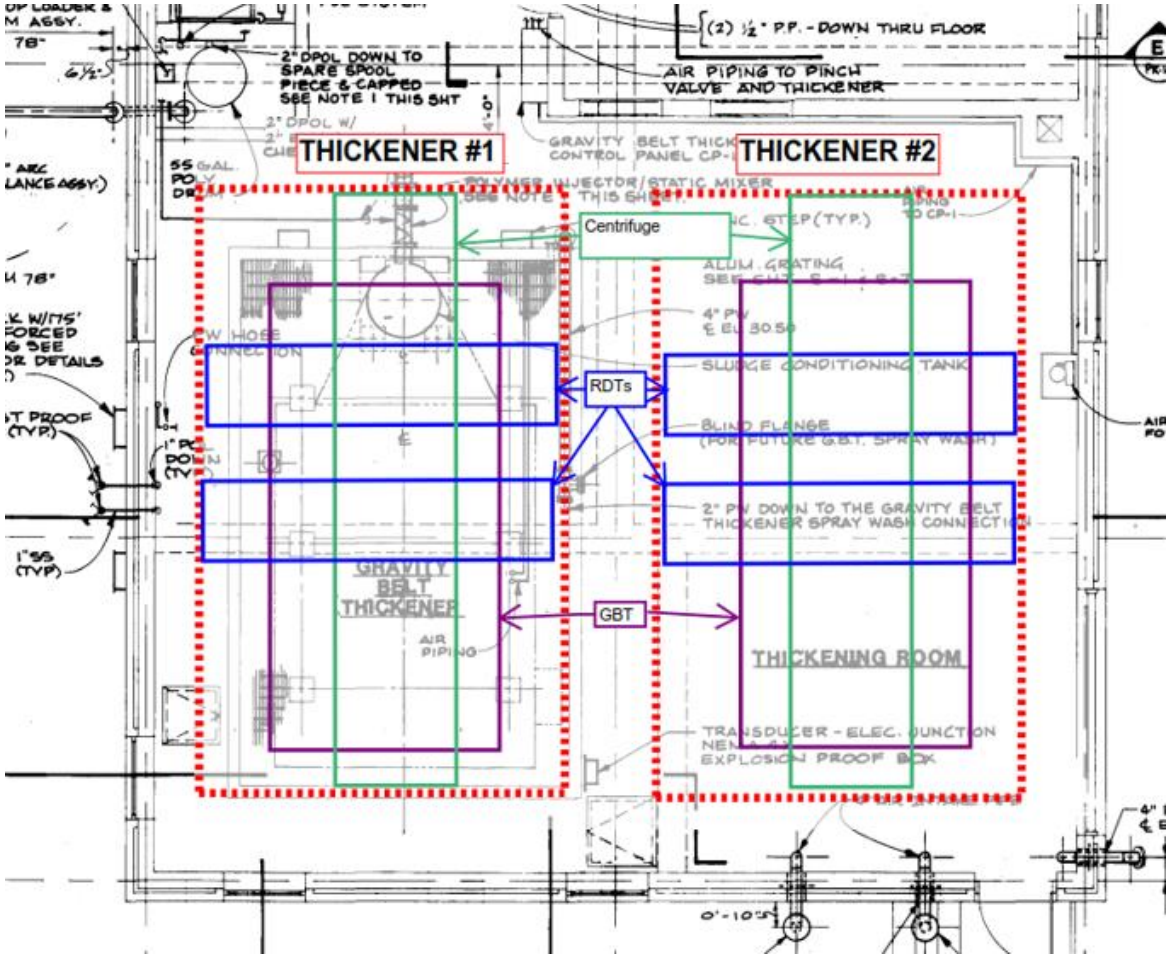
Scarborough WWTF Alternative 3



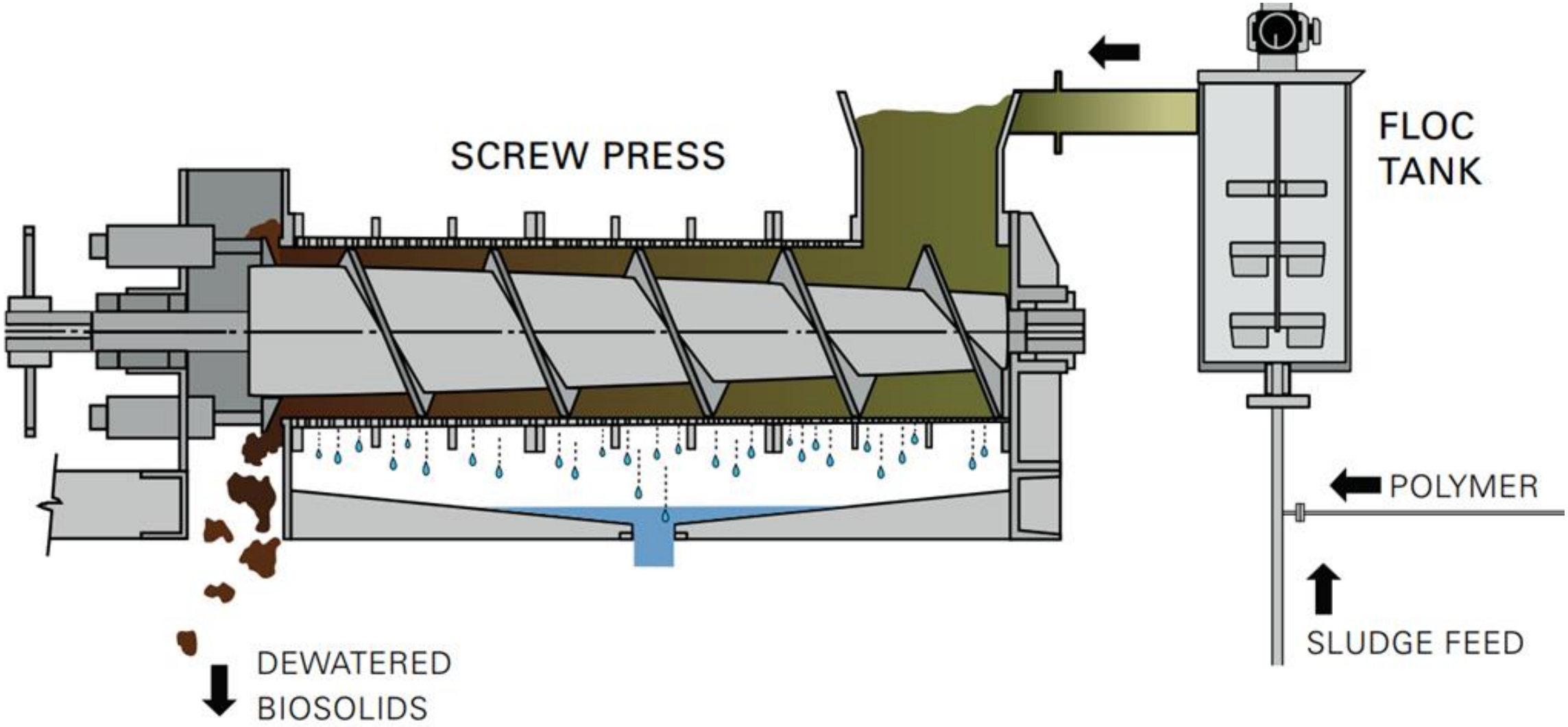
Scarborough WWTF Alternative 4

Sludge Thickening





Scarborough WWTF Alternative 5



Scarborough WWTF Recommended Alternative



Regional WWTF

- **Forecasted Regional Wastewater Flows**
- **Additional 0.281 mgd capacity needed to meet annual average day**
- **Alternative 1, build capacity expansion at RWWTF**
- **Alternative 2, continue to lease available treatment capacity**
- **Timing of capacity expansion will depend on regional partners.**

Parameter	Existing Flow	OWTS to Sewer Conversion	Residential/Commercial Development	Total
Minimum Monthly Average	0.75	0.15	0.09	0.99
Annual Average	1.14	0.22	0.14	1.5
Maximum Month Average	1.67	0.32	0.21	2.2

Wastewater Facilities Plan

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Recommendation Summary

Project Summary	Estimated Cost
Sewer Expansion Projects	$104.6M
Pump Station Upgrades	$24.1M
Scarborough WWTF Recommended Plan	$75.8M

Recommendation Summary



Recommendation Summary



Collection System

- Remove onsite septic systems
- Residential/Commercial development



Pump Stations

- Capacity upgrades
- Age related needs
- Condition related needs



Scarborough WWTF

- Plan for Sewer Expansion
- Economic Development
- Replace Aged Equipment
- Meet Permit needs



Regional WWTF

- Identify Capacity Needs
- Regional Planning

Contact Information



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THANK YOU

TOWN OF NARRAGANSETT
DEPARTMENT OF COMMUNITY DEVELOPMENT
25 FIFTH AVENUE ~ NARRAGANSETT, RI 02882

MEMORANDUM

To: Alexander Menzies, President
Narragansett Town Council

From: Mark Brady, Chairman
Narragansett Planning Board

Date: July 24, 2025

Subject: Recommendation on the Facilities Plan Update for Wastewater Management

BACKGROUND

Narragansett is the owner of the of the Town's wastewater collection system and is the sole owner of the Scarborough Wastewater Treatment Facility (SWWTF) which treats wastewater collected throughout southern Narragansett (including Galilee). In addition, Narragansett is one of three partners that own the Regional Wastewater Treatment Facility (RWWTF) which provides wastewater treatment services for northern and central Narragansett, the University of Rhode Island, and South Kingstown. Narragansett is the facility's host community. Under the existing partnership agreement, 24.4% of the plant's capacity is allocated to Narragansett. Narragansett, via a yearly short-term lease, secures additional space from the University's presently unused allocation to meet its current demands.

The Town received a grant to fund the Wastewater Facilities Plan (WWFP) from the U.S. Department of Commerce - Economic Development Administration (EDA) under EDA's FY 2020 Public Works and Economic Adjustment Assistance Notice of Funding Opportunity (FY20 PWEAA NOFO). With the cooperation and assistance of RIDEM, RI Commerce Corporation, and RI Food Policy Council in January 2023, the Town accepted the grant award in February 2023 and awarded a contract to prepare the plan to Wright-Pierce in June 2023.

The Town and its consultant, Wright-Pierce, have prepared a comprehensive update of the WWFP for the Town. The WWFP is an inclusive study of needs and solutions for the SWWTF and the Town's wastewater collection and conveyance systems, including the areas and systems that contribute wastewater to the RWWTF.

The current Facilities Plan was approved by RIDEM in November 2007 and adopted by the Town Council in December 2007. As required by RIDEM, the WWFP assesses existing conditions, projected demand for wastewater collection and treatment service, and the anticipated capital investment required to maintain Narragansett's wastewater collection system and SWWTF over the next 20 years. The WWFP amendment is necessary to evaluate and update the Town's wastewater needs and projections for future facilities implementation to establish solutions for achieving RIDEM water quality objectives. This Plan does not include an assessment of sewer line conditions or outline any need for renovation during the Plan's 20-year planning horizon.

The recommended 20-year capital investment plan is approximately $200 million to maintain and improve the SWWTF, our townwide collection system, and to expand service to a half dozen presently unserved neighborhoods and enhance service to enable expanded seafood processing in Galilee. This report does not include a conditions assessment, demand analysis, or cost estimate for capital maintenance and improvements to the RWWTF located on Westmoreland Street. That analysis is expected to be completed by South Kingstown in 2026. The completion schedule requires RIDEM approval of Narragansett's WWFP by September 4, 2025.

This document provides a long-range look at wastewater conveyance and treatment systems. Also included are related issues and an assessment of the current condition and capacity of our infrastructure, as well as projections for future build-out scenarios. The WWFP considers residential and commercial development in Town, sewer expansion needs to replace onsite wastewater treatment systems, and wastewater needs required to support the fishing industry in the Port of Galilee. The approved document is used both as a guide for the annual Capital Improvement Program (CIP) submittals (as part of the budget submittal process) and as the basis for the annual submittal to RIDEM for their Project Priority List (PPL), which in turn ranks projects for funding eligibility under various State financial aid programs.

RECOMMENDATION

At their regular monthly meeting held on Tuesday, July 16, 2025, and at a Special Planning board meeting on July 22, 2025, the Planning Board took under consideration the draft "Wastewater Planning & Design Facilities Plan Report" dated May 2025. During that July 16, 2025, meeting there was extensive discussion between the Board and consultants for Wright-Pierce, which prepared the Plan under a contract with the Town of Narragansett. Jonathan Gerhard, the Town Engineer, also participated in the discussion at that meeting.

The Salt Pond Coalition Executive Director attended the July 16 meeting and spoke in support of the sewer extension project to the islands to improve water quality within the salt pond.

The Planning Board finds that the Plan is consistent with the Town's Comprehensive Plan, specifically the following:

***Land Use Policy LU2.5:* Ensure that growth can be accommodated by existing or planned infrastructure and community services.**

a) Continue to extend sewers in accordance with the Wastewater Management Plan to developed residential neighborhoods where they are needed to address or prevent public health issues.

b) Prohibit sewer line extension into undeveloped areas that are unbuildable without sewers, or carefully weigh the impacts of sewer extensions upon the environment, growth and related items.

***Community Services and Facilities Goal CSF8:* Ensure the proper treatment of wastewater to protect public health and the natural environment.**

a) Improve and extend sewage collection systems in existing developments in the South End (Pt. Judith Road watershed) and North End (Narrow River, Wesquague Watersheds). Avoid extensions of lines which would stimulate overdevelopment in sensitive areas.

d) Evaluate the use of innovative sewage treatment methods where it can be shown that there is a net improvement in the environment over the existing conditions

Following staff review and discussion, and upon a motion made by Mr. Thomas Callahan, and seconded by Dr. Joseph O'Neill, the Planning Board voted to recommend APPROVAL of the plan with the following considerations:

1. That the **Town Council review progress on the WWFP annually with the Engineering Department.**
2. That the Town Council **consider criteria to use so that they can prioritize expansion to unserved neighborhoods not serviced by sewers** and consider alternatives thereto as well as service **to expand Galilee fish processing**. A schedule for each priority should also be created so as to set timelines for improvements.

3. The agreement between the Town and the University of Rhode Island for additional allocation expires on June 30, 2025. The Town pays 44% of the cost of the operations and maintenance based on the flow from the Town. And the University's Bay Campus wastewater flow counts toward the Towns allocation. The University pays the Town $70,000 for the bay Campus; the Board is unclear whether or not that fee offsets the flow. The Planning Board asks that the Town Council consider **renegotiating terms of the agreement regarding the RWWTF to permanently expand Narragansett's owned allocation** to properly account for the Town's role in providing housing for 6000-8000 URI students, planned expansion of the Bay Campus. Recognizing Narragansett's role as host community for the University is a key element is considering permanent reallocation.

4. That the **Town's wastewater treatment system (treatment plant and pump stations) is designed to accommodate two capacity issues**: peak wastewater generation during the 8-week summer occupancy in July and August; and peak wastewater flows during and after rain events due to stormwater infiltration into sewer lines and illegal discharge into the sewers from sump pumps.

5. That because of its' age and condition, **SWWTF (Scarborough) requires significant renovation and must be expanded to meet projected demands** including the increased wastewater flows from extension of sewers to areas currently operating with onsite wastewater systems.

6. **The majority of the Town's pump stations require investment to address renovation, flood protection, and additional capacity needs to meet projected demand.** Three of five pump stations in the Southern part of the Town's wastewater system (feeding the Scarborough Treatment Facility) are inadequate to meet demand and one of fourteen pump stations in Northern part of the Town's wastewater system (feeding the RWWTF) is inadequate to meet demand.

7. **The majority of the Town's pump stations require flood proofing.** Nine of fourteen pump stations in the Northern area and four of five in the Southern area need appropriate flood management to reduce risk. A Resiliency Plan is being developed concurrently with this Plan and is included in the Plan as Appendix C. It provides detailed analysis and cost estimates for flood proofing needed at each pump station. The Plan's "Pump Station Recommendations" in the Executive Summary (Tables 1-5 & 1-6) and Tables 7-14 and 7-15; Tables 8-3 and 8-4 **need to be revised to consistently include the recommendations and accompanying cost estimates for flood proofing from the Resiliency Plan.** If a pump station is flooded, untreated wastewater is likely to flow from a manhole. During a major coastal storm, many pump stations are currently vulnerable to flooding simultaneously.

8. The treated effluent produced by both the Westmoreland and Scarborough plants is discharged directly to Narragansett Bay approximately 1200 to 1600 feet offshore pursuant to the terms of the National Pollutant Discharge Elimination System (NPDES) permits through the EPA. **Regular capital maintenance and improvements to the plants and collection system is essential to protecting Narragansett's ocean water quality as well as its marine and recreational resources.**

9. **The WWFP should clearly articulate the future life expectancy of the SWWTF as well as the future capacity needed at the RSWWTF**. The WWFP should provide a clear timeline to implement each improvement/alternative.

10. **The Planning Board supports the consultant's recommendation for the selected Alternative #3 - sludge management and Alternative #5 - upgrading the Scarborough Wastewater Treatment Facility**, although the Board is unclear of the disinfection component presented in the WWFP. The Board suggests that the Town Council give it further consideration.

11. **The Plan needs to be revised to include a project prioritization list/sequence for pump station floodproofing, renovation and upgrade/capacity expansion.** The Planning board recommends that the first priority would be to maintain existing facilities with sequence based on urgency of need for maintenance, and the second priority would be to flood proof the system and facilities with priority based on vulnerable areas. The third priority is adding capacity for sewer extensions based on stations that don't meet current demand and then provide capacity for sewer extensions on the islands to improve the water quality of the salt pond.

12. The sewer expansion needs to accommodate onsite wastewater treatment systems outlined in this 20-year plan (Table 1-4 and Table 7-13 and Table 8-2) were also in the previous 20-year plan. Briggs Farm was the only major new sewer extension during the past 20 years. **The Plan should be revised to include a priority sequence for sewer extensions** once the Wastewater Treatment Facility is expanded to accommodate increased wastewater flows.

13. The importance of sewers for the environment is well covered in the Plan's narrative and the need to protect and improve the water quality of the salt ponds and Narrow River. **Sewer extensions to Harbor Island and Great Island are necessary to help improve water quality in the salt pond.** The Planning Board acknowledges that while sewer extensions to the islands will benefit water quality regarding the elimination of OWTS systems in a sensitive environment, benefits may be off set because sewer installation allows for increased development that will generate additional water quality impacts from stormwater runoff.

14. **The Planning Board recommends that the Town Council refer this Plan to the Finance Committee to help determine how to fund the SWWTF.** The Finance Committee may be able to assist with budgeting for project scheduling and recommend a cost structure for extension of sewer to new areas and paying for increased capacity in a way that is fair and equitable for long-term rate payers. The Board surmises that there is a fundamental fairness issue of asking existing rate payers to fund the expanded capacity of pump stations and the wastewater treatment facility as this would be, in effect, a subsidy by long-time rate payers for new development and redevelopment that may be primarily being built for second homes and rental business properties.

15. The consultants projected capacity demand for the wastewater treatment facility and pump stations using buildout projections from the Town's existing Comprehensive Plan. They modified buildout based on estimates to reflect some of the recent changes in State zoning and subdivision regulations that mandate increased density for areas with access to sewer and water. (page 6-2) They also projected peak summer demand based on current summer flows. It is likely that **the demand projected in this Plan is under-designed because of unforeseen increased development and density permitted in excess of the town's previously existing baseline zoning through State statute.** The need to adjust buildout projections is noted in the Plan on page 6-2. There will be increased density that creates demand for wastewater pumping and treatment for development of properties with comprehensive permits, accessory dwelling units (ADUs), duplexes, density bonuses that accompany subdivisions that trigger inclusionary zoning requirements, additional lots and housing units created by unmerging of lots, and potential development of areas such as Fort Green and Camp Cronin that were not considered in buildout analysis.

16. The Town needs to better manage the problem of increased wastewater flows during rain events by preventing any additional illegal sump pumps discharging to sewer lines. Enforcement after construction is futile. As one strategy, the **Town should change zoning to preclude the development of new basements in high water table overlay districts** and require new development in this area are built on 'slab on grade'. This would eliminate the necessity for sump pumps in these areas.

17. The Town Council needs to address the Direct and Indirect impacts (pages 8-7 and 8-8) specifically with regard to increased density projections. **The Planning Board questions the Plan's finding: "*no change to population or land use anticipated*"** (page 8-8). History has demonstrated that development is stimulated when sewers are extended, e.g., the neighborhoods of Mettatuxet and Pettaquamscutt as well as other areas of Town where sewer extensions have led to dramatic increase in development. This impact is amplified by recent state laws which require higher density in areas where sewer and water are present.

Motion Passed 5-0 (Brady, O'Neill, Friday, Callahan, DeSimone)

NARRAGANSETT TOWN COUNCIL
NOTICE OF PUBLIC HEARING
TOWN OF NARRAGANSETT
WASTWATER FACILITIES PLAN UPDATE

Public Notice is hereby given that the Town Council of the Town of Narragansett will hold a Public Hearing at **7:00 PM on Monday, August 4, 2025 in the Town Council Chamber, Town Hall, 25 Fifth Avenue, Narragansett, RI 02882,** in accordance with RI Department of Environmental Management wastewater facilities planning requirements.

The purpose of this hearing is to allow the public the opportunity to provide comments on record on the draft Wastewater Facilities Plan. The Wastewater Facilities Plan evaluates the Town's wastewater needs and projections for the next 20-year planning period to establish updated solutions for achieving RI Department of Environmental Management water quality objectives. The draft Wastewater Facilities Plan will be available for public review at the Town Engineering Department Office from 8:30 a.m. to 4:30 p.m. beginning July 18, 2025 through August 4, 2025 and on the Town's website at www.narragansettri.gov.

The public hearing transcript, responses to comments, and any revisions to the draft document will be incorporated into the final Wastewater Facilities Plan submitted to RI Department of Environmental Management for approval.

Individuals requesting interpreter services for the hearing impaired must call 782-0626 seventy-two (72) hours in advance of the meeting date.

By Order of the Town Council
Sarah Masson, CMC
Town Clerk

The Narragansett Times July 18, 25 and August 1, 2025

Wastewater Facilities Plan Update

Town of Narragansett, Rhode Island

August 4, 2025

Ryan Bodnaruk, PE
Andrew Smith, PE

WRIGHT-PIERCE
Engineering a Better Environment

Presentation Overview

Wastewater Facilities Plan Overview
Collection System
Scarborough WWTF
Regional WWTF
Recommended Plan
Summary and Next Steps
Questions & Discussion

Wastewater Facilities Plan Overview

Town-Wide Planning

- 20-year period
- Unsewered areas
- Economic development
- Key areas of protection and environmental concern

Wastewater Collection System

- Existing pipes
- Pump stations
- Capacity
- I/I Control

Wastewater Treatment Plant

- RIPDES Permit
- Aging equipment
- Capacity

Regional Wastewater Planning

- Regional WWTF
- South Kingstown
- University of Rhode Island
- Capacity

Wastewater Planning is a RIDEM requirement

Wastewater Facilities Plan Process

1. Evaluate Existing Conditions and Identify Future Needs

2. Alternatives Identification and Screening

3. Recommended Plan for 20-Year Planning Period

Wastewater Facilities Plan

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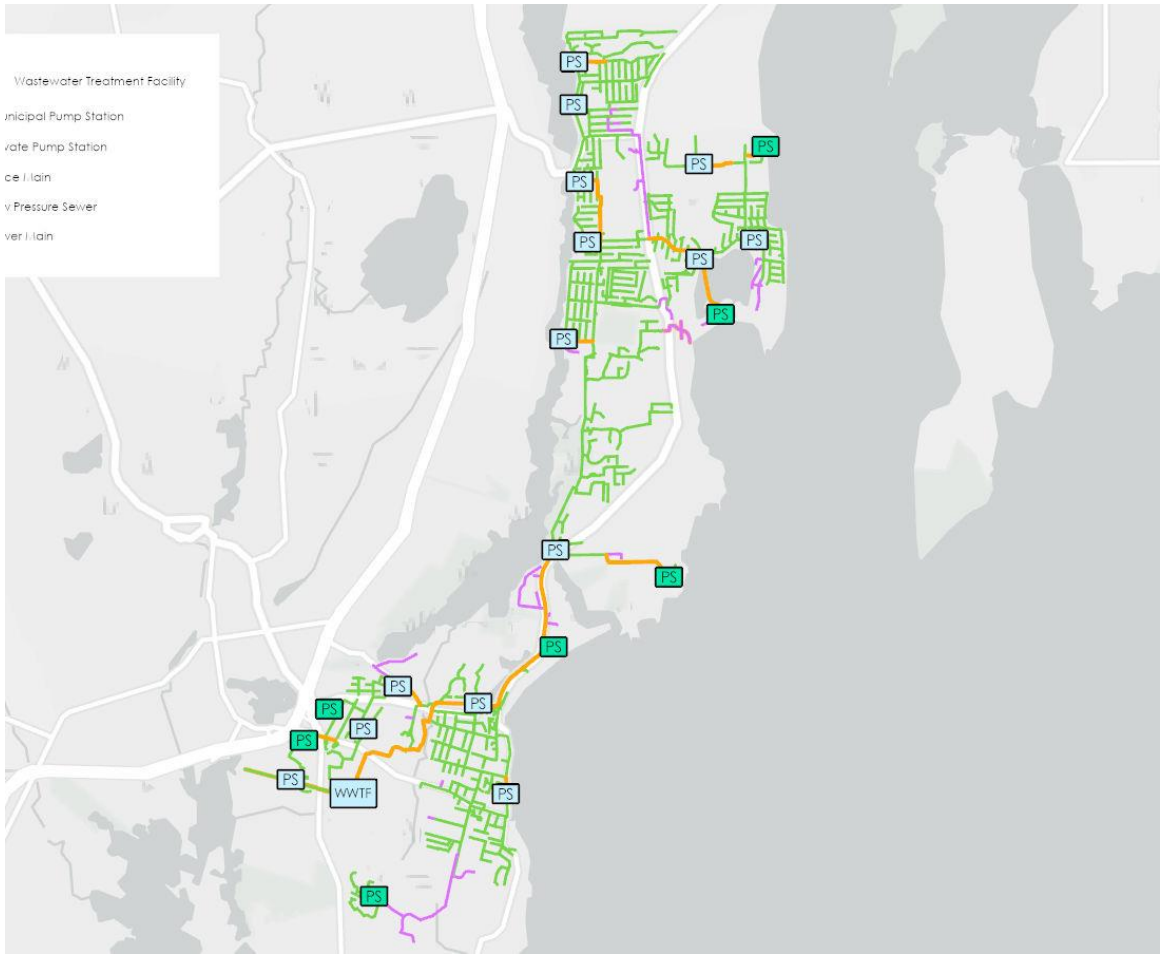
Evaluate Existing Conditions



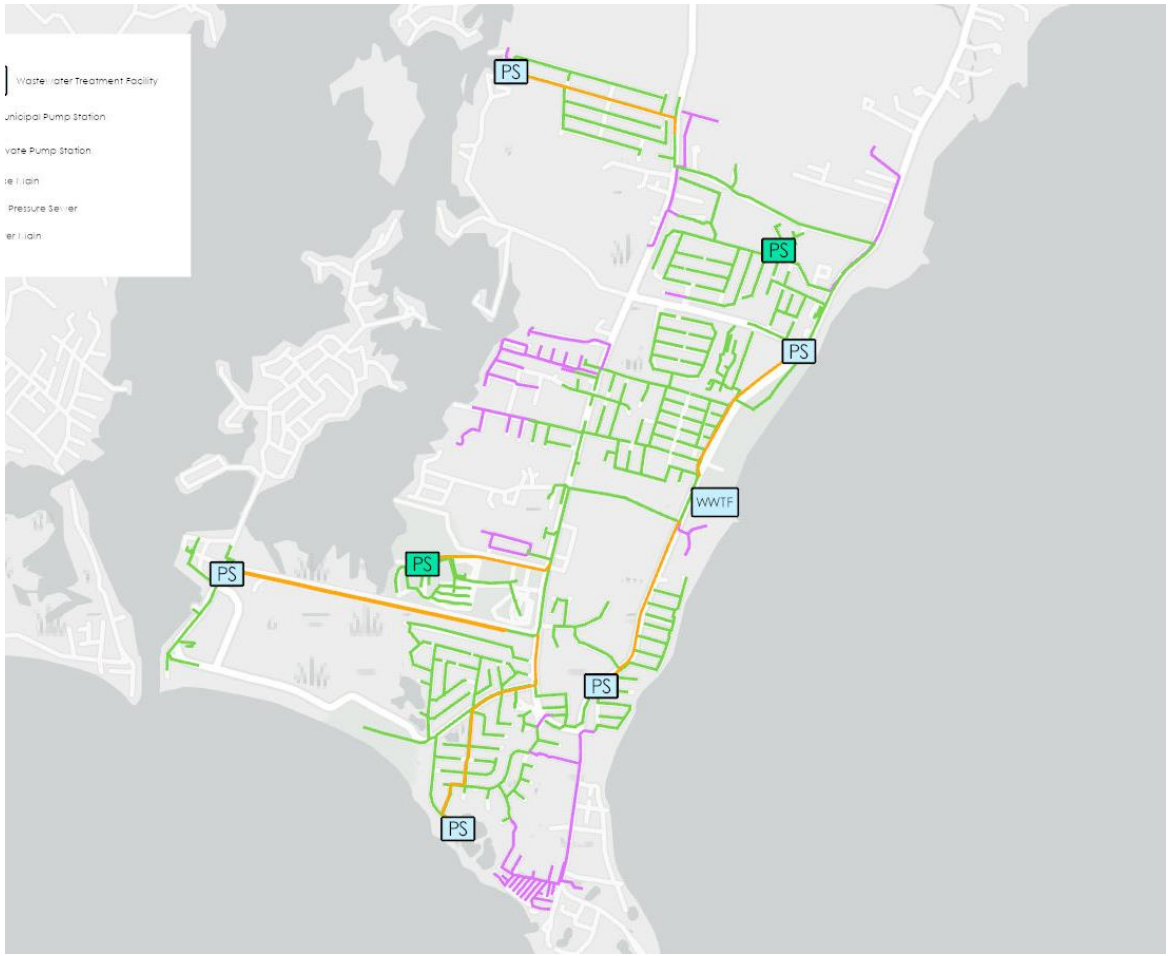
- Planning Area
- Town Demographics
- Environmental Factors
- Community Comprehensive Plan
- Economic Development
- Flows, wasteloads, sewer data
- Condition Assessment of Infrastructure
- Perform wastewater needs assessment

Collection System

North, flows to Regional Plant



South, flows to Scarborough Plant



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Engineering a Better Environment

Pump Stations Evaluation







Scarborough WWTF Evaluation



Scarborough WWTF Evaluation





Scarborough WWTF Evaluation





Scarborough WWTF Evaluation





Regional WWTF



- Three Regional Partners
  - South Kingstown
  - Narragansett
  - University of Rhode Island
- Located in Narragansett
- Operated by South Kingstown
- "Owned capacity" is shared based on capital investment
- Operation/Maintenance cost is shared based on measured flow contribution

Regional WWTF

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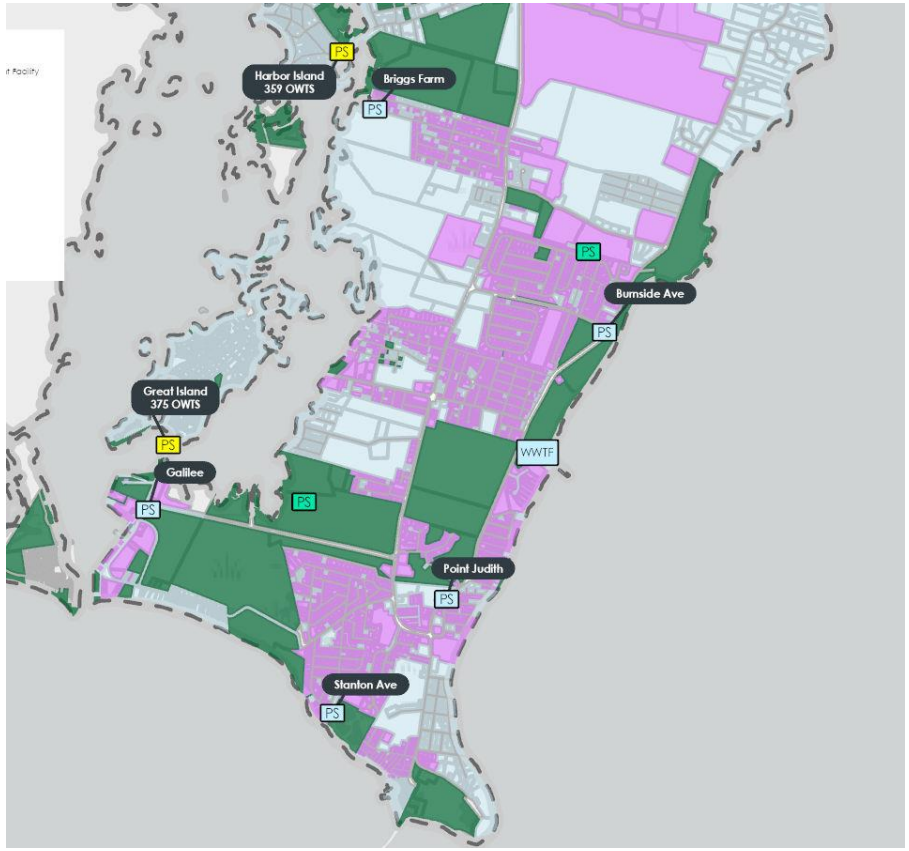
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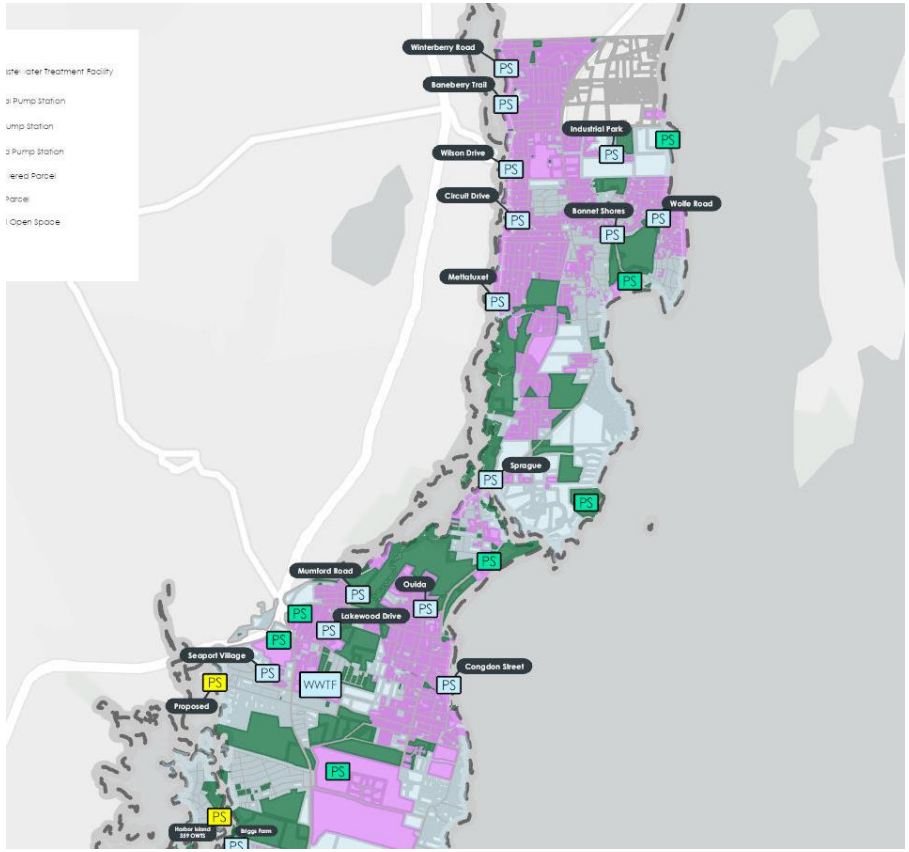
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- OWTS to Sewer Conversions
- Plan for all areas except Jerusalem

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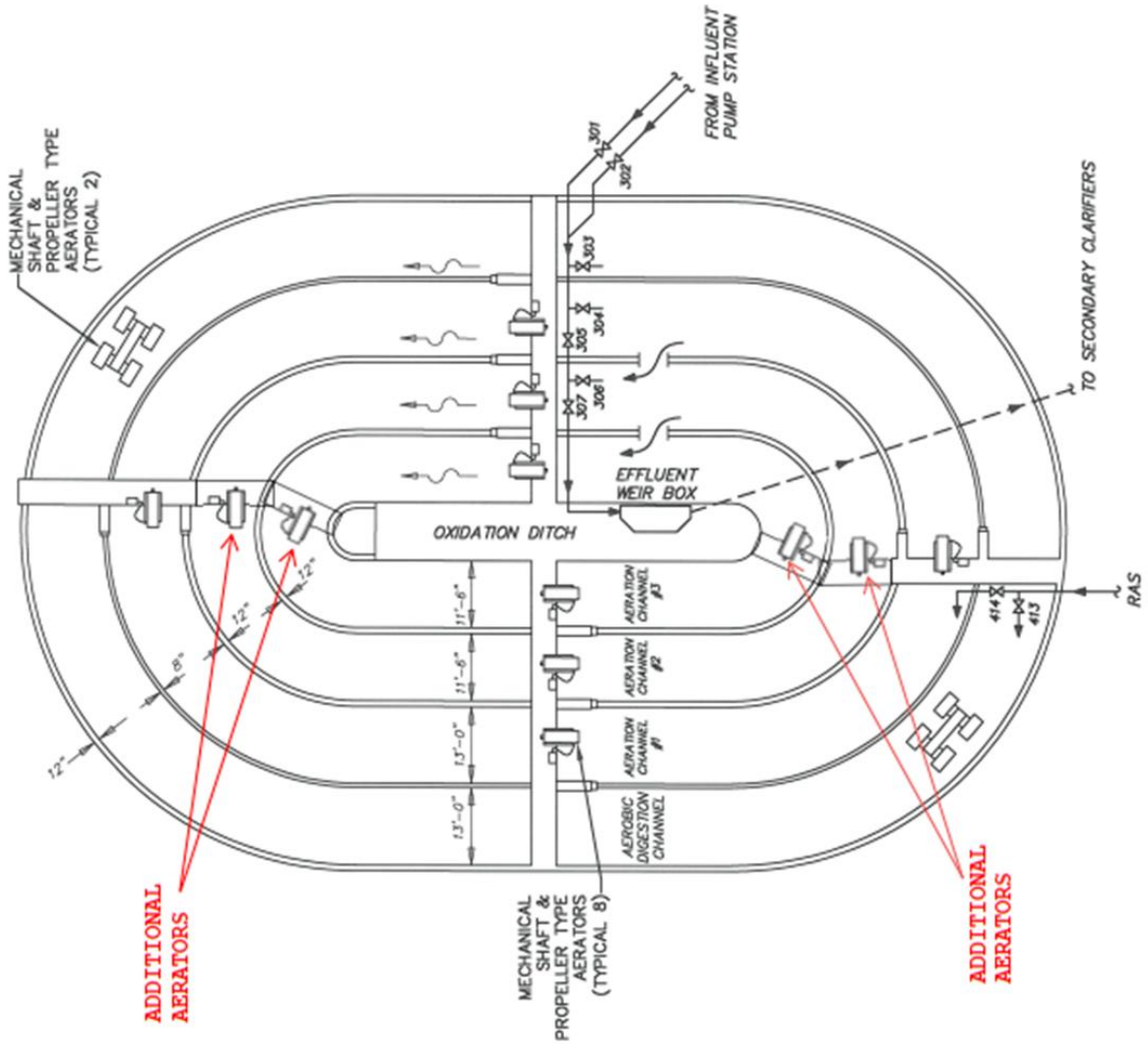
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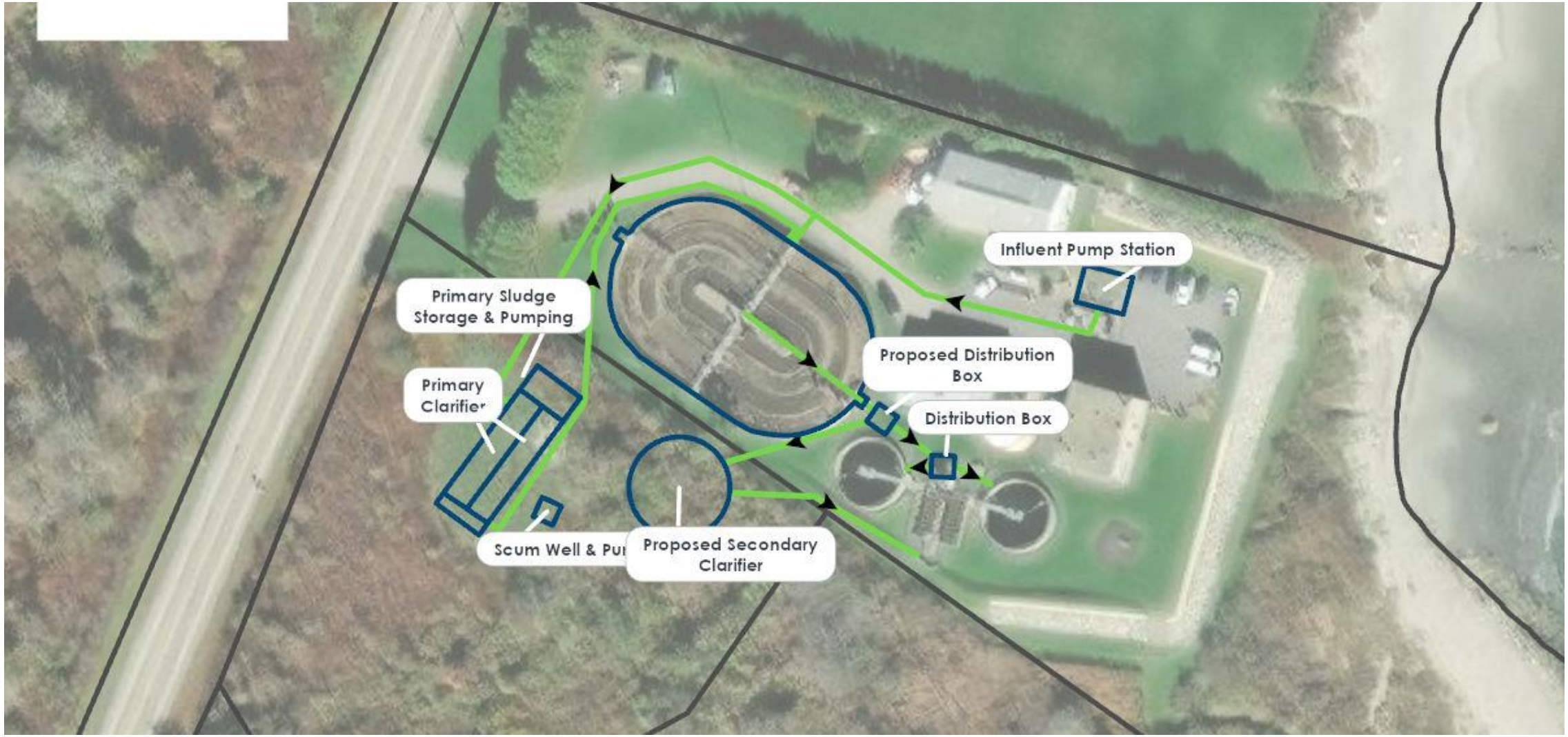
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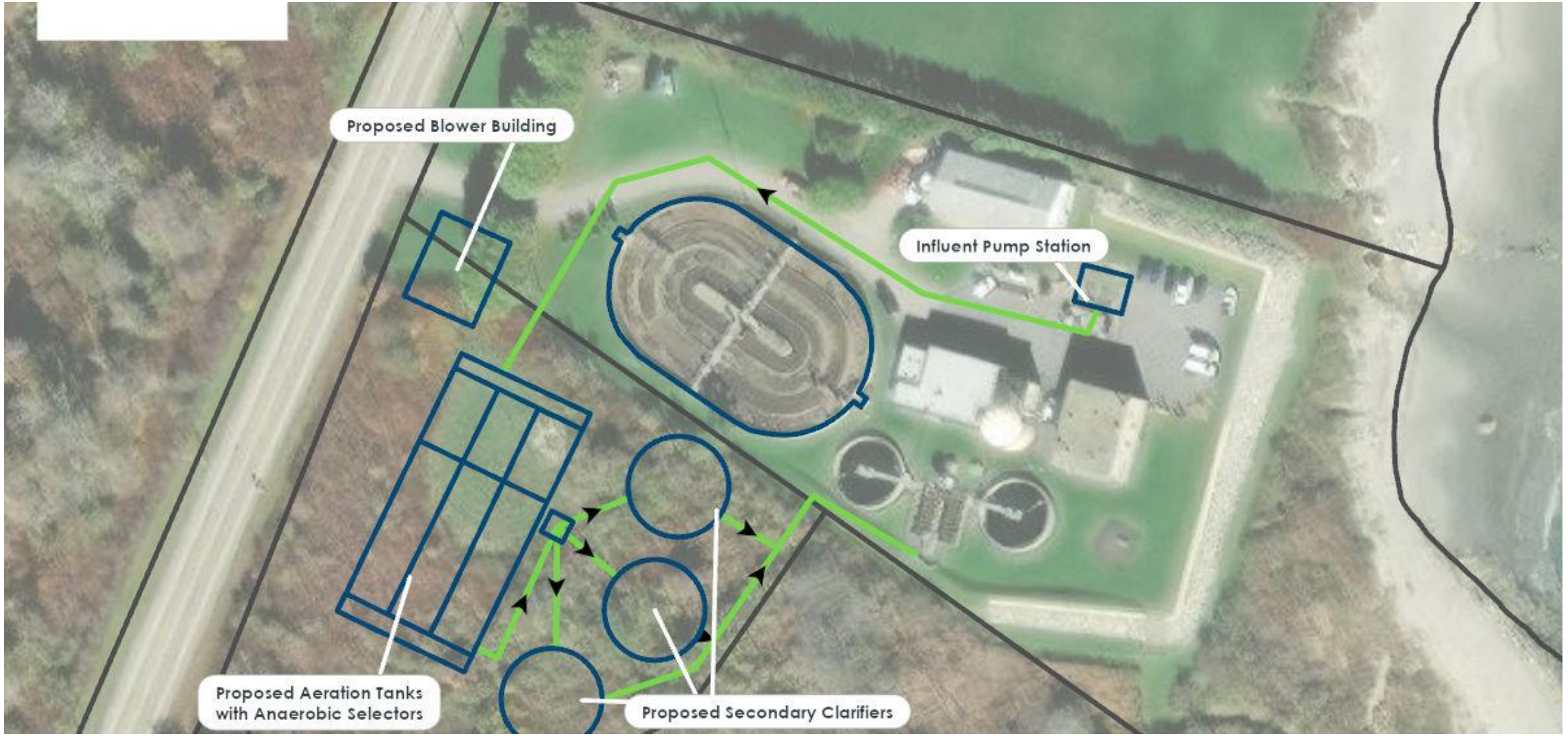


Scarborough WWTF Alternative 2



WRIGHT-PIERCE
Engineering a Better Environment

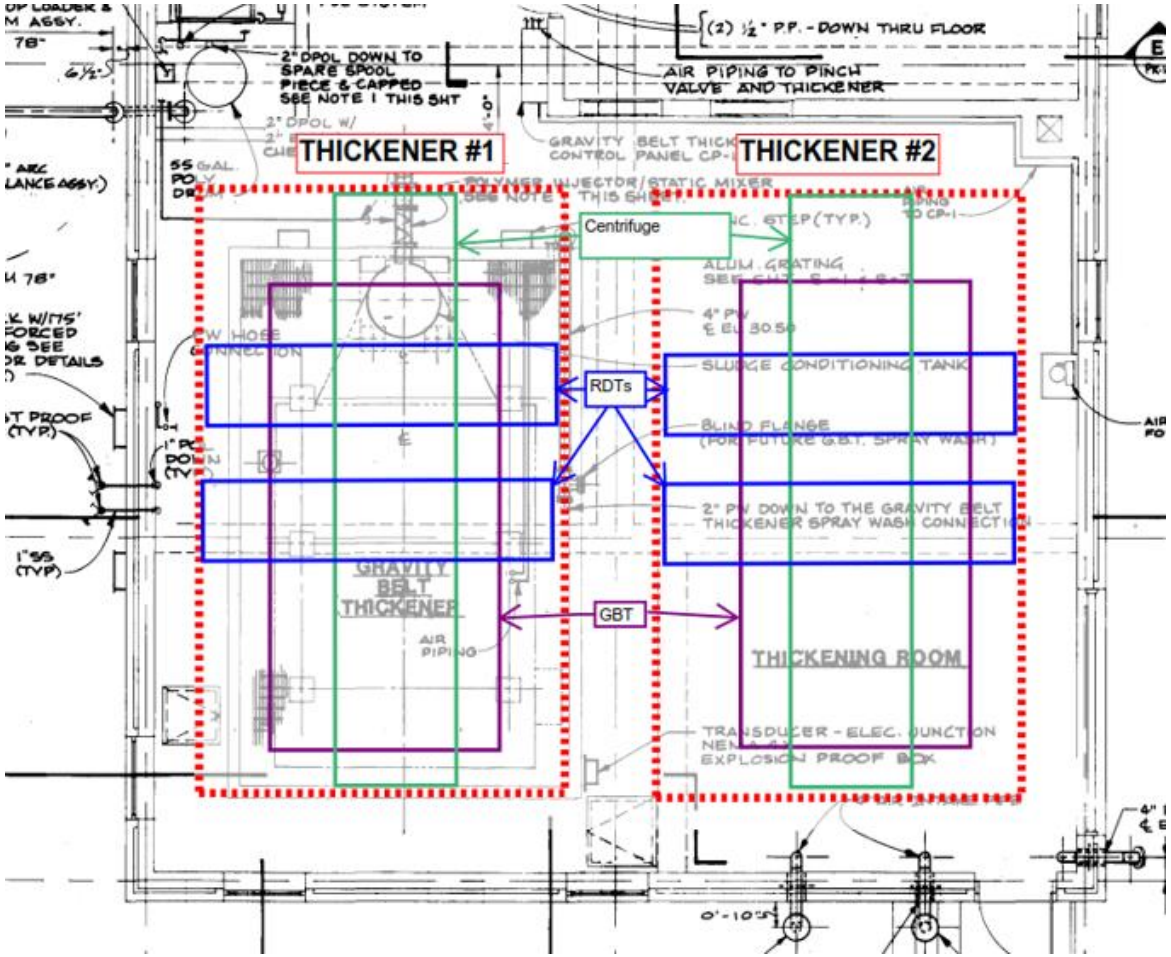
Scarborough WWTF Alternative 3



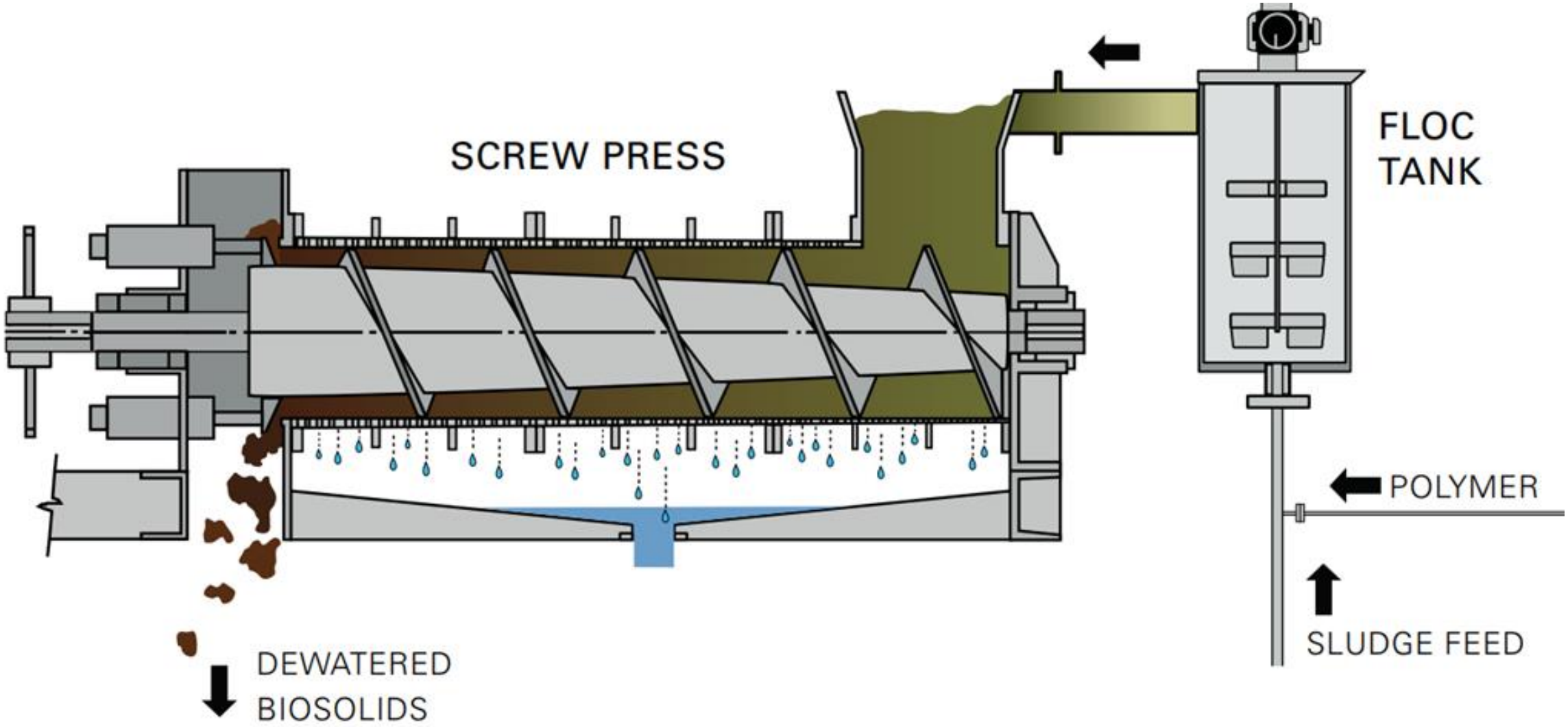
Scarborough WWTF Alternative 4

Sludge Thickening





Scarborough WWTF Alternative 5



Scarborough WWTF Recommended Alternative



Regional WWTF

- **Forecasted Regional Wastewater Flows**
- **Additional 1.0 mgd capacity needed to meet maximum month average**
- **Alternative 1, build capacity expansion at RWWTF**
- **Alternative 2, continue to lease available treatment capacity**
- **Timing of capacity expansion will depend on regional partners.**

Parameter	Existing Flow	OWTS to Sewer Conversion	Residential/Commercial Development	Total
Minimum Monthly Average	0.75	0.15	0.09	0.99
Annual Average	1.14	0.22	0.14	1.50
Maximum Month Average	1.69	0.33	0.20	2.22

Wastewater Facilities Plan

1 Evaluate Existing Conditions and Identify Future Needs

2 Alternatives Identification and Screening

3 Recommended Plan for 20-year Planning Period

Recommendation Summary

Project Summary	Estimated Cost
Sewer Expansion Projects	$104.7M
Pump Station Upgrades	$24.1M
Scarborough WWTF Recommended Plan	$75.8M

Recommendation Summary



Collection System

- Remove onsite septic systems
- Residential/Commercial development



Pump Stations

- Capacity upgrades
- Age related needs
- Condition related needs



Scarborough WWTF

- Plan for Sewer Expansion
- Economic Development
- Replace Aged Equipment
- Meet Permit needs



Regional WWTF

- Identify Capacity Needs
- Regional Planning

Recommendation Summary



Contact Information



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THANK YOU

WRIGHT-PIERCE
Engineering a Better Environment

Town of Narragansett Wastewater Facilities Plan 08/04/25 Public Hearing - Summary of Substantive Public Comments and Responses

A Public Hearing was conducted on August 4, 2025, to allow the public the opportunity to provide comments on the draft Wastewater Facilities Plan (Plan). The following is a summary by topic of substantive public comments and responses.

Wastewater loading strength/treatment process design capacity and efficiency: Concerns about the strength of influent wastewater and impacts of increased summer demands and proposed reintroduction of fish processing effluent as relating to the design capacity and efficiency of the existing and proposed Scarborough WWTF treatment process were expressed during the hearing.

Response: The existing Scarborough WWTF aerators can meet existing demands minimum day, average day, and maximum month oxygen demand, but not the existing maximum day condition. Insufficient air supply to meet the maximum day demand correlates with the treatment process issues that occur during peak demand during summer months.

The wastewater loads in the Plan for residential and commercial flow are developed from Scarborough WWTF operating data records. Loads from fish processing were developed through review of current operating practices, wastewater characteristics, and potential industry expansion with representatives from local fish processing industry operators; estimated flows and loads were provided by fish processing industry personnel based on production history and projected expansion capacity. The Scarborough WWTF recommended alternative is a conventional activated sludge process that is sized to handle the projected wastewater loads as identified in the Plan, and is an appropriate treatment process for the proposed flow conditions.

Zoning density/treatment capacity: Concerns about impacts resulting from zoning changes that would allow for increased density development as relating to treatment capacity at both the Scarborough and Regional WWTFs and were expressed during the hearing.

Response: The Plan considers conditions as currently allowable under state legislation and the Town zoning ordinance, and projected growth from the Town comprehensive plan. Recent legislation allowing increased density development is included in the future wastewater flow projections. Development projections accounted for Rhode Island General Assembly legislation allowing the development of substandard lots. Future changes allowing additional increased density development or projecting more extensive growth that could introduce additional wastewater flow would need to be evaluated based on the specific changes proposed and/or adopted. Concerns regarding specific zoning issues being considered by the Town are outside of the scope of the wastewater facilities planning process.

Odor Control: Concerns about plant odors were expressed during the hearing.

Response: The Plan includes provisions for odor controls in the recommended improvements.

Implementation timeline: Concerns about the intended timeline and urgency to implement the proposed improvements were expressed during the hearing.

Response: The Plan has a 20-year planning window. The final Plan will include additional information relating to implementation schedules and priority sequencing. The Town acknowledges the pressing need for improvements to the Scarborough WWTF and capacity expansion at the Regional WWTF and intends to expedite critical tasks to the extent possible.

Regional Partnership Intermunicipal Agreements: Concerns about the existing agreements with the Town of South Kingstown and University of Rhode Island for the Regional WWTF were expressed during the hearing.

Response: The Plan includes projection of Narragansett's future flow to the Regional WWTF to be incorporated into the Town of South Kingstown's Wastewater Facilities Plan. The intermunicipal agreements will need to be reviewed with respect to the updated Narragansett and South Kingstown Wastewater Facilities Plans and the University's master plan to determine if modifications to existing agreements are necessary to address the needs and concerns of each Regional partner.

URI Bay Campus Expansion: Concerns about potential expansion at the URI Bay Campus were expressed during the hearing.

Response: The URI Bay Campus Master Plan was last published in 2016 and re-affirmed in 2021. The Plan identified two near-term project priorities: a replacement for the Horn Laboratory Building and a home for the Ocean Engineering Department; and construction of an Ocean Robotics Laboratory. Existing and future potential wastewater flows are accounted for in the Facilities Plan Update.

Inflow: Concerns about extraneous flow due to inflow were expressed during the hearing.

Response: The Plan includes recommendations to continue investigations into extraneous flow sources and implement the improvements of prior sewer system evaluation study projects to identify and remove inflow sources.

Resiliency: Concerns about flooding impacts and resiliency were expressed during the hearing.

Response: The Town's draft Wastewater Facilities Resiliency Plan is included as an appendix in the Wastewater Facilities Plan and assesses flooding potential. The draft Resiliency Plan currently is being revised to address RIDEM review comments. All new facilities must be designed to meet applicable flood protection regulations and requirements.

Funding: Concerns about funding the proposed improvements were expressed during the hearing.

Response: Plan approval will allow the Town to pursue various financing sources, including Clean Water State Revolving Funds and federal economic development or other grants. The final Plan will include a fiscal sustainability plan for maintaining, repairing, and replacing the wastewater facilities.

Staffing: Concerns about staffing were expressed during the hearing.

Response: The Town's normal wastewater staffing level satisfies current operation and maintenance requirements for the collection facilities and Scarborough WWTF. The final Plan will include a staffing plan for the proposed facilities.

STATE OF RHODE ISLAND

TOWN COUNCIL of the TOWN OF NARRAGANSETT

* *

IN RE:

C.1 Public Hearing/Decision
A MOTION to open and hold a public hearing
on the Town's draft Wastewater Facilities Plan

C.2
A MOTION to close the public hearing

* *

Monday, August 4, 2025
7:00 p.m.

Town Hall - Council Chambers
25 Fifth Avenue
Narragansett, RI 02882

BEFORE:

ALEXANDER MENZIES,
Council President
JAMES DURKIN,
President Pro Tem
JASON COLONIES
DONNA VIGNALI

APPEARANCES:

FOR THE COUNCIL: James M. Callaghan, Esquire

ALSO PRESENT:

James R. Tierney, Town Manager
Sarah Masson, CMC, Town Clerk

I N D E X

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MOTIONS

MOTION TO OPEN

BY Mr. Durkin: 1
SECOND by Ms. Vignali: 1
(**APPROVED**)

MOTION TO CLOSE

BY Mr. Durkin: 125
SECOND by Ms. Vignali: 125
(**APPROVED**)

C.1 Public Hearing/Decision
A MOTION to open and hold a public hearing on the Town's draft Wastewater Facilities Plan

C.2
A MOTION to close the public hearing

(**PUBLIC HEARING COMMENCED AT 8:01 P.M.**)

PRESIDENT MENZIES: We're now on to the public hearing portion of the meeting.

Is there a motion to open and hold a public hearing on the Town's draft Wastewater Facilities Plan?

MR. DURKIN: Motion to open and hold.

MS. VIGNALI: Second. Second.

PRESIDENT MENZIES: Oh, thank you. All those in favor?

(**VOICE VOTE**)

PRESIDENT MENZIES: Any opposed?

(**NO RESPONSE HEARD/SEEN**)

PRESIDENT MENZIES: Motion passes four-zero.

We're now in the public hearing, and I believe we're going -- who -- do we kick this off to Jon first or -- all right.

So I'd like to invite Jon up to lead us into this discussion. Thank you.

(MR. GERHARD APPROACHED PODIUM)

PRESIDENT MENZIES: And good evening.

MR. GERHARD: Good evening, members of the Council, the public, and Town staff, and those viewing online.

I just have a brief introduction of what we're here tonight. The purpose of a Wastewater Facilities Plan is to evaluate a municipality's wastewater needs for a 20-year planning period.

MR. CALLAGHAN: And, Jon, just, just for the record -- Jon, for the record, just give your name for the record. Thanks.

MR. GERHARD: I'm Jon Gerhard, Jonathan Gerhard, the town engineer, employed by the Town of Narragansett.

The purpose of a Wastewater Facilities Plan is to evaluate a municipality's wastewater needs for a 20-year planning period. The Town's current Facilities Plan was approved by RI DEM and adopted by the Town Council in 2007. And a plan amendment is necessary at this time.

The proposed plan considers residential and commercial development in town, so we're expanding needs to replace on-site wastewater treatment

systems, wastewater needs for the fishing industry and the Port of Galilee, and areas that contribute wastewater to the regional wastewater treatment facility.

The Town received a grant to fund the Wastewater Facilities Plan from the U.S. Department of Commerce, Economic Development Administration and awarded a contract to Wright-Pierce in June 2023 to prepare the plan amendment. The draft Wastewater Facilities Plan was submitted to RI DEM in May 2025 and was also submitted to the town Planning Board at that time.

Wright-Pierce made a presentation to the plan at the July 15th, 2025, Planning Board meeting. I believe there's a typo in the agenda item that said the 18th but the Planning Board meeting was the 15th in the presentation.

A revised draft was submitted to DEM on the 18th of July and was also made available to the public prior to viewing. That's the copy that's online with, uh, with the agenda and the notifications.

This public hearing tonight is being held to meet RI DEM regulations and allow the public the opportunity to provide oral and/or written comments

on record on the draft Facilities Plan prior to its approval and adoption. The transcript of the hearing, along with any revisions to the draft plan arising from the public participation process and RI DEM review comments will be incorporated into the final document for RI DEM approval, which must be submitted by August 18th, 2025, to meet the funding agency project schedule and approval deadlines. Once approved by RI DEM, the Wastewater Facilities Plan will be presented to the Town Council for former -- formal adoption.

So, in all of the issues that everyone has been addressing tonight, this -- the plan is intended to resolve the problems for treatment and to bring our facilities up into state-of-the-art conditions and, and addressing all the odor complaints so that we have a fully operational and, and functional facility.

And, with that, I would like to introduce Andrew Smith, of our consulting firm, Wright-Pierce, who has prepared a presentation for the Council and the public.

MR. DURKIN: Jon, can I ask you a question. And, and maybe it's for him, but I think he's more the, the -- is there a possibility that,

you know how they have sensors for noise, is there sensors for smell?

MR. GERHARD: There's odor sensors, but, generally, what you would be, would be sensing for is the hydrosulfide is the primary one that you would look for in, in wastewater, but sometimes, you know, that's more of a stale and septic smell where the wastewater treatment process is a processed wastewater smell, which can be different. But we can investigate to see what type of, what type of, um, technology there is.

Again, our, our focus has been to try and implement and, and deal with the, the problem at hand which is, you know, we have a change in the flow characteristics, you know, both volume metrically and, and strength-wise in the, in the beginning of July and it really kind of kicks the plan -- the plant, you know, off its wheels.

The Facilities Plan, the evaluation they did, you know, shows that -- the investigation Wright-Pierce did shows that some of the, you know, the treatment processes are undersized for that peak day that we get, you know. We can handle just about everything else but that peak day comes and it really, it really knocks it in, it knocks it for

a loop and it takes a while to, to recover from this.

We're in the processing of recovering, we're trying to implement the odor -- some additional odor control measures. But, you know, primarily to get the plant running and, and functioning the way it's supposed to be is the primary goal.

MR. DURKIN: So is, is it true that somebody said tonight that nobody operates at the plant over the weekend; is that -- is there nobody there on-site?

MR. GERHARD: We have minimum staffed. We have -- our normal working hours are 7:00 a.m. to 3:30 p.m., Monday through Friday. On the weekends, we have -- staff does come in. There's a laboratory analyses and, and sample collection that are required to be done on a daily basis. So they come in. Uh, it's a short shift. Um, you know, they'll, they'll -- that they're there for and someone -- there's -- people are on call at all times. So if there are complaints that are called in, you know, they would call in to dispatch and, and those would get transferred to the, uh, treatment staff.

MR. DURKIN: Yes.

MR. GERHARD: Staff is not fully manned on the weekends, though, no.

MR. DURKIN: Excuse me, I was just thinking that it would be, you know, be nice to just have some -- if there was an alarm or a sensor that the smell reached a certain point where it disturbed people that an alarm or some kind of notification would come out so, you know, it could be dealt with immediately. Um --

MR. GERHARD: Mm-hmm. Well, we could investigate what the -- what type of technology --

MR. DURKIN: Yeah.

MR. GERHARD: -- you know, that would have to be incorporated into our existing systems and controls. But, again, part of the expansion plans or really -- and it's -- there's not a significant expansion on, on really either side. It's more, it's more a technological and treatment capacity expansion as opposed to hydraulic expansion. We do talk of, of providing sewers to the, to the unsewered areas of town, but the flow increase is not substantial. It's, it's the capacity and the treatment. The treatment technology that is, that is the intent of, of what we need to have improved.

MR. DURKIN: Right. Okay. So I guess, if I have any questions, I'll wait until after the presentation.

PRESIDENT MENZIES: Yeah, well, I probably have some additional questions for you as well, but we'll just wait until after the presentation.

MR. GERHARD: I won't be going home until after we're done, so --

(LAUGHTER)

MR. GERHARD: And, again, like --

PRESIDENT MENZIES: Thank you.

MR. GERHARD: -- I said, I'd like to introduce Andrew Smith from Wright-Pierce. He's one of the design engineers who's worked on the plan, and we've worked closely with to try to develop this, uh, this plan here.

PRESIDENT MENZIES: Thank you.

(PRESENTATION ONSCREEN)

(PAUSE)

MR. SMITH: Good evening. Andrew Smith. Um, thank you for having me.

Um, I will just say, hearing the public forum, uh, I, I can feel the -- there's some, uh --

MR. CALLAGHAN: Mr. Smith, I'm going to

ask if the steno can swear you in, please. Thank you.

THE STENOGRAPHER: Please raise your right hand.

ANDREW SMITH, first having been duly sworn, testified as follows.

THE STENOGRAPHER: Okay. Please state and spell your full name for the record.

MR. SMITH: Andrew Smith, a-n-d-r-e-w, s-m-i-t-h.

THE STENOGRAPHER: Thank you.

(PAUSE)

MR. SMITH: So we -- I work for Wright-Pierce. We did the Facilities Plan -- Wastewater Facilities Plan update. I'm here to tell you about that project and what we found.

There's a lot of information here. I'll try to move as, as quickly as I can so that the public has a chance to, uh, to ask their questions. And here we go.

(SLIDE PRESENTATION)

MR. SMITH: So our presentation overview. First, we will go over what a Facilities Plan is. We'll talk about your collection system, the Scarborough wastewater

treatment plant. We'll then talk about the Regional Wastewater treatment plant, and then what our recommended plan is and then, obviously, the time for questions and discussion.

(NEXT SLIDE)

A Wastewater Facilities Plan. So the first thing to know is this is a Rhode Island Department -- Rhode Island DEM requirement.

It is part of the, I guess, State requirements for anyone who operates a wastewater plant to do that. We have -- uh, what it covers is some town-wide planning. It is for a 20-year period. Uh, it covers unsewered areas; it addresses issues for economic development; um, and then it addresses key areas for environmental protection and concern, you know, for instance, the Narrow River, special area management plan, or special area management, yup, plan.

Uh, we'll address your wastewater collection system, their existing pipes in the ground, what condition are they in.

There are pump stations throughout town that convey sewage to the wastewater plants. There are capacity issues and then we have what we call inflow and infiltration. So that's when, you know,

sump pumps or, uh, direct connections or groundwater gets into the sewer system and just adds to the water that has to be treated.

We will talk about your Scarborough wastewater treatment plant, uh, the, the permit that it has to abide by. We'll talk about the aging equipment and the capacity issues at that plant. And the regional wastewater treatment plant, you know, which is shared by South Kingstown, Rhode Island, we'll talk about, uh, Narragansett's needs, uh, at that plant as well.

(NEXT SLIDE)

So the planning process. The first part -- first thing we do is we evaluate the existing conditions and identify what the needs are in the future for the town. The next we look at alternatives to, to address these issues. And then, finally, we come up with a recommended plan for the 20-year period.

(NEXT SLIDE)

So the first part, we'll look at your existing conditions and identify your wastewater needs for the next 20-year planning period.

(NEXT SLIDE)

So to evaluate the existing conditions, first, we look at the planning area. In this case, it's the Town of Narragansett. We look at the town demographics that includes, you know, population, you know, housing stock. Uh, we look at environmental factors in Narragansett. The, you know, the quality of the soil for, uh, for typical septic systems is not great. That's one environmental factor. A high groundwater table is another one. Uh, you know, there's a lot of great environmental resources here, you know, the Salt Pond, the Narrow River, the estuaries. We look at protecting those assets for the Town.

We look at your community Comprehensive Plan, uh, zoning laws. We look at, you know, how that will impact the future needs for the wastewater. And then we also look at, you know, we work with Scott, and we get the flows, the waste flows and the sewer data that you currently have so that we can then project what you'll need in the future.

We do a condition assessment of the infrastructure throughout town, and then, you know, all this leads to a wastewater needs assessment for the 20-year planning period.

(NEXT SLIDE)

So a little bit about the Narragansett collection system. Uh, as has been mentioned before, you do have two treatment plants. The regional wastewater treatment plant on Westmoreland Street.

(NEXT SLIDE)

Oops, wrong button. Hang on.

(MR. SMITH GOING THROUGH SLIDES)

All right. Uh, the regional plant located on Westmoreland Street serves the north part of town. That area has 14 pump stations and some other private pump stations, you know, and sewers that all feed that plant. The south portion of town, uh, the sewer system flows to the Scarborough treatment plant, which we know is adjacent to Scarborough State Beach.

So, on the maps here, you can see the, the green lines are sewer -- are gravity sewer pipes. The purple lines are low-pressure sewers, which are just sewer collection system that function a little bit differently. And then the yellow lines are force mains, which is the pipes used to convey, uh, waste from the pump stations to further down the collection system.

(NEXT SLIDE)

As part of this project, we evaluated your pump stations. Uh, what we found was many of the pump stations, you know, are -- have aging equipment. You know, there's, you know, electrical equipment that's past it's useful life. Um, this picture, in the middle, shows one of the wet wells. You can see there's, you know, corrosion throughout. Um, the wastewater plant is not the greatest, uh, the greatest environment for, for pumps and operating equipment. It's not a clean environment. And, you know, so that's, you know, these things need upkeep and upgrade, uh, throughout the system.

(NEXT SLIDE)

The Scarborough treatment plant is in much the same boat as the pump stations. There's a lot of equipment there that is aged, um, and it needs, uh, upgrade. I know there was mention of baseline improvements. We'll get to what that means in the, in reference to the plan.

First, I'm just going to give you a quick walk-through on how the Scarborough treatment plant works. So what we -- so right here (indicating), we have the main, the main influent sewer will come in. It flows through here and then right in this area (indicating), there is a what we call the

headworks.

And the headworks is where there's some initial screens and some grit removal technology. What that does is it gets rid of all the large debris that might collect in the sewer, um, things that, you know, typically, you wouldn't think would be there, you know, pieces of 2-by-4s, bricks, um, those things sometimes come through and that is mainly there to protect the equipment behind it.

From there -- and then we have grit removal, which removes sand and other, you know, nonorganic material from the flow. From there, it goes into this little spot here (indicating), which is an influent pump station.

Now, this pump station, all it does is it, is it pumps the wastewater to a higher elevation up to this racetrack-looking thing. This is called the oxidation ditch (indicating) and it is the, sort of the heart and soul of the treatment process. It's a secondary treatment process. And the way -- and it's -- this is the way wastewater is treated throughout the world and the country.

What it is, is actually bacteria is sort of grown and maintained and used, uh, to remove what we call BOD, which is biochemical oxygen demand.

So it basically removes the, the biochemical waste from the water, and it's -- and it's sort of a living mass of bacteria that does that.

So one thing to keep in mind is that this, this treatment process, it is sort of a living process. It's biological, um, and so, you know, it responds to things like weather, um, you know, the amount of food that's available to it, all those sorts of things. It's not just adding chemicals. There's, you know, there's a living component to this.

Uh, the way this process works is the flow will come in, it will go through the -- actually, just uses the first three rings here (indicating), and what it will do is it flows around in a circle, and then it goes into the next circle, and then it goes into the next, I guess, oval I should say.

And, then, once it's through that process, this was designed for a certain amount of flow, for a certain amount of time, to get what we call the retention time to allow enough treatment to occur.

Once that -- it's been through this process, it will flow through a pipe and it goes into these two tanks (indicating), the round ones, and those are called the secondary clarifiers.

So, after it's treated, the secondary

clarifiers slows the flow down and the, um, the waste forms larger particles called flocs. Those will settle to the bottom of those tanks and the clean, treated water will flow over the top of those tanks.

And, once it flows over the top of those tanks, it goes into this last treatment process, which is called disinfection. That's where it's dosed with chlorine and, you know, it stays in there for enough time to get any residual bacteria. And, from there, it flows out of the plant along this path (indicating), and it flows a half mile offshore. So sort of way over here (indicating). Um, and out there, there are diffusers, out in Rhode Island Sound, where that water is released, uh, a half mile from the beach.

There's another process that's a part of this. This building here is the solids handling process (indicating). So all the waste in these tanks, that settles to the bottom, has to be processed and disposed of. And the way they do that is there's -- they have some, some equipment that takes the water out of it, um, you know, and it's called dewatering, and it takes most of the water out of it, and then it's trucked away for, uh,

incineration.

So that's a quick overview on how that plant works. Now, this plant -- where do I need to point this thing.

(NEXT SLIDE)

There we go. You know, this plant does have equipment that's operating past its useful life. These are the pumps in the influent pump station. I believe they're 15 years old. The -- these are the solids handling pumps. They were installed in 1996.

(NEXT SLIDE)

Here is photos of the oxidation ditch. So you'll see these -- this is one of the key, um, (indicating) components. This little machine it's a blower. It blows air into the water because this treatment process requires oxygen. Um, and one of the limiting factors here is the way that this tank is, is at the current flows you have, we can't get enough oxygen into that air with what is existing.

And this is the, uh, settling tank, which shows -- this is where the solids settle to the bottom and the clean water flows over these weirs to be -- for further treatment.

(NEXT SLIDE)

And, lastly, here is the disinfection tanks. These are constructed with baffles so that you get enough detention time, it sort of flows around these. And this last piece of equipment is the dewatering press (indicating).

So, again, the equipment's old, um, and the other key thing is here it, you know, the oxidation ditch, in particular, does not have enough capacity to treat the maximum daily flows that you see at the plant.

(NEXT SLIDE)

The last piece of the existing conditions is this is the Westmoreland plant. Um, it's a similar process, different technology, a similar flow pattern.

I'm not going to get into this, this is -- but what the key points here is we have three regional partners, South Kingstown, Narragansett, and the University of Rhode Island. The plant is located in Narragansett. It's operated by the Town of South Kingstown. The capacity at the plant was divided up, uh, percentage-wise based on the original capital investment that each town made back in the '70s. And that's -- when expansions occur, that has been adjusted. I can show you that

in a second.

Um, the operation and maintenance costs for this plant is shared on, uh, a measured flow contribution.

(NEXT SLIDE)

So that regional plant was -- the original agreement was in 1972. Uh, in 1991, they expanded treatment capacity. Uh, and then, in 1995, Narragansett needed additional, um, treatment capacity so they began leasing capacity from the University.

There's a lot of numbers up here. I'll kind of highlight some of the important ones.

Narragansett currently owns about 1.2 million gallons per day. "MGD," is million gallons per day. That's how we talk about wastewater flows. They lease an additional 200,000 gallons or .2 MGD, so the current available capacity is 1.4 MGD. Uh, Narragansett's average daily flow is .75 MGD, but their maximum monthly average, which is a 30-day average flow, is 1.69. So that's, you know, higher than what the capacity of what they currently own.

The history here is, when it was originally built, Narragansett owned, uh, 19 percent of the original flow; South Kingstown and the

University of Rhode Island each had about 40 percent. In 1991, there was an expansion. URI did not gain any more flow because they didn't pay for that expansion.

South Kingstown and Narragansett both contributed, and the current -- Narragansett currently owns 24.4 percent. I use the only -- the term, "owns," loosely, they, they -- but they do own the capacity, uh, 1.2 MGD, 24 percent.

(NEXT SLIDE)

So now that we sort of know the lay of the land, um, we have -- we looked at some alternatives for, um, the 20-year plan.

(NEXT SLIDE)

For the collection system and the south collection system, the -- there are two, two pieces to sewer system expansion. One piece is replacing on-site wastewater treatment systems or sewer expansion. The other piece is planning for, um, you know, development within, uh, sewered areas.

Um, the, the plan calls for sewers in the south, uh, sewer area or, or that's adjacent to Scarborough, and everywhere except Jerusalem across the, uh, across the Salt Pond there.

Um, the major projects are, uh, you know,

Great Island, Harbour Island, which, you know, those areas are, you know, you know, adjacent to the, um, the Salt Pond and, you know, the special management areas. So that's, you know, environmental concern. And then, you know, the other projects are listed here.

Just because your street isn't up here, doesn't mean that we haven't accounted for that in planning for the plant. This just means these are some of the major projects, um, that would be planned for.

(NEXT SLIDE)

In the north collection system, uh, the plan is for, uh, providing sewers in all areas except for the west passage, which I believe is right sort of the northeast (indicating) corner of town. Uh, the major projects here are Bonnet Point and, uh, Wandsworth Street area, actually right near the, uh, Westmoreland treatment plant.

(NEXT SLIDE)

We redid a capacity assessment and condition assessment of all the pump stations. Um, the pump -- there are five pump stations that need to be upgraded for capacity. Um, they -- in the 20 -- as we expand the sewers, uh, their, you know, they won't have the ability to, uh, uh, to handle those

flows. And then there are other pump stations that, um, just need upgrades to maintain equipment and to continue to meet the existing flows.

(NEXT SLIDE)

At the treatment plant, uh, we looked at the projected flows, uh, and what we call, uh, waste loads or BOD loading. "BOD," stands for biochemical oxygen demand. "TSS," stands for total suspended solids. So these represent the waste that's coming in. The flow represents the volume of water coming in.

The future (indicating), uh, the future flows to handle residential, you know, the existing flows plus, you know, the residential and commercial build-out in the next 20 years, um, you know, the flows are, you know, the average day is 1.04 million gallons per day, the maximum day up to 3.44 millions gallon per day. And then these are pounds per day for the, um, the waste.

The other piece of this is the economic development piece in the, um, in the port, the Port of Galilee. Uh, what you'll notice is the future fish processing if, if -- you know, if there was -- if -- currently, the plant does not allow fish processing. There's a whole pretreatment

program. Currently, there are no fish processors that send waste to the plant.

But if, you know, if there's, there's the plan to do that, um, what would happen is you would notice the flows increase very little, 1.04 to 1.06, 1.56 to 1.6. But what you'll notice is that the wasteloads increase quite a bit (indicating), are almost double. So the fish processing adds, uh, BOD and TSS. It does not really add any significant flow.

Uh, and the way we plan for this is we spoke to the fish processors there, and the goal here would be for economic development for the town. Uh, and, you know, we spoke to Town Dock and, uh, and Seafreeze about what their current operations are and what the potential expansion is. It's a very unique situation where it is state-owned land with the express purpose, um, for the fishing industry.

So, and one of the -- one of the things that -- one of the big things that blocks the fishing industry from expanding their processing abilities, at this location, is, um, the wastewater, uh, the wastewater infrastructure is the limiting factor.

(NEXT SLIDE)

So to address these, we looked at, um, three

alternatives for the oxidation ditch -- or to improve the treatment process.

The first option was to do the best we can with the, with the existing treatment process. And what that would mean is we saw the picture of the blowers we had before, it would be adding additional aerators.

Uh, and then the other piece of it is the way this works now is there are three (indicating) rings that are used for treatment. And you can see they go through the, the opening here and go through the middle. This outer ditch is currently used for storage of, uh, of sludge, uh, and it -- sludge digestion, um, and what we looked at was, if you added this additional outer ring to the treatment process (indicating), it would, it would actually double the volume of this treatment process. Uh, but what we found was this alternative was enough to, uh, handle the residential needs of the city but it would not provide capacity for, uh, the fishing industry.

(NEXT SLIDE)

The second option we looked at was what we call primary treatment. So primary treatment would be building some additional tanks here (indicating).

So the way this would work, if you remember, we had flow coming into the plant, goes through the headworks, goes through the pump stations, rather than getting pumped to the oxidation ditch, we would pump to what we call primary settling tanks.

So this is -- this takes the initial (indicating) flow and this will -- these tanks work similar to these, solids settle to the bottom, the solids are collected, and then the remaining water flows over the top and would go on to the oxidation ditch. Uh, and from there, it would go on through the rest of the treatment process as, as it does today.

What we found was that this did not actually do any better than just expanding the oxidation ditch, so we did not expand on that any further. It actually adds quite a bit of treatment complexity to add this, particularly in the solids handling because these solids that you collect are different than the solids you collect from this process. Um, and it was much more expensive. So that's where we ended that one.

(NEXT SLIDE)

Whoops.

(PREVIOUS SLIDE ONSCREEN)

A third alternative is essentially to construct a brand-new treatment flow process. Uh, Alternative 3 would be to abandon the oxidation ditch (indicating) and to build a new secondary treatment process. Uh, it actually would look very similar to, uh, the type of treatment process of the Westmoreland plant.

Um, if you recall that, that, um, slide, you know, they're rectangular tanks. It's, again, a biological treatment. It would have selector zones which, you know, maintain different types of, uh, bacteria in different zones so that you can, you know, basically control the treatment process a bit better.

Uh, so what that would be is you would have three tanks (indicating), uh, going into three secondary clarifiers. And this -- you would have a building here (indicating) with electrical equipment. This -- these tanks are much deeper than the oxidation ditch. And the blowers in here can provide a lot more air into that water. And the air is what your treatment process needs.

Uh, the other advantage of this is there are three tanks in the winter. You would have the ability to function with two and do maintenance on

the third. Uh, during the summer months, you would need -- you would keep them all online to have the available capacity.

(NEXT SLIDE)

The other piece of this is solids handling. The, the Scarborough plant currently does sludge, uh, sludge thickening. I think I misspoke before but it is sludge thickening. Uh, so what that does is the solids, they need -- the water needs to be reduced in them, and then this process basically creates liquid sludge that's thicker, and it's hauled off-site.

One of the biggest issues, in wastewater treatment today, is sludge disposal. Um, right now, the Scarborough plant's sludge disposal is at the, um, uh, Woonsocket incinerator, and they have given notice that they will no longer be accepting liquid sludge. Um, the time frame on that isn't clear, but it's a regional issue, not just a Narragansett issue. So the alternative to sludge thickening is --

(NEXT SLIDE)

-- sludge dewatering. A screw press is one technology. What happens with the solids is they go into this screw press (indicating), and instead

of just getting rid of some of the water, it gets rid of most of the water. And what you get is a, uh, they call it sludge cake. Um, and it's a solid material that would get hauled away in a roll-off, rather than a liquid tank.

(NEXT SLIDE)

So, for the Scarborough plant, our recommended alternative is to, uh, go with Alternative 3, which would include, uh, you know, abandoning the oxidation ditch and this could continue to be used for sludge, you know, aerated sludge storage (indicating). Um, you would be building the new secondary treatment system, new secondary clarifiers. Uh, the additional flows would require some expansion of the disinfection system.

The solids handling system we recommend, uh, we recommend going with dewatering just because you will then have more disposal options for the future.

Um, the last piece that the, um, on the recommended plan that the, um, that the report discussed was what we call the baseline improvements. And what those, those baseline improvements mainly address is, is the, you know, addressing the aging equipment throughout the

plant. So that includes things like the influent pump station, the headworks, uh, you know, the building, uh, improvements that are needed.

Uh, you know, it includes the disinfection system. So that, uh, I heard the 36 million being mentioned. That baseline improvements does not really address the, um, this -- the new treatment system or the solid system but it sort of the other items in the plant, uh, that need, uh, you know, attention.

(NEXT SLIDE)

We're almost done here.

At the regional plant, we didn't really -- we are where this is operated by South Kingstown, our role here was to identify the wastewater needs. And what we found, when we forecasted the wastewater flows, is an additional one million gallons of capacity is needed to meet the needs of the north, uh, collection system. Um, you'll see the existing flow is, you know, .75 MGD. Um, the annual average is 1.14 and up to 1.7 for the maximum month. Uh, the two alternatives to that are to build a capacity expansion or to continue to lease, uh, available treatment as available.

The timing of this is such that South Kingstown

and URI's planning efforts are a little bit behind ours. I believe they are under contract to do their Wastewater Facilities Plan, so the, you know, the sort of the solutions here is also going to depend on, on the needs of those other communities.

(NEXT SLIDE)

So the cost here, um, were some big numbers. The sewer expansion, um, you know, just over a 100 million. You know, now, this is over a 20-year period. Uh, the pump station upgrades, when you take into account the capacity and, you know, the sort of aging equipment needs, um, 24 million over -- it sounds like a lot but that's over 20-plus pump stations. Uh, and then our recommended plan for the Scarborough treatment plant is 75 million.

(PAUSE)

And that includes the 36 million for baseline improvements; 33 million for the new secondary treatment system; and 6 million for the solids handling process.

(NEXT SLIDE)

Uh, you know, a quick summary. The collection system we looked at removing on-site septic systems. It's really critical for the town. The

soil isn't great, and you have a beautiful environment to protect. Uh, and then, you know, to con -- continue to support the residential and commercial, you know, build-out and the needs of the current residents.

The pump station, we mentioned the capacity, age, and condition-related needs. And the Scarborough treatment plant, um, the Scarborough treatment plant, you guys are at, you guys are at capacity. Um, you know, one with, with the summer heat and, uh, you know, there's, there's no more room for growth at that plant.

And, finally, the regional plant, you know, it's going to depend on regional planning, but we've identified sort of the, what is needed for Narragansett's capacity.

(NEXT SLIDE)

We already did that.

(NEXT SLIDE)

You know, there's my contact information if there's questions.

(PAUSE)

Um, and that's, uh, that's my presentation.

(APPLAUSE)

AUDIENCE MEMBER: I'll sign off now.

(LAUGHTER)

PRESIDENT MENZIES: Well, thank you very much, Andrew and Jon, for being here. And I will turn the floor over to the Council to ask questions. But really, really appreciate -- it's very ironic the timing of this presentation with everything that we've heard this evening. Um, but I think it's, it's -- it's exceptionally important that these issues get addressed.

And, you know, I appreciate the efforts, all the research, the proposals. The Planning Board has taken -- has done their due diligence to read through thoroughly the plan and provide us with recommendations, as well, which we will also address as well.

But, first, I'll start off with Councilor Durkin, if he wants to kick us off with any questions.

(MR. DURKIN LAUGHING)

PRESIDENT MENZIES: Or does anyone on the Council have any specific questions maybe.

MR. DURKIN: Um, yes. So, um, so Andrew?

MR. SMITH: Yup.

MR. DURKIN: Yeah, so, when you talked

about the Scarborough plant, the, um, you called it the racetrack there.

MR. SMITH: Yup --

MR. DURKIN: Okay. So --

MR. SMITH: Yeah, the technical term is, "oxidation ditch," but, yup, the racetrack I called it.

MR. DURKIN: So the -- (pause) -- you said that you could double the capacity by using the outside ring.

MR. SMITH: Well, you can -- you can double the volume. That outside ring has the same volume as the inside three rings, but you can't, you can't treat -- I can't -- if it treats one million, I can't treat two million.

MR. DURKIN: Right.

MR. SMITH: So it's not doubling the capacity, it was just increasing the volume. Um --

MR. DURKIN: So then if you --

MR. SMITH: -- because the limiting factor isn't the volume, the limiting factor is the ability to get oxygen into the water --

MR. DURKIN: Right.

MR. SMITH: -- for the bacteria.

MR. DURKIN: So then you would need to

take advantage of that outside ring and then you would have to do something with the oxyenators -- the oxygenators, that -- those blue things that stick (indicating) into the water?

MR. SMITH: Yup, yup. Yeah, they're just blowers, they're fancy fans --

MR. DURKIN: Right.

MR. SMITH: -- that blow air in there. Um, but the, the -- there's limits on how much oxygen you can get in there. You can't just keep adding, um, blowers, uh, because of the depth of those tanks, they're about 7-feet deep. And just the -- there's a limit, uh, because of the pressure and limits of the physical properties of water, you just can't get any more oxygen in there when they're that -- the typical treatment plant -- conventional treatment plant, the tanks would be, you know, you know, 10-, 12-feet deep.

Um, so there's just -- and, you know, the technology that you can use to get water into those is much different -- or get air into those types of systems is much different than the technology you could use on an oxidation ditch.

An oxidation ditch is a more primitive technology, much simpler, um, you know, but it's,

you know, it's generally designed for smaller communities, which probably made sense in 1982 in, um, Narragansett.

MR. DURKIN: So, um, so then if you did use that outside ring, then you'd need another oxidation ditch to take care of the volume that that would create, not just the, you know, the air propo --

MR. SMITH: So the -- so to get the most out of that oxidation ditch, you would take the outer ring and you would, instead of using it for sludge digestion, which it is currently used for now, you would add it to the treatment process.

So the water that flow through the outside -- so if the water would flow through four rings instead of three. And then you would have to add, uh, I think about, I think it was about eight more blowers. You need blowers in the outer ring and you'd need some additional ones on the inner rings. Um, and, if you did that, what we found was that should be able to treat the current flows and potential sewer expansions. What it will not do is it will not provide capacity to the port.

MR. DURKIN: So, then, what would that cost, that, without -- like, I'm trying to think,

as a Town Council person, that's our responsibility, but I'm thinking that the, you know, the fish processing should be the State's responsibility, you know, because it's on their property, they're, you know, they're getting the taxes from the -- you know, it's their operation so --

MR. SMITH: Sure, yeah, I guess one of, you know, as Jon mentioned before, this plan was, was funded by Economic Development money.

MR. DURKIN: Yeah.

MR. SMITH: You know, we've worked with companies throughout New England, um, that have used Economic Development money to address wastewater needs. Um, so, you know, that is, you know, that is an option that's, um, out there.

MR. DURKIN: So if -- so, you know, from what I understand, we're not processing the fish at -- the squid is the biggest product --

MR. SMITH: Sure.

MR. DURKIN: -- out of Point Judith, and we're not processing it. We're sending it overseas and letting them process it, and then it's coming back to us nice and clean and, you know --

MR. SMITH: Right. So some, I guess

some of the motivation from the Rhode Island Economic Development was to look at our -- restoring some of that production.

MR. DURKIN: Yeah, okay, yup.

MR. SMITH: Yeah, so the history there is the plant, back in the '80's, did accept fish waste, um, and then a pretreatment program was implemented so the fish processors were then required to treat the waste down to a certain level so they didn't overload the plant. Um, what that did was it, um, in the long term, it, it limited, you know, it -- that was a difficult process for them to do, um, so it became more economical for them to do the processing elsewhere.

MR. DURKIN: Yeah, so that's, that's interesting history. We all know about the smells that the pretreatment eliminated for a period of time. But it does seem like somehow those smells are back. And I don't know, you know, it seems like they did go away, in Scarborough, for a period of time.

MR. GERHARD: Yeah, I think, Council Member Durkin, that what happened was there was a pretreatment system down there, and there was -- those became cost prohibitive to, to

the State tenants down there. It improved our -- it improved conditions at the plant somewhat. They were still having some violations but then they ultimately just said we are -- we can't afford to operate these at the capacity they need to for them to maintain their pretreatment permits and discharge cleaning up waste. Because, basically, they have to pretreat the industrial waste and send us something that's more inline with the normal residential waste.

But, again, that was 20 years ago, and we've had some expansion. We've had aging equipment. And, and the issue was that, essentially, the plant was built in the, in the 1980s. And that's -- the process has worn down to the extent we've got new, new aeration equipment in there, but it's, it's operating a little differently than the original equipment, uh, and there's some challenges with that.

But, but, as, as Andrew mentioned, the, you know, the, the, the retrofitting that outer ring as a treatment process would kind of bring us back to where we were like you were talking, you know, 30 years ago when -- in the '90s when they first, first made those pretreatment upgrades, you know,

like, okay, this plant can handle what we're getting right now but it can't really do anything else for us.

So -- and that was in, I think in -- I just looked it up, it was about $16 million, which was about the same price as, as any of our baseline improvements where some of them other components that we're looking not to do that.

Um, so the plan is, is to, to, um, to um -- the baseline improvements were to fix all the old equipment that we can still use in the future. And then the recommendation is that new aeration system, which, like he said, it's, it's deeper, it's designed for those systems.

And the whole purpose of this grant that we got for the plan was that, as you mentioned financially, that the State or the federal government would pony up their money and provide the, provide the financial backing for these expansions to improve the economy.

You know, it's a partnership we went into with the EDC, um, and, and the State food council and various other, um, state agencies including RI DEM. So we're trying to find, you know, the -- got to get the plan approved first and then that opens up,

opens the avenue up for, for other financing sources.

MR. DURKIN: So is people currently actually looking for that money in anticipation of these --

MR. GERHARD: We can't look -- ask for the money. We have to get this plan approved first.

MR. DURKIN: Okay.

MR. GERHARD: And then, then that's where it opens up.

MR. DURKIN: That makes sense.

MR. GERHARD: It's -- hear it every, every time we have any kind of meetings with the, with the Economic Development Agency and from The Feds that it's, it's like, this will open the door, this will open the door. But we have to get this piece done first.

MR. DURKIN: So are you planning on using, um, Number 3, suggestion 3, um, going forward or is that something that --

(DIAGRAM ONSCREEN)

MR. DURKIN: -- the Town Council decides or together we decide or how does that --

MR. GERHARD: Yeah, this -- that's what

this hearing is for, to get everyone's -- the public input and then, um, and then we go and then we take the plan and we -- and that's whatever the other public input, your input, um, but the idea -- the intent is to get a consensus on that. We submit that to DEM for approval. Then that comes back and then your -- then the Council would ultimately adopt it and then that becomes the Town's wastewater planning document.

MR. DURKIN: Yeah.

MR. GERHARD: But, if there's, if there's significant changes to this, then we would need to know that and, and we have to get in a plan in the next two weeks.

MR. DURKIN: Oh.

PRESIDENT MENZIES: How many weeks? Sorry.

MR. DURKIN: Two weeks.

MR. GERHARD: Two weeks.

MR. DURKIN: Next week (laughing).

PRESIDENT MENZIES: Okay.

MR. DURKIN: That's how it works. You know, I don't want to ask all the questions.

PRESIDENT MENZIES: No, that's all right. If you have them, you should ask;

otherwise, we can just, like, share the floor with the other Councilors.

MR. DURKIN: Well, I was going to just ask my questions on the north -- on the regional plant.

PRESIDENT MENZIES: Yeah, go ahead.

MR. DURKIN: It's funny that, you know, I mean, URI is basically shut down in the summertime so they probably don't create that much, um, use. So is it the weather that creates the smell in the summer or is it the --

MR. GERHARD: It's -- at the regional, it's -- their, their flows are more consistent at the regional plant. Um, URI's flows do drop down, you know, at the beginning of the summer.

MR. DURKIN: Yeah.

MR. GERHARD: I'd have to look at the numbers to see exactly what the flow changes are, but, but, um, you know, generally, it's -- again, it's, it is, unfortunately, a -- it's a biological process that, that is dealing with odors and smells.

Um, and, and as, um, Andrew mentioned, uh, South Kingstown is, uh, in the beginning processes of their facilities plan, which actually is what

will ultimately decide what the regional plant does for us, and that extra million gallons. What it's going to come down to is their plan will have to incorporate that, that additional capacity that we need and then come up with a means to pay for it, which is to send us the bill.

And, again, those -- the dollar figures that are, that are presented for this plan don't include the regional plant yet. So that will be, that will be an additional, you know, area down the line. But, again, it's, it's those, those will be whether, you know, that will all -- there'll be funding sources and SFR loans and, and, uh, infrastructural bank is where we'll look for those funds.

MR. DURKIN: Yeah, so I just know, uh, when I was previously on the Town Council, the Town tried to help do sewers down at Great Island. And, I, I think twice now, they have voted against sewers on Great Island. So I don't know if there's any, like, indication that septic systems are affecting the pond water because that would be very helpful to know because, if that's the case, then we would want to push that. But, if it's not the case, then I would just let it be.

MR. GERHARD: Well, as, as, for instance, the existing plan is very similar to the current recommended -- this plan recommended in terms of the areas to be sewered. You know, the entire town, with the exception of Jerusalem and, and West Passage. Uh, the Great Island and Harbour Island were included in that.

But, but, essentially, it's up to the voters there, you know. They would have to foot the bill for the bonding and for the sewer expansion because they would be the direct benefits. So that's, that's what happened in the past.

And I believe the prior plan, you know, was, was written that way when they, they vote for funding. But, you know, we could, we could still do the plant expansions that -- we wouldn't be able to do any of those, uh, or collection system expansions until we had the, the plant expansion in place.

MR. DURKIN: Yeah.

MR. GERHARD: So that would happen -- have to happen first. So it's all, it's all intermingled but, um, it's, it's, uh, it -- ultimately, the voters will have to look at stuff, too, if we're going to bond, bond funds for that,

and, and there'd be new assessments for all those new sewers.

MR. DURKIN: Thanks, Jon.

MS. VIGNALI: So, I, I think -- thank you for the presentation. I think it's, you know, definitely something that needs to be looked at. There's definitely been, um, you know, there's definitely reason to consider all of this. And I think Alex is right. It's just so coincidental that it's just coming on with the problems that we're having at the plant.

So I guess my question is, um, is there anything we can do to be proactive to help the smell currently now that we can incorporate into these plans in the future so that we're taking, you know, steps to help what's going on now, current. Because, obviously, this is going to be something that we're going to, it's going to take a long time to do. Just is there something we can do, right now, that would also benefit us in the future down the road if we just -- you know, when we decide or if we decide to do this.

MR. GERHARD: Well, any of the short-term improvements would be, would be, um, you know, whatever we can get out of those at the time

to benefit the, uh, the, the odor controls.

You know, the problem and the key, unfortunately, the key problem is, is, as Andrew mentioned, the biological process. That's the source of the smells as well. The ditch, with, with the biological process and the biomass in there and the, and the sludge digestion channel, that's, that's where it is, too. If we can, you know, we're going to look -- we're looking to see what we can improve.

But, again, unfortunately, it really -- I mean, the -- really, the plant runs terrifically ten months out of the year -- ten-and-a-half months, um, out of the year.

We get a little dip in the influent flow in June right, you know, as URI school closes, or for whatever reason we get a little, a little lag in the actual hydraulic, you know, flows through the plant. And then, on the Fourth of July, it's, you know, the switch goes off and it's just, it just gets blasted with that one real, high-end flow. And it's, I think a combination of, you know, the old equipment, um, some, somewhat increased loads, and also the, the, as I mentioned, the capacity, the aeration capacity, uh, some of the, they're

just a little undersized or, or insufficient.

So we're going to look, look -- we've -- we did get some temporary, uh, portable equipment this year that we put in the tanks, when, when it was coming into, into June and July. Um, but it -- clearly, it wasn't quite enough.

We're going to look in to see if we can find another -- some, some additional ways. I got some things we're viewing, I'll review with Wright-Pierce as well to see if there's things we can implement in the, in the, in the short-term, it's, um, to make those things happen.

Uh, and, obviously, the improvements as, as we said that, that new, the treatment process to replace the current one, will be much more efficient and, and all of the new systems will have odor control and odor, um, odor containment considerations will be part of the design process.

MS. VIGNALI: Thank you. The Planning Board -- in one of the Planning Board's recommendations, they said that the contract expired in June. Um, is that a yearly contract or is that something that we can now negotiate for more capacity? I didn't quite understand that part of it.

MR. GERHARD: Well, it had been a five-year agreement going back to '95 or thereabouts when the first one was. Um, and we had, initially, it, it was extended for two years, I believe, in 2023, uh, when we signed this contract with the intent that we would get this Facilities Plan done and we would know what our future capacity needs were there for that agreement to be made to be renegotiated.

And then we -- or maybe it was -- it might have even been a year before that, but we went through one more one-year extension, and then, and then we requested another one-year extension this year in March, um, and they got back to us. We've got verbal agreement that they're willing to -- that URI is willing to extend the lease.

Uh, there was some discussion on what the cost was, and, um, you know, so, so there will be some agreement on whether they were going to increase the cost or not and then -- but there's also discussion that they weren't interested in doing anything more than a year.

So, you know, the whole idea is to get -- we've got these numbers here that are up there on the board that I've sent -- we've sent the draft plan

off to South Kingstown because they are the managing partner and they have to incorporate those flows in there.

And then, you know, we need to, we need to circle back with URI because the last meeting we had was, uh, several weeks ago when they discussed, they said they're willing to, to extend the lease, um, but they wanted to talk different, different numbers to it. And I have not had a response. And I, I have to reach back out to them.

So, you know, we're going to, we're going to need that capacity for more than a year, because it -- people are asking timetable here. It's -- these things don't happen in, in two or three years, you know, that's, that's when we'd be looking at least. You know, maybe two years down the road we can start implementing some of these, some of these, um, construction plans depending on where the money. But like, as soon as, as soon as we have the approvals, then, we can start looking for the money and figure out where and what, what the exact timetable is going to be.

MS. VIGNALI: Thank you.

MR. COLONIES: So I just want to clarify that. That was the question I was going to ask.

So you don't see this happening for, you know, you don't see these new structures, if we did Alternative 3, these new structures wouldn't be built for two or three years down the road; is that what we're thinking?

MR. GERHARD: Probably along those lines, maybe even a little longer for the, for the actual, um, those major treatment plants.

I think the key, because of the age of the plant, it's, it's more than likely going to be the, uh, baseline improvements to get that done because, you know, the, the can's been kicked down the road for quite some time here, so we need to get that to work.

And then, you know, my intent would be to try and, uh, present -- as you see the plan, the plan is to reutilize the, uh, the ditch to basically, instead of just using the outer ring as sludge storage, all four rings. But, I think by doing that, we would, we would have the ability to take, take one or two of the rings down and do some maintenance and try and provide for some additional, uh, some treatment there.

But, but, yeah, it's probably, you know, it's between design and construction, permitting, you

know, it's it's a, it's an extended timetable.

MR. COLONIES: Uh-huh. And as far as URI's negotiations, I don't want to get involved too much with it, but one would think that we have some pull with the amount of resi -- student population that we have with them.

MR. GERHARD: Well, it's, as I mentioned, I mentioned to, um, someone speak to it earlier in the meeting, or prior to the meeting, that it, it, the consideration, the amount and what URI has, I mean, they've got the Bay Campus, you know, that's 15,000 gallons a day that they send typically through the town. We bill them for all that, you know. We bill them $40,000 a year or thereabouts for that. And I think that's where they're -- you know, our sewer rates went up, and we bill them as a customer, just like any other customer. So -- and they're a large customer and they go into excess every year, so they get a good-size bill.

Um, but the, the idea that we do provide, you know, residential housing for URI, as well as the -- have the Bay Campus here, um, those need to be acknowledged, uh, within those negotiations.

But the current process was just, okay, we've

got an agreement. It was established, in parts, between 1995 and say 2005, the basis of it, and, generally, the agreement didn't really change much except for some of the num -- the, the, uh, fee changed a couple of times and the volume changed a couple of times. But, otherwise, it was the same agreement. So it's always easier to get something that everybody's approved, previously approved.

Unfortunately, there's been a change of Administration at URI side, both on my counterparts and in the upper, in the upper, um, campus management that they're looking at it with a different, uh, level of scrutiny, scrutiny at this point. But, uh, we do need to come to a, a -- both a short-term for the lease capacity and a long-term for our, our ultimate -- and what we, what we own and control at the plant.

MR. COLONIES: Thank you.

PRESIDENT MENZIES: Okay. So I wrote down some questions preliminarily, just so I wouldn't forget. And can you -- just as a start off, can you just provide us with just a quick timeline of expectations of when this needs to be approved by.

I believe that there were -- as I was reading

through it, that there were a number of recommendations, including sending -- from the Planning Board -- to send this off to Finance Committee to provide us with a recommendation on how an alternative would be funded, you know, a timeline of sending this to the RI DEM. I just want to know, from our understanding, just what it is that we are, like, under --

MR. GERHARD: Well, to --

PRESIDENT MENZIES: -- the clock.

MR. GERHARD: -- again, the clock is from the funding source that we need to have all -- or we need -- the plan, uh, was to be completed by September 4th but that's not going to be ultimately approved. But we need to, we need to complete all our work. And then, the end of that will be the, um, DEM's final review and approval.

From this stage, we get -- we have, uh, the 18th of August is when we need to submit the plan, revised plan incorporating the public hearing, all the public comments, whatever changes are addressed, to address those conditions, and, um, get that to DEM by the 18th of August.

And then they have -- they'll review that.

They issue a, um, a public, um, there's a public notification because there's an environmental approval component to the, uh, to the, to the plan, which this one would, would come up with, you know, essentially, they'll come up with a finding of no significant impact because it, it is our plant. It's an existing plant, and it's, uh, it's working with the existing expansion. So that is a 30-day window that they have.

And then, ultimately, the approval is, um, their approval would be September 4th, October 4th or October 6th -- excuse me, I think I have it, the schedule here.

PRESIDENT MENZIES: Okay.

(MR. GERHARD REVIEWING DOCUMENTS)

(MS. VIGNALI LEFT MEETING)

MR. GERHARD: I think this is it. Um, so we're at the public hearing point now, um, final plan on the 18th to DEM, which, which, again, it's -- we've been through it, we've been through it with, with, uh, from our side. Technically, this is, this makes the most sense for the town, and, and, to resolve all our issues including the expansion for seaport.

Um, and then DEM would have two weeks until the

29th, and I think I may have seen that they may, they may lag that by a couple of days, but they'll issue their 30-day public notice on or about the end of August.

Um, and then the 30-day window clocks out until the end of September. Then they would issue their final approval on the 6th of October. Um, and then we would need to, you know, before December, we need to submit our final drawdown request and, uh, and reimbursement for the, the design fees we've paid to, to the consultant, to, to the federal government for reimbursement.

And in between that that's not on this window, um, is that, after DEM issues that final approval, that's when that fourth plan will formally be re-presented to the Council, uh, for adoption.

Um, and, again, it's, it's really to adopt the facilities, you know, for what our plan is moving forward. And I believe some of the comments were to develop some sort of scheduling.

MR. SMITH: (Nodding in the affirmative.)

MR. GERHARD: We'll have a -- the, the final plan will have a better idea of the scheduling and the, the sequencing in there of, of,

of the proposed facilities. But this, this window is, is compressed, um, just due to the timing we have and, and the development process of the plan.

PRESIDENT MENZIES: Thank you. Just as a procedural-related question, if the general feedback from the Council this evening is in support of the recommended -- the recommendation of Alternative Number 3; but, again, from the Planning Board, there was a recommendation, which I agree with, that we send this off to Finance for review and provide us with recommendations on how to go about --

(MS. VIGNALI REJOINED MEETING)

-- the cost, would we have to vote on it before or can it -- while it's in review, through all of these other phases, still send this off to Finance for their review?

MR. CALLAGHAN: I think you do it any number of ways.

PRESIDENT MENZIES: All right.

MR. CALLAGHAN: In the, in the end, this probably should go to Finance, in some respect, to get their analysis so they should analyze all three options. You can decide which option you think might be right for the plan itself and then move

forward that way. But Finance should weigh in for sure.

PRESIDENT MENZIES: Definitely, okay.

MR. GERHARD: And, just as a note, I know some of -- we indicated when, in my introduction, that it had been submitted to DEM and then, again, this is -- it's been submitted twice to DEM, some of their comments involve the financial planning process is that, that, uh, weren't included in these first two steps that we need to work with the finance director, uh, prior to submitting that developable plan.

And it's -- generally, it's basic funding, you know. It will, you know, if we don't have the money, we'll have to bond it or, or, um, you know, look for, as we said, look for grant monies and, and other outside funding sources and the like.

And then those detailed, the detailed financing things could be, um, can be worked out, you know, after the plan's approved as well.

PRESIDENT MENZIES: And alternative option 3, again, a big issue that's been brought forth this evening, was this, the odor. Would alternative option 3, and based on your guys' understanding, address a lot of that odor that --

'cause, again, I see proposed aeration tanks. Again, I'm not an expert on this but I'm just asking, um, as that is an issue that's been brought forth this evening.

MR. GERHARD: Yes, as Andrew mentioned, this, the new design is, is set up, it will be designed and there will be additional, um, there will be additional waste profiling and the like when they go into the final design work and, and, uh, detail design for that. But the, the plan will be designed to, to treat the higher strength loading, whatever, whatever the design strength is that we determine, whether it -- from this, it will be, it will improve that system. So -- and, and be able to treat that.

Um, and, again, we will also incorporate other control measures because we are aware of them at this point.

PRESIDENT MENZIES: Thank you. And, again, this is actually a comment that I had shared with Councilor Durkin in the past, before I think we were elected, was this, what -- how long this current agreement of the shared facility with South Kingstown and URI has been in place. And to see 1972, that's a lot of years that has passed.

So I would propose, uh, if the Council agrees, to maybe take a second look at this, maybe, you know, take into consideration the times that have changed, the current makeup of the town, um, and maybe have some discussions with South Kingstown and URI.

I know one of the, one of the ideas that I think many of us shared, during the election season, was trying to build the relationship with our neighbors and having these, this open dialogue. And I think that this particular issue is one that I myself am continuing to get educated on as we're making these decisions. And I think it would be, I think, beneficial for all, especially Narragansett, if we consider having a second discussion with South Kingstown and URI on the shared facility.

And then the, you know, I think one of the, in regards to, I think it was the lease question, I, I -- it was like 70,000 a year.

MR. GERHARD: (Nodding in the affirmative.)

PRESIDENT MENZIES: Does that fully cover what is being, like, expended by, I think it's from URI, right? Or it's --

MR. GERHARD: Well, we, we lease back

capacity that they pay for at the beginning. And that's, and that would be the goal of, of this project. Uh, like you said, the '72 agreement is the original agreement. There's been 17, 18 --

PRESIDENT MENZIES: Amendments.

MR. GERHARD: -- other agreements plus the lease, the lease amendments and the like in there.

But, um, we would, we would look to, uh, you know, as part of this, you know, my, my feeling is you look at the numbers as like, well, Narragansett just has never had enough. We've got the least capacity back, you know, who, what, you know, blame the engineer, which engineer back then didn't give us the right numbers.

But I don't know, in terms of, you know, you also ask the question about the, someone mentioned the question about the, the plant being in our town, and but, but South Kingstown is the operating partner. I'm not sure what type of, you know, being the host community, what type of benefit was given back then, uh, and the like.

But the, the goal would be to come up with, you know, as a result of all this, get -- everybody's got what capacity they need for the next 20 years

and everybody 's -- and all the departments are in agreement that, okay, we're all whole after this. And, you know, we don't have to worry about leasing once we get the capacity and the upgrades done that we need to have done so that, you know, uh, we can kind of try to do away with or modify the sewer policy to the extent that it's, it's, you know, more manageable and, and not a question of, okay, well, did it rain yesterday, do we have enough capacity at the plant for this, for this project or not.

Um, but as I, I concur with you, Council President, that, that the intent is to try to revisit all of the agreements and get everybody all on the same page and update those to the extent that they should be or need to be.

PRESIDENT MENZIES: Excellent. Great to hear. Just, I think one or two final comments if I can read my handwriting. Um, I made a com -- I wrote down a question early on when it was referenced that there's minimum staffing on weekends, that there's basic lab analysis that needs to be done --

MR. GERHARD: (Nodding in the affirmative.)

PRESIDENT MENZIES: -- daily. In your professional opinion, is there any work or any delay of the work that due to, due to having minimum staffing on the weekends? Do you see any benefit, if there was additional help at that facility on weekends, or do you, in your professional opinion, is the work that needs to get done getting done.

MR. GERHARD: The work, you know, the minimum work that is required for our permit is getting done. Um, needless to say, the, the odor issues and the difficulties we have, um, you know, if nobody's there on the weekends, and, and it's more crowded on the weekend, it becomes more difficult and -- but I think part of the challenge is too, is, you know, one of the worst days is the Fourth of July. And it's, it's not just weekends. It's weekends and holidays.

So holiday day, you know, everybody, everybody is off on their plans, but we, we do, um, you know, work to prepare the plant to the extent possible, whether it's June coming into July or Friday going into Saturday on the weekend to make sure that it can run on its own.

And we do have, you know, it is monitored and

controlled. We get, we get reports of alarming conditions that need to be addressed. And, and, as we said, someone does come into the plant, you know, Saturday morning and Sunday morning. Uh, it's a three-hour shift instead of an eight-hour shift. But they, they go through and, um, and, you know, they walk the plant, check out, make sure everything is all right, and then do the lab work and then come in the next day for the same.

So we're, you know, we're meeting our obligations now. But, you know, additional staffing, uh, and, and other shifts would be, would, would, you know, would only benefit the, uh, you know, the maintenance and the, uh, the man -- operational times on the plant. But that involves, you know, negotiating, you know, with the labor union and the, and the like.

We are reviewing the, um, the facilities plan does have a staffing component to it and then there are other staffing documents and, um, you know DEM has to approve the staffing.

And I believe that, um, that the, the, uh, press, that option with the solids handling may, um, require an additional shift, and we could look to instead of it having, you know, be an extra hour

a day, a couple days a week, we could possibly make it a, um, a, you know, a multi-man shift on a, on a Saturday or something like that. But, um, but, yeah, it's, we're -- we will man the plant to the extent we need to.

PRESIDENT MENZIES: And then my last question is, this is, I think it was brought, brought up during the presentation that the current processing plant, everything, the way that we currently see it right by the ocean, this is not something unique to Narragansett. That there are other models around the country that process this similarly, um, just wondering if there's anything else that other cities and towns around the country that are doing differently than maybe not have been in this recommendation.

(PAUSE)

MR. SMITH: Well, uh, so wastewater treatment, you know, since, you know, since, you know, early 1900s, has been a biological treatment process. Um, they've -- there's been improvement's to that process. Um, you know, over the years, you know, being able, you know, knowing what we know now and being able to control the types of bacteria and things like that, that wasn't done initially.

Um, there are often, um, depending on what the permit requires. Um, so the RIPDES permit or the Rhode Island Pollution Discharge Elimination Permit, uh, you know. So the good thing for Narragansett is their, your outfall is in Rhode Island Sound, half mile off the coast. Um, it's on ocean outfall, which has a very, um, uh, so you have an easier permit to meet than communities that discharge into a freshwater body or a river, um, they -- 'cause, you know, you know, the ocean, um, handles more I guess, for lack of a better way to say it.

Um, so the places that are using, um, you know, what we call tertiary treatment or a third treatment process, um, you know, they would have to meet different, uh, contaminants, um. But to meet your permit for, um, biochemical oxygen demand, BOD and TSS, um, to meet that permit, that, you know, you don't need more than a secondary treatment process, Um, you need an approved treatment process. Um, but you don't need, um, any additional technologies, um, for, you know, additional, um, treatment beyond that.

Um, in the design process, I know the odors, um, throughout the evening, have been a recurring

theme. Um, and, you know, during the design process, you know, right now, we're in the planning stage. When we get to the design process, that, that will be a factor in, uh, the design. Um, you know, so there are technologies you can use to control the odor, um, you know, air scrubbers, uh, you know, you know, granulated carbon -- actived carbon filters and different things like that that you can incorporate into these, um, designs that will, um, you know, in addition to treatment processes that's not overloaded and causing the odors, you'd also be able -- you know, there are technologies to treat the, uh, you know, any odors that, that do come out.

I mean, it is still a wastewater plant, um, and, you know, there are going to be days when it smells because the weather changed. But, um, but there are ways to, to make that, um, manageable and good for everybody. There are technologies available and, um, you know, the new treatment process would be the first and foremost in that.

PRESIDENT MENZIES: Thank you. And, actually, I did have one final question for Jon. You mentioned SK in your -- or SK's timeline that they're a little bit behind us in working through

their Wastewater Facilities Plan. From a timeline perspective and from, based on my understanding, that a lot of what it is we're agreeing upon is also dependent on which I'm wrapping my head around here, what our neighboring towns and other negotiations and discussions go on, does, does the order of operations here make sense or should we be waiting for -- I mean, I don't want to wait --

MR. GERHARD: No.

PRESIDENT MENZIES: -- I'm just making it very clear.

MR. GERHARD: I think that in the past, um, they have been done, um, by the same consultant as somewhat of a joint venture, um, between, between South Kingstown and Narragansett.

Um, URI, again, they've pretty much previously had sat back and said, we don't need any more capacity. And I think in this new plan, they may look for more capacity, but they would be responsible for something like what we've done here is, okay, develop what your flows are, this is what you want to do.

So, if they, they looked to have some more capacity at the plant, you know, um, 'cause, you know, again, 1 MGD is a nice round number to

increase the capacity at the plant. If we just said, okay, well, that's ours, that's how we're going to do it, that's all we need. But South Kingstown or URI have to plan for their additional work in there, so it may be, you know, 1.25 or something or 1.5. But they'll all, they'll -- in terms of timing, you know, we -- they need our number up there, they need that 1 MGD additional capacity. So that's really the number that, that South Kingstown needs.

Um, they'll do the process evaluation on their side for that based on all the data that they would collect, like Wright-Pierce did for us. But timing-wise, um, you know, it's kind of a concurrent but we've got our part done. So there's no -- you know, we wouldn't need to wait on the rest of our plan to get this piece done.

PRESIDENT MENZIES: Excellent. Well, thank you so much for your time. There may be additional questions to address --

MR. GERHARD: May.

PRESIDENT MENZIES: -- depending on how the public goes. But really appreciate both of your times and the presentation. Oh, Mr. Durkin has a couple of other follow-ups.

MR. DURKIN: Sorry.

PRESIDENT MENZIES: Sorry about that.

MR. DURKIN: Jon, what did you say URI Bay Campus, um, the amount of gallons is 150 --

MR. GERHARD: I just looked at those today, too, because the question's been asked a few times and I didn't have it off the top of my head. It's about, over the last five years, from 2021 through 2024, fiscal years, it's about 15,000 gallons a day on average over the year.

Um, they have some slight seasonal increases. I want to say the, um, they're a little lower in the, uh, we bill them off of the, the water meter flow, and they'd be an OA customer. So I think that they're, they're January, February, March flows are slightly lower. And the other three quarters are slightly higher, but they're pretty much consistent throughout the year for their --

MR. DURKIN: And then -- okay, thank you. And then is there anything that, you know, our, our sewer plant's open to the air? Are they purposely open to the air for their --

MR. GERHARD: Some are, some aren't and some have, you know, again, if you go up north into Maine, they're covered but it's not so much for the

air, it's for freezing temperatures and the like. And then there's some more odor control. You know, covering tanks can be done. Um, but, again, that's -- the issue is is that we have, we, on occasion with -- and it's, and it's -- if it was -- if it came up slowly and it ramped up, we would be able to handle it, but we kind of see a, you know, doubling in the increase of the waste strength over a period of a day or two.

And it really, you know, the bugs, you know, the bugs are biologically -- well, we call them bugs, the biological process, the biomass there, it's, it's a sensitive, you know, entity, and it just, it just can't quite handle it.

So, you know, you can you, can cover, cover things up and make them, make them work, you know, a little better or try to control the odors. But that presents additional challenges on the, um, on the, uh, treatment side for collecting condensation and treating the airstream and the, the like.

MR. DURKIN: And then one other question there, um, so if we were going to move this on, then do we have to move it on and pick an alternative or can we move on the plan to help you with your timeline and then pick an alternative

after we talk to the Finance?

MR. GERHARD: Well, I guess, if, if there's disagreement on the alternative, we would have to go back to the drawing board, which would kind of throw everything out of the, the timetable. The, the, the issue, you know, the plant is, is, it's in need of, of a, um, you know, improvements and essentially replacement. That's what the plan is, is a replacement.

And, as, as many of the people, you know, the public had, had mentioned during the public comment period, it's like, you know, the plant should just be replaced. It's essentially what this plan does. And then, to the extent that we can reutilize the existing facilities, but they'll need, they'll need some upgrading and improvement on them as well.

You know, the structures are older, so but, you know, we've gone through, you know, with, with staff, with the consultant, and with the, with the operating staff to go and develop the plan, um, and this is what our recommendation to the Council is.

So if, if there's, you know, disagreement as to what the recommendation is, we would have to, you know, address that with your comments, um, and incorporate that into the final plan here in the

next week, as, you know, we make changes.

MR. DURKIN: And Alternative 3 is approximately $200 million?

MR. GERHARD: Uh, that's the full Alternative 3, which was $105 million for the collection system upgrades. But, you know, large portions of that collection system or that's the collection system expansion, I'm sorry, large portions of that would be, you know, Great Island, Harbour Island, and any of those big sewer expansion projects.

Um, and then it was 75 million was the treatment plant work, uh, expansion and then the rest of the difference in there would be, um, was it 30-some-odd million is in the pump stations. And whether it's some need expansions and others just need, you know, upgrade and equipment replacements because --

MR. DURKIN: So I assume that if you, you know, pick Alternative 3, then the bonding of the money can be done in --

MR. GERHARD: Yeah, it's all staged out, it's all staged out.

MR. DURKIN: Right, right.

MR. GERHARD: And it's got to be

sequenced, you know, so --

MR. DURKIN: But 75 million for the Scarborough plant to --

MR. GERHARD: Yeah.

MR. DURKIN: -- infrastructure.

MR. GERHARD: That's, that's -- and that could be, potentially, could be a large, one big project or, you know, depending on how it's phased in --

MR. SMITH: Sequencing.

MR. GERHARD: -- it would be sequenced in, again, with replacement of those existing systems.

MR. DURKIN: And we would have to wait for the South Kingstown plan to deal with the regional sewer plant.

MR. GERHARD: Yeah, the South, the South Kingstown's plan would deal with the regional. And, again, they'll, they'll come in with their numbers and their, you know, I forget what their timetable is. It's within the next year or so if I recall correctly. I just don't have the --.

(MR. DURKIN AND PRESIDENT MENZIES CONFERRING)

PRESIDENT MENZIES: Any other questions

for Jon?

MS. VIGNALI: So, I'm, I'm just really trying to understand, understand this whole thing. And I'm, I'm just having a little bit of a -- and you may have explained this -- so capacity versus -- so if we were to go plan 3, Alternative 3, do you need to increase capacity in order to be able to run that plan? Or I mean, how does capacity fit in with what's happening here? If, if you could just clarify that for me.

MR. GERHARD: Well, that, that plan is to provide the additional capacity necessary to treat the projected waste for the 20-year period.

MS. VIGNALI: So with negotiations, and I'm not quite sure how that works either, but -- so do they have the right to say, no, they're not giving it to us?

MR. GERHARD: The, the agreements allow for us to ask -- there are some other conditions on if we go over, um, if any one of the partners goes over their flow, which may or may not have been, um, administered to the full extent that they should be in the past. But, but, yeah, we, we need to come to an agreement with our, with our, um, with our partners.

You know, they, they, the, um, difficult thing would be like, oh, well, you can't lease it any more. It's like, well, we can't just shut the spigot, you know, we're connected, we have these flows.

Uh, one of the other, the other items that we need to, to address and try to improve upon is the, uh, uh, I and I problems that we have in the central part of town. That's a big factor on the regional plant. Scarborough not as much, but the regional plant, it's a big factor on.

So all those are tied in together to the, to the expansion plan, to the recommended plan.

MS. VIGNALI: So, so we should start having these conversations then and, and -- with them and just letting them know that this is what we're thinking.

MR. GERHARD: Yeah, I've, I've forwarded the draft plan, as it was presented to the Council and the public, and it's in that binder over there (indicating). Um, that's been sent to South Kingstown already --

MS. VIGNALI: Okay. Perfect.

MR. GERHARD: -- so they have it in their hands. And, again, we've already, you know,

the conversations on our short-term lease capacity, uh, South Kingstown was involved in those, you know, and their, you know, their initial comments were, well, you know, what are you guys going to do about that? We're -- you know, the plan is to figure out how much capacity we need at the treatment plant, the regional plant, and how to make that happen, you know, in cooperation with you and your facilities plan. And so that's, you know, I just --

MS. VIGNALI: Thank you so much for clarifying that for me. I understand it a little bit more. Thank you.

PRESIDENT MENZIES: All set? All right. Let's open it -- oh, do you have anything else? Oh, sorry.

MR. TIERNEY: Alex, before you open it to the public --

PRESIDENT MENZIES: Yup.

MR. TIERNEY: -- 'cause it's finished up with one of my employees.

PRESIDENT MENZIES: Sorry.

MR. TIERNEY: So there's no confusion, we have been negotiating with our partners. This is not -- we're not taking a second whack at it.

We continue to negotiate with them, and, and we've expressed our concerns, and we're going back and forth on the draft. So I don't want the public to be misled to think that we are not doing that. We have been doing it.

And regarding staffing at the plant, we also have on-call staff who get alerted to the bells and whistles and the alarms and they respond, and they notify the superintendent who in turn will notify Jon and me. Those are in addition to the other staff as they come in to do the testing. Just to be clear. Thank you.

PRESIDENT MENZIES: Thank you. Appreciate it. We'll start with Mr. Brady in the back. I go in the order in which I saw hands.

(MR. BRADY APPROACHED PODIUM)

PRESIDENT MENZIES: Oh, and before Mr. Brady comes up, I just want to, just for a point of clarity, just to let everyone know that the Planning Board did provide the Town Council with their series of recommendations. After thoroughly reviewing the report, they did their due diligence. They provided the Council with these recommendations. And I have confirmed with our Town Clerk that these have been filed.

MR. BRADY: Thank you. Do you want me sworn in?

THE STENOGRAPHER: Yes.

MARK A. BRADY, first having been duly sworn, testified as follows.

THE STENOGRAPHER: Please state and spell your full name for the record.

MR. BRADY: Mark, m-a-r-k, A. Brady, b-r-a-d-y. I'm chairperson of the Narragansett Planning Board.

THE STENOGRAPHER: Thank you.

MR. BRADY: I want to compliment you guys. This is not an easy, uh, slog through even from people who understand what's going on.

Um, we tried in our discussions and it really wasn't a hearing, it was a great discussion, to try to ask questions that we thought people at home would be asking. So, if you haven't watched it and you want to, please, we really try to get it down on a level where average people sitting at home asking the same questions you guys are.

And I appreciate, Donna, your confusion because, as clear as they were, it's clear as poop.

Um, a couple of things. And I'm trying to, I'm trying to answer your questions, I'm writing around

in circles. We did not focus in on the regional plant. That wasn't the scope of work here. Um, we did ask some questions and, and you asked similar questions.

Right now, we are capacity on the regional plant on our share. We lease from URI additional capacity. All right.

Um, one of the questions I think, uh, Councilor Durkin, I think you asked or somebody asked was and, and Jim asked it, was the financial relationship. We pay for our lease, our additional capacity, and we charge URI for the Bay Campus. They are not a wash. We pay considerably more in our fee then we are receiving in our usage fees. And that's just a capacity -- it's just a function of the economics.

Um, we charge by user and gallons and there's meters there, and that fee does not equal the fee that we charge for our -- we pay for our capacity. Does that help one of the questions that came up I think?

Um, one of the things I really want to make clear is we really, uh -- oh, another thing is we looked at and we asked about holding off anything we did, uh, as far as construction, to try to time

with any construction the regional plant would do to see if we could get, uh, savings. They're in the same neighborhood. And what came back was really no. Um, there may be some stuff they can do but overall, it's, it's apple and oranges (indicating) and we really need to be looking at what we're doing.

Um, our recommendation, to look at it from a financial point of view, was to utilize staff, finance committee, and any re -- any experts in the field, but it was not to hold up this process. And I think that's the key thing here is, if this doesn't go in on time and get approved, it's all dead in the water. All right.

They got to get it in. We can look at the numbers after they start the process and while they're there. But they really need to get this in.

And what we recommended was option 3. And part of that was because we're hoping to attach, on both federal and state, for Economic Development monies. Uh, but our recommendation was to look at that functionality of Galilee and do a cost-benefit analysis and see if it really benefits us. Do we get new jobs out of that or even keep the industry

we have. Because those of us that grew up down here, go down there and look, and the fleets nothing what it used to be when we were kids. Um, but can we hold onto those jobs here.

The other thing to understand is the technology that's going to be built-in for that plant, benefits the entire plant. It's not just that they're in a little corner. This upgrades our entire plant.

One of the things that you were asking about what are other people doing? We asked the same thing. And we asked what kind of new technology is out there. Um, what came back was this is the newest and the best. It is proven. It's a benchmark.

To start getting into cutting-edge technology gets costly and it also gets dangerous. Um, you don't know how well it's going to work. Um, and you've got maintenance issues where this is predictability. We know it works. It's the newest out there. It's an accepted benchmark within the industry.

Um, I think the -- some of us are in a situation where we've had to make decisions today about things and said, thank, God, I'm not going to

be here in this chair 30 years from now to deal with this. Jon's in that chair.

This really isn't any longer a situation where we get this encyclopedia of study and we stick it on a shelf and say, that looks good. Uh, we've got to deal with this.

And there are two things, and I think that's what's confusing also is we have this treatment factor, and we have this capacity (indicating).

So a lot of the incremental amount of money we're talking about, yes, can help the treatment side. It's not going to do any good for us on the capacity side. And certainly not if, if we want to look at growth within the community. We're there. This one is ours.

And the regional one is coming down, and we're going to have to share some of the cost there. But, as I've said, we didn't address that. That wasn't our focus. This is ours.

Um, one of the things that we looked at, especially with the total cost of this, um, was really looking at, can we phase develop this. Not only from an engineering point of view and a functionality point of view, but from a funding point of view. And that was one of the things that

we asked for, for a timeline is what can we do when and how do we do it. You don't want to take something offline because you could get the money for it and it stops the whole plant.

Um, we looked at need, impact, expiration dates. We also looked at repurposing and adoptive reuse of components that we already have to try to save money. Can we take something that's there and reuse it to add a benefit to the plant and reduce our costs.

Uh, one of the things that we really wanted to look at, too, was how does this new investment affect our ongoing expenses. You know, do we hold still, can we reduce them, because we have new technologies and, and reduce some of our operating expenses. And, incrementally, how well does our existing operations. One of the issues is, you know, the immediate one for the public is the smell. How do, how do we improve with this investment.

Um, uh -- (reviewing notes) -- so, as I said, we looked at the Galilee situation, scheduled phased, um, again, some -- again, I was trying to write your questions down.

Uh, and, um -- (reviewing notes) -- one of the

things that -- I don't want to be a bearer of bad news, but I am -- one of the things that was not a scope of this is -- so our pump stations and the plants were a part of the scope. Um, what was not a part of the scope of this work is the delivery, is our sewer pipes.

Um, our pipes are 40-plus years old. Um, typical sewer pipe is 8 inches. If you simply Google, "40-year-old sewer pipe," and hit image -- and I wouldn't do it right now, I wouldn't do it over dinner -- but you're going to look and you're going to see that those pipes are no longer 8 inches.

Um, regardless of how small or big, if we can't get the waste from somebody's home to the plant, it's, um, really futile to improve the plant and not be able to get waste there. So that was one of the things to look at.

One of the things we talked about is, um, looking at addressing connection fees. Um, and I am not one to increase taxes or people's fees. I've got to pay 'em. But one of the things to look is our connection fee and maybe look at the model that some of the utilities, especially the gas company, and what they charge for somebody to

connect to the gas line. And then, then look at how do we amortize that for the, for the user over a 10 or 20-year period, so they're not facing that bill upfront. Can we carry that. Um, I don't pretend I know the legalities of that. Um, it just was a, a discussion that came up.

The other thing -- and correct me, guys, if I'm wrong -- but June and July is not our only peak, December and January is a peak. And it's mostly, um, infiltration.

Infiltration is a funny -- is a -- it's what engineers use so you pay us to translate. But all it is is water from the outside of the system getting into the system. And it usually comes with storms, raising water tables, miss -- uh, worn-down connections that are loose now, cracked pipes, and those types of things. So we have another spike, and, um, it takes us there, too.

So the sad news, and I wish I could tell you that, you know, we can, we can, you know, putty here and tape here, but whatever money we put into this just to kind of carry us, we're not going to get a return on that investment. And really we're looking at replacing this.

How we do it, um, really, these guys have done

a great job at looking at all the options. We've really pushed to look at how do we -- can we phase it, can we phase it not only on the development but also the financing it.

And the other part, and, again, I want to reiterate, one, they've got to get this in so we have any chance of funding. I don't think the Town wants to pay this bill.

And two, looking at Galilee, was to look at the economic development part of this as a funding mechanism and helping in other funding sources to get us to where we need to be financially. But it does benefit the entire community as a whole because it will upgrade the entire plant.

Does that help clear things up a little bit?

MS. VIGNALI: Yup.

MR. BRADY: Great. I compliment you guys because I got to tell ya, you know, you going through this and I understand this stuff, it's, it's not, it's not really fun. I'm sorry.

PRESIDENT MENZIES: I, I thoroughly enjoyed the --

(MR. BRADY LAUGHING)

-- presentation this evening. Talk about sludge and --

MR. BRADY: Yeah, exactly. And those are some --

PRESIDENT MENZIES: I appreciate it.

MR. BRADY: -- those are some of the things, too, that they pointed out is the options for some of this stuff is going away or if it's there, it's going to be a transportation cost that's going to make it economically infeasible that we're going to have to look for an alternative. And I'd rather look for an alternative that is part of a greater solution than just starting going *ad hoc,* we pay this to go here, this to go here, and that to go there.

Anybody have any questions?

PRESIDENT MENZIES: Just in general, thank you --

MR. BRADY: No, thank you, guys.

PRESIDENT MENZIES: -- for providing us with a summary, and, again, just to reiterate, we have made sure --

MR. BRADY: Yeah.

PRESIDENT MENZIES: -- they have been on file -- they have been filed, excuse me. And there was like 400 pages in that report so to be able to get the summary and the recommendations in the five

page, at least the abridged summary that the Planning Board reviewed and sent over was very much appreciated, so --

MR. BRADY: And, again, I compliment, you, great questions.

PRESIDENT MENZIES: Thank you.

MR. BRADY: Thank you.

PRESIDENT MENZIES: Mr. Schofield. I saw you next.

(MR. SCHOFIELD APPROACHED PODIUM)

THE STENOGRAPHER: Excuse me --

MR. SCHOFIELD: Good evening.

THE STENOGRAPHER: Please raise your right hand.

HARRY SCHOFIELD, first having been duly sworn, testified as follows.

THE STENOGRAPHER: Please state and spell your full name for the record.

MR. SCHOFIELD: Yes, Harry Schofield, 9 Atlantic Avenue.

MR. SCHOFIELD: Good evening, everyone. Uh, I am here tonight as -- on behalf of the Narragansett Town Residents Association. And I have a letter to all of you and the Town Council, which I have copies of, which, once I read the

letter, I'd like to submit it to the Clerk and the Council members, uh, so that you have a copy.

PRESIDENT MENZIES: Thank you.

MR. SCHOFIELD: First of all, I'd like, you know, dear -- it says, (reading) dear, dear Town Council members, uh, it's, it's good to finally -- excuse me.

(MR. SCHOFIELD CHANGING EYEGLASSES)

Wrong glasses. (Reading) It's good to finally see attention on drafting a new Wastewater Facilities Plan.

Unfortunately, Narragansett's sewer and water problems have taken a years' long backseat to the ongoing battle between resident interest and landlord/developer interest.

This battle, between ordinances to limit and control oversized build-outs and rentals and the slurry of landlord lawsuits to fight against them, has taken all the air out of Narragansett's town governing space and thus has left little room for a progressive solution to our wastewater infrastructure.

You, our Town Council, knew full well or should have known the degree of neglect to our sewer and water problems when you took office last November,

and you should have made this your first priority. Instead, you chose to recommend 13 zoning amendments to the Planning Board, essentially gutting decades of zoning regulations that protect the town from overbuilding.

These proposed changes to increase housing density are irresponsible in the light of this wastewater crisis.

Fortunately, the Planning Board, led by Mark Brady, acted swiftly, responsibly, and professionally in responding within the allowable 45-day period shooting down these amendments citing that they would be detrimental to neighborhoods and serve to worsen -- that's the word, "worsen," -- the affordable housing crisis. These amendments were crafted by developers for developers. There's no mystery, as has been said, as to how they came about. They were crafted by developers for developers.

(PAUSE)

Most importantly, the Planning Board cited the detrimental impact these amendments would have to our already overburdened sewer and water system as concurred by our town engineer, and, again, tonight.

While I commend the Council President for mustering the vote to shut this effort down, based upon strong, town-wide residential objections together with the Planning Board's report, the fact that you are bringing them back on a piecemeal basis, starting Wednesday night, reflects this Council's tone deafness to the seriousness of our sewer and water problems.

Several times a year, Scarborough Beach is closed due to sewer contamination, as we've heard. For the past decade, we have been subjected to water shortages every summer, and now south-end residents have just been informed their water is contaminated.

Overstuffed summer and student rental properties, too many showers, together with too much sink and toilet discharge, are overwhelming our already maxed-out system, as you heard tonight.

The seriousness of this problem suggests that not another shovel should be put in the ground, in Narragansett, to further expand its housing stock and density.

The Planning Board report submitted to the Council on July 24th -- (pause) -- states unequivocally that the current, you know, proposed,

you know, plan that they approved, that you just heard tonight, prepared by Wright-Pierce is underdesigned for unforeseen future development.

The Planning Board report states that many pump stations are vulnerable to flooding. Further, before sewer extensions, in environmentally sensitive areas are undertaken, the report recommended an analysis of the clean water benefits versus the additional load of new build-outs they enable to ensure the project results in a net gain in sewer capacity and water quality, in areas like Salt Pond.

Finally, it's noteworthy that nothing in this plan addresses any repairs or upgrades to our existing sewer pipe infrastructure as Mr. Brady just told you. So pipes that leak in heavy rain will still leak. Further, it is unknown how much added load will result from connecting Galilee fish processing to this newly planned upgrade, despite the fact that it's something we need to do for the economic reasons Mr. Brady talked about.

Then there are our water problems. Not enough for some loads, and now the south-end water is contaminated. This is unacceptable, and should spell emergency in your minds. Instead, thus far,

you have ignored the town's infrastructure problems in favor of making landlords and real estate investors happy at the expense of residents and to the detriment of any improvements in affordable housing -- the detriment of improvements to affordable housing.

Most concerning, in light of these issues, is this Council's steady efforts to replace good public servants on key boards and commissions with developer-friendly allies.

On March 3rd, 2025, Jerry Brunetto was denied reappointment to the Planning Board. Jerry was replaced with developer, Steve DeSimone, who was the only Planning Board vote in favor of the 13 amendments.

On every Planning Board vote taken during the Planning Board evaluation of the 13 amendments, Mr. DeSimone was the only vote in favor of adopting the proposed changes, with all other Planning Boards voting against them.

On July 7th, 2025, there was and -- there was an opening on the Zoning Board due to a full member terming out. Both alternates sought reappointments. Alternate number one, Albin Kaimer, was not reappointed. Alternate

number two, John Bailey, was reappointed. David Trenteseaux was appointed to the full Zoning Board, and Karen Catuogno was appointed alternate one.

Note that Trenteseaux was issued a violation by DEM for filling in wetlands, and that letter is attached to my letter. Whereas, during the interviews, Kaimer expressed concerns about development.

On July 1st, 2025, Housing Authority member, Vicky Baud, with nearly 20 years experience at the Narragansett Housing Authority, was passed up again. The first time she was passed over, the TC appointed Susan Cicilline Buonanno, instead of Vicky. And this last time, the TC appointed Frances Cote, a retired nurse, rather than Vicky, who, again, has 20 years of experience.

No doubt Planning Board Chair Brady is in your sights for replacement as well, with another DeSimone-like developer, despite Mr. Brady's obvious expertise. But, for the record, this town needs Planning Board Chair Brady and you need to reappoint him.

Stacking boards and commissions with people whose agenda is to support special interests, in

this case, landlord/developer interest over resident town interest, is the sure path to corruption. I note that Councilman Durkin is already the subject of a Rhode Island Ethics Commission full investigation.

To summarize, the July 24th Planning Board report on SWWTF also noted the need to renegotiate terms of wastewater use with URI, especially due to the 6 to 8,000 students living here nine months of the year.

Also, in this regard, note that the Crane report, which we've had for over a year, states that the only true solution to Narragansett's housing crisis is for URI to build lots more housing on the Kingston and Bay campuses and for the town to use, quote, a carrot-and-stick approach, to getting them to do so. Note that the stick part of this strategy is our current, valid 3 Student Ordinance that this Council has refused to support and to enforce. I think these comments speak for themselves.

This September will mark my 49th year as a Narragansett resident. In all those 49 years, I've never seen such flagrant support for special interests at the expense of town interest by any

other sitting council.

I urge the Council President to utilize his leadership to reset the course toward the town's best interest over special interest.

Thank you. And this is respectfully submitted.

PRESIDENT MENZIES: Thank you.

(APPLAUSE)

PRESIDENT MENZIES: In the back I saw her next --

MR. SCHOFIELD: One other --

PRESIDENT MENZIES: Oops, sorry.

MR. SCHOFIELD: Just a couple of, uh, antecedal (*sic*) comments. Uh, you know, this was a wonderful presentation here tonight. And, you know, though not a wastewater engineer, I am an engineer and it is obvious, listening to this, is that this is well thought out by people with good expertise in the field and that this Alternative 3 is the only reasonable alternative. So trying to nickel-and-dime that is a waste of time. And, as Mr. Brady said, you don't have time to waste.

And the other comment I want to make, um, is the fact that, uh, in view of the monies going back and forth here, between URI and the town. When you consider that we're paying more to URI then we're

getting, at the same time the amount of students we're housing continues to steadily increase, uh, therefore increasing the burden to the sewer and water system, we've spent the evening talking about.

I mean it just shows you how ridiculous the situation is for Narragansett, a town of 16,000 people with half the population being half the undergraduate class of a University that is negligent in not having put forth the living space. Even their own self-assessment plan says the University's limited because it's a dead campus and doesn't have the facilities, the living spaces it should.

Thank you.

(APPLAUSE)

PRESIDENT MENZIES: Thank you.

In the back.

(MR. SCHOFIELD HANDING DOCUMENT TO TOWN CLERK)

(MS. DICOMES APPROACHED PODIUM)

CHRISTINA DICOMES, first having been duly sworn, testified as follows.

THE STENOGRAPHER: Please state and spell your full name for the record.

MS. DICOMES: Christina,

c-h-r-i-s-t-i-n-a, Dicomes, d-i-c-o-m-e-s.

THE STENOGRAPHER: Thank you.

MS. DICOMES: Thank you.

I have a question for the engineers. The biggest problem right now that I could glean from your presentation, which was great, I have two degrees -- undergraduate degrees in microbiology and chemistry, so I do understand a lot of what you were talking about with the, um, microbiology, as far as treating everything. It seems that, I think the thing that the Council needs to understand is that we are beyond capacity at the Scarborough treatment facility, correct?

(PAUSE)

PRESIDENT MENZIES: Just as a point of clarity, just procedurally, ideally, you have your time to speak during the public hearing. Just for the flow of this whole hearing, if you could ask your questions and then we'll allow them to come up and answer your questions.

MS. DICOMES: My question is, is the problem with the Scarborough facility the capacity, that it cannot handle present capacity?

PRESIDENT MENZIES: Is there any other questions?

MS. DICOMES: Well, the other comment I want to make is the fact that if what I've heard it's a capacity issue and we need to rebuild that facility instead of talking about putting a Band-Aid on it.

And I truly sympathize with all of the residents who are dealing with the odor issues. I've dealt with odor issues in Johnston for years with the landfill. They have mitigated those. They have taken the steps to take care of that. But this is not happening in Narragansett for the residents whether it's at one facility or the other.

If the problem truly is capacity, the Town Council has, in its ability, to try to limit the capacity of what's going into the treatment facility. One is the 3 Student Ordinance. And why you, as the Town Council members, are not going to enforce it baffles everybody in this town. Why not? Can you answer that question for us?

And the other thing is, in 2005, when a sewer project was going on at Briggs Farm, there was a moratorium on building permits issued, as well as sewer tie-ins. The town has the ability to have a building moratorium.

(APPLAUSE)

It should be doing that.

(APPLAUSE)

So will the questions be answered or will we just be given lip service again?

PRESIDENT MENZIES: Thank you. And I will ask if the town engineer would like to respond now or at the end.

MR. GERHARD: I can respond to these.

PRESIDENT MENZIES: Thank you.

MR. GERHARD: I'll respond to the first two questions. The first was, is the problem with the facility the capacity now. Um, I think we may have not explained it clearly.

There are two capacity issues really. There is treatment capacity and hydraulic capacity. Um, the Scarborough plant is within its hydraulic capacity but its treatment capacity is, is stressed at times and then overwhelmed at times. And, and the issue is, um, it's really the, the peak day that we get, the worst day of the year, we can't put enough air into the system because the -- between the combination of the equipment and tank configuration is just undersized to be able to handle that load. And, unfortunately, it comes in in a day, um, but

it takes a month or two or better to resolve and get the capacity back into place.

Um, I'd just like to mention my wastewater superintendent, Scott Goodson. He takes it more seriously than anybody I've ever met in the industry before. Um, and he takes it to heart. And, if he, you know, it's to the point that it, it, you know, you've got to tell him, it's like, look, you need to go home and get some rest. It's, it's -- you're not doing anything wrong here. The plant has -- you know, we have a design issue here that we have to resolve as well as, you know, it's not like he comes in and, you know, the plant's running fine one day and, and he'll just forget about it for the rest of the month.

So -- but it's, it's the, the capacity issues are, it's really a very short-term and a very shock-loading issue that we have at Scarborough. At the regional plant, it's a hydraulic capacity and our ownership capacity, and in terms of the permit in our ownership there. So that's really more of it.

The treatment process over there is a little more stable from a, from a permitting-wise. The odor controls aside, um, but, again, that's, that's

the case in terms of operations there.

So is the, the other question was is expansion -- is the expansion of capacity just a Band-Aid. And no, it's not. The intent is that we, we increase the, um, we -- with the new plant, the design will be designed for both the peak day, max day loading, and provide a better hydraulic system and, and the tank sizing configuration that it, that it withstands both the hydraulic loads and the treatment loads that it receives better than the current plant is.

And then the other items have to do with other Council business and the like that is not part of the --

THE STENOGRAPHER: I'm sorry, is not what?

MR. GERHARD: It's not, it's not the, it's not the purview of the Engineering Department.

PRESIDENT MENZIES: Thank you. Dr. Alba.

(DR. ALBA APPROACHED PODIUM)

THE STENOGRAPHER: Please raise your right hand.

DR. ALBERT ALBA, first having been duly sworn, testified as follows.

THE STENOGRAPHER: Please state and spell your full name for the record.

DR. ALBA: Dr. Albert Alba, 24 Eagles Nest Terrace, Narragansett, Rhode Island.

THE STENOGRAPHER: Thank you.

DR. ALBA: One of the things I enjoyed through my thesis work and doctorate work is to examine background research.

So we have a proposal and the Planning Board recommended, you know, choice 3. I'm sure these engineers are very skilled and intellectual. I would like to ask them where in their engineering backgrounds from their, from their company or even another company, had a similar design as proposed in the town of Narragansett?

Based on usage capacity, I'm sure we are not going to be the only ones that came up with this design. I hope we're not going to be just the prototype. I hope they have background research, because I would hate to have or spend all this money and then the stench and odor these people are gonna have to live with.

So I would like them to provide that, as part of the analysis, where maybe the Town Council can actually go and visit those plants, speak with the

neighborhoods, speak with the people who live in those areas. I think that's a good idea. So I would strongly recommend this be considered.

It's a large sum of money and even though the engineers and the Planning Board is supporting this, we need to have some kind of assurance that, after we're spending this kind of money and doing this kind of investment, that we're not going to have the stench or some other excuse coming up, well, you know, it's, it's due to the, you know, just the -- we just can't keep up with it or they'll say, they might say, when we proposed this, we didn't realize that the building capacity is going to be increasing because of the state.

If we're not going to have a control over this, if we are going to, uh, allow more and more houses, we're going to allow more and more ADUs, um, and you might -- they might come back and say, well, that wasn't part of the game plan.

So we have to see where a similar-type sized unit, where it's located. And, based on the carrying capacity, we have to look at the forecasts of the future carrying capacity, because if we don't have that in hand, we might be setting us up. So we have to project, if we cannot control.

Also, we have a unique situation in Narragansett. We have summer rentals. I hear people talking about having control over four versus three or, you know, to me, to be honest with you, three versus four does not really matter to me.

You know, I was against some of the other issues, you know, these, these dorm-style houses didn't come overnight. People came crying to me saying, it wasn't this Town Council that allowed this dorm-style house to get built. We had bulk zoning back then. We had ordinances back then, but what good are the ordinances if we're not enforcing them. I have --

(APPLAUSE)

So we have to take control. We can have all the ordinances we could have, yeah, we're going to enforce it. But when they have the four, live in a four college students, where was the enforcement?

How about summer rentals? When we have people going into these summer rentals like sardines, where is the control?

So unless we have a handle, we can have every ordinance in the book and say we are not gonna drop any of these ordinances. But, if the Town of

Narragansett, if we're not going to regulate and have some kind of control, then to say that we have to have three versus four students or to have a bulk zoning in place and we're not enforcing it, then what is the purpose of having the ordinances?

So these are the things we have to consider. So you have to look at -- and I hope you guys look at this when you're doing your design analysis -- how many people are living in these summer rentals? How many people are inflowing the town of Narragansett, our population? Are we going to be able to handle that?

Because if we don't have a handle on that, then we don't know if this proposal that you're putting forth, even though it's the best of the three, if that's going to be adequate enough. We don't know that because there must be a certain capacity -- carrying capacity even for this -- the new and the greatest proposal here. But how do we know that in itself is going to be sufficient?

Now, in regards to costs, we're saying, well how is URI doing their costs? Okay.

So in Sarasota, Florida, if you have a short-term rental, there is a 13 percent tax. 7 percent goes to the state, 6 percent goes to the

town.

We all heard, in January, the State is going to have, I believe a 5 or 6 percent short-term rental. Maybe we don't know what percent is going to go to the town of Narragansett, so we don't really have control too much over that. But we do, as a town, we can impose a short-term rental tax of say 6 percent on both the UR -- student rentals and short-term rentals.

And the rental owners will be required to, to pay that. And that money will go back to the town. And that's almost like a usage fee so to speak. And it may curtail the amount of short-term rentals because everyone has a price point. Everyone does.

And, if the people who are renting these properties out are going to have to pay this tax, that has a good chance of lessening the amount of people who might be moving into -- renting out short-term rentals. So at least we're going to get a return on our dollar.

Also, Mayor Smiley, of Providence, has charged every street-level parking operator a surcharge. I don't know if it's a dollar or a certain percent, but we have a lot of street -- you know, look at Galilee, right. What, what are we getting in

return for those street-level parking lots? Not a heck of a lot.

Remember, we put together an RFP but -- we didn't put the RFP, we responded to the RFP. In fact, the RI DEM and Procaccianti/Paolino, uh, uh, PRI10, they put the RFP together and they wanted to have, in Galilee, something which will help the fishing industry, help the Town of Narragansett, help tourism. And what did we get? A 20-year, street-level parking lot.

We, as a -- we, as a town, can request, as Providence did, and give a surcharge for all street-level parking. In fact, I don't even know if they -- we, we never issued a Special Use Permit. So, actually, they're violating our own zoning in that area.

So I just hope these are the considerations that we can have and think about. Because, like I said, I, I know you're an educated man. I respect both of you as engineers, but these are the considerations we have to look at and also see. And I would like to see -- and maybe you could provide that to us, maybe we can find out what city or town in the United States has a similar type plan that you're proposing with us.

I also would like to bring out this one other concern. More and more cities and towns are getting flooded, inundated with flooding throughout the United States, 4, 5 feet. Well, when I heard the Planning Board give the presentation or the developers give the presentation, they said, one of the concerns about the plant being there is the water. If it ever gets flooded, there could be major overflow to our oceans, the toxins.

So it might be just a matter of time when Narragansett gets 5 or 6 feet of water. So I would like you to address that, as well, in regards to what are we going to do to mitigate harm if we have a major flooding situation which has been occurring throughout the United States.

Thank you for your time. God bless you. Thank you.

(APPLAUSE)

PRESIDENT MENZIES: Anyone else?

Miss Scowcroft.

(APPROACHED PODIUM)

MS. SCOWCROFT: Oh, boy.

THE STENOGRAPHER: Excuse me, please raise your right hand.

MS. SCOWCROFT: Gail --

GAIL SCOWCROFT, first having been duly sworn, testified as follows.

THE STENOGRAPHER: Please state and spell your full name for the record.

MS. SCOWCROFT: Gail Scowcroft, g-a-i-l, s-c-o-w-c-r-o-f-t.

THE STENOGRAPHER: Thank you.

MS. SCOWCROFT: Okay. So I'm -- I want to address the elephant in the room in a second. But, before I do, I want to make sure that the plans that are being developed include the fact that North Kingstown is building 500 new housing units, and they are going to have to draw on their wastewater system capacity.

Also the Bay Campus is in the process of a large expansion, building several new buildings, including a new robotics facility that's going to need a lot of water. And so I'm not sure if that's part of the -- if those are the considerations that have been factored in. But we may not be able to draw more water out of the north end, um, as we have been in, in the past. So that's, that's a question.

But the elephant in the room has been alluded to by several of the other people that have spoken

before me and that's the 8,000 URI students that live here nine months a year. And we don't really know if that number is accurate. I've heard 6 to 8,000 students.

Well, in 1991, when our capacity was increased, we had a couple of thousand students and now we have close to 4,000 -- I'm sorry, four times that in our town for nine months a year. We know that about half of our population, September to May, is comprised of Narragansett students, undergraduates and graduate students.

We are a University dormitory annex and yet URI is not helping Narragansett solve our problems. Where are they tonight? I know Dean Simo was here because they want to use our beach again for their couple hundred students or whoever come here for Greek day. That's fine and dandy, but where are they helping us solve this, this wastewater problem? It's their problem too because we're housing all those students. That's the elephant in the room.

The Crane report was very firm about the fact that Narragansett needs to deal with the student population here and that we can't afford to keep growing that population in our town.

We have a 3 Student Ordinance, several people have mentioned that tonight, and I will reiterate, none of us understand why you are not enforcing a solid, legal ordinance in our town. It's irresponsible not to enforce that ordinance.

And, shamefully and disgracefully, Mr. Durkin, you were cited with a violation for violating that 3 Student Ordinance. And, behind closed doors, in an executive session, that was thrown out, and we don't know why that happened either. So why is that ordinance not being enforced? Why didn't your violation stand? We know for a fact that you have violated it.

So this is something that we have -- the other council put in place so that we can limit the amount of use of our infrastructure, improve the health of our neighborhoods, et cetera. You guys need to work on this and straighten it out and get your act together. We're not going to stand for this level of corruption anymore in our town.

Thank you very much.

(APPLAUSE)

PRESIDENT MENZIES: Thank you. I just want to give our engineers just the opportunity to respond. You can, Jon, if you want to respond now

or at the end.

MR. GERHARD: I'm not sure if Miss Scowcroft had any particular technical questions.

(MR. GERHARD APPROACHING PODIUM)

PRESIDENT MENZIES: Okay.

MR. GERHARD: But, um, I can respond to Dr. Alba's questions.

One, the first question on when or where has a similar design been used in communities. This is, it's called a conventional activated sludge process, which is used conventionally throughout municipal -- wastewater treatment throughout the country. Um, so it's, it's all, you know, our Westmoreland plant is a conventional plant, so the design is the, you know, that's the design standard now.

The process was developed, you know, 120 years ago, but it's been refined. And, uh, again, as we said, we'll, we'll fine-tune and maximize the efficiency of the new process units and the, um, and the treatment, the actual equipment that does the air transfer. So that's in -- the system is, in this type of design, is used everywhere, coastal facilities, inland facilities.

Um, seasonal facilities. You know, and we'll have the ability with our, our current system we can't take it offline. The racetrack, as it is, you start from the outside and you work your way to the middle. There's no way to take it offline. So it's been there and operating since 1983.

With the new system, we have compartmentalized the tanks and we will be able to, you know, in the wintertime we can take or, in lower flow periods, we take, you know, two of the tanks, can take some tanks out of service and not, not utilize the, the additional capacity and space for treatment that we, that we need in the summer to save, save wear on equipment and then, then also be able to make sure it's maintained properly.

Um, the design projections, the question on how many people are in summer rentals and the impact of the summer rentals. Well, our flow day -- our, our existing flows account for -- are -- base our meter water use. And, and, well, that's -- our billing is based on metered water use but our flow data and is based on the actual flow data that's metered at the treatment facility. So the existing density with four, five, six, one person in, in the rental units, is in those flow numbers and the, and the

existing data we have.

The flow projections are based on current zoning plus I believe we have -- we are incorporating some of the, some of the legislative changes from the last year are, are incorporated into some of the design projections for the build-out. But if, if it changes that we can quadruple density, then the numbers would be off.

So it's, it's, there is -- there is an accounting for the legislative changes and the increased density. And the existing, the existing flow figures have whatever our current demand is. So the, the, the flow projections and our loading projections are, are, you know, fine-tuned to the extent that they can be.

PRESIDENT MENZIES: Excellent. Thank you so much. And I'll go to the back.

MS. SUCH: I'm Angela Such and just two quick comments.

PRESIDENT MENZIES: No, that's all right.

(MS. SUCH APPROACHED PODIUM)

PRESIDENT MENZIES: I'm trying to keep track of who's already spoken. So it's hard for me to --

MS. SUCH: Is that okay? I came up before?

PRESIDENT MENZIES: No, no, no. Have you spoken for the public hearing already?

MS. SUCH: No.

PRESIDENT MENZIES: That's perfectly okay.

MS. SUCH: I'm Angela Such --

THE STENOGRAPHER: Do you solemnly swear the testimony -- please raise your right hand.

ANGELA SUCH, first having been duly sworn, testified as follows.

THE STENOGRAPHER: Please state and spell your full name for the record.

MS. SUCH: Angela Such, a-n-g-e-l-a, s-u-c-h.

THE STENOGRAPHER: Thank you.

MS. SUCH: Yes.

So, as far as extending out the capacity, I think I read something in the report that they were accounting for like 2.4 people per capita per household in like from the 2020 Census. So I find that a little bit anecdotally low, I would say, seeing that we know college students are more than

2.4 and our summer renters are more than 2.4. So that's just one comment I wanted to make on that.

The second thing I wanted to talk about is I liked where, um, Councilman Durkin was going. I thought with the racetrack, um, maybe as an interim solution because we know it's going to take five to ten years to build-out solution number 3. So, if we could do this, you know, use the outer ring of the racetrack with more airflow while this is getting built out to accomplish our capacities that we have or that we need with our current, I would think we would love to cost that out, the timeline, if it adds -- I don't know what it is, anything about that but I just wanted to express that. That's all.

PRESIDENT MENZIES: Thank you.

MS. SUCH: Thank you.

PRESIDENT MENZIES: Anyone else have any testimony to provide for this public hearing? Yes, Miss Celeberto.

(MS. CELEBERTO APPROACHED PODIUM)

THE STENOGRAPHER: Please raise your right hand.

CATHERINE CELEBERTO, first having been duly sworn, testified as follows.

THE STENOGRAPHER: Please state and spell your full name for the record, please.

MS. CELEBERTO: Catherine Celeberto, c-a-t-h-e-r-i-n-e, c-e-l-e-b-e-r-t-o.

THE STENOGRAPHER: Thank you.

MS. CELEBERTO: One night, I said to Mr. Gebhard (*sic*), why don't you just send everyone an e-mail and tell them, just flush once a day. And he said, I wish I could.

This is the problem. We have an inflow problem. We don't have a sewer system that, um, can accommodate five, six students during the school year and eight to ten in the summer and, believe me, there are eight to ten. I see it right in my own neighborhood in the, in the summer.

Our, our plants weren't designed to accommodate those numbers. And this is why Scarborough stinks and Westmoreland stinks. So you want an immediate solution to that? You limit the number of people in each house. And, in the meantime, I guess Mr. Gebhard's going to have to send that e-mail to everybody to tell them to flush once.

Thank you.

PRESIDENT MENZIES: Thank you. Anyone else who wishes to speak for the public hearing

that hasn't done so already?

(**NO RESPONSE HEARD/SEEN**)

PRESIDENT MENZIES: Okay -- yup. Sorry.

(MR. MCKENNA APPROACHED PODIUM)

KEVIN MCKENNA, first having been duly sworn, testified as follows.

THE STENOGRAPHER: Please state and spell your full name for the record, please.

MR. MCKENNA: Kevin McKenna, k-e-v-i-n, m-c-k-e-n-n-a.

THE STENOGRAPHER: Thank you.

MR. MCKENNA: And I live at 31 Pleasant Avenue.

You know, you're to be commended tonight for the presentation on the sewer facilities, Planning Board, everybody involved. It was extremely informative and, uh, I think it's going to go a long way to help us address some of the problems that, that this town is now facing.

That said, you know, a few takeaways. First off, is that we appear to have a capacity problem in both facilities. This capacity problem will take a few years to address. It's not going to be solved overnight.

That said, if in fact, we have a capacity

problem and it's gonna take a few years to address, why would we be thinking of tearing away existing zoning ordinances to increase housing sizes within smaller lots, allowing more rental units, you know, throughout the entire town, which would further tax our sewer and water systems.

I mean, really, what we need is a timeout. We need to think seriously of probably enforcing a moratorium, as opposed to increasing the number of rental units within the town.

And it's something, you know, it's, it's something that we can't just, you know, put off and put off. It's become almost Orwellian in nature. From George Orwell's famous book of *1984*. We're living that right now. And it appears that we're in a position where the party told you to reject the evidence of your eyes and ears. It was their final, most essential command. We need to start dealing with reality and adjust accordingly.

Thank you.

(APPLAUSE)

PRESIDENT MENZIES: Thank you. So I just want to invite Jon up for closing answers and final thoughts from the Council.

First, again, really appreciate all the back

and forth. This has been a very busy night, that's why I cautioned the length of the hearing early on.

Do you have any comments on any of the final thoughts or any questions that were brought up?

MR. GERHARD: No. Like I said, there was a, there was a comment or -- well, I do have just a short response, um, on the projection of density in 2.4 people per unit. Uh, we have to, you know, we have to use some basis of our design, uh, and projections and that comes from Census data.

Again, the Census data is based on projections, um, and those are short periods of time. But we do have -- we do know and understand what that increase and that max day loading data is. And it's -- and we -- the existing loads are based on what our average load is. And we know what the BOD is, and we can project those numbers.

So the, the numbers in the persons per unit, we have to display those in there, but they -- those don't come into play quite so much on the max days because the peaking factors are based on our actual flow data.

Um, and then, in terms of what we can do in the short-term, we are looking to maximize everything

we can do with the plant out there. You know, I'm going to have some more conversations tomorrow with the town manager and the wastewater superintendent, as well as our consultant to see what we can, uh, what we can work out and try and, um, resolve those conditions.

And, again, unfortunately, it's, it's -- we're in the situation of we've just got to get through this piece here but to be prepared for next year for the short-term issues.

Um, comments on inflow problem, yes, that is, that is an issue with, with -- and more so at the regional facility where we just have a straight hydraulic capacity, um, issue. And, and, again, part of the plan is recommendations to look into those, those aspects more carefully with some more detailed design reports.

And then, the last one, we appreciate all of the, you know, positive support from the town, uh, and, and the public that we've gotten and from the Council tonight, as well as the Planning Board. Um, and you know, it just, it's, you know, I have to concur that if, you know, anything that would increase density is going to lead to any increased flows which will, which will, you know, impact what

our design aspects are.

so, you know, if, if they, if there are any other, you know, future zoning changes or state legislation that increases the density to the extent that we have to revisit our flow numbers, then we would have to do that at that time.

But, otherwise, I just, you know, thank, thank the Council for its consideration here and the public for all their attention. Um, and, you know, it's, it's high time that we, we get this project or we need to get this plan approved so that we can move forward with these, these, uh, improvements that are long overdue.

PRESIDENT MENZIES: Excellent. So thank you, Jon, Andrew, everyone for their very thorough, well thought-out questions and comments. And, again, there's going to be a lot of questions and comments that come up over the next couple of weeks. And I'm sure this won't be the last time we hear the complaint about the odor.

So, again, please direct all of your questions to the town manager or the Town Council, and we will work to connect to the appropriate departments to answer those inquiries.

So, again, thank you very much for being here

and the amount of time spent on this hearing.

MR. GERHARD: (Nodding in the affirmative.)

PRESIDENT MENZIES: So, with that being said, is there a motion to close the public hearing?

MR. DURKIN: Motion to close the public hearing.

MS. VIGNALI: Second.

PRESIDENT MENZIES: All those in favor.

(**VOICE VOTE**)

PRESIDENT MENZIES: Any opposed?

(**NO RESPONSE HEARD/SEEN**)

PRESIDENT MENZIES: Motion passes, four-zero. Thank you.

(**PUBLIC MEETING CONCLUDED AT 10:26 P.M.**)

C E R T I F I C A T E

I, **KATHLEEN A. COSTELLO, RMR,** hereby certify that the foregoing is a true, accurate, and complete transcript of my stenographic notes taken at the above-entitled Narragansett Town Council meeting conducted on August 4, 2025.

IN WITNESS WHEREOF, I have hereunto set my hand this 17th day of August 2025.

KATHLEEN A. COSTELLO, RMR,
NOTARY PUBLIC

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WRIGHT-PIERCE
Engineering a Better Environment

Appendix J
Fiscal Sustainability Report

TOWN OF NARRAGANSETT, RI

Report

MARCH 2024

Pump Station Asset Management Plan



WRIGHT-PIERCE
Engineering a Better Environment

Pump Station Asset Management Plan

Town of Narragansett, RI

March 2024

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Section 1 Introduction

1.1 Goals and Objectives of Evaluation

This report summarizes the evaluation work completed for the Town of Narragansett's 19 Pump Stations. The purpose of this evaluation is to meet the following objectives:

- Create an asset hierarchy for the Town's Pump Station assets.
- Conduct condition assessment of assets at the 19 pump stations.
- Perform criticality/risk analysis of significant pump station assets.
- Identify best practices and management strategies for the Town's assets.
- Develop a 10-year Capital Improvement Plan.
- Provide evaluation findings in a format that the Town can use to populate their Computerized Maintenance Management System (CMMS).

1.2 Asset Evaluation Procedures

Asset condition assessments are based on information provided by the Town, interviews with operations staff, and field observations by Wright-Pierce personnel. During the site visits:

- Basic testing was performed with commonly available tools. The results were used to identify assets performing outside the expected range.
- The Wright-Pierce team spoke with Narragansett personnel to verify performance history and learn about the reliability of each asset.
- Data was collected by the Wright-Pierce team using Fulcrum, a cloud-based data collection software.
- The condition assessment was limited to readily accessible areas. No permit confined space entry was performed.
- No destructive testing of construction materials (concrete, paint, metal, insulation, etc.) was performed to determine the condition of assets.

The detailed evaluation forms for each asset are in Appendix A.

1.3 Basis for Estimates of Probable Costs

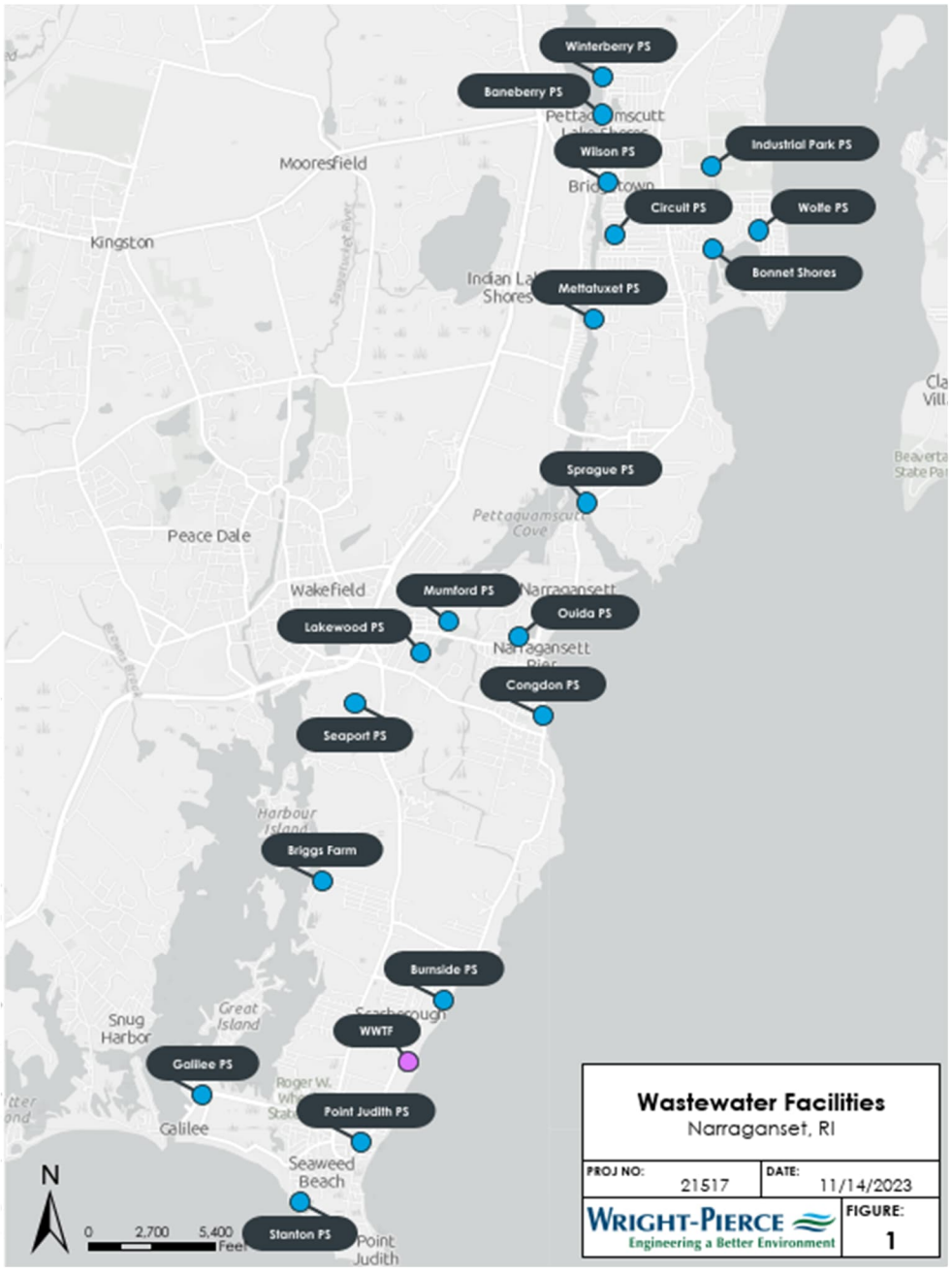
Planning-level costs have been estimated for recommended wastewater system improvements. These planning-level costs were estimated using standard cost estimating procedures consistent with industry standards utilizing unit cost information. Total capital cost estimates include an allowance of the estimated construction costs to account for construction contingency, design and construction phase, engineering, permitting, materials testing, as well as financing, administrative and legal expenses. The planning cost information presented herein is in current dollars and is based on an ENR Index of 13510 (11/15/2023).

These estimates were primarily developed for planning level budgeting and are generally reliable for determining the relative costs associated with equipment replacement. To group proposed improvements into biddable projects, additional factors not easily defined for this planning level report would need to be considered during preliminary and final design (e.g., foundation conditions, owner selected features and amenities, building code issues, bypass pumping, etc.). Contingency was included in the estimates to account for unknown design conditions. However, this contingency allowance may not be adequate in all circumstances.

1.4 Wastewater System Overview

The Town of Narragansett's wastewater system consists of nineteen pump stations and a treatment plant. The collection system is split into two different systems. The north end system has 14 pump stations, and all wastewater flows are conveyed to the South Kingstown Regional Wastewater Treatment Facility. The south end system has 5 pump stations, and all wastewater flows are conveyed to the Scarborough Wastewater Treatment Facility located on Ocean Road for treatment. An overview of the Narragansett wastewater system is shown in Figure 1-1.

Figure 1-1 Wastewater System Overview



Section 2 Risk Analysis/Modeling and Management Strategies

2.1 Introduction

All assets are not equally important to a wastewater utility's operation. Some assets are critical to operations and others are not critical. Some assets can easily be repaired or replaced with minimal operational impact. Other assets are difficult to repair or replace and cause major service disruptions upon failure. A community must examine its own wastewater system assets to determine which assets are critical and why.

Analyzing existing wastewater system assets to determine the probability of failure (PoF) and the consequence of failure (CoF) provides valuable information about assets in the system. This risk analysis is the foundation for developing cost-effective asset management strategies. Risk-based asset management planning allows the Town to allocate money to best reduce risk and maintain service.

2.2 Asset Registry

An asset registry is a list of items identified as assets to be evaluated and maintained. The registry includes what is owned by the Town and where it is located. The asset registry identifies which items are considered assets to be evaluated. An asset is a maintenance managed item (MMI). A MMI is an asset that is maintained, parts are identified, decisions are made to repair, refurbish, or replace.

To develop the asset registry for the wastewater system, the Town provided Wright-Pierce with the following data sources:

- As-built drawings
- Design drawings
- O&M Manuals
- Staff

2.3 Risk Analysis Model

2.3.1 Probability of Failure

The first step to determine risk is to find the Probability of Failure (PoF). PoF is the probability that an asset is subject to failing. To determine the PoF, a condition assessment is performed. An asset is more likely to fail if it is old, has a history of failure, has a known failure record in other locations, or has a poor condition rating. An asset is less likely to fail if it is newer, has little to no history of failure, and has a good to excellent condition assessment rating. The categories used in analyzing facility assets for the PoF condition assessment are physical condition, reliability, performance, and maintainability.

Physical Condition rating is based off several tests and questions including vibration, noise, temperature, coating condition, wear or corrosion, and leakage. The following are the possible condition ratings:

- 1-New or Excellent Condition
- 2-Very Good Condition
- 3-Minor Defects Only

- 4-Some Defects and Deterioration
- 5-Moderate Deterioration
- 6-Moderate to Significant Deterioration
- 7-Significant Deterioration
- 8-Significant Deterioration w/ Major Repairs Performed on Equipment
- 9-Virtually Unserviceable
- 10-Unserviceable

Reliability rating is based on the history of the asset. It relates the number of reported breakdowns or unplanned maintenance calls and potential downtime related to the availability of parts and service for the asset. The following are the possible reliability ratings:

- 1-Exceptional (No Problems)
- 2-Random Breakdown (Every 5 Years)
- 3-Occasional Breakdown (Every 2 Years)
- 4-Periodic Breakdown (Once per Year)
- 5-Continuous Breakdown (Multiple Times per Year)

Current Performance rating is based on efficiency, attention required, and the asset's ability to meet required demands. The following are the possible performance ratings:

- 1-Meets or Exceeds all Performance Targets
- 2-Minor Performance Deficiencies
- 3-Considerable Performance Deficiencies
- 4-Major Performance Deficiencies
- 5-Does not meet any Performance Targets

Maintainability rating is based on the level and frequency of maintenance and monitoring required to keep the asset operational. The following are the possible maintainability ratings:

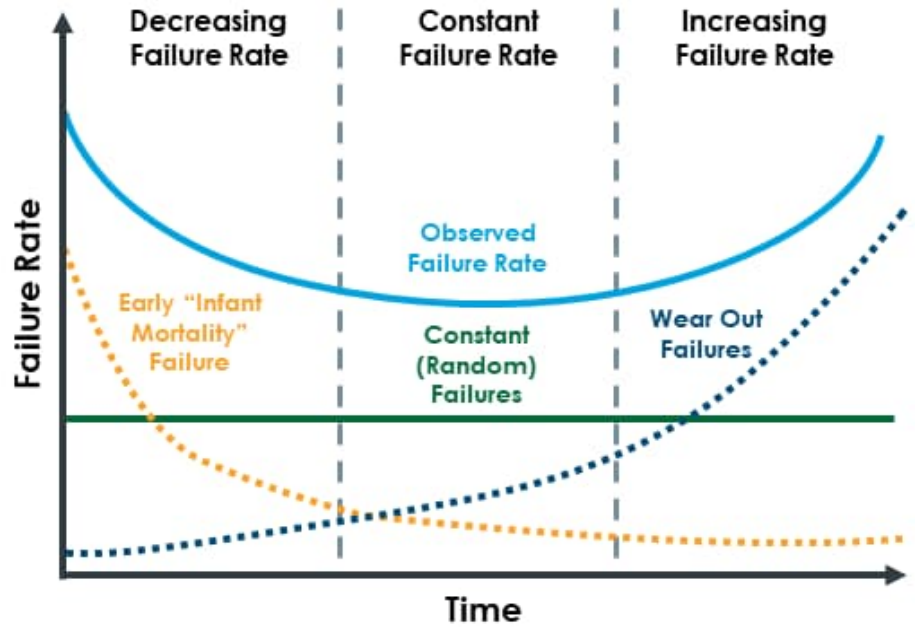
- 1-Easily Maintained
- 2-Largely Preventative Maintenance
- 3-Periodic Corrective Maintenance
- 4-More Frequent Corrective Maintenance
- 5-Work Orders Well Above Average
- 6-Corrective Maintenance has become Routine

Once the condition assessment is complete, the PoF score is determined. Using the condition and reliability ratings, the remaining life of the asset is determined. The remaining life is used to perform a Weibull analysis and produce the probability of failure. The Weibull analysis is based off the bathtub curve Figure 2-1 below. The bathtub curve has three distinct zones:

- Decreasing Failure Rate – When an asset first starts, early Infant Mortality (defective equipment, poor installation, for example) is the primary mode of failure.
- Constant Failure Rate – Over time, random failures are the primary mode of failure.
- Increasing Failure Rate – As an asset ages and parts wears out, the failure rate increases.

A failure rate is found using the Weibull curve. The failure rate is adjusted based on the performance and maintainability ratings found during the inspection to determine a final PoF.

Figure 2-1 Bathtub Curve



2.3.2 Consequence of Failure

The second step to determine risk is to find the Consequence of Failure (CoF). PoF tells us how often a failure might occur. CoF considers the cost and impacts when a failure does occur. The cost of failure could include loss of fire protection, public health impacts, social costs, collateral damage caused by asset failure, legal costs related to damage caused by the failure, environmental cost. The CoF score is calculated using the triple bottom line concept. The triple bottom line approach considers social, economic, and environmental impacts of asset failure. Wright-Pierce also includes replacement time and redundancy when calculating the final CoF score.

The Social/Community factor gives weight to the social/community consequences that would occur if an asset fails. Potential consequences included in this factor are shown in Table 2-1.

The Economic/Financial Scoring factor gives weight to the economic and financial consequences that would occur if an asset fails. Potential consequences included in this factor are shown in Table 2-2.

The Environmental factor gives weight to the environmental consequences that would occur if an asset fails. Potential consequences included in this factor are shown in Table 2-3.

Table 2-1 Social/Community Scoring

Potential Consequences	Score					
	1	3	5	7	9	10
Loss of Service	Can be out of service indefinitely	Cannot be down a month	Cannot be down a week	Cannot be down a day	Cannot be down 8 hours	Cannot be down one hour
Safety	No impact	Minimal Impact	Minor injury	Moderate Impact on Public Safety	Significant Impact to Public Safety	Significant and Immediate Impact to Public Safety
Agency's Image	No media or no consequence	Neutral coverage	Adverse media	Widely adverse media	Continual; political opposition	Nationally adverse media

Table 2-2 Economic/Financial Scoring

Potential Consequences	Score					
	1	3	5	7	9	10
Economic Impact	Low cost	Moderate cost	High cost	High cost; diverts $	Painful change of priorities	Likely to trigger rate increase, staff changes
Financial Impact	Insignificant	<$10k	<$50k	<$100K	<$1 million	>$1 million

Table 2-3 Environmental Scoring

Potential Consequences	Score					
	1	3	5	7	9	10
Spill/ Flood	No Impact	Short duration, small quantity	Moderate flooding, some offsite spillage	Many inconvenienced; moderate health and habitat issues	Severe health and habitat issues; some mandatory vacation of premises	Large areas vacated and closed to public access; extensive specialized containment cleanup required
Permit Compliance	No consequence	Minor violation - reporting only	Regulatory sanction possible	Regulatory sanction likely; Damage reversible less than one year	Extensive regulatory sanction virtually assured; damage reversible in one to five years	Severe sanctions; damage reversible in five years or more

The CoF score is a sum of the factors listed below normalized to a 1-10 scale. The weighting factors were selected to appropriately reflect the potential risk for each factor in Narragansett.

Table 2-4 Consequence of Failure Factor Weighting

Factor	Weighting
Social/Community	35%
Economic/Financial	30%
Environmental	35%

After the CoF is determined, replacement time and redundancy factors are incorporated into the calculation. These two factors increase or decrease the score based on the replacement time and level of redundancy for each asset.

2.3.3 Final Score

After final scores for PoF and CoF are determined, a management strategy can be assigned to each asset based on the risk matrix in Figure 2-2. Management strategies are selected to maximize cost-effective maintenance practices and reduce the risk associated with the asset.

Figure 2-2 Risk Matrix

Probability of Failure	Consequence of Failure									
	1	2	3	4	5	6	7	8	9	10
10	D	D	B	B	A	A	A	A	A	A
9	D	D	B	B	A	A	A	A	A	A
8	D	D	C	B	B	B	A	A	A	A
7	D	D	C	B	B	B	B	B	A	A
6	F	F	C	C	C	B	B	B	B	B
5	F	F	F	C	C	C	C	C	C	C
4	F	F	F	E	C	C	C	C	C	C
3	F	F	F	E	E	E	E	C	C	C
2	F	F	F	E	E	E	E	E	E	E
1	F	F	F	E	E	E	E	E	E	E

Management strategies include:

- **Group A** – Critical Renew & Replace (R&R) – (High PoF, High CoF). Asset has reached the end of its useful life or is near the end of its useful life but has high consequence of failure. Asset should be replaced within the year.
- **Group B** – Priority Renew & Replace (R&R) – (High PoF, High CoF). Asset is nearing the end of its useful life. Asset should be put on the 5-year CIP to be replaced.
- **Group C** – Add Predictive Maintenance Schedule – (Mid PoF, High CoF). Asset is about halfway through its useful life and parts will begin to wear out. A predictive maintenance schedule should be implemented.
- **Group D** – Opportunistic Renew & Replace – (High PoF, Low CoF). Asset has a low consequence of failure and is considered acceptable to fail. Replace as it fails.
- **Group E** – Routine Maintenance or Preventative Maintenance Schedule – (Low PoF, High CoF). Asset is new or early in its useful life. A routine or preventative maintenance schedule needs to be implemented.
- **Group F** – Run to Fail – (Low PoF, Low CoF). Asset has low consequence of failure and is considered acceptable to fail. No preventative or predictive maintenance should be scheduled for these assets.

Figure 2-3 shows a summary of management strategies for the Narragansett wastewater system assets.

Figure 2-3 Summary of Assets by Strategy

Group	Strategy	Count	% Assets
A	Critical R&R	24	9%
B	Priority R&R	44	9%
C	Add PdM Schedule	103	17%
D	Opportunistic R&R	16	2%
E	Rt or PM Schedule	121	29%
F	Run to Fail	169	35%
G	(undefined)	0	0%
	Total	477	

Risk can be reduced by decreasing the PoF by repair, replacement, or refurbishment of an asset. Risk can also be reduced by decreasing the CoF through redundancy, relocation, insurance, or alarms. Typically, the most cost-effective means of reducing risk for aging assets is to reduce the PoF through infrastructure replacement projects. The assets with the greatest PoF and CoF are the assets with the greatest risk. These assets should be further evaluated to determine the best way to reduce the risk.

2.4 Asset Registry

The asset registry is the backbone of an effective CMMS program. If an asset is not in the asset registry, it cannot be managed or tracked very easily. The asset registry lists assets and important asset information. A well-developed asset registry will include the following (if applicable):

- Asset ID number
- Asset description
- Serial number
- Model number
- Equipment class
- Manufacturer
- Material
- Size and capacity
- Installation date
- Service life
- Replacement cost

- Criticality ranking
- Warranty begin and end date
- Equipment condition rating

The asset registry should be organized in a hierarchy that allows staff to report on the performance and cost impacts of assets quickly and effectively.

2.5 Asset Hierarchy

An asset hierarchy is the logical organization of assets that supports effective condition and cost analyses for groups of assets. The asset hierarchy is typically built upon a series of 'parent/child' relationships. Asset hierarchies are set up to support both high-level CMMS decision-making and more immediate maintenance management decision-making.

Wright-Pierce has developed an asset hierarchy that encompasses the Town's pump station assets.

The purpose of the asset hierarchy is to:

- Support CMMS reporting.
- Support maintenance cost reporting.
- Support related CMMS functionality, such as the ability to assign assets to work orders.
- Capture all wastewater assets.
- Provide flexibility to add new assets in the future.

The asset numbering convention uses a series of codes that provide useful information about the asset. The asset number structure includes a facility number, a location number, a room number, an asset classification, and an identifying asset number. An example asset ID is 200-202-001-PP-01:

200 = Facility Number (Pump Station)
202 = Location Number (Bonnet Shores)
001 = Room Number (Pump Room)
PP = Asset Classification (Pump)
01 = Asset Number (Pump No. 1)

This example (200-202-001-PP-01) is the asset ID for Pump No. 1 located in the pump room of the Bonnet Shores pump station.

The complete asset hierarchy for the Narragansett pump stations is in Appendix B.

Section 3 Recommended Capital Improvement Plan

3.1 Introduction

This section summarizes the condition assessment of Narragansett's 19 pump stations. Architectural, Electrical, I&C, Mechanical, Process, and Structural assets were included in the evaluation. The locations included in the condition assessment are:

- Baneberry Pump Station
- Bonnet Shores Pump Station
- Briggs Farm Pump Station
- Burnside Pump Station
- Circuit Pump Station
- Congdon Pump Station
- Galilee Pump Station
- Industrial Park Pump Station
- Lakewood Pump Station
- Mettatuxet Pump Station
- Mumford Pump Station
- Ouida Pump Station
- Point Judith Pump Station
- Seaport Pump Station
- Sprague Pump Station
- Stanton Pump Station
- Wilson Pump Station
- Winterberry Pump Station
- Wolfe Pump Station

Asset condition assessments are based on information provided by the Town, interviews with Town operations staff, and field observations by Wright-Pierce personnel. Wright-Pierce conducted site visits from August 9, 2023 through August 16, 2023. During the site visits:

- Basic testing was performed with commonly available tools. The results were used to identify assets performing outside the expected range.
- The Wright-Pierce team spoke with Town personnel to verify performance history and learn about the reliability of each asset.
- The condition assessment was limited to readily accessible areas. No permit confined space entry was performed.
- No destructive testing of construction materials (concrete, paint, metal, insulation, etc.) was performed to determine the condition of assets.

3.2 Evaluation Recommendations

The recommendations are divided into two categories, Priority Improvements and Predictive Improvements. The Priority Improvements include safety or code issues that should be fixed right away, equipment that has reached the end of its useful life, requires immediate repair, or repair is anticipated within two years. The Predictive Improvements include items that do not have an immediate impact on system performance, and equipment anticipated to reach the end of their useful life within three to 10 years.

Based upon the field evaluation, the following Priority Improvements (short term 1-2 years) and Predictive Improvements (long term 3–10 years) are recommended to correct the deficiencies identified.

3.2.1 Baneberry Trail Pump Station

Table 3-1 Observations and Recommended Improvements to the Baneberry Trail Pump Station

Description	Room Area	Observation	Recommendation	Plan Year
Priority Asset Improvements				
Basket Strainer	Wet Well	An operator made their own basket strainer for catching rags in the influent.	Replace the basket strainer with one that is specifically designed for this application with a slide rail removal.	2025
Control Panel - Pumps	-	Estimated renewal date.	Replace in kind.	2025
Control Panel - Air	-	Estimated renewal date.	Replace in kind.	2025
Panelboard	-	Estimated renewal date.	Replace in kind.	2025
Building	-	No load rating labeled on monorail.	Label load rating per OSHA requirements.	2025
Grounds	-	Bushes and weeds too overgrown to inspect left side of building.	Trim vegetation back 5' from building.	2025
Pumps	-	Single rail system makes it difficult to remove and reseat pumps.	Replace rails with dual rail system.	2026
Predictive Asset Improvements				
Disconnect - Main	-	Wet Well shares the same air space as electrical equipment.	Electrical upgrade to bring station into compliance. Will require separate new structure for electrical equipment.	2027
			Total Estimated Cost:	**$538,000**

3.2.2 Bonnet Shores Pump Station

Table 3-2 Observations and Recommended Improvements to the Bonnet Shores Pump Station

Description	Room Area	Observation	Recommendation	Plan Year
Priority Asset Improvements				
Hoist and Monorail	Pump Room	Monorail load rating not labeled per OSHA requirements.	Label load rating as required by OSHA.	2025
Motor- Pump No. 1	Pump Room	ESTOP not labeled.	Label ESTOP for pump.	2025
Motor- Pump no. 2	Pump Room	ESTOP not labeled.	Label ESTOP for pump.	2025
Generator	Electrical Room	Estimated renewal date. Breaker does not have the required clearance.	Replace generator outside, not enough room in building.	2026
Building	-	Unfinished walls throughout the building and no ceilings, just exposed insulation roof structure.	Cover insulation with FRP panels.	2026
Predictive Asset Improvements				
VFD – Pump No. 1	Electrical Room	Estimated renewal date.	Replace in kind.	2031
VFD – Pump No. 2	Electrical Room	Estimated renewal date.	Replace in kind.	2031
			Total Estimated Cost:	**$290,000**

3.2.3 Briggs Farm Pump Station

Table 3-3 Observations and Recommended Improvements to the Briggs Farm Pump Station

Description	Room Area	Observation	Recommendation	Plan Year
Priority Asset Improvements				
-	-	None	N/A	-
Predictive Asset Improvements				
Dehumidifier	-	Estimated renewal date.	Replace in kind.	2027
Exhaust Fan	-	Estimated renewal date.	Replace in kind.	2027
Hot Water Heater	-	Estimated renewal date.	Replace in kind.	2027
Supply Fan – Wet Well	-	Estimated renewal date.	Replace in kind.	2027
Panel – Distribution	-	Estimated renewal date.	Replace in kind.	2034
Flowmeter	-	Estimated renewal date.	Replace in kind.	2034
Panel – Lighting	-	Estimated renewal date.	Replace in kind.	2034
Pump Motors	-	Estimated renewal date.	Replace in kind.	2034
RTU	-	Estimated renewal date.	Replace in kind.	2034
Surge Protector	-	Estimated renewal date.	Replace in kind.	2034
			Total Estimated Cost:	**$312,000**

3.2.4 Burnside Pump Station

Table 3-4 Observations and Recommended Improvements to the Burnside Pump Station

Description	Room Area	Observation	Recommendation	Plan Year
Priority Asset Improvements				
Control Panel	Electrical Room	Estimated renewal date.	Replace in kind.	2025
Transmitter - Flowmeter	Electrical Room	Estimated renewal date.	Replace in kind.	2025
Exhaust Fan – Wet Well	Exterior	Estimated renewal date.	Replace in kind.	2025
Panelboard – Generator	Generator Room	Estimated renewal date.	Replace in kind.	2025
Pump No. 1	Pump Room	Corrosion from old leak in filter. Peeling paint with manufacturer's coating visible underneath but no corrosion.	Clean, prep, and paint.	2025
Pump No. 2	Pump Room	Corrosion from old leak in filter. Peeling paint with manufacturer's coating visible underneath but no corrosion.	Clean, prep, and paint.	2025
Tank - Diesel	Exterior	Some cracking on top of tank around extruding pipes. Signage faded and can't be read.	Replace safety signage.	2025
Pump Station Grounds	-	Tree branches hanging in the way of gate opening.	Trim branches hanging in front of the gate.	2025
Generator	Generator Room	Breaker does not have proper clearance.	No recommendations at this time.	-
Automatic Transfer Switch	Generator Room	The screen is located up high. Not a code violation but is a usability issue.	No recommendations at this time.	-

Description	Room Area	Observation	Recommendation	Plan Year
Predictive Asset Improvements				
Dehumidifier	Pump Room	Estimated renewal date.	Replace in kind.	2027
Unit Heater – Electric	Pump Room	Estimated renewal date.	Replace in kind.	2027
Unit Heater – Electric	Electrical Room	Estimated renewal date.	Replace in kind.	2027
Building	-	Unfinished ceiling in generator room. Mold on walls and floors in pump room. The exterior door facing the street has holes in it.	Install FRP panels for generator room ceiling. Remediate the mold from the pump room. Replace exterior door.	2027
Disconnect – Main	Generator Room	Estimated renewal date.	Replace in kind.	2032
Transformer – Generator	Generator Room	Estimated renewal date.	Replace in kind.	2032
Flowmeter	Pump Room	Estimated renewal date.	Replace in kind.	2034
Pump Motors	Pump Room	Estimated renewal date.	Replace in kind.	2034
RTU	Electrical Room	Estimated renewal date.	Replace in kind.	2034
			Total Estimated Cost:	**$452,000**

3.2.5 Circuit Drive Pump Station

Table 3-5 Observations and Recommended Improvements to the Circuit Drive Pump Station

Description	Room Area	Observation	Recommendation	Plan Year
Priority Asset Improvements				
Pump No. 2	Wet Well	Rail broke off when pump was being lowered back in, base is rotted through.	Repair pump base and rail.	2025
Hoist and Monorail	-	Load rating not labeled.	Label load rating on monorail per OSHA requirements.	2025
Predictive Asset Improvements				
Panelboard	-	Does not have 30" working space. Open to wet well atmosphere.	Electrical upgrade will be part of entire station upgrade to bring station into compliance. Will require separate new structure for electrical equipment.	2027
Pump No. 1	Wet Well	Rail is up against discharge pipe flange making pump removal difficult.	Replace single rail system with dual rail offset from pipe flange as part of entire station upgrade.	2027
Pump No. 2	Wet Well	Rail is up against discharge pipe flange requiring confined space entry for pump removal.	Replace single rail system with dual rail offset from pipe flange as part of entire station upgrade.	2027
Building	-	All interior building surface are unfinished. Deck too small to comfortably start generator located inside building. Painting on vents flaking and peeling off. Wooden slats rotting in some places. Driveway too small for truck and snow plow in winter. Landing step not structurally safe and board is broken with no real support beneath the door frame. Stairs not structurally sound.	All repairs will be part of an entire pump station upgrade.	2027
			Total Estimated Cost:	**$538,000**

3.2.6 Congdon Pump Station

Table 3-6 Observations and Recommended Improvements to the Congdon Pump Station

Description	Room Area	Observation	Recommendation	Plan Year
Priority Asset Improvements				
Dry Well	-	Lifting hook load rating is not labeled.	Label lifting hook load rating per OSHA requirements.	2025
Exhaust Fan	Dry Well	Estimated renewal date.	Replace in kind.	2025
Congdon Street Pump Station		Nearby homeowner does not like the "ugly" structure in front of their view.	Improve external aesthetics.	2026
Predictive Asset Improvements				
Unit Heater - Electric	Dry Well	Estimated renewal date.	Replace in kind.	2028
Control Panel	Dry Well	Estimated renewal date.	Replace in kind.	2033
Panel – Distribution	Dry Well	Estimated renewal date.	Replace in kind.	2033
			Total Estimated Cost:	**$148,000**

3.2.7 Galilee Pump Station

Table 3-7 Observations and Recommended Improvements to the Galilee Pump Station

Description	Room Area	Observation	Recommendation	Plan Year
Priority Asset Improvements				
Piping, Valves, and Appurtenances	Pump Room	Check valve on pump no. 1 leaks.	Repair leaking check valve.	2025
Control Panel	Control Room	Old enclosure gutted and new internals installed. Touch screen not recognizing touch, have to click multiple times.	Troubleshoot OIT to figure out why touch is not working properly.	2025
Predictive Asset Improvements				
Control Panel	Control Room	Estimated renewal date.	Replace in kind.	2028
Disconnect – Main	Control Room	Estimated renewal date.	Replace in kind.	2028
Panel – Main Distribution	Control Room	Estimated renewal date.	Replace in kind.	2028
Panel – Lighting	Control Room	Estimated renewal date.	Replace in kind.	2028
MCC	Control Room	Estimated renewal date.	Replace in kind.	2028
Transmitter – Flowmeter	Control Room	Estimated renewal date.	Replace in kind.	2028
VFD - Pump No. 1	Control Room	Abandoned in place.	Repairs to be part of full station upgrade.	2028
VFD - Pump No. 2	Control Room	Abandoned in place.	Repairs to be part of full station upgrade.	2028
Disconnect – Main	Exterior	Estimated renewal date.	Replace in kind.	2028
Exhaust Fan	Exterior	Fan intakes fumes from wet well and sends them into the dry side so it is not used.	Repairs to be part of full station upgrade.	2028

Description	Room Area	Observation	Recommendation	Plan Year
Galilee Pump Station	Grounds	12 fence panels don't have bracing. All show signs of rust. Vegetation growing over some panels.	Repairs to be part of full station upgrade.	2028
Generator	Roof	Breaker is tripping constantly.	Repairs to be part of full station upgrade.	2028
Dehumidifier	Pump Room	Estimated renewal date.	Replace in kind.	2028
Pump No. 2	Pump Room	Estimated renewal date.	Replace in kind.	2028
Piping, Valves, and Appurtenances	Pump Room	Estimated renewal date.	Replace in kind.	2028
Transformer	Pump Room	Estimated renewal date.	Replace in kind.	2028
Unit Heater – Electric	Pump Room	Estimated renewal date.	Replace in kind.	2028
Sump Pumps	Pump Room	Can only run one sump pump at a time or breaker trips.	Repairs to be part of full station upgrade.	2028
Flowmeter	Exterior	Does not work.	Repairs to be part of full station upgrade.	2028
Pump Station Grounds	-	12 fence panels don't have bracing, all show signs of rust, some vegetation growing over some panels.	Repairs to be part of full station upgrade.	2028
Building	-	The floor is significantly deteriorated allowing groundwater intrusion. Paint peeling and flaking considerably on walls. Could not see ceiling because a tarp was hanging to catch rainwater leaking from hatch above. Pump room wall coatings have failed.	Repairs to be part of full station upgrade.	2028

Total Estimated Cost: **$3,408,000**

3.2.8 Industrial Park Pump Station

Table 3-8 Observations and Recommended Improvements to the Industrial Park Pump Station

Description	Room Area	Observation	Recommendation	Plan Year
Priority Asset Improvements				
Panel - Bubbler System		Abandoned in place.	Remove panel, it's no longer used.	2025
Hoist		Lifting hooks are missing load rating labels required by OSHA.	Label lifting hooks load rating per OSHA requirements.	2025
Exhaust Fan		Smoke coming from the motor and fan not spinning.	Replace exhaust fan.	2025
Control Panel		Estimated renewal date.	Replace in kind.	2025
Main Electrical Enclosure		Estimated renewal date.	Replace in kind.	2025
Generator Receptacle		Estimated renewal date.	Replace in kind.	2025
Pump No. 1		Estimated renewal date.	Replace in kind.	2025
Pump No. 2		Estimated renewal date.	Replace in kind.	2025
Pump - Sump		Estimated renewal date.	Replace in kind.	2025
Manual Transfer Switch		Estimated renewal date.	Replace in kind.	2025

Description	Room Area	Observation	Recommendation	Plan Year
Predictive Asset Improvements				
Industrial Park Pump Station	Grounds	Old tree/vine grew up through fence and large portions are still stuck in the fence. Fence is bent in some places because of the growth. Concrete slab around wet well is disintegrating. No bypass at this station.	Remove tree and repair fence as required. Patch spalling concrete around wet well. Install bypass.	2027
Dehumidifier		Estimated renewal date.	Replace in kind.	2032
RTU		Estimated renewal date.	Replace in kind.	2034
			Total Estimated Cost:	**$631,000**

3.2.9 Lakewood Drive Pump Station

Table 3-9 Observations and Recommended Improvements to the Lakewood Drive Pump Station

Description	Room Area	Observation	Recommendation	Plan Year
Priority Asset Improvements				
Control Panel		Estimated renewal date.	Replace in kind.	2025
Dehumidifier		Estimated renewal date.	Replace in kind.	2025
Exhaust Fan		Estimated renewal date.	Replace in kind.	2025
Motor – Pump No. 1		Estimated renewal date.	Replace in kind.	2025
Predictive Asset Improvements				
RTU		Estimated renewal date.	Replace in kind.	2034
			Total Estimated Cost:	**$188,000**

3.2.10 Mettatuxet Pump Station

Table 3-10 Observations and Recommended Improvements to the Mettatuxet Pump Station

Description	Room Area	Observation	Recommendation	Plan Year
Priority Asset Improvements				
Panelboard	Electrical Room	Estimated renewal date.	Replace in kind.	2024
Unit Heater - Electric	Electrical Room	Estimated renewal date.	Replace in kind.	2024
Hoist and Monorail	Mid Level	No load rating labeled per OSHA requirements.	Label with load rating as required by OSHA.	2025
Exhaust Fan	Mid Level	Estimated renewal date.	Replace in kind.	2025
Motor - No. 1	Pump Room	Disconnect and estop not labeled.	Label disconnect and e-stop.	2025
Motor - No. 2	Pump Room	Disconnect and estop not labeled.	Label disconnect and e-stop.	2025
Exhaust Fan	Pump Room	Estimated renewal date.	Replace in kind.	2025
Unit Heater - Electric	Pump Room	Estimated renewal date.	Replace in kind.	2025
Disconnect - Main	Electrical Room	Estimated renewal date.	Replace in kind.	2025
Panelboard	Electrical Room	Estimated renewal date.	Replace in kind.	2025
Unit Heater – Electric	Electrical Room	Estimated renewal date.	Replace in kind.	2025
Mettatuxet Pump Station	-	Some weeds growing up through asphalt/gravel and fence. Some fence panels have broken barbed wire along the top.	Repair broken barbed wire portions of fence.	2025
Building	-	Some peeling paint and crumbling grout on exterior concrete walls.	Clean, prep, and paint pump room walls.	2026

Description	Room Area	Observation	Recommendation	Plan Year
Automatic Transfer Switch	Electrical Room	Door can't open 90 degrees as required by code.	No recommendations at this time.	-
Predictive Asset Improvements				
Exhaust Fan	Exterior	Estimated renewal date.	Replace in kind.	2027
Pump Motors	Pump Room	Estimated renewal date.	Replace in kind.	2030
Pump VFD's	Mid Level	Estimated renewal date.	Replace in kind.	2032
Dehumidifier	Pump Room	Estimated renewal date.	Replace in kind.	2032
			Total Estimated Cost:	**$139,000**

3.2.11 Mumford Road Pump Station

Table 3-11 Observations and Recommended Improvements to the Mumford Road Pump Station

Description	Room Area	Observation	Recommendation	Plan Year
Priority Asset Improvements				
Panel – Main Distribution		Estimated renewal date.	Replace in kind.	2025
Panel – Lighting		Estimated renewal date.	Replace in kind.	2025
Building		Paint on some trim is flaking and peeling and some shingles on building siding need repainting. Some siding shingles near ground look a bit degraded. Exterior door has many dents, presumably from being hit with many baseballs and has a tear on the right door panel where it was impacted.	Clean, prep, and paint siding. Replace door.	2026

Description	Room Area	Observation	Recommendation	Plan Year
Predictive Asset Improvements				
Dehumidifier		Estimated renewal date.	Replace in kind.	2027
Exhaust Fan		Estimated renewal date.	Replace in kind.	2027
Control Panel		Estimated renewal date.	Replace in kind.	2034
Flowmeter		Estimated renewal date.	Replace in kind.	2034
Pump Motors		Estimated renewal date.	Replace in kind.	2034
Phase Loss Relay		Estimated renewal date.	Replace in kind.	2034
RTU		Estimated renewal date.	Replace in kind.	2034
			Total Estimated Cost:	**$299,000**

3.2.12 Ouida Pump Station

Table 3-12 Observations and Recommended Improvements to the Ouida Pump Station

Description	Room Area	Observation	Recommendation	Plan Year
Priority Asset Improvements				
Hoists	Mid-Level	Lifting hook load ratings are not labeled per OSHA requirements.	Label lifting hook load ratings as required by OSHA.	2025
MCC	Electrical Room	Items stored in front.	Remove items stored in front of panel per NEC requirements.	2025
Exhaust Fan – Pump Room	Electrical Room	Estimated renewal date.	Replace in kind.	2025
Exhaust Fan – Control Room	Electrical Room	Estimated renewal date.	Replace in kind.	2025
Exhaust Fan	Generator Room	Estimated renewal date.	Replace in kind.	2025
Pump VFD's	Generator Room	Estimated renewal date.	Replace in kind.	2025
Grit Classifier	Grit Room	Estimated renewal date.	Replace in kind.	2025
Grit Removal Unit	Grit Room	Estimated renewal date.	Replace in kind.	2025
Blower No. 2	Grit Room	Belt guard is broken.	Replace broken belt guard.	2025
Damper	Grit Room	Linkage broken.	Replace damper.	2025
Motor - Blower No. 1	Grit Room	Disconnect doesn't work. Needs to be shut off from MCC.	Replace broken disconnect.	2025
Motor - Blower No. 2	Grit Room	Disconnect doesn't work. Needs to be shut off from MCC.	Replace broken disconnect.	2025
Tank - Diesel Bulk	Exterior	Safety signs are faded and overgrown with lichen.	Clean tank and replace signage.	2025

Description	Room Area	Observation	Recommendation	Plan Year
Pump Motors	Pump Room	Estimated renewal date.	Replace in kind.	2025
Predictive Asset Improvements				
Odor Control System No. 1	Grit Room	Estimated renewal date.	Replace in kind.	2027
Flowmeter No. 1	Mid-Level	Estimated renewal date.	Replace in kind.	2029
Tank – Diesel Bulk	Exterior	Estimated renewal date.	Replace in kind.	2032
Tank – Diesel Day	Generator Room	Estimated renewal date.	Replace in kind.	2032
Pumps	Pump Room	Estimated renewal date.	Replace in kind.	2032
Flowmeter No. 2	Mid-Level	Estimated renewal date.	Replace in kind.	2034
Transmitters – Wet Well Level	Mid-Level	Estimated renewal date.	Replace in kind.	2034
Control Panel – Sump Pump	Pump Room	Estimated renewal date.	Replace in kind.	2034
Blowers	Grit Room	Estimated renewal date.	Replace in kind.	2034
			Total Estimated Cost:	**$2,629,000**

3.2.13 Point Judith Pump Station

Table 3-13 Observations and Recommended Improvements to the Point Judith Pump Station

Description	Room Area	Observation	Recommendation	Plan Year
Priority Asset Improvements				
Building		Cedar shingle siding paint has reached the end of life. Monorail is missing load rating.	Clean, prep, and paint siding. Label monorail load rating per OSHA requirements.	2025
Control Panel - Pumps	Control Room	Currently a bubbler system, and they want to go to a transducer, handle doesn't open well.	Replace control panel and convert level controls from a bubbler system to a submersible pressure transducer.	2026
Panel – Main Distribution	Control Room	Estimated renewal date.	Replace in kind.	2026
Panel – Lighting	Control Room	Estimated renewal date.	Replace in kind.	2026
RTU	Control Room	Estimated renewal date.	Replace in kind.	2026
Flowmeter	Pump Room	Estimated renewal date.	Replace in kind.	2026
Pump Motors	Pump Room	Estimated renewal date.	Replace in kind.	2026
Predictive Asset Improvements				
All Electric Unit Heaters	-	Estimated renewal date.	Replace in kind.	2027
Dehumidifier	Pump Room	Estimated renewal date.	Replace in kind.	2032
Exhaust Fan	Pump Room	Estimated renewal date.	Replace in kind.	2032
Supply Fan	Pump Room	Estimated renewal date.	Replace in kind.	2032
Automatic Transfer Switch	Control Room	Estimated renewal date.	Replace in kind.	2033

Description	Room Area	Observation	Recommendation	Plan Year
Transformer	Control Room	Estimated renewal date.	Replace in kind.	2033
Disconnect – Main	Control Room	Estimated renewal date.	Replace in kind.	2033
Disconnect – Main	Exterior	Estimated renewal date.	Replace in kind.	2033
			Total Estimated Cost:	**$353,000**

3.2.14 Salt Pond/Seaport Village Pump Station

Table 3-14 Observations and Recommended Improvements to the Salt Pond/ Seaport Village Pump Station

Description	Room Area	Observation	Recommendation	Plan Year
Priority Asset Improvements				
Exhaust Fan		Has not been hooked up to power source yet.	Connect to power source.	2025
Generator		Very close to building and regulator. 208v but service is 240v. Blown head gasket.	Replace generator with proper voltage and leave required clearances.	2025
Basket Strainer		Currently using a suspended milk crate to catch rags coming out of sewer that has to be vacuumed out weekly.	Install a permanent basket strainer on the wet well influent.	2026
Pumps		Both pumps get easily clogged by rags on a regular basis.	Install a permanent basket strainer on the wet well influent.	2026
Predictive Asset Improvements				
Control Panel		Estimated renewal date.	Replace in kind.	2027
			Total Estimated Cost:	**$193,000**

3.2.15 Sprague Pump Station

Table 3-15 Observations and Recommended Improvements to the Sprague Pump Station

Description	Room Area	Observation	Recommendation	Plan Year
Priority Asset Improvements				
Hoist and Monorail	Electrical Room	Load rating not labeled per OSHA requirements.	Label load rating	2025
Panel – Distribution PPB	Electrical Room	Estimated renewal date.	Replace in kind.	2025
Automatic Transfer Switch	Generator Room	Estimated renewal date.	Replace in kind.	2025
Hoist and Monorail	Generator Room	Load rating not labeled per OSHA requirements.	Label load rating as required by OSHA.	2025
RTU	Generator Room	Mice inside panel.	Have exterminator block any holes the mice may be using to get in.	2025
Disconnect - Main	Generator Room	Does not have proper clearance.	Replace in new location with the proper clearance per NEC.	2025
Motor - Pump No. 2	Pump Room	Leak from exhaust fan ductwork dripping on pumps causing premature corrosion.	Repair leak in exhaust fan ductwork.	2025
Motor- Pump No. 3	Pump Room	Disconnect not labeled. Leak from exhaust fan ductwork dripping on pumps causing premature corrosion.	Label disconnect. Repair leak in exhaust fan ductwork.	2025
Exhaust Fan No. 2	Exterior	Vegetation growing up sides and into vents restricting airflow.	Remove vegetation. Trim back at least 5 feet.	2025

Description	Room Area	Observation	Recommendation	Plan Year
Sprague Pump Station	Grounds	Fence is rusty and some barbed wire is broken. Half of fence is so covered by vegetations that it cannot be inspected. Weeds very overgrown through gravel walkways and asphalt of parking lot. Weeds overgrown blocking bypass and potential trip hazard near wet well.	Remove all vegetation 5 feet off fence. Remove all weeds from driveway and sealcoat. Remove all overgrowth from site.	2025
Predictive Asset Improvements				
Wet Well		Concrete top slab is deteriorating due to H_2S corrosion.	Parge coat deteriorated concrete and coat wet well with H_2S resistant coating.	2027
Building	-	Some cracking in floor near passage to lower levels. Ceilings and walls unfinished, no insulation. Doors are made of plywood.	Install insulation and steel entry doors.	2027
Pump VFD's	Electrical Room	Estimated renewal date.	Replace in kind and relocate to generator room.	2030
Unit Heater - Electric	Electrical Room	Estimated renewal date.	Replace in kind.	2031
Unit Heater - Electric	Pump Room	Estimated renewal date.	Replace in kind.	2031
Generator	Generator Room	Estimated renewal date.	Replace in kind.	2032
Exhaust Fan	Electrical Room	Estimated renewal date.	Replace in kind.	2033
			Total Estimated Cost:	**$637,000**

3.2.16 Stanton Avenue Pump Station

Table 3-16 Observations and Recommended Improvements to the Stanton Avenue Pump Station

Description	Room Area	Observation	Recommendation	Plan Year
Priority Asset Improvements				
Piping, Valves, and Appurtenances	Dry Well	Check valve above pump no. 2 is leaking.	Repair leaking check valve.	2025
Generator	Exterior	Enclosure in poor shape from ocean.	Clean, prep, and coat enclosure to protect from the ocean atmosphere.	2026
Stanton Avenue Pump Station	Grounds	Fence is significantly deteriorated and vegetation growth has taken over sections of fence.	Trim back vegetation 5 feet from fence and replace fence.	2026
Pumps and Motors	Dry Well	Estimated renewal date.	Replace with submersible style station.	2026
Piping, Valves, and Appurtenances	Dry Well	Estimated renewal date.	Replace with submersible style station.	2026
MCC	Electrical Room	No housing pad installed.	Replace MCC on a housing pad.	2026
Control Panel	Electrical Room	Salt water is getting in and corroding everything. Major corrosion on top from louver, signs of rust on PLC terminals.	Replace control panel in flood proof electrical building.	2026
Unit Heater - Electric	Electrical Room	Estimated renewal date.	Replace in kind.	2026
Dry Well		Everything is very corroded and rusty in dry well. Lots of moisture collecting on flat surfaces.	Replace dry well with submersible style station.	2026
Building - Electrical	-	Water intrusion through vents causing corrosion.	Flood proof building.	2026

Description	Room Area	Observation	Recommendation	Plan Year
Predictive Asset Improvements				
-	-	None	N/A	-
			Total Estimated Cost:	**$2,066,000**

3.2.17 Wilson Drive Pump Station

Table 3-17 Observations and Recommended Improvements to the Wilson Drive Pump Station

Description	Room Area	Observation	Recommendation	Plan Year
Priority Asset Improvements				
Slide Gate – Wet Well Isolation	Wet Well	Pedestal base installed in influent channel catching rags.	No recommendation at this time.	-
Predictive Asset Improvements				
Control Panel - Pumps	Electrical Room	Estimated renewal date.	Replace in kind.	2029
Control Panel - Grinder	Electrical Room	Estimated renewal date.	Replace in kind.	2029
Panel – Distribution	Electrical Room	Estimated renewal date.	Replace in kind.	2029
Hydraulic Power Pack - Grinder	Electrical Room	Estimated renewal date.	Replace in kind.	2029
RTU	Electrical Room	Estimated renewal date.	Replace in kind.	2029
Automatic Transfer Switch	Electrical Room	Estimated renewal date.	Replace in kind.	2029
Dehumidifier	Pump Room	Estimated renewal date.	Replace in kind.	2029
Exhaust Fan	Pump Room	Estimated renewal date.	Replace in kind.	2029

Description	Room Area	Observation	Recommendation	Plan Year
Pump Motors	Pump Room	Estimated renewal date.	Replace in kind.	2029
Unit Heater – Electric	Pump Room	Estimated renewal date.	Replace in kind.	2029
Exhaust Fan	Wet Well	Estimated renewal date.	Replace in kind.	2029
Grinder	Wet Well	Estimated renewal date.	Replace in kind.	2029
Generator	Generator Room	Installed in space open to wet well. Breaker doesn't have required clearance.	Replace generator outside building. Seal door between rooms so only access to wet well is from outside.	2029
Building	-	All walls and ceilings unfinished. Some patches of floor unfinished. Some cracking on the foundation at the front left corner (as viewed from the street). Main entrance door is broken on the inside.	Needs finished walls, ceilings, floors, and new exterior door.	2029
			Total Estimated Cost:	**$3,072,000**

3.2.18 Winterberry Pump Station

Table 3-18 Observations and Recommended Improvements to the Winterberry Pump Station

Description	Room Area	Observation	Recommendation	Plan Year
Priority Asset Improvements				
Building	-	Wet well has mold growing on walls. Exterior siding paint is peeling. Roof shingles have failed. No load rating shown on beam.	Remove mold from wet well. Clean, prep, and paint exterior walls. Replace roof with asphalt shingles. Label load rating on beam per OSHA requirements.	2025
Pumps	Pump Room	Concentric reducers installed on suction lines instead of eccentric.	When pumps are due for replacement, the reducers should be changed out for an eccentric one with flat side installed on top. Not expected to be needed in the next ten years.	-
Slide Gate – Wet Well Isolation	Wet Well	Pedestal base sits in influent channel causing rags to get caught up on bolts.	No recommendations at this time.	-
Predictive Asset Improvements				
Control Panel – Pumps	Control Room	Estimated renewal date.	Replace in kind.	2030
Control Panel – Grinder	Control Room	Estimated renewal date.	Replace in kind.	2030
Unit Heater – Electric	Control Room	Estimated renewal date.	Replace in kind.	2030
Panel - Distribution	Electrical Room	Estimated renewal date. Wet well shares the same air space through non airlock door.	Replace in kind. Seal door between rooms so only access to wet well is from outside.	2030
Generator	Generator Room	Installed in space open to wet well.	Replace generator outside building.	2030
Supply Fan	Generator Room	Estimated renewal date.	Replace in kind.	2030
Dehumidifier	Pump Room	Estimated renewal date.	Replace in kind.	2030

Description	Room Area	Observation	Recommendation	Plan Year
Exhaust Fan	Pump Room	Estimated renewal date.	Replace in kind.	2030
Flowmeter	Pump Room	Estimated renewal date.	Replace in kind.	2030
Dry-pit Float	Pump Room	Estimated renewal date.	Replace in kind.	2030
Motor – Pump No. 1	Pump Room	Estimated renewal date.	Replace in kind.	2030
Unit Heaters	Pump Room	Estimated renewal date.	Replace in kind.	2030
Hydraulic Power Pack - Grinder	Control Room	Estimated renewal date.	Replace in kind.	2030
Grinder	Wet Well	Estimated renewal date.	Replace in kind.	2030
RTU	Electrical Room	Estimated renewal date.	Replace in kind.	2030
			Total Estimated Cost:	**$3,445,000**

3.2.19 Wolfe Pump Station

Table 3-19 Observations and Recommended Improvements to the Wolfe Pump Station

Description	Room Area	Observation	Recommendation	Plan Year
Priority Asset Improvements				
Hoist		Lifting hooks are missing their load rating labels required by OSHA.	Label lifting hook load rating per OSHA requirements.	2025
Wolfe Road Pump Station		Overgrown around generator receptacle.	Trim back vegetation around generator receptacle.	2025
Predictive Asset Improvements				
Full Station		All equipment is past its useful life, heavy corrosion, and signs of wear present.	Replace the station with a submersible style.	2027
			Total Estimated Cost:	**$1,624,000**

3.3 Risk Assessment

In previous sections of this report, risk analyses were conducted to create weighting criteria to establish priority and objectives for each of the Town's pump stations. The risk analyses were conducted on all assets and provides the foundation for the development of the most cost-effective Asset Management Plan allowing the Town to add risk reduction into capital planning.

3.4 Recommended Capital Improvement Plan

Specific recommendations for each facility were summarized in this section. Estimated costs are provided, on a near-term (1-2 years) and long-term (3-10 years) basis, also known as Priority and Predictive Asset Improvements, respectively.

The total estimated project cost for the Recommended Capital Improvement Plan (CIP) over the 10-year planning period is approximately $20.9 million. This is a planning level budgetary cost estimate and will need to be reviewed and updated annually or as needed by the Town over the course of the upgrade program. It is recommended that each proposed improvement project be reevaluated before beginning the design, as changes in scope can occur over the course of the ten-year plan.

The timing of the improvements in the CIP is based on our review of the probability of failure, consequence of failure, and the risk matrix developed. This represents an appropriate process to prioritize the projects in the Plan. This CIP should be coordinated with other ongoing work. The proposed 10-Year Capital Improvement Plan is shown in Table 3-20.

This report provides planning level budgets for proposed improvements to help the Town plan future capital improvements. The prioritized asset improvement list presented in this report is based on Wright-Pierce's engineering expertise and experience and should not be considered financial advice.

Table 3-20 Ten-Year Capital Improvement Plan

Location	Priority Costs (Yr 1-2)	Minor Costs (Yr 3-10)	Plan Year 2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total
Baneberry Trail	$ 174,400	$ 363,000	$ 136,900	$ 37,500	$ 249,900	$ -	$ -	$ -	$ -	$ -	$ -	$ 113,100	$ 538,000
Bonnet Shores	$ 255,800	$ 34,200	$ 1,500	$ 254,300	$ -	$ -	$ -	$ -	$ 34,200	$ -	$ -	$ -	$ 290,000
Briggs Farm	$ -	$ 311,500	$ -	$ -	$ 21,600	$ -	$ -	$ -	$ -	$ -	$ -	$ 289,900	$ 312,000
Burnside Avenue	$ 108,800	$ 343,100	$ 108,800	$ -	$ 35,400	$ -	$ -	$ -	$ -	$ 33,200	$ -	$ 274,500	$ 452,000
Circuit Drive	$ 500	$ 537,300	$ 500	$ -	$ 537,300	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 538,000
Congdon Street	$ 31,400	$ 116,300	$ 6,400	$ 25,000	$ -	$ 6,400	$ -	$ -	$ -	$ -	$ 109,900	$ -	$ 148,000
Galilee	$ 2,500	$ 3,405,500	$ 2,500	$ -	$ -	$ 3,405,500	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,408,000
Industrial Park	$ 367,100	$ 263,400	$ 367,100	$ -	$ 249,900	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ 12,300	$ 631,000
Lakewood Drive	$ 90,000	$ 97,900	$ 90,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 97,900	$ 188,000
Mettatuxet	$ 67,200	$ 71,100	$ 58,400	$ 8,800	$ 6,300	$ -	$ -	$ 28,300	$ -	$ 36,500	$ -	$ -	$ 139,000
Mumford Road	$ 40,700	$ 257,700	$ 15,700	$ 25,000	$ 7,300	$ -	$ -	$ -	$ -	$ -	$ -	$ 250,400	$ 299,000
Ouida Street	$ 1,296,300	$ 1,332,700	$ 1,296,300	$ -	$ 447,400	$ -	$ 17,600	$ -	$ -	$ 627,600	$ -	$ 240,100	$ 2,629,000
Point Judith	$ 220,600	$ 132,200	$ 8,800	$ 211,800	$ 24,900	$ -	$ -	$ -	$ -	$ 15,700	$ 91,600	$ -	$ 353,000
Salt Pond/Seaport Village	$ 113,000	$ 79,600	$ 88,000	$ 25,000	$ 79,600	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 193,000
Sprague	$ 108,800	$ 527,700	$ 108,800	$ -	$ 150,000	$ -	$ -	$ 68,000	$ 11,700	$ 290,500	$ 7,500	$ -	$ 637,000
Stanton Avenue	$ 2,066,000	$ -	$ 1,500	$ 2,064,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,066,000
Wilson Drive	$ -	$ 3,071,900	$ -	$ -	$ -	$ -	$ 3,071,900	$ -	$ -	$ -	$ -	$ -	$ 3,072,000
Winterberry Road	$ 25,000	$ 3,419,700	$ 25,000	$ -	$ -	$ -	$ -	$ 3,419,700	$ -	$ -	$ -	$ -	$ 3,445,000
Wolfe Road	$ 5,500	$ 1,618,400	$ 5,500	$ -	$ 1,618,400	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,624,000
GRAND TOTAL	$ 4,974,000	$ 15,984,000	$ 2,322,000	$ 2,652,000	$ 3,428,000	$ 3,412,000	$ 3,090,000	$ 3,516,000	$ 46,000	$ 1,005,000	$ 209,000	$ 1,279,000	$ 20,959,000

Note: All budgetary costs include a 3% per year escalation.

General OH&P	20%
Bond and Insurance	3%
Ancillary Equipment/Material Adder	25%
Project Contingency	50%
Engineering Design and Bidding Services	20%
Engineering Construction Services	15%
Material Testing	1%
Legal/Admin and Easements	0%
Wetlands & Con.Com	0%

Section 4 Asset Management Funding Plan

As presented in the previous sections there are significant capital expenditures which will need to be made over the next 10 years. This section identifies potential funding options that can be considered for implementation as necessary.

4.1 Funding Options

Most of the priority improvements and predictive improvements may not be reflected within the Town's current rates. Based on the preliminary budgets presented within the previous sections it is likely that options for additional funding will need to be investigated. Some potential means of funding a CIP include the following:

- Rate Increase – Although not popular, a rate increase is a potential means of raising additional funds for capital improvements. For this, a detailed rate study should be performed that would take the increased budget into account. The scope of an in-depth rate study could include a review of alternative rate structures, increasing block rates, establishment or updating of a variety fees, etc.
- Debt Service Charge – This is a newer revenue stream that other wastewater departments are beginning to implement for the principal and interest of specific debt that can then be eliminated once the particular debt is retired. This set up is similar to a debt exclusion on a Town's property tax.
- Bonding – In general, bonding of improvements over a specified period of time will decrease the annual outlay so that more improvements can be completed annually. Bonding caps should be considered so that repayment is limited to the available budget (this would allow new debt to be taken on as older debt is paid off).
- Loans – Other available funding options for larger capital projects (e.g. $1.0 million or more) include the RIDEM Clean Water State Revolving Fund (CWSRF) and the RI Infrastructure Bank provide low-interest programs.
- Discounts and Rebates – RI Energy has discount and rebate programs available for more energy and gas efficient equipment to be installed.

In general, there are many financing opportunities that should be taken into consideration. Ultimately, the Town of Narragansett will need to review and adjust the Asset Management Plan as required to meet the Town's priorities and desired rate structure.

Appendix A
Field Reports

Link to Field Reports: CLICK HERE

Appendix B
Asset Hierarchy

Facility/Room Numbering Guide

Narragansett, RI					
Location		Facility		Room	
No.	Description	No.	Description	No.	Description
100	Wastewater Treatment Facility				
			Place Holder		
200	Pump Stations				
		201	Baneberry Trail		
		202	Bonnet Shores		
				001	Pump Room
				002	Wet Well
				101	Electrical Room
				EXT	Exterior
				R01	Roof
		203	Briggs Farm		
		204	Burnside Avenue		
				001	Mid Level
				002	Pump Room
				003	Wet Well
				101	Electrical Room
				102	Generator Room
				EXT	Exterior
				R01	Roof
		205	Circuit Drive		
		206	Congdon Street		
		207	Galilee		
				001	Pump Room
				002	Wet Well
				101	Control Room
				EXT	Exterior
				R01	Roof
		208	Industrial Park		
		209	Lakewood Drive		
		210	Mettatuxet		
				001	Mid Level
				002	Pump Room
				003	Wet Well
				101	Electrical Room
				EXT	Exterior
				R01	Roof
		211	Mumford Road		
		212	Ouida Street		
				001	Mid Level
				002	Pump Room
				003	Wet Well
				101	Electrical Room
				102	Generator Room
				103	Grit Room
				EXT	Exterior
				R01	Roof
		213	Point Judith		
				001	Pump Room
				002	Wet Well
				101	Control Room
				EXT	Exterior
				R01	Roof
		214	Salt Pond/Seaport Village		
		215	Sprague		
				001	Electrical Room
				002	Pump Room
				003	Wet Well
				101	Generator Room
				EXT	Exterior
				R01	Roof

		216	Stanton Avenue		
				001	Dry Well
				002	Wet Well
				101	Electrical Room
				EXT	Exterior
				R01	Roof
		217	Wilson Drive		
				001	Electrical Room
				002	Pump Room
				003	Wet Well
				101	Generator Room
				EXT	Exterior
				R01	Roof
		218	Winterberry Road		
				001	Control Room
				002	Pump Room
				003	Wet Well
				101	Electrical Room
				102	Generator Room
				EXT	Exterior
				R01	Roof
		219	Wolfe Road		
300	Collection System				
		301	Manholes		
		302	Catch Basins		
		303	Gravity Mains		
		304	Service Laterals		
400	Vehicles				
		401	Maintenance		
		402	Operations		



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Scarborough WWTF
Asset Management Evaluation Summary

Asset ID	Description	Location	Room/Area	Installed Date	Asset Class	Default Service Life	Condition Rating	Reliability Rating	Current Performance	Maintainability	Estimated Renewal Date
100-1	Blower 2	Aeration	Channel 2	2017	Process Equipment	20	2-Very Good Condition	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2040
100-2	Mixer No. 4	Aeration	Waste Channel	2017	Process Equipment	20	2-Very Good Condition	1-Exceptional (No Problems)	2-Minor Performance Deficiencies	1-Easily Maintained	2042
100-3	Mixer No. 6	Aeration	Waste Channel	2017	Process Equipment	20	2-Very Good Condition	1-Exceptional (No Problems)	2-Minor Performance Deficiencies	1-Easily Maintained	2042
100-4	Blower 4	Aeration	Waste Channel	2017	Process Equipment	20	2-Very Good Condition	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2040
100-5	Mixer No. 5	Aeration	Channel 1	2017	Process Equipment	20	2-Very Good Condition	1-Exceptional (No Problems)	2-Minor Performance Deficiencies	1-Easily Maintained	2042
100-6	Blower 10	Aeration	Channel 3	2017	Process Equipment	20	2-Very Good Condition	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2040
100-7	Mixer No. 7	Aeration	Channel 1	2017	Process Equipment	20	2-Very Good Condition	1-Exceptional (No Problems)	2-Minor Performance Deficiencies	1-Easily Maintained	2042
100-8	Mixer No. 1	Aeration	Channel 1	2017	Process Equipment	20	2-Very Good Condition	1-Exceptional (No Problems)	2-Minor Performance Deficiencies	1-Easily Maintained	2042
100-9	Channel 3 Gate	Aeration		1983	Valve	30	3-Minor Defects Only	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	1-Easily Maintained	2027
100-10	Blower 5	Aeration	Channel 1	2017	Process Equipment	20	2-Very Good Condition	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2040
100-11	Blower 6	Aeration	Waste Channel	2017	Process Equipment	20	2-Very Good Condition	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2040
100-12	Mixer No. 8	Aeration	Channel 3	2017	Process Equipment	20	2-Very Good Condition	1-Exceptional (No Problems)	2-Minor Performance Deficiencies	1-Easily Maintained	2042
100-13	Splitter Gate	Aeration		1980	Valve	30	4-Some Defects and Deterioration	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	1-Easily Maintained	2025
100-14	Mixer No. 2	Aeration	Channel 2	2017	Process Equipment	20	2-Very Good Condition	1-Exceptional (No Problems)	2-Minor Performance Deficiencies	1-Easily Maintained	2042
100-15	Blower 9	Aeration	Channel 2	2017	Process Equipment	20	2-Very Good Condition	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2040
100-16	Blower 1	Aeration	Channel 1	2017	Process Equipment	20	2-Very Good Condition	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2040
100-17	Blower 3	Aeration	Channel 3	2017	Process Equipment	20	2-Very Good Condition	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2040
100-18	Mixer No. 3	Aeration	Channel 3	2017	Process Equipment	20	2-Very Good Condition	1-Exceptional (No Problems)	2-Minor Performance Deficiencies	1-Easily Maintained	2042
100-19	Mixer No. 10	Aeration	Channel 3	2017	Process Equipment	20	2-Very Good Condition	1-Exceptional (No Problems)	2-Minor Performance Deficiencies	1-Easily Maintained	2042
100-20	Mixer No. 9	Aeration	Channel 3	2017	Process Equipment	20	2-Very Good Condition	1-Exceptional (No Problems)	2-Minor Performance Deficiencies	1-Easily Maintained	2042
100-21	Blower 7	Aeration	Channel 1	2017	Process Equipment	20	2-Very Good Condition	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2040
100-22	Gate - Chlorine Tank 2 Effluent	Chlorine Contact Tank		1995	Valve	30	3-Minor Defects Only	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	1-Easily Maintained	2039
100-23	Gate - Chlorine Tank 2 Influent	Chlorine Contact Tank		1995	Valve	30	3-Minor Defects Only	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	1-Easily Maintained	2039
100-24	Sampler	Chlorine Con	Shed	2013	Process Equipment	10	2-Very Good Condition	1-Exceptional (No Problems)	1-Meets or Exceeds all Performance Targets	1-Easily Maintained	2028
100-25	Gate - Chlorine Tank 1 Influent	Chlorine Contact Tank		1995	Valve	30	3-Minor Defects Only	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	1-Easily Maintained	2039
100-26	Gate - Chlorine Tank 1 Effluent	Chlorine Contact Tank		1995	Valve	30	3-Minor Defects Only	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	1-Easily Maintained	2039
100-27	Manual Bar Rack	Headworks		1990	Process Equipment	30	2-Very Good Condition	1-Exceptional (No Problems)	1-Meets or Exceeds all Performance Targets	1-Easily Maintained	2034
100-28	Aerated Grit Tank	Headworks		1980	Concrete Structure/Building	45	3-Minor Defects Only	1-Exceptional (No Problems)	1-Meets or Exceeds all Performance Targets	1-Easily Maintained	2045
100-29	Lift screw	Headworks	Outside	2015	Process Equipment	20	3-Minor Defects Only	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2038
100-30	Blower No. 1	Headworks		1983	Motor	20	4-Some Defects and Deterioration	3-Occasional Breakdown (Every 2 Years)	3-Considerable Performance Deficiencies	3-Largely Preventative Maintenance	2025
100-31	Lakeside Raptor Fine Screen	Headworks	Outside	2020	Process Equipment	20	2-Very Good Condition	1-Exceptional (No Problems)	1-Meets or Exceeds all Performance Targets	3-Largely Preventative Maintenance	2040
100-32	Blower No. 2	Headworks		1983	Motor	20	4-Some Defects and Deterioration	3-Occasional Breakdown (Every 2 Years)	3-Considerable Performance Deficiencies	3-Largely Preventative Maintenance	2025
100-33	Piping, Valves, and Appurtenances	Influent Pump Station		1981	Piping	40	4-Some Defects and Deterioration	1-Exceptional (No Problems)	1-Meets or Exceeds all Performance Targets	1-Easily Maintained	2039
100-34	Pump 3	Influent Pump Station		2011	Pump without Motor	30	3-Minor Defects Only	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2041
100-35	Motor - Pump No. 1	Influent Pump Station		2010	Motor	20	2-Very Good Condition	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2037
100-36	Pump 2	Influent Pump Station		2011	Pump without Motor	30	3-Minor Defects Only	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2041
100-37	Sump Pumps	Influent Pump Station		2010	Pump with Motor	30	2-Very Good Condition	1-Exceptional (No Problems)	1-Meets or Exceeds all Performance Targets	1-Easily Maintained	2051
100-38	Pump 1	Influent Pump Station		2011	Pump without Motor	30	2-Very Good Condition	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2046
100-39	Motor - Pump No. 3	Influent Pump Station		2010	Motor	20	2-Very Good Condition	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2037
100-40	Motor - Pump No. 2	Influent Pump Station		2010	Motor	20	2-Very Good Condition	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2037
100-41	Wet Well Gate	Influent Pump Station		1980	Valve	30	3-Minor Defects Only	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	1-Easily Maintained	2025
100-42	RAS Motor 2	Maintenance	Pump Room	1992	Motor	20	3-Minor Defects Only	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2025
100-43	Pump No. 1	Maintenance	Pump Room	2006	Pump without Motor	25	3-Minor Defects Only	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2040
100-44	RAS Motor 1	Maintenance	Pump Room	1992	Motor	20	3-Minor Defects Only	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2025
100-45	Motor No. 2 ADS Pump	Maintenance	Basement	1992	Motor	20	3-Minor Defects Only	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2025
100-46	Pump No. 2	Maintenance	Pump Room	2005	Pump without Motor	25	3-Minor Defects Only	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2041
100-47	Piping, Valves, and Appurtenances	Maintenance	Basement	1992	Piping	35	3-Minor Defects Only	1-Exceptional (No Problems)	1-Meets or Exceeds all Performance Targets	1-Easily Maintained	2043
100-48	Motor No. 1 ADS Pump	Maintenance	Basement	1992	Motor	20	3-Minor Defects Only	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2025
100-49	Sodium Hypochlorite Tank	Maintenance	Garage	2013	Chemical Feed System	15	3-Minor Defects Only	1-Exceptional (No Problems)	1-Meets or Exceeds all Performance Targets	1-Easily Maintained	2035
100-50	Pump No. 3	Maintenance	Pump Room	2005	Pump without Motor	25	3-Minor Defects Only	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2041
100-51	RAS Motor 3	Maintenance	Pump Room	1992	Motor	20	3-Minor Defects Only	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2025
100-52	Piping, Valves, and Appurtenances	Maintenance	Pump Room	1981	Piping	35	2-Very Good Condition	1-Exceptional (No Problems)	1-Meets or Exceeds all Performance Targets	1-Easily Maintained	2032
100-53	ADS Pump 1	Maintenance	Basement	1992	Pump without Motor	25	4-Some Defects and Deterioration	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2028
100-54	Sodium Bisulfite Tank	Maintenance	Garage	2013	Chemical Feed System	15	3-Minor Defects Only	1-Exceptional (No Problems)	1-Meets or Exceeds all Performance Targets	1-Easily Maintained	2035
100-55	Secondary Clarifier No. 2 Mechanism	Secondary Settling		2006	Process Equipment	30	2-Very Good Condition	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2047
100-56	Secondary Clarifier No. 1 Mechanism	Secondary Settling		2006	Process Equipment	30	2-Very Good Condition	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2047
100-57	Clarifier 2 motor	Secondary Se	Clarifier 2	2006	Motor	20	2-Very Good Condition	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2035
100-58	Clarifier 1 motor	Secondary Se	Clarifier 1	2006	Motor	20	2-Very Good Condition	2-Random Breakdown (Every 5 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2035
100-59	Thickened Sludge Pump 1 Motor	Solids Handli	Pump room	1992	Motor	20	4-Some Defects and Deterioration	3-Occasional Breakdown (Every 2 Years)	2-Minor Performance Deficiencies	5-Periodic Corrective Maintenance	2025
100-60	Belt Filter Press	Solids Handling Facility		1992	Process Equipment	20	5-Moderate Deterioration	4-Periodic Breakdown (Once per Year)	3-Considerable Performance Deficiencies	7-More Frequent Corrective Maintenance	2025
100-61	GBT Pump 2	Solids Handli	Pump room	1992	Pump without Motor	25	3-Minor Defects Only	3-Occasional Breakdown (Every 2 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2026
100-62	Thickened sludge pump 1	Solids Handli	Pump room	1992	Pump without Motor	25	7-Significant Deterioration	3-Occasional Breakdown (Every 2 Years)	5-Does not meet any Performance Targets	5-Periodic Corrective Maintenance	2025
100-63	GBT Pump 2 Motor	Solids Handli	Pump room	1992	Motor	20	3-Minor Defects Only	3-Occasional Breakdown (Every 2 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2025
100-64	GBT Pump 1	Solids Handli	Pump room	1992	Pump without Motor	25	4-Some Defects and Deterioration	4-Periodic Breakdown (Once per Year)	5-Does not meet any Performance Targets	3-Largely Preventative Maintenance	2025
100-65	Polymer System	Solids Handling Facility		1992	Chemical Feed System	15	6-Moderate to Significant Deterioration	5-Continuous Breakdown (Multiple Times per Year)	3-Considerable Performance Deficiencies	5-Periodic Corrective Maintenance	2025
100-66	GBT Pump 1 Motor	Solids Handli	Pump room	1992	Motor	20	3-Minor Defects Only	3-Occasional Breakdown (Every 2 Years)	2-Minor Performance Deficiencies	3-Largely Preventative Maintenance	2025

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