Report

Wastewater Facilities Plan Update

Prepared For:

Tiverton Wastewater District
86 Main Road
Tiverton, RI 02878

Prepared By:

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PREAMBLE

The purpose and many of the recommendations of the 2014 Wastewater Facilities Plan Update vary significantly from the 2000 Facilities Plan Update. As requested by RIDEM, the 2000 Facilities Plan Update was used as the basis for the development of this Facilities Plan Update with format changes intended to highlight these variations for the reviewer. The 2014 update maintained the information from the 2000 Facilities Plan Update which was still valid and shows it in “italic” format followed by updated information.

On July 3, 2014, an act to create and establish the Tiverton Wastewater District was approved by the Governor of Rhode Island. All wastewater assets were transferred from the Town of Tiverton, Rhode Island (Town), through its Wastewater Management Commission to the Tiverton Wastewater District.

This Amendment incorporates the construction and integration of the proposed Twin River Casino and Hotel development within the Town of Tiverton into the Wastewater Facilities Plan Update dated February 2014.

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1.0 EXECUTIVE SUMMARY

The Town of Tiverton, Rhode Island (Town), through its Wastewater Management Commission and in conjunction with AECOM Technical Services, Inc. (AECOM), completed the 2014 Wastewater Facilities Plan Update in accordance with the requirements of the Rhode Island Department of Environmental Management (RIDEM). The Town has had an accepted Wastewater Facilities Plan on file since 1976. The most recent update approved by RIDEM in 2000 was prepared by the Louis Berger Group, Inc. (Berger) from the original 1976 Wastewater Facilities Plan.

Since 2000, a number of changes in local and state regulations regarding onsite wastewater treatment systems (OWTS) has made a second update to the Wastewater Facilities Plan necessary. The most prominent change was the passing of the 2007 Cesspool Phase Out Act. This Act set a time table for the inspection and replacement of cesspools located within 200 feet of a coastal area or within 200 feet of a public drinking water supply.

In 2012, AECOM was hired by the Town to again update its Wastewater Facilities Plan. The 2000 Facilities Plan Update was reviewed in its entirety and was found to contain several conclusions and recommendations that were still relevant to the Town. However, there were other recommendations and/or conclusions that required modification due to the changes in regulations over the past 12 years. As was the situation in 2000, a majority of the Town is serviced by On-Site Wastewater Treatment Systems (OWTS). Due to the soil conditions and age of the onsite systems a large number are failing. In addition, the small lot sizes and poor soils in many areas of the Town make the installation of a new traditional onsite treatment system a challenge.

Since 2000, the Town has constructed the Mount Hope Bay Interceptor and has allowed several new developments to connect to the sewer system. At present the system has approximately 550 customers and approximately 7.5 miles of gravity sewer.

Through the 2014 Wastewater Facilities Plan, the Town is seeking to expand the existing sewer system into the areas of Town that would benefit the most from them. The areas for expansion were determined by evaluating the regulatory, financial, and public health benefits each would experience if sewers were constructed. Based on the review of the existing documents and updating various technical and financial information, the following plan is recommended:

1. Expand the existing wastewater collection system into the following areas: (a) Bay Street Area; (b) Church Street Area; (c) Garden Heights Area; (d) Lepes Road Area; (e) Mill Street Area; (f) North Stafford Road Area; (g) Riverside Drive Area; and (h) Robert Gray Area.
2. Conduct a study to develop a suitable alternative to individaul installations of advanced treatment systems for The Delano's Island area on Nanaquaket Pond.

3. Phase the implmentation over a period of at least 10 years with the first phase being areas with the most critical enviormental concerns, followed by other areas based on economics and need.
4. Create a Sewer District that encompasses the existing and future sewer collection areas so that only properties located within the Sewer District will be responsible for the costs to design, construct and operate the system.
5. Develop a Capital Improvement Plan and associated financial plan which results in a financially stable and self-sufficient operation.
6. Research and apply for funding sources, as applicable, including grants and low interest loans, in order to reduce the burden of costs on the rate payers and users of the system.

Under the recommended scenario, the number of connections would increase from 550 up to 4,000 and the average daily flow would increase from 90,000 gallons per day to approximately 1,329,000 gallons per day. A preliminary sewering plan for all of the study areas has been completed as part of this Facilities Plan Update. The preliminary sewer plan consists of gravity sewer, low pressure sewer, force mains and pumping stations. Design and construction of the sewer expansion will occur over many years and will be prioritized based on public health needs, regulatory obligations, and financial considerations.

As of the writing of this Facilities Plan Update, the highest priority areas are those that are affected by the 2007 Cesspool Phase Out Act and the Bay Street area. The portions of the project affected by the 2007 Cesspool Phase Out Act include a portion of the Riverside Drive Area and a portion of the Robert Gray Area. These two sub areas will be combined to form one project. The Bay Street Area will be a separate project. Sewer Design and Construction for these two areas will be concurrent.

Funding will be on a project by project basis. It is anticipated that the funding will be accomplished through a combination of grants and low interest loans, with the loans being repaid through the assessment of betterments.

On July 3, 2014, an act to create and establish the Tiverton Wastewater District was approved by the Governor of Rhode Island. All wastewater assets were transferred from the Town of Tiverton, Rhode Island (Town), through its Wastewater Management Commission to the Tiverton Wastewater District.

In 2017, AECOM was hired by the Tiverton Wastewater District to amend its Wastewater Facilities Plan Update. The amended update incorporates into the Wastewater Facilities Plan the construction and integration of the proposed Twin River Casino and Hotel development located near the state line, west of William S Canning Boulevard (Route 81) and Hurst Lane. The proposed development consisting of a casino, hotel, surface and structured parking, internal roadways, stormwater management areas, and other amenities will occupy 20.2+/- acres of the 46.6+/- acre site.

2.0 PROJECT NEED AND PLANNING AREA

2.1 Statement of Project Need

This Town of Tiverton Wastewater Facilities Plan Update has been prepared in accordance with the Rhode Island Department of Environmental Management policies and guidelines. The Facilities Plan satisfies the intent of the State Guide Plan and the draft Tiverton Comprehensive Community Plan (CCP, 1996) by providing a blueprint for systematic management of the town's present and future wastewater facilities, and to plan for optimal future expansion of the system. The Facilities Plan Update also allows the Town to qualify for State Revolving Fund assistance for capital investments to the system, as well as other federal monies that may become available.

This second update to the 1976 Facilities Plan is being prepared for the purpose of evaluating the existing wastewater needs of Tiverton and determining if those needs are consistent with the Facilities Plan Update prepared in 2000, by Louis Berger, Inc. and approved by Rhode Island Department of Environmental Management (RIDEM) Division of Water Resources on March 28, 2000. This update to the Facilities Plan will evaluate the existing wastewater system; will evaluate future development in the existing service area; will assess the areas of Town subject to the Rhode Island 2007 Cesspool Phase Out Act (Cesspool Act) with regard to failing onsite waste disposal systems (OSWDS); will prioritize potential sewer needs areas, and determine the estimated design and construction costs to address each needs area.

The Town of Tiverton, Rhode Island and its consultant, AECOM, have completed a review of the Town's Wastewater Facilities Plan in accordance with the requirements of the RIDEM Division of Water Resources. The purpose of the review is to assess the current and future wastewater needs of the Town and to determine if the recommendations presented in the original Facilities Plan, prepared by Camp, Dresser and McKee (CDM) in 1976 and updated by the Louis Berger Group, Inc. in 2000, are still applicable and recommend changes to the Wastewater Facilities Plan that will address the needs of the Town over the next 20 years.

The primary driver for conducting this Facilities Plan Update is the Cesspool Phase Out Act enacted by the State of Rhode Island in 2007. In general, the legislation specifies the following:

- Cesspools that are within 200 feet of identified critical resources must be replaced by January 1, 2014;
- Properties with Cesspools that have sewers available must tie in by January 1, 2014;
- If failed, the cesspool must be replaced within 1 year or sooner if imminent health hazard exists; and

- Exemption: The Act identifies an exemption which applies to cesspools located in areas to be sewered on or before January 1, 2020. Properties using cesspools for wastewater disposal within these areas are exempted from the January 1, 2014 phase-out date provided that a project to sewer the area is identified in a Facilities Plan approved by RIDEM and the Municipality states in writing to RIDEM prior to January 1, 2013 that it will carry out the project. Additionally, bonding/financing authority must be obtained by December 31, 2014.

In addition, other drivers include the following:

- Pollution in the stormwater outfalls identified in the January 2010 Total Maximum Daily Load (TMDL) Study;
- High percentage of properties with failed on-site wastewater disposal systems; and
- Properties with contaminated soils.

This project will amend the currently approved Facilities Plan by confirming the need for sewer service in the northern portion of the Town, including all proposed and existing high density residential developments in this area. The project will update the environmental assessment necessary to address providing sewer service to Tiverton. The Facilities Plan, dated 1976, recommended providing a wastewater collection system in four areas of the Town: North Tiverton, Stone Bridge, Bulgarmarsh Road, and Stafford Road. The Facilities Plan concluded that the remainder of the Town would be best served by individual site sewer disposal systems. This decision was based on economics, lot sizes, and soil conditions. The basic conclusion remains valid and consistent with the Comprehensive Community Plan adopted by the Town in 2009. The planning area of this document was limited to those areas north of Bulgarmarsh Road.

2.2 Planning Area Parameters

2.2.1 Planning Area

The Town of Tiverton is located in the East Bay section of Rhode Island, in Newport County as shown in Figure 1. The Town borders Westport, Massachusetts to the east, Little Compton to the south, and Fall River, Massachusetts to the north. The western boundary of the Town is by the Sakonnet River and Mount Hope Bay.

The Facilities Plan, dated 1976, recommended providing a wastewater collection system in four areas of the Town: North Tiverton, Stone Bridge, Bulgarmarsh Road, and Stafford Road. The Facilities Plan concluded that the remainder of the Town would be best served by on-site individual sewerage disposal systems (ISDS). The basis of this decision was on economics, lot sizes, and soil conditions. The conclusion remains valid and consistent with the draft CCP. Therefore, the planning area of this document will be limited to these areas. Figure 2 depicts the planning area.

As noted above, the 2000 Facilities Plan Update maintained the planning area defined in the original Facilities Plan. However, this Facilities Plan Update determined that sewer service would not be provided to the Bulgarmarsh Road area, as that area would be adequately served by OWTS. In addition, the State has passed the Cesspool Act which aims to eliminate all cesspools within 200 feet of critical resources such as the Sakonnet River waterfront. The passage of this Act impacts several areas of Town not included in the 2000 Facilities Plan Update. These changes necessitate an update to the existing Facilities Plan. Figure 2 shows the updated planning area covered in this report. In addition, several small sewer extensions have been constructed since the 2000 Facilities Plan Update. The sewer extensions allowed have been primarily to serve new developments in the Town and were not constructed to address existing needs within the Town.

Since the completion of the 2000 Facilities Plan Update the Town developed an Onsite Wastewater Management Plan (referred to as an Individual Sewage Disposal System (ISDS) Wastewater Management Plan in the 2000 Facilities Plan Update) in 2003 and adopted an Onsite Wastewater Ordinance into Section 9 of the Town's Sewer Use Ordinance.

The enhanced planning area shown in Figure 3 includes nine Sewer Needs Areas of Tiverton: the Bay Street Area, the Church Street Area, the Lepes Road Area, the Mill Street Area, the North Stafford Road Area, the Robert Gray Area, the Garden Heights Area, Riverside Drive Area and the Twin River Casino and Hotel Area. Portions of the Bay Street Area, the Church Street Area, and the North Stafford Road Area currently include limited sewer connections to the Fall River system.

FIGURE 1 – TOWN MAP – TIVERTON

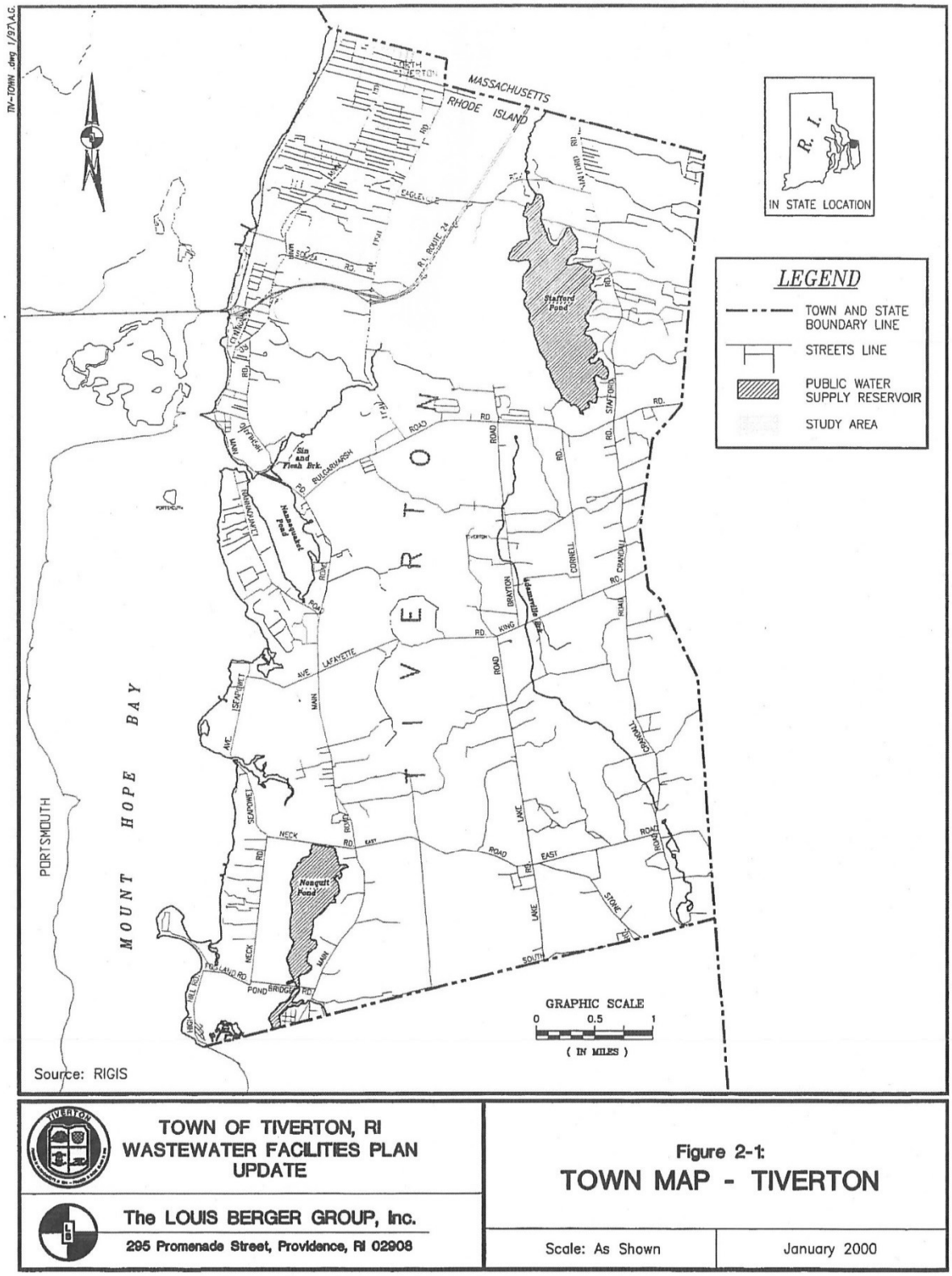
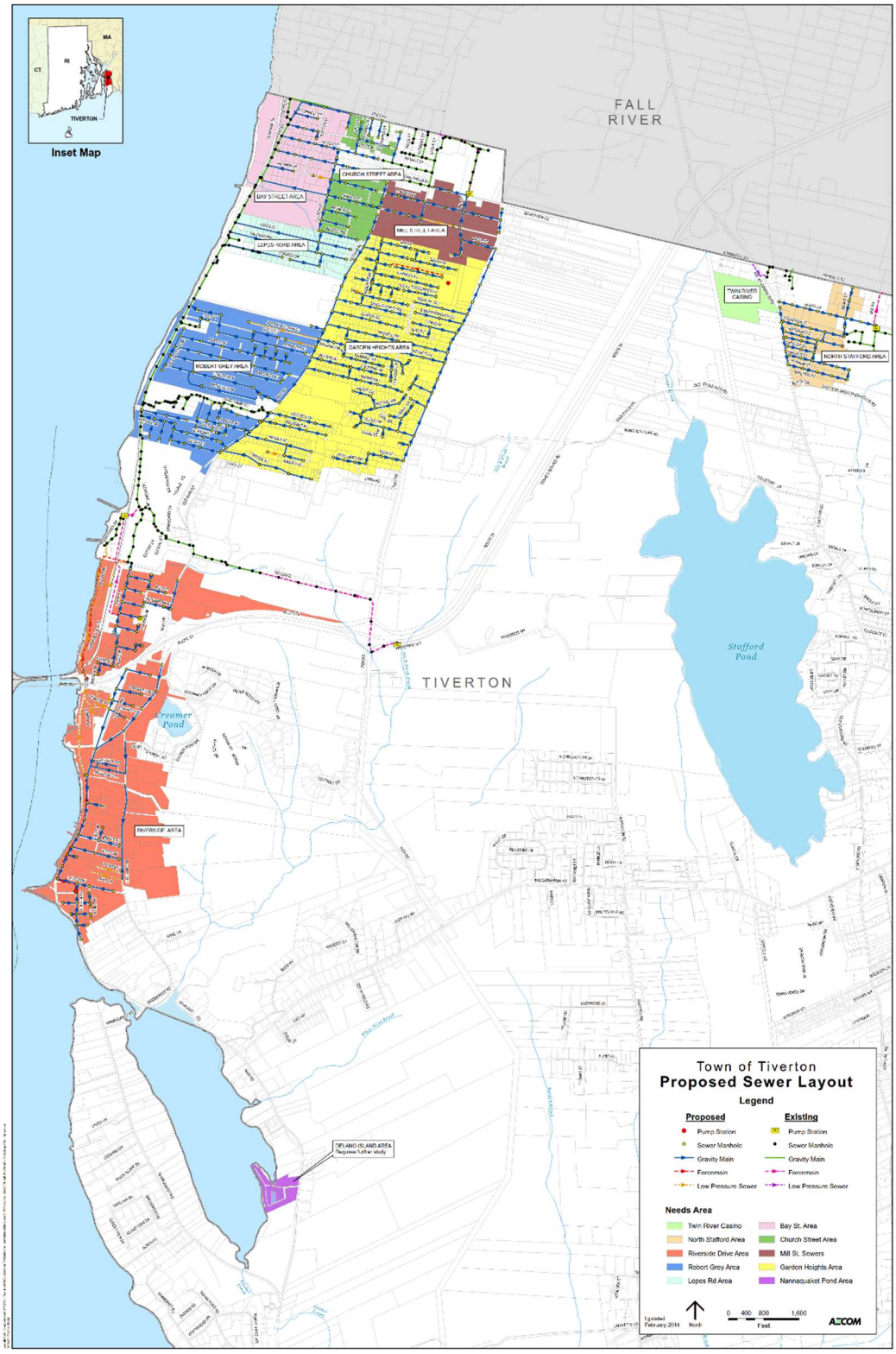


FIGURE 2 – STUDY AREA



2.2.2 Political/Institutional Structures

The Town of Tiverton has a Council form of government. The Council President is the Chief Executive, while the Town Administrator manages the day-to-day affairs of the Town. The majority of the Town's policy and planning functions are carried out by various volunteer boards and commissions, which are overseen by the elected town council. The annual budget is developed by the budget committee and subject to review and approval by a financial town meeting at the beginning of May each year. The Town's fiscal year begins on July 1.

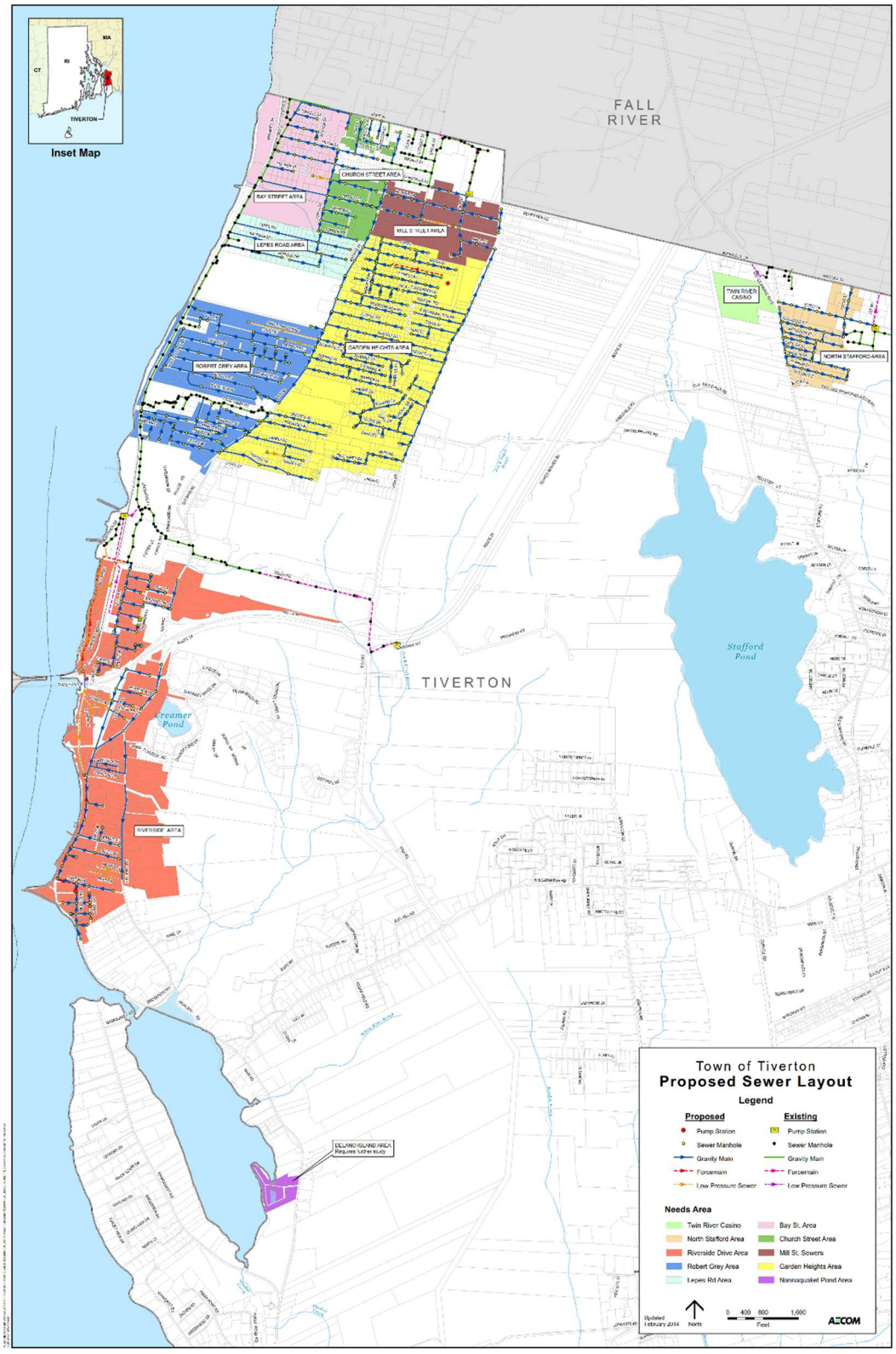
The only change that has been made to the political/institutional structure following the 2000 Facilities Plan Update is that a Financial Town Referendum has replaced the old Town Meeting.

2.2.3 Planning Entities

The latest Comprehensive Community Plan (CCP) was adopted in 2006. This CCP, the 2000 Facilities Plan Update, as well as existing sewer data were used to establish the existing conditions in the Town. The existing conditions are essential to determining the planning process as they, along with state/local regulations and applicable design guides, help to establish the parameters for projecting the flows in each of the needs areas.

The Onsite Wastewater Management Plan that established the goals and objectives for individual as well as community onsite disposal systems was adopted in 2003.

FIGURE 3 – SEWER NEEDS BY AREA



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3.0 SUMMARY OF EXISTING WASTEWATER FACILITIES PLAN

3.1 Introduction

In accordance with the requirements of Section 201 of Public Law 92-500 "Federal Water Pollution Act Amendments of 1972" the Town of Tiverton prepared a wastewater collection and treatment "Facilities Plan" dated October 15, 1976. The Plan aimed at meeting the wastewater management needs present in 1976, and established a 20-year planning solution for the collection and treatment of wastewater generated townwide.

In 2000, the Town hired Louis Berger, Inc. to update the 1976 Wastewater Facilities Plan (Facilities Plan Update). The Facilities Plan Update reaffirmed the need for sewers in North Tiverton and the Stone Bridge Area of Tiverton. The Facilities Plan Update reviewed the original 20-year plan, revised the needs areas and construction cost estimates for the needs areas, and established a new 20-year plan for the Town.

This update to the Facilities Plan will evaluate whether or not the recommendations in the 2000 Facilities Plan Update are consistent with the current needs of the Town and determine whether or not the recommendations are in line with the Town and State Rules and Regulations. This update will also provide a conceptual sewer design for the planned areas and review the sewer design that was completed for North Tiverton following the finalization of the original Wastewater Facilities Plan.

3.2 Wastewater Management Needs

The Facilities Plan identified the following wastewater management needs throughout the town:

- *Extensive use of septic tanks and leaching fields are used to dispose of the wastewater. In 1974, a soils report prepared by the Soil Conservation Service concluded that 80-percent of the land within the town has severe or very severe limitations for the location of septic tank leaching fields based on water table elevation, bedrock depths, slopes, degree of stoniness, etc. The report also stated that septic systems can be located in some areas with generally undesirable soils characteristics, but the cost of installation and operation may be substantial.*

  Since the writing of the 1976 Wastewater Facilities Plan, a large number of onsite waste disposal systems throughout the Town have failed and additional units are in need of repair. A small portion of these systems have been repaired and/or replaced, but the majority has not been due to the cost associated with replacement, poor soils, and small lot sizes.

- *There is a potential health hazard from surfacing of wastewater effluent due to poor soil characteristics and the large number of subsurface disposal systems. Due to limited areas in town having access to public water supply, there is also a greater health hazard from potential contamination of groundwater due to the proximity of private wells to subsurface disposal systems.*
- *Disposal of domestic and industrial wastewater for densely populated areas can most efficiently be managed by the installation of a municipal sewer system.*
- *In sparsely populated areas of the town, such as south Tiverton, zoning restrictions requiring larger lot sizes can help to minimize potential future problems due to increased development pressures.*

3.3 Wastewater Flows

The methodology used in this update for estimating existing and future flows varies significantly from that used in the 2000 Wastewater Facilities Plan Update. Tiverton has a small wastewater collection system (approximately 550 customers) that is located primarily in the northwestern portion of the Town. Wastewater flow estimates were determined using a combination of existing flow data and Rhode Island Department of Environmental Management's Flow Estimation Policy for Design of Sanitary Sewers.

3.3.1 Wastewater Flows in Existing Sewered Area

The existing sewered area is serviced by approximately 43,000 linear feet (lf) of gravity sewer that has connections to approximately 125 parcels. This equates to approximately 94,000 gpd of wastewater flow. The "existing" flows were determined based upon two years of actual water usage data broken down by type of land usage. Refer to Table 1 for a Summary of Wastewater Flow from the Existing Service Area. However, several of these parcels have been subdivided and/or have had apartment buildings, elderly housing or other multi-residential buildings constructed, resulting in a total of 550 connections for this area. In addition, the existing gravity sewer is adjacent to approximately 135 parcels that are not currently connected to the sewer system. Several of these parcels are large and thus, have potential for either subdivision or construction of multi-residential buildings. Therefore, the number of connections at build out for the existing area was projected by utilizing the existing connection rate of 4.4 per parcel. This indicates that there is the potential for approximately 615 new connections to be made to the existing infrastructure.

TABLE 1 - SUMMARY OF WASTEWATER FLOW FROM THE EXISTING SERVICE AREA

Type of Land Use	Number of Connections	Wastewater Flow - ADF (GPD/Connection)	Total Actual Flow - ADF – ADF(GPD)
Residential	523	162	84,726
Commercial	22	398	8,756
Industrial	1	2	2
Town	4	80	320
Totals	550	---	93,804

Review of the existing water usage data revealed that the existing usage was far below the minimum design standard required by the Rhode Island Department of Environmental Management's Flow Estimation Policy for Design of Sanitary Sewers. Therefore, the State's minimum design flow of 300 gallons per day (gpd) per household (gpd/hd) was used. Using this information the existing sewered areas have a potential flow at build out of 278,600 gpd.

However, the design flow per day based on connections does not tell the whole story with regard to total system flow. In addition to the wastewater flow discharge per connection, flow contributions from infiltration and inflow (I/I) must also be considered to account for wet weather intrusions typical of aging sewer systems. I/I may be determined based on the size and length of pipe installed. Assuming an I/I rate for existing sewers of 500 gpd per inch mile (gpdim), the amount of flow attributed to I/I is estimated to be about 51,300 gpd.

Therefore, the average daily flow (ADF) for the existing sewered area at build out is estimated to be 329,900 gpd.

3.3.2 Wastewater Flows in Planning Areas

3.3.2.1 Bay Street Area

The Bay Street Area is located in the northwest corner of Tiverton and consists of approximately 123 parcels. The majority of these parcels have been developed with single family residential buildings. Therefore, a connection rate of one connection per parcel has been used. Based the number of parcels attributed to the area and the minimum design flow of 300 gpd/hd, the wastewater flow associated with the Bay Street Area is estimated to be 36,900 gpd.

Preliminary design estimates indicate that approximately 8,750 lf of gravity sewer

will be required to provide service to this area. Using an I/I rate of 300 gpdim and an average pipe size of 10-inch the flow attributed to I/I is estimated to be 5,000 gpd.

The total combined flow (wastewater and I/I) estimated for the Bay Street Area is 41,900 gpd.

3.3.2.2 Church Street Area

The Church Street Area is located in North Tiverton to the east of the Bay Street Area, west of Main Road, north of Borden Road, south of State Line and consists of approximately 183 parcels. Like the Bay Street Area, the Church Street Area is comprised of many single family residences and a majority of the parcels have been developed. Therefore, a connection rate of one connection per parcel has been used. Based the number of parcels attributed to the area and the minimum design flow of 300 gpd/hd, the wastewater flow associated with the Church Street Area is estimated to be 54,900 gpd.

The preliminary design for the sewer in this area requires approximately 11,000 lf of sewer. Using an I/I rate of 300 gpdim and an average size pipe of 10-inch the flow attributed to I/I is estimated to be 6,300 gpd.

The total combined flow (wastewater and I/I) estimated for the Church Street Area is 61,200 gpd.

3.3.2.3 Lepes Road Area

The Lepes Road Area is located west of Main Road, south of the Church Street and Bay Street areas and consists of approximately 122 parcels. This area is primarily built out and consists mostly of single family residences. Therefore, a connection per parcel rate of one has been used. Based the number of parcels attributed to the area and the minimum design flow of 300 gpd/hd, the wastewater flow associated with the Lepes Road Area is estimated to be 36,600 gpd.

The preliminary design for the sewer in this area requires approximately 7,250 lf of sewer. Using an I/I rate of 300 gpdim and an average pipe size of 10-inch the flow attributed to I/I is estimated to be 4,200 gpd.

The total combined flow (wastewater and I/I) estimated for the Lepes Road Area is approximately 40,800 gpd.

3.3.2.4 Mill Street Area

The Mill Street Area is located on the east side of Main Road, north of the Garden

Heights Area and consists of approximately 149 parcels. The area is comprised of single family residences. Therefore, a connection rate of one connection per parcel has been used. Based the number of parcels attributed to the area and the minimum design flow of 300 gpdhd, the wastewater flow associated with the Mill Street Area is estimated to be 44,700 gpd.

The preliminary design estimates that 7,850 lf of sewer will be required to service this area. Using an I/I rate of 300 gpdim and a pipe size of 10-inch the estimated flow associated with I/I is 4,500 gpd.

The total combined flow (wastewater and I/I) estimated for the Mill Street Area is approximately 49,200 gpd.

3.3.2.5 Garden Heights Area

The Garden Heights Area is located east of Main Road between Ash Road and Hayden Road and consists of approximately 953 parcels. The area is comprised primarily of single family residences and a majority of the parcels have been built out. Therefore, a connection rate of one connection per parcel has been used. Based the number of parcels attributed to the area and the minimum design flow of 300 gpd/hd, the wastewater flow associated with the Garden Heights Area is estimated to be 285,900 gpd.

Full expansion into this area would require that a second interceptor be constructed along Fish Road. If the area is fully developed, approximately 54,650 lf of sewer will be required to provide service to the area. Using an I/I rate of 300 gpdim and an average pipe size of 10-inch the flow attributed to I/I is estimated to be 31,100 gpd.

The total combined flow (wastewater and I/I) estimated for the Garden Heights Area is approximately 317,000 gpd.

3.3.2.6 Robert Gray Area

The Robert Gray Area is located west of Main Road between John E. Duggan Road and Dewey Avenue and consists of approximately 585 parcels. The area is mostly built out and consists primarily of single family residences. Therefore, a connection rate of one connection per parcel has been used. Based the number of parcels attributed to the area and the minimum design flow of 300 gpd/hd, the wastewater flow associated with the Robert Gray Area is estimated to be 175,500 gpd.

The preliminary design estimates that 30,350 lf of sewer will be required to service this area. Using an I/I rate of 300 gpdim and a pipe size of 10-inch the estimated flow associated with I/I is 17,300 gpd.

The total combined flow (wastewater and I/I) estimated for the Robert Gray Area is approximately 192,800 gpd.

3.3.2.7 Riverside Drive Area

The Riverside Drive Area is located to the south of the Robert Gray Area and the Garden Heights Area and consists of approximately 600 parcels. This area has the largest number of properties affected by the 2007 Cesspool Phase Out Act. This area also has a substantial area that would be best served using low pressure sewers. A majority of parcels are extremely small and contain only a single family residence. There are a small number of commercial properties located in this area, however most are store fronts and a small cafe that do not have large water requirements based on existing water records. Therefore, a connection rate of one connection per parcel has been used. Based the number of parcels attributed to the area and the minimum design flow of 300 gpd/hd, the wastewater flow associated with the Riverside Drive Area is estimated to be 180,600 gpd.

The preliminary design estimates that 30,950 lf of sewer will be required to service this area. Using an I/I rate of 300 gpdim and a pipe size of 10-inch the estimated flow associated with I/I is 17,600 gpd.

The total combined flow (wastewater and I/I) estimated for the Riverside Drive Area is approximately 198,200 gpd.

3.3.2.8 North Stafford Road Area

The North Stafford Road Area is located near the state line, east of Stafford Road, generally between Sheldon Street and Hurst Lane and consists of approximately 103 parcels. The majority of these parcels have been developed with single family residential buildings. Therefore, a connection rate of one connection per parcel has been used. Based the number of parcels attributed to the area and the minimum design flow of 300 gpd/hd, the wastewater flow associated with the North Stafford Road Area is estimated to be 30,900 gpd.

The preliminary design estimates that 12,600 lf of sewer will be required to service this area. Using an I/I rate of 300 gpdim and a pipe size of 10-inch the estimated flow associated with I/I is 7,200 gpd.

The total combined flow (wastewater and I/I) estimated for the North Stafford Road Area is approximately 38,100 gpd.

3.3.2.9 Twin River Casino and Hotel Area

The Twin River Casino and Hotel Area (Casino) is located near the state line, west of William S Canning Boulevard (Route 81) and Hurst Lane and consists of approximately 46.6+/- acres which 20.2+/- acres will be developed. The Casino's preliminary design estimate indicates that the average daily flow will be 40,700 gpd. The Casino provided estimated flow rates and design assumption as indicated in Appendix 9. These flows will be pumped from the Casino property to the intersection of Stafford Road and Hurst Lane. A new gravity transmission main will be constructed in Hurst Lane from the intersection of Stafford Road and Hurst Lane to the intersection of Hurst Lane and Lee Way. A new gravity transmission main will be constructed from the existing Hurst Lane Pump Station to the intersection of Hurst Land and Lee Way thereby eliminating the need for the existing Hurst Lane Pump Station. A new gravity transmission main will be constructed from the intersection of Hurst Lane and Lee Way to the intersection of Lee Way and Hancock Street with connection into the existing Fall River collection system. Wastewater flows will be treated at the Fall River Wastewater Treatment Facility.

The Casino will be responsible for all costs associated with the installation of the onsite and off-site collection, pumping and transmission facilities as well as abandonment of the existing Hurst Lane Pump Station

3.4 Wastewater Collection System

At 100 percent build out of the nine study areas, the Wastewater Commission would have approximately 4,000 customers accounting for an estimated average daily flow of 1.37 million gallons per day (MGD). This flow is well below the ADF of 2.0 MGD allowed in the inter-municipal agreement (IMA) with Fall River (See Appendix 1). If a peaking factor of 3.64 (based on TR-16 - Guides for the Design of Wastewater Treatment Works, (2011 Edition as Revised in 2016) by the New England Interstate Water Pollution Control Commission) is applied to this flow the peak flow for the system would be estimated to be 4.60 MGD, which is below the 6.0 MGD allowed by the IMA. Refer to Table 2 for a Summary of Projected Wastewater Flows, and note that I/I is not peaked as it is not influenced by diurnal factors. Construction of the sewer system will be completed in a number of phases over several years. The flow estimates presented above represent the total expected flow for the wastewater system as a whole.

TABLE 2 - SUMMARY OF PROJECTED WASTEWATER FLOWS

Area	Wastewater Flow (GPD)	I/I (GPD) *	Total Flow (GPD)
Existing Sewered Area **	278,600	51,300	329,900
Bay Street Area	36,900	5,000	41,900
Church Street Area	54,900	6,300	61,200
Lepes Road Area	36,600	4,200	40,800
Mill Street Area	44,700	4,500	49,200
Garden Heights Area	285,900	31,100	317,000
Robert Gray Area	175,500	17,300	192,800
Riverside Drive Area	180,600	17,600	198,200
North Stafford Road Area	30,900	7,200	38,100
Power Plant	60,000	N/A	60,000
Twin River Casino and Hotel Area	40,700	300	41,000
Total	1,225,300	144,800	1,370,200
With 3.64 Peaking Factor	4,455,900*	144,800*	4,600,700*

*I/I is not peaked because it is not subject to diurnal influences

**Consists of approximately 550 existing connections and 600 future connections within the existing service area.

The wastewater collection system proposed in this Facilities Plan Update varies significantly from that described in the 2000 Facilities Plan Update.

The existing wastewater collection system consists of four sewer pumping stations, a gravity interceptor known as the Mount Hope Bay Interceptor that runs from Souza Road, down to the coast line then turns north parallel to the coast to the State Line, and several gravity lateral sewers interspersed throughout the northern portion of Tiverton.

Expansion into the majority of the study areas may be accomplished by connecting to existing infrastructure. The carrying capacity of the Mount Hope Bay Interceptor was evaluated by AECOM and found to be sufficient for anticipated flows.

A preliminary design was prepared for each of the nine study areas. The preliminary design for the Bay Street Area, the Church Street Area, the Lepes Road Area, the Robert Gray Area, the Garden Heights Area and the Mill Street area was compared to the sewer design for the respective areas that had been completed following the acceptance of the original Wastewater Facilities Plan (1976). It was found that the preliminary design prepared for this update to the Facilities Plan was substantially similar to the original design. However, it should be noted that prior to construction in some of these areas, the Town will have to acquire several easements.

The preliminary design for the collection system design includes a combination of gravity sewer and low pressure sewer, with a majority of the low pressure sewers being required in the Riverside Drive Area. In addition two pump stations will be required for the Riverside Drive Area and one pump station may be required for the Garden Heights Area dependent upon the final design and the Town's ability to obtain the required easements.

3.5 Wastewater Treatment and Disposal

The Facilities Plan recommended two alternatives for the treatment of the wastewater generated in Tiverton: construct a wastewater treatment facility in Tiverton or utilize the *existing Fall River WWTF. The preferred alternative for the treatment of wastewater was to connect to the existing Fall River WWTF. This alternative was clearly more cost-effective than siting a new treatment and disposal facility in the town.*

Tiverton has entered into an Inter-Municipal Agreement (IMA) with Fall River that allows for the Town to dispose of an average daily flow of 2.0 MGD and a peak of 6.0 MGD. This IMA is in effect unless material breach of the agreement occurs, at which point either party may terminate the agreement. The IMA between the City of Fall River and the Town of Tiverton adequately addresses the needs of the Town at considerably less cost than building a new wastewater treatment plant. Therefore, the construction of a Wastewater Treatment Facility in Tiverton will not be investigated further in this update.

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4.0 CURRENT SITUATION

4.1 General

The current physical, demographic, and infrastructure characteristics of Tiverton are summarized in this section. The discussions are focused on the study area, as defined in Section 2.2.1. These current conditions define the baseline physical constraints and service needs against which the proposed wastewater management facilities will be evaluated.

This section also summarizes various environmental characteristics with relevance to implementation of wastewater management systems/facilities.

A majority of the information contained in this section has not changed since the acceptance of the 2000 Facilities Plan Update. Therefore, minimal adjustments have been made to this section.

4.2 Surficial Soils

Surficial soils are a determining factor for the suitability and performance of on-site wastewater disposal systems. The majority of the soils in the study area have severe septic constraints due to high water table, steep slopes, and low permeability, based on the Soil Conservation Service Soil Survey of Rhode Island. Figure 4 shows the soil types present in the study area.

Table 3 *presents the dominant soil types in Tiverton (>1% in area) and their limitations for site wastewater disposal. Rules and Regulations Establishing Minimum Standards Relating to Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems (ISDS) specify that leach lines should be installed with the outflow line at a minimum depth of 18 inches. Although the leach line may be as deep as 42 inches, it is recommended that it be placed as shallow as practical. Therefore, the permeability of soil at a depth range of 18 to 24 inches is very important for the performance of an ISDS system. ISDS Regulations also specify that the minimum ISDS percolation rate for use of a subsurface disposal system is not to be greater than 40 minutes per inch.*

As indicated in Table 3*, the soils in the majority of Tiverton are generally unsuitable for the installation and use of ISDS absorption fields due to low percolation rates (>40 minutes per inch) within the 18-24 inch zone. The most prevalent soils group in Tiverton is the series consisting of deep, well-drained medium textured soils. The permeability of these soils is moderate to moderately rapid in the surface layer, however, very slow in the substratum. The substratum layer of low permeable soil places moderate to severe constraints to on-site wastewater disposal, typically necessitating special design and installation considerations. The depth to the high water table is typically greater than four feet.*

FIGURE 4 – SOIL TYPES

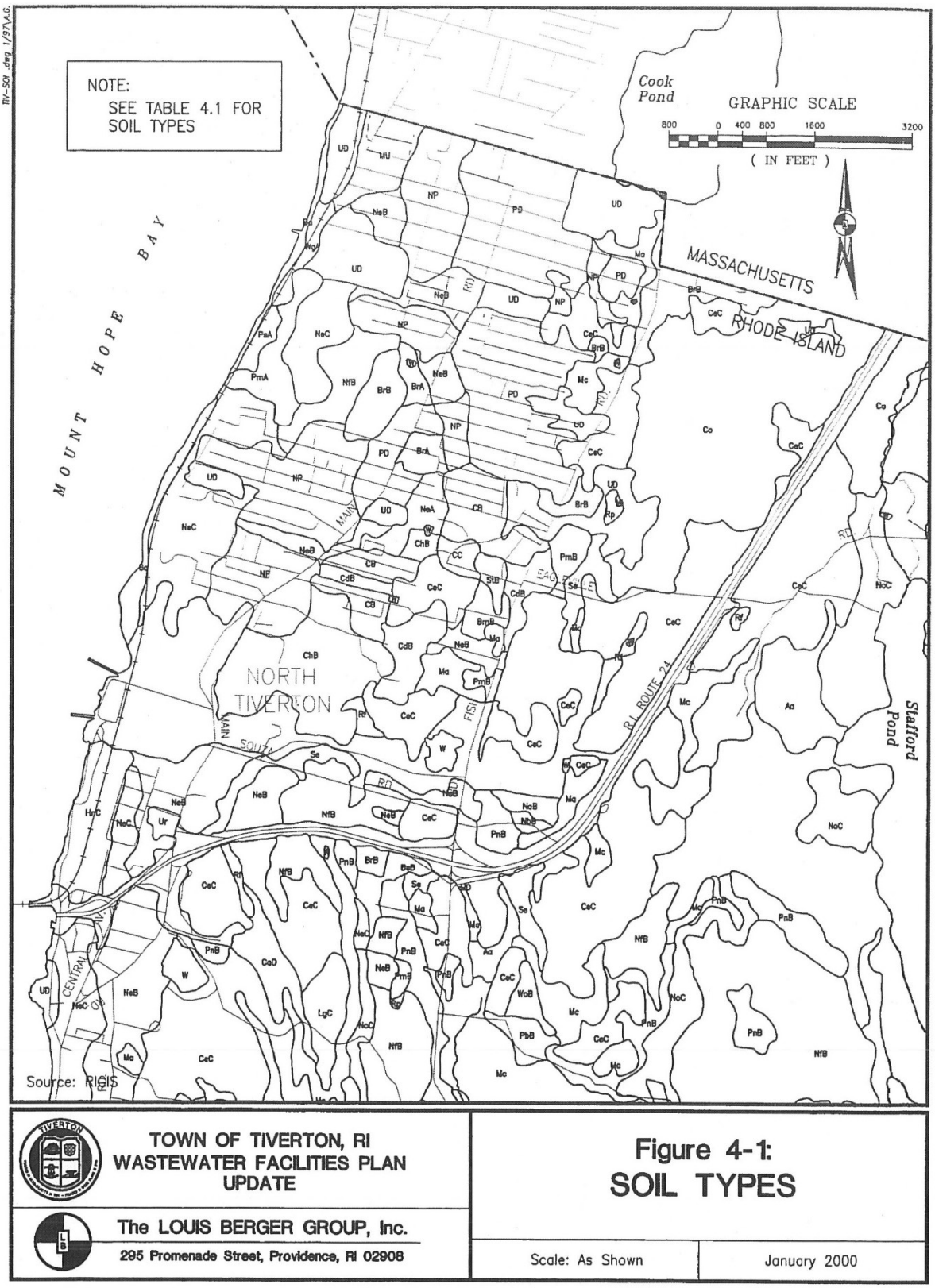


TABLE 3 - TIVERTON SURFICIAL SOILS

Soil		Area		Disposal Constraints	Depth (inches)	Perm. (min/in)
		Acre	%			
Aa	Adrian Muck	330	1.7	Severe: wetness, floods	0-20 20-60	3-20 3-10
Bb	Broadbrook very stony silt loam	880	4.6	Severe: percs slowly	0-36 36-60	30-100 >300
CeC	Canton-Charleton fine sandy loam	2.010	10.5	Moderate: slope, large stones	0-22 22-60	10-30 3-10
ChB ChD	Canton-Charleton stony fine sandy loam	785	4.1	Moderate: slope, large stones	0-22 22-60	10-30 3-10
Co	Carlisle Muck	750	3.9	Severe: wetness, floods	0-55	10-30
EfA EfB	Enfield silt loam	250	1.3	Slight	0-25 25-60	30-100
Ma	Mansfield mucky silt loam	275	1.4	Severe: wetness. floods	0-15 15-60	30-100 >300
Me	Mansfield very stony mucky silt	1,310	6.8	Severe: wetness, floods	0-15 15-60	30-100 >300
Mk	Matanuck mucky peat	280	1.5	Severe: wetness, floods	0-6 6-60	3-10 >3
NeA NeB NeC	Newport silt loam	3,505	18.3	Severe: percs slowly	0-8 8-24 24-60	10-100 10-100 >300
NfB	Newport very stony silt loam	1,230	6.4	Severe: percs slowly	0-33 33-60	30-100 3-30
NoC	Newport extremely stony silt loam	665	3.5	Severe: percs slowly, large stones	0-8 8-24 24-60	10-100 10-100 >300
PmA PmB	Pittstown silt loam	745	3.9	Severe: wetness, slowly	0-28 28-60	30-100 300-1000
PnB	Pittstown very stony silt loam	735	3.8	Severe: wetness, percs slowly	0-28 28-60	30-100 300-1000
Rf	Ridgebury, Whitman and Leicester extremely stony fine sandy loam	525	2.7	Severe: slowly, large stones	0-20 20-60	10-100 >300
Se	Stissing silt loam	680	3.6	Severe: wetness, percs slowly	0-15 15-60	30-100 300-1000
Sf	Stissing very stony silt loam	500	2.6	Severe: wetness, percs slowly	0-28 28-60	30-100 300-1000
UD	Udorthents,urban land complex	790	4.1	N/A	N/A	N/A

In summary, the soils of Tiverton typically present on-site wastewater management constraints due to physical properties such as a high groundwater table and low permeability. Figure 5 shows the extent of the areas within the study area with severe septic constraints based upon SCS soil classifications.

4.3 Geology

The topography of Tiverton consists of a gently rolling topography which rises from waterfront to low bluffs along the River. Low lying coastal and freshwater wetlands occupy a large area of the Town. The highest elevation in Tiverton is located at Pocasset Hill in North Tiverton with an elevation of 320 feet above mean sea level. From this point, a ridge line is formed along Main Road to Fall River roughly parallel to the River. This ridgeline serves as a divide to define the glacial till within the Town. The area to the east of the ridge is upland till plains, while the area to the west is Narragansett till plains.

Upland till plains is the most prevalent glacial till in Rhode Island. The till is derived mostly granite, schist, and gneiss rocks. The till is commonly characterized as being relatively loose and unconsolidated. Glacial stones and boulders are scattered on the surface and bedrock outcrops are common. Narragansett till plains are covered with glacial till from sedimentary rock, shale, sandstone, conglomerate, and coal. The till is generally compacted and finer textured. The bedrock in Tiverton is comprised of older granite from several ages and Pennsylvania sedimentary rock.

4.4 Wetlands

Figure 6 shows the wetland sites in Tiverton identified by the Rhode Island Geographic Information System (RIGIS). Wetlands comprise a significant land area in Tiverton and create a major natural feature within the town. Saltwater wetlands, defined by having a salinity in excess of 0.5 parts per thousand, comprise over 528 acres. The two largest saltwater wetlands in Tiverton are Sapowet and Marshes. Freshwater wetlands cover approximately 4,500 acres. The most significant freshwater wetlands are Great Swamp and Cedar Swamp in southern Tiverton and Basket Swamp and Pocasset Cedar Swamp in North Tiverton.

4.5 Floodplains

Development in stream flood plains may exacerbate flooding due to increased or concentrated downstream runoff. The flood hazard areas associated with Tiverton surface waters are defined in the Flood Insurance Rate Maps for the town showing flood boundaries, floodways, and base flood elevations (FEMA 1992). Flood hazard analyses have been completed by the Federal Emergency Management Agency (FEMA) in the Flood Insurance Study revision of April 17, 1984, and indicate the anticipated extent of flooding and detailed water surface data.

FIGURE 5 – SUMMARY OF SEPTIC CONSTRAINTS

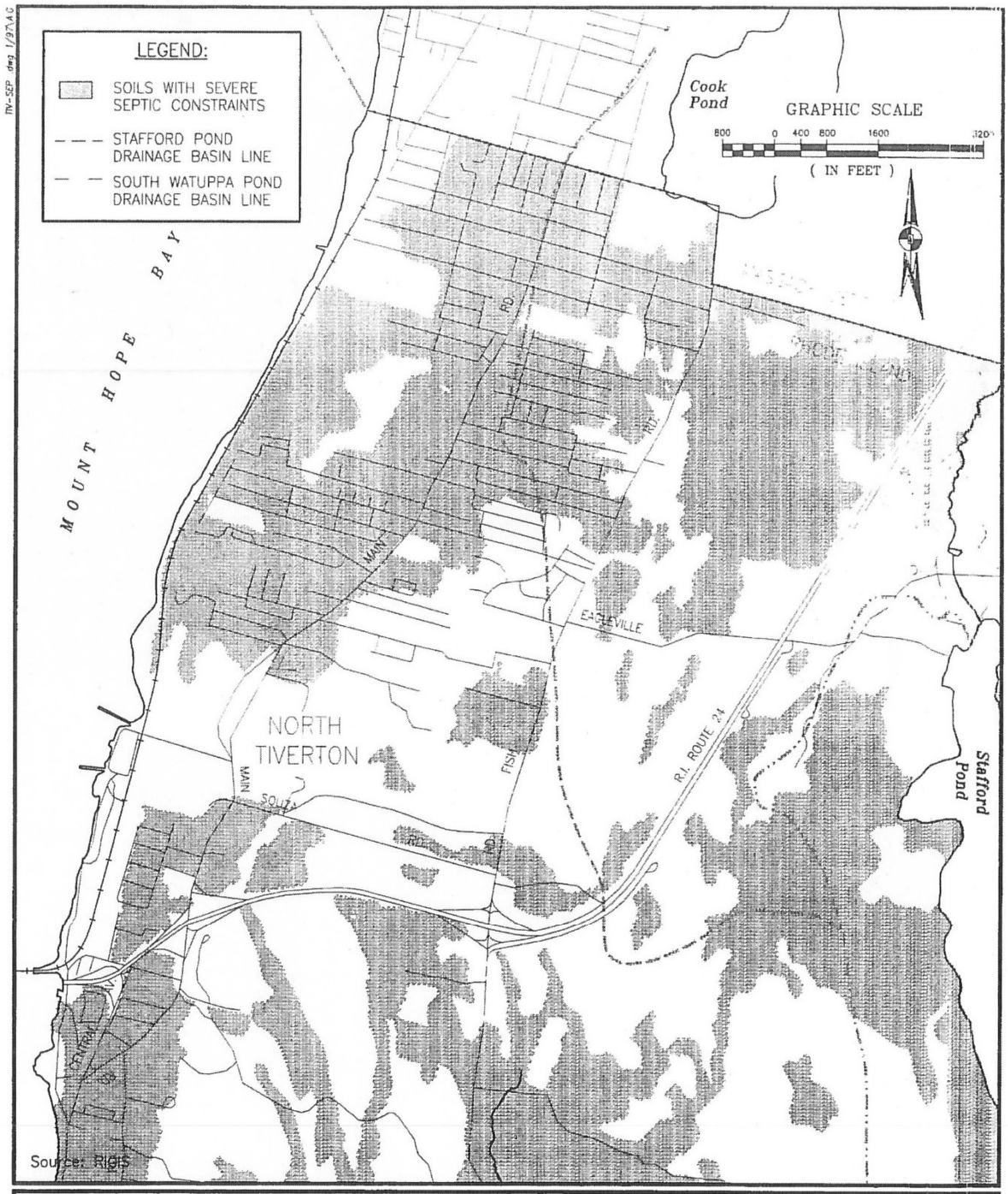


FIGURE 6 – WETLANDS

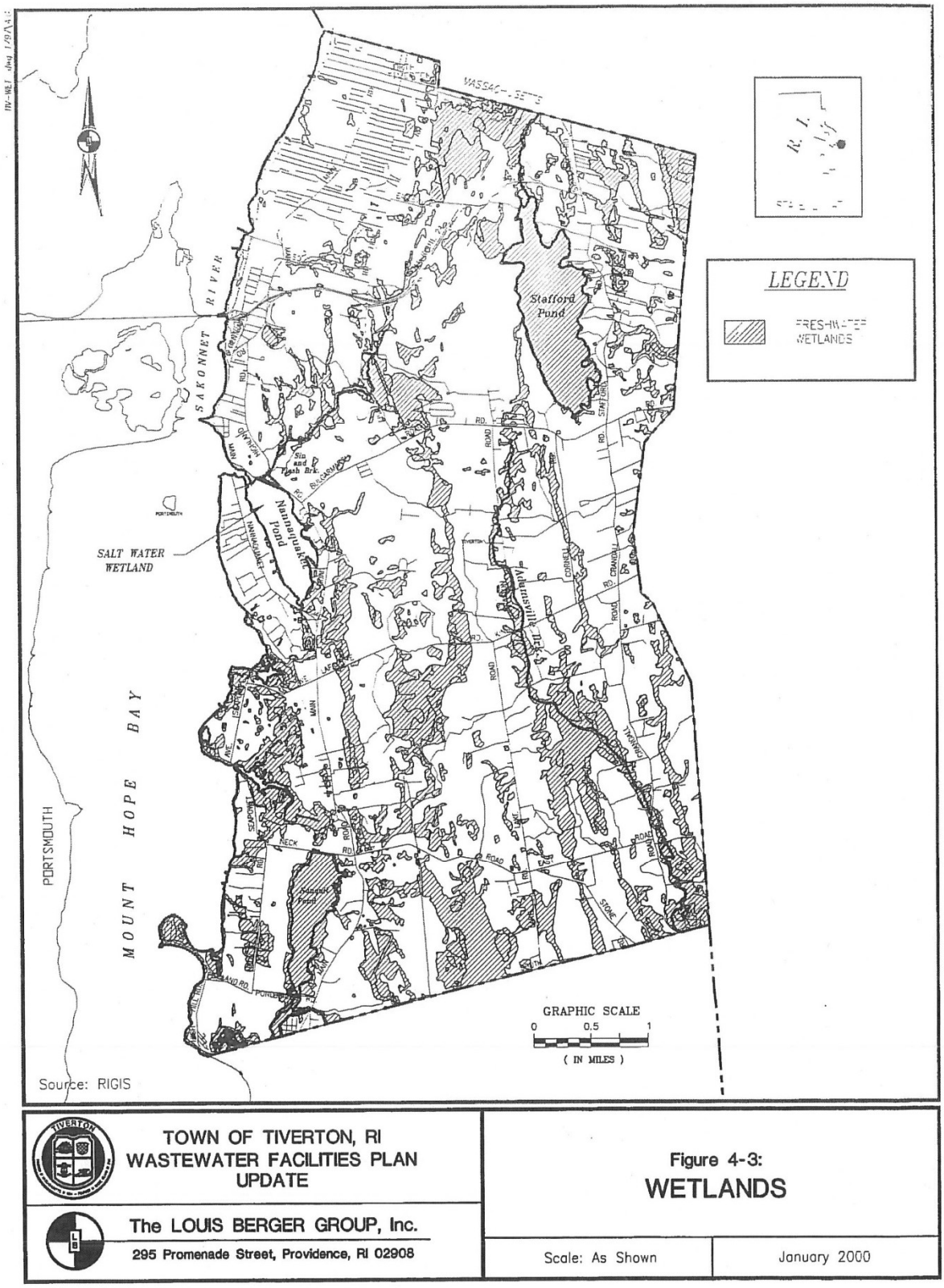


Figure 7 presents flood hazard areas for Tiverton. The areas outlined are subject to coastal flooding. The areas denoted by "1" and "2" are subject to velocity hazard due to wave action.

4.6 Coastal Areas

The coastal resources of are regulated by the state Coastal Resources Management Council (CRMC) program, which six types of coastal waters and the appropriate activities allowed each. CRMC jurisdiction extends to all tidal waters including coastal ponds, non-tidal coastal ponds associated with a barrier beach system, shoreline features such as beaches, coastal wetlands, coastal cliffs, bluffs and banks, rocky shores and manmade shorelines, and a 200-foot buffer zone shoreward of all of these features.

Table 4 indicates the development types prohibited or permitted in accordance with CRMC Category A and B applications for Type 1 Conservation Waters. Category A applications are required for routine matters and categories of construction and maintenance work that do not require review by the full Council if established criteria are met. More rigorous Category B review is required to ensure proposed alterations conform with the goals, policies, prerequisites, information requirements, and standards of the program.

TABLE 4 - SHORELINE DEVELOPMENT IN CRMC TYPE 1

Filling, Removal, and Grading of Shoreline Features

- *Prohibited in or on Beaches and Dunes, Coastal Wetlands, Cliffs, Bluffs and Banks, and Rocky Shores*
- *Category A review is required on Moderately Developed Barrier Beaches*
- *Category B review is required in Areas of Historic/Archaeological Significance*

Residential, Commercial/Industrial and Recreational Structures

- *Prohibited in or on Tidal Waters, Beaches and Dunes, Moderately Developed Barrier Beaches, Coastal Wetlands, Cliffs, Bluffs, and Banks, and Rocky Shores*
- *Category B review is required for residential and recreational structures in areas of Historic and Archaeological Significance, and for recreational along Shores*

Municipal Sewage Treatment Facilities

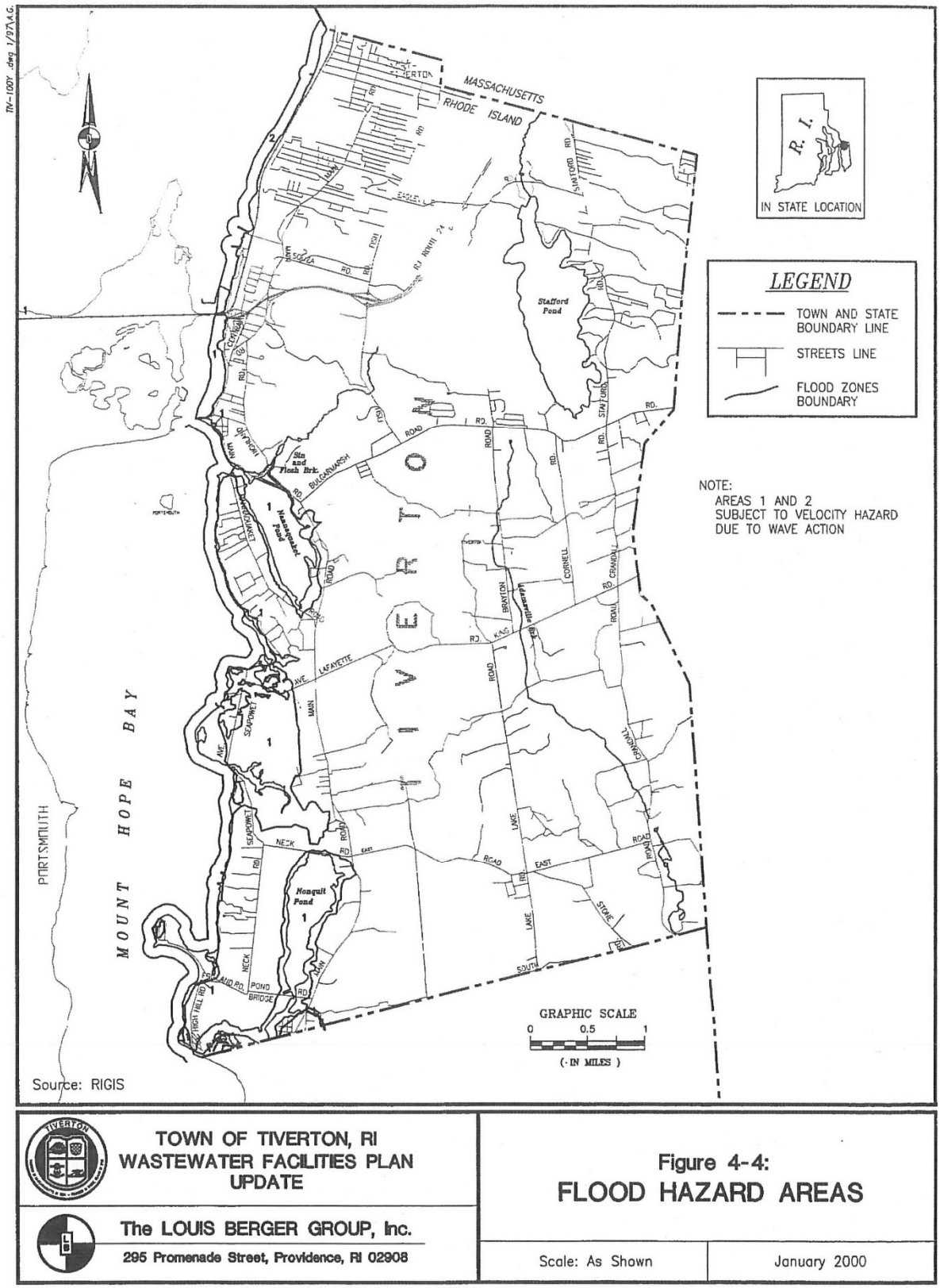
- *Category B review is required in areas of Historic and Archaeological Significance and for municipal sewer line construction on Moderately Developed Barrier Beaches*
- *Prohibited in or on Tidal Waters, Beaches and Dunes, Coastal Wetlands, Cliffs, Bluffs and Banks, Rocky Shores and along Shorelines*

ISDS

- *Prohibited in or on Tidal Waters, Beaches and Dunes, Moderately Developed Barrier Beaches, Coastal Wetlands, Cliffs, Bluffs and Banks, Rocky Shores and along Shorelines*
- *Category B review is required in areas of historic and archaeological significance*

Source: CRMC, The State of Rhode Island Coastal Resources Management Program (as amended), 1990.

FIGURE 7 – FLOOD HAZARD AREAS



4.7 Surface Water Characteristics

RIDEM assesses the water quality of the State's rivers, streams, estuaries and oceans to identify whether or not designated uses are being supported/attained. The most recent summary of RIDEM's water quality findings is published in the biennial State of the State's Waters – Rhode Island: A Report to Congress, July 1977. This report classifies the water quality resources of the following water bodies in Tiverton: Sakonnet River, Stafford Pond, Nonquit Pond, and Adamsville Brook (refer to Figure 8 for the location of the subject waters). Provided in Table 5 is a summary of RIDEM's evaluation.

Pursuant to Section 303(d) of the Clean Water Act, RIDEM has provided public notice of a draft list of Rhode Island water bodies that are not in compliance with Rhode Island Water Quality Standards and for which more stringent pollution controls need to be developed. The Section 303(d) list provides a comprehensive inventory of water bodies impaired by all sources, including point sources, non-point sources, or a combination of both. Section 303(d) established a continuous process for Rhode Island priorities in development of a Total Maximum Daily Load study. The bodies located in Tiverton are shown in Table 6.

TABLE 5 - SUMMARY OF WATER QUALITY EVALUATION 305(B) REPORT

Waterbody	Status	Water Quality Class	Comment
Adamsville Brook	Good	B	Waterbody meets all of the standards for all of the intended uses
Nonquit Pond	Not Assessed	A	
Sakonnet River	Threatened	SA	Impacted due to high density of boats in Stone Bridge area, point sources from road and agricultural runoff, and failed septic systems.
Stafford Pond	Impaired	A - drinking water with treatment	Excessive nutrient loadings cause frequent algae blooms. Failed septic systems and agricultural runoff expected sources.

TABLE 6 - 303 (d) LIST: WATER BODIES

Item	Stafford Pond	Sakonnet River
Waterbody ID Number	RI0007037L-01	R10010031-00
TMDL Priority	Group 1	Group 1
Area (acres)	480.00	0.63
Status	PS	PS
DEM Trophic Class	E	--
Water Quality Class	AA	SA
Cause	Hypoxia, nutrients, excessive algal growth	Fecal Coliform, Shellfish Closure

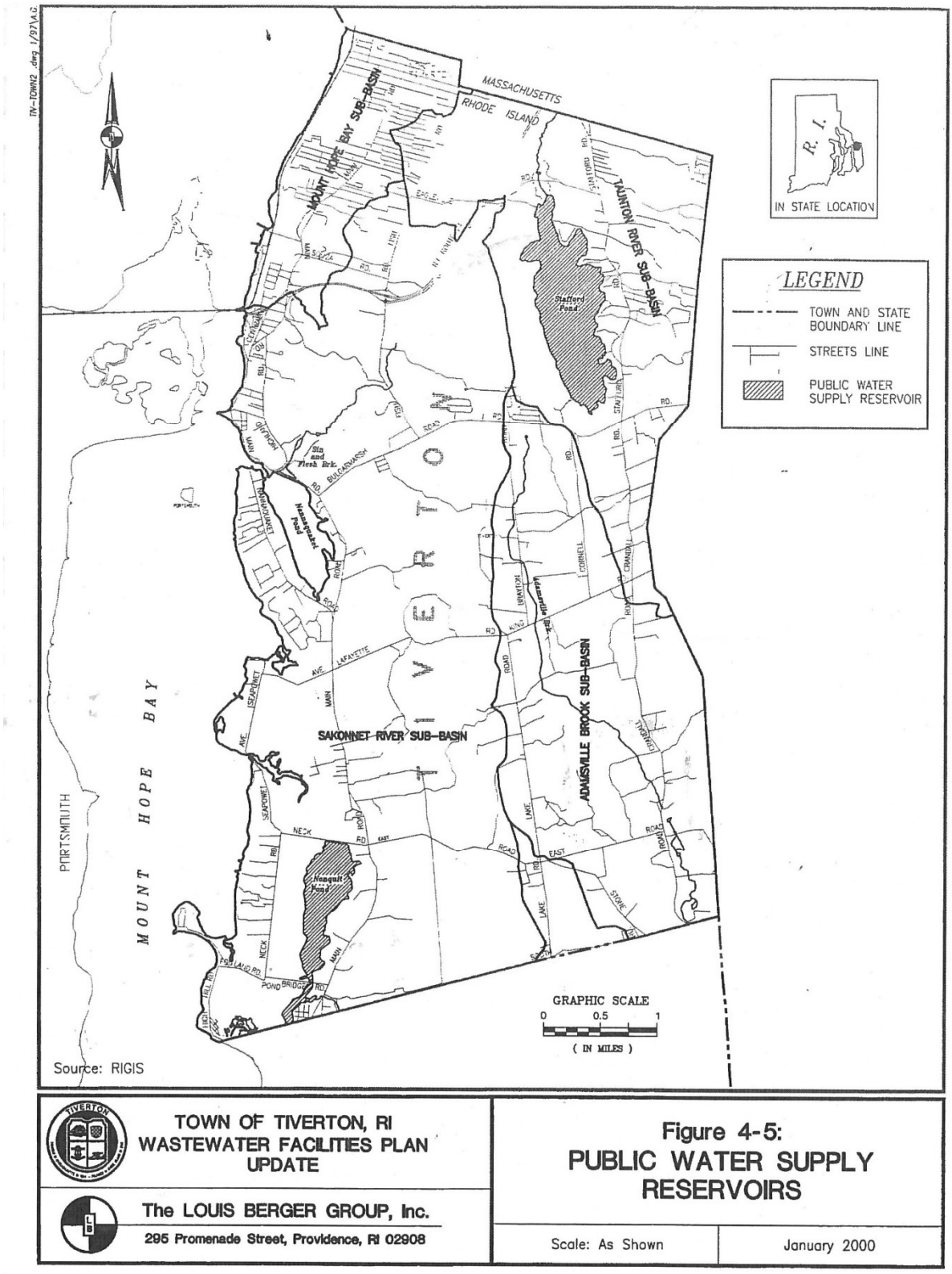
Source: Rhode Island Department of Environmental Management. 2006 Rhode Island List: 2006
Key: PS= Partially Supporting; NS = Non Supporting; E = Eutrophic

4.7.1 Public Drinking Water Reservoirs

There are two public water reservoirs located in Tiverton: Stafford Pond and Nonquit Pond. Stafford Pond, located in northeastern Tiverton, is the primary source of drinking water for Tiverton, Fall River, and Portsmouth. The water rights to the pond are owned by the City of Fall River and are purchased by Town's three water districts: Stone Bridge Fire District, the former Tiverton Water Authority, and North Tiverton Fire District. Stafford Pond is a tributary to South Watuppa Pond, which is also part of the Fall River water supply system. Stafford Pond only partially supports its water quality classification due to elevated fecal and nutrient levels. Failed septic systems, development on its eastern shore, and runoff from a nearby dairy farm have been potentially identified as major sources of pollutants. In addition, recreational uses on the Pond including the use of motor boats have the potential for contamination. Nonquit Pond is currently evaluated as fully supporting of its water quality classification, but threatened due to historical elevated levels of coliform and turbidity. Provided in Figure 8 are the watershed basins for Stafford Pond located within the study area.

It should be noted that the 2000 Facilities Plan Update as cited above incorrectly identifies three (3) water districts in the Town. There are only two (2) water districts in the Town, the Stone Bridge Fire District and the North Tiverton Fire District.

FIGURE 8 – PUBLIC WATER SUPPLY RESERVOIRS



4.7.2 Point Sources of Pollution

Following the writing of the 2000 Facilities Plan Update the United States Environmental Protection Agency (USEPA) issued a more wide reaching set of National Pollutant Discharge Elimination System (NPDES) regulations. The State of Rhode Island administers this program and therefore, it is locally known as the Rhode Island Pollution Discharge Elimination System (RIPDES) regulations. Under RIPDES regulations point source discharges are prohibited unless authorized by a RIPDES permit.

Under Phase II of the RIPDES regulations, the Town of Tiverton applied for and was granted a RIPDES permit. However, the Town-wide RIPDES does not cover private facilities or private or public industrial facilities. Industrial facilities, whether privately or public owned are required to apply for a separate industrial RIPDES permit. These permits have been applied for and granted to numerous facilities located throughout the Town.

Since the preparation of the 2000 Facilities Plan Update, there has been improvement in the water quality of the ponds, brooks, and rivers assessed through the Environmental Protection Agency's 305 (b) Reports. Compared to the superseded Table 4-3, Table 5 shows that there have been some improvements to water quality. Information provided in Table 5 is per the EPA website and is current through 2012. However, the water bodies located adjacent to the areas with historic septic tank failures still have water quality issues that cannot be abated until the all of the failing septic tanks have been repaired or replaced or sewers are installed in those areas.

4.7.3 Non-point Sources of Pollution

Non-point sources of pollution are described as a wide and diffused group of activities and processes which contribute pollutants to surface water bodies and ground water aquifers. Sources of non-point source pollution include: failing septic systems, soil erosion from construction sites, application of road salts to roadways, overuse of fertilizers and pesticides on lawns and gardens, leaking underground storage tanks, agricultural runoff, and runoff from streets and parking lots. The mass of pollutants from these non-point sources can be reduced through source control techniques or installation of pollution control measures.

RIDEM has developed a Non-point Source Pollution Management Plan for Ten Surface Water Supply Watershed; Stafford Pond basin is one of the ten. The purpose of this plan is to provide communities and water suppliers with data and recommendations that can assist with the protection of the surface water reservoirs via enhanced management of land use within reservoir watersheds. The plan includes recommendations to help mitigate existing non-point source pollution problems. The Town has adopted a Soil Erosion and

Sedimentation Control Ordinance to minimize the transport of sediment to surface waters from construction activities. The Town must continue its efforts in establishing a surface and groundwater management strategy to control non-point pollution. Pollutants associated with construction activities, runoff from residential developments, failed septic systems, and poor agricultural practices are the most common sources of non-point pollution threatening water quality. It has been concluded that non-point source pollution is the cause for Stafford Pond partially supporting its water quality classification.

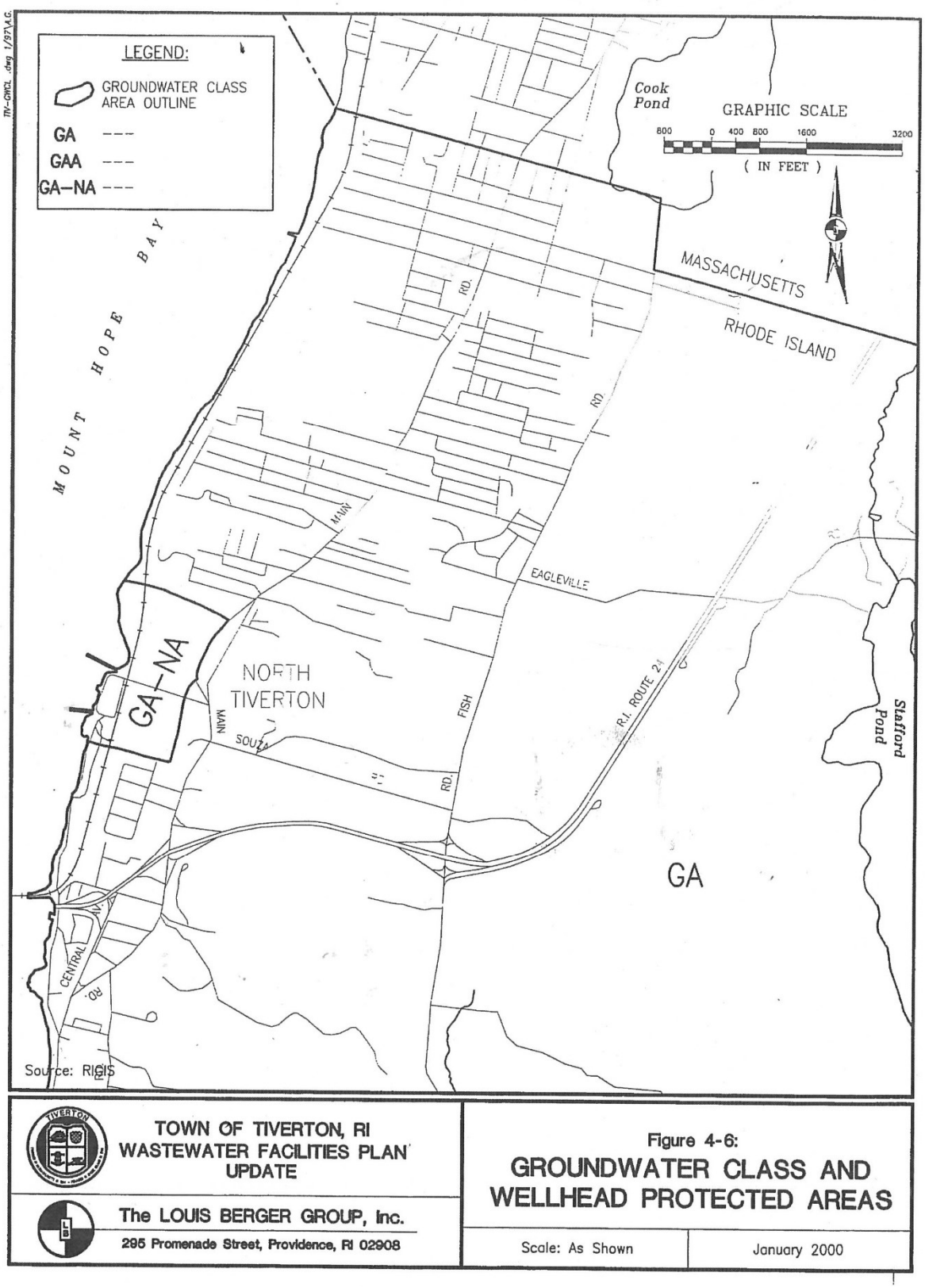
4.8 Groundwater Characteristics

The groundwaters of the state are regulated by RIDEM in accordance with Rules and Regulations for Groundwater Quality. These regulations establish classifications for the aquifers with corresponding water quality standards, and community and non-community wellhead protection guidelines. The groundwater classifications define the quality standards, appropriate uses, and level of protection necessary for aquifers, as follows:

- *GAA: Groundwater sources suitable for public drinking water use without treatment. Includes the critical portions of the aquifer recharge area.*
- *GA: Groundwater sources that may be suitable for public or private drinking water use without treatment.*
- *GB: Groundwater sources that may not be suitable for public and private drinking water use without treatment due to know or presumed degradation.*
- *GC: Groundwater sources that may be suitable for certain waste disposal practices.*
- *NA: Areas classified NA described groundwater that does not meet standards established for these classes (NA: non-attainment).*

Provided in Figure 9 is a map depicting the groundwater classifications for North Tiverton. As illustrated by the figure, the groundwater classification for North Tiverton is GA. There are two areas within the aquifer that are not attaining the GA standard. One area of the aquifer in non-attainment is adjacent to the former Charter Oil Terminal (Northeast Properties) site in the vicinity of Main Road and Carey's Lane. As described in Section 4.7.2, the former terminal is the site of an active groundwater and soils remediation process due to historic releases of petroleum. The other area in non-attainment of the GA standard is the eastern shore of Stafford Pond. This area does not attain the GA standard primarily due to failed septic systems.

FIGURE 9 – GROUNDWATER CLASS AND WELLHEAD PROTECTED AREAS



4.9 Land Use and Demographic Data

The following information is provided in the CCP in Section 5.1, "Current Land Use"

- *The pattern of land use and development within this area four distinct sectors -North Tiverton, East Tiverton, Stone Bridge and Southern Tiverton. Tiverton's area includes 29.7 square miles of land and 5.8 square miles of water, a combined total of 35.5 square miles on the eastern shore of the Sakonnet River.*
- *North Tiverton is an area of older residential commercial development, extending north of Route 24. The area includes a neighborhood retail and service strip along the Main Road; and residential development, primarily single family units, on the side streets. The area south of Judson Street along Main Road strip is prevailed by commercial uses. The east side of Fish Road has development with general commercial and light industrial uses, while the west side remains essentially residential with some institutional uses.*
- The Bourne Mill, a historic 19th Century Mill building has been renovated into an upscale apartment building. The Pocasset School and the Pocasset Park are two other significant land uses in this area. In addition, the large oil storage tanks, formerly owned by Northeast Petroleum, on 100 acres of land on both sides of Main Road have been converted into the Villages on Mount Hope Bay Condominiums.

Residential Land Use *- Approximately 85 percent of the land area of Tiverton is zoned for residential use. High density residential use includes multi-family housing, duplexes or single family housing on lots generally one third of an acre or less, and mobile home parks. North Tiverton has developed primarily in a high density residential pattern.*

Medium density residential development includes areas predominantly developed for single family housing on individual lots of one-half to three quarters of an acre. Medium density development is located in areas which are more environmentally sensitive or lack either public water or public sewers. Many of the medium density areas, zoned R-30 and R-40, are located within reservoir watersheds.

Low density residential areas are zoned R-60 and R-80 and typically support less than one dwelling per acre. Agricultural production, single family residential dwellings, large estates, essential uses and facilities and open space/recreation are appropriate uses in these areas. Soils are often limited in their ability to support high-density development; frequent flooding is sometimes experienced along the areas' waterways.

Commercial Land Use *- Commercial land use prevails along major portions of Main Road north of Route 24 and limited portions of Main Road south of Route 24 and the area east of Fish Road. General commercial and service land use is present on portions along Road near Route 24 and segment north of Bulgarmarsh Road.*

Industrial Land Use *- The area in North Tiverton on either sides of Route 24 are zoned General Industrial (GI) and Light Industrial (LI). Major industries are not prevalent due to lack of infrastructure and support services. An industrial park having a total area of 228 acres is being developed at the intersection of Route 24 and Fish Road. The following light industries exist in the park or adjacent to the park: Tiverton Power Associates, a fiberglass boat manufacturer, Murdock Systems, and a printing company.*

Institutional Uses *- Public facilities in Tiverton include municipal buildings and public schools. Municipal buildings include town hall and the town library located on Highland Road, the police headquarters located south of Route 24 at Fish Road, and the senior citizens center on Canonicus Street.* Additionally, the Community Center on Judson Street is a public facility that should be included with the municipal buildings.

There are five public schools located in Tiverton. These include the Fort Barton Elementary School, the Pocasset Elementary School, Ranger Elementary School, Tiverton Middle School and Tiverton High School.

Conservation, Recreation and Open Space Uses *- This land use type includes the following areas which are currently eliminated from intensive use and not anticipated to be extensively developed in the future:*

- *Fresh water ponds, wetland and streams;*
- *Salt marshes, tidal ponds and coastal beach areas;*
- *Areas subject to periodic flooding;*
- *Unique natural areas;*
- *Public recreation lands; and*
- *Major conservation lands, public and private.*

An ordinance was adopted under zoning laws in 1987 to provide for cluster development. This zoning provision allows for the modification of zoning requirements which will allow for preservation of open space or recreational areas within a subdivision. The cluster provisions require the deduction of the acreage of special natural features when calculating the density of and imposes dimensional requirements.

Zoning - The Zoning Ordinance for Tiverton was re-written and adopted in 1996 and revised again in 2010. Nine land use districts have been established; four residential districts, three commercial districts, one industrial district, and water front district. Table 7 summarizes the zoning districts and the allowable uses.

A watershed protection overlay district around Stafford Pond was created in 1986. The purpose of the district is to protect the quality and quantity of the drinking water supplies by regulating development around the pond. The district limits density of residential development to 3 acres per unit, provides for a 200-foot buffer from Pond, and restricts the use of chemicals, fuels, pesticides and other sources of contamination.

Demographics - Based on the 2010 Federal Census, the total population in Tiverton is 15,780. The following 2010 Census data is relevant to the proposed sewer system:

- Total Housing Units 7,446, of which 6,684 were occupied;
- Population served by study area is approximately 9,500;
- 78 percent are owner-occupied;
- Average of 2.49 persons per housing unit (owner-occupied or renter-occupied); and
- 80 percent dwellings are in single-family (attached or detached) units.

The following describes the population characteristics for the entire town of Tiverton. Table 8 *shows the age of Tiverton's housing. Nearly 40 percent of the housing stock was constructed between 1950 and 1970. However approximately 25 percent of the housing in Tiverton was constructed before 1939, prior to subdivision developments.*

The profile that emerges from these statistics is one of Tiverton as a moderately growing community with a significant percentage of housing stock in single-family owner-occupied units. Over half of the housing stock is more than thirty years old, therefore constructed prior to current building codes and ISDS regulations, and including features that might not be in compliance with today's codes. In addition, many of these structures are at an age when renovation or rehabilitation of on-site systems may be recommended or required.

TABLE 7 - TIVERTON ZONING DISTRICTS

Zoning District	Lot Area	Minimum Lot Dimensions and Building Setbacks				Maximum Building Coverage and Height		
		Lot Width (feet)	Front Yard (feet)	Rear Yard (feet)	Side Yard (each side)	Bldg. Coverage (percent)	Height, main bldg. (feet)	Height, acces. bldg. (feet)
Uses in R-30 Residential District								
Single-family dwelling	30,000 SF	150	30	30	20	15	35	20
Two-family dwelling	40,000 SF	150	30	50	20	20	35	20
Multi-family structure or apartment house	40,000 SF plus 10,000 SF for each unit above 2 units, plus 5,000 SF for each additional bedroom over 2 bedrooms per unit	150	40	50	30	20	35	20
Convalescent, rest or nursing home; retirement residence/assisted living facility	3 acres	200	40	60	30	25	35	20
Uses allowed under Article IV, Section 3. Farming or raising of animals	40,000 SF	150	40	50	30	15	35	20
Public, semi-public and recreation uses	60,000 SF	175	40	60	30	20	35	20
Other permitted or special uses	30,000 SF	120	35	40	20	20	35	20
Uses in R-40 Residential District								
Single-family dwelling	40,000 SF	150	40	40	25	15	35	20
Convalescent, rest or nursing home; retirement residence/assisted living facility	3 acres	200	40	60	30	25	35	20
Commercial raising of animals or fowl	100,000 SF	200	40	60	50	10	35	40

Source: Town of Tiverton Zoning Ordinance adopted in 2010.

TABLE 7 (Continued) - TIVERTON ZONING DISTRICTS

Zoning District	Lot Area	Minimum Lot Dimensions and Building Setbacks				Maximum Building Coverage and Height		
		Lot Width (feet)	Front Yard (feet)	Rear Yard (feet)	Side Yard (each side)	Bldg. Coverage (percent)	Height, main bldg. (feet)	Height, acces. bldg. (feet)
All other uses allowed under Article IV. Section 3. Farming or raising of animals	40,000 SF	150	40	60	30	15	35	20
Public, semi-public and recreation uses	60,000 SF	175	40	60	30	20	35	20
Other permitted or special uses	40,000 SF	150	40	60	30	15	35	20
Uses in R-60 Residential District								
Single-family dwelling	60,000 SF	175	40	60	30	15	35	20
Two-family dwelling	60,000 SF	175	40	60	30	20	35	20
Multi-family structure or apartment house	60,000 SF plus 10,000 SF for each unit above 2 units, plus 5,000 SF for each additional bedroom over 2 bedrooms per unit	175	40	60	30	20	35	20
Multi-family structure or apartment house	60,000 SF plus 10,000 SF for each unit above 2 units, plus 5,000 SF for each additional bedroom over 2 bedrooms per unit	175	40	60	30	20	35	20
Convalescent, rest or nursing home; retirement residence/assisted living facility	3 acres	200	40	60	30	25	35	20
Commercial raising of animals or fowl	100,000 SF	200	40	60	50	10	35	40
All other uses allowed under Article IV. Section 3. Farming or raising of animals	60,000 SF	175	40	60	30	15	35	20

TABLE 7 (Continued) - TIVERTON ZONING DISTRICTS

Zoning District	Lot Area	Minimum Lot Dimensions and Building Setbacks				Maximum Building Coverage and Height		
		Lot Width (feet)	Front Yard (feet)	Rear Yard (feet)	Side Yard (each side)	Bldg. Coverage (percent)	Height, main bldg. (feet)	Height, acces. bldg. (feet)
Public, semi-public and recreation uses	60,000 SF	175	40	60	30	20	35	20
Other permitted or special uses	60,000 SF	175	45	80	35	15	35	20
Uses in R-80 Residential District								
Single-family dwelling	80,000 SF	200	50	80	35	10	35	25
Convalescent, rest or nursing home; retirement residence/assisted living facility	3 acres	200	50	100	35	25	35	25
Commercial raising of animals or fowl	100,000 SF	200	50	100	35	10	35	40
All other uses allowed under Article IV. Section 3. Farming or raising of animals	80,000 SF	200	50	100	35	15	35	25
Public, semi-public and recreation uses	80,000 SF	200	50	100	35	20	35	25
Other permitted or special uses	80,000 SF	200	50	100	35	10	35	25
Uses in VC Commercial District								
Any permitted or special use	12,000 SF	100	20	10	10	25	35	25
Uses in GC Commercial District								
Any permitted or special use (see Note 1 regarding residential uses)	12,000 SF	100	0	20	0 to 20*	50	50	25
Commercial raising of animals or fowl	100,000 SF	200	40	60	50	10	35	40

TABLE 7 (Continued) - TIVERTON ZONING DISTRICTS

Zoning District	Lot Area	Minimum Lot Dimensions and Building Setbacks				Maximum Building Coverage and Height		
		Lot Width (feet)	Front Yard (feet)	Rear Yard (feet)	Side Yard (each side)	Bldg. Coverage (percent)	Height, main bldg. (feet)	Height, acces. bldg. (feet)
Public, semi-public and recreation uses	12,000 SF	100	50	20	20	25	40	25
* Minimum set back along side street is 0 feet; minimum setback where side yard abuts a residential zone is 20 feet; minimum setback between commercial lots must meet all applicable building codes as well as the Uniform Fire Code of RI.								
Uses in HC Commercial District								
Any permitted or special use	20,000 SF	120	40	50	20	25	40	25
Public, semi-public and recreation uses	20,000 SF	120	50	20	20	25	35	25
Uses in W Waterfront District*								
Any permitted or special use (see Note 1 regarding residential uses)	10,000 SF	80	10	10	10	25	35	20
* The dimensional standards applied to any particular development within the Waterfront District are also subject to the requirements of the Coastal Resources Management Council (CRMC) as appropriate.								
Uses in I Industrial District								
Any permitted or special use (see Note 1 regarding residential uses)	40,000 SF	150	40	60	35	50	40	25
Uses allowed under Section 3. Farming or raising of animals	40,000 SF	150	40	60	35	15	35	40
Public and semi-public uses	20,000 SF	120	40	50	20	25	40	25

Note 1: For residences in a GC, W or I District, the dimensional regulations of the nearest residential district shall apply.

Note 2: The minimum lot areas listed above may not be adequate in certain cases to meet state standards for on-site sewage disposal; a larger lot area may be specified by the department of environmental management as part of the approval of an individual septic disposal system.

TABLE 8 - HOUSING AGE

Decade	Housing Units Built	Percent
1939 or earlier	1,399	21.75
1940-1949	484	7.5
1950-1959	1,017	15.75
1960-1969	1,072	16.6
1970-1979	878	13.6
1980-1989	600	9.3
1990-1999	799	12.3
2000-2009	210	3.2

Source: US Census 2010, Town of Tiverton Website, and 2000 Facilities Plan Update

5.0 WASTEWATER MANAGEMENT FACILITIES

5.1 Summary of ISDS Systems

Almost all of the wastewater generated in the study area is disposed of through onsite disposal systems. Due to the limitations of the unsuitable soils and relatively high groundwater levels existing throughout the town, these systems are typically subject to regular maintenance problems and inefficient operation.

RIDEM ISDS regulations govern the installation and operation of on-site wastewater disposal systems. The ISDS regulations include specific provisions for acceptable soil percolation; setbacks from site features such as structures, wells, surface water, etc.; and design criteria for on-site systems. A typical modem septic of the most common leach trench type as defined by ISDS is shown in Figure 10.

The ISDS regulations first became effective and enforceable by RIDEM in 1970. Prior to 1970 the design, construction, and use of on-site systems was not regulated. According to the current Tax Assessor's records, 46 percent of the total housing units in Tiverton were constructed prior to 1970, and would not have been subject to any formal on-site system regulations. There are approximately 3,700 housing units townwide, and 2,469 in North Tiverton, that were constructed prior to 1970 and are utilizing an on-site system that was not subject to prior review.

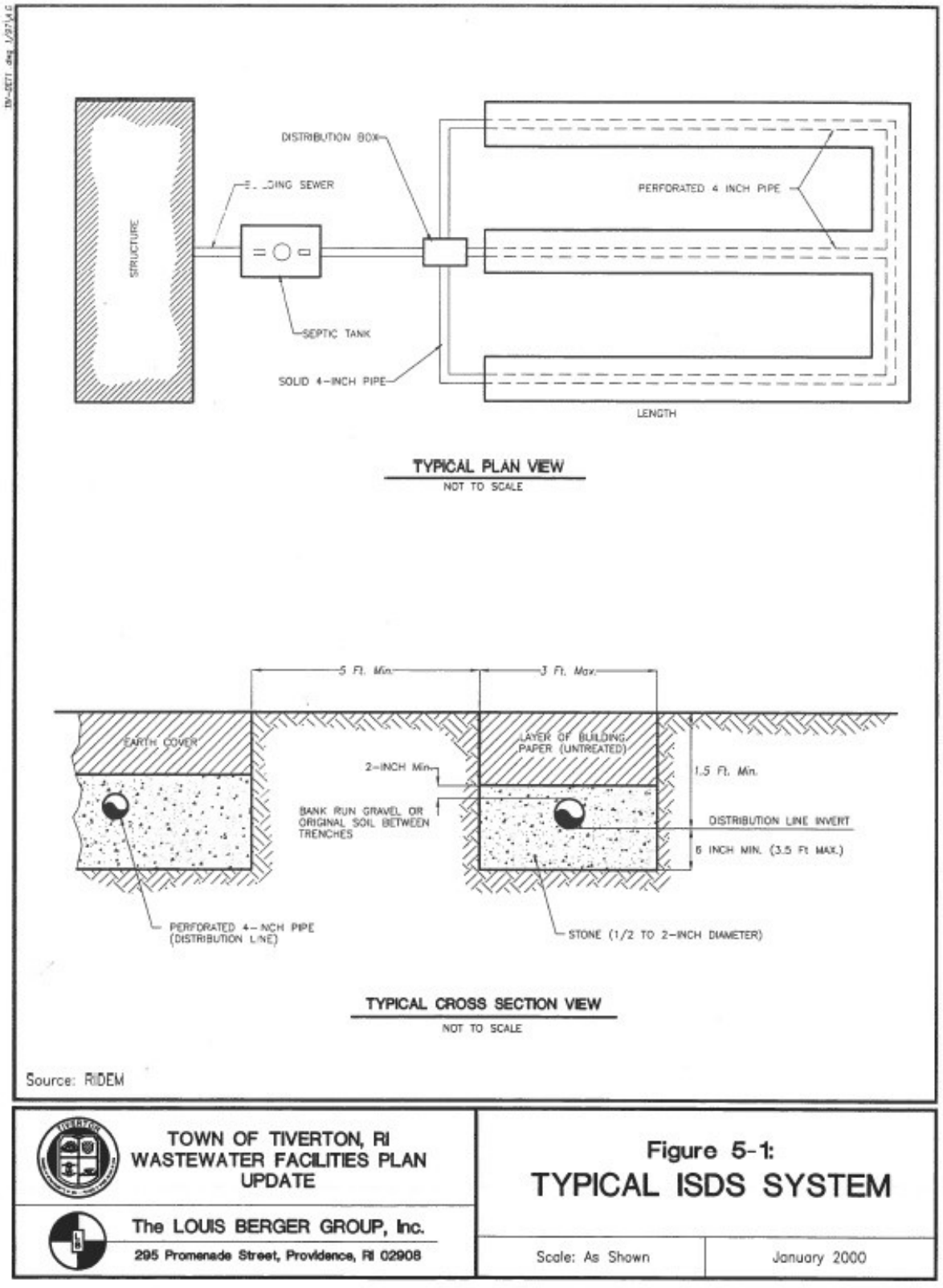
While the percentage of total housing units in Tiverton that were constructed prior to 1970 has been reduced due to the overall increase in housing units, there are still a large number of housing units town wide and specifically in North Tiverton that are utilizing on-site systems that were not subject to prior review.

It is not uncommon for residences of older construction to have systems utilizing features that may have been standard practice at the time of construction that are no longer in compliance with ISDS regulations, such as small metal drums or wooden cisterns for solids separation in lieu of a septic tank, and leach area overflow outlets to surface water.

Since the acceptance of the Facilities Plan Update in 2000, the Town has passed an On-Site Waste Disposal System Management Plan. *The ISDS Wastewater Management Plan ~~will provide~~* provides *sufficient land use and environmental data to serve as the basis for establishment of an ISDS Wastewater Management District.* At a minimum, the analysis will include the following:

- *Identification of the approximate number, type, and location of ISDS systems;*
- *Identification of the approximate number of impacts of failed/failing systems on surface waters and groundwater; and*
- *Analysis of cause of ISDS failure area(s) (i.e., soils. age, etc).*

FIGURE 10 – TYPICAL ISDS SYSTEM



The Town has limited the area to be sewered to North Tiverton and portions east Tiverton and Stone Bridge Area. At this point, it is considered economically infeasible to expand sewer service to Bulgarmarsh Road and the Stafford Pond area. The decision to eliminate portions of Stone Bridge Area and Bulgarmarsh Road were also based on larger lot sizes present in medium density residential development (R-30) and soil conditions. The focus of the Town has shifted to the development of an ISDS Wastewater Management District to service these areas of the Town. The decision to eliminate the Stafford Pond area was based on the Town's proposed development and implementation of an ISDS Wastewater Management District.

The rationale for excluding portions of the Stone Bridge Area and the Bulgarmarsh Road are still applicable.

The primary, initial objective for the Town in developing an ISDS Wastewater Management Plan was to focus on the residential areas adjacent to ponds. The Town has determined that it is most cost effective to focus on serving these areas along with the remainder of the Town with conventional, alternative on-site, community systems. Should the Plan determine that it is not economically environmentally beneficial (or detrimental to public health) to utilize alternative on-site or community ISDS systems for any specific areas, then the Town would be required to update the Facilities Plan accordingly.

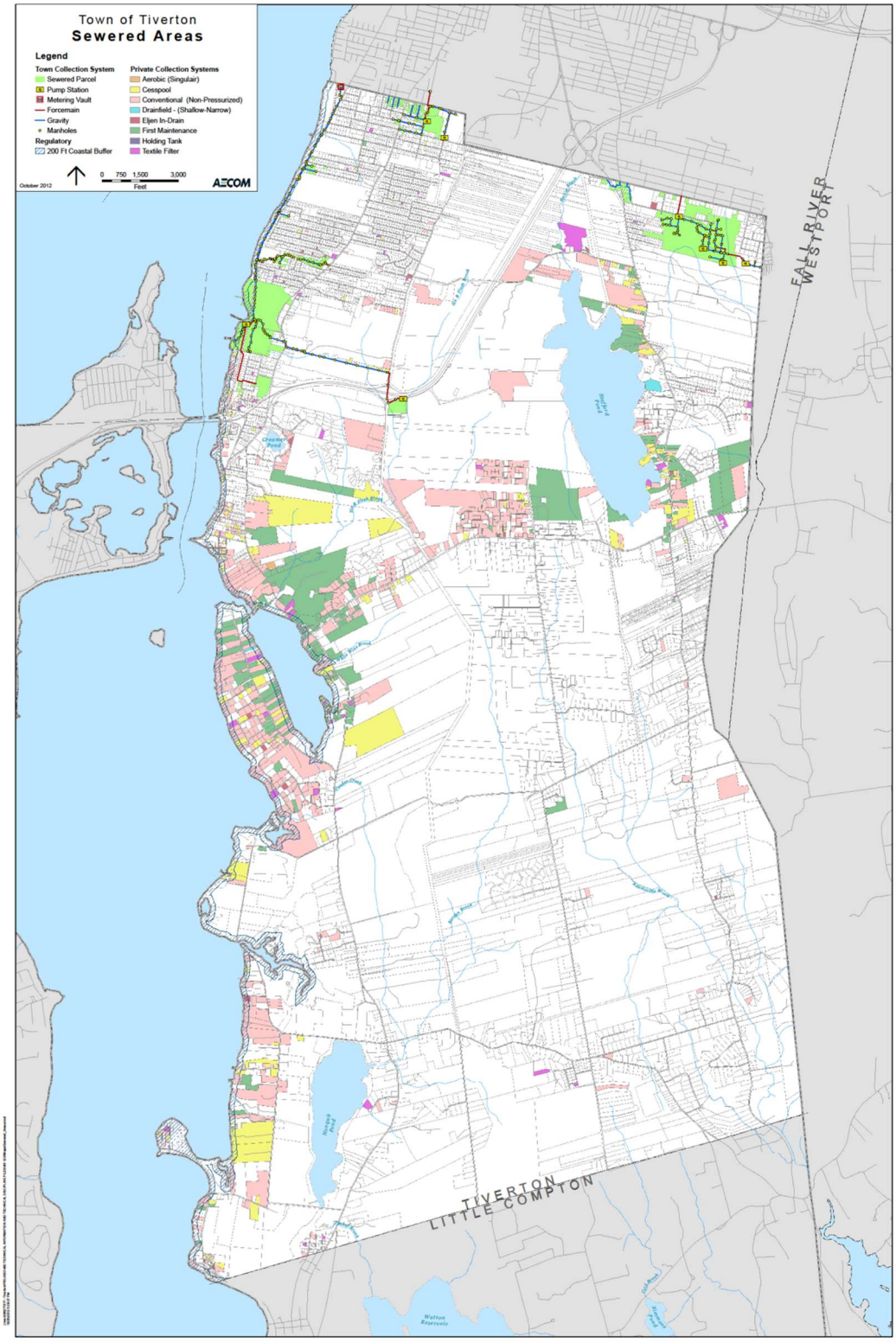
The Onsite Wastewater Management Plan did not determine any areas of Town other than those identified in the 2000 Facilities Plan Update where it was not economically and environmentally beneficial to utilize alternative on-site or community ISDS systems.

5.2 Wastewater Treatment Facilities

Tiverton does not operate any wastewater treatment facilities. Wastewater generated from approximately 50 residences located in northern part of the town bordering Fall River, Massachusetts, are discharged to the Fall River WWTF. All septage pumping from Tiverton ISDS septic tanks are also discharged into the Fall River WWTF. All other wastewater generated in Tiverton is disposed of in subsurface on-site systems.

Since the completion of the 2000 Facilities Plan Update, an additional 500 residences located in the northern portion of Tiverton have been connected to the wastewater system and discharge to the Fall River Wastewater Treatment Facility. The remainder of wastewater generated in Tiverton is disposed of in single unit subsurface on-site systems. Figure 11 shows the existing sewer service area and types of onsite wastewater disposal systems.

FIGURE 11 – EXISTING SEWER SERVICE AREA AND TYPES OF OWTS



5.3 Initial and Ultimate Wastewater Flow Rates

The wastewater flow rates within the study area estimated in this section are based on existing development (residences, commercial/industrial, institutions) that would generate "initial" flows and potential future development that would generate "ultimate" flows. In order to assess potential need for wastewater management facilities in the study area, it has been assumed wastewater flows generated presently and those resulting from future development would be connected to the proposed sanitary sewer system.

A similar philosophy was used in the development of flows discussed in Section 3 of this report. The "initial" flows were based upon actual water usage data and the minimum required design flows. The potential future development within the existing sewered area combined with the potential expansion of the sewers into the study areas make up the "future" flows. The "initial" flow combined with the "future" flow result in the "ultimate" flows for the Town. It is assumed that the sewer expansion into the study areas would be connect to the existing sanitary sewer system.

The categories of wastewater generation are described in following sections, with initial and ultimate wastewater flow rates summarized in Table 9. The permitted maximum annual average discharge into the Fall River WWTF system is 2.0 million gallons per day (MGD), and a maximum daily peak discharge of 6.0 MGD is allowed under the IMA.

Since the completion of the 2000 Facilities Plan Update, the Mount Hope Bay interceptor has been completed and there are currently 550 customers connected to the existing system. The study areas addressed in this update will discharge to the Mount Hope Bay interceptor with the exception of Phase 2 of the Garden Heights Area, Mill Street Area and Twin River Casino and Hotel Area. Therefore, breaking the flows out into Mount Hope and Fish Road for the purpose of flow calculations is no longer pertinent. Refer to updated Table 9.

The ultimate average wastewater generation for the study area is approximately 1.3 MGD. A majority of the wastewater flow is anticipated to be from Residential properties. A more thorough description of how these flows were determined can be found in Section 3 of this report.

TABLE 9 - SUMMARY OF WASTEWATER FLOW RATES

Type of Land Use	Existing Service Area - Actual Flows					Existing Service Area - Build Out		
	Number of Connections	ADF For Planning (gpd)	Total Actual Flow	ADF For Planning (gpd)	Total Planning Flow (gpd)	Number of Connections	ADF For Planning (gpd)	Total Planning Flow (gpd)
Residential	523	162	84,726	162	84,726	616	300	184,800
Commercial	22	398	8,756	398	8,752	-	398	-
Industrial	1	2	2	2	2	-	398	-
Town	4	80	320	80	320	-	80	-
SubTotal	550	171	93,804		93,800	616		184,800
	Length of Pipe					Length of Pipe		
I/I	43,075		51,300		51,300	-		-
Total			**145,104**		**145,100**			**184,800**

Type of Land Use	Riverside Drive Area			Robert Grey Area			Bay Street Area		
	Number of Connections	ADF For Planning (gpd)	Total Planning Flow (gpd)	Number of Connections	ADF For Planning (gpd)	Total Planning Flow (gpd)	Number of Connections	ADF For Planning (gpd)	Total Planning Flow (gpd)
Residential	602	300	180,600	585	300	175,500	123	300	36,900
Commercial	-	398	-	-	398	-	-	398	-
Industrial	-	398	-	-	398	-	-	398	-
Town	-	80	-	-	80	-	-	80	-
SubTotal	602		180,600	585		175,500	123		36,900
	Length of Pipe			Length of Pipe			Length of Pipe		
I/I	30,950		17,600	30,350		17,300	8,750		5,000
Total			**198,200**			**192,800**			**41,900**

Type of Land Use	Church Street Area			Mill Street Area			Garden Heights		
	Number of Connections	ADF For Planning (gpd)	Total Planning Flow (gpd)	Number of Connections	ADF For Planning (gpd)	Total Planning Flow (gpd)	Number of Connections	ADF For Planning (gpd)	Total Planning Flow (gpd)
Residential	183	300	54,900	149	300	44,700	953	300	285,900
Commercial	-	398	-	-	398	-	-	398	-
Industrial	-	398	-	-	398	-	-	398	-
Town	-	80	-	-	80	-	-	80	-
SubTotal	183		54,900	149		44,700	953		285,900
	Length of Pipe			Length of Pipe			Length of Pipe		
I/I	11,000		6,300	7,850		4,500	54,650		31,100
Total			**61,200**			**49,200**			**317,000**

TABLE 9 - SUMMARY OF WASTEWATER FLOW RATES (continued)

Type of Land Use	North Stafford Road Area			Nannaquaket Pond Area			Lepes Road Area		
	Number of Connections	ADF For Planning (gpd)	Total Planning Flow (gpd)	Number of Connections	ADF For Planning (gpd)	Total Planning Flow (gpd)	Number of Connections	ADF For Planning (gpd)	Total Planning Flow (gpd)
Residential	103	300	30,900	-	300	-	122	300	36,600
Commercial	-	398	-	-	398	-	-	398	-
Industrial	-	398	-	-	398	-	-	398	-
Town	-	80	-	-	80	-	-	80	-
SubTotal	103		30,900	-		-	122		36,600
	Length of Pipe			Length of Pipe			Length of Pipe		
I/I	12,600		7,200	-		-	7,250		4,200
Total			**38,100**			**-**			**40,800**

Type of Land Use	Twin River Casio and Hotel Area		
	Number of Connections	ADF For Planning (gpd)	Total Planning Flow (gpd)
Residential			-
Commercial	1	40,600	40,600
Industrial	-		-
Town	-		-
SubTotal	1		40,600
	Length of Pipe		
I/I	3,092		1,400
Total			**42,000**

1. 10 State Standrads Requires 100 gpd/per capita for design on residential systems.
2. 2010 Census states 2.49 people/dwelling.
3. Sewered Area has 265 parcels.
4. Sewered Area has 125 parcels connected to the system.
5. Sewered Area has 550 connections per billing record. Therefore, average 4.4 connections per parcel.
6. Assumed 300 gpdim for new piping and 500 gpdim for existing piping for I/I calculation.
7. Assumed average pipe size at 8-inches for new pipe for I/I calculation.
8. The Wastewater Flow Summary does not include the Nanaquaket Pond Area estimated wastewater flows since the solution for this area was to be an on-site solution.

Wastewater Flow Summary	
ADF (gpd)	1,165,200
Misc. ADF (gpd)	60,000
Total ADF (gpd)	1,225,200
Peaking Factor	3.64
PDF (gpd)	4,455,600
I/I Flow (pgd)	146,000
Total Design Flow (gpd)	4,601,600

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6.0 FUTURE SITUATION

6.1 General

This section summarizes the physical, demographic, and infrastructure situation projected to occur in Tiverton by the year 2020. Future conditions reflect the zoning and infrastructure demands for which the proposed wastewater management facilities will include capacity. Projections of future conditions are based upon population data projections obtained from Rhode Island Statewide Planning.

Projections of future conditions are based upon population data projections contained in the 2004 Rhode Island Statewide Planning Population Projections and the 2006 Tiverton Comprehensive Community Plan (CCP). Future conditions are projected through the year 2033.

6.2 Land Use

As indicated in Section 6.3, "Demographics," growth in Tiverton leveled off after the year 2010 as expected. The future growth in the study area is expected to be high density residential and planned light industrial. A brief description of the future trends in various land use categories are as follows:

- ***Residential Land Use** - It is anticipated that future residential development in the study area will occur in all densities, as identified in Table 7. Development in high density residential areas will occur along Main Road and west side along Fish Road, assuming that the future land use plan is adhered to and that future subdivisions are environmentally feasible.*
- ***Commercial Land Use** - Commercial land use in the future is expected to follow existing and occur within established highway business corridors generally along Main Road and Fish Road. The Northeast Properties site (former Charter Oil) is anticipated to develop with mixed high density residential and commercial uses.*
- ***Industrial Land Use** - The Town Industrial Park is proposed in a 228-acre area at the intersection of Route 24 and Fish Road. Adjacent industrial development may also occur along Fish Road north of the Road intersection, including a potential area of acres (Douglass Property).*

The CCP presented Tiverton's future Land Plan, with a scope of analysis based upon the following:

- *Consider allocation of land for residential, business, industrial, municipal facilities, public and recreation, institutional facilities, mixed uses, open space, natural and fragile areas.*
- *Consider performance zoning as a means for determining lot area requirements.*

- *Reassess zoning regulations to ensure that developments that seek to enhance the identity of special areas are not precluded and projects that would destroy the identity of the Town are prevented.*
- *Explore zoning regulations to provide buffers between zones which have incompatible uses.*
- *Review currently allowed uses within commercial zones to reduce incompatibility, such as for commercial amusement businesses.*
- *Prepare and implement regulations with regards to the siting of utility and accessory structures.*
- *Inventory and evaluate town-owned property to determine its best use based on the comprehensive plan. Review inventory on a periodic basis as part of the capital planning process.*
- *Evaluate development options on vacant industrial property for possible re-zoning.*
- *Evaluate the potential to create a waterfront zoning district.*
- *Evaluate the need for professional technical services and update the fee structure for site plan, special exception and building permit review to cover costs of consultants.*

6.3 Demographics

County population projections prepared by Rhode Island Statewide Planning through the year 2030 are presented in Table 10. The population of Tiverton as of the 2000 census (15,260) was greater than the population predicted for 2000 in 1994 (14,473), a difference of approximately 5.4 percent. The projection in 2004 for 2010 was 15,704 while the actual total according to the 2010 census was 15,780, resulting in a difference between projected and actual of 0.5 percent.

TABLE 10 - NEWPORT COUNTY POPULATION PROJECTIONS

Municipality	2000	2005	2010	2015	2020	2025	2030
Jamestown	5,622	5,843	6,027	6,302	6,609	6,872	7,064
Little Compton	3,593	3,664	3,723	3,811	3,910	3,994	4,056
Middletown	17,334	17,350	17,364	17,385	17,408	17,427	17,442
Newport	26,475	26,086	25,763	25,278	24,737	24,275	23,937
Portsmouth	17,149	17,553	17,889	18,392	18,954	19,434	19785
Tiverton	15,260	15,502	15,704	16,006	16,342	16,630	16,841
Newport County	85,433	85,998	86,470	87,174	87,960	88,632	89,125

Source: Rhode Island Statewide Planning, Rhode Island Population Projections, August 2004.

6.4 Economics

6.4.1 Introduction

Tiverton's economic base is founded on farming and fishing, with a more recent growth in light industrial and commercial enterprises. The following three areas have been identified that would promote the economic growth retaining the original identity of the town:

- *Improvement on the existing attributes - agriculture and fishing;*
- *The investment and the environmentally sensitive planning that has been done for the ongoing industrial park development has the potential to provide growth opportunities for large, clean commercial enterprises; and*
- *Examination of the Town's regulations for possible changes to promote small business which could provide economic growth with little change to the face of the town.*

As noted in the 2000 Facilities Plan Update, historically, Tiverton's economic base was founded on farming and fishing. However, according to the CCO, there has recently been growth in the manufacturing, light industry and local commercial enterprises.

The following is from the Tiverton CCP:

- *Forty Five Percent of the Town's private industry jobs were in retailing, followed by services which accounted for twenty three percent. New commercial construction accounted for 206,803 sq. ft. from 1980 to 1989, with a total value of $10 million. Most of this construction was in small buildings of 15,000 sq. ft. or less. Industrial construction totaled only 9,200 sq. ft.*
- *A significant portion of North Tiverton is zoned for commercial and industrial uses. Tiverton has taken a proactive stance to promote economic activity by purchasing 228 acres of industrially zoned property near the Fish Road exit off Route 24. The town proposes to develop the property as a high-quality industrial park under the auspices of the Industrial and Recreational Commission. A site plan is in the process of being prepared for the park and the permitting process has begun. A 15 year build out has been projected.*
- *Market studies prepared for the park in 1988 indicate very little demand for unsewered industrial land in the market area. The Industrial and Recreational Commission has proposed to provide sewer extension to the industrial park. With proper infrastructure requirements in place the proposed project could be very competitive with other area industrial parks if it is developed as a high-end facility with signage and layout, and appropriate industrial infrastructure.*

- *Agricultural activities are a special form of economic enterprise in Tiverton. According to the Rhode Island Division of Agriculture and Marketing there are 28 agricultural enterprises in the town. These farms include dairy, sheep, hogs, fruits and vegetables, eggs and poultry, and Christmas trees. According to information from Rhode Island Geographical Information Systems approximately 2,100 acres in the town are in active agricultural use, totaling about 11 percent of the land area of the town.*
- *Tiverton has an active fishing industry which operates off its coast. A fleet of "Quahoggers" sail daily from Tiverton for grounds in the lower Sakonnet and Narragansett Bay. They bring their catch to the town's four fish markets.*

6.4.2 Tax Base

The Town's financial characteristics for FY 2012 are presented in Table 11.

TABLE 11 - FINANCIAL CHARACTERISTICS

	Fiscal Year 2012 (#1,000)	Percent
General Government	$1,466	3.15
Financial Administration	4,132	8.88
Public Safety	4,760	10.23
Health & Sanitation	781	1.68
Public Works	1,828	3.93
Associated Activities	515	1.11
Education	30,253	65.05
Parks and Recreation	207	0.45
Municipal Capital Expenditures	2,566	5.52
Total	$46,509	100.0

Source: FY 2012 Tiverton Financial Report.

The following was also obtained from the FY 2012 Tiverton Financial Report:

- Expenditure appropriations for the fiscal year 2012 amounted to $46,508,900.
- Educational services accounted for 65.05 percent of the total budget.
- Public works expenditures accounted for less than 4 percent of the total budget.

6.4.3 Economic Goals and Objectives

The town desires to expand economic opportunities and pursue forms of development that will maximize economic benefit with a minimal impact on the environment and character of Tiverton. Specific objectives include the following:

- *Promote mechanisms to encourage small business opportunities and job development;*
- *Formulate a commercial and industrial development strategy which creates opportunities to enlarge the tax base and is consistent with the character of the town;*
- *Preserve and maintain the fiscal ability of the town to deliver essential services and fund necessary public improvements;*
- *Promote the utilization of Tiverton's waterfront for water-dependent economic uses; and*
- *Preserve and protect agricultural activities which contribute to the economic life of Tiverton residents.*

The 2006 CCP affirmed the economic goals and objectives described above.

6.5 Wastewater Generation

At 100 percent build out of the nine study areas, the Wastewater Commission would have approximately 4,000 customers accounting for an estimated average daily flow of 1.37 million gallons per day (MGD). This flow is well below the ADF of 2.0 MGD allowed in the inter-municipal agreement (IMA) with Fall River (See Appendix 1). With a peaking factor of 3.66 applied to this flow (not including the I/I, which is not subject to diurnal factors) the peak flow for the system would be estimated to be 5.01 MGD, which is below the 6.0 MGD allowed by the IMA. Refer to Section 3 and Section 7 for a detailed discussion on wastewater generation.

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7.0 EVALUATION OF ALTERNATIVES

This section summarizes the evaluation of feasible alternatives for wastewater management within the study area. The alternatives developed are consistent with the Town's approved Wastewater Facilities Plan, and the Town's CCP.

This section summarizes the alternatives evaluated in the Wastewater Facilities Plan Update that was approved in 2000 and the alternatives being evaluated in this Facilities Plan Update. Existing alternatives will be evaluated in terms of their applicability to the current needs of the Town.

7.1 Unsewered Areas

Except for the small number of users at the RI/MA state line which are currently connected to the Fall River WWTF, none of the areas of North Tiverton are served by sanitary sewers. A majority of the area in North Tiverton also exhibits significant constraints to sewage disposal systems. As stated previously, an ISDS Wastewater Management Plan is being developed concurrently to address the Town's needs prior to the construction of any sewers.

At present, the Town has approximately 550 sewer customers located primarily in the North Tiverton area. Based on the existing connections, the zoning regulations for the Town, and the Comprehensive Community Plan it is estimated that at full build out approximately 600 new connections could be added to the existing sewer system. Currently, the areas of Tiverton not connected to the wastewater system are serviced by individual onsite wastewater disposal systems.

7.2 Optimum Use of Existing Facilities

Operation and maintenance of wastewater disposal systems should be in compliance with guidelines. The following are recommended measures that should be encouraged to optimize operation of systems:

- *Solids pumping should be performed on a regular basis, at least every 3 years;*
- *Attention should be given to limiting peaks in residential flow rates (i.e. doing fewer loads of laundry on a regular basis, rather than a large number in a single day); and*
- *Minimize extraneous water and surface runoff to leaching areas (i.e. redirect roof leader flows).*

State and local regulations regarding the use of onsite wastewater disposal systems have been revised since the Wastewater Facility Plan Update of 2000. The State of Rhode Island has implemented the 2007 Cesspool Phase Out Act which requires that all cesspools located within 200 feet of a qualified water body be replaced. The Town has adopted an Onsite Waste Disposal Program that meets State regulations. The program requires initial First Maintenance Inspections of existing systems, regular maintenance such as cleaning of effluent screens and pumpouts, and periodic follow-up inspections to document OWTS compliance and to adjust pumping schedules as required. The inspections help

to identify systems with potential problems before they fail and become an imminent threat to public health. Figure 12 shows the properties that have conducted inspections in an approximately 3 year period ending in July 2013.

7.3 Summary of Alternatives

The following sections describe the alternatives that were evaluated for the study area:

7.3.1 No Action

The existing on-site wastewater disposal facilities would be operated and maintained according to the guidelines to ensure proper functioning. No further action would be taken to install a municipal system for the conveyance and treatment of wastewater. This alternative is considered infeasible for the following reasons:

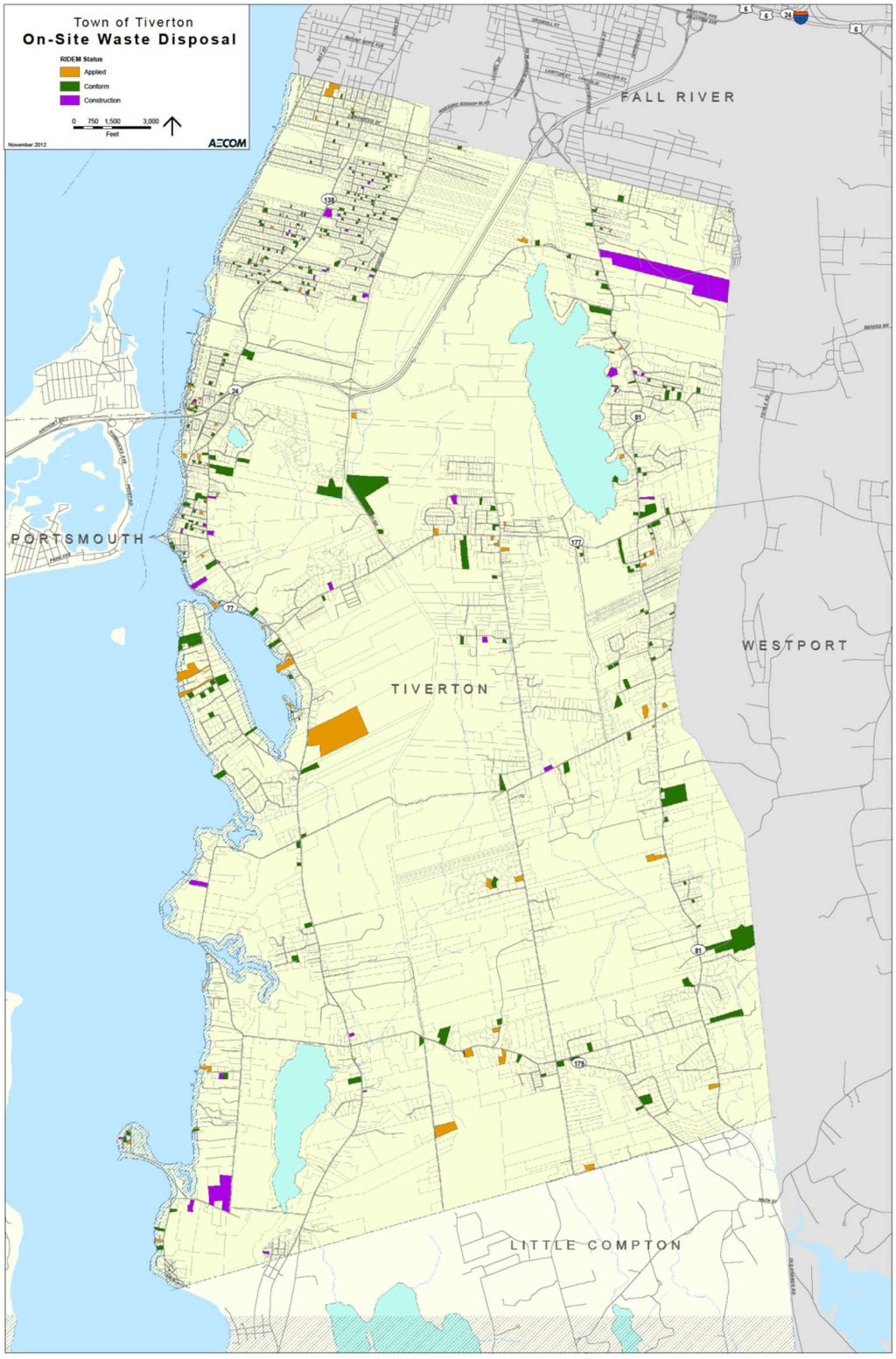
- *Potential public health problems due to on-site disposal of wastewater will continue, and may become more prevalent in the future as development density increases.*
- *Potential environmental impacts due to on-site disposal of wastewater will continue.*
- *In the study area limitations on land use due to the lack of adequate wastewater facilities would impact the feasibility of future development.*

In addition to the above reasons, the following additional reasons make this alternative infeasible:

- No action to replace cesspools would be in violation of the Cesspool Phase Out Act enacted by the State of Rhode Island in 2007.
- The high percentage of properties with failed on-site wastewater disposal systems would remain with additional failures anticipated.
- Continued use of inadequate on-site disposal of wastewater will continue to pollute groundwater and surface waters.

There are several areas of Town in which No Action is the preferred scenario. These areas are not subject to the Cesspool Phase Out Act and have sufficient land area to repair, replace or renovate existing onsite waste disposal systems and therefore have been excluded from the study area.

FIGURE 12 – ON-SITE SYSTEM INSPECTIONS



7.3.2 Upgrade/Replacement of Existing OWTS

Upgrades or replacements to existing onsite wastewater treatment systems are highly dependent on the site specific conditions including lot size, type of soils and depth to groundwater. As part of this evaluation five conditions were developed and reviewed as follows:

- Typical Septic System Installation - 4 bedroom house, good soil classification, good percolation rate, low groundwater level, and 1,500 gallon septic tank.
- Poor Soils and Low Groundwater Table - 4 bedroom house, poor soil classification, poor percolation rate, low groundwater level, a 1,500 gallon septic tank, and a mounded system or larger leachfield (up to 3,000 sq. ft.)
- Poor Soils and High Groundwater Table - 4 bedroom house, poor soil classification, poor percolation rate, high groundwater level, a 1,500 gallon septic tank, and a mounded system required and a larger leachfield probable.
- Advanced Treatment System - 4 bedroom house, good soil classification, good percolation rate, low groundwater level, and a 1,500 gallon septic tank.
- Advanced Treatment System with Difficult Site Conditions - 4 bedroom house, poor soil classification, poor percolation rate, high groundwater level, a 1,500 gallon septic tank, and a mounded system required or a larger leachfield.

7.3.3 Community Wastewater Treatment and Disposal

This alternative would consist of implementing a small community wastewater treatment and disposal system in the Study area, which typically utilize subsurface disposal in a location with suitable soils. This alternative is considered infeasible for the following reasons:

- *A sewer collection system to convey flows to the proposed site would still be required, hence implementation costs would not be significantly reduced; and*
- *A site with adequate soils for reliable subsurface disposal of the proposed wastewater flow rates is not available in the study area.*

Sites may be available for subsurface disposal of reduced flow rates, potentially serving residential uses only. However, this would not address the land use issues for development and would therefore place a greater financial burden on the residential users that would have to solely pay for the system. This alternative will be addressed further in the ISDS Wastewater Management Plan.

7.3.4 Sewering Alternatives

Nine needs areas (See Figure 3) were identified through the review of local and state regulations, the review of inspection reports, and the review of previous studies. These areas are as follows:

- Bay Street Area
- Church Street Area
- Garden Heights Area
- Lepes Road Area
- Twin River Casino and Hotel Area
- Mill Street Area
- North Stafford Road Area
- Riverside Drive Area
- Robert Grey Area

These areas are comprised primarily of small lots that have known issues with their onsite waste disposal systems. In addition, some of these areas contain properties that are subject to the 2007 Cesspool Phase Out Act. Upon the identification of the needs areas, a preliminary sewer design was established to aid in the preparation of cost estimates for each project area. The completed preliminary sewer design for North Tiverton was compared to the previous design prepared by C.E. Maguire in 1979. The two designs had some minor differences, but in general contained similar recommendations for the areas. Figures 13, 14 and 15 show the preliminary location of sewers and force mains, the location of required/recommended easements, and direction of flow for each section of pipe.

Not included in the Needs Areas is the Delano's Island Area on Nanaquaket Pond. This area consists of about 60 residential lots and would require about 3,000 feet of gravity sewer. Total flows for this area would be about 19,400 gallons per day (18,000 gal/day sanitary flow and 1,400 gal/day I/I). However, this area is very distant from the proposed sewer service areas and would be very expensive to connect to the proposed infrastructure. However, regulatory requirements may dictate that the residents in this area replace their on-site disposal systems or install advanced treatment systems. Further study is required to develop a suitable plan for this area.

FIGURE 13 – PRELIMINARY SEWER LAYOUT – NORTH TIVERTON

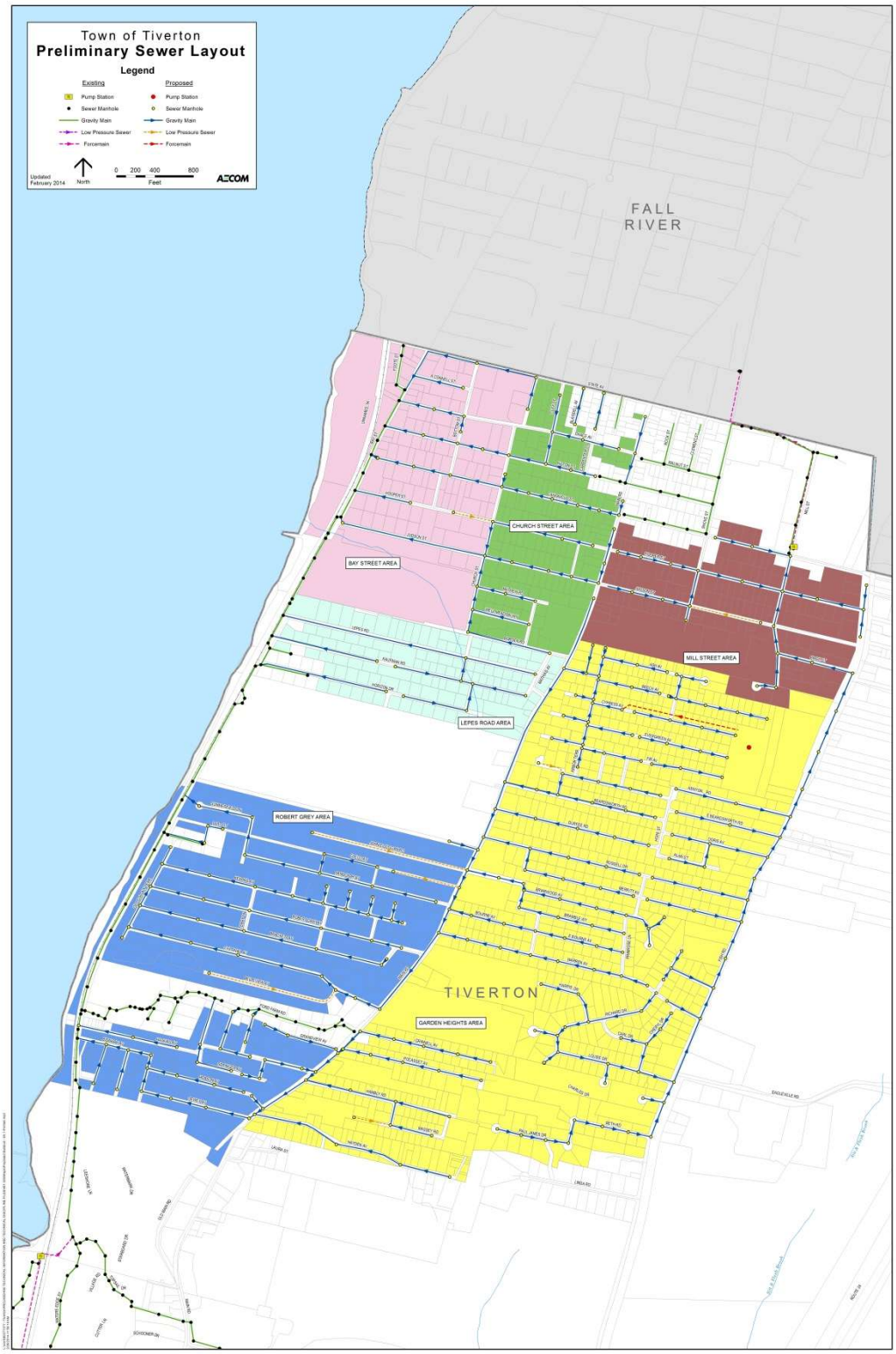


FIGURE 14 – PRELIMINARY SEWER LAYOUT – NORTH STAFFORD ROAD AREA

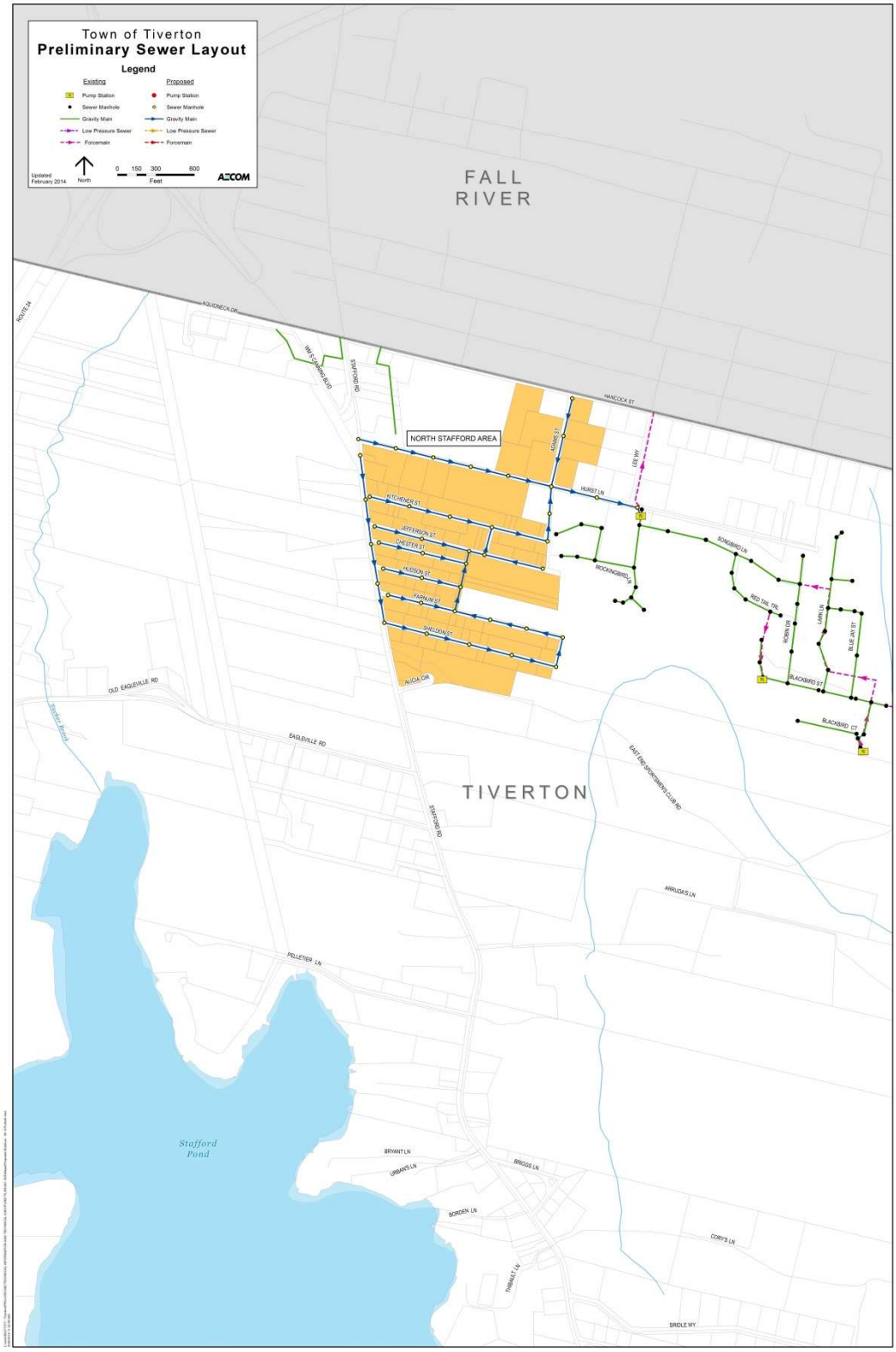
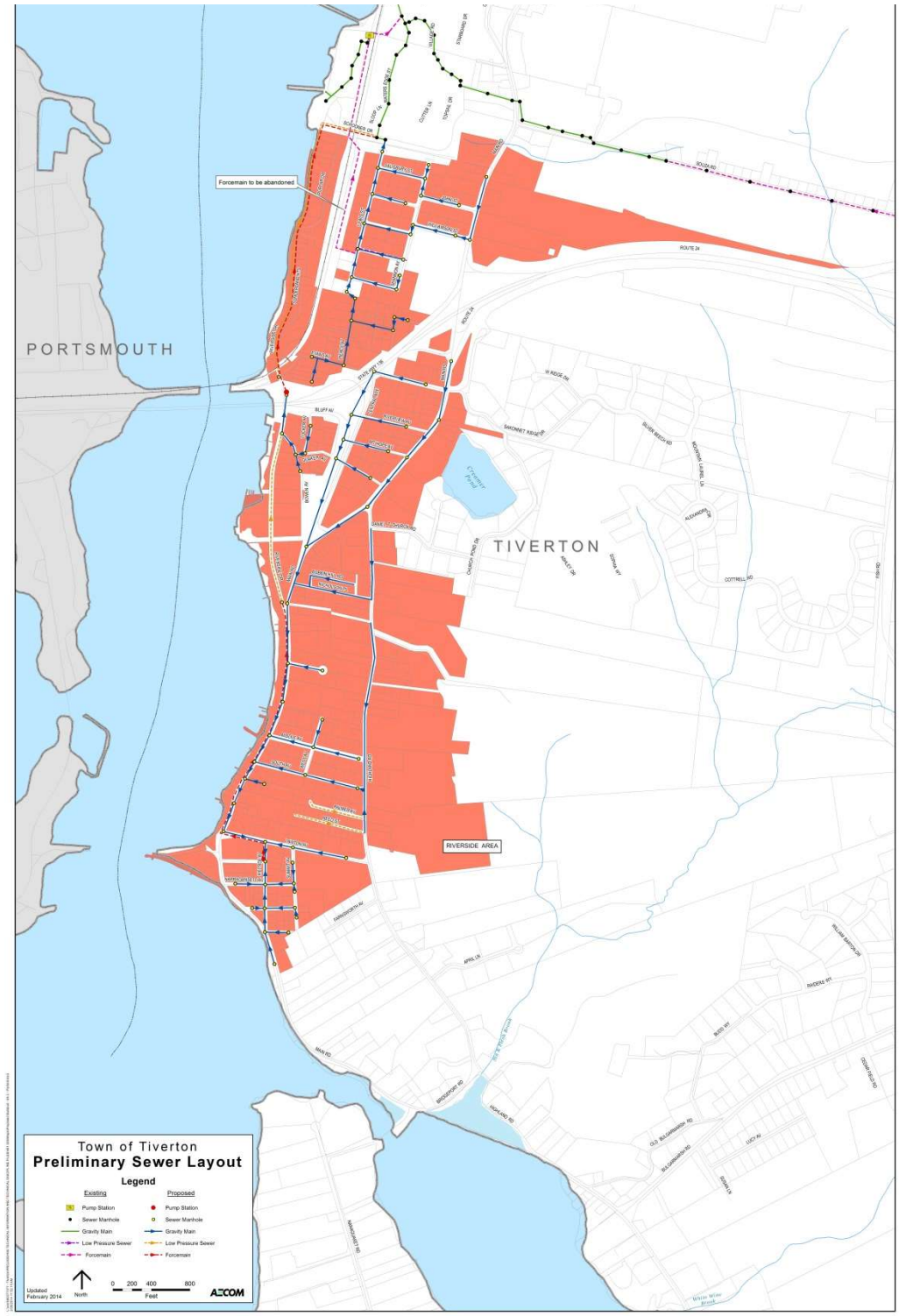


FIGURE 15 – PRELIMINARY SEWER LAYOUT - RIVERSIDE DRIVE AREA



7.3.4.1 Riverside Drive Area

The Riverside Drive Area is located approximately from Stone Bridge to Schooner Drive (See Figure 15). It is anticipated that the Riverside Drive Sewer Project will be divided into three phases. The first phase consists primarily of parcels subject to the 2007 Cesspool Phase Out Act. A majority of the parcels in Phase 1 of the Riverside Drive Area will be serviced by low pressure sewers due to the small lot size and narrow roads. The second phase would expand the sewer system in this area to along Highland Road with the third and final phase allowing properties west of but adjacent to Highland Road to connect. Preliminary cost estimates for the design and construction of the sewers in this area are contained in Section 7.4 of this plan. The Riverside Drive Area consists of approximately 600 parcels in total that will be serviced by 32,950 linear feet of gravity sewer, 6,500 linear feet of low pressure sewer and 6,600 linear feet of force main. Expansion into this area will require the construction of two pumping stations, one located in the vicinity of the Route 24 overpass and the other in the vicinity of Lawton Road (See Figure 15).

7.3.4.2 Bay Street Area

The Bay Street Area is located from Bay Street to Church Street and from Judson Street to the State Line. The area is located in North Tiverton. In the past, hazardous waste has been encountered in this area. It is anticipated that the Bay Street Area will be completed as one phase (See Figure 13). A portion of the Bay Street Area is subject to the 2007 Cesspool Phase Out Act. In addition, the Mount Hope Bay Interceptor is located in this area. The main connection to the City of Fall River, Massachusetts is located here. The Bay Street Area consists of approximately 125 parcels that will be serviced by 8,750 linear feet of gravity sewer and 450 feet of low pressure sewer.

7.3.4.3 Lepes Road Area

The Lepes Road Area is located between the Robert Gray Area and the Church Street Area (See Figure 13). The Lepes Road sewer project will be completed as one phase. The Lepes Road area consists of 120 parcels that will be serviced by 7,250 feet of gravity sewer.

7.3.4.4 The Church Street Area

The Church Street Area is bounded by Church Street on the east, Main Road on the west, Lepes Road to the south and the State Line to the North (See Figure 13). The work in this area will be completed in one phase. Similar to the Bay Street Area, the Church Street Area has a small amount of existing gravity sewer. The existing gravity sewer in this area will be replaced and re-routed to eliminate unnecessary connections to Fall River. The Church Street Area consists of approximately 180 parcels that will be serviced by 11,000 linear feet of gravity sewer. No portion of the Church Street Area is subject to the 2007 Cesspool Phase Out Act.

7.3.4.5 Robert Gray Area

The Robert Gray Area extends from the coast to Main Road and from Dewey Avenue to Robert E. Duggan Road (See Figure 13). It is anticipated that the Robert Gray area will be divided into three design and construction phases. The first phase will address the portion of the area that is subject to the 2007 Cesspool Phase Out Act. This area consists of approximately 580 parcels that will be serviced by 30,350 feet of gravity sewer and 3,800 feet of low pressure sewer. It is important to note that the proposed low pressure sewer for this area may be eliminated or reduced by obtaining the easements necessary to construct additional gravity sewers in the area.

7.3.4.6 Garden Heights Area

The Garden Heights Area is bounded on the east by Main Road, on the West by Fish Road, to the North by Ash Avenue and to the South by Hayden Avenue (See Figure 13). Due to the topography of the area, it is anticipated that the Garden Heights Area will be designed and constructed in two phases. Phase 1 of the Garden Heights Area will flow Westerly to Main Road. Phase 2 flows towards Fish Road, and will require the construction of an interceptor on Fish Road as well as one additional pumping station. The Fish Road interceptor as well as Phase 2 of Garden Heights area will ultimately flow to the Mill Street Pumping Station and be pumped into Fall River from there. The Garden Heights area consists of 950 parcels in total that will be serviced by 54,650 feet of gravity sewer main, and 1,300 feet of force main. The low pressure sewer may be replaced by gravity sewer if the necessary easements are obtained by the Town. No portion of the Garden Heights Area is subject to the 2007 Cesspool Phase Out Act.

7.3.4.7 Mill Street Area

The Mill Street Area is located east of the Church Street Area and north of the Garden Heights Area (See Figure 13). The Mill Street area contains a small amount of existing gravity sewer main, one pumping station, and a short run of sewer force main that connects into the Fall River wastewater system. The work associated with this project area will be completed in one phase. The Mill Street Area consists of 150 parcels that will be serviced by 7,850 feet of gravity sewer and 800 feet of low pressure sewer. The low pressure sewer may be replaced by gravity sewer if the Town is able to obtain the necessary easements. No portion of the Mill Street area is subject to the 2007 Cesspool Phase Out Act.

7.3.4.8 North Stafford Road Area

The North Stafford Road Area is bounded by the State Line to the north, East End Sportsmen's Club Road to the south, Adams Street to the east and Stafford Road to the west. There is a small amount of existing gravity sewer and one pumping station in this area. In addition there are three connections to Fall River. The North Stafford Road Area is comprised of 100 parcels and 12,600 feet of gravity sewer. No portion of the area is subject to the 2007 Cesspool Phase Out Act. It is anticipated that this area of Town will be sewered in one Phase.

7.3.4.9 The Twin River Casino and Hotel Area

The Twin River Casino and Hotel Area is located near the state line, west of William S Canning Boulevard (Route 81) and Hurst Lane and consists of approximately 46.6+/- acres which 20.2+/- acres will be developed. The Casino's preliminary design estimate indicates that the average daily flow will be 40,700 gpd. These flows will be pumped from the Casino property to a new gravity transmission main in Hurst Lane and Lee Way to the Fall River collection system. Wastewater flows will be treated at the Fall River Wastewater Treatment Facility.

7.3.4.10 Implementation of Sewer Expansion

The following areas and or portions of areas have been identified as high priority areas based on current local and state regulations and known problem areas:

- Phase 1 of the Riverside Drive Area,
- The Bay Street Area, and
- Phase 1 of the Robert Gray Area.

These areas will be the initial focus of sewer construction. Additional areas will be addressed in subsequent projects and the priority for those areas will be determined following discussions with the homeowners and the completion of the Public Hearing. Expansion into the areas not identified above has been deemed too costly at this point. The availability of funds, the outcome of the public meetings and hearings, and the results of further study regarding the Delano's Island Area will be the determining factor on the final Sewer District boundaries.

7.4 Preliminary Cost Estimates

7.4.1 Understanding Project Costs

- Betterments – A betterment covers the cost of designing and constructing the sewer system infrastructure in the public ways. Users have the option to pay for their betterment in one lump sum payment or over a period of time (typically 20 years) at a set interest rate. For example, if your betterment is $20,000, and you select to pay for it over a 20-year time period at an interest rate of 4%, your monthly payment would be $118. The exact method and details of assessing betterments has not been determined at this time.
- Private Property Connection - Individual sewer laterals will be constructed from the sewer line to each property boundary line by a Contractor hired by the Commission. However, additional costs are required to connect from the lateral to the building plumbing. The cost will vary depending on the length of sewer service pipe, unique site conditions, requirements for a pumping system, septic system decommissioning requirements, and the extent of site restoration required. These costs are estimated to average between $5,000 and $15,000. These costs have been included in the planning level project costs in order to compare alternatives. It has not been determined if the private property connection will be installed by the Commission or be the responsibility of the property owner. These costs, if installed by the Commission, will be recovered through a betterment.
- Private Plumbing Additions/Modifications - Individuals may elect to revise their interior

plumbing in order to connect to the sewer system infrastructure. These costs are not included in the planning level project costs and are the responsibility of the property owner. The cost will vary depending on the additions/modifications planned.

- Annual Sewer User Charge - Like all public utilities, there is a sewer service charge to each sewer user that pays for ongoing operation and maintenance of the public sewer system. The current sewer user charge is calculated based on the amount of water usage metered at each property. The amount paid per cubic foot of water usage is based on an increasing block rate schedule for both water usage and sewer service. The rates periodically change based on the cost to operate and maintain each system. The more you use, the more you pay. For example, for a single family residential house the sewer usage charge would be approximately $65 per month (base fee of $150 per year plus a disposal fee of $6.34 per 100 cubic feet of water used, assuming 27 cubic feet or 200 gallons of usage per household per day).
- On-site Wastewater Disposal System - On-site wastewater disposal systems have an expected useful life from between 20 to 30 years. Rehabilitation or replacement costs in order to provide proper wastewater treatment and disposal are not included in the planning level project costs and are the responsibility of the property owner. The cost will vary depending on the whether the system can be rehabilitated or requires replacement. In addition, costs will vary based on site specific conditions. It is also noted that the homeowner would be required to repeat the expenditure about 25 years later.

7.4.2 Development of Project Costs

As part of the development of this planning document, order-of-magnitude estimates were developed for the various components of the proposed expansion of the wastewater collection and transport system. Early during the planning phase, a summary of the major components was developed and used by the Commission and AECOM to discuss and ultimately agree upon the project's scope. This summary was used as a basis of the project level planning cost estimate.

The costs to expand a wastewater collection and transport system obviously vary with the layout configuration ultimately selected as well as the specific site conditions. Nonetheless, it is possible to put together a "menu" of system components required for each area of expansion. The costs presented are planning level costs and should be refined as additional informational details are identified and/or determined. This refinement to the project scope includes items such as the required depth of gravity sewers, depth to groundwater, types of soils and ledge anticipated to be encountered, and materials of construction. Refinement also includes types of process equipment, type of mechanical systems, redundancy and site

security, and types of control systems for wastewater pumping stations. In addition, project constraints, project schedule, and overall project complexity will impact project costs. It is recommended that planning level project costs be updated just prior to appropriation of funding for design and construction.

The planning level project costs are preliminary in nature and contain construction cost, construction contingencies, administrative, legal, construction engineering, environmental and regulatory permitting. The Class 4 opinion of probable construction costs were developed in accordance with "AACE International Recommended Practice No. 18R-97 - Cost Estimate Classification System – As Applied in Engineering, Procurement, and Construction for the Process Industries" as prepared by the Association for the Advancement of Cost Estimating (AACE) International dated February 2, 2005. Refer to Table 12 for the AACE International Cost Estimating classification system.

TABLE 12 - AACE INTERNATIONAL COST ESTIMATING CLASSIFICATION SYSTEM

	Primary Characteristic	*Secondary Characteristic*			
ESTIMATE CLASS	**LEVEL OF PROJECT DEFINITION** Expressed as % of complete definition	**END USAGE** Typical purpose of estimate	**METHODOLOGY** Typical estimating method	**EXPECTED ACCURACY RANGE** Typical variation in low and high ranges [a]	**PREPARATION EFFORT** Typical degree of effort relative to least cost index of 1 [b]
Class 5	0% to 2%	Concept Screening	Capacity Factored, Parametric Models, Judgment, or Analogy	L: -20% to -50% H: +30% to +100%	1
Class 4	1% to 15%	Study or Feasibility	Equipment Factored or Parametric Models	L: -15% to -30% H: +20% to +50%	2 to 4
Class 3	10% to 40%	Budget, Authorization, or Control	Semi-Detailed Unit Costs with Assembly Level Line Items	L: -10% to -20% H: +10% to +30%	3 to 10
Class 2	30% to 70%	Control or Bid/ Tender	Detailed Unit Cost with Forced Detailed Take-Off	L: -5% to -15% H: +5% to +20%	4 to 20
Class 1	50% to 100%	Check Estimate or Bid/Tender	Detailed Unit Cost with Detailed Take-Off	L: -3% to -10% H: +3% to +15%	5 to 100

Notes: [a] The state of process technology and availability of applicable reference cost data affect the range markedly. The +/- value represents typical percentage variation of actual costs from the cost estimate after application of contingency (typically at a 50% level of confidence) for given scope.
[b] If the range index value of "1" represents 0.005% of project costs, then an index value of 100 represents 0.5%. Estimate preparation effort is highly dependent upon the size of the project and the quality of estimating data and tools.

It is understood that AECOM has no control over costs of labor, materials, competitive bidding environments and procedures, unidentified field conditions, financial and/or market conditions or other factors likely to affect the opinion of probable project costs, all of which are and will unavoidably remain in a state of change. It is further understood that the probable project costs are a "snapshot in time" and that the reliability of this opinion of probable project costs will inherently degrade over time. Therefore, the probable project costs are based on an Engineering News Record (ENR) Construction Cost Index of 9542 for June 2013. Refer to Table 13 for a "menu" of planning level project costs and Table 14 for the planning level project costs for each of the proposed sewer system expansion areas.

Table 15 presents a comparison of the alternatives. The comparison was performed to compare the capital and operational costs for each of the upgrading/replacing onsite wastewater treatment system alternatives and construction of a wastewater collection system. Based on this economic evaluation it is recommended that a wastewater collection system be constructed.

TABLE 13 - MENU OF PLANNING LEVEL PROJECT COSTS

Description	Unit	Unit Cost
Onsite Wastewater Treatment Systems		
Typical Septic System Installation	Each	$15,000
Poor Soils and Low Groundwater Table	Each	$17,500
Poor Soils and High Groundwater Table	Each	$20,000
Advanced Treatment System	Each	$25,000
Advanced Treatment System with Difficult Site	Each	$50,000
Public Property		
Gravity Sewer	L.F.	$225
Force Main	L.F.	$160
Low Pressure Sewer	L.F.	$135
Pump Station	Each	$750,000
Private Property		
Gravity Sewer	L.F.	$100
Low Pressure Sewer	Each	$12,800
Contingency	Percent	15.00%
Inflation	Percent/Year	3.00%
Project Services	Percent	25.00%
Design Engineering	Percent	10.00%
Construction Engineering	Percent	12.00%
Town Administrative Costs/Financing	Percent	3.00%

TABLE 14 - PLANNING LEVEL PROJECT COSTS FOR THE PROPOSED SEWER SYSTEM EXPANSION AREAS

			Proposed Sewer System Expansion Area			
			Riverside Drive Area Phase 1		Riverside Drive Area Phase 2	
Description	Unit	Unit Cost	Quantity	Extended Total	Quantity	Extended Total
Construction						
Public Property						
Gravity Sewer	L.F.	$225	7,250	$1,631,250	18,200	$4,095,000
Force Main	L.F.	$160	6,650	$1,064,000		
Low Pressure Sewer	L.F.	$135	5,100	$688,500	1,400	$189,000
Pump Station	Each	$750,000	2	$1,500,000		
Private Property						
Gravity Sewer	L.F.	$100	5,040	$504,000	12,920	$1,292,000
Low Pressure Sewer	Each	$12,800	86	$1,100,800	24	$307,200
Sub-Total				**$6,488,550**		**$5,883,200**
Contingency				$973,283		$882,480
Sub-Total Construction Cost				**$7,461,833**		**$6,765,680**
Project Services *	Percent	25%	1	$1,865,458	1	$1,691,420
Total Estimated Project Cost				**$9,327,291**		**$8,457,100**

* Design and Construction Engineering and Town Administrative Costs/Financing

			Proposed Sewer System Expansion Area			
			Robert Gray Area Phase 1		Bay Street Area	
Description	Unit	Unit Cost	Quantity	Extended Total	Quantity	Extended Total
Construction						
Public Property						
Gravity Sewer	L.F.	$225	4,300	$967,500	8,750	$1,968,750
Force Main	L.F.	$160				
Low Pressure Sewer	L.F.	$135			450	$60,750
Pump Station	Each	$750,000				
Private Property						
Gravity Sewer	L.F.	$100	3,080	$308,000	4,640	$464,000
Low Pressure Sewer	Each	$12,800			7	$89,600
Sub-Total				**$1,275,500**		**$2,583,100**
Contingency				$191,325		$387,465
Sub-Total Construction Cost				**$1,466,825**		**$2,970,565**
Project Services *	Percent	25%	1	$366,706	1	$742,641
Total Estimated Project Cost				**$1,833,531**		**$3,713,206**

* Design and Construction Engineering and Town Administrative Costs/Financing

TABLE 14 (continued) - PLANNING LEVEL PROJECT COSTS FOR THE PROPOSED SYSTEM EXPANSION AREAS

			Proposed Sewer System Expansion Area			
			Robert Gray Area Phase 2		Robert Gray Area Phase 3	
Description	Unit	Unit Cost	Quantity	Extended Total	Quantity	Extended Total
Construction						
Public Property						
Gravity Sewer	L.F.	$225	16,250	$3,656,250	9,800	$2,205,000
Force Main	L.F.	$160				
Low Pressure Sewer	L.F.	$135	3,800	$513,000		
Pump Station	Each	$750,000				
Private Property						
Gravity Sewer	L.F.	$100				
Low Pressure Sewer	Each	$12,800				
Sub-Total				**$4,169,250**		**$2,205,000**
Contingency				$625,388		$330,750
Sub-Total Construction Cost				**$4,794,638**		**$2,535,750**
Project Services *	Percent	25%		$1,198,659		$633,938
Total Estimated Project Cost				**$5,993,297**		**$3,169,688**

* Design and Construction Engineering and Town Administrative Costs/Financing

			Proposed Sewer System Expansion Area			
			Garden Heights Area Phase 1		Garden Heights Area Phase 2	
Description	Unit	Unit Cost	Quantity	Extended Total	Quantity	Extended Total
Construction						
Public Property						
Gravity Sewer	L.F.	$225	27,200	$6,120,000	27,450	$6,176,250
Force Main	L.F.	$160			1,300	$208,000
Low Pressure Sewer	L.F.	$135	700	$94,500		
Pump Station	Each	$750,000			1	$750,000
Private Property						
Gravity Sewer	L.F.	$100				
Low Pressure Sewer	Each	$12,800				
Sub-Total				**$6,214,500**		**$7,134,250**
Contingency				$932,175		$1,070,138
Sub-Total Construction Cost				**$7,146,675**		**$8,204,388**
Project Services *	Percent	25%		$1,786,669		$2,051,097
Total Estimated Project Cost				**$8,933,344**		**$10,255,484**

* Design and Construction Engineering and Town Administrative Costs/Financing

TABLE 14 (continued) - PLANNING LEVEL PROJECT COSTS FOR THE PROPOSED SYSTEM EXPANSION AREAS

			Proposed Sewer System Expansion Area			
			Riverside Drive Area Phase 3		Lepes Road Area	
Description	Unit	Unit Cost	Quantity	Extended Total	Quantity	Extended Total
Construction						
Public Property			5,500	$1,237,500	7,250	$1,631,250
Gravity Sewer	L.F.	$225				
Force Main	L.F.	$160				
Low Pressure Sewer	L.F.	$135				
Pump Station	Each	$750,000				
Private Property						
Gravity Sewer	L.F.	$100	1,720	$172,000	4,880	$488,000
Low Pressure Sewer	Each	$12,800				
Sub-Total				**$1,409,500**		**$2,119,250**
Contingency				$211,425		$317,888
Sub-Total Construction Cost				**$1,620,925**		**$2,437,138**
Project Services *	Percent	25%		$405,231		$609,284
Total Estimated Project Cost				**$2,026,156**		**$3,046,422**

* Design and Construction Engineering and Town Administrative Costs/Financing

			Proposed Sewer System Expansion Area			
			Mill Street Area		Church Street	
Description	Unit	Unit Cost	Quantity	Extended Total	Quantity	Extended Total
Construction						
Public Property						
Gravity Sewer	L.F.	$225	7,850	$1,766,250	11,000	$2,475,000
Force Main	L.F.	$160				
Low Pressure Sewer	L.F.	$135	800	$108,000		
Pump Station	Each	$750,000				
Private Property						
Gravity Sewer	L.F.	$100	5,960	$596,000	7,320	$732,000
Low Pressure Sewer	Each	$12,800				
Sub-Total				$2,470,250		$3,207,000
Contingency				$370,538		$481,050
Sub-Total Construction Cost				**$2,840,788**		**$3,688,050**
Project Services *	Percent	25%		$710,197		$922,013
Total Estimated Project Cost				**$3,550,984**		**$4,610,063**

* Design and Construction Engineering and Town Administrative Costs/Financing

TABLE 15 - COMPARISON OF WASTEWATER DISPOSAL ALTERNATIVES

Description	Onsite Wastewater Treatment System*	
	Typical Septic System Installation	Poor Soils and Low Groundwater Table
Capital Cost - Installation	$15,000	$17,500
Monthly Payment (2 Percent Loan—10 years)	$140	$163
Monthly Operations and Maintenance	$11	$11
Estimated Total Monthly Cost	$151	$174

Description	Onsite Wastewater Treatment System*	
	Poor Soils and High Groundwater Table	Advanced Treatment System
Capital Cost - Installation	$20,000	$25,000
Monthly Payment (2 Percent Loan—10 years)	$186	$232
Monthly Operations and Maintenance	$24	$39
Estimated Total Monthly Cost	$210	$271

Description	Onsite Wastewater Treatment System
	Advanced Treatment System with Difficult Site
Capital Cost - Installation	$50,000
Monthly Payment (2 Percent Loan—10 years)	$464
Monthly Operations and Maintenance	$39
Estimated Total Monthly Cost	$503

Description	Wastewater Collection System **	
	Range of Costs	
Capital Cost - Installation	$11,000	$16,500
Monthly Payment (3 Percent Betterment—40 Years)	$40	$60
Monthly Operations and Maintenance	$65	$65
Estimated Total Monthly Cost	$105	$125

* Based on 10 year, 2 percent loan under the septic system replacement program

** Based on the formation of a Sewer District and receiving a 45 percent grant and a 40 year 3 percent loan from USDA Rural Development.

7.5 Environmental Impacts

Though the approach to design and construction of sewer expansion differs from the approach detailed in the 2000 Wastewater Facilities Plan Update, the areas serviced are substantially similar and the location of the interceptors are also similar, therefore, the potential environmental impacts will be substantially similar to those identified below.

The proposed sewer expansion areas include the connection into the existing Mount Hope Bay Interceptor along the abandoned railroad right-of-way which conveys the wastewater flows to the Fall River WWTF. The proposed sewer expansion is proposed to be designed and constructed in phases as shown in Table 16. It is recommend that this proposed schedule be considered flexible and be adjusted according to changing needs and availability of funding. Each of the phases of the project consists of substantially similar components. Therefore, the environmental impact to each of the proposed sewer expansion areas is substantially similar.

Potential environmental impacts of the selected alternative sewer system construction projects are summarized in the following paragraphs according to the regulatory jurisdiction affected:

- *Wetlands: Regulated wetlands are identified in several locations throughout the existing area (Figure 6). In new development areas all improvements, including wastewater facilities, will receive site plan review and approval. During this process, all potential wetlands impacts will be identified and mitigated according to regulations. RIDEM review and approval will also be required for construction of wastewater facilities within the existing areas. Construction of the sewers will occur within existing public right-of-ways and therefore have minimal environmental impact. Required permits, for items such as stream crossings during construction, will be obtained where applicable.*

  Hence, potential impacts to wetlands by wastewater facilities implementation in North Tiverton will be fully avoided and/or mitigated. It is anticipated that during the design phase the siting of wastewater system elements within existing wetlands will be avoided, particularly for pumping stations which are typically in low-lying locations where wetlands are likely to occur.

TABLE 16 - PROPOSED DESIGN AND CONSTRUCTION SCHEDULE

Phase Number	Description	Proposed Design and Construction Schedule
1	Riverside Drive Area – Phase 1 Robert Gray Area – Phase 1 Twin River Casino and Hotel Area	2014 thru 2019
2	Robert Gray Area – Phase 2 Robert Gray Area – Phase 3	2017 thru 2021
3	Lepes Road Area	2018 thru 2021
4	Garden Heights Area – Phase 1	2018 thru 2022
5	Bay Street Area Church Street Area	2019 thru 2024
[6]	Riverside Drive Area – Phase 2 Riverside Drive Area – Phase 3	2020 thru 2030
7	Mill Street Area	2025 thru 2030
8	Garden Heights Area – Phase 2	2030 thru 2035
9	North Stafford Road Area	2032 thru 2037”

- Flood Hazard Areas: A portion of the proposed interceptor and lateral sewers are located adjacent to flood hazard areas identified along the Mount Hope Bay (Figure 7). A majority of the proposed interceptor and lateral sewers are proposed to be constructed within existing roadway right-of-ways while the remaining will occur within proposed utility easements. The proposed utilities will be constructed above the regulatory flood height (100-year floodplain). Therefore, the construction of the proposed interceptor and lateral sewers will not be occurring in a flood hazard area. that the following actions will be taken to minimize the possibility of exfiltration of wastewater from the system: (a) exfiltration/infiltration tests will be performed on all gravity

sewers; (b) pressure tests will be performed on all force mains; and (c) vacuum tests will be performed on all sewer manholes.

Since the 2000 Wastewater Facilities Plan Update, the Mount Hope Bay Interceptor was constructed from the state line to approximately Schooner Road. It is not necessary for this interceptor to be lengthened or increased in diameter to accommodate the expansion of the system.

- *Public Water Supply: Surface and ground water supply sources will not be impacted by the proposed facilities. A benefit to groundwater is anticipated from the implementation of the sewer system, which will cease the existing discharge of wastewater to the subsurface through on-site systems* and to various surface water bodies through the existing stormwater system.

- Cultural Resources: The Mount Hope Bay interceptor is complete and no additional work is anticipated on it, so this interceptor will not trigger further review. However, a portion of the proposed interceptor and lateral sewers, including some gravity sewer, low pressure sewer and force main are located within 200 feet of the Bay, therefore, a Category B review by CRMC is anticipated. A majority of the proposed interceptor and lateral sewers are located within existing roadway right-of-ways while the remaining elements will be constructed within proposed utility easements and therefore no potential coastal resources impacts have been identified. It is recommended that this be reviewed during the design phase of the project.

  Based on the location of known sites and on environmental models developed by Historical Preservation and Heritage Commission, the general project area has a high likelihood of containing archeological sites associated with pre-colonial and colonial uses of the area. However, it likely that development of roads and houses has disturbed some or perhaps most of this area, destroying its archeological integrity. During the design phase, the need and extent of Phase I assessment study will be conducted to determine if any intact land surfaces have survived. This assessment may dictate the need for extensive Phase I subsurface testing in undisturbed areas (if applicable) to determine if there are archeological resources within the project area.

  The main benefit of the proposed wastewater management facilities will be the cessation of subsurface discharges of wastewater in the study area. Other positive environmental benefits of the selected plan include preservation of currently protected areas in concert with the town ordinance and other regulations such as wetlands and coastal jurisdictions. New development growth has not been projected beyond levels that can be sustained while maintaining the quality of North Tiverton.

7.6 Construction Impacts

In general, construction of the proposed interceptor and laterals will occur within existing public right-of-ways. However, in order to avoid the construction of additional pumping stations and/or individual pumping systems on private properties sewer easements will be required. It is anticipated that sewer pipe easements will be 20-feet wide for Town access and maintenance. In addition, private land takings of approximately 0.5 acres in size would be required for each of the proposed pumping stations. Post construction restoration of the easements and land takings will include loaming, seeding and plantings as appropriate.

The construction impacts for each of the proposed sewer expansion areas would be essentially the same. Minor short-term traffic impacts are anticipated during construction. The impacts would be minimized by the development and implementation of a traffic management plan. In addition, there are potential construction nuisance impacts such as noise, dust, site debris, and erosion. However, these impacts would be regulated by the Town through requirements included in the construction specifications.

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8.0 PLAN SELECTION

8.1 Selected Plan

The Plan that was described in the 2000 Facilities Plan update was a viable plan that addressed the needs of Tiverton at the time. However, only a portion of Phase 1 as described above was completed. Additional sewers have been constructed in Tiverton and connected to the Mount Hope Bay interceptor as part of various private construction projects.

The revised sewer plan will address those properties affected by the 2007 Cesspool Phase Out Act as well as those properties that are located in the Bay Street Area of Town first. Both of these areas are subject to official time tables for the design and construction of sewers. The parcels located within Cesspool Phase Out Sewer Project are subject to the 2007 Cesspool Phase Out Act, while the Bay Street Area is subject to an agreement between the Town and the Rhode Island Department of Environmental Management for hazardous waste mitigation in that area. These projects will be completed coincident with one another, but designed and bid as separate projects (See Figure 13 and Figure 15).

The Cesspool Phase Out Act Sewer Project will benefit approximately 290 parcels and will consists of two pump stations, 11,550 linear feet of gravity sewer main, 6,650 linear feet of force main, and 5,100 linear feet of low pressure sewer. The Bay Street Project will benefit approximately 125 parcels and will consist of approximately 8,750 linear feet of gravity sewer main. Completion of the remaining study areas will be based on the onsite wastewater treatment system inspections. Priority will be given to those areas with the greatest number of failing systems. It is anticipated that the priority will be as follows:

- Riverside Drive between Main Road and Highland Avenue;
- Robert Gray Area from Work done as part of the Cesspool Phase Out Sewer Project to Main Road; and
- Bay Street Area.

The order in which the projects will be completed may change based on the results of the onsite wastewater treatment system inspections. For the benefit of public health and the environment it is important that the areas with the greatest number of failing systems be addressed first. Therefore, until the inspections are completed throughout the entire Town, the final order for the project, or even the total number of phases cannot be determined.

8.2 Environmental Impacts of Selected Plan

Potential environmental impacts of the selected sewer system construction project are summarized in the following paragraphs according to the regulatory jurisdiction affected:

- ***Wetlands*** *- Regulated wetlands are identified in the vicinity of the Town Industrial Park, as well as in several locations throughout the existing area (Figure 6). In new development areas all improvements, including wastewater facilities, will receive site plan review and approval. During this process, all potential wetlands impacts will be identified and mitigated according to regulations. RIDEM review and approval will also be required for construction of wastewater within the existing areas.*

  The flows associated with the Town Industrial Park have been included in the flow projections, but there are no immediate plans to provide sewer to this area. If the industrial park area is sewered in the future, the above process will be followed.

  Hence, potential impacts to wetlands by wastewater facilities implementation in North Tiverton will be fully avoided or mitigated. It is anticipated that during the design phase the siting of wastewater system elements within existing wetlands will be avoided, particularly for pumping stations which are typically in low-lying locations where wetlands are likely to occur.

  As stated above, it is anticipated that during the design phase, the siting of the sewer pipes and pump stations will be done in such a manner as to avoid existing wetlands. The proposed pump stations may be located within the wetland buffer zone, but will not be located within any wetlands.

- ***Flood Hazard Areas*** - The Mount Hope Bay Interceptor was constructed within the abandoned railroad right-of-way. A majority of the Cesspool Phase Out Sewer Project is located within the 100-year flood plain, but it is anticipated that only gravity sewer mains and sewer force mains will be located within the 100-year flood plan. As is typical in wastewater conveyance systems, all piping networks will be designed with watertight joints to minimize the potential for exfiltration of wastewater into the groundwater/Bay. It is anticipated that the required sewer pump stations will not be located within the 100-year flood plain.

- ***Public Water Supply*** *- Surface and ground water supply sources will not be impacted by the proposed facilities. A benefit to groundwater is anticipated from the implementation of the sewer system, which will cease the existing discharge of wastewater to the subsurface through on-site systems.*

- ***Coastal Resources*** *- The proposed Mount Hope Bay Interceptor is within 200 feet of the Bay, therefore, a Category B review by CRMC is anticipated. Since the Interceptor is located entirely within the former railroad right-of-way, no potential coastal resources impacts have been identified. Potential benefits may be implemented along the Interceptor alignment by enhancing ground surface conditions with improvements such as removal of railroad ballast and introducing plantings, and potential placement of a biking/hiking trail in the abandoned right-of-way.* The Mount Hope Bay Interceptor has been constructed and underwent all of the required reviews. The Cesspool Phase Out Act Sewer Project will require construction of gravity sewer mains and sewer force mains within 200 feet of the Bay, therefore, a Coastal Resource Management Coalition (CRMC) review will likely be required. The gravity mains and the force mains will be constructed within the roadways and therefore, will not impact coastal resources.

  Based on the location of known sites and on environmental models developed by Historical Preservation and Heritage Commission, the general project area has a high likelihood of containing archeological sites associated with pre- colonial and colonial uses of the area. However, it is likely that the development of roads and houses has disturbed some, perhaps most of this area, destroying its archeological integrity. During the design phase, the need and extent of Phase I assessment study will be conducted to determine if any intact land surfaces have survived. This assessment may dictate the need for an extensive Phase I subsurface testing in undisturbed areas (if applicable) to determine if there are archeological resources within the project area. As cited above, though the likelihood of archeological sites surviving the development of the roads and houses in the study areas is small, it is still a possibility. Therefore during the design phase, an assessment will be done to determine if any archeological resources are present with the project areas.

- ***Temporary Construction Impacts*** *- Construction related impacts will occur when the project is implemented. Construction will occur within existing public right-of-ways and therefore have minimal environmental impact. Required permits for items such as stream crossings during construction will be obtained where applicable. Construction on state highways will require a permit through RIDOT Division of Maintenance. Potential construction nuisance impacts such as dust, site debris, and erosion will be regulated by the Town through requirements included in the construction specifications. The major construction item is the Mount Hope interceptor, which is along an abandoned railroad easement. The benefit of this proposed alignment is that it minimizes construction impacts to the business district and residential areas.* The construction impacts detailed above are consistent with the impacts anticipated for the work in the studies areas described in this update.

The main benefit of the proposed wastewater management utilities will be the cessation of subsurface

discharges of wastewater. Other positive environmental benefits of the selected plan include preservation of currently protected areas in concert with the Town zoning ordinance and other regulations such as wetlands and coastal jurisdictions. New development growth has not been projected beyond levels that can be sustained while maintaining the environmental quality of North Tiverton.

8.3 Selected Plan Summary

The following is a summary selected plan:

- Expand the existing wastewater collection system to service up to nine new areas of Town as identified as follows: (a) Riverside Area; and (b) Robert Gray Area; (c) Bay Street Area; (d) Church Street Area; (e) Lepes Road Area; (f) Garden Heights Area; (g) Mill Street Area; (h) North Stafford Road Area; and (i) Twin River Casino and Hotel Area. Additionally, the Delano's Island area on Nanaquaket Pond has been identified as requiring further study to develop a suitable alternative to everyone installing advanced treatment systems.
- Under the recommended scenario, the number of connections would increase from 550 up to 4,000;
- The average daily flow would increase from 90,000 gallons per day to approximately 1,369,000 gallons per day;
- The selected plan will be phased over a period of at least 10 years with the first phase being areas with the most critical environmental concerns, followed by other areas based on economics and need;
- Create a Sewer District that encompasses the existing and future sewer collection areas so that only properties located within the Sewer District will be responsible for the costs to design, construct and operate the system;
- Develop a Capital Improvement Plan and associated financial plan which results in a financially stable and self-sufficient operation; and
- Research and apply for, as applicable, funding sources including grants and low interest loans in order to reduce the burden of costs on the rate payers and users of the system.

9.0 PLAN IMPLEMENTATION

9.1 General

This section summarizes the considerations included in implementation of the selected alternative in the study area.

9.2 Institutional Responsibilities

The institutional responsibilities involved in expanding, maintaining, and effectively operating the Tiverton's wastewater facilities are summarized in Table 17.

TABLE 16 - INSTITUTIONAL RESPONSIBILITIES

1. Maintain the existing Intermunicipal Agreement with Fall River to obtain wastewater treatment capacity at the Fall River WWTF.
2. Provide Operation and Maintenance services for the facilities, including adequate staffing and equipment, compliance monitoring, record keeping, etc.
3. Continue to regulate new development in accordance with the Town Zoning Ordinance, limiting development to locations with suitable soils and site conditions.
4. Administer sewer construction contracts, user connections, and fee structures.
5. Draft Special Legislation to form a Sewer District that will allow use of the USDA Grant and Loan Program. Special legislation will be drafted so as to allow each service area to vote individually to become part of the sewer district. Upon becoming a part of the sewer district, which benefits from the USDA grant and loan program, residents will be responsible for betterments and sewer use fees rather than bearing the full cost of upgrading/compliance without the grant and loan program.
6. Implement bonding to finance the construction phases of the selected alternative. Establish a betterment assessment which includes user contributions that will pay for their relative use of facilities.
7. Update Sewer Rules and Regulations.
8. Maintain the currently established Wastewater Management Commission in performing its two objectives: (a) Collection/transport system overview; and (b) Town's on-site disposal system overview (via collection funding from the Town).

9.3 Implementation Steps

A proposed implementation schedule for the selected alternative is as follows:

Step 1 As indicated in Table 17, the Town will identify and obtain the resources for implementation of the project according to an affordable phasing schedule. A preliminary financing schedule has been developed in Section 10.

The following items need to be addressed as part of the development of the Sewer District and implementing the recommended project:

- Statement of Need
- Boundaries
- Powers
- Meetings
- Board Composition
- Elections
- Acquisition of Facilities (Transfers)
- Eminent Domain
- Annual Report
- Rules
- Sewer Connections
- Laying Pipe
- Ability to Receive Federal and State Grants and Loans
- Ability to Contract
- Notice of Entry
- Pretreatment
- Inspection
- Penalties
- Enforcement
- Sewer Charges, Fees, Assessments and Rates
- Bonds
- Reserves
- Notes
- Tax Exemption
- Authority to Borrow
- Right to tax

Step 2 The Town will coordinate with the City of Fall River to expand administrative framework per the existing Intermunicipal Agreement, as necessary. A copy of the existing Agreement is included in Appendix 1.

Step 3 The construction of the sanitary sewer system will be completed in multiple phases as described in Section 8.1. The Town intends to establish a policy to require mandatory tie-ins upon completion of each construction phase. It is anticipated that the policy will include deferment for those property owners that have recently replaced failed on-site systems. At this time, the Town has not estabilished the details of the mandatory tie-in policy.

9.4 Operation and Maintenance

The Operations and Maintenance (O&M) of the system will continue to be the responsibility of Tiverton's Department of Wastewater Management, under the direction and funding of Tiverton's Wastewater Management Commission. The collection system will continue to be maintained in compliance with all local and state regulations and in accordance with standard practices for wastewater facilities and the existing O&M procedures.

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10.0 PROJECT FINANCING

10.1 Plan Financing

This Section addresses the financing of implementation of the selected plan. Project costs are summarized, including both capital costs and operation and maintenance costs which will be associated with wastewater management facilities. A preliminary cost allocation scheme presents methods for determining the fair share of project costs to be borne by users.

As anticipated, project financing was a key item of interest and comment during the public participation of this Wastewater Facilities Plan Update. During the public informational meetings, the residents generally accepted the recommended plan for expanding sewers into the various neighborhoods, but requested additional details and the development of policies prior to committing to the proposed plan.

10.2 Project Cost/Fee Descriptions

Table 18 summarizes the types of project costs and fees that will be incurred during implementation of the wastewater management facilities.

TABLE 17 - PROJECT COST/FEE DESCRIPTIONS

TYPE	DESCRIPTION	TYPICAL RANGE
Debt [1]	Principle and interest payments to retire the bond (3% at 40 year)	$40 to $60 per month for average residential user
Connection Fee [2]	One-time fee paid by each user at the time of connection to the system	To be determined
Facilities Assessment	One-time fee paid by large users for share of costs of downstream facilities	Depends on capacity needed
Sewer User Fee [3]	On-going costs for O&M of the WWTF and Sewer District based on water use	$65 per month for average residential user

Notes:

[1] Based on forming a Sewer District and receiving a 45 percent grant and a 40 year 3 percent loan from USDA Rural Development.

[2] Connection fee included in Debt for users who connect within one year after acceptance of the system and authorization to connect. After one year a connection fee will be charged.

[3] Based on average usage of 27 cubic feet (200 gallons) per day, current sewer user fee of $150 per year and $6.24 per 100 cubic feet of water usage.

10.3 Project Costs

10.3.1 Capital Costs

The estimated project capital costs (construction and engineering) were presented in Section 7 based on an Engineering News Record (ENR) Construction Cost Index of 9542 for June 2013.

The project capital costs are estimated to be $82,584,000 which are planned to occur over six phases during a 15 to 20 year period. Table 19 summarizes the estimated project capital costs. Table 20 summarizes the estimated project capital costs by service area.

TABLE 18 - ESTIMATED PROJECT CAPITAL COSTS

Description	Estimated Costs
Construction	$57,449,000
Contingency	$8,617,000
Sub-Total Estimated Construction Cost	$66,066,000
Project Services *	$16,518,000
Total Estimated Project Cost	$82,584,000

* Design and Construction Engineering and Town Administrative Costs/Financing

TABLE 20 - ESTIMATED PROJECT CAPITAL COSTS

Description	Riverside Drive Area -Phase 1	Riverside Drive Area -Phase 2	Robert Gray Area -Phase 1	Bay Street Area
Construction	$6,489,000	$5,883,000	$1,276,000	$2,583,000
Contingency	$973,000	$882,000	$191,000	$387,000
Sub-Total Estimated Construction Cost	$7,462,000	$6,765,000	$1,467,000	$2,970,000
Project Services *	$1,866,000	$1,691,000	$367,000	$743,000
Total Estimated Project Cost	$9,328,000	$8,456,000	$1,834,000	$3,713,000

Description	Robert Gray Area - Phase 2	Robert Gray Area - Phase 3	Garden Heights Area - Phase 1	Garden Heights Area - Phase 2
Construction	$6,286,000	$2,833,000	$8,295,000	$8,954,000
Contingency	$943,000	$425,000	$1,244,000	$1,343,000
Sub-Total Estimated Construction Cost	$7,229,000	$3,258,000	$9,539,000	$10,297,000
Project Services *	$1,807,000	$815,000	$2,385,000	$2,574,000
Total Estimated Project Cost	$9,036,000	$4,073,000	$11,924,000	$12,871,000

Description	Mill Street Area	Church Street Area	North Stafford Road Area	Riverside Drive Area - Phase 3
Construction	$2,470,000	$3,207,000	$3,247,000	$1,410,000
Contingency	$371,000	$481,000	$487,000	$212,000
Sub-Total Estimated Construction Cost	$2,841,000	$3,688,000	$3,734,000	$1,622,000
Project Services *	$710,000	$922,000	$934,000	$406,000
Total Estimated Project Cost	$3,551,000	$4,610,000	$4,668,000	$2,028,000

Description	Lepes Road Area	Existing System Buildout
Construction	$2,119,000	$2,397,000
Contingency	$318,000	$360,000
Sub-Total Estimated Construction Cost	$2,437,000	$2,757,000
Project Services *	$609,000	$689,000
Total Estimated Project Cost	$3,046,000	$3,446,000

* Design and Construction Engineering and Town Administrative Costs/Financing

On March 18, 2013, the Commission and AECOM met with USDA Rural Development to discuss the ability to obtain funding for the recommended plan through USDA's Grants and Loans Program.

A summary of USDA's Grant and Loan program follows.

- A separate contract and loan application would be required for each project. Each project would then be eligible for:
  - ✓ 45 percent grant;
  - ✓ 2.5 to 3 percent loan, 40 year payback; and
  - ✓ Combined $2M to $3M in funding per year.
- It was noted that USDA typically does not fully utilize its yearly allocation and additional yearly funding may be available by applying through the Town's political representatives.

It was noted that there are two key eligibility requirements: population and median income.

- Population – Population must be less than 10,000. The Town of Tiverton does not qualify since its population from the 2012 US Census is approximately 15,200. However, if a Sewer District was established with a population less than 10,000, the project would qualify.
- Median Income – Median Income must be less than national median income. The Town of Tiverton does qualify based on information from North Tiverton Water District and Stonebridge Water District. If additional information is required, a house-to-house survey could be conducted limited to the proposed service area.

Based on the formation of a Sewer District and utilizing grants and loans through USDA as presented above, the range of costs for the average residential user is estimated to range between $11,000 and $16,500. This equates to an average payment between $40 and $60 per month (3 percent loan, 40 year payback).

10.3.2 Operations and Maintenance Costs

The O&M costs will be paid by all users of the sewer system, with fees including the following items:

- The user's proportionate share of the O&M of the Fall River WWTF
- The user's proportionate share of future capital improvements to the Fall River WWTF and Fall River collection system

- Any surcharges due to Fall River for treatment of flows in excess of the agreed capacity available to the users (2.0 MGD average daily flow, 6.0 MGD peak flow)
- O&M of the Tiverton's sewer collection system and pumping stations

The user's proportionate share of the O&M of the Fall River WWTF would be based on the actual measured flow received at the WWTF from Tiverton. Chagres to individual Tiverton users would be in accordance with the Intermunicipal Agreement administered by the Town (See Appendix 1). Sewer use billings are based on water supply consumption. Future upgrades to the Fall River WWTF and collection system that may cause the fee to increase. For example, future upgrades may be required if increased levels of treatment are mandated by revised regulatory requirements.

Like all public utilities, there is a sewer service charge to each sewer user that pays for ongoing operation and maintenance of the public sewer system. The current sewer user charge is calculated based on the amount of water usage metered at each property. The amount paid per cubic foot of water usage is based on an increasing block rate schedule for both water usage and sewer service. The rates periodically change based on the cost to operate and maintain each system. For example, for a single family residential house the sewer usage charge would be $65 per month (base fee of $150 per year plus a disposal fee of $6.34 per 100 cubic feet of water used, assuming 27 cubic feet or 200 gallons of usage per household per day).

10.4 Cost Allocation

The proposed sewer system infrastructure will be allocated via the mechanisms described below.

- Betterment - Covers the cost of designing and constructing the sewer system infrastructure in the public ways, including service connections up to the private property line. Users have the option to pay for their betterment in one lump sum payment or over a period of time (typically 20 years) at a set interest rate. For example, if a homeowner's betterment is $20,000, and he selects to pay for it over a 20-year time period at a 4 percent interest rate, the monthly payment would be $118.
- Private Property Connection – As stated above, individual sewer service connections will be constructed from the Town sewer line to each property boundary line by the Town's Contractor, and the cost for this service connection is included in the betterment. However, there is an additional cost for the pipe between the property line and the building plumbing, which is estimated to cost between $5,000 and $15,000, depending on the length of sewer service pipe, unique site conditions, requirements for a pumping system, septic system decommissioning requirements, and the extent of site restoration required. Depending on regulatory requirements, these costs may be the responsibility of the individual homeowners or may be covered by a betterment (separate from the betterment for construction of utilities within public ways).
- Private Plumbing Additions/Modifications - Individuals may elect to revise their interior plumbing in order to connect to the sewer system infrastructure. These costs are not included in the betterment(s) or Private Property Connection costs and are the responsibility of the property owner. The cost will vary depending on the additions/modifications planned.

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11.0 PUBLIC PARTICIPATION PROGRAM

11.1 Program Summary

The public participation program for the Tiverton Wastewater Facilities Plan consists of the following elements:

A. Conduct public meetings to review the draft Wastewater Facilities Plan Update, at a specified time during regularly scheduled Wastewater Management Commission meetings. The primary purpose of these meetings is to determine the scope of project, the goals of the project, review data and information, identify project areas, financing options, project schedule, and obtain information from Town departments and officials and general public. Interested members of the public may also attend the meetings and provide preliminary comments according to the bylaws governing public meetings.

B. Conduct public informational meetings to present the draft Wastewater Facilities Plan Update and give the residents of the proposed areas to be sewered the opportunity to review and discuss all aspects of the plan. The Wastewater Management Commissioners, The Superintendent, and the Town's Consultant, AECOM, will be in attendance to address questions that are asked.

C. Conduct a Public Hearing to present the draft Wastewater Facilities Plan Update and receive comments from the Town Council and the public. A public hearing record will include comments from members of the Town Council, the public, and local agencies. The Wastewater Management Commissioners, the Superintendent, and the Town's Consultant, AECOM, will be in attendance.

D. A public information program will be developed in order to bring the proposed sewer project to the public, solicit public input, and answer questions. As part of this program, a project binder has been put in three public locations so that the public can view the document as it evolves. These locations are: (a) Town Hall; (b) Wastewater Management Commission Offices located at The Community Center; and (c) the Essex Library.

11.2 Agency Correspondence and Comments

As part of the review and approval process, the Town of Tiverton submitted the draft Wastewater Facility Plan Update to the following regulatory agencies:

Mr. Art Zeman, P.E., Principal Engineer
Wastewater Treatment Facilities Program
State of Rhode Island
Department of Environmental Management
Office of Water Resources
235 Promenade Street
Providence, RI 02908-5767

RI Department of Environmental Management
Division of Fish and Wildlife
Great Swamp Field Headquarters
277 Great Neck Road
West Kingston, RI 02892

Mr. Robert A. Smith, P.E.
Deputy Chief Engineer
Rhode Island Department of Transportation
Two Capitol Hill, Rm 224
Providence, RI 02903-1124

Ms. Nancy Hess
Principal Environmental Planner
Rhode Island Statewide Planning Program
One Capitol Hill
Providence, RI 02908

Mr. John Brown
Historic Preservation Officer
Narragansett Tribal Historic Preservation Office
215 Fenner Hill Road
Hope Valley, RI 02832

Mr. Edward F. Sanderson, Executive Director
State Historic Preservation Office
Historical Preservation & Heritage Commission
Old State House
150 Benefit Street
Providence, RI 02903-1029

NOAA/NMFS
Habitat Conservation Division
212 Rogers Avenue
Milford, CT 06460

Mr. Grover J. Fugate, Executive Director
Coastal Resources Management Council
Oliver H. Stedman Government Center
4808 Tower Hill Road – Suite 3
Wakefield, RI 02879-1900

The Town of Tiverton, through its Wastewater Management Committee, submitted a request to and received a response from the City of Fall River regarding the acknowledgments of the recommendations in this Wastewater Facility Pan Update and the ability of the City to accept, transport and treat the future flows presented in the Wastewater Facility Pan Update. Refer to Appendix 8 for the correspondence sent and letter received from the City of Fall River

11.3 Public Comments

Three public information meetings were held which were intended to give the residents of the proposed areas to be sewered the opportunity to review, and discuss all aspects of the plan. A presentation of the draft Wastewater Facilities Plan Update was made, with questions and comments following from the public. The Wastewater Management Commissioners, the Superintendent, and the Town's Consultant, AECOM, were in attendance. The three public information meetings are summarized as follows:

- A public informational meeting for the Bay Street neighborhood was held on April 22, 2013 at the Tiverton Community Center. Although the meeting was targeted to discuss the needs of the Bay Street neighborhood, the meeting addressed why, where, when and how much for all of the proposed sewer projects.
- A public informational meeting for the Riverside Drive neighborhood was held on April 29, 2013 at the Tiverton Community Center. Although the meeting was targeted to discuss the needs of the Riverside Drive neighborhood, the meeting addressed why, where, when and how much for all of the proposed sewer projects.
- A public informational meeting for the Robert Gray neighborhood was held on May 8, 2013 at the Tiverton Town Hall. Although the meeting was targeted to discuss the needs of the Robert Gray neighborhood, the meeting addressed why, where, when and how much for all of the proposed sewer projects.

A public hearing was held on June 17, 2013 at the Tiverton High School which was intended to present the draft Wastewater Facilities Plan Update. A presentation of the draft Wastewater Facilities Plan Update was made, with comments received from the Town Council and general public. The Wastewater Management Commissioners, the Superintendent, and the Town's Consultant, AECOM, were in attendance. The public hearing was videotaped and can be found at Tiverton Videos using the following link: http://tivertonvideos.blogspot.com

11.4 Responsiveness Summary

Refer to Appendix 4 for a copy of the advertisement, presentation, attendance sheets and handout from the three public informational meetings.

Refer to Appendix 5 for a copy of the questions and answers from the three public informational meetings.

Refer to Appendix 6 for the advertisement, presentation, attendance sheets and summary of the questions and answers from the Public Hearing.

Refer to Appendix 7 for the newspaper articles about the project.

Refer to Appendix 8 for copies of correspondence to the Regulatory Agencies and responses as well the City of Fall River, MA.

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APPENDIX 1 – INTERMUNICIPAL AGREEMENT

AGREEMENT FOR WASTEWATER TREATMENT
BETWEEN
CITY OF FALL RIVER, MASSACHUSETTS
AND TOWN OF TIVERTON

THIS AGREEMENT, made and entered into this 25th day of June, 1996, by and between the City of Fall River, a Municipal Corporation within the Commonwealth of Massachusetts, in the County of Bristol, acting through its Sewer Commission, hereinafter called the "City", party of the first part, and the Town of Tiverton, a Municipal Corporation, in the County of Newport, State of Rhode Island, acting through its Tiverton Sewer Commission, hereinafter called the "Town", party of the second part, and

WHEREAS, the City owns and operates a wastewater treatment works in order to treat wastewater originating in the Town and the City, and

WHEREAS, the Town intends to discharge into the City wastewater collection and/or treatment system sanitary and/or industrial wastewaters for treatment in City's wastewater treatment works, and

NOW THEREFORE, in consideration of these premises and mutual benefits to be derived by the parties hereto, an Agreement is prepared in the following form:

SECTION 1. DEFINITIONS

Section 1.1 - For the purpose of this Agreement, the following terms are defined:

1.1.1 "Average Daily Flow" shall mean the total annual flow as measured at the metering station, divided by the number of days in the year.

1.1.2 "Biochemical Oxygen Demand" (abbreviated BOD) shall mean the quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedure in five (5) days at 20 degrees Centigrade (68 degrees Fahrenheit) expressed in milligrams per liter by weight (or pounds per day) .

1.1.3 "Industrial Wastes" are the liquid wastes, other than sanitary sewage, resulting from manufacturing and/or industrial operations or processes or drains.

1.1.4 "Maximum Daily Flow" shall mean the maximum flow recorded at the metering station during a 24-hour period during any calendar year.

1.1.5 "Metering Station" shall mean a suitable facility for measuring, recording, and totalizing the flow of wastewater from the Town to the Fall River Sewer System.

1.1.6 "Sanitary Sewage shall mean sewage discharging from the sanitary conveniences such as toilets, washrooms, urinals, sinks, showers, drinking fountains and from kitchens, restaurants, cafeterias and floor drains from industrial, manufacturing or process areas essentially free of industrial wastes or toxic materials.

1.1.7 "Shall" is mandatory; "may" is permissive.

1.1.8 "Total Suspended Solids" (abbreviated TSS) shall mean solids that either float on the surface of, or are in suspension in water, or sewage, or wastewater, or other liquids and which are removable by laboratory filtering, expressed in milligrams per liter by weight (or pounds per day).

1.1.9 "User Charges" shall mean a charge levied on users of the wastewater facilities for the cost of operation and maintenance.

1.1.10 "Wastewater" shall mean the spent water of the participating municipalities and may be a combination of the liquid and water carried wastes from residences, commercial buildings, industrial plants and institutions, together with any infiltration/inflow that may be present.

1.1.11 "Wastewater Treatment Facilities" shall mean all facilities for collection, conveying, pumping, treating and disposing of wastewater

1.1.12 "Town Flow" means the amount of average daily flow of wastewater flowing into the City from the Town.

SECTION 2. RESPONSIBILITIES OF CITY

Section 2.1

The City shall operate and maintain the City's wastewater treatment facility.

Section 2.2

The City shall receive, transport and dispose of the Town's sanitary and industrial wastewater provided the Town agrees to

adopt such rules, regulations and/or by-laws as are necessary to secure compliance by system users with the standards provided for within this agreement or as otherwise may be amended or in accordance with any applicable local, State or Federal regulations.

Section 2.3

The City shall receive the Town's wastewater at a location or locations mutually agreeable to both parties, the physical connection being subject to the approval of the City.

Section 2.4

The City, on behalf of and as an agent for the Town, will perform technical and administrative duties necessary to implement and enforce the Town's sewer use ordinance. The City will: (1) update the industrial waste survey; (2) issue permits to all users required to obtain a permit; (3) conduct inspections, sampling, and analysis; (4) take all appropriate enforcement action as outlined in the City's enforcement response plan; and (5) perform any other technical or administrative duties the parties to this agreement deem appropriate. In addition, the City may, as an agent of the Town, take emergency action to stop or prevent any discharge which presents or may present an imminent danger to the health or welfare of humans, which reasonably appears to threaten the environment, or which threatens to cause interference, pass through, or sludge contamination. The Town shall provide the necessary support to enforce the applicable regulations.

SECTION 3. RESPONSIBILITIES OF TOWN

Section 3.1

The Town shall maintain the existing wastewater collection facilities including a metering Station which shall be installed when a sewer interceptor is built prior to entering the City limits. If the Town plans to expand sewer services to other areas of the Town, the Town shall be responsible for financing, planning, constructing and maintaining such wastewater collection facilities. Expansion of sewer services to other areas of the Town would require approval by the City if Town flow exceeds the Town's allotted flow.

Section 3.2

Characteristics of wastewater delivered to the City wastewater treatment facilities by the Town and any users of the

system within the Town shall conform to the requirements of wastewater permitted by the City, under its sewer use ordinance as issued and amended from time to time and all applicable local, State and Federal regulations.

Section 3.3

The Town agrees to adopt such rules, regulations and/or bylaws as are necessary to secure compliance by systems users with the standards provided for within this Agreement, or as 'otherwise may be amended and to ensure conformity with the requirements of any agency of the City, the Commonwealth of Massachusetts, or any other governmental agency which might have jurisdiction covering the system. The Town agrees to enforce such rules, regulations and/or by-laws. The City shall have the right to require the Town to take appropriate legal action against any system user to enforce compliance with the terms of this Agreement and user fees owed the City. The Town agrees that the City shall be the lead enforcement agent, as noted in Sections 2.4 and 3.4 in matters relating to the Federally Approved Industrial Pretreatment Program.

Section 3.4

As the City has implemented a federally approved Industrial Pretreatment Program and retains the responsibility to protect the Treatment Facility and receiving waters from industrial interference, the Town shall convey the right to the City to take appropriate legal action against any system user to enforce compliance with the Town's Sewer Use Ordinance. This includes, but is not limited to requiring industrial users to self monitor their discharge and report to the City; install the proper pretreatment systems if necessary; to submit to inspections for the purpose of compliance; to allow the City to issue industrial discharge permits; and to levy fines or terminate discharge, rights for continued non compliance. All significant industrial users must obtain and maintain an industrial discharge permit with the City and any other applicable permits.

Section 3.5

The Town agrees that the discharge of sanitary and/or industrial wastes containing heavy metals, cyanide and/or toxicity will not be allowed. All wastes to be discharged must be in accordance with the City's industrial pretreatment guidelines presently in effect or any other which may take effect in the future.

Section 3.6

The Town hereby agrees that at no time will they intentionally allow the discharge of wastewaters which are economically and/or technically more burdensome to treat than those described in this Section.

Section 3.7

The Town hereby agrees that stormwater will not be allowed to enter the sewer system, and inflow and infiltration will be reasonably controlled-and minimized.

SECTION 4. TERM

The term of this Agreement shall continue from the date of execution until terminated by mutual agreement.

SECTION 5. IMPLEMENTATION

Section 5.1

The City agrees to provide wastewater treatment facilities with a portion of the capacity allocated to handle waste from the Town. The capacity allocated is 2.0 MGD with an instantaneous peaking factor of 3 for an instantaneous limit of 6.0 MGD. This capacity limit can be adjusted by-mutual agreement and addenda to the agreement.

Section 5.2

The portion of the average capacity allocated to Tiverton is 2 million gallons per day, 4,170 pounds per day of BOD and 4,170 pounds per day of TSS.

SECTION 6. PAYMENT - CAPITAL INVESTMENT

Section 6.1

All new connections to the collection system shall pay a one time fee to the City of $5.00 per gallon of the projected flow. Appendix A identifies standard flow projections. Non standard facility flow projections not outlined in Appendix A shall be subject to reasonable engineering -practices and estimates. The City retains the right for final approval of flow projections. A summary of said payments shall be included in the quarterly statement identified in Section 7.1.4 for City invoicing.

SECTION 7. PAYMENTS: OPERATION AND MAINTENANCE

Section 7.1
7.1.1 The Town shall make quarterly payments towards the costs of operation and maintenance of the wastewater treatment facilities on the following basis: Until the Town of Tiverton constructs and installs its main metering chamber on State Avenue as part of its construction of a public sewer system, the Town shall pay for the total flow received quarterly on a per gallon basis at a rate of $1.50 /CFF. If user charges identified in Section 19-99 of the Fall River Revised Ordinances are increased, the Town rate shall be increased by the same proportionate percent increase.

7.1.2 Any costs associated with the operation and maintenance and/or capital repair in the Town of Tiverton connection shall be borne 100% by the Town.

7.1.3 The Town is responsible for assuring that all sources; of discharge from the Town to the City are properly accounted for.

7.1.4 Upon completion of each quarter (September 30, December 31, March 31 and June 30), or at reasonable intervals as agreed by both parties, the Town shall submit to the City a summation of the total flow for the quarter from the Town along with the necessary support documentation. The City shall invoice the Town by calculating the total flow by the applicable rate. Invoices are due and payable within 30 days of receipt.

7.1.5 Upon approval of the agreement, the City will continue the direct billing of customers until the proper Town billing system is in place, for a period not to exceed 180 days. The Town is responsible for any unpaid invoices through this period.

SECTION 8. MEASUREMENT OF FLOW AND SAMPLING OF WASTEWATER

Section 8.1

The volume of flow used in computing the Town's quarterly invoices shall be based upon readings obtained by suitable flow measurements and recording devices operated and maintained by the Town of Tiverton, all costs to be borne by the Town of Tiverton, said devices subject to approval by the City. It is also agreed that, in the event of flow into the City before a metering station is installed, then invoices shall be based upon water consumption charges of the North Tiverton Fire District, Stone Bridge Fire District and/or Tiverton Water Authority, and in the event there are users who are not within such Fire Districts or Water Authority, then flow shall be based upon the number of bedrooms in such dwelling(s) and computed at a rate of usage of

110 gallons per bedroom. If such latter users are not residential, then an arrangement mutually satisfactory to the City and Town shall be negotiated and struck.

8.1.1 The Town of Tiverton shall be responsible for checking, the accuracy and reliability of the flow metering and recording equipment. The City shall be advised of the results of any test on the equipment and the methods employed.

8.1.2 The volume of flow in computing the operating and maintenance costs shall be based upon readings directly from the metering station or other approved site. The collecting of flow meter readings for the purpose of computing and distribution charges shall be the responsibility of the Town of Tiverton. Once every month, the Town will provide the City with wastewater volume for that period, based upon the meter readings.

Section 8.2

The City and Town hereby agree that the determination of character and concentration of wastewater and the associated sampling technique shall be in accordance with the latest edition of "Standard Methods for the Examination of Water and Wastewater" published jointly by the Public Health Association, the American water works Association and the Water Pollution Control Federation, or any other method mutually agreed upon by the City and Town.

8.2.1 The sampling and determination of the character and concentration of Town's wastewater shall be performed by the Town of Tiverton. The sampling location will be mutually agreed upon by the Town and the City. The cost for sampling and analysis shall be the responsibility of the Town of Tiverton.

8.2.2 Samples shall be collected by the Town in such a manner as to be representative of the actual quality of the wastewater. Representative proportional composite samples shall be collected monthly and analyzed accordingly as required by the City's Industrial Pretreatment Program.

8.2.3 The results of the wastewater sampling and analytical program shall be reported to the City upon request and in accordance with the City's Industrial Pretreatment Program.

8.2.4 The City shall be given full and free access to the Town of Tiverton's wastewater metering station(s) as required for the purposes of inspection, measurement, sampling and testing.

8.2.5 In the event the metering equipment is temporarily out of order or service for any reason the volume of wastewater and strength will be based on the period representing the highest

volume and strength unless otherwise agreed by both parties on the basis of past experience.

8.2.6 The Town of Tiverton shall notify the Sewer Commission immediately in the event that the metering equipment is out of order or service.

8.2.7 The Town of Tiverton shall be responsible for facilitating repairs of the metering equipment and the costs associated with said repairs.

Section 8.3

For the purpose of compliance with the Industrial Pretreatment Program, the City will at least annually sample, inspect and analyze the wastewater from all significant industrial users within the Town. The industry is responsible for and will be invoiced directly for the costs associated with sampling and analysis.

SECTION 9. TRUCKED WASTES

Section 9.1

The City agrees to accept and treat at its treatment facility wastes from the Town's septic tanks, seepage pits, and cesspools. The Town will maintain its priority status as a neighboring community as it has in the past. All persons operating vacuum or "cesspool" pump trucks desiring to discharge these wastes to the facility must be approved by the Sewer Commission and the Fall River Health Department, make payment for treatment costs at the same rates fixed from time to time by the City for waste from Out of Town accounts, and comply with the conditions of the City's sewer use ordinance and the Rules and Regulations for the Disposal of Septage.

Section 9.2

Should the Town desire to reserve a portion of daily septage capacity at the treatment facility to assure that their needs are met, such reservations must be negotiated with and approved by the City as to logistics and payment schedules.

SECTION 10.1 CAPITAL IMPROVEMENTS

In the event that the City must undertake major repairs replacement, or add to the joint wastewater collection and treatment facilities or is directed or ordered to provide a

higher degree of treatment in the future, or to otherwise modify the process from that contemplated at the time of execution of this Agreement, the net capital cost of such replacement or additional facilities shall be apportioned between all the parties using the facility as follows:

1. The primary mechanism anticipated for such costs is to include such debt directly into the sewer user fee structure. As such all customers of the system would be equally assessed by the user fee system.

2. The Town shall not be obligated to pay for separate fines or penalties for legal actions of which the Town has no control. This, however, cannot be used as a mechanism to adjust user fees.

3. If treatment facility improvements are planned to be financed via non user fee assessments, then the Town shall be responsible for their apportionate share using the approved flow, BOD and TSS allotments as agreed by both parties. This provision is subject to the Town of Tiverton installing its main meter chamber on State Avenue as part of its construction of a public sewer system.

SECTION 11. RECORDS AND ACCESS

Section 11.1

The City and Town shall maintain complete and accurate books and records concerning all matters relative to this Agreement. Such records shall be open for inspection and making copies or extracts thereof to accountants and other duly authorized representatives of the other party.

The Town records shall include, but not be limited to, as built plans of all sewers and storm drains, schematics of all connections to sewer and storm drains, building permits for all facilities connected to sewer, and documents regarding proper operation and maintenance of the Town's sewers.

Section 11.2

Both the City and the Town agree to make available to representatives and agents of the other for purposes of inspection all facilities and equipment related to the wastewater system of each.

SECTION 12. SEPARATE AGREEMENTS

Any separate agreements relating to wastewater collection and treatment between the Town and adjacent municipalities which would result in additional discharges to the City's sewer system must be reviewed and approved by the City. In any event, the Town shall in the aggregate be restricted to the wastewater strengths and flows, and any increase must be formally contracted for between the Town and City.

SECTION 13. NOTIFICATION OF CHANGE

The Town agrees to notify the City in writing as far in advance as possible of anticipated or planned significant increases or decreases in the quantity and/or quality of the wastes to be discharged to the City's wastewater treatment facilities.

SECTION 14. TERMINATION

Section 14.1

For any material breach of this Agreement, continued for three months after notice thereof in writing by other party, either party may terminate this Agreement. Upon receipt of said notice, both parties will enter into discussion within thirty (30) days to assure proper termination of the Agreement.

Section 14.2

There shall be no circumstance under which the City will be obligated to return to the Town any portion of the Town's capital investment.

Section 14.3

The City maintains the right of refusal to accept the Town's waste if any section or subsection of this Agreement is materially violated. The Town shall be notified in writing, and the Town shall be granted ninety (90) days to respond to a purported violation of this Agreement. If the matter is of immediate danger to the treatment facilities, public health or the environment, the City retains the right of immediate refusal.

Section 15. AMENDMENTS

Section 15.1

No amendments to this agreement shall be effective until adopted by the Fall River City Council.

IN WITNESS WHEREOF, the respective parties hereto have caused this Agreement to be signed by them and have affixed their hands and seals on the day and year referred to above written.

WITNESS

_____

_____

_____

CITY OF FALL RIVER

Mayor

Corporation Counsel Attesting to Form and Manner of Execution

TOWN OF TIVERTON

By: President, Tiverton Town Council

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Rev. May 29, 1996

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APPENDIX 2 – GLOSSARY OF WASTEWATER TERMS AND ACRONYMS

A

Absorb - To take in.

Accretion - A gradual increase in land area adjacent to a river.

Acid Rain - The acidic rainfall which results when rain combines with sulfur oxides emissions from combustion of fossil fuels.

Acre-Foot - The amount of water required to cover one acre to a depth of one foot. An acre-foot equals 325,851 gallons, or 43,560 cubic feet. A flow of 1 cubic feet per second produce 1.98 acre-feet per day.

Activated Carbon Adsorption - The process of pollutants moving out of water and attaching on to activated carbon.

Activated Sludge - Term given to a method of wastewater treatment that uses aerobic and facultative bacteria in suspension to remove wastes. Activated sludge is a popular method of treatment, and dozens of variations on the basic process exist.

Adhesion - The molecular attraction asserted between the surfaces of bodies in contact. Compare cohesion.

ADF - Average Daily Flow.

Adsorption - The adhesion of a substance to the surface of a solid or liquid. Adsorption is often used to extract pollutants by causing them to be attached to such adsorbents as activated carbon or silica gel. Hydrophobic, or water-repulsing adsorbents, are used to extract oil from waterways in oil spills.

Aeration - The mixing or turbulent exposure of water to air and oxygen to dissipate volatile contaminants and other pollutants into the air.

Aeration Basins - Provide the conditions necessary (food, air and water) for the decomposition of organic waste. This process is often referred to as activated sludge to indicate the "activation" of microorganisms for organic decomposition and removal.

Aerobic - Wastewater treatment depending on oxygen for bacterial breakdown of waste.

Aerobic Bacteria – Bacteria that require the presence of free or dissolved oxygen in their environment for survival and reproduction.

Alkalinity - The measurement of constituents in a water supply which determine alkaline conditions. The alkalinity of water is a measure of its capacity to neutralize acids.

Algal Bloom - A phenomenon whereby excessive nutrients within a river, stream or lake cause an explosion of plant life which results in the depletion of the oxygen in the water needed by fish and other aquatic life. Algae bloom is usually the result of urban runoff (of lawn fertilizers, etc.). The potential tragedy is that of a "fish kill," where the stream life dies in one mass extinction.

Anaerobic - Wastewater treatment in which bacteria breakdown waste without using oxygen.

Anaerobic Bacteria - Bacteria that live and reproduce in an environment that contains no free or dissolved oxygen. They get their required oxygen by breaking down chemical compounds that contain oxygen such as sulfate (SO_4) or nitrate ($NO_{3)}$.

Aquatic - Growing in, living in, or frequenting water.

Aquifer - A geologic formation that will yield water to a well in sufficient quantities to make the production of water from this formation feasible for beneficial use; permeable layers of underground rock or sand that hold or transmit groundwater below the water table.

Artesian Aquifer - A geologic formation in which water is under sufficient hydrostatic pressure to be discharged to the surface without pumping.

Artesian Well - A water well drilled into a confined aquifer where enough hydraulic pressure exists for the water to flow to the surface without pumping.

B

Back Siphonage - Reverse seepage of water in a distribution system.

Backwashing - Reversing the flow of water through a home treatment device filter or membrane to clean and remove deposits.

Bar Screen -Preliminary treatment apparatus used to remove large pieces of trash -- sticks, rags, and the like -- from raw wastewater.

Barrage - Any artificial obstruction placed in water to increase water level or divert it. Usually the idea is to control peak flow for later release.

Beneficial Use - the amount of water necessary when reasonable intelligence and diligence are used for a stated purpose; Texas law recognizes the following uses as beneficial: (1) domestic and municipal uses, (2) industrial uses, (3) irrigation, (4) mining, (5) hydroelectric power, (6) navigation, (7) recreation, (8) stock raising, (9) public parks, and (10) game preserves.

Bioaccumulation - Uptake and retention of substances by an organism from its surrounding medium (usually water) and from food.

Bio-monitoring - A test used to evaluate the relative potency of a chemical by comparing its effect on a living organism with the effect of a standard population on the same type of organism.

Bioremediation -A process that uses living organisms to remove pollutants.

Biosolids - A nutrient-rich organic material resulting from the treatment of wastewater. Biosolids contain nitrogen and phosphorus along with other supplementary nutrients in smaller doses, such as potassium, sulfur, magnesium, calcium, copper and zinc. Soil that is lacking in these substances can be reclaimed with biosolids use. The application of biosolids to land improves soil properties and plant productivity, and reduces dependence on inorganic fertilizers.

Black Water - Wastewater from toilet, latrine, and privy flushing, and sinks used for food preparation or disposal of chemical or chemical-biological ingredients.

Blinds - Water samples containing a chemical of known concentration given a fictitious company name and slipped into the sample flow of the lab to test the impartiality of the lab staff.

Blow-down - The water drawn from boiler systems and cold water basins of cooling towers to prevent the buildup of solids.

Boiling Point - The temperature at which a liquid boils. It is the temperature at which the vapor pressure of a liquid equals the pressure on its surface. If the pressure of the liquid varies, the actual boiling point varies. For water it is 212 degrees Fahrenheit or 100 degrees Celsius.

BOD (Biochemical Oxygen Demand) - A measure of the amount of oxygen required to neutralize organic wastes.

Brine - Highly salty and heavily mineralized water containing heavy metal and organic contaminants.

Buoyancy - The tendency of a body to float or rise when immersed in a fluid; the power of a fluid to exert an upward force on a body placed in it.

C

Calcium Carbonate - CACO3 - a white precipitate that forms in water lines, water heaters and boilers in hard water areas; also known as scale.

Calorie - Amount of energy required to raise the temperature of 1 gram of water 1 degree Celsius.

Carbonates - The collective term for the natural inorganic chemical compounds related to carbon dioxide that exist in natural waterways.

CERCLA - Comprehensive Environment Response, Compensation and Liability Act. Also known as SUPERFUND. The Act gave EPA the authority to clean up abandoned, leaky hazardous waste sites.

Cesspool Act - Rhode Island Cesspool Phase Out Act

CFU - Colony forming units.

Chlorination - The adding of chlorine to water or sewage for the purpose of disinfection or other biological or chemical results.

Chlorine Demand - The difference between the amount of chlorine added to water, sewage, or industrial wastes and the amount of residual chlorine remaining at the end of a specific contact period.

Chute Spillway - The overall structure which allows water to drop rapidly through an open channel without causing erosion. Usually constructed near the edge of dams.

Circulate - To move in a circle, circuit or orbit; to flow without obstruction; to follow a course that returns to the starting point.

Cistern -A tank used to collect rainwater runoff from the roof of a house or building.

Coagulation - In water treatment, the use of chemicals to make suspended solids gather or group together into small flocs.

COD (Chemical Oxygen) - The COD test measures the chemical oxidant required to break down organics. COD is an indicator of the concentration of organics in water. The COD test can be completed in a few hours and is frequently substituted for BOD. COD levels are usually greater than BOD for a give wastewater.

Cohesion - A molecular attraction by which the particles of a body are united throughout the mass whether like or unlike.

Cold Vapor - Method to test water for the presence of mercury.

Coliform Bacteria - Non-Pathogenic microorganisms used in testing water to indicate the presence of pathogenic bacteria.

Colloids - Finely divided solids which will not settle but which may be removed by coagulation or biochemical action.

Combined Sewer - A sewer system that carries both sanitary sewage and stormwater runoff. When sewers are constructed this way, wastewater treatment plants have to be sized to deal with stormwater flows and oftentimes some of the water receives little or no treatment.

Composite Sample, Weighted - A sample composed of two or more portions collected at specific times and added together in volumes related to the flow at time of collection.

Concentration - Amount of a chemical or pollutant in a particular volume or weight of air, water, soil, or other medium.

Condensation - The change of state from a gas to a liquid.

Confluent Growth - In coliform testing, abundant or overflowing bacterial growth which makes accurate measurement difficult or impossible.

Conservation - To protect from loss and waste. Conservation of water may mean to save or store water for later use.

Contamination - The introduction into water of sewage or other foreign matter that will render the water unfit for its intended use.

Critical Low Flow - Low flow conditions below which some standards do not apply. The impacts of permitted discharges are analyzed at critical low-flow.

CRMC - Coastal Resources Management Council.

CFS - Cubic Foot per Second is the rate of discharge representing a volume of one cubic foot passing a given point during 1 second. This rate is equivalent to approximately 7.48 gallons per second, or 1.98 acre-feet per day.

D

Deionized Water - Water free of inorganic chemicals.

Demand - The number of units of something that will be purchased at various prices at a point in time.

Deposit - Something dropped or left behind by moving water, as sand or mud.

Desalination - The process of salt removal from sea or brackish water.

Detention Time - Time a theoretical particle/water drop will remain in a tank or basin. The product of capacity divided by flow.

Detection Limit - The lowest level that can be determined by a specific analytical procedure or test method.

Diatomaceous - Consisting of or abounding in diatoms, a class of unicellular or colonial algae having a silicified cell wall that persists as a skeleton after death.

Diluting Water - Distilled water that has been stabilized, buffered, and aerated. Used in the BOD test.

Discharge - The volume of water that passes a given point within a given period of time. It is an all-inclusive outflow term, describing a variety of flows such as from a pipe to a stream, or from a stream to a lake or ocean.

Discharge Permit - A permit issued by a state or the federal government to discharge effluent into waters of the state or the United States. In many states both State and federal permits are required.

Disinfection - The killing of the larger portion of the harmful and objectionable bacteria in the sewage. Usually accomplished by introduction of chlorine, but more and more facilities are using exposure to ultraviolet radiation, which renders the bacteria sterile.

Disinfection Byproducts - Halogenated organic chemicals formed when water is disinfected.

Dissolve - The process by which solid particles mix molecule by molecule with a liquid and appear to become part of the liquid.

Dissolved Oxygen (DO) - The amount of free oxygen available in water or other liquid solution for use by bacteria. Measured in ppm (parts per million) or mg/L (milligrams per liter).

Dissolved Solids - Inorganic material contained in water or wastes. Excessive dissolved solids make water unsuitable for drinking or industrial uses.

Distillation - Water treatment method where water is boiled to steam and condensed in a separate reservoir. Contaminants with higher boiling points than water do not vaporize and remain in the boiling flask.

Distilled Water - Water that has been treated by boiling and condensation to remove solids, inorganics, and some organic chemicals.

Diversion - To remove water from a water body. Diversions may be used to protect bottomland from hillside runoff, divert water away from active gullies, or protect buildings from runoff.

Domestic Wastewater - The liquid wastes generated by residences, commercial, and institutional facilities.

Drainage Area - The area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the stream above the specified location.

Duplicates - Two separate samples with separate containers taken at the same time at the same place.

E

Effluent - Any substance, particularly a liquid that enters the environment from a point source. Generally refers to wastewater from a sewage treatment or industrial plant.
Enteric Viruses - A category of viruses related to human excreta found in waterways.

Environment - Aggregate of external conditions that influence the life of an individual organism or population.

EPA - Environmental Protection Agency

Erosion - The wearing away of the land surface by wind, water, ice or other geologic agents. Erosion occurs naturally from weather or runoff but is often intensified by human land use practices.

F

Facultative Bacteria -bacteria that function equally well whether free or dissolved oxygen is available in their environment or not.

Fecal Coliform - The portion of the coliform bacteria group which is present in the intestinal tracts and feces of warm-blooded animals. A common pollutant in water.

FEMA - Federal Emergency Management Agency.

Fermentation, Anaerobic - Process in which carbohydrates are converted in the absence of oxygen to hydrocarbons (such as methane).

Filter - A device used to remove solids from a mixture or to separate materials. Materials are frequently separated from water using filters.

Filtration - The mechanical process which removes particulate matter by separating water from solid material, usually by passing it through sand.

Flocculation - Large scale treatment process involving gentle stirring whereby small particles in flocs are collected into larger particles so their weight causes them to settle to the bottom of the treatment tank.

Flora - Plant population of a region.

Flow - The rate of water discharged from a source expressed in volume with respect to time.

Flow Augmentation - The addition of water to meet flow needs.

Force Main - Sewer line fed by a lift station; carries pumped wastewater to a point where other pumps or gravity can take over.

FPS - Feet per Second

Freezing - The change of a liquid into a solid as temperature decreases. For water, the freezing point is 32 F or 0 C.

Fresh Water - Water containing less than 1,000 parts per million (ppm) of dissolved solids of any type.

Fresh Salt Water Interface - The region where fresh water and salt water meet. It is commonly referred to as the "bad water line", although it is zone and not a line.

Frost - A covering of minute ice crystals on a cold surface.

G

Gallon - A unit of volume. A U.S. gallon contains 231 cubic inches, 0.133 cubic feet, or 3.785 liters. One U.S. gallon of water weighs 8.3 pounds.

Geohydrology - A term which denotes the branch of hydrology relating to subsurface or subterranean waters; that is, to all waters below the surface.

gpd - Gallons per Day

gpcd - Gallons per Capita per Day

gpd/hd - Gallons per day per household

gpdim – Gallons per day per inch mile

gpm - Gallons per Minute

Grab Sample - A sample taken at a given place and time.

Granular Activated Carbon - Pure carbon heated to promote "active" sites which can adsorb pollutants. Used in some home water treatment systems to remove certain organic chemicals and radon.

Gravity Sewer - Sewer line that uses a declining grade to induce the flow of wastewater. This is the most common type of sewer line in existence.

Grey Water - Wastewater from clothes washing machines, showers, bathtubs, handwashing, lavatories and sinks that are not used for disposal of chemical or chemical-biological ingredients.

Groundwater - Water within the earth that supplies wells and springs; water in the zone of saturation where all openings in rocks and soil are filled, the upper surface of which forms the water table.

Groundwater Recharge - The inflow to a ground water reservoir.

Groundwater Runoff - The portion of runoff which has passed into the ground, has become ground water, and has been discharged into a stream channel as spring or seepage water.

H

Hard Water - Water containing a high level of calcium, magnesium, and other minerals. Hard water reduces the cleansing power of soap and produces scale in hot water lines and appliances.

Hardness (Water) - Condition caused by dissolved salts of calcium, magnesium, and iron, such as bicarbonates, carbonates, sulfates, chlorides, and nitrates.

Head - The pressure of a fluid owing to its elevation, usually expressed in feet of head or in pounds per square inch, since a measure of fluid pressure is the height of a fluid column above a given or known point.

Heavy Water - Water in which the majority of hydrogen atoms are the deuterium isotope.

HP - Horsepower is a common term regarding electrical power.

Hydrograph - A chart that measures the amount of water flowing past a point as a function of time.

Hydrologic Cycle - Natural pathway water follows as it changes between liquid, solid, and gaseous states; biogeochemical cycle that moves and recycles water in various forms through the ecosphere. Also called the water cycle.

Hydrologic Unit - A geographic area representing part or all of a surface drainage basin or distinct hydrologic feature.

Hydrometer - An instrument used to measure the density of a liquid.

Hydrostatic Head - A measure of pressure at a given point in a liquid in terms of the vertical height of a column of the same liquid which would produce the same pressure.

Hydrostatic Pressure - Pressure exerted by or existing within a liquid at rest with respect to adjacent bodies.

I

Ice - A solid form of water.

IMA – Intermunicipal Agreement is a document that presents the legal terms on an agreement between two or more legal entities.

Impermeable - Material that does not permit fluids to pass through.

Impervious - The quality or state of being impermeable; resisting penetration by water or plant roots. Impervious ground cover like concrete and asphalt affects quantity and quality of runoff.

Indicator Organisms - Microorganisms, such as coliforms, whose presence is indicative of pollution or of more harmful microorganism.

Indicator Tests - Tests for a specific contaminant, group of contaminants, or constituent which signals the presence of something else (ex., coliforms indicate the presence of pathogenic bacteria).

Infiltration - The groundwater that enters a sewer system through such means as defective pipes, pipe joints, or porous manhole walls. Infiltration does not include Inflow, however, "Rainfall Induced Infiltration" (RII) of groundwater may occur during and for a short period after rainfall events and have similar characteristics to Inflow.

Inflow - Storm water that enters a sewer system directly through a connection such as roof leaders; basement, foundation, and yard drains; catch basins, etc.

I/I - The total quantity of water in a sewer system from both infiltration and inflow, not distinguished as to source.

Influent - The commercial and residential waste materials carried in water via underground pipes to the water pollution control facility; (also referred to as wastewater or sewage).

Interbasin Transfer - The physical transfer of water from one watershed to another.

ISDS - Individual Sewage Disposal Systems, as regulated by the Rhode Island Department of Environmental Management

J

K

L

Laboratory Water - Purified water used in the laboratory as a basis for making up solutions or making dilutions. Water devoid of interfering substances.

Lag Time - The time from the center of a unit storm to the peak discharge or center of volume of the corresponding unit hydrograph.

Lagoon - A shallow pond where sunlight, bacterial action, and oxygen work to purify wastewater. Lagoons are typically used for the storage of wastewaters, sludges, liquid wastes, or spent nuclear fuel.

Lake - An inland body of water, usually fresh water, formed by glaciers, river drainage etc. Usually larger than a pool or pond.

Leachate - Water containing contaminants which leaks from a disposal site such as a landfill or dump.

Leaching - Extraction or flushing out of dissolved or suspended materials from the soil, solid waste, or another medium by water or other liquids as they percolate down through the medium to groundwater.

LF - Linear Foot

Lift Station - An assembly of a wet well, a level control, and one or more pumps designed to take the flow from a gravity sewer system and boost it over a hill or up some other grade where the installation of gravity sewer lines is impossible or impractical.

Limiting Factor - Factor such as temperature, light, water, or a chemical that limits the existence, growth, abundance, or distribution of an organism.

Liquid - A state of matter, neither gas nor solid, that flows and takes the shape of its container.

M

Marsh - An area periodically inundated and treeless and often characterized by grasses, cattails, and other monocotyledons.

MCL - Maximum Contaminant Level - The maximum level of a contaminant allowed in water by federal law. Based on health effects and currently available treatment methods.

Median Stream Flow - The rate of discharge of a stream for which there are equal numbers of greater and lesser flow occurrences during a specified period.

Melting - The changing of a solid into a liquid.

Melt Water - Water that comes from the melting ice of a glacier or a snow bank.

Method Blank - Laboratory grade water taken through the entire analytical procedure to determine if samples are being accidentally contaminated by chemicals in the lab.
Micrograms per Liter (Ug/L) - One thousand micrograms per liter is equivalent to 1 milligram per liter. This measure is equivalent to parts per billion (ppb)

Migration - The movement of oil, gas, contaminants, water, or other liquids through porous and permeable rock.

mg/L - Milligrams per Liter which is equivalent to parts per million (ppm).

MG – Million gallons which is a common unit of volume.

MGD - Million Gallons per Day which is a common unit of flow measurement in a wastewater treatment facility. Equals 1,000,000 gallons.

Minimum Streamflow - The specific amount of water reserved to support aquatic life, to minimize pollution, or for recreation. It is subject to the priority system and does not affect water rights established prior to its institution.

Mixed Liquor - Term used to describe the mixture of wastewater with activated sludge in a wastewater treatment facility.

Municipal Sewage - Sewage from a community which may be composed of domestic sewage, industrial wastes or both.

N

NPDES - "National Pollutant Discharge Elimination System. Permitting system set up by Federal law in 1972 with the intended purpose of protecting the waters of the United States,

Natural flow - The rate of water movement past a specified point on a natural stream. The flow comes from a drainage area in which there has been no stream diversion caused by storage, import, export, return flow, or change in consumptive use caused by man-controlled modifications to land use. Natural flow rarely occurs in a developed country.

Natural Resource - Any form of matter or energy obtained from the environment that meets human needs.

NIPDWR - National Interim Primary Drinking Water Regulations.

Nitrogen - A nutrient that can cause an overabundance of bacteria and algae when high amounts are present, leading to a depletion of oxygen and fish kills. Several forms occur in water, including ammonia, nitrate, nitrite or elemental nitrogen. High levels of nitrogen in water are usually caused by agricultural runoff or improperly operating wastewater treatment facilities.

Non-consumptive Use - Using water in a way that does not reduce the supply. Examples include hunting, fishing, boating, water-skiing, swimming, and some power production.

Non-contact Recreation - Recreational pursuits not involving a significant risk of water ingestion, including fishing, commercial and recreational boating, and limited body contact incidental to shoreline activity.

Nonporous - Something which does not allow water to pass through it.

Nonpoint Source - Source of pollution in which wastes are not released at one specific, identifiable point but from a number of points that are spread out and difficult to identify and control.

Nonpotable - Not suitable for drinking.

Nonthreshold pollutant - Substance or condition harmful to a particular organism at any level or concentration.

NPDES Permit - Permit issued under the National Pollutant Discharge Elimination System for companies discharging pollutants directly into the waters of the United States.

NTU - Nephlometric turbidity units.

Nutrient - As a pollutant, any element or compound, such as phosphorous or nitrogen, that fuels abnormally high organic growth in aquatic ecosystems.

O

Organic Chemicals - Chemicals containing carbon.

Outfall - The place where a wastewater treatment facility discharges treated water into the environment.

Overflow - A discharge of untreated wastewater from the collection system.

Oxygen Demanding Waste - Organic water pollutants that are usually degraded by bacteria if there is sufficient dissolved oxygen (DO) in the water.

OSWDS - On-site Waste Disposal Systems

OWTS - Onsite Wastewater Treatment Systems

P

PPB (Parts per Billion) - A measurement of concentration in a solution; i.e. how many "parts" of what is being measured for every one billion equivalent "parts" of the solution.

PPM (Parts per Million) - A measurement of concentration in a solution; i.e. how many "parts" of what is being measured for every one million equivalent "parts" of the solution. Example -- one red sand grain mixed in among 999,999 other white sand grains yields a red sand grain measurement of 1 ppm. Functionally equivalent to mg/L.

Pathogens - Bacteria or other things (virii, et. al) that cause disease in a host.

Peak Flow - In a wastewater treatment plant, the highest flow expected to be encountered under any operational conditions, including periods of high rainfall and prolonged periods of wet weather.

Percolation - The movement of water through the subsurface soil layers, usually continuing downward to the groundwater or water table reservoirs.

Permeability - The ability of a water bearing material to transmit water. It is measured by the quantity of water passing through a unit cross section, in a unit time, under 100 percent hydraulic gradient.

pH - Numeric value that describes the intensity of the acid or basic (alkaline) conditions of a solution. The pH scale is from 0 to 14, with the neutral point at 7.0. Values lower than 7 indicate the presence of acids and greater than 7.0 the presence of alkalis (bases). Technically speaking, pH is the logarithm of the reciprocal (negative log) of the hydrogen ion concentration (hydrogen ion activity) in moles per liter.

Phosphorous - A nutrient that can cause an overabundance of bacteria and algae when high amounts are present, leading to a depletion of oxygen and fish kills. High levels of phosphorous in water are usually caused by agricultural runoff or improperly operating wastewater treatment facilities.

Plug - Cement, grout, or other material used to fill and seal a hole drilled for a water well.

Point Source - Source of pollution that involves discharge of wastes from an identifiable point, such as a smokestack or wastewater treatment facility.

Pollution - Undesirable change in the physical, chemical, or biological characteristics of the air, water, or land that can harmfully affect the health, survival, or activities of human or other living organisms.

Pond - A body of water usually smaller than a lake and larger than a pool either naturally or artificially confined.

Porous - Something which allows water to pass through it.

Potable - Suitable, safe, or prepared for drinking.

PPB - Parts per Billion - Number of parts of a chemical found in one billion parts of a solid, liquid, or gaseous mixture. Equivalent to micrograms per liter (Ug/L).

PPM - Parts per Million - Number of parts of a chemical found in one million parts of a solid, liquid, or gaseous mixture. Equivalent to milligrams per liter (mg/L).

Precipitate - A solid which has come out of an aqueous solution. (ex., iron from groundwater precipitates to a rust colored solid when exposed to air).

Preservative - A chemical added to a water sample to keep it stable and prevent compounds in it from changing to other forms or to prevent microorganism densities from changing prior to analysis.

Primary Treatment - Mechanical treatment in which large solids are screened out and suspended solids in the sewage settle out as sludge.

Pump - A device which moves, compresses, or alters the pressure of a fluid, such as water or air, being conveyed through a natural or artificial channel.

Pumped Hydroelectric Storage - Storing water for future use in generating electricity. Excess electrical energy produced during a period of low demand is used to pump water up to a reservoir. When demand is high, the water is released to operate a hydroelectric generator.
Purge - To force a gas through a water sample to liberate volatile chemicals or other gases from the water so their level can be measured.

Purgeable Organics - volatile organic chemicals which can be forced out of the water sample with relative ease through purging.

Q

R

Rain - Water drops which fall to the earth from the air.

Rain Gage - Any instrument used for recording and measuring time, distribution, and the amount of rainfall.

Raw Wastewater - Wastewater that has not been treated by any means at all.

RCRA - Resource Conservation and Recovery Act - federal legislation requiring that hazardous waste be tracked from "cradle" (generation) to "grave" (disposal).

Receiving Waters - A river, ocean, stream, or other watercourse into which wastewater or treated effluent is discharged.

Recharge - Refers to water entering an underground aquifer through faults, fractures, or direct absorption.

Recharge Zone - The area where a formation allows available water to enter the aquifer. Generally, that area where the Edwards Aquifer and associated lime stones crop out in Kinney, Uvalde, Medina, Bexar, Comal, Hays, Travis, and Williamson counties and the outcrops of other formations in proximity to the Edwards limestone, where faulting and fracturing may allow recharge of the surface waters to the Edwards Aquifer.

Reclaimed Water - Domestic wastewater that is under the direct control of a wastewater treatment facility owner/operator which has been treated to a quality suitable for a beneficial use.

Reservoir - A pond, lake, tank, or basin (natural or human made) where water is collected and used for storage. Large bodies of groundwater are called groundwater reservoirs; water behind a dam is also called a reservoir of water.

Residual Chlorine - The available chlorine which remains in solution after the demand has been satisfied.

Reverse Osmosis - A water treatment method whereby water is forced through a semipermeable membrane which filters out impurities.

RIDEM - Rhode Island Department of Environmental Management.

RIGIS - Rhode Island Geographic Information System.

River - A natural stream of water of considerable volume.

River Basin - The area drained by a river and its tributaries.

Runoff - Surface water entering rivers, freshwater lakes, or reservoirs.

S

Saline Water - Water containing more than 1,000 parts per million (ppm) of dissolved solids of any type.

Salinity - Amount of dissolved salts in a given volume of water.

Sanitary Landfill - Landfill that is lined with plastic or concrete or located in clay-rich soils to prevent hazardous substances from leaking into the environment.

Sanitary Sewer - A sewer intended to carry only domestic, commercial and/or industrial wastewaters.

Saturation - The condition of a liquid when it has taken into solution the maximum possible quantity of a given substance at a given temperature and pressure.

Seal - The impermeable material, such as cement grout bentonite, or puddling clay placed in the annular space between the borehole wall and the casing of a water well to prevent the down hole movement of surface water or the vertical mixing of artesian waters.

Secondary Treatment - Second step in most waste treatment systems, in which bacteria break down the organic parts of sewage wastes; usually accomplished by bringing the sewage and bacteria together in trickling filters or in the activated sludge process. Compare primary treatment, tertiary treatment.

Sedimentation - A large scale water treatment process where heavy solids settle out to the bottom of the treatment tank after flocculation.

Separate Sewer - A sewer system that carries only sanitary sewage, not stormwater runoff. When a sewer is constructed this way, wastewater treatment plants can be sized to treat sanitary wastes only and all of the water entering the plant receives complete treatment at all times.

Septage - The materials derived from subsurface wastewater disposal systems in areas not serviced by public sewer. The mixture of liquid and solid wastes originating in septic tanks or cesspools that is periodically pun1ped from the tanks and transported to a wastewater treatment facility.

Septic - A condition produced by the presence of anaerobic bacteria. Severe septic conditions are revealed by black, odorous water with little or no dissolved oxygen present.

Septic Tank - Underground receptacle for wastewater from a home. The bacteria in the sewage decompose the organic wastes, and the sludge settles to the bottom of the tank. The effluent flows out of the tank into the ground through drains.

Settleable Solids - In sewage, suspended solids that will settle when the sewage is brought to a quiet state for a reasonable length of time, usually two hours.

Siltation - The deposition of finely divided soil and rock particles upon the bottom of stream and river beds and reservoirs.

Sludge - Solid matter that settles to the bottom of sedimentation tanks in a sewage treatment plant and must be disposed of by digestion or other methods or recycled to the land.

Snow - Precipitation in the form of branched hexagonal crystals, often mixed with simple ice crystals, which fall more or less continuously from a solid cloud sheet. These crystals may fall either separately or in cohesive clusters forming snowflakes.

Solute - Any substance derived from the atmosphere, vegetation, soil, or rock that is dissolved in water.

Soil Erosion - The processes by which soil is removed from one place by forces such as wind, water, waves, glaciers, and construction activity and eventually deposited at some new place.

Specific Heat - The amount of heat required to raise the temperature of a kilogram of a substance (water) by 1 degree Celsius.

Spillway - The channel or passageway around or over a dam through which excess water is diverted.

Sq.ft. – Square feet

Standard Solution - Any solution in which the concentration is known.

Stormwater Discharge - Precipitation that does not infiltrate into the ground or evaporate due to impervious land surfaces but instead flows onto adjacent land or water areas and is routed into drain/sewer systems.

Stream - A general term for a body of flowing water.

Surface Water - Water that flows in streams and rivers and in natural lakes, in wetlands, and in reservoirs constructed by humans.

T

Tertiary Treatment - Removal from wastewater of traces or organic chemicals and dissolved solids that remain after primary treatment and secondary treatment.

TDS - **Total Dissolved Solids** - The sum or all inorganic and organic particulate material. TDS is an indicator test used for wastewater analysis and is also a measure of the mineral content of bottled water and groundwater. There is a relationship between TDS and conductivity. In general, for the San Antonio River basin, TDS = 0.6 approximates conductivity. Or, conductivity * .6 approximates TDS. People monitoring water quality can measure electrical conductivity quickly in the field and estimate TDS without doing any lab tests at all.

TMDL - Total Maximum Daily Load

Toxicity Reduction Evaluation (TRE) - A study conducted to determine the source(s) of toxicity in a discharge effluent so that these sources can be controlled sufficiently to allow a discharger to comply with their permit limits.

Toxicity Test - The means to determine the toxicity of a chemical or an effluent using living organisms. A toxicity test measures the degree of response of an exposed test organism to a specified chemical or effluent.

TSS (Total Suspended Solids) - Components in influent or septage that result in particle deposition in receiving waters.

U

Ultraviolet Disinfection (UV) - A disinfection method in which final wastewater effluent is exposed to ultraviolet light to kill pathogens and microorganisms.

USGS -United States Geological Survey.

Underdrain - A concealed drain with openings through which the water enters when the water table reaches the level of the drain.

Underflow - Movement of water through subsurface material.

Upflow - An upward flow.

V

W

Wastewater - Water containing waste including grey water, black water or water contaminated by waste contact, including process-generated and contaminated rainfall runoff.

Water - The liquid that descends from the clouds as rain; forms streams, lakes, and seas, and is a major constituent of all living matter. It is an odorless, tasteless, colorless, very slightly compressible liquid.

Water Cycle - Natural pathway water follows as it changes between liquid, solid, and gaseous states; biogeochemical cycle that moves and recycles water in various forms through the ecosphere, also called the hydrologic cycle.

Water Pollution - Degradation of a body of water by a substance or condition to such a degree that the water fails to meet specified standards or cannot be used for a specific purpose.

Water Table - Level below the earth's surface at which the ground becomes saturated with water. The surface of an unconfined aquifer which fluctuates due to seasonal precipitation.

Water Table Aquifer - An aquifer confined only by atmospheric pressure (water levels will not rise in the well above the confining bed).

Watershed - Land area from which water drains toward a common watercourse in a natural basin.

WWTF - Wastewater Treatment Facility.

Wetland - Area that is regularly wet or flooded and has a water table that stands at or above the land surface for at least part of the year, such as a bog, pond, fen, estuary, or marsh.

Whole-Effluent Toxicity - The aggregate toxic effect of an effluent measured directly by a toxicity test.

X

Y

Yield - the quantity of water expressed either as a continuous rate of flow (cubic feet per second, etc.) or as a volume per unit of time. It can be collected for a given use, or uses, from surface or groundwater sources on a watershed.

Z

Zone of Aeration - A region in the Earth above the water table. Water in the zone of aeration is under atmospheric pressure and will not flow into a well.

Zone of Saturation - The space below the water table in which all the interstices (pore spaces) are filled with water. Water in the zone of saturation is called groundwater.

APPENDIX 3 – REFERENCES

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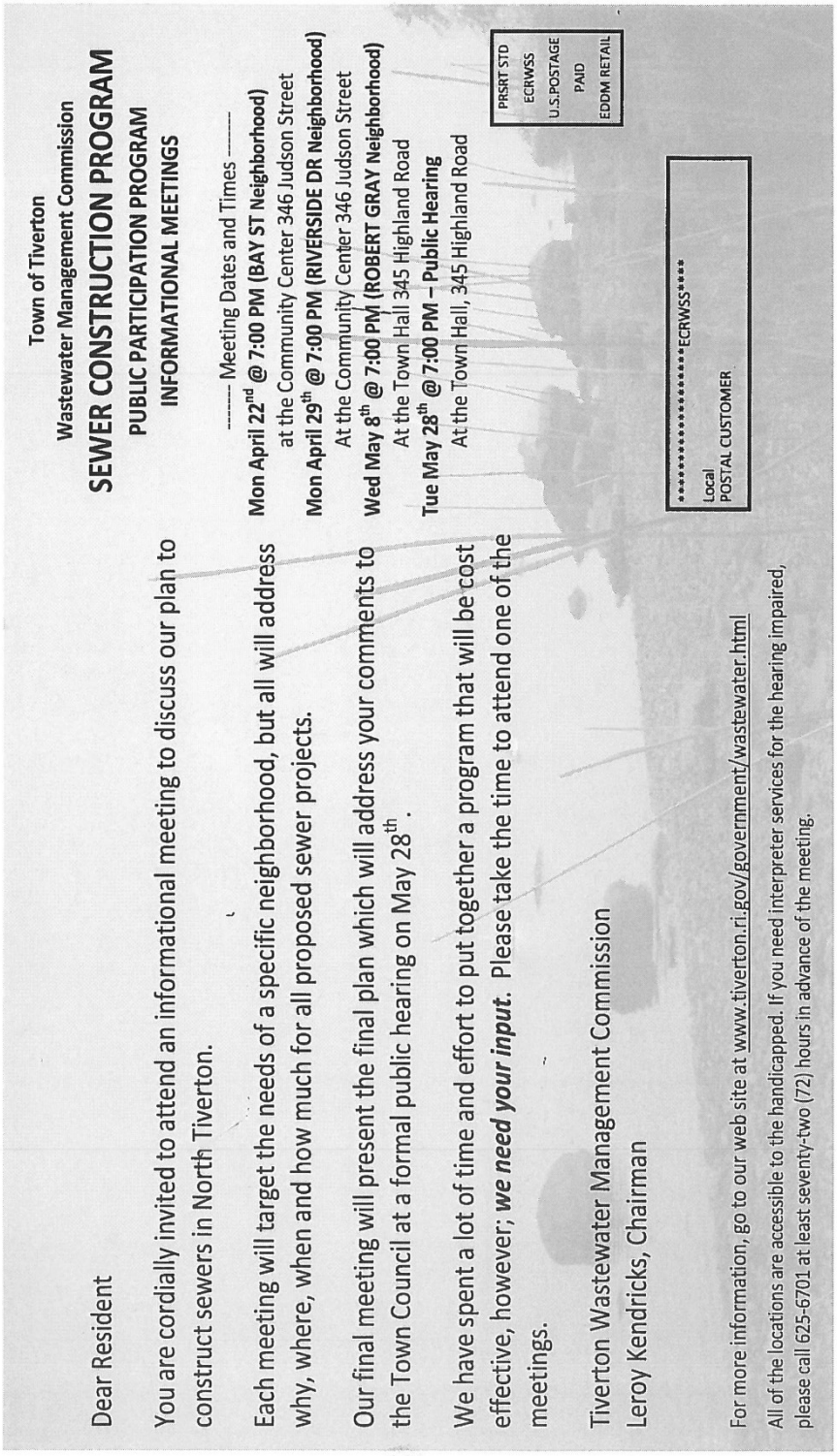
APPENDIX 4 – PUBLIC INFORMATION MEETINGS - ADVERTISEMENTS, SIGN-IN SHEETS,



Town of Tiverton
Wastewater Management Commission

SEWER CONSTRUCTION PROGRAM

PUBLIC PARTICIPATION PROGRAM
INFORMATIONAL MEETINGS

Dear Resident

You are cordially invited to attend an informational meeting to discuss our plan to construct sewers in North Tiverton.

Each meeting will target the needs of a specific neighborhood, but all will address why, where, when and how much for all proposed sewer projects.

Our final meeting will present the final plan which will address your comments to the Town Council at a formal public hearing on May 28th.

We have spent a lot of time and effort to put together a program that will be cost effective, however; ***we need your input.*** Please take the time to attend one of the meetings.

Tiverton Wastewater Management Commission
Leroy Kendricks, Chairman

------ Meeting Dates and Times ------

Mon April 22nd @ 7:00 PM (BAY ST Neighborhood)
at the Community Center 346 Judson Street

Mon April 29th @ 7:00 PM (RIVERSIDE DR Neighborhood)
At the Community Center 346 Judson Street

Wed May 8th @ 7:00 PM (ROBERT GRAY Neighborhood)
At the Town Hall 345 Highland Road

Tue May 28th @ 7:00 PM – Public Hearing
At the Town Hall, 345 Highland Road

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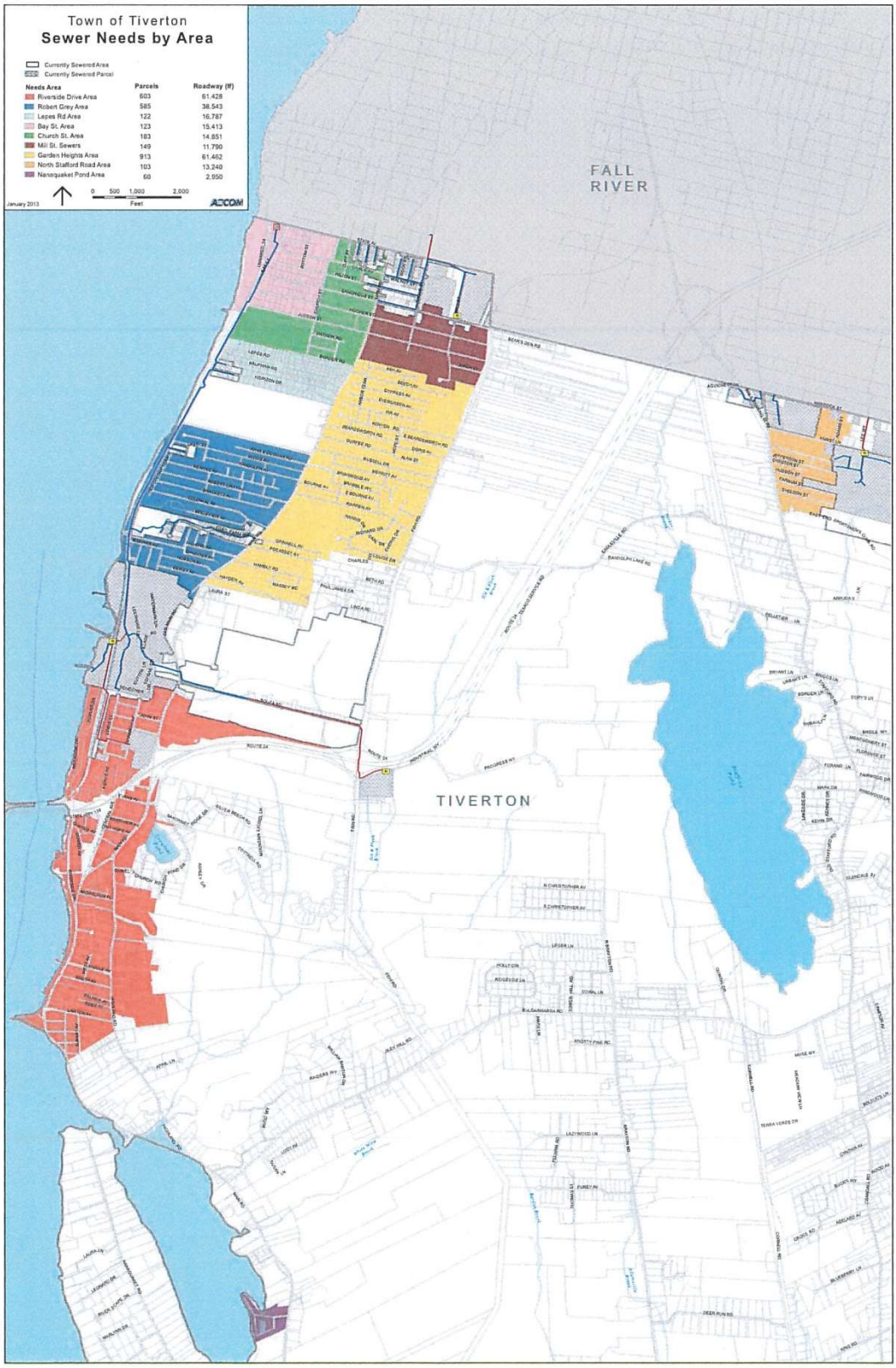
For more information, go to our web site at www.tiverton.ri.gov/government/wastewater.html

All of the locations are accessible to the handicapped. If you need interpreter services for the hearing impaired, please call 625-6701 at least seventy-two (72) hours in advance of the meeting.

PRESENTATION, AND HANDOUT


Town of Tiverton
Sewer Needs by Area
Currently Sewered Area
Currently Sewered Parcel
Needs Area | Parcels | Roadway (lf)
Riverside Drive Area | 603 | 61,428
Robert Grey Area | 585 | 38,543
Lepes Rd Area | 122 | 16,787
Bay St. Area | 123 | 15,413
Church St. Area | 183 | 14,851
Mill St. Sewers | 149 | 11,790
Garden Heights Area | 913 | 61,462
North Stafford Road Area | 103 | 13,240
Nanaquaket Pond Area | 60 | 2,950
0 500 1,000 2,000
Feet
January 2013
AECOM
FALL RIVER
TIVERTON

E.N.A.C.T.

Environmental Neighborhood Awareness Committee of Tiverton

88 Bay Street, Tiverton, RI 02878 401-625-5837 enactri@aol.com

SEWER SYSTEM CONSTRUCTION
PUBLIC PARTICIPATION PROGRAM
INFORMATIONAL MEETING

Monday, April 22, 2013 @ 7:00 PM

Tiverton Community Center

346 Judson Street

Tiverton, RI 02878

The Town of Tiverton Waste Water Management Commission has spent a lot of time and effort to put together a comprehensive sewer system construction plan that will be as cost effective as possible for the residents of Tiverton. At the above meeting, a presentation will answer why, where and when sewer projects will be happening and also what the preliminary costs estimates are. At the end of the presentation, there will be ample time to address questions and concerns from residents. Revisions to the plan will be made based on concerns from residents and a final plan will be presented to the Tiverton Town Council at a formal public hearing on May 28, 2013.

However, the program as it will be presented at this informational meeting is not cast in stone. ***They need and want our input!***

Please take the time to attend.

Respectfully,

ENACT

Lucy Pavao, President

If you have any questions or need to request interpreter services for the hearing impaired, please call 401-625-6701 at least seventy-two (72) hours in advance of the meeting.

This location is handicapped accessible.

Town of Tiverton
Wastewater Management Commission

SEWER CONSTRUCTION PROGRAM
PUBLIC PARTICIPATION

SIGN IN SHEET 4/22/13

Name	Address	Email
Mr. Jose P. Cordeiro	57 Canonicus St	
Larry Head	28 Hilton St	—
Carlos Amaral	17 Ford St	
[illegible] Amaral	" "	
[illegible] Borges	Leo Chace [illegible]	
Gail Cowell	190 Bay St	gail9194@aol.com
[illegible] Duarte	4 Hilton St	
Lisa Mendoza	28 Hooper St.	
David Cummings	28 Hooper St.	
Mike Morrett	40 Judson St	MPMONY@AOL
Paul Terceiro	33 Bay St	
[illegible] Medeiros	33 Bay St	
Lucy Pavao	88 Bay St	
Anne Medeiros	80 Bay St	
Cynthia Reagan	35 Hilton St	
Patrick M [illegible]	130 Bay St	
John [illegible]	89 + 95 Canonicus	
[illegible]	66 Bato	
Janice Carron	145 Judson St	
[illegible]	20 Judson St	
Tim Watters	54 Judson St	tim@watters.name
Joe Cordeiro	51 Canonicus St.	
Antonio [illegible]	55 Canonicus	

Page 1 of 2

Town of Tiverton
Wastewater Management Commission

SEWER CONSTRUCTION PROGRAM
PUBLIC PARTICIPATION

SIGN IN SHEET

4/29/13

Name	Address	Email
Anne Horvath	29 Riverside Drive	
Daniel McCullough	1299 Main R.D.	
Joseph Bruno	20 Narragansett Ave	
[illegible]	8 Tucker Ave	
Raeann White	8 Tucker Ave	
Jackie + Ernie Silvia	414 Riverside Drive	
Rose Marie Teixeira	10 Evans Ave	
Deborah Gee	15 Evans Ave	geewizgee@cox.net
MARK A Sullivan	308 Riverside Dr	
Robert Kearney	18 Tucker Ave	
Margaret Ryan	18 Tucker Ave	margaret1@yahoo.com
Evelyn Dora	20 Cottage Ave	[illegible]
Claude + Barbara Dimeo	134 Evans Ave	
A.J. LATINVILLE	3 RIVERSIDE DR	
Dave Castro	48 Dewey Ave	dcastro4@cox.net
Rosalie Burton	95 Shannon Ave. Tiv RI	
Sharon Silvia	273 Riverside Dr	
Sharon Moore	281 Riverside Dr	
GEORGE WEST	156 HIGHLAND RD	
Shawn Rogers	122 Evans Ave	
SEAN LEWIS	23 EVANS CT	
Jim Crowell	95 Lewis St.	
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Tim HOPKINS	55 REED ST	
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Mary Jane (Dottie) Hayward	19 Oakland St. Tiv. RI	
Abel Gallagher	484 Riverside Dr	

michelle 401-624-2169
513-316-9039 cell

Page 2 of 2

Town of Tiverton
Wastewater Management Commission

SEWER CONSTRUCTION PROGRAM
PUBLIC PARTICIPATION

SIGN IN SHEET

4/29/13

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ROSEMARY OFMELLO	20 PIERCE AVE	———
WADE CAMARAN	260 Riverside Dr	
LAUREL RODMAN	79 MASSEY RD	LARODMAN@MSN
John Rodman	"	johnprodman@MSN.com
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* Peter Andromalos	1506 MAIN RD.	
Gus STRATTON	255 RIVERSIDE DR.	ggstrattonmd@gmail.
Charlie + June Smith	128 Riverside Dr.	
Charles Page	50 Highland Rd	27.page@gmail.com
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peter@propointcs.com
(401) 480-9301

Town of Tiverton
Wastewater Management Commission

SEWER CONSTRUCTION PROGRAM
PUBLIC PARTICIPATION

SIGN IN SHEET

5/8/13

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Carol Castro	" " "	" "
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GERALD FERREIRA	35 CRAIG AVE	N/A
HAZELJANE JERAULD	611 OLD COLONY TERRACE	
MIMI MUTTY	630 OLD COLONY T.	
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WILLIAM DAPONTE	54 BELLVIEW AVE	DAPBill1@YAHOO.COM
Paul & Clare White	643 Old Colony Terrace	paul.white104@gmail.com
KATHLEEN VAILLANCOURT	20 OREGON AVE.	kathy.vaillancourt@gmail.com
WALTER [illegible]	665 OLD COLONY TERR.	TERANCE [illegible] @YAHOO.COM
LARRY MELLO	39 COLONIAL, AVE	
	NANCY RODRIGUES + Joseph	
	165 KEARNS Ave	

Page 2 of 2

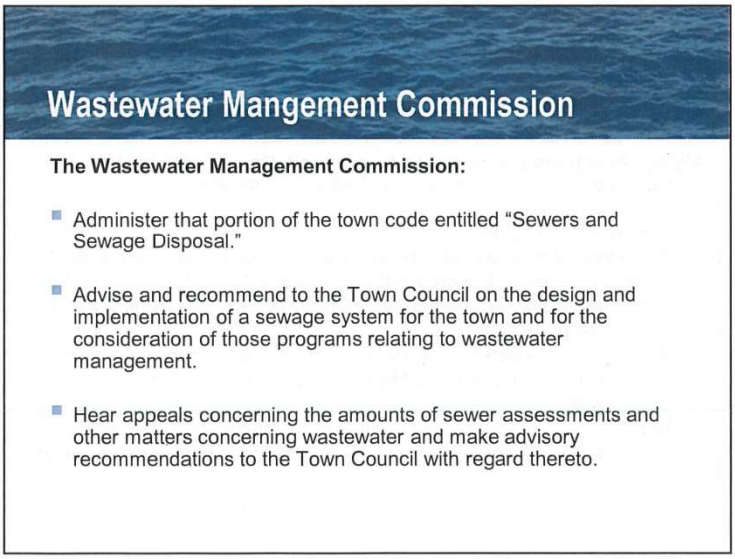
Town of Tiverton
Wastewater Management Commission

SEWER CONSTRUCTION PROGRAM
PUBLIC PARTICIPATION

SIGN IN SHEET

Name	Address	Email
Luis M. LIMA	160 ROBERT GRAY AVE TIVERTON RI	04M4075@GMAIL.com
Christopher Brodeur	48 Kearns Ave	cjbrodeur81@aim.com
Anne Fanning	621 Old Colony Terrace	afanning.c21@msn.com
Claire Chace	165 Kearns Ave	
Michael Turner	148 Randolph Ave	
Don Katyl	6 Miles Ave	don_katyl@cox.net
Jim Crudale	204 Robert Gray Ave	
Andrew Rochelle	195 Kearns Ave	
Robert Higgins	610 Old Colony Terrace	rchig@cox.net
Norbert Labine	675 Old Colony Terrace	unclenorby@yahoo.com
ROBERT BARLOW	1486 MAIN RD TIVERTON	
Roger Bennis	68 Narragansett Ave, Tiv.	CAESAR68N@VERIZON.NET
Barbara Manning	506 Riverside DR. TIV	BABS21@Cox.Net
DANIEL RAPOZA	506 Riverside Dr. TIV	
Jim & Sally Lockhart	19 Miles Ave	Lockhart19@cox.net
ROBERT VAILLANCOURT	240 ROBERT GRAY AVE	REPGVAL@Verizon.Net
Susan & Howard Benesch	219 Brackett Ave.	SKBHIB219@verizon.net
Susan Gill	1392 Main Rd	Susangill1392@gmail.com
NATHAN TITCOMB	12 PAUL TERRACE	pe921982@yahoo.com
Peter Glewski	10 Terry Lane	bugmanri@aol.com
RAY Albernaz	171 BRACKET AVE.	raymond.albernaz@nationalgrid.com
Andrea Raposa	84 Bismark Ave	araposa@portsmouthabbey.org
LORRAINE KRUMINS	48 CRAIG AVE	
LORI ALBERNAZ	171 BRACKETT AVE	JACOBY14@COX.NET
Roger Gomes	29 Evans Ave	
Bernhard Krumins	48 Craig ave	tallmeatman@yahoo
CARA HART	185 Kearns Ave	
Nancy Mello Sally Black	227 Colonial Marilyn Drive	


Tiverton
Wastewater Management
Commission
Wastewater Management :
Public Participation
Program
Leroy Kendricks, PE, Chairman


Wastewater Mangement Commission
The Wastewater Management Commission:
Administer that portion of the town code entitled "Sewers and Sewage Disposal."
Advise and recommend to the Town Council on the design and implementation of a sewage system for the town and for the consideration of those programs relating to wastewater management.
Hear appeals concerning the amounts of sewer assessments and other matters concerning wastewater and make advisory recommendations to the Town Council with regard thereto.

1

Rhode Island Cesspool Act of 2007

Cesspool Inspection and Replacement Timetable:
All cesspools within the 200 foot zones identified in the Regs:

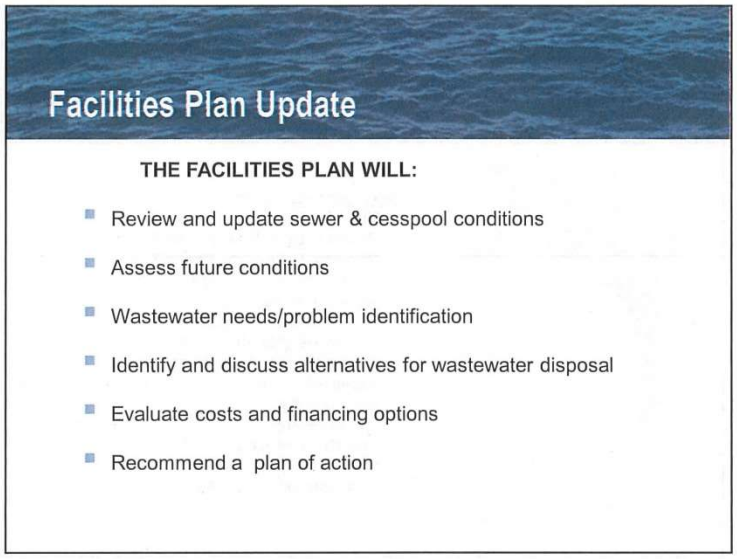
- Will have to be inspected, upon notice from DEM;
- Will have to be replaced by January 1, 2014
- If found to be failed, will need to be replaced within 1 year;
- If found in already sewered areas, will need to be hooked-up to the sewer within one year of the sale of the associated property; and

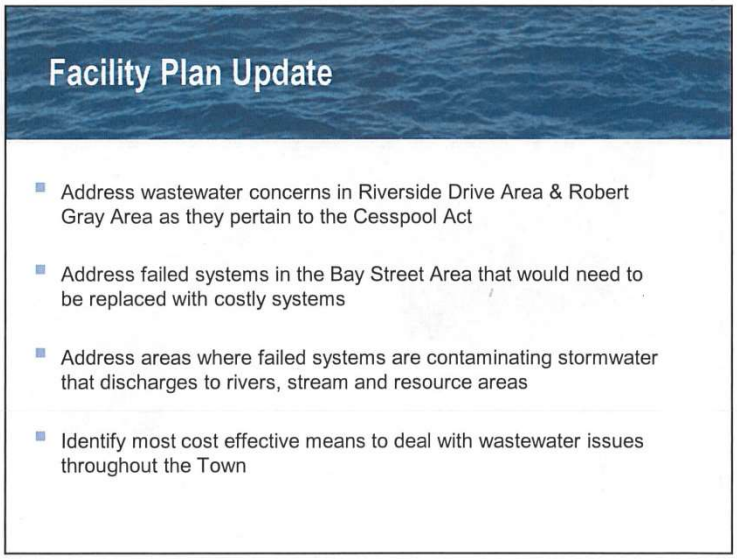
Rhode Island Cesspool Act of 2007

My neighborhood is planned to be sewered. Do I need to replace my cesspool? No, provided you meet **all** of the following:

- Cesspool is not failed;
- Your property is proposed to be sewered no later than January 1, 2020;
- You do not propose to increase flow of wastewater to the cesspool (for residential structures, you are not proposing to add a bedroom) prior to the installation of sewers;
- Your city or town obtains bonding authorization for expansion of sewers to the area of the building served by the cesspool no later than December 31, 2014; and
- You certify in writing that the building will be connected to the sewer system within 6 months of receipt of notification to connect to the sewer system.

2


Facilities Plan Update
THE FACILITIES PLAN WILL:
Review and update sewer & cesspool conditions
Assess future conditions
Wastewater needs/problem identification
Identify and discuss alternatives for wastewater disposal
Evaluate costs and financing options
Recommend a plan of action


Facility Plan Update
Address wastewater concerns in Riverside Drive Area & Robert Gray Area as they pertain to the Cesspool Act
Address failed systems in the Bay Street Area that would need to be replaced with costly systems
Address areas where failed systems are contaminating stormwater that discharges to rivers, stream and resource areas
Identify most cost effective means to deal with wastewater issues throughout the Town

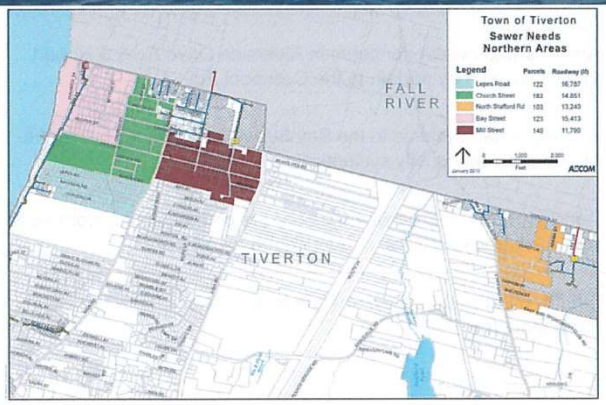
3

Facility Plan: Sewer Area Study

Infrastructure Expansion

- Riverside Drive Area - Phase 1
- Riverside Drive Area - Phase 2
- Riverside Drive Area - Phase 3
- Robert Gray Area - Phase 1
- Robert Gray Area - Phase 2
- Robert Gray Area - Phase 3
- Garden Heights Area - Phase 1
- Garden Heights Area - Phase 2
- Lepes Road Area
- Mill Street Area
- Bay Street Area
- Church Street Area
- North Stafford Road Area
- Nannaquaket Pond Area

Facility Plan: Northern Areas



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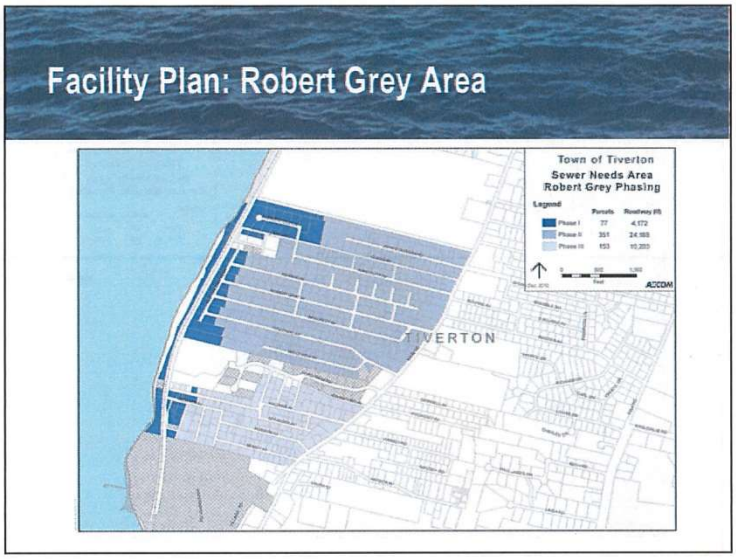
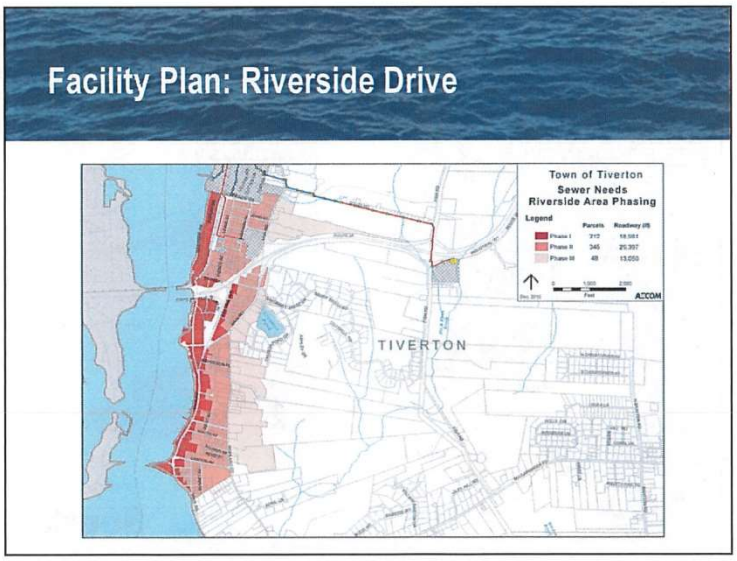
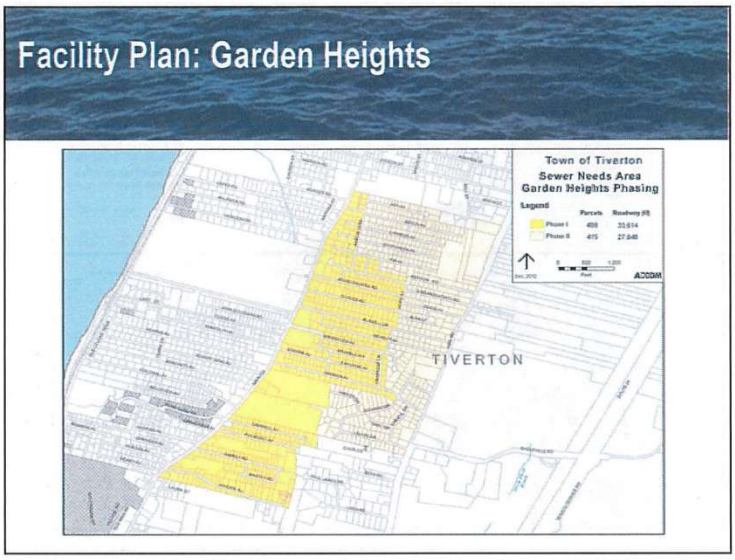
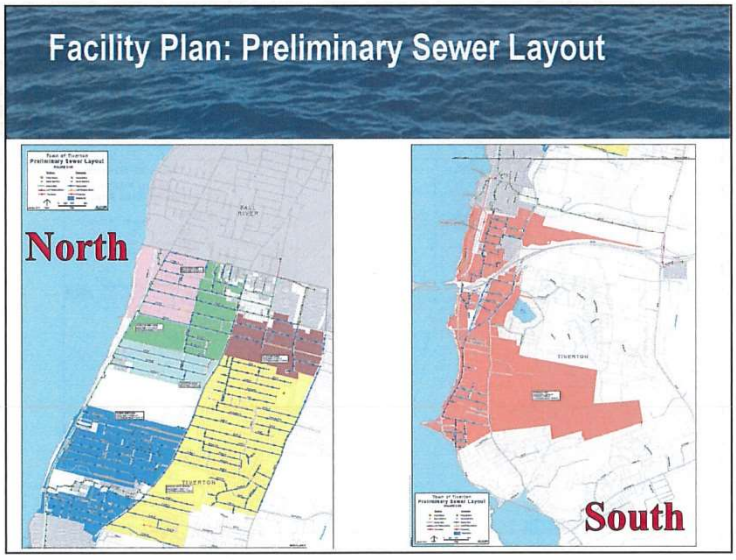

Facility Plan: Robert Grey Area
Town of Tiverton
Sewer Needs Area
Robert Grey Phasing
Legend
TIVERTON


Facility Plan: Riverside Drive
Town of Tiverton
Sewer Needs
Riverside Area Phasing
Legend
TIVERTON

5


Facility Plan: Garden Heights
Town of Tiverton
Sewer Needs Area
Garden Heights Phasing
Legend
TIVERTON


Facility Plan: Preliminary Sewer Layout
North
South

6

Summary of Costs

Site Condition No. 1–Typical Septic System Installation	Cost
Capital Cost - Installation	$15,000
Monthly Payment (2 Percent Loan–10 years)	$140
Monthly Operations and Maintenance	$11
Estimated Total Monthly Cost	$151

Site Condition No. 2–Poor Soils and Low Groundwater Table	Cost
Capital Cost - Installation	$17,500
Monthly Payment (2 Percent Loan–10 years)	$163
Monthly Operations and Maintenance	$11
Estimated Total Monthly Cost	$174

Site Condition No. 3–Poor Soils and High Groundwater Table	Cost
Capital Cost - Installation	$20,000
Monthly Payment (2 Percent Loan–10 years)	$186
Monthly Operations and Maintenance	$24
Estimated Total Monthly Cost	$210

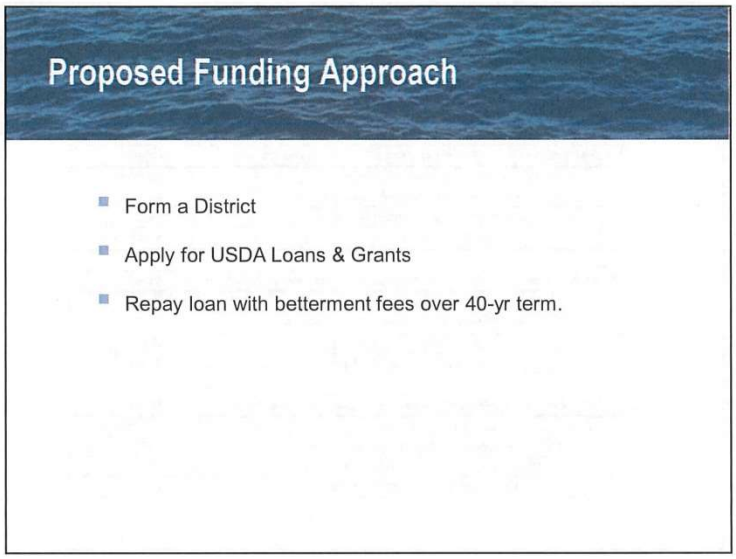
Summary of Costs

Site Condition No. 4A–Advance Treatment	Cost
Capital Cost - Installation	$25,000
Monthly Payment (2 Percent Loan–10 years)	$232
Monthly Operations and Maintenance	$39
Estimated Total Monthly Cost	$271

Site Condition No. 4B–Advance Treatment on difficult site	Cost
Capital Cost - Installation	$50,000
Monthly Payment (2 Percent Loan–10 years)	$464
Monthly Operations and Maintenance	$39
Estimated Total Monthly Cost	$503

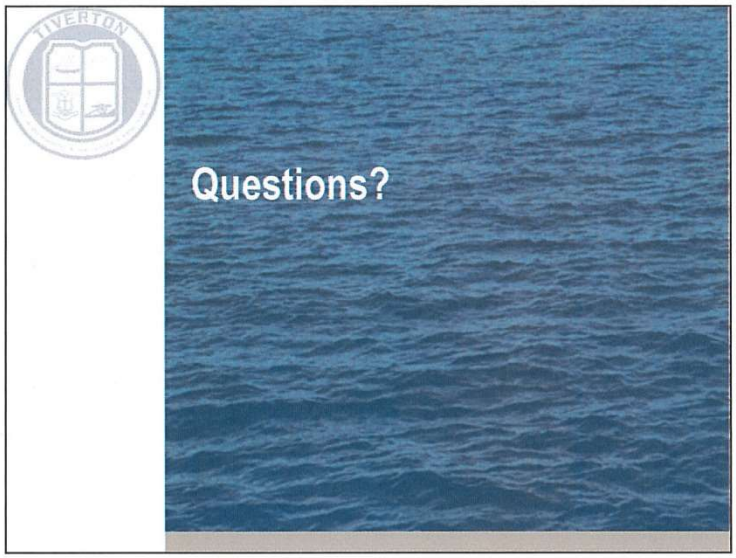
Betterment Cost and Sewer User Charge	Range of Costs	
Betterment	$11,000	$16,500
Monthly Payment (3 Percent Betterment–40 Years)	$40	$60
Monthly Sewer User Charge (Current Rate)	$65	$65
Estimated Total Monthly Cost	$105	$125

7


Proposed Funding Approach
Form a District
Apply for USDA Loans & Grants
Repay loan with betterment fees over 40-yr term.


Public Participation Program
------- Meeting Dates and Times -------
Mon April 22nd @ 7:00 PM (BAY ST Neighborhood)
at the Community Center 346 Judson Street
Mon April 29th @ 7:00 PM (RIVERSIDE DR Neighborhood)
At the Community Center 346 Judson Street
Wed May 8th @ 7:00 PM (ROBERT GRAY Neighborhood)
At the Town Hall 345 Highland Road
Tue May 28th @ 7:00 PM – Public Hearing
At the Town Hall, 345 Highland Road

8



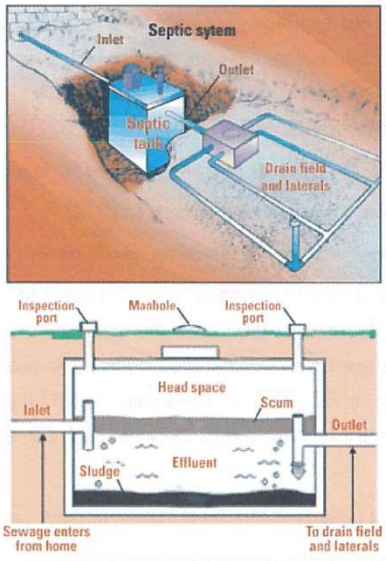
9

Tiverton, RI

SEWER SYSTEM CONSTRUCTION PROGRAM

Septic System vs. Town Sewer System

Understanding the Costs Associated with Wastewater Disposal



A Septic System is a system on your property consisting of a septic tank, distribution box, and disposal field. A septic system provides separation of the solids and liquids, but not full treatment of the waste.

A Town Sewer System would consist of an underground sewer pipeline in the street that would transfer household wastewater to a Wastewater Treatment Facility for complete treatment of the waste.

Letter from the Tiverton Wastewater Management Commission

April 2013

Residents of Tiverton,

The Town of Tiverton, Rhode Island and our consultant, AECOM, have completed a review of the Town's Wastewater Facilities Plan in accordance with the requirements of the Rhode Island Department of Environmental Management (RIDEM) Division of Water Resources. The purpose of the review is to assess the current and future wastewater needs of the Town, determine if the recommendations presented in the original Facilities Plan, prepared by Camp, Dresser and McKee (CDM) in 1976 and updated by the Louis Berger Group, Inc. in 2000, were still applicable and recommend changes to the Wastewater Facilities Plan that will address the needs of the Town over the next 20 years. The primary driver for conducting this Facilities Plan Update is the Cesspool Phase-out Act enacted by the State of Rhode Island in 2007. In general, the legislation specifies the following:

- *Cesspools that are within 200 feet of identified critical resources must be replaced by January 1, 2014;*
- *Properties with Cesspools that have sewers available must tie in by January 1, 2014;*
- *If failed, the cesspool must be replaced within 1 year or sooner if imminent health hazard exists;*
- *Exemption: The Act identifies an exemption which applies to cesspools located in areas to be sewered on or before January 1 2020. Properties using cesspools for wastewater disposal within these areas are exempted from the January 1, 2014 phase-out date provided that a project to sewer the area is identified in a Facilities Plan approved by RIDEM and the Municipality states in writing to RIDEM prior to January 1, 2013 that it will carry out the project. Additionally, bonding/financing authority must be obtained by December 31, 2014.*

In additon, other drivers include the following:

- *Pollution in the stormwater outfalls identified in the Janaury 2010 Total Maximun Daily Load (TMDL) Study;*
- *High percentage of properties with failed on-site wastewater disposal systems; and*
- *Properties with contaminated soils.*

This project will amend the currently approved Facilities Plan by reaffirming the need for sewer service in the northern portion of the Town, including all proposed and existing high density residential developments in this area. The project will update the environmental assessment necessary to address providing sewer service to Tiverton. The Facilities Plan, dated 1976, recommended providing a wastewater collection system in four areas of the Town: North Tiverton, Stone Bridge, Bulgarmarsh Road, and Stafford Road. The Facilities Plan concluded that the remainder of the Town would be best served by individual site sewer disposal systems. This decision was based on economics, lot sizes, and soil

conditions. The basic conclusion remains valid and consistent with the Comprehensive Community Plan adopted by the Town in 2009. The planning area of this document was limited to those areas north of Bulgarmarsh Road. Based on the review of the existing documents and updating various technical and financial information, this project recommends:

- *Expand the existing wastewater collection system to service up to 8 new areas of Town as identified as follows: (a) Riverside Area; and (b) Robert Gray Area; (c) Bay Street Area; (d) Church Street Area; (e) Lepes Road Area; (f) Garden Heights Area;(g) Mill Street Area; (h) North Stafford Road Area; These areas are shown on Page 4 & 5. Additionally, the Delano's Island area on Nanaquaket Pond has been identified as requiring further study to develop a suitable alternative to everyone installing advanced treatment systems.*
- *Under the recommended scenario, the number of connections would increase from 550 up to 4,000;*
- *The average daily flow would increase from 90,000 gallons per day to approximately 1,200,000 gallons per day;*
- *The recommendation will be phased over a period of at least 10 years with the first phase being areas with the most critical enviormental concerns, followed by other areas based on economics and need;*
- *Create a Sewer District that encompasses the existing and future sewer collection areas so that* ***only properties located within the Sewer District will be responsible for the costs to design, construct and operate the system;***
- *Develop a Capital Improvement Plan and associated financial plan which results in a financially stable and self-sufficient operation; and*
- *Research and apply for, as applicable, funding sources including grants and low interest loans in order to reduce the burden of costs on the rate payers and users of the system.*

A public information program has been developed in order to bring the proposed sewer program to the public, solicit public input, and answer questions. As part of this program, a project binder has been put in three public locations so that the public can view the document as it evolves. These locations are: (a) Town Hall; (b) Wastewater Management Commission Offices located at The Community Center; and (c) the Essex Library. In addition, public information meetings has have been scheduled which are intended to give you the opportunity to review, and discuss all aspects of the plan. The Wastewater Management Commissioners; The Superintendent; and the Town's Consultant, AECOM, will all be in attendance to address questions you may have.

We look forward to your participation in this very important Project. If you have any questions, please contact John Lincourt, Superintendent at 401-625-6701.

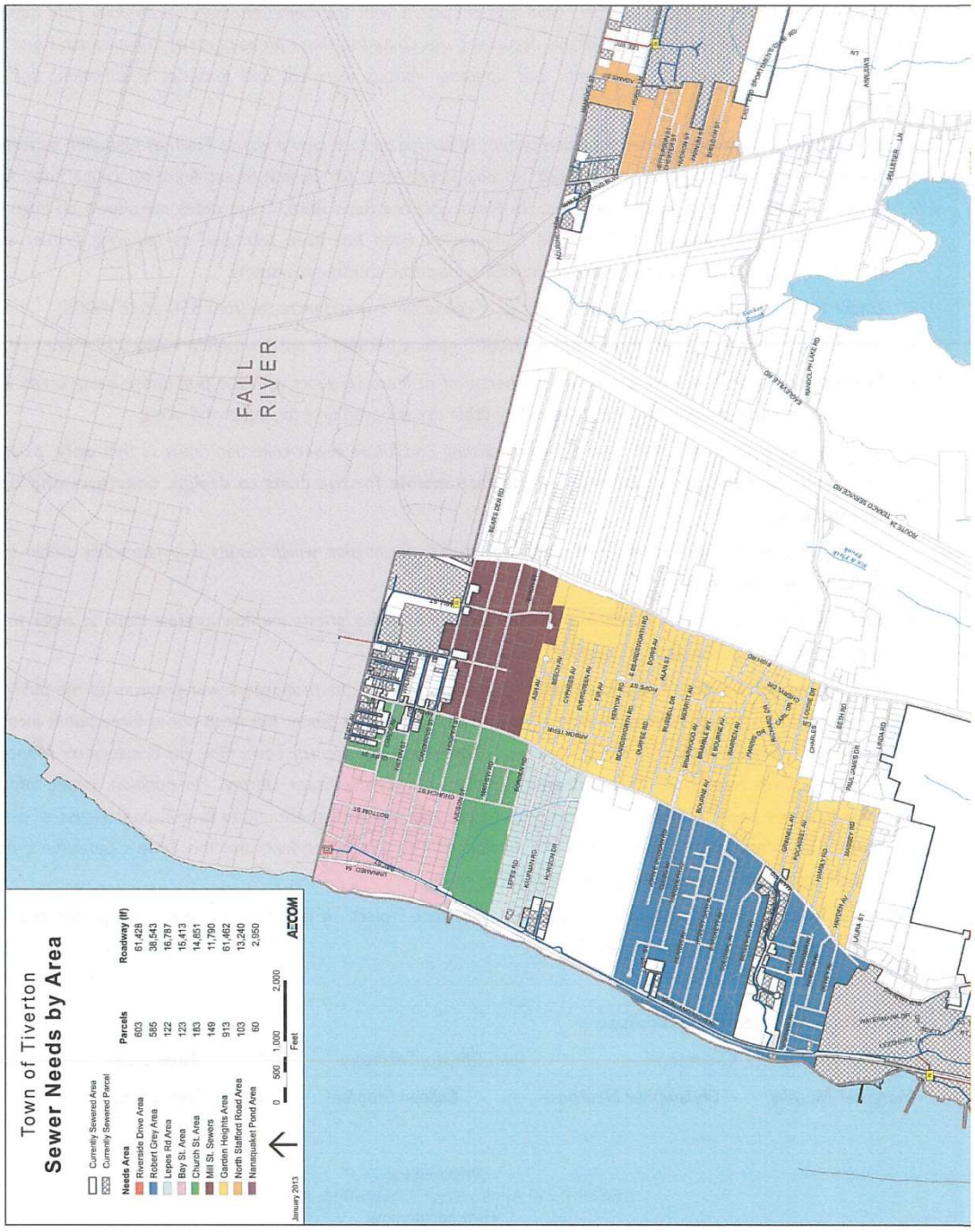
Wastewater Management Commission

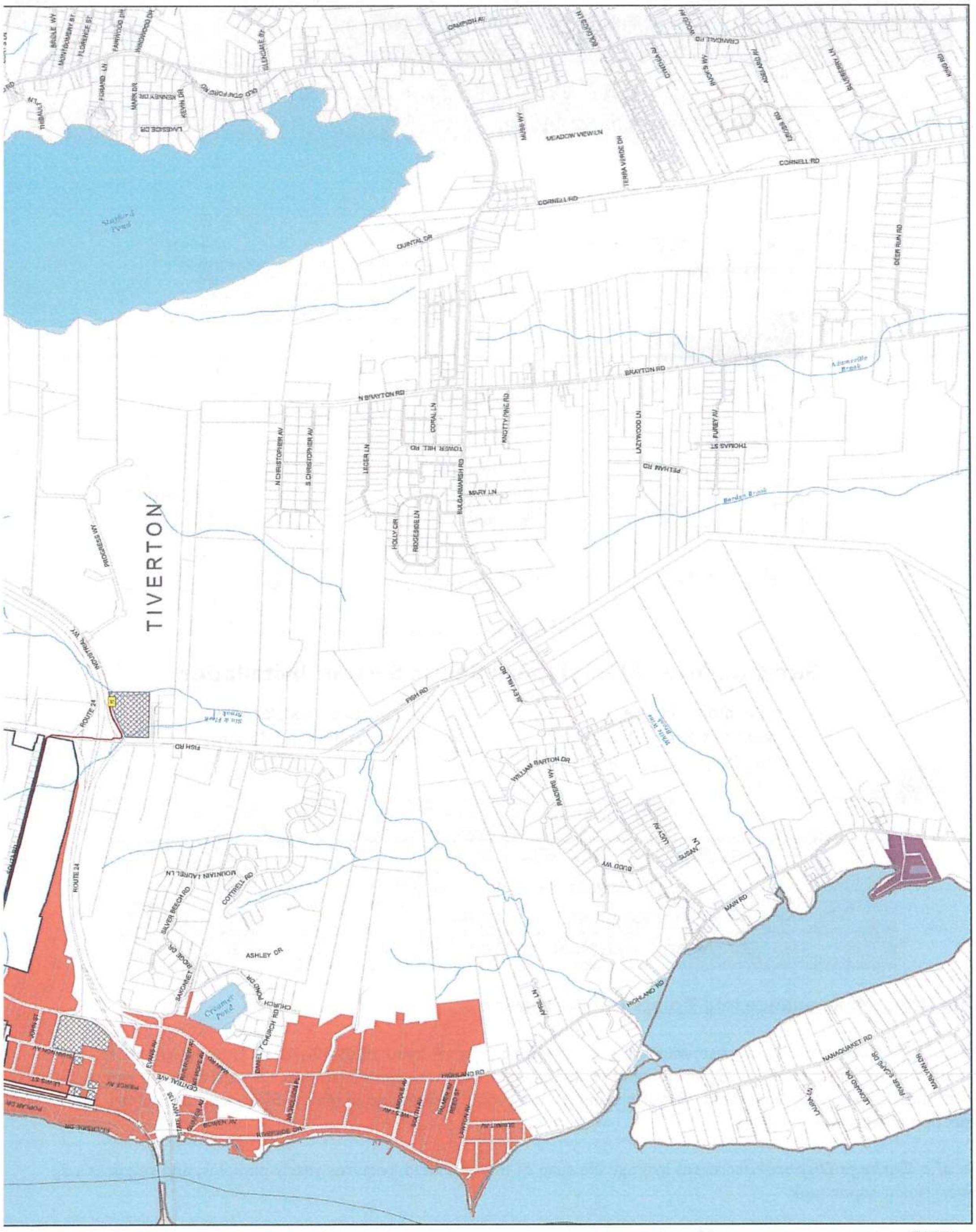
Leroy Kendricks, P.E., Chairman *John Christo, Secretary* *Noel Berg*

Margaret Murphy *Christopher Nearpass* *Colleen Stanton* *Jeffery Sterns, P.E.*

Prepared by:
AECOM, 250 Apollo Drive, Chelmsford, MA 01824
www.aecom.com
April 2013

3


FALL
RIVER
Town of Tiverton
Sewer Needs by Area
Currently Sewered Area
Currently Sewered Parcel
Needs Area
Parcels
Roadway (lf)
Riverside Drive Area 603 61,428
Robert Grey Area 585 38,543
Lepes Rd Area 122 16,787
Bay St. Area 123 15,413
Church St. Area 183 14,851
Mill St. Sewers 149 11,790
Garden Heights Area 913 61,462
North Stafford Road Area 103 13,240
Nanaquaket Pond Area 60 2,950
0 500 1,000 2,000
Feet
AECOM
January 2013

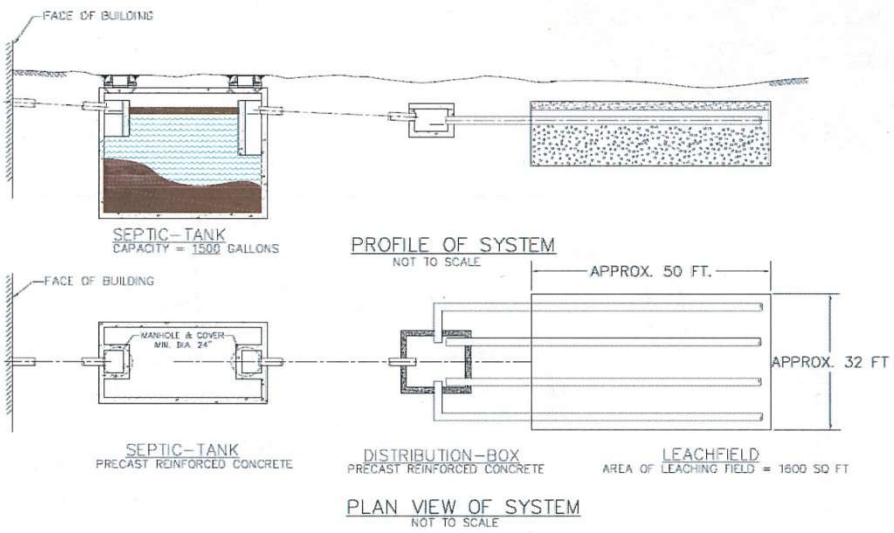

TIVERTON
CORNELL RD
MEADOW VIEW LN
QUINTAL DR
DEER RUN RD
BRAYTON RD
N BRAYTON RD
N CHRISTOPHER AV
S CHRISTOPHER AV
LEGER LN
MARY LN
LAZYWOOD LN
THOMAS ST
FISH RD
ROUTE 24
MOUNTAIN LAUREL LN
COTTRELL RD
ASHLEY DR
MAIN RD
HIGHLAND RD
NANAQUAKET RD

5

Tiverton Wastewater Management Commission

ON-SITE WASTEWATER DISPOSAL

Understanding What Impacts System Costs



Site Condition No. 1: Typical Septic System Installation

4 Bedroom House
Good Soil Classification
Good Percolation Rate

Low Groundwater Level
Septic Tank = 1,500 gallons

DESCRIPTION	COST
CAPITAL COST - INSTALLATION	$15,000
MONTHLY PAYMENT (2 PERCENT LOAN– 10 YEARS)	$140
MONTHLY OPERATIONS AND MAINTENANCE	$11
ESTIMATED TOTAL MONTHLY COST	**$151**

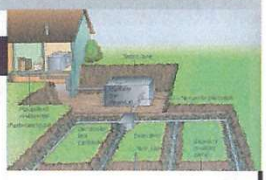
Operation, Maintenance and Points of Information

Typical Life Span of a on-site wastewater disposal system can range from 10 to 30 years. The average life span is estimated to be 20 years. Poor Operation and Maintenance of your on-site wastewater disposal system can greatly impact the life span of the leachfield. Regular maintenance should include septic tank pumping and overall system inspection at least every 2 years.

Use of a Garbage Disposal decreases average life span of the leachfield, requires yearly pumping, and requires a 2-compartment septic tank.

The Leachfield represents about 75 percent of the overall estimated cost for a typical on-site wastewater disposal system.

6



ON-SITE WASTEWATER DISPOSAL (CONTINUED)

Understanding What Impacts System Costs

Site Condition No. 2: Poor Soils and Low Groundwater Table

4 Bedroom House
Poor Soil Classification
Poor Percolation Rate

Low Groundwater Level
Septic Tank = 1,500 gallons

Mounded System OR
Larger Leachfield
(Up to 3,000 sq ft)

DESCRIPTION	COST
CAPITAL COST - INSTALLATION	$17,500
MONTHLY PAYMENT (2 PERCENT LOAN– 10 YEARS)	$163
MONTHLY OPERATIONS AND MAINTENANCE	$11
ESTIMATED TOTAL MONTHLY COST	$174

Site Condition No. 3: Poor Soils and High Groundwater Levels

4 Bedroom House
Poor Soil Classification
Poor Percolation Rate

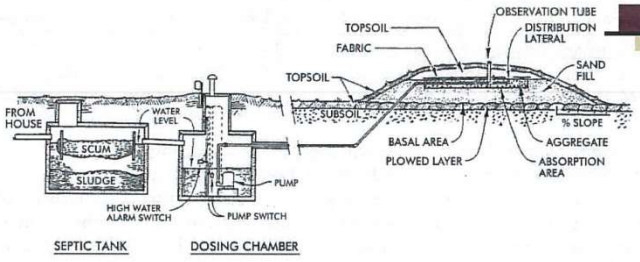
High Groundwater Level
Septic Tank = 1,500 gallons

Mounded System Required
Larger Leachfield Probable

DESCRIPTION	COST
CAPITAL COST - INSTALLATION	$20,000
MONTHLY PAYMENT (2 PERCENT LOAN– 10 YEARS)	$186
MONTHLY OPERATIONS AND MAINTENANCE	$24
ESTIMATED TOTAL MONTHLY COST	$210

What is a Mounded System?
Mounded septic systems are designed to address certain site restrictions such as slow/fast permeable soils, shallow soil cover over porous bedrock, and/or high water table.

What are the Disadvantages of a Mounded System?
Higher construction costs, property aesthetics, and pumps or siphons are required.



3 Main Components of a Mounded System

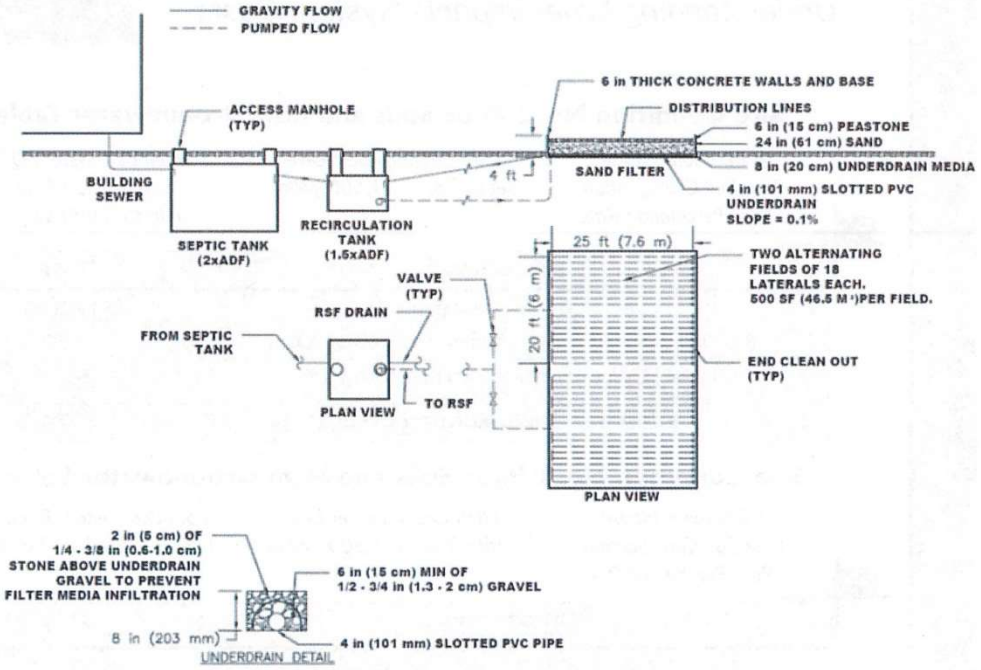
1. Septic Tank
2. Dosing or Pump Chamber
3. Elevated Mound

7

Tiverton Wastewater Management Commission

ON-SITE WASTEWATER DISPOSAL (CONTINUED)

Understanding What Impacts System Costs



Site Condition No. 4: Advanced Treatment System

4 Bedroom House
Poor Soil Classification
Poor Percolation Rate

Low Groundwater Level
Septic Tank = 1,500 gallons
Mounded System OR

Larger Leachfield
(Up to 3,000 sq ft)

DESCRIPTION	COST	COST ON DIFFICULT SITE
CAPITAL COST - INSTALLATION	$25,000	$50,000
MONTHLY PAYMENT (2 PERCENT LOAN–10 YEARS)	$232	$464
MONTHLY OPERATIONS AND MAINTENANCE	$39	$39
ESTIMATED TOTAL MONTHLY COST	$271	$503

What is a Advanced Treatment System?
An advanced treatment system is any onsite waste disposal system design which uses components other than the traditional combination of a septic holding tank and a soil absorption system and provides enhanced treatment performance.

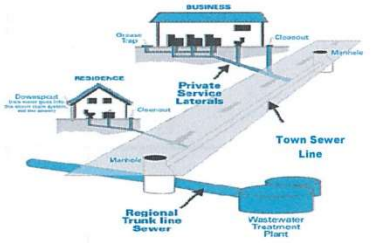
What are the Disadvantages of a Advanced Treatment System
Higher design and construction costs, higher operation and maintenance costs, property aesthetics, pumps or siphons, yearly Inspection by a Registered Professional Engineer, and annual testing are required.

8

Town Sewer System vs. On-site Wastewater Disposal System

What's Involved in Connecting or Not Connecting?

1. **Betterment** - Covers the cost of designing and constructing the sewer system infrastructure in the public ways. Users have the option to pay for their Betterment in one lump sum payment or over a period of time (typically 20 years) at a set interest rate of 4 percent. For example, if your Betterment is $20,000, and you select to pay for it over a 20-year time period, your monthly payment would be $118.



2. **Private Property Connection** - Individual sewer lateral will be constructed from the Town sewer line to each property boundary line by the Town's Contractor. The cost for this lateral is included in the Betterment. However, additional costs that are the responsibility of the property owner include connection from the lateral to the building plumbing, which is estimated to be an average cost between $5,000 and $15,000. The cost will vary depending on the length of sewer service pipe, unique site conditions, requirements for a pumping system, septic system decommissioning requirements, and the extent of site restoration required.

3. **Private Plumbing Additions/Modifications** - Individuals may elect to revise their interior plumbing in order to connect to the sewer system infrastructure. These costs are not included in the Betterment or Private Property Connection and are the responsibility of the property owner. The cost will vary depending on the additions/modifications planned.

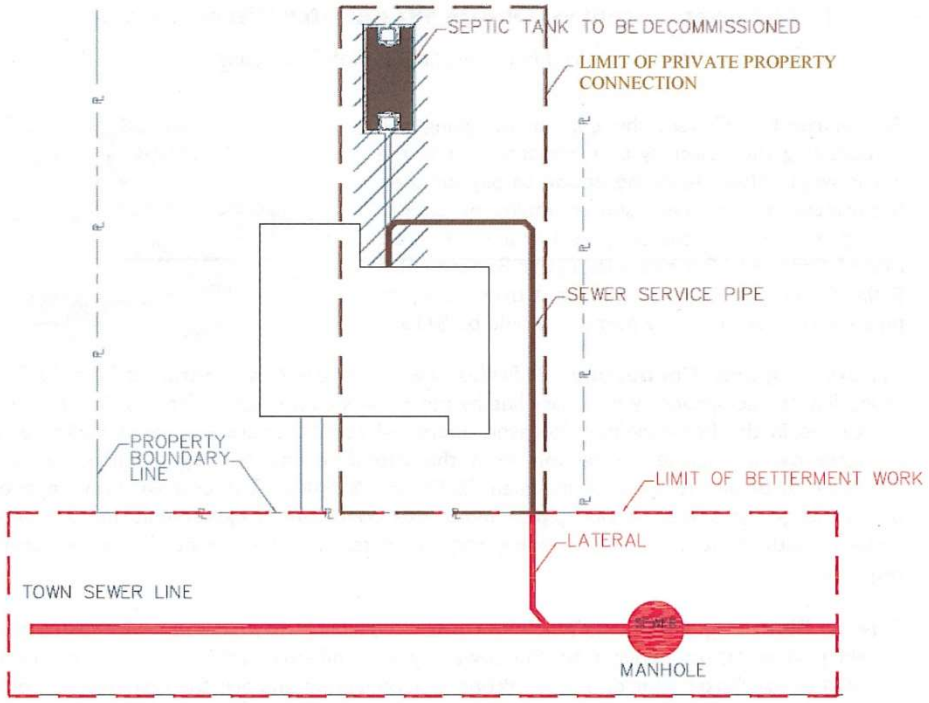
4. **Annual Sewer User Charge** - Like all public utilities, there is a sewer service charge to each sewer user that pays for ongoing operation and maintenance of the public sewer system. The current sewer user charge is calculated based on the amount of water usage metered at each property. The amount paid per cubic foot of water usage is based on an increasing block rate schedule for both water usage and sewer service. The rates periodically change based on the cost to operate and maintain each system. The more you use, the more you pay. For example, for a single family residential house your sewer usage charge would be $65 per month (base fee of $150 per year plus a disposal fee of $6.34 per 100 cubic feet of water used.

5. **On-site Wastewater Disposal System** - On-site wastewater disposal systems have a useful life of around 20 to 30 years. At the end of the useful life, the on-site wastewater disposal system will need to be rehabilitated/replaced in order to provide proper wastewater treatment and disposal. For example, if the cost to install an on-site system is $17,500, the homeowner would be required to repeat the expenditure in about another 25 years.

9

Tiverton Wastewater Management Commission

TOWN SEWER SYSTEM



BETTERMENT COST AND SEWER USER CHARGE (DOES NOT INCLUDE COST FOR PRIVATE PROPERTY CONNECTION OR PRIVATE PLUMBING ADDITIONS/MODIFICATIONS)	RANGE OF COSTS	
BETTERMENT	$11,000	$16,500
MONTHLY PAYMENT (3 PERCENT BETTERMENT–40 YEARS)	$40	$60
MONTHLY SEWER USER CHARGE (CURRENT RATE)	$65	$65
ESTIMATED TOTAL MONTHLY COST	**$105**	**$125**

THIS ALTERNATIVE IS BASED ON FORMING A SEWER DISTRICT AND RECEIVING A 45 PERCENT GRANT AND A 40 YEAR 3 PERCENT LOAN FROM USDA RURAL DEVELOPMENT

See **Page 11** for a Summary of
Septic System Costs vs. Town Sewer System Costs

10

Summary of Estimated Costs

Site Condition No. 1–Typical Septic System Installation	Cost
Capital Cost - Installation	$15,000
Monthly Payment (2 Percent Loan–10 years)	$140
Monthly Operations and Maintenance	$11
Estimated Total Monthly Cost	**$151**

Site Condition No. 2–Poor Soils and Low Groundwater Table	Cost
Capital Cost - Installation	$17,500
Monthly Payment (2 Percent Loan–10 years)	$163
Monthly Operations and Maintenance	$11
Estimated Total Monthly Cost	**$174**

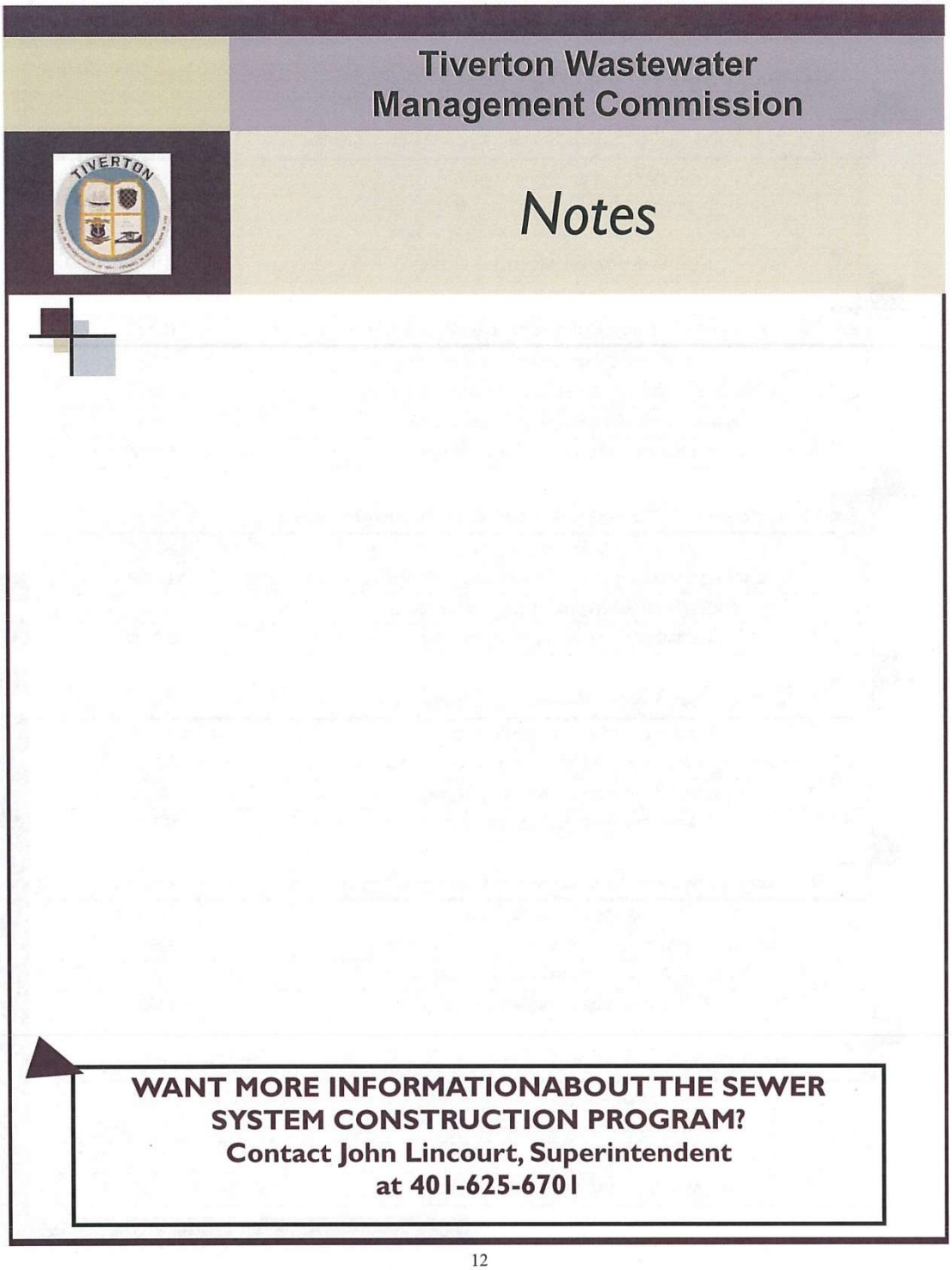
Site Condition No. 3–Poor Soils and High Groundwater Table	Cost
Capital Cost - Installation	$20,000
Monthly Payment (2 Percent Loan–10 years)	$186
Monthly Operations and Maintenance	$24
Estimated Total Monthly Cost	**$210**

Site Condition No. 4A–Advance Treatment	Cost
Capital Cost - Installation	$25,000
Monthly Payment (2 Percent Loan–10 years)	$232
Monthly Operations and Maintenance	$39
Estimated Total Monthly Cost	**$271**

Site Condition No. 4B–Advance Treatment on difficult site	Cost
Capital Cost - Installation	$50,000
Monthly Payment (2 Percent Loan–10 years)	$464
Monthly Operations and Maintenance	$39
Estimated Total Monthly Cost	**$503**

Betterment Cost and Sewer User Charge	Range of Costs	
Betterment	$11,000	$16,500
Monthly Payment (3 Percent Betterment–40 Years)	$40	$60
Monthly Sewer User Charge (Current Rate)	$65	$65
Estimated Total Monthly Cost	**$105**	**$125**

11


Tiverton Wastewater
Management Commission
Notes
WANT MORE INFORMATIONABOUT THE SEWER
SYSTEM CONSTRUCTION PROGRAM?
Contact John Lincourt, Superintendent
at 401-625-6701
12

FAQ's

Frequently Asked Questions

Tiverton Wastewater Facilities Plan Update

Q	***Who is the Wastewater Management Commission?***
A	The WWMC is a commission of volunteers appointed by the Town Council. The purpose of the WWMC is to oversee wastewater issues in accordance with the Town Charter and the Wastewater Ordinance under the direction of the Town Council. The current WWMC consists of two practicing Professional Engineers, a retired professional engineer, a wastewater operator, a Certified Public Accountant, a construction manager and a retired contracts manager. In support of the Commission is the Wastewater Superintendent as well as the DPW Director.
Q	***Why are you doing this study?***
A	Recent events have necessitated that we update our Wastewater Facilities Plan. The Facilities plan that we are currently operating under was originally completed in 1976 and last updated in 2000. If we don't do this study, we must continue to follow the recommendations of our last Facilities Plan which is completely out of date. The old plan recommends that the entire North end of town should have sewers installed. Until we tell RIDEM otherwise, this is our plan. Even the On-Site program that was passed in 2006 doesn't supersede the outdated Facilities Plan. RIDEM considers our On-Site program as our plan to regulate those areas not covered by sewers. RIDEM recently told us to begin to implement our outdated Facilities Plan. The longer we do nothing, the stronger their insistence will be, until they eventually fine us like they did Portsmouth. This new study will take into account the advanced technologies of modern septic systems, and the escalating costs of installing sewers, it will document which areas in town are most critical and need to be serviced by sewers now, which areas can wait for better economic times and which areas should continue using septic systems. It will document those areas where sewers are feasible alternatives. If the State accepts our updated Wastewater Facilities Plan, it will not force us to install sewers where we have documented that they are not the preferred method of wastewater treatment.
Q	***Has the State put the Town on notice that many cesspools are not in compliance?***
A	In 2010, the State did a study of Mt. Hope Bay and determined that the Town's stormwater drainage system is discharging elevated levels of fecal bacteria. They attributed the high bacteria to failed septic systems in the area and put us on notice that we must begin installing sewers per our most current Facilities plan. Here's a direct quote from the State's Report: "*The 2000 Tiverton Facilities Plan approved by RIDEM proposes sewering the entire North Tiverton area. The Town must commit to a schedule to commence the design and construction of sewers for these problem areas.*"

	Our inspection program has identified some failed systems, but not all cesspools are failing the mandatory inspections.
Q	***How does the State's Cesspool Phase Out law affect us?***
A	The State's Cesspool Phase-Out law requires all properties within 200 feet of the shoreline that rely on cesspools for wastewater disposal to replace their cesspools with a conforming septic system by January 1, 2014. The properties along Main road from the Nanaquaket Bridge to the north end of Riverside Drive are the most affected area in town. The cost of septic systems for many property owners in this area will be excessive, exceeding $60,000 in some cases. These properties will have to meet both RIDEM and CRMC requirements to site new septic systems. This neighborhood is close to our interceptor making it a prime candidate for installing a sewer line to service those properties along the shoreline. Our current Facilities Plan does not address this area and therefore we will not be able to use any grants or the low interest State Revolving Fund (SRF) loan program to fund any project in this area.
Q	***I live in an area of town that will never receive sewer service. I have to pay to maintain my own septic system; I don't want to pay for other people to maintain their septic system.***
A	A big part of this study is going to be finances. The study will identify what the costs will be to install sewers in recommended areas and will identify grants and low interest loans available to finance the construction. All cost breakdowns will assume that ONLY THOSE WHO WILL BE SERVICED BY SEWERS WILL SHARE THE COST OF THE SEWER CONSTRUCTION.
Q	***I live in an area that is planned for sewers, but I just upgraded my septic system. I don't want to tie in.***
A	We have an existing program which will be extended and expanded once we begin installing sewers. If you just spent the money to do the right thing and fixed a failed septic system, we will give you relief from the one year mandatory tie-in requirement. At this time we have not determined the extent of the relief, this will be one of the items that the study will work on.
Q	***What is the cost of the Facilities Plan, and how will it be financed.***
A	The cost of the study will be $58,500. It will be financed partly through the $10,000 that the Budget Committee included in the approved FTR and the balance through a loan from the State Revolving Loan fund. The part of the project which will be financed by the SRF loan will have to be paid back in 3 yearly payments. We will not start paying it back until FY 2014.

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APPENDIX 5 – PUBLIC INFORMATION MEETINGS - QUESTIONS AND ANSWERS

SEWER CONSTRUCTION PROGRAM
PUBLIC PARTICIPATION PROGRAM INFORMATIONAL MEETING

BAY STREET NEIGHBORHOOD

APRIL 22, 2013 at 7:00 PM

Number	Question/Statement	Answer
1	If a cesspool with high groundwater condition exists, it is required to be replaced. If so when the sewers are installed do we have to pay for the sewers also?	The Commission is working with RIDEM to avoid this situation.
2	Our cesspool replaced in 2006 and we're now going to be required to connect?	The Commission has not yet but will be addressing these types of situations. The program is not to be punitive. The more properties that connect, the lower the cost will be for everyone.
3	We have a concern being located at the low end of the system.	Only the first floor is to be connected via gravity sewer. RI requires that a check valve be installed on all connections. If you elect to connect a basement, a pump would most likely be required.
4	Most properties in this area would most likely fall into the 4A site condition.	Reference made to flyer with a site that requires an Advanced Treatment System.
5	What about the costs for the private property connection?	These costs are included in the average cost of $21,000 per property.
6	If a property is sold what happens to the loan?	Typically paid off at the time of the sale.
7	Why can't it be transferred to the new owner?	It may be able to but it will have to be negotiated between the owners and the financing origination.
8	Is the grant approved?	No. The project has been reviewed with USDA. USDA stated that funding at a 45 percent grant and 40 year low interest loan is available for these types of projects. A requirement would be to form a district similar to the Stone Gate and North Tiverton Water Districts.

9	How close are you to forming a district?	The Commission is currently reviewing the requirements to form a district with Atlantic States Rural Water. Future meetings will be schedule with legal counsel and the Town Manager. The formation of a district requires state legislative approval. Each sewer expansion area will vote to be included into the districts – scheduled for Spring 2014 via a special vote.
10	If Bay Street votes against the project and you have a failed system, can I tie into the abutting sewer?	You would be required to bring the system into compliance or the Commission would review the ability to tie into the abutting sewer on a site by site consideration.
11	RI DOT owns Bay Street therefore they paid for the contamination cleanup?	Yes
12	What's the status of the cleanup funding?	6 years remain on the $1M policy, $400,000 remaining in the settlement fund.
13	What happens to undeveloped lots?	Each buildable parcel will have a service lateral installed.
14	Who owns the stormwater piping?	The Town.
15	Can a stormwater service pipe be added to eliminate I/I into the new wastewater system?	Yes but these costs are not part of the wastewater program and would need to be addressed with the Town.
16	If we have a properly operating septic system why tie-in?	The Commission wants to have 100 percent tie-in as this would reduce individual costs and is more environmentally sound. But the Commission will review these types of situations to identify a reasonable tie-in schedule.
17	Will tie-in costs be more in 5 years than now?	Yes.
18	Will other utilities be upgraded?	This will be reviewed with the Town and the utility companies including water gas and stormwater.
19	Does the 4 inch diameter pipe still exist upstream near the intersection of Bay and Foot Streets?	No. This was abandoned with the construction of Sakonnet Bay Manor.
20	Sakonnet Bay Manor placed fund into a bond. What's the status?	The Commission will review.
21	What is the time line?	About 3.5 years for design through construction. The Commission will work with RIDEM to avoid forced upgrades to onsite systems.

22	Funding limited to specific areas?	The Work will be phased into $2M to $3M as this is the annual limit by RIDEM. The Commission will continue discussion with USDA to improve funding.
23	What about the past design?	The project was voted down by a Town-wide vote even with 90 percent US EPA grants. The drawings need to be updated to bring them into compliance with today's standards and for changes to the areas that have occurred over the past 25 +/- years.
24	The existing water line was impacted by the contamination. What will happen with the new sewer lines?	None anticipated since the materials of construction will consist of PVC piping, and coatings on manholes.
25	Status of cleanup contamination funding?	Remaining funding will be used during the installation of the wastewater system if contamination is encountered.
26	The Commission should press forward since it is in the best interest for all.	The Commission agrees. This is the show case for the Town and each area will vote to move forward with in their project area.
27	Do you have Town Council support?	Yes – The Town Manager and Town Solicitor have attended various Commission meetings and the Commission has received their support for the Facility Plan Update.
28	Status of the cleanup in the roadway?	Some critical areas have been addressed while other areas will be addressed during the installation of the wastewater system if contamination is encountered.
29	Where is the location of existing sewers?	Requested to review the handout. Discussed pipe sizing and history of the system.
30	What is the step-by-step process?	Obtain written support from the Town; review and approval by the state; review and approval from each neighborhood (majority of the number of votes cased); design system; and construct system.

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SEWER CONSTRUCTION PROGRAM
PUBLIC PARTICIPATION PROGRAM INFORMATIONAL MEETING

RIVERSIDE DRIVE NEIGHBORHOOD

APRIL 29, 2013 at 7:00 PM

Number	Question/Statement	Answer
1	We should do almost anything for “free” money. What are the costs?	Estimated between $11,000 and $16,500 per property. These costs will vary between the different neighborhoods. The project will have one sewer district with financing through sub districts.
2	What is the schedule?	About 4 years for planning through construction. We are required to form a district first in order to obtain the 45 percent grant.
3	How good is the cost estimate? Will be OK at $125 per month but not if its $200 per month.	The project cost estimated includes a contingency and inflation factor.
4	This is an age issue as I’m on a fixed income. What do I give up?	No Response.
5	Our system is less than 1.5 years old. What be required to connect?	These types of situation will be reviewed on a case-by-case basis.
6	The roadway has been recently paved on the bridge but there is a drainage issue.	Stormwater is by the Town.
7	Are private property costs included?	Yes.
8	When the system is completed and our system is abandoned can we use the land area?	Yes.
9	What is the impact to property values?	Typically it has a positive impact with the sale of the property.
10	Why should the property owners pay to have the roadways rebuilt?	This will be discussed with the Town and other utility companies in order to offset some of the wastewater project costs.
12	Do we get a betterment fee even if we are not connected?	Typically yes but no policy has been set yet.
13	How was the 200 foot offset determined?	It was set as part of the 2007 Cesspool Phase Out Act.

14	How stable are the costs associated with the Fall River WWTF?	The costs are based on the existing Intermunicipal Agreement. However, the Commission plans to discuss how the costs can be reduced with the City of Fall River.
15	The handout states that private property costs are not included?	Page 10 incorrectly states that the private property costs are not included.
16	What is the entire project schedule for all areas?	About a 20-year schedule.
17	Is the 40 year payback set by the USDA?	Yes. The program is developed to assist areas with financial difficulties. It is based on the ability to pay back the loan. The time frame cannot be changed. Properties pay the district that then pays the loan. It is OK to pay the betterment off early.
18	What's the difference between a 1.5 Inch diameter service line and a 4 or 6-inch service line?	The 1.5-inch line is for properties connected via low pressure pumps while the 4 or 6-inch line is for properties connected via gravity. Most of the connections are anticipated to be via gravity.
19	Can the betterment be transferred to the new property owner?	It may be able to but it will have to be negotiated between the owners and the financing origination.
20	Are there differences between residents and businesses?	No. Same grant and loan program. Equal pay for equal service.
21	Are there pump stations?	Yes. Two proposed but unknown as to type at this time but they will be provided with emergency generators.
22	What is the cost difference between trench pavement and overlay pavement?	Estimated between 6 and 8 percent.
23	What's the time delay for digging up a newly paved road?	5 Years per State of Rhode Island.
24	How is the project bonded?	Setup a district; each neighborhood votes to be included in the district; Town Council approves to send to State; obtain USDA grant/loan; properties within each neighborhood pays the project costs for that neighborhood.

25	What if a neighborhood votes the project down?	The homeowner is responsible to address on-site disposal with no outside aid. Homeowners are required to do inspections and report findings to the Commission. The Commission needs the data to help protect the environment and to move the project forward.
26	When were the inspections requested to be done?	About 1 year ago. Started with areas within 200 feet of Mount Hope Bay and moving into other areas.
27	Is the sewer use charges tied to the water charge?	Yes, even if the water is used outdoors. This is typical in the industry.
28	Are the RIDEM deadlines being met?	Yes since the report submitted deadline was extended until June. RIDEM is working with the Commission since the Commission is taking a proactive approach.
29	What are the next steps?	Public Hearing schedule for May, 28, 2013. Ask property owners for a favorable vote to form a district. RIDEM required connections by 2020. Areas to vote to be included into the district and only residents within the neighborhood will vote.
30	Are costs common for the project?	Yes for operation and maintenance but different for capital costs for each neighborhood.
31	What about transferring a betterment?	Typically at the sale of the property. It may be able to be transferred to the new property owner but it will have to be negotiated between the owners and the financing origination.
32	Can you review the system layout?	Requested to review the handout. The proposed system layout was explained. It was noted that the conceptual design will be updated as more detailed information is obtained.
33	Low pressure sewers are about 1/3 the costs of gravity sewer. Systems installed in Dartmouth were between $2,500 and $3,000.	The cost information will be reviewed and updated as more detailed information is obtained.
34	What about backflow prevention?	RI requires that a check valve be installed on all connections.
35	Will a low pressure pump be required for each connection?	Yes with the property owner required to maintain the pumping system.

36	How do you address power failures?	The proposed pumping stations will be equipped with emergency generators. Properties with low pressure pumps will have an alarm for high water condition, stand by connection for an emergency generator or be tied to the properties emergency generator.
37	We're required to pay for these services. Water and fire protection via the North Tiverton Water District and now sewer to a new district?	No response.
38	If you have a failed system you can't sell the property.	No response.
39	Is there any economic development potential?	Yes. This was discussed at previous Commission meetings. It will help to reduce the project costs.
40	Can Riverside Drive Phase 3 be included now?	Yes if the interest exists.

SEWER CONSTRUCTION PROGRAM
PUBLIC PARTICIPATION PROGRAM INFORMATIONAL MEETING

ROBERT GRAY NEIGHBORHOOD

MAY 8, 2013 at 7:00 PM

Number	Question/Statement	Answer
1	Do sewers exist in Town?	Yes. Requested to review the handout. Location of existing explained.
2	Where does the system tie into?	A majority of the existing system ties into the Mount Hope Bay interceptor which flows into the City of Fall River. The remaining portion of the system ties directly into the City of Fall River.
3	What's involved with a system inspection?	A Town-wide inspection program began in 2006. It was schedule to be completed within 2 to 3 years. The Commission has made a renewed effort to get the inspections completed. The inspection identifies the type of system; structural status of the system; water levels; and solids buildup. The inspection costs about $100 and $180 to $250 if a pump out is required.
4	Is it proposed to sewer the entire Town?	No. Only areas that cannot utilize on-site system because of various conditions including high groundwater, poor soils, small lots, properties located near the shoreline, and the Cesspool Act.
5	Do sewers equal pipes?	Yes.
6	Is there a cost to treat the wastewater at Fall River?	Yes per the existing Intermunicipal Agreement.
7	How is the cost determined?	Set price with some minor adjustments. Based on water use bill through the Water District.
8	If you water your lawn, is there a charge for water and sewer?	Yes.
9	Fall River tripled their rates?	No. The City of Fall River raised non-wastewater rates to address stormwater issues.
10	Costs don't include user fee?	The costs do include user fees. Requested to review the handout.

11	Can you have a separate water meter for outside water usage and therefore not pay for water which does not enter the sewer system?	This would have to be discussed with the Water District.
12	Is this fair?	Yes. A majority of municipalities charge sewer user fees based on 100 percent of water usage.
13	The cost projections are not comparing similar items. 10 years vs 40 years?	The 10 year values are based on a private loan to upgrade an on-site system while the 40 year values are based on obtaining a loan through USDA. The capital cost could also be paid off without obtaining a loan.
14	How many property owners are required to vote in favor of the program for it to move forward?	A majority vote is required for approval.
15	Is the rate locked with USDA?	The rate will be set on a project by project basis. The information shown is based on current data provided by USDA.
16	What is the $65 value based on?	It is an average user fee using the current user fee rate.
17	Will the stormwater system be upgraded in the Robert Gray area?	No. Stormwater improvements are not part of this project. However, the Commission will be working with the Town and other utility companies to review upgrades to their systems. These costs are not included with the costs shown in the presentation and handouts.
18	Can the Commission issue a tax?	The forming of a district will allow the Commission to issue betterments and user fees in order to pay loans and costs associated with operating and maintaining the system.
19	Will there be one and multiple districts?	The project will have one sewer district with financing through sub districts.
20	Will we be able to delay and/or defer a tie-in based on a properly operating on-site system?	This has not been determined and is an item that the Commission will be reviewing.
21	Can the Commission extend the deadline?	The time frame for removal of cesspools is based on the Cesspool Act. RIDEM has indicated that they will work regarding schedules with the Commission as long the Commission has a plan and is moving forward with the plan.

22	A property owner with a 1/10th acre lot will pay the same as a property owner with a ½ acre lot?	Yes. Equal pay for equal service. Most lots in this neighborhood have 10,000 to 15,000 sq.ft. lots.
23	When will a vote occur? Prior to or after inspections.	Some inspections will have been completed and others will occur after the Spring 2014 vote. You can inspect at any time.
24	Letter from RIDEM regarding compliance with the Cesspool act?	Properties located within 200 foot of Mount Hope Bay were required to be incompliance with the Cesspool Act.
25	Why now and not previously?	Compliance is driven by the Cesspool Act. A sewer construction program was previously voted down by a Town-wide vote even with 90 percent US EPA grants.
26	Based on time frame, will we have to upgrade a failed system and then pay to tie into the sewer system?	No. The Commission is working with RIDEM to avoid this type of situation.
27	When would we have to make this decision?	Discuss with the Commission so that it can be discussed with RIDEM.
28	Can the USDA funding (grant/loan) only be used for the sewer system?	Yes. Funding is available for on-site system upgrades including the Community Septic System Program.
29	What if we have other questions?	Forward to the Commission through their Website and/or e-mail.
30	Is there a list on inspectors?	Yes. Contact the Commission through their Website and/or e-mail.
31	Are we locked into these inspectors?	No but some are also pumpers and the system is required to be inspected prior to pumping. Therefore you may pay more for two visits.
32	If soap suds are flowing down the street, why is it not being addressed?	It will be but the Commission needs to have property owners complete their inspections so that the Commission can review and take appropriate action.
33	What is the failure rate in the neighborhood?	Not know as incomplete inspection information exists.
34	How often should you pump out a system?	A cesspool is required to be pumped every year. A septic system is should be pumped every 2 to 3 years.

35	Why not complete as a Town project?	In order to receive the 45 percent grant and low interest loan the population must be under 10,000. Currently the Town has a population over 15,000. Therefore the formation of a district addresses this requirement.
36	What is the time required between inspections?	A cesspool is required to be pumped every year and inspected every 2 years. A septic system is required to be pumped every 2 to 3 years and inspected every 5 years. The time frame is determined by the inspector based on type of system, usage and past operating information.
37	Do we have to put funding up front?	No. Property owners will pay monthly once connected to the system.
38	I have a hybrid system (pre 1965 installation). A cesspool used as a septic tank.	It is still considered a cesspool.
39	What about Stafford Pond residents?	Considered too costly to connect. Majority already have advanced treatment systems.
40	What was the funding for the 1980's plan?	Grants from US EPA at 75 percent and State at 15 percent. The project was voted down by a Town-wide vote even with 90 percent US EPA and State grants.

APPENDIX 6 – PUBLIC HEARING

John Lincourt, Superintendent
Wastewater Management Commission

Phone 625-6701

TOWN OF TIVERTON, RHODE ISLAND
TIVERTON WASTEWATER MANAGEMENT COMMISSION
343 HIGHLAND ROAD

WASTEWATER MANAGEMENT COMMISSION JOINT WORKSHOP WITH TOWN COUNCIL

In accordance with the Open Meeting Law, Section 42-46-6, notice is hereby given that the Wastewater Management Commission will hold a Joint Workshop with the Town Council Monday, June 17, 2013 at the Tiverton High School Auditorium, 100 North Brayton Road at 7:00 p.m.

AGENDA:

1. Call to Order
2. Public Informational Meeting on Sewer System Construction Program
3. Adjournment

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John Lincourt, Superintendent
Wastewater Management Commission

OBITUARIES / STATE

4th ANNIVERSARY
In Loving Memory Of
Janet Varanese
June 6, 2009

We hold you close within our Hearts and there you shall remain. To walk with us throughout our Lives, until we meet again. To Think… we could not say goodbye Will always bring regrets. For the hearts that loved you dearly are the hearts that don't forget.
Loved and Sadly Missed by
Mom, Dad, June & Chet

from store shelves immediately if the commissioner of public health deems them a dangerous substance, under legislation being considered by lawmakers on the Mental Health and Substance Abuse Committee.

Parents, pharmacists and substance abuse counselors implored lawmakers to give the commissioner emergency powers to temporarily ban new addictive designer drugs that crop up, while state health officials decide whether to permanently schedule them as illegal drugs.

Sen. John Keenan (D-Quincy) pointed to the ban on bath salts that took two years in the Legislature to pass, while hundreds of people around the state were negatively affected by the addictive stimulant, he said.

mittee, sponsored the legislation (S 917) to give the public health commissioner the ability to order stores to stop selling the products.

The commissioner could classify a drug, chemical or substance as a Schedule 1 drug on a temporary basis if it "is necessary to avoid an imminent hazard to the public safety and is necessary for the preservation of the public health, safety or general welfare," according to the legislation.

Schedule 1 drugs, substances or chemicals are defined as drugs with no currently accepted medical use and a high potential for abuse, according to the Drug Enforcement Administration's website. Schedule 1 drugs are the most dangerous drugs with potentially severe psychological or physical dependence, and include heroin, LSD, ecstasy and marijuana, according to the DEA.

John McGahan, president

"Mad Hatter Incense."

McGahan said compa manufacturing the produ intentionally market ther young teens and college-a students with their packa

Kathy Keough, a moth from Quincy, said a few months ago her 19-year-o son Christopher showed up at her doorstep crying screaming and cursing. H confessed to snorting "K and "Spice," a synthetic drug sold over the counte in some convenience stor After he was rushed to th hospital and treated, he v involuntarily committed a substance abuse treatm facility, she said.

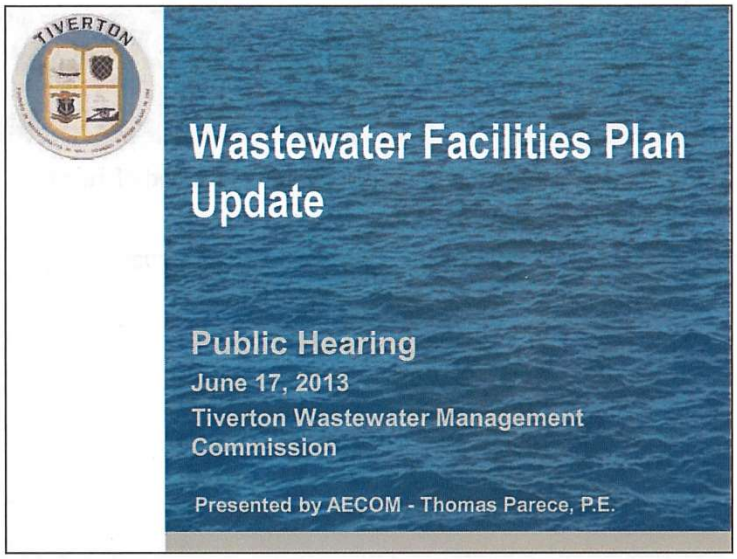
"My son, he thought because it is legal, you ca buy it at a gas station, yo buy it at a convenience st it must be okay," she said

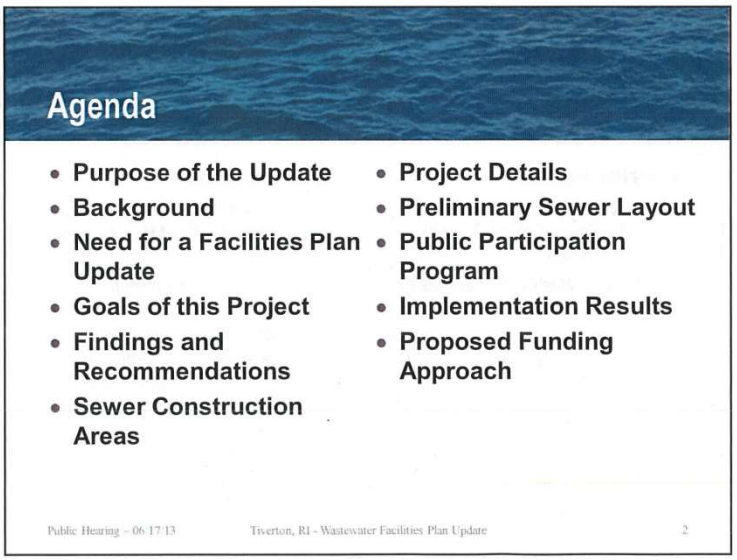
David Morgan, a phar macist from Weymouth, giving the public health c missioner emergency pow to pull the products from stores would protect you people.

NOTICE

The Tiverton Wastewater Management Commission will hold a Public Informational Meeting on Sewer System Construction Program at a Joint Workshop with the Tiverton Town Council on Monday, June 17, 2013 at the Tiverton High School Auditorium, 100 North Brayton Road at 7:00 p.m.

Nancy L. Mello
Town Clerk


TIVERTON
Wastewater Facilities Plan Update
Public Hearing
June 17, 2013
Tiverton Wastewater Management Commission
Presented by AECOM - Thomas Parece, P.E.


Agenda
Purpose of the Update
Background
Need for a Facilities Plan Update
Goals of this Project
Findings and Recommendations
Sewer Construction Areas
Project Details
Preliminary Sewer Layout
Public Participation Program
Implementation Results
Proposed Funding Approach
Public Hearing – 06/17/13
Tiverton, RI - Wastewater Facilities Plan Update
2

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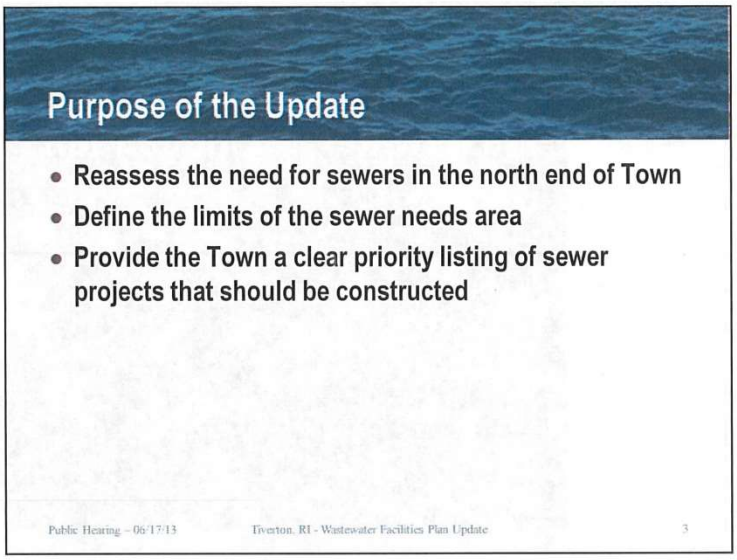
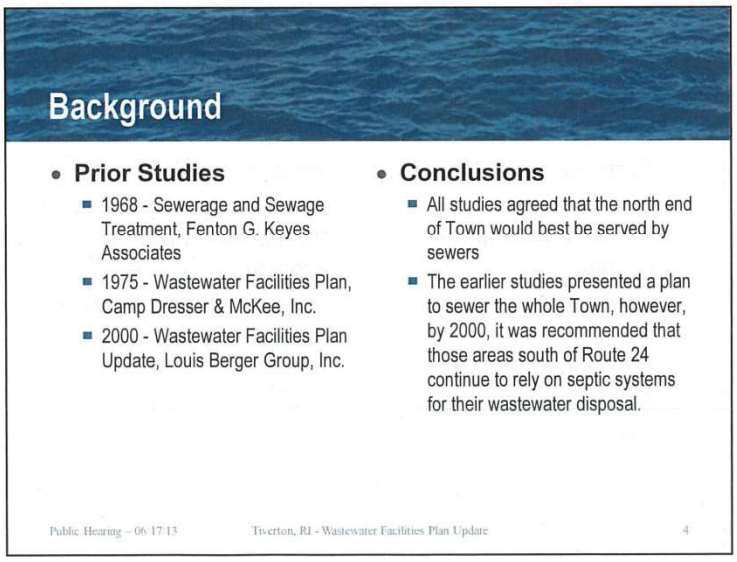

Purpose of the Update
Reassess the need for sewers in the north end of Town
Define the limits of the sewer needs area
Provide the Town a clear priority listing of sewer projects that should be constructed
Public Hearing – 06/17/13
Tiverton, RI - Wastewater Facilities Plan Update
3


Background
Prior Studies
1968 - Sewerage and Sewage Treatment, Fenton G. Keyes Associates
1975 - Wastewater Facilities Plan, Camp Dresser & McKee, Inc.
2000 - Wastewater Facilities Plan Update, Louis Berger Group, Inc.
Conclusions
All studies agreed that the north end of Town would best be served by sewers
The earlier studies presented a plan to sewer the whole Town, however, by 2000, it was recommended that those areas south of Route 24 continue to rely on septic systems for their wastewater disposal.
Public Hearing – 06/17/13
Tiverton, RI - Wastewater Facilities Plan Update
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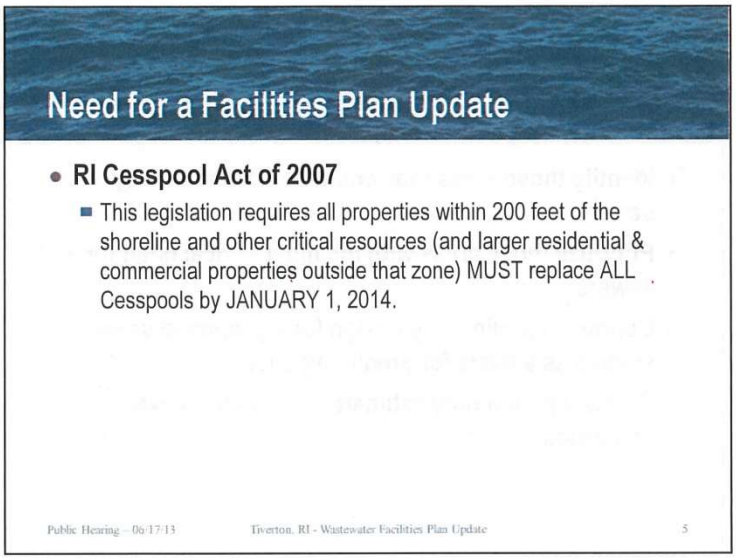
Need for a Facilities Plan Update
RI Cesspool Act of 2007
This legislation requires all properties within 200 feet of the shoreline and other critical resources (and larger residential & commercial properties outside that zone) MUST replace ALL Cesspools by JANUARY 1, 2014.
Public Hearing – 06/17/13
Tiverton, RI - Wastewater Facilities Plan Update
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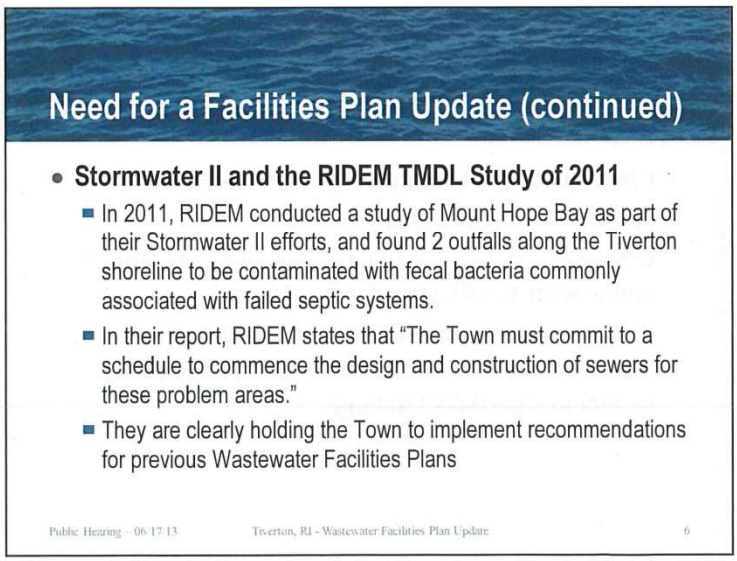
Need for a Facilities Plan Update (continued)
Stormwater II and the RIDEM TMDL Study of 2011
In 2011, RIDEM conducted a study of Mount Hope Bay as part of their Stormwater II efforts, and found 2 outfalls along the Tiverton shoreline to be contaminated with fecal bacteria commonly associated with failed septic systems.
In their report, RIDEM states that "The Town must commit to a schedule to commence the design and construction of sewers for these problem areas."
They are clearly holding the Town to implement recommendations for previous Wastewater Facilities Plans
Public Hearing – 06/17/13
Tiverton, RI - Wastewater Facilities Plan Update
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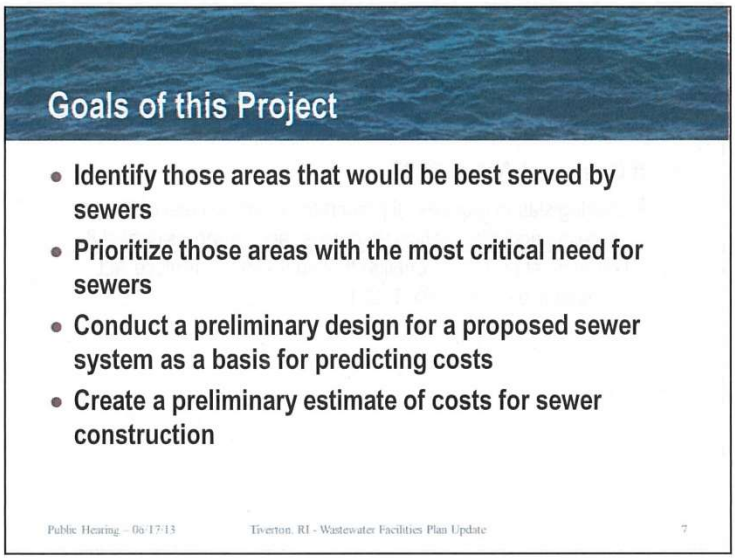
Goals of this Project
• Identify those areas that would be best served by sewers
• Prioritize those areas with the most critical need for sewers
• Conduct a preliminary design for a proposed sewer system as a basis for predicting costs
• Create a preliminary estimate of costs for sewer construction
Public Hearing – 06/17/13
Tiverton, RI - Wastewater Facilities Plan Update
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Goals of this Project (continued)
• Create a schedule for completing all construction
• Identify funding sources
• Create a financial plan to complete all sewer projects and operate the Wastewater Department
• Satisfy requirements of RIDEM and EPA to insure that the Town qualifies for State Revolving Fund (SRF) financing and USDA Funding
Public Hearing – 06/17/13
Tiverton, RI - Wastewater Facilities Plan Update
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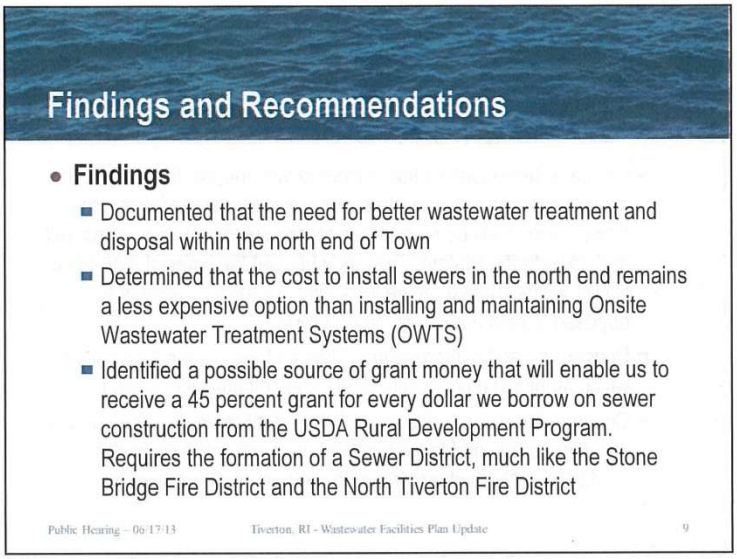
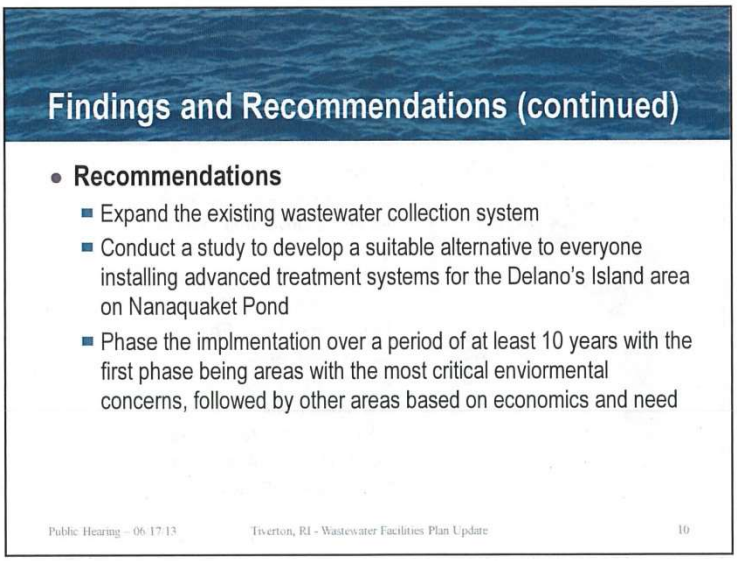

Findings and Recommendations
Findings
Documented that the need for better wastewater treatment and disposal within the north end of Town
Determined that the cost to install sewers in the north end remains a less expensive option than installing and maintaining Onsite Wastewater Treatment Systems (OWTS)
Identified a possible source of grant money that will enable us to receive a 45 percent grant for every dollar we borrow on sewer construction from the USDA Rural Development Program. Requires the formation of a Sewer District, much like the Stone Bridge Fire District and the North Tiverton Fire District
Public Hearing – 06/17/13
Tiverton, RI - Wastewater Facilities Plan Update
9


Findings and Recommendations (continued)
Recommendations
Expand the existing wastewater collection system
Conduct a study to develop a suitable alternative to everyone installing advanced treatment systems for the Delano's Island area on Nanaquaket Pond
Phase the implmentation over a period of at least 10 years with the first phase being areas with the most critical enviormental concerns, followed by other areas based on economics and need
Public Hearing – 06/17/13
Tiverton, RI - Wastewater Facilities Plan Update
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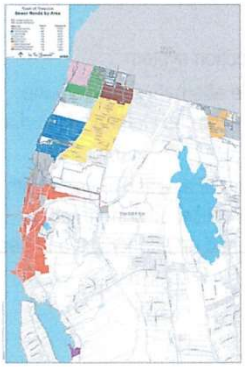
Findings and Recommendations (continued)

- Create a Sewer District that encompasses the existing and future sewer collection areas so that only properties located within the Sewer District will be responsible for the costs to design, construct and operate the system. The study has set the limits of a proposed Sewer District based on the feasibility of installing Sewers as opposed to continued reliance on OWTS
- Develop a Capital Improvement Plan and associated financial plan which results in a financially stable and self-sufficient operation
- Continue to research and apply for, as applicable, funding sources including grants and low interest loans in order to reduce the burden of costs on the rate payers and users of the system

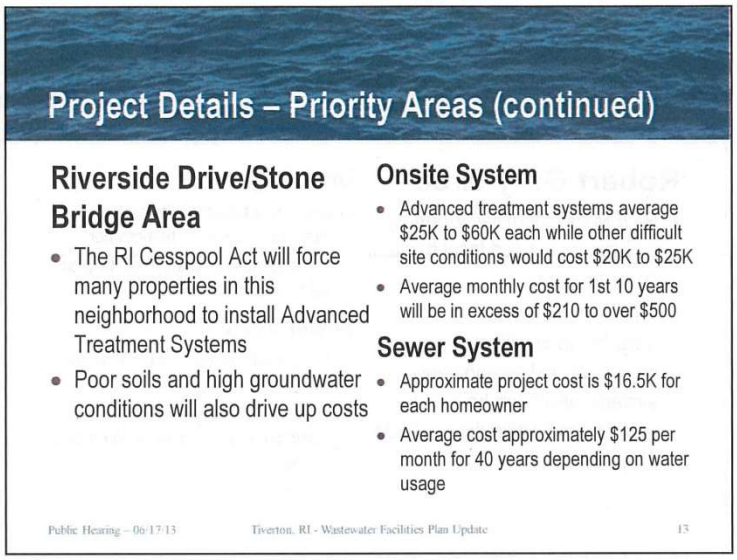
Public Hearing – 06/17/13 Tiverton, RI - Wastewater Facilities Plan Update 11

Sewer Construction Areas



Riverside Drive Area - Phase 1
Riverside Drive Area - Phase 2
Riverside Drive Area - Phase 3
Bay Street Area
Robert Gray Area - Phase 1
Robert Gray Area - Phase 2
Robert Gray Area - Phase 3
Lepes Road Area
Church Street Area
Mill Street Area
Garden Heights Area - Phase 1
Garden Heights Area - Phase 2
North Stafford Road Area

Public Hearing – 06/17/13 Tiverton, RI - Wastewater Facilities Plan Update 12


Project Details – Priority Areas (continued)
Riverside Drive/Stone Bridge Area
The RI Cesspool Act will force many properties in this neighborhood to install Advanced Treatment Systems
Poor soils and high groundwater conditions will also drive up costs
Onsite System
Advanced treatment systems average $25K to $60K each while other difficult site conditions would cost $20K to $25K
Average monthly cost for 1st 10 years will be in excess of $210 to over $500
Sewer System
Approximate project cost is $16.5K for each homeowner
Average cost approximately $125 per month for 40 years depending on water usage
Public Hearing – 06/17/13
Tiverton, RI - Wastewater Facilities Plan Update
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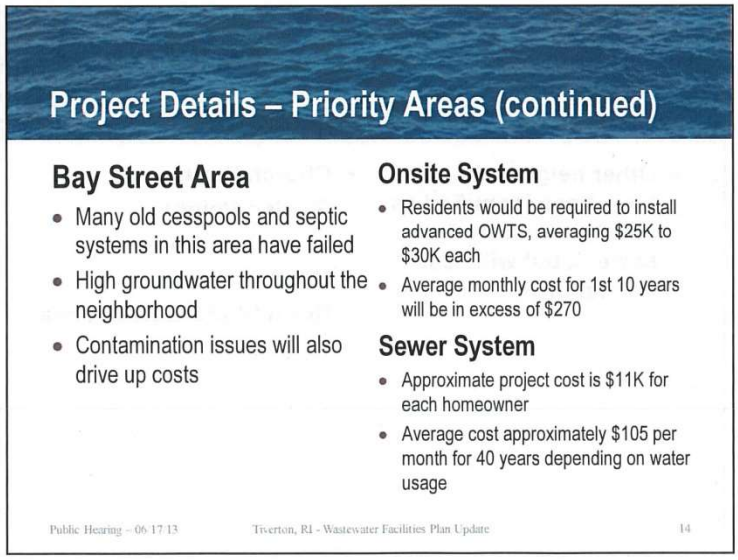
Project Details – Priority Areas (continued)
Bay Street Area
Many old cesspools and septic systems in this area have failed
High groundwater throughout the neighborhood
Contamination issues will also drive up costs
Onsite System
Residents would be required to install advanced OWTS, averaging $25K to $30K each
Average monthly cost for 1st 10 years will be in excess of $270
Sewer System
Approximate project cost is $11K for each homeowner
Average cost approximately $105 per month for 40 years depending on water usage
Public Hearing – 06/17/13
Tiverton, RI - Wastewater Facilities Plan Update
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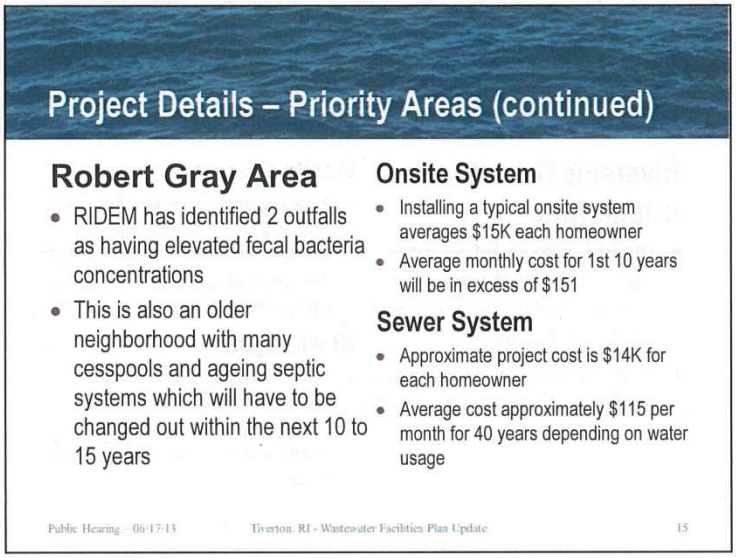
Project Details – Priority Areas (continued)
Robert Gray Area
RIDEM has identified 2 outfalls as having elevated fecal bacteria concentrations
This is also an older neighborhood with many cesspools and ageing septic systems which will have to be changed out within the next 10 to 15 years
Onsite System
Installing a typical onsite system averages $15K each homeowner
Average monthly cost for 1st 10 years will be in excess of $151
Sewer System
Approximate project cost is $14K for each homeowner
Average cost approximately $115 per month for 40 years depending on water usage
Public Hearing – 06/17/13
Tiverton, RI - Wastewater Facilities Plan Update
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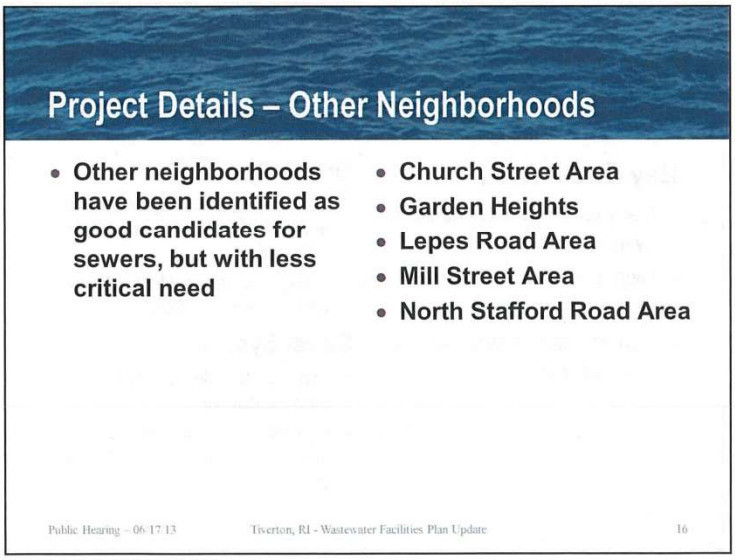
Project Details – Other Neighborhoods
Other neighborhoods have been identified as good candidates for sewers, but with less critical need
Church Street Area
Garden Heights
Lepes Road Area
Mill Street Area
North Stafford Road Area
Public Hearing – 06/17/13
Tiverton, RI - Wastewater Facilities Plan Update
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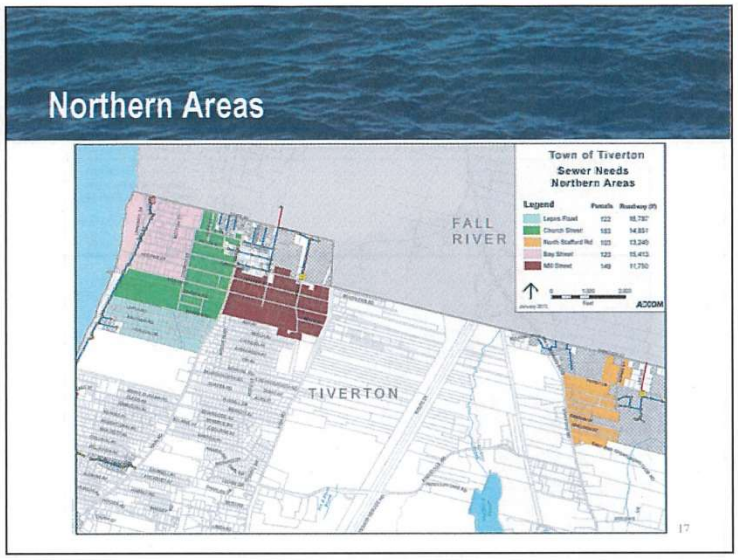
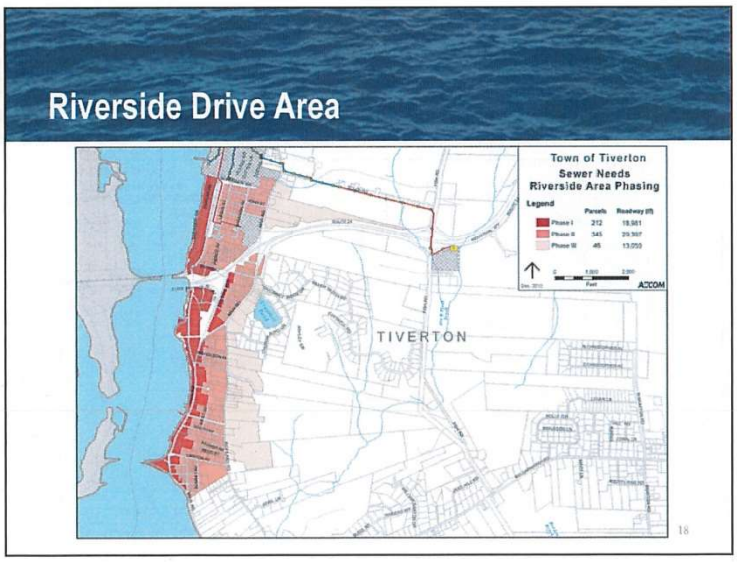
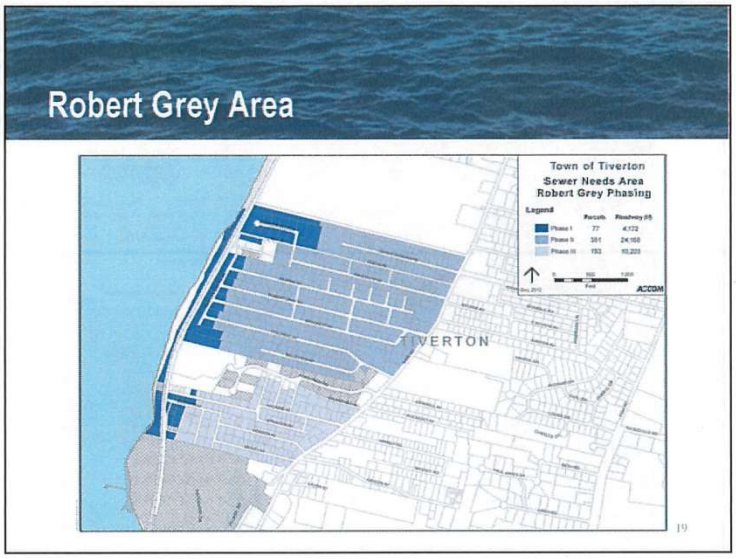

Northern Areas
Town of Tiverton
Sewer Needs
Northern Areas
Legend
FALL
RIVER
TIVERTON
ACCOM
17


Riverside Drive Area
Town of Tiverton
Sewer Needs
Riverside Area Phasing
Legend
TIVERTON
ACCOM
18


Robert Grey Area
Town of Tiverton
Sewer Needs Area
Robert Grey Phasing
Legend
TIVERTON
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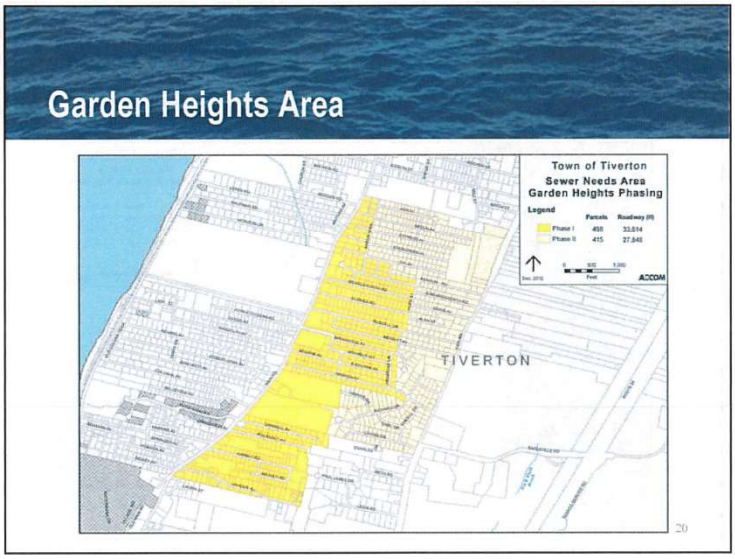
Garden Heights Area
Town of Tiverton
Sewer Needs Area
Garden Heights Phasing
Legend
TIVERTON
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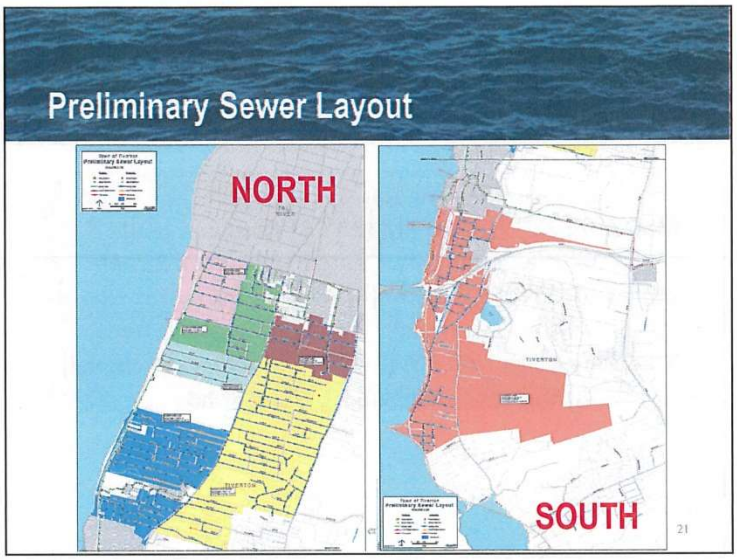

Proposed Funding Approach

- Form a Sewer District
- Apply for USDA Loans and Grants
- Repay loan with betterment fees over 40-yr term

Public Hearing – 06/17/13 Tiverton, RI - Wastewater Facilities Plan Update 22

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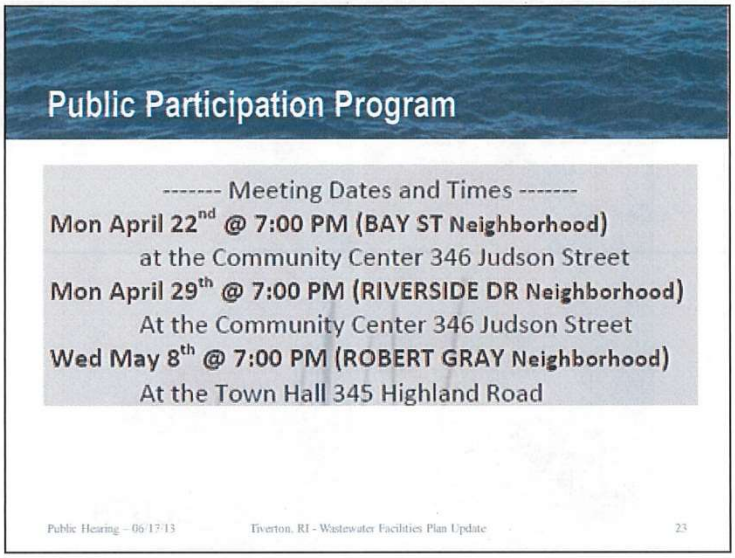
Public Participation Program
------- Meeting Dates and Times -------
Mon April 22nd @ 7:00 PM (BAY ST Neighborhood)
at the Community Center 346 Judson Street
Mon April 29th @ 7:00 PM (RIVERSIDE DR Neighborhood)
At the Community Center 346 Judson Street
Wed May 8th @ 7:00 PM (ROBERT GRAY Neighborhood)
At the Town Hall 345 Highland Road
Public Hearing – 06/17/13
Tiverton, RI - Wastewater Facilities Plan Update
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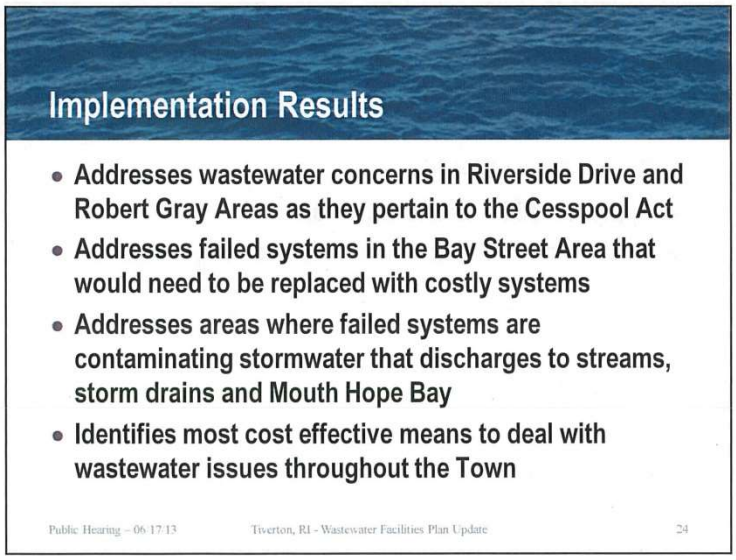
Implementation Results
Addresses wastewater concerns in Riverside Drive and Robert Gray Areas as they pertain to the Cesspool Act
Addresses failed systems in the Bay Street Area that would need to be replaced with costly systems
Addresses areas where failed systems are contaminating stormwater that discharges to streams, storm drains and Mouth Hope Bay
Identifies most cost effective means to deal with wastewater issues throughout the Town
Public Hearing – 06/17/13
Tiverton, RI - Wastewater Facilities Plan Update
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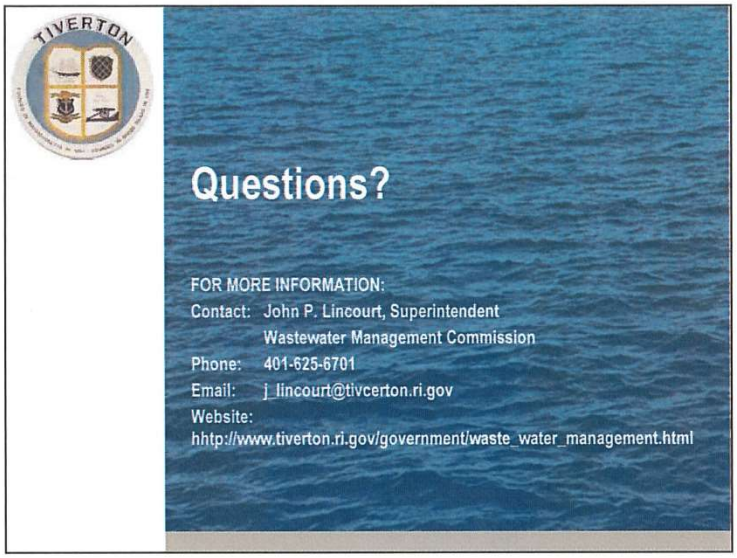
TIVERTON
Questions?
FOR MORE INFORMATION:
Contact: John P. Lincourt, Superintendent
Wastewater Management Commission
Phone: 401-625-6701
Email: j_lincourt@tivcerton.ri.gov
Website:
hhtp://www.tiverton.ri.gov/government/waste_water_management.html

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Town of Tiverton
Wastewater Management Commission

For Future mailings + Information

SEWER CONSTRUCTION PROGRAM
PUBLIC PARTICIPATION

6/17/2013

SIGN IN SHEET

Name	Address	Email
NANCY Mello		
Bill Vieira	Brackett Ave	
Tom Timberlake	65 Reed St	Tom@Timberlake.com
Irene Correia	417 Judson St.	
Joanne A. Cottrell	35 Main	JCOTT@COMCAST.NET
Roger Benney	68 Narragansett Ave.	CAESAR68N@VERIZON.NE
LARRY MELLO		
Deborah Gee	15 Evans Ave	geewizgee@cox.net
RoseMarie Teixeira	10 Evans Ave	
[illegible]	327 Judson St	
Jim Gonzalo	Long Pasture Way	Administrator@Tiverto
CHRIS AUDET	160 HIGHLAND AVE. FALL RIVER MA.	FRCC4133@MSN.COM
Pauline Levesque	30 Dewey Ave Tiv.	
PAULINE NADEAU	15 AMES ST TIV	
BARBARA ALMEIDA	134 EVANS AVE TIV.	—
CLAUDE ALMEIDA	134 EVANS AVE. TIV.	—
Steve Berlucchi	DPW	
ROSEMARY EVA	TIVERTON PLANNING BOARD	
LOUIS HAKOEM	25 HIGHLAND COURT TIV. RI	louis02878@cox.net
JEFF SOARES	14 SUMMERFIELD LN. TIVERTON RI	jeffsoares16@Gmail.com
Joanne McGlynn	43 Mathew Rd. Tiverton	jmcglynn2@cox.net
Nancy McGlynn	223 Judson St. Tiverton RI	
BARBARA MANNING	506 Riverside DR TIV.	BABS 21 at cox.net
Daniel Peppon	506 Riverside Dr.	
[illegible]	100 CHURCH ST TIVERTON, RI	
Joshua Beebe	24 Brackett Ave Tiverton RI	Sbeebe85@Gmail.com
Charlie/Jane Smith	128 Riverside Dr Tiv	
[illegible]	203 Brackett Ave	
[illegible]	1765 Main Rd	ESHOREPROP@AOL.COM

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Town of Tiverton
Wastewater Management Commission

6/17/2013

SEWER CONSTRUCTION PROGRAM
PUBLIC PARTICIPATION

SIGN IN SHEET

Name	Address	Email
Mary Ziepniewski	1723 Main Rd	Cottagerentalshotmail.co
David S McCullough	1299 Main RD	
John MORAN	46 RIVERSIDE DR	
Sally Black	64 Broadview Dr	sallyablack@
LEONARD SCHMIDT	9 So COURT	
Dayna MAYO	55 BISMARK AVE	
J Clancy	24 SUMMERFIELD	Jim.Clancy@Gmail
Lester Schwartz	25 "	
D Holmes	3631 MAIN Rd	

SEWER CONSTRUCTION PROGRAM
PUBLIC PARTICIPATION PROGRAM PUBLIC HEARING

JUNE 17, 2013 at 7:00 PM

Number	Question/Statement	Answer
	The Town Council of the Town of Tiverton, held a Joint Workshop with the Wastewater Management Commission on Monday, the 17th day of June 2013 at 7:00 p.m. at the Tiverton High School. Mr. Roderick opened the joint workshop and called the meeting to order. A roll call was conducted followed by the pledge of allegiance. Opening remarks by Mr. Kendricks following by a presentation by Mr. Parece followed by question/statements and answers.	
1	No name given - Thank you Mr. Kendricks. On the betterments fees, you're using a $20,000 investment as a betterment for sewer, how accurate is that figure? It that what it's going to cost us to run a sewer by our house this betterment fee?	Mr. Parece - On the handout on page 9 there is a discussion on what a betterment is. That's only an example of what the costs are if the betterment was about $20,000. For this particular project, the range is somewhere between $11,000 and $16,500. That's assuming the 45% grant is obtained. The numbers are todays costs so if they were projected out for various phases those costs would increase a little bit based on inflation. But there is also a contingency that has been built-in into those construction numbers.
2	That would be as low as it would be in your estimation. Roughly $10,000 per household?	Mr. Parece - That's correct.
3	On the annual sewer user charge, these rates, are these projected reduced rates with increased volume or are they existing rates? Is that what we pay now?	Mr. Parece - Those are the existing rates for the sewer user charges.
4	So if this plan would come into effect those rates would drop significantly? Somewhat?	Mr. Kendricks - Not sure if the rates would drop because what we have here, we don't have a wastewater treatment plant, we send our sewerage to Fall River. And so a sewer user charge consists of two parts. It' will be what Fall River charges us which may increase or stay the same. We don't have a lot of control over that and the administrative piece that comes to Tiverton; it comes to the Sewer District in order to maintain the pipes that we have in Town. So its two parts. So what we have done on the back of the handout (Page 11) where we've estimated costs, it shows the monthly payment that would be the betterment fee and then the monthly sewer user charge. And that fee consists of both the projected Fall River charge as well as our administrative and

		operation charge to maintain the pipes in Town.
5	The plant which is located in Fall River is a regional wastewater facility. Correct?	Mr. Kendricks - That's what I understand. I haven't talk to Fall River about this particular project. But I understand that it's a facility that has the capacity and has other users of it other than the residents of Fall River.
6	Including Tiverton?	Mr. Kendricks – Yes, we currently discharge wastewater to that plant. Yes.
7	So this is my understanding, things that I've read nothing official. I don't know what their mission statement is or how they were set up. But that system was designed to handle so much waste from Rhode Island, from Tiverton. They also handle Assonet and regional wastewater facility. It's not a Fall River facility. It has nothing to do with the City, it just happens to be located on their proper.	Mr. Parece – It is a City of Fall River facility. In Tiverton's case, Tiverton has what is called an IMA, Intermunicipal Agreement, for flows up to 2 million gallons. And within that 2 million gallons, this proposed plan is going to bring the flows from some 90,000 gallons to like 1.2 million gallons so still well within the capacity of the Intermunicipal Agreement and the capacity at Fall River.
8	In your experience Tom, is there a possibility with increase flows we can get a better or reduced rate.	Mr. Parece - That has been one of the discussions with the Council. To have a discussion with Fall River. If we bring on this many more users on, can we renegotiate the existing Intermunicipal Agreement?
9	So that gives us a little leverage?	Mr. Parece - There may be some leverage. One other that I want to talk about, when I mentioned the $11,000 to $16,500 that not only includes the cost for the work on the public property, that is in the streets, but it also includes the connecting from the street up to the house.
10	Right up to the home?	Mr. Parece – Right up to the home. That's correct. It's a worst case scenario.
11	So these fees are basically the higher end or more than what you anticipate.	Mr. Kendricks – We tried to be conservative because this is a budgetary estimate. We have not done a design yet. But based on Tom's experience, AECOM's experience with this we think we're in the right ball park. One of the other things too, is that Fall River charges a connection fee and as part of our renegotiations or negotiations with them we're going to try to get lowered too. Again enticing more users on that give them more flows and more revenues that should them some consideration in reducing the fees.

12	This water usage number in handout is charged by the cubic foot. Correct? What's the average use per month for a normal family of 4?	Lincourt – Yes. Generally the annual usage is about 95 hcf, hundred cubic feet. I'd have to do some quick calculations to bring it down into gallons and monthly. Mr. Kendricks – Calculations based on actual water usage.
13	So that's very accurate and very reasonable?	Mr. Kendricks – Right for the average user.
14	That's not bad.	No response.
15	That's all I have. Thank you.	Mr. Parece - You're welcome.
16	Ms. Mello - I've have some basic questions because I did attend the meeting with the Robert Gray Area. There were about 90 people there and I've had a lot of people question me since that point. They didn't quite understand and I questions Council and they didn't quite understand. When you talk about these fees, what you doing each contract separately, so that's a different fee for each contracted area?	Mr. Kendricks – That's correct.
17	This is not, you can't just bank on that fee because it depends upon how many people in your area for that contract to be done. So is it 6 areas that you have or 8 contract areas?	Mr. Parece – There's a total of 8 service areas or proposed service areas. The sewer user fee is $6.34 per hundred cubic feet and would stay the same throughout for anybody that's connected to the system. It's the capital costs for each of those individual areas that would vary based on the number of users in the area for the betterment fees and that's way there's a range from $11,000 to $16,500 to cover those proposed areas of construction.
18	OK I understand that. Now when you say there's going to be a vote by the people. How many residents, are you going by household? Is that how you determine how many people in the district or how many people in each contract? So do you know how many are actual in the areas you are talking about?	Mr. Parece - Yes we have a parcel count within each of those areas and that how we came up with these particular numbers.
19	What is your parcel count?	Mr. Parece - There's some 550 within the Robert Gray Area
20	So when you say there's a vote	Mr. Parece – So the Robert Gray Area, just like the other areas, will than vote as a neighborhood or as a service area, do they want to be included in this sewer district and it

		would have to be a majority vote. That's what's proposed right now.
21	So a majority of the 500 or suppose 40 show up and 21 people vote for sewer. So are you saying that's a majority vote?	Mr. Parece - It's a majority of the individuals vote
22	Not a majority of the neighborhood that is going to be sewered?	Mr. Parece - So if only 100 people show up out the 500ish and 51 vote in favor of it, the Commission would take that as an affirmative that they want to be within the district.
23	By the way I'm not saying that I'm for or against it but these questions keep coming up and I don't think it's being explained that way. When you talk about forming a wastewater district, what are you actually saying to the people that they may not understand? Which is that you need to be apart from the Town of Tiverton. Are you setting up as district so as North Tiverton Water Department that were all use to in North Tiverton, some with Stonebridge but pretty much were all with North Tiverton. We understand North Tiverton' financial problems, Water District I'm talking about, and that there comes problems with that. You know what ever, pipe water tanks this that and the other, are you saying that this wastewater district, which have to leave the Town and be its on independent entity?	Mr. Parece – That is correct. Because that's the only way you can get under the 10,000 population limit that USA, USDA requires in order to receive that 45% grant and that 3% loan over a 40 year period of time.
24	OK. So let's take an example of my neighborhood of 500 homes, 50 show up, 27 want it and were going to have sewers. OK and it is a necessary evil but people keep asking me this stuff and I don't think it's out there the information. OK so the sewerage is going to go down there and you going to go out and bid the contract and say it's going to costs, let's say is going to cost, oh I don't know what sewers cost, say $10 million and you going to divide by those 500. Those that didn't show up, it doesn't matter your vote is not taken, that how we got the Industrial Park and a lot of things. You have to be paying attention. You have to do your part and show up.	Mr. Parece - Yes
25	OK now we hit ledge and it's more and that's just going to keep adding to that one little area.	Mr. Parece – That is correct.

26	Should there be districts that opt not to have sewers. I'm not saying it's wise I'm just saying shouldn't. That's all the less revenue that's going to stream into this district for future needs for our capital expense for our administration, for our everything, for our users fees we put on for everything that goes onto that contract. So there is a possibility of higher costs for some of these contracted districts?	Mr. Parece - If some of the other areas opt out and decide not to be part of the district than the other the other individuals within would pay for the user fees which accounts for the operation and maintenance of the existing system. It does not, and I'll repeat, it does not include any capital improvements for future expansion areas. That would have to go back to the exact same thing at that time and to be voted into the district and they would be responsible for those particular sewer needs in the future or capital costs.
27	OK. I think I raised this question at the last meeting. We had an extension drainage survey done in that area. I know people don't like that it and I don't like driving down my road in the last week as I have in the last week with all the rain and the streets are flooded. Not flooded but that's a drainage issue as well. Shouldn't the Town's drainage be part of this digging up roads, putting in sewer lines? Shouldn't drainage and sewerage kind of go hand in hand or no?	Mr. Parece – Anytime we do the wastewater projects like installing pipelines, we always coordinate with the municipality for other infrastructure needs that may be there. Rebuilding roadways, intersections stormwater, etc. We also coordinate with the other utility companies that may be there whether it be gas, underground cable to have them upgrade at the same time so that the can share in some of the costs. They'd be responsible for their upgrades but they may share in some of the reconstruction costs of the roadway itself.
28	But some of our problems will not be resolved because I can tell you that the Town does not have the money.	Mr. Parece - Right now the roads are going to be rebuilt as part of this project. But it is not building additional infrastructure stormwater infrastructure in order to address some of those drainage areas.
29	Now the Town owns the interceptor?	Mr. Parece – Along Mount Hope Bay, correct.
30	We wouldn't be taking that over as a wastewater district, would we?	Mr. Parece – Yes that interceptor, and all of existing infrastructure that existing in the Town would be taken over as part of this district.
31	And that infrastructure is supposed to go up into the industrial park. We're going to take that on?	Mr. Parece – Yes you already own part of that pipeline that goes up there. There's already a pump station up there from that industrial park area.
32	How are we going to get it up the rest of the way if only these little districts handling it?	Mr. Parece – Most of this infrastructure is what we call gravity sewer it flows by gravity from a high elevation to a lower elevation. There are some areas that will need wastewater pumping stations, in order to transport or pump the wastewater from a low elevation up to a higher elevation.

33	But that not one of our little contract areas?	Mr. Parece – There is a couple of pump stations within our contract areas. There are actually two pump stations in the Riverside Drive Area in order to do that.
34	And the industrial park area?	Mr. Parece – The industrial park pump station already exists.
35	But the infrastructure lines do not?	Mr. Parece – The main line to connect to Mount Hope Bay interceptor does. If the industrial park decides to expand within that area that infrastructure would be part of their expansion when their building structures, buildings, etc.
36	It just concerns me that if we have problems with the interceptor you say that we're going to pick up that cost. If there are any issues with it we own it. We going to leave the umbrella of the Town we cannot go back to the Town. It's like the North Tiverton Water District.	Mr. Parece - In that case it's no different than what's happing now. If there's a problem with the interceptor its part of the Commission responsibility to maintain that as part of the sewer user fees. So it's already in that funding.
37	I'm not saying I'm for or against please get the information out. These people deserve the right to know need to know that your own your own, don't look to the Council, don't look for the Town. You own that district just like in North Tiverton we collectively own the North Tiverton Fire/Water District. We own that and all the problems.	Mr. Parece – I understand. And one other thing I didn't mention on the last slide is John Lincourt's information of the handout so if there are questions following up this absolutely please get a hold of John and send those questions along.
38	Mr. Hakeem - Just want to in my mind try to understand how the community, as Nancy just touched on, we have two districts serving the community from the standpoint of water service – North Tiverton and Stonebridge Fire District. You mentioned that this is not going to be quasi-municipal. What I mean by that, the district it will have to obviously serve the Town. If it serves the Town is it responsible to the Town Council or do they stand separate?	Mr. Parece – No it would stand completely separate. Part of the requirement of the district is to go for special legislation to get that approved.

39	Enabling act. Now Nancy was pointing out responsibilities by district. I'm a little confused could you explain that? Providing sewer service in the community, sectionalized, and it's done by districts within or organizations within districts or it is one sewerage commission which handles all the districts?	Mr. Parece – Sure. There will be one sewer district that will cover all of the existing service area plus all of the eight proposed services areas. And then from a funding view point, or financial view point, there will be what I call sub-districts – Robert Gray vs Bay vs Church etc. that will be responsible for the capital costs. Again that's the betterment to build sewers within those areas but, the whole district is a separate entity that would be run by the Commission which is where the sewer user fees come in for the operation and maintenance for that entire district.
40	Now, it's interesting that you talk about funding in December of 2014. Right? Enabling special legislation for bonding, you need funding? This funding is for the purpose of what?	Mr. Parece – That's Correct. The funding from RIDEM, excuse me, from the USDA, Department of Agriculture, through their Rural Development funding is to provide design and construction to build the infrastructure for each of these areas.
41	So this is basically the groundwork to establish the cost associate with the certain areas, districts? In other words the projected cost you have not established yet.	Mr. Parece - We've done some preliminary cost estimates which are the numbers you have here and that were presented here. The $11,000 to $16,500.
42	I'm talking about what goes before the community as a referendum. How much is that? There's no number?	Mr. Parece - The Commission has those numbers by neighborhood. They range from $11,000 to $16,500 per resident or parcel that would connect by neighborhood.
43	I understand that I'm talking about the total budget for each district. How many million is that going to be?	Mr. Parece - The overall total project cost for all the services areas is some $72 million, total capital cost.
44	Now that apparently in not going to be presented that way in 2014. Is it?	Mr. Parece – No, because it will be broken down neighborhood or by service area. So each service area, Robert Gray vs. Bay will have their particular portion of that total cost.
45	And that's the only district or area that's going to vote on the referendum?	Mr. Parece - Each of those individual areas will vote on their individual area based on the presentation of those numbers.

46	OK that's what I was interested in. Thank you.	Mr. Parece – You're very welcome. Mr. Kendricks - I just like to add that every area that's identified will not necessarily get sewers. Our initial proposal is to have the three most critical areas be first. But eight years out, if we get to the second phase of Garden Heights Area and the residents vote not to have sewers than there will not be sewers in that area. So although the projected cost for everything if everybody was to enter is something like $72 million. Realistically we don't think that it may be cost effective on some of the ones that are further out. So really we've focused on the initial three.
47	No name given - OK but under that scenario, if I may follow-up. The people in North Tiverton already have sewers. Our lines are already in, that means we have no construction costs. Is that correct?	Mr. Kendricks - When you say the people in North Tiverton have sewers.
48	The people who are currently tied into the sewer system, will not have any construction cost because they already have theirs in.	Mr. Kendricks – If they have sewers right now the will be no additional monies.
49	So the people for instance that live in Nancy's area will be paying construction costs, but I in the North end who am already tied in will not have to pay any construction cost.	Mr. Kendricks – That's correct.
50	The second, another question that I have. Don't you think that we should be negotiating with Fall River first before you bring this proposal to the people? Right now the way it stands and correct me if I'm wrong, you take out your checkbook and write out a check for $550 per bedroom to the City of Fall River. And you ask what that is for? Well just because. Just because, I so no. Then we want to help out the poor people in the North end because their depressed, low income people. So while they have their limited check books out, we sock them with another betterment fee because now the Town of Tiverton has made their house better we hit them with a $2,700 betterment fee. How do you feel that you're helping the poor people in that area? And then they'll have the privilege of paying I believe is the highest rate in New	Mr. Parece – Obviously I was not involved with the negotiation, I guess I'll call it, when the intermunicipal agreement was done many years ago. And yes the plant did have federal and state funding to build the City of Fall River facility. But the intermunicipal agreement is a legal document that says here is how you will be charged for that. Obviously there is a cost to transport and treat the wastewater at Fall River and that's what the intermunicipal agreement is for. That's why the Commission is going back to negotiate with them. So the number we presented here are more of a worst case scenario with some contingencies and hopefully everything will be better and less costly than what's been presented here today.

	England for the disposal. And why is Fall River, why are they allowed, why are we allowing them to make money on our sewerage? That's a regional facility. They got federal money because of the fact Tiverton and Fall River communities were involved in that, that construction. Yet there making money on us. Why? Why and how? You can take a house in Fall River vs the same identical house in Tiverton and the people in Tiverton are paying more than double the amount the people in Fall River are paying. That's unfair.	
51	No name given - Say our district doesn't want to do it, but than some households want to do it. Can we still be part of it because we would still need to be tied in? The pumping station is in what, the Mill complex, that runs through the Mill district to get to the gold shaded area. And I'm in the Mill area and my district doesn't want it but I do. Can I still hook up and would I be part of another district because the Mill district doesn't exist because they voted it down?	Mr. Parece - Those are some of the details that need to be worked out to see where you physically live, how close you may be.
52	Because we have, I know in my area a lot of houses that were foreclosed that people bought them and they told me that they weren't eligible for the USDA grant loan. Now that being said, how you said were going to get that, I always thought that once you get that grant initially for your home your no longer entitled for that grant at all. For anything from USDA.	Mr. Parece – I'm not sure what grant that had before for getting their home. There are different grant programs within USDA. This one is specifically for infrastructure improvements and upgrades. But we'd have to look at those case-by-case scenarios to look at somebody that your so close maybe the system could be expanded to be able to include that. It may cost you more because obviously you're putting pipeline by other people's houses to do it but, maybe you think that's more cost effective.
53	Yea because my wife wanted me to ask that just because of the fact that I know some people in my area, obviously I can't speak for all but some people want it and some don't. And I'm one of those individuals that would rather have it. Because I grew up in Fall River and my mother, that lives in the south end of Fall River that has septic and I'd rather for her to have sewer. So I was just wondering say the individuals voted it down and say 20 individuals go out to vote and clearly don't want it but I still do, would I still be able to have that option?	Mr. Parece - We'd have to look at a case-by-case scenario if that comes up. But that's way its important to get the right information out there, and be proactive to the neighborhood to explain why it needs to happen to make it more cost-effective.

54	Thank you.	Mr. Parece - You're welcome. Mr. Kendricks – I want to make a statement. I do want to make a statement that this idea of voting wither you want it in a particular area or not, just keep in mind that if the area votes it down than the residents are still responsible for onsite, for putting in an onsite wastewater system if they fail. So let's just say for the sake of argument that the people of Riverside vote it down. Now you've got costs, and you saw the costs, that you're, you know, you're putting in a high tech system in that case, could cost anywhere from $30,000 to $60,000. So just keep in mind that if you vote it down, that there's no such thing as a free lunch. You haven't gotten away for instance. It's going to be a situation where you're going to pay one way or another. The vote is whether you take it on yourself and taker out a second mortgage or home equity loan or whatever, or you join the district and be part of a 45 cents on the dollar financing as well as a 40 year amortization. So those are the real choices. There's not a do nothing choice unless you have a system that's fully functional and in compliance.
55	No name given - I guess I'll be involved with Phase 1 or Phase 2. OK. Now if it does pass would there be any consideration for the people who have replaced their systems since you guys send out the inspection notices in 2011. I just replaced my system. Now you're saying people are going to have to do something one way or another. Now I'm going to be hit twice.	Mr. Kendricks – Yes. That's a pretty common question and the answer is Yes there will be consideration for people who have recently put in systems. The idea is that we do not want this to be punitive to those people. But we have not come up with a solid policy on what's that going to be yet. We need to kind of gauge the support and we also need to do inspections to figure out what percentage of people have failed systems and would benefit but there will absolutely be consideration for people who have put in systems.
56	Mr. Bennis - I don't think your statement there will be some consideration for people who have put in systems is adequate. I've been fighting for the last 20 years to get something in writing other than oh yea we will consider that. Because oh yea we will consider that is worth very little. There're other words but I don't want to use them. To create sewer districts without necessary regulations proceeding sewers would solve a big problem for the people who need the sewers the most. And it's very clear that some need them	Mr. Parece – Over the period of next 6 to 8 months, the Commission is going to be meeting many times to discuss exactly those points so that those polices are developed and approved by the Commission before it goes to a vote in the Spring by the various neighborhoods. Mr. Kendricks – I want to add that although some of those numbers that Mr. Bennis stated seem high or seem inflated. All of those numbers are imaginary. Mr. Bennis

desperately. But that would be cutting the throats of other people. That could be cutting the throats of the people who just put in a $25,000 to $50,000 system. And according to the present regulations in Town today, that person is only guaranteed 5 years usage. Than if the sewers go by his house he has to tie into the sewers or his house will be condemned. And he will be hit twice. The proposed sewers will take 2 to 5 years to provide sewers to the areas listed in the proposed areas. Right now many people in the area of the proposed sewers have already obtained new septic systems at a cost of roughly $25,000 to $50,000. For the present regulations when these sewers are installed, these people will only have 5 years of guaranteed use. They will be forced to use the new sewers at a cost of roughly 800 to $3,000 per year. Also in the next 2 to 5 years that it takes to install the sewers, any person who wishes to sell his or her home will be required to have s septic inspection. And if the septic system fails, they will be forced to install a new system at a cost of the $25,000 to $50,000 before selling the house. Than if they raise the price of their home to recover the cost of the new septic system any buyer who is aware of the facts will ask that the price be lowered by $25,000 not raised $25,000 to $50,000 because they will be forced to abandoned this new septic system and pay the cost of the new sewers when the sewers are installed. In addition to those problems any person who has connected to the new sewers in Tiverton will be paying a fortune in sewer fees for every drop of water that he uses on his car, on his lawn, on his flowers or on any new shrubbery that needs water to keep it from dying in the summer. That is because the sewer fee is based upon the water usage. I have used roughly 120,000 gallons of water per year over the last several years and pay roughly $1,000 per year for water. With roughly 80,000 gallons per year of water used outside of the house, $650 per year is for outside water. With sewer use tied to water an d the basic rule of thumb is that sewer fees are twice your water fee, I will be paying $1,300 per year in sewer fees for the water that never reaches the sewer. That's highway robbery. There's a solution to these problems and the solution needs to be implemented in the Tiverton regulations has no clue as to what the actual costs are going to be and he's using words like exorbitant cost and this and that. Really don't, they're really not appropriate at this time. We haven't done enough work yet to really know all the costs and how we're going to allocate all of the costs. We not doing this, you know, Mr. Bennis made it sound like we're out to make money. First of all the ordinances that involve with the Town right now, is not going to be the ordinances of a sewer district. If there is a sewer district it will have its own ordinances and it will be ruled by what the circumstances are at the moment for the district itself. So what he quoted the Town ordinance now and that you only have 5 years has nothing to do with what going to happen in the future with the sewer district. So you know, we're going to give you information in which for you to make your decision on whether or not your going to support this or not. But things he mentioned, water meters for outdoor watering and those sort of things, those things, I've been in the industry, in the water and wastewater industry, for 38 years and there are very, very few communities, and I can't think of any right now, that have separate meters for outdoor water vs indoor water. What we're talking about doing in terms of basing the sewer bill off of the water bill is common practice throughout the United States. And there are no sewer meters, except if you're a large industrial user, so water bills are usually based off water, sewer bills are usually based off water bills, or there's a flat fee charge based on the average for a community. And so we're not doing anything any different than anyone else or not proposing to do anything different from anyone else. But I will guarantee you this, were trying to do everything we can on the Commission to make this as cost effective and least cost as we can. We will go to Fall River. We will try to negotiate connection fees down as well as user charges down. We think we have an attractive proposition for the City of Fall River and if we can bring in several thousand new users they get the advantage of increased monthly income and we don't think that they need to charge $1,500 per connection fee for 3 bedroom, when they're going to be getting the user fees. So as a new entity we going, the contract they have with the Town of

	before the sewer plan is approved by the voters. I have proposed to the Town Council several times over the last 20 years but it has never been implemented. The solution is simple. Implement the Section 18-9.8.8, 25 year guarantee of use for a new septic ISDS OWDS that I documented in memo RB11G50 dated 7/14/11. That guarantee, 25 years of use of a septic system, when sewers are introduced. Just another fee sentences. Item 2, make that guarantee a property covenant belonging to the property and automatically transferable to any new owners. So it doesn't dissolve as soon as you sell your property and the new owner now has to connect to the sewer. Implement the Tiverton regulation that make a property owners right to purchase an outdoor water meter for measurement of outdoor water usage and make sewer bills calculated on indoor water use only. And that is, if and when, the property owner pays for the outdoor water meter and notifies the Sewer Commission of his desire to have outdoor water usage deleted from his sewer bill. That way people won't have to be paying for the outside water use. That was a policy in Town for many years and then for whatever reason, possibly to get more money for the Sewer Commission, for existing sewers that are already in Town that was dropped. But is should be reinstituted. I think we need those 2 or 3 basic regulations in effect. Because voters that vote for this in their area could be slitting the throats of the poor guy next door that just put one in. For slitting their own throat by being nice to the guy next door that can't possibly put one in because he can't get to his back yard or he doesn't have a piece of property big enough. And it's the same for the water usage, why should people be paying if they want to have a decent lawn or they want to keep a bunch of new shrubbery and flowers from drying in a hot spell they shouldn't be force to pay sewer fees for that. I hope that these regulations can be adopted before it goes to the voters.	Tiverton, if there's a sewer district will be a new contract with the sewer district. So we feel we have some attractive things that we can talk to them about, and we're going to use everything we can to get the best deal for the residents.
57	Ms. Gee - I live on the top of Evans Avenue which is part of the Riverside Drive district. And my few questions are concerns that you're going to start with lower section with more need and work?	Mr. Kendricks – Riverside 1 and 2 need under the same phase. One will not be separate from two.

58	Now are the phases going to be charged differently if I have, if it's going to be more difficult to do Phase 1, are we, am I going to be paying as Phase 3 what happened in Phase 1 to be implemented or go in as one complete grouping?	Mr. Parece – All of Riverside Phase 1, 2 and 3... Mr. Kendricks – No, 3 is not in the first phase just 1 and 2. Mr. Parece – Yes, but they'll vote as one. Mr. Kendricks – No, just 1 and 2 will vote. Mr. Parece – But, you'll combine the costs overall. Mr. Kendricks – Over the first two.
59	So the top of Evens Avenue is Phase 2 I'm assuming? And will split whatever it costs to?	Mr. Parece – Correct Mr. Kendricks - Phase 1 and 2 will vote at the same time. So whatever it costs for Phase 1 and 2 will be amortized over all the residents in 1 and 2.
60	OK, even though it may cost you more to do Phase 1 than it would for Phase 2?	Mr. Kendricks – Actually the reason, and that's a very good question. The reason that we put Riverside Drive 1 and 2 together is because we have to put pump stations in. And if we put the pump stations in just in Phase 1 than the Phase 1 people would be paying an exorbitant cost because Phase 2 has to use those pump stations. So in order to be fair, we put Phase 1 and 2 together since they both are going to use the pump stations, so we had it that they would share the costs. Otherwise it wouldn't be fair for everyone in Riverside Drive 1 and 2.
61	If it gets voted in for Riverside to do this, I can't opt out as an individual who already has a septic system, functioning septic system?	Mr. Kendricks – That's correct. If the community to put sewers in…
62	I could ask you to pass me house but I'd still be paying on it?	Mr. Kendricks – That's correct.

63	OK. If you come up the street, you put a connection at my house, but don't bring it on to my property, I'm still paying?	Mr. Kendricks – We need to establish that. I mean, there's two parts to a connection to the sewer system. There's the public part, the parts that are out in the street and then there's the connection between the street and your house.
64	OK	Mr. Kendricks – And so a sewer pipe that goes out in front of your house benefits you, whether you connect on it or not.
65	Yes	Mr. Kendricks - So that's one part. The part that corrects to your house allows you of course to deposit your sewerage into the system. One other thing we have to consider and again this is part of the next 6 months on how we're going to formulate the ordinance and the rules and regulations of the district. For that person that has a functioning septic system, that put it in 5 years ago, their still going to get the benefit of the sewer out in the street in terms of land value and that sort of thing. But there might be some consideration or I think there should be some consideration for them not hooking up right away because they've already made a major investment. But all this is subject to be discussed, we got to gauge how many people are interested, the total cost. One of the things we want to do right now, we want to accelerate our inspection program for these three areas so that we can get an accurate count on how many have failed system, how many people have new systems, etc. So that as we formulate our policy for the district we take all of that into consideration. If we go to Riverside Drive and there are 700 possible connections, and we see that 5 people have had their systems put in within the last 5 years, that's one set of facts. If we find that there's 100 people that put in, in the last 5 years, that's a different set of facts. And those are things we need to find out before we settle in on what the deferment might be, what it could be, what it should be, etc. So those are the things, this is not an attempt to try to weasel out of something, what we're engineers and were trying to find out enough facts to make an informed policy that's fair for everybody and not unfair to anybody.

66	So you're coming in the street into, onto my property to where it would be connected and then I'd have to hire somebody to actually connect it to my house.	Mr. Kendricks – No. The cost that you're seeing is from the street all the way connected to your house.
67	So someone will be connecting to my house?	Mr. Kendricks – Well we don't know how the construction contracts are going to work out. But we wanted to give the residents the overall projected cost of what it would be from the street all the way to their house including the connection fees for Fall River, etc. So those numbers, the $11k to $16.5k, that's all inclusive. So we tried to give you all the information we can. So how it actually plays out, we have to wait until we get into design, financing, etc. but we wanted to give you the magnitude of what we're talking about.
68	OK and if you are coming onto property, for example, my has no easy access from the street. And when they dug up the street they repair the street. If you dig up my cement driveway to get to my connection, are you repairing my cement driveway? That would all be part of the deal.	Mr. Parece – Yes, that's correct. All restoration on that property will be repaired.
69	I wouldn't have to add that to my expenses on my own?	Mr. Parece – No.
70	OK thank you very much.	Mr. Parece – You're welcome.
71	No name given - As of this moment now, what you're saying now is you don't actually have a total picture of how many failed systems are in these projected areas. I'm not talking cesspool failed systems. You don't have that number?	Mr. Kendricks – We don't have that number yet. That you for that question. We're in the mist of in certain areas of Town an inspection program. Right now, the inspection, everybody in the Riverside Drive Area should be having their systems inspected so that we can have a more accurate of what's going on in those areas. Now I know that a lot of residents have been reticent to have their properties inspected because they feel like well I know I'm in trouble so I don't want the bad news. But one of the things we've been talking about, as a Commission, if an inspection is going to cost $200 to have it pumped and inspected, etc. and you already know that you're not in compliance. One of

		the things we've been talking about is maybe not having those properties inspected but having the owner sign an affidavit basically saying that they understand that they have a failed system. That way they don't have to pay the money, but they can be counted as a system that needs to be replaced. So we're talking amongst the Commissioners to try to save the residents money of the inspection but we still need the data. So again we're trying to come up with ways to try to make this partible to people and not punitive in any way. But we definitely need the data so that we can make decisions on what this sewer district will look like and what the cost impacts are going to be to the residents.
72	Mr. Bennis – I have to take exception to your characterization my statements and number plucked out of a hat or out of the sky. Because strangely enough my number apparently seem to be the same as your numbers in many cases. Meaning that you either copied my numbers or you plucked them out of the same hat as I did.	No response.
73	Mr. Berlucchi – I commend these gentlemen for this plan that they've put together and the angle in which they've with to kind of reduce the cost if the funding comes through the USDA program. I'm also working in a coordinating basis because we have been given notice by DEM that the Robert Gray Area and Summerfield Lane has two discharges, one each, that have been found to be polluting Mount Hope Bay. And my responsibility as the operator of the stormwater system, by being the Director of Public Works, I'm the license operator by DEM to operate all of the catch basins, this is for rain water not sewerage, and all of the drainage pipes that drain everywhere in Town. So I'm quite involved this citation and the citation implicitly says, we have to plan and come up with a plan to sewer the Robert Gray and Summerfield Areas. These tow point discharges. So my first question is, can you put up the proposed scheduling? I just want to make sure in your proposed scheduling for that area that all of the TMDL area that we've been cited for is included. So that would be my first question. Because that's really important.	Mr. Lincourt – There is no proposed scheduling in the presentation.

74	Not a schedule but you had phasing. I'm looking for the phasing. It had a list, it listed the roads.	Mr. Parece – There was a list but that list was not in order of phasing to occur. I think it's alphabetical but it may not even be alphabetical. But I can roughly tell you the phases.
75	I'm curious of that. Go ahead.	Mr. Parece – So you're talking about Riverside?
76	The conflict we is that I have been cited through the Director to the Town to address a very specific sewer problem. In addressing that sewer problem is to sewer Robert Gray Area and Summerfield Lane. The Robert Gray Area extends to the east side of Main Road. This is a big area. So are we going to say, and I'm fully for their plan, is that the plan that I'm going to walk into DEM and that this is our facility management plan and I'm not addressing the area you cited me for. I mean how are we going to handle that as a Town? I don't want to walk into DEM and tell them I'm going to handle to problem you cited me for by not doing what you cited me for. So that has to be addressed as a priority issue.	Mr. Lincourt – Steve, we are addressing all of those areas. What we probably not going to do is going to DEM and say we're going to sewer all of those areas tomorrow. We are presenting a schedule of when we're going to start the Robert Gray Area. The Robert Gray Area is pretty much going to be two phases, we're going to do the first phase first, and then the next phase be somewhat a couple of years down the line but this is the schedule that we're going to have as a workable schedule. This Town doesn't afford can't afford to do it in one shot. And this is what we have to tell DEM and see if we can work out with DEM that they can accept our schedule.
77	I agree what that and the only thing is we're not going to tell DEM what to do. They're going to tell us what to do. They've been very kind for almost two years now. As you know we're being doing illicit discharge testing trying to build a case that maybe there's a smoking gun out there. The truth is its coming from all the cesspools and from all the septic system that have failed. There's no denying it. But the question of priority comes up. Their priority to me is to take care of the entire area of Summerfield Lane and Robert Gray first. They have never mentioned any of the other areas. You know your plan is great, but it's not addressing that need. If they buy your plan, that's fine, but what if they don't? And they say you have to address what we're telling you to address. That's $10 mill and $2 more million for drainage right off the top.	Mr. Kendricks – My comment to that is that I understand it but that's part of what we have to wrestle with as a district and as a Town. Because reality is that if we get the USDA grant and loan monies, we're only talking about in the range of $2 to $3 million per year. So there's no possibility, there's no possibility to say OK I want $8 million next year to cover Robert Gray or any area. So we're really talking phasing all these things in $2 to $3 million increments as the money becomes available. So we got the stormwater problem, we got the Bay Street Area contamination problem, we got the Riverside Drive cesspool act problem. So I'm not here prepared to say what's the highest priority at this point. We've identified all three as high priorities. It will somewhat depend on how the vote goes. If the Bay Street people say we want it and Robert Gray people say we don't want it. Than the stormwater problem still has to be addressed and the wastewater issues still needs to be addressed. So it's not a simple problem, it's a complicated problem and DEM absolutely knows that, you know, fiscal

		constraints are going to dictate some of the solutions and the timing of those solutions.
78	I'm bringing your plan to them.	No response.

Mr. Kendricks – Do we have any other questions? Ed, do you want to have any closing remarks?

Mr. Roderick - I want to thank everyone for coming out. Is there anything that the Councilors want to ask? If not, I want to thank the Wastewater Commission for the hard work that they put in. We all know that sewers are a necessary evil and as much as we hate the idea of the cost eventually parts of the Town are going to have to be sewered. So we're going to have to take that into consideration. They're doing their darndest to ensure that we can do it in a fiscally responsible way and address the needs of this Town. Let's see what happens going forward but continue to bring the information to the Council and we'll work with you. Again thank you. The meeting adjourned at 8:15 pm.

APPROVED
JUL 8 2013
TOWN COUNCIL
TIVERTON, RI

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
COUNTY OF NEWPORT

The Town Council of the Town of Tiverton, County and State aforesaid held a Joint Workshop with the Wastewater Management Commission on Monday, the 17th day of June 2013 at 7:00 p.m. at the Tiverton High School Auditorium, 100 North Brayton Road.

MEMBERS PRESENT:
Councilor President Roderick, Vice-President deMedeiros, Councilor Chabot, Councilor Gerlach. and Councilor Lambert. Councilors Arruda and Pelletier were absent

Town Solicitor Andrew M. Teitz and Town Administrator James Goncalo were also present.

1. Call To Order
Council President Roderick called the Joint Workshop to order with a pledge of allegiance to the flag. Town Clerk Nancy Mello conducted the roll call for the Town Council.

2. Public Informational Meeting on Sewer System Construction Program
Leroy Kendricks, Wastewater Management Chairman conducted roll call for Wastewater Management (WWM). Members in attendance were Christopher Nearpass, Jeffrey Stearns, Michelle Tepfenhart, John Christo, Colleen Stanton and John Lincourt, WWM Superintendent. Thomas Parece from AECOM, WWM Consultant explained the presentation for the WWM Facilities Plan Update (the Plan). The purpose of the update was to reassess the need for sewers in the North end of Town, define limits of sewer needs area and provide a priority listing of sewer projects. Prior studies have been done, concluded the North end of Town would be best served by sewers. The RI Cesspool Act of 2007 requires all properties within 200 feet of the shoreline and other critical areas replace all cesspools by January 1, 2014. The Stormwater II and RIDEM study of 2011 found the shoreline to be contaminated with fecal bacteria commonly associated with failed septic systems. In that report RIDEM stated the Town must commit to a schedule to commence design and construction of sewers for those problem areas. The goals are to identify, prioritize, conduct a preliminary design, create a preliminary estimate, create a schedule, identify funding sources, create a financial plan and satisfy requirements of RIDEM and EPA. The findings were a documented need for better wastewater treatment, determined cost to install sewers in the north end and identified funding sources. Recommendations include expand the existing wastewater collection system, conduct a study, create a sewer district, develop a Capital Improvement Plan and continue to research and apply for funding sources including grants and low interest loans.

The sewer construction area would be broken into phases from Fall River to Riverside Drive. The three most critical areas are Riverside Drive/Stone Bridge area. Onsite systems average $25,000 to $60,000, average monthly cost over ten years in excess of $210 per month. The projected cost for a sewer system is $16,500 with an average cost of $125 per month over 40 years. The Bay Street area has old cesspools and septic systems. An Onsite system in that area would average $25,000 to $30,000, average monthly cost in excess of $270. A sewer system in that area would cost approximately $11,000 with an average cost of $105 per month. The Robert Gray area is an older neighborhood with cesspools and aging septic systems. In this area an onsite system would cost approximately $151 per month, a sewer system would average $115 per month over 40 years. Other neighborhoods have also been identified but with less critical needs. The proposed funding approach includes forming a Sewer District, applying for USDA loans and grants and repaying the loan with betterment fees over a 40 year term. Had neighborhood meetings. The results of this implementation addresses wastewater concerns in the Riverside Drive and Robert Gray areas, failed systems and identifies cost effective means. Questions included accuracy of cost estimates, annual charge rate, if contingencies were built in, Fall River's participation in this project. Mr. Kendricks explained estimates were conservative, have not had discussions with Fall River regarding the connecting fees. Questions about the Robert Gray area, clarification regarding the fees, contracts for each separate area, is it a majority vote of the people in that area. Mr. Parece explained if 500 were in that district and 100 people voted then 51 would be the majority. Concerned about the explanation of the district, would be a separate independent entity from the Town. Questions arose about the Interceptor line and the Industrial Park relative to sewers, negotiations with Fall River first before bringing the proposed project to the people. Would

have to take on a case by case basis those who already have an up to date system. Mr. Kendricks explained if the sewer district was voted down the residents would still be responsible for putting in on site systems, will be

consideration for those who put in systems. Questions arose about charging by water usage, opting out if owning a functioning system and if no easy access who pays. Mr. Kendricks explained some things still need to be established, trying to find facts to make an informed policy. DPW Director Steve Berlucchi duties included being the licensed operator for rainwater and Stormwater basins; have to come up with a plan for Robert Gray and Summerfield areas. Does not see in this plan addressing specific areas, have done illicit discharge testing probably caused from cesspools and failed systems. Mr. Kendricks explained the next step would be to ask the Council to approve a Facilities Plan Update.

At this time Councilor Roderick closed the Informational Hearing and called for motion to adjourn the workshop.

ADJOURNMENT:
Councilor Gerlach motioned, seconded by Councilor Chabot to adjourn. The motion passed unanimously.

The meeting adjourned at 8:15 p.m.

A True Copy
ATTEST: Nancy L. Mello
Nancy L. Mello, Town Clerk

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APPENDIX 7 – NEWSPAPER ARTICLES

The Herald News
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Tiverton contracts firm to study effects of failing septic systems

By Michael Gagne
Correspondent
Posted Sep 30, 2012 @ 12:12 AM

TIVERTON — Nearly three weeks ago, the Tiverton Town Council approved a $58,500 contract with environmental firm AECOM to study the effects of failing septic systems and assess the feasibility of installing sewer systems in northern parts of the town near the state line.

Members of the council and the town's Wastewater Management Commission agreed the study is one step toward complying with Rhode Island Department of Environmental Management regulations and satisfying the requirements of the state's Cesspool Act of 2007.

The act required that homeowners and business owners replace failed septic systems with newer septic systems or tie into a sewer system. The act also states that septic systems can't be closer than 200 feet from the shore or other bodies of water used for drinking water or recreation.

At the council's Sept. 10 meeting, Wastewater Management Commission Chairman Leroy Kendricks presented a map of the town highlighting the areas near the state line where septic systems are failing and where "hazardous soil" had been found, according to a DEM inspection program. They include properties on Bay Street, Cooper Street and Judson Street, as well as Old Colony Terrace.

Kendricks said the program revealed "quite a few failures in those areas," calling it "a serious problem." The DEM has "put the town on notice" regarding these systems.

He cited the closure of Fogland Beach early last summer as another reason Tiverton needs to study its wastewater management.

"When the beach is closed down because of bacteria counts, it's on the entire town," Kendricks said. "Is it runoff, is it from septic system?"

"We know for a fact ... that the septic system problem may not be the entire problem, but it is certainly a significant contributor to the problem," Kendricks said, adding that stormwater drainage may also need to be looked at.
"I think the responsible thing to do is to take this thing seriously and get ahead of it.

"It's also in the interest of the town to come up with a comprehensive solution," Kendricks added.

In an interview with The Herald News, Kendricks said the study would look at where to recommend sewer installation. The facilities plan would also assess how to finance the system — determining betterment fees for residents and businesses, and looking for loans and grants to cover installation costs.

AECOM, an environmental firm with a local office in Chelmsford is the environmental firm contracted for the study. While Kendricks is employed by the Providence-based Woodward & Curran, that firm is not contracted to work on Tiverton's wastewater plan, a fact that commission members recently emphasized.

Kendricks said the purpose of the facilities upgrade is not to force sewers where they don't make economic sense. He anticipates that a plan for wastewater management in the area would likely combine traditional gravity sewer systems with newer low-pressure systems, which use grinder pumps to push wastewater through pipes that can be as small as two inches in diameter.

He said a problem for residents who live near the waterfront is that they probably don't have enough land to install a standard septic system.

"You would have to put in a high-tech system, which could run anywhere from $30,000 to 60,000," he said. "If you have to put one of those in, and you have to finance it yourself, then you're going to do a second mortgage on your house."

"It's a blight on the community, and takes whatever you have left of your yard ... This plan helps the residents, so they're not looking into second mortgages when they know sewers would be coming in the next five years."

Kendricks said potential developers and commercial interests "are always looking for utilities," and said it was another reason to look into extending sewer systems.

The Wastewater Management Commission has a few deadlines it must adhere to. The DEM requires a draft plan by Dec. 31. A year later, the town needs to come up with a financial plan and state its commitment to that plan. Kendricks said the town has until 2020 before sewers have to be installed. The plan is not to punish those who have already invested in solving their wastewater removal problems.

Upgraded high-tech septic systems would remove most, but not all, of the soil pollutants from wastewater. For instance, they still wouldn't remove nitrogen very well, according to the Wastewater Management Commission.

The study will be paid for by $10,000 the commission had already received from the town, along with $50,000 from the Federal Reserve. Kendricks said the first payment for that load would not be due until 15 months after it's dispersed.

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Tiverton sewer study under way

By Michael Gagne
Correspondent
Posted Nov 19, 2012 @ 12:40 AM

TIVERTON — A study into the feasibility of expanding sewers throughout North Tiverton is currently under way, according to the town's Wastewater Management Commission.

The findings of the $58,500 study, currently being performed by the environmental engineering and consulting firm AECOM of Chelmsford, will be made known publicly before the end of the year.

The town has a Dec. 31 deadline to report the study's findings to the Rhode Island Department of Environmental Management, which had previously identified failing septic systems and soil contamination in areas including Bay Street, Cooper Street and Judson Street.

At approximately that time, the wastewater management commission would also hold public hearings on the findings, said its chairman Leroy Kendricks.

In addition to looking at the feasibility of sewer expansion, the study will also recommend betterment fees for tying businesses and residences into that system, which already exists in parts of North Tiverton.

The study is likely to recommend that this sewer be expanded.

Wastewater from this system is currently transported via a 24-inch sewer interceptor and treated in Fall River's Regional Wastewater Treatment Facility, said Kendricks.

The sewer study is also looking into grants and other funding for sewer expansion, to mitigate betterment fees, which are determined by the number of bedrooms in each residence. It will also examine recommending broad exceptions for residents and business owners who have already had to upgrade their septic systems.

"This will allow you to not have to get rid of a septic system and incur cost of tying in for now," said Tiverton Wastewater Supt. John Lincourt.

Those residents may still have to tie into the system some 10-20 years down the road.

Fall River charges a betterment fee, Lincourt said, for tying into its system of about $550 per bedroom.

Other charges for homeowners and business owners include the expense of hiring contractors to connect their buildings to sewer lines.

Lincourt estimated those charges "could be another $1,500" or more, if contractors have to "pop through the front foundation" of a building.

AECOM engineers have been met with members of the Wastewater Management Commission regularly, according to meeting minutes for the commission submitted to the Tiverton Town Council.

Per the state Cesspool Act of 2007, septic systems within 200 feet of shoreline or other water bodies are being phased out. The DEM had previously identified several areas, particularly along the coast in North Tiverton and near Nannaquaket Pond, where septic systems are failing.

Lincourt noted that expanded sewers are not around the corner just yet. The town's current course of action is "just a study."

DEM Says $17 Million Sewer Expansion Needed In Tiverton

Posted by Erin Tiernan , February 26, 2013 at 08:20 AM

Tiverton is planning for a $17 million sewer expansion after DEM found town drainage pipes were carrying pollutants into the Mt. Hope Bay.

The state Department of Environmental Management (DEM) is requiring a North Tiverton neighborhood to be connected to town sewers after discovering pollution in the Mount Hope Bay from failed septic systems, according to Tiverton officials.

Connecting the entire neighborhood will cost Tiverton $17 million.

"Pollution was in the Mt. Hope Bay and discharges from two pipes was severely affecting water quality in the bay," said Stephen Berlucchi, director of public works, describing a DEM water quality study along the East Bay up to Fall River.

After DEM identified the two Tiverton neighborhoods where failed septic systems were releasing pollutants into the Mt. Hope Bay: the Robert Gray Avenue Watershed and the Summerfield Lane Watershed.

Berlucchi said a DEM report told the town to commit to a design and project schedule to commence construction of sewers for these prob areas.

"We talked about ways dispute it, but it's pretty hard to dispute sample residue coming out of our pipes," said Berlucchi.

According to Berlucchi, the large instance of septic failures in North Tiverton caused pollutants to leech into the town's groundwater system, where they were flushed through to the Mt. Hope Bay.

While no action was taken on a schedule, design or timeline for the sewer expansion during Monday night's meeting, town employees are working with DEM to develop a long term - perhaps 20 year - construction.

Currently that town is still conducting a facilities update that will help with designs for the sewer expansion.

Berlucchi identified a three-phase approach to the construction:

- **Phase one** would initially attach 77 homes along Old Colony Terrace at a cost of $1.1 million
- **Phase two** would connect another 351 homes north up to Main Street at a pricetag of about $6 million.
- **Phase three** would tie in another 500 homes on the other side of Main Street for $10 million.

"We can't do it all at once, it would absolutely tear up the entire town," said John Lincourt, sewer superintendent. "What we are planning on doing is manageable sewer contracts so that we finish the project in a reasonable time - which a reasonable time is really 20-year time span to do the whole town."

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Tiverton faces $17M sewer project to address pollution concerns in Mount Hope Bay

By Michael Gagne
Correspondent
Posted Mar 08, 2013 @ 12:03 AM

TIVERTON — The state Department of Environmental Management wants the town to connect at least two neighborhoods in North Tiverton to the sewer system to address ongoing pollution in Mount Hope Bay, a project likely to cost $17 million over the next two decades.

Tiverton's Department of Public Works Director Stephen Berlucchi recently addressed the concern during a public hearing that was part of the town's application to renew DEM permits for its stormwater drainage systems.

"We have $17 million in sewer work hanging over our heads," Berlucchi said during the hearing. "We've talked about ways of disputing it, but it's pretty hard to dispute sample results that are coming right out of our pipes."

DEM, in its 88-page Total Maximum Daily Load report from 2010, said it found fecal coliform bacteria spilling into Mount Hope Bay through two stormwater discharge pipes near the Robert Gray Avenue and Summerfield Lane watersheds.

The report stated that the pollution is likely from failed septic systems and animal waste. DEM instructed the town, in the report, to "commit to a schedule to commence the design and construction of sewers for these problem areas."

Berlucchi also told the council that brochures with information on minimizing stormwater pollution were distributed to homeowners in the neighborhoods near the polluted pipes.

The $17 million sewer project would ultimately tie in 851 homes along Old Colony Terrace, Robert Gray Avenue, Summerfield Lane, and along Main Road, extending to the Garden Heights neighborhood, Berlucchi explained.

It would take place in phases, Berlucchi said.

The priority would be connecting 77 homes in the area of Old Colony Terrace, at a cost of $1.1 million.

Sewers would then be extended from that first project to 351 more homes up to Main Road for an additional $6 million. Eastward from there, 500 homes in the Garden Heights area would then be added to the system, adding a final $10 million to the project.

Tiverton Wastewater Management Superintendent John Lincourt said there was not a specific timeframe for the sewer project, although he estimated the project could take about 20 years, through "manageable sewer contracts."

"We can't do it all in one shot. That would absolutely tear up the town," Lincourt said. "We're going to spread it out. We're going to take care of those areas with the highest need for sewers first."

Lincourt said his department was investigating ways to reduce the cost of sewer construction.
They include applying for water and waste disposal grants from the United States Department of Agriculture and utilizing Rhode Island's revolving loan fund.

The department is looking for a facility management plan from the town, Berlucchi said. It recently completed a sewer facility plan update.

DEM is expected to resume inspections of septic systems in the town starting in July 2014.
"We don't expect good results from those inspections," Berlucchi said. "We know we have a problem."

Right now, without sewers, homeowners are "on the hook" for having and maintaining functional septic systems.

Most cesspools and failed septic systems have been replaced, Berlucchi noted.

The state Cesspool Act of 2007 requires that all cesspools within 200 feet of a water source in the Mount Hope Bay watershed must be upgraded to conventional systems by Jan. 1, 2014, said Russ Chateaneuf, DEM's chief of groundwater and wetlands protection.

"If the cesspools can limp along (there) may be enough time for them to put sewers in and not have folks invest in a septic system option," Chateaneuf said.

That area between Robert Gray Avenue and Summerfield Lane "is characterized by a high water table, high ledge, extreme slopes and high-density residential development, which increase the likelihood of septic system failure," according to DEM's 2010 TMDL report.

Tiverton's storm drains are not the only pollution source.

The DEM report also stated, "combined sewer overflows from the City of Fall River have historically been and may continue to be the most significant point source of bacterial pollution to Mount Hope Bay during wet weather." However, the report also stated DEM is unable to identify how much bacterial pollution that may be.

Stormwater runoff from other municipal storm drainage systems, including those in Bristol, Swansea and Somerset, are also contributing to the bacterial problems in Mount Hope Bay.

The report also states that after sewers are implemented, the town must again sample its storm drains to confirm that "elevated bacteria levels" no longer persist.

Berlucchi said every year the town is required to report on its stormwater systems. The application and report will be submitted to DEM by March 10.

The town is authorized to discharge stormwater under a general permit from DEM.

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Tiverton meeting to focus on plans for expanding town's sewer system

By Kevin P. O'Connor
Herald News Staff Reporter
Posted Jun 02, 2013 @ 05:09 PM

FREETOWN — The public will get a chance to offer opinions on plans to expand the sewer system in the north end of town.

The Town Council will meet with the Wastewater Management Commission on June 17 to go over the proposed sewer construction system.

The meeting will be open to the public. It will be held in the high school beginning at 7 p.m.

A state law passed in 2007 mandates stricter enforcement of rules governing cesspools and septic systems. The town will be required to comply with portions of the law beginning in 2014, town documents state.

A study by the town in 1976 identified the need for several densely built neighborhoods in the north end of town to tie into municipal sewers.

Subsequent tests of stormwater and groundwater flowing into the Mount Hope Bay revealed the water is carrying elevated levels of bacteria that contributes to pollution in the bay, town documents state.

The town currently has 550 buildings connected to the sewer system that pump effluent to the Fall River sewer system for treatment.

The plan, once completed, would increase that number from 550 to 4,000 connections. The daily flow would increase from 90,000 gallons a day to 1,200,000 gallons a day, the study showed.

The proposal under consideration calls for sewers to be installed in the Riverside neighborhood, Robert Gray area, Bay Street area, Church Street area, Lepes Road area, Garden Heights area, Mill Street area and the North Stafford Road area. Further study is needed for the Delano's Island area on Nanaquaket Pond, the proposal states.

A flier explaining the sewer construction program is available on the town's website. A project binder has been placed at Town Hall, the Wastewater Management Commission Office and the Essex Library.

Questions and suggestions will be accepted at the hearing, commission members state.

Email Kevin P. O'Connor at koconnor@heraldnews.com.

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Tiverton wastewater commission unveils plan to deal with sewage problems

By Kevin P. O'Connor
Herald News Staff Reporter
Posted Jun 17, 2013 @ 11:58 PM

TIVERTON — Sewage is a problem that will cost the town trouble and millions of dollars, an engineer studying the matter said.

The town's Wastewater Management Commission presented the outlines of a plan that it said would address the problem without tearing the town apart or putting it in the poorhouse.

The commission and the Town Council held a workshop Monday at Tiverton High School to unveil the commission's Wastewater Facilities Plan Update and answer questions from the 50 people who attended.

"What is driving the study, really, is the Rhode Island Cesspool Act of 2007," said Thomas Parece, the engineer who presented the plan. "Plus, in 2011, the DEM (Department of Environmental Management) said the town had to do something about its discharge."

Most of the town uses cesspools or septic systems to handle sewage. In some neighborhoods, that is not working, Parece said.

The area around Riverside Drive and in the Robert Gray neighborhood, the houses are too close together and the soil is too poor for septic systems to work without homeowners investing very expensive on-site systems, Parece said.

Other neighborhoods are involved, too, from Bay Street on the Fall River line south to Riverside Drive. Most of the problems are on the shore of the Mount Hope Bay, west of Main Road.

Parece and Leroy Kendricks, chairman of the Wastewater Management Commission, proposed a 10-year plan that would call for the formation of an independent sewer management agency and a series of public votes, allowing each neighborhood to vote to accept or reject sewers.

The formation of an independent sewer management agency would allow the commission to apply for federal grants that would pay for up to 45 percent of the construction, Kendricks explained.

Those grants are available only to towns or systems of fewer than 10,000 people. The town of Tiverton has 15,000 residents.

The town would be asked to vote on establishing that sewer management agency, probably in the spring, Kendricks said.

After that, each neighborhood involved would have to vote to accept or reject sewers.

"If the areas vote this down, the residents will still be responsible for installing on-site systems at their homes," Kendricks said. "Those systems can fail and the homeowner will be responsible for the cost of repairing them.

"If you vote down sewers, you haven't gotten away. You will have to pay, one way or the other."

Most homeowners will pay less, over 10 years, if they connect to the sewers than they would maintaining a septic system, Kendricks said.
The plan is to pump the sewage to the Fall River sewage treatment plant.
In the Bay Street area, for instance, engineers estimate the average monthly cost of installing and maintaining individual septic systems will come to $240 a month. With sewers, the cost should come to about $105 a month.

In the Riverside Drive area, septic costs could run from $210 to $500 a month, versus an average of $125 a month for sewers, Parece said.
The commission would be releasing a final study with more complete cost estimates before the town must vote on the matter next year, Kendricks said.

Email Kevin P. O'Connor at ***koconnor@heraldnews.com***.

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Tiverton sewer meeting set

By Kevin P. O'Connor
Herald News Staff Reporter
Posted Jun 17, 2013 @ 12:14 AM

TIVERTON — Everything you wanted to know about sewers in town will be offered for consideration at the meeting Monday of the Town Council and the Wastewater Management Commission.

The meeting is set for 7 p.m. in the auditorium at the High School, 100 N. Brayton Road.

"We'll be presenting the facilities plan update," said Leroy Kendricks, commission chairman. "Our consultant will present the results of the update and the recommendations to the town. We'll accept questions."

The commission plan calls for the construction of sewers in several neighborhoods in the north end of town. Tiverton ties into the Fall River wastewater system.

"The facilities plan will update the areas of town that would benefit from the installation of sewers," Kendricks said.

"Generally, these are the older areas in town that have failed systems. It makes better economic sense for those residents for us to extend the sewers."

Other neighborhoods must give up septic systems and use sewers because of new, stricter, mandates from the state Department of Environmental Management, studies by the town have shown.

"There are several drivers for the plan," Kendricks said. "One is regulatory. The new DEM regulations must be complied with."

The plans will be explained and the commission and its consultants will hear concerns of town residents at the meeting Monday, Kendricks said.

"After the public hearing, this plan will go to the Town Council and they will approve it or not," Kendricks said. "Then it will go to the DEM for their approval."

If the plan is accepted, it will go to the town voters for approval of bonds to pay for construction.

"We have a long row to go before we get to construction," Kendricks said.

The meeting is open to the public.

Email Kevin P. O'Connor at ***koconnor@heraldnews.com***.

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Tiverton discussing plan that would greatly expand sewer service

By Kevin P. O'Connor
Herald News Staff Reporter
Posted Jun 23, 2013 @ 07:01 PM

TIVERTON — The town will get out of the sewage business and a new agency will be in charge of carrying away human waste, if the town's plans work out.

The Wastewater Management Commission outlined its plans last Monday to greatly expand the town's sewer system and also overhaul the way it does business.

The commission held a workshop with the Town Council last Monday to outline the commission's new facilities plan, which calls for connecting 3,450 more homes to sewers and also breaking the commission off from the town to form its own agency.

The changes would take 10 years to complete and would cost $72 million, according to Thomas Parece, the engineer who completed the study.

But the federal government would pay up to 45 percent of that amount if the money is going to a municipality or an agency that serves fewer than 10,000 people, said Leroy Kendricks, the chair of the commission.

Because of that, the Wastewater Management Commission would have to become an independent agency, similar to the North Tiverton Water District and the Stonebridge Water District, Kendricks said.

The overall plan is to increase the number of homes being offered sewers from the current 550 to a total of 4,000. That would increase the town's flow to the Fall River treatment facility from 90,000 gallons a day to 1.3 million gallons a day, the study showed.

Sewers would be expanded into the Riverside Drive area first, then the Robert Gray neighborhood, the Bay Street neighborhood and then to the Church Street area, the Garden Heights area, the Lepes Road area, the Mill Street area and the North Stafford Road area.

"The next step from here will be to get on the agenda for the next Town Council meeting and present them with the facilities plan for their acceptance," Kendricks said.

"If they accept it, it will go to the state Department of Environmental Management for review and comments." Then the General Assembly will be asked to establish a Tiverton Wastewater Management Agency that will give it the legal right to borrow money and sign contracts.

At that point, the two town employees who work for the Wastewater Management Commission would become employees of the new agency, Kendricks said.

"All during that time, in the fall, we will be giving people an education about what we are proposing and why," Kendricks said. "Then we will go into each neighborhood for a vote."

Each neighborhood would be considered a separate district and each neighborhood would be allowed to vote to accept or reject sewers. A majority vote of property owners would decide the matter, Kendricks said.

The process would begin with Riverside Drive, where poor soil, small house lots and proximity to Mount Hope Bay results in the most pollution going into the bay from home septic systems. That area also has the highest average costs per home to maintain septic systems, the study showed.

Part of the educational process will be to make sure homeowners understand the bad choices they are facing. The town is under orders from the DEM to crack down on residential septic systems to eliminate the flow of bacteria and effluent finding its way into Mount Hope Bay, Kendricks said.

Sewers, over 10 or 15 years, will be the cheapest way for homeowners to dispose of wastewater, Kendricks said.

The study showed that homeowners would face costs ranging from $150 to $500 a month to install and maintain septic systems, with difficult sites, like the Riverside Drive area, costing more. The study estimated homeowners will pay about $105 a month in sewer costs over the first 10 years when considering the loan payment on an $11,000 connection fee and $65 in monthly usage fees.

"We are doing everything we can as a commission to make this as cost effective as we can," Kendricks said.

Email Kevin P. O'Connor at ***koconnor@heraldnews.com***.

Editorial: Bay Street — insult to injury

By Bruce Burdett / September 26, 2013 / 1 Comment

Remember Bay Street? That part of Tiverton where people were prisoners in homes they couldn't sell because their yards were laced with poison?

Those people are mostly still there. There's still arsenic, cyanide and lead in the soil. They are still stuck.

And that letter they just got from the state Department of Environmental Management wasn't word of rescue. It was an order that they replace their outdated cesspools and septic systems or face big fines.

They must wonder whether to laugh or cry.

Here comes the state, the same state that has sat by for going on two decades while these people live out their lives trapped by toxins, suddenly alarmed that toilet waste might taint the soil and water.

You'd think those officials would have been embarrassed to send such a letter.

This is a neighborhood whose soil is so bad in places that people can't plant vegetable gardens. Grandparents fear to have grandchildren over to play in the yard. A day care had to cover its outside play space with rubber mats.

Cleanups started from time to time, some with fanfare attended by governor, lawmakers and the press. But these sputtered as costs climbed. Lately, the approach has been to look away and pretend this place doesn't exist.

Yet now, these same authorities are alarmed that waste from this neighborhood might pollute the water, might be bad for boating and fishing.

That, apparently, is where authorities draw the line.

LETTERS TO THE EDITOR

DEM didn't order residents to replace cesspools

To the editor:

I am writing in response to your September 27 editorial entitled "Bay Street – insult to injury." This piece is filled with inaccuracies and misinformation and, thus, does a disservice to both Tiverton residents and the Department of Environmental Management (DEM). I would like to set the record straight.

First, contrary to what the editorial says, DEM did not send letters to Bay Street residents directing them to "replace their outdated cesspools and septic systems or face big fines." Indeed, DEM did not send any letters regarding septic systems or cesspools to Bay Street residents because they are not subject to the RI Cesspool Act of 2007. That law, approved by RI General Assembly, requires DEM to work with towns and landowners to ensure that cesspools are eliminated in certain sensitive areas of the state.

To assist the Town in carrying out the Cesspool Act, DEM sent a letter to Tiverton officials reminding them of the opportunity to take advantage of a clause in the Act that allows an exemption for properties located in areas where sewer extensions are planned. At no time – either in writing or verbally – did DEM put the town on notice that outdated septic systems and cesspools must go or the town would be penalized. In order to explore whether to take advantage of the available exemption, the town developed a Facilities Plan that includes an evaluation of appropriate long-term wastewater treatment and disposal options. In that plan, the town identified three priority areas to extend sewers, including Bay Street.

In regard to the Bay Street area and the question of sewers, the contaminated soil clean-up being performed – under the terms of a 2009 Settlement Agreement and Memorandum of Understanding among DEM, Southern Union Company, the Town of Tiverton and the Bay Street Neighborhood Association – allowed the town to delay removal of contaminated soils under and along streets and rights-of-way until the town made a decision regarding whether to bring sewers to the Bay Street area. These agreements do not require the installation of sewers; they allow the town to consider whether it will elect to install sewers.

Currently, the effort to remediate and restore areas with contaminated soils on private property is nearing completion with only a few properties left to address. Hoffman Engineering is drafting the Remedial Closure Reports for each of the neighborhood blocks and will be submitting them to DEM for review and approval. This effort has taken longer than everyone would wish, and DEM and town officials are pleased to see progress.

Many environmental issues are difficult and complicated. I hope we can share factual and clear information as DEM works with the Town of Tiverton, its officials and residents, on problems and opportunities within your community.

Janet Coit
Director, RI Department of
Environmental Management

Editor's note: While the DEM did not contact Bay Street residents directly, as the editorial incorrectly stated, the town Wastewater Management Commission (WMC) chairman told the Town Council Sept. 9 that it has been made clear by DEM that "There is no option to do nothing." The WMC estimates that along Bay Street, where 90 percent of the septic systems have failed, residents face a choice between $270 a month for updated septic system (average replacement cost $25,000) or $105/month for sewers.

Volunteers cleaned boatload of trash from town beaches

Twenty volunteers gathered at Grinnell's Beach on Saturday, Sept. 21, toclean up Tiverton's beautiful coastline.

Teams of three were assigned to Grinnell's, Fogland, Seapowet and Bayview beaches, as well as Jack's Island, and Pond and Nanaquacket bridges where approximately 160 pounds of trash were collected.

Many thanks to all those who contributed to the international goal of trash-free seas and of keeping Tiverton a clean and beautiful town: Pat Dubois, Francesca Viccione, Sharon Culberson, Susan Mignone, Jayne Timberlake, Barbara Haddad, Jan Stewart, Linda Lacroix, Pam Goulet, Jeanne Spencer, Harley Quicksall, Amber Fitzgerald, Lois Kane, Cheryl Marotto, Bill Humphrey, Kathleen Duffy, Maya Murphy, Trish Sylvester, and Simone Pasquariello.

Jewel M. English
Tiverton Garden Club

APPENDIX 8 – AGENCY CORRESPONDENCE

TOWN OF TIVERTON, RHODE ISLAND

Wastewater Management Commission

October 9, 2013

RI Department of Environmental Management
Division of Fish and Wildlife
Great Swamp Field Headquarters
277 Great Neck Road
West Kingston, RI 02892

Ms. Nancy Hess
Principal Environmental Planner
Rhode Island Statewide Planning Program
One Capitol Hill
Providence, RI 02908

Mr. Robert A. Smith, P.E.
Deputy Chief Engineer
Rhode Island Department of Transportation
Two Capitol Hill, Rm 224
Providence, RI 02903-1124

Mr. Edward F. Sanderson, Executive Director
State Historic Preservation Office
Historical Preservation & Heritage Commission
Old State House
150 Benefit Street
Providence, RI 02903-1029

Mr. John Brown
Historic Preservation Officer
Narragansett Tribal Historic Preservation Office
215 Fenner Hill Road
Hope Valley, RI 02832

Mr. Grover J. Fugate, Executive Director
Coastal Resources Management Council
Oliver H. Stedman Government Center
4808 Tower Hill Road – Suite 3
Wakefield, RI 02879-1900

NOAA/NMFS
Habitat Conservation Division
212 Rogers Avenue
Milford, CT 06460

RE: Tiverton, RI
2013 Wastewater Facilities Plan Update

Dear Mr. Zeman:

The Town of Tiverton, thorough its Wastewater Mananagement Commission is pleased to submit our draft 2013 Wastewater Facilities Plan Update for your review and approval. The draft 2013 Wastewater Facilities Plan Update which has been completed in accordance with the requirements of the Rhode Island Department of Environmental Management (RIDEM). Attached is A COPY OF THE Executive Summary for your information. In addition, the compete document can be found on our website as follows: http://www.tiverton.ri.gov/departments/wastewater/sewers.php under the link named "Draft Facilities Plan Update".

Town Hall - 343 Highland Road - Tiverton, Rhode Island 02878-4499 - Phone (401) 625-6701 - Fax (401) 625-6783

The Town has had an accepted Wastewater Facilities Plan on file since 1976 with a most recent update approved by RIDEM in 2000. Since 2000, a number of changes in local and state regulations regarding onsite wastewater treatment systems (OWTS) has made a second update to the Wastewater Facilities Plan necessary. The 2000 Wastewater Facilities Plan Update was used as basis for the development of the 2013 Facilities Plan Update with format changes intended to highlight these variations for the reviewer. The update maintains information in the 2000 Wastewater Facilities Plan Update which is still valid and shown in "italic" and information that is outdated is shown "italic" and "strikethrough" followed by updated information.

Through this update to the Wastewater Facilities Plan, the Town is seeking to expand the existing sewer system into the areas of Town that would benefit the most from them. The areas for expansion were determined by evaluating the regulatory, financial, and public health benefits each would experience if sewers were constructed. Based on the review of the existing documents and the updating of various technical and financial information, the following plan has been recommended:

1. Expand the existing wastewater collection system into the following areas: (a) Bay Street Area; (b) Church Street Area; (c) Garden Heights Area; (d) Lepes Road Area; (e) Mill Street Area (f) North Stafford Road Area; (g) Riverside Drive Area; and (h) Robert Gray Area.

2. Conduct a study to develop a suitable alternative to individaul installations of advanced treatment systems for The Delano's Island area on Nanaquaket Pond.

3. Phase the implmentation over a period of at least 10 years with the first phase being areas with the most critical enviormental concerns, followed by other areas based on economics and need.

4. Create a Sewer District that encompasses the existing and future sewer collection areas so that only properties located within the Sewer District will be responsible for the costs to design, construct and operate the system.

5. Develop a Capital Improvement Plan and associated financial plan which results in a financially stable and self-sufficient operation.

6. Research and apply for funding sources, as applicable, including grants and low interest loans, in order to reduce the burden of costs on the rate payers and users of the system.

Under the recommended plan, the number of connections would increase from 550 up to 4,000 and the average daily flow would increase from 90,000 gallons per day to approximately 1,300,000 gallons per day. Design and construction of the sewer expansion will occur over many years and will be prioritized based on public health needs, regulatory obligations, and financial considerations.

As of the writing of this Facilities Plan Update, the highest priority areas are those that are affected by the 2007 Cesspool Phase-Out Act and the Bay Street area. The portions of the project affected by the 2007 Cesspool Phase Out Act include a portion of the

Riverside Drive Area and a portion of the Robert Gray Area. These two sub areas will be combined to form one project. The Bay Street Area will be a separate project. Sewer Design and Construction for these two areas will be concurrent.
Funding will be on a project by project basis. It is anticipated that the funding will be accomplished through a combination of grants and low interest loans, with the loans being repaid through the assessment of betterments.

We thank you in advance for your favorable review and look forward to the Intergovernmental Agencies assisting the Town in implementing the recommendations contained in the 2013 Wastewater Facilities Plan Update.

Please do not hesitate to contact me at 401-625-6701 or e-mail at j_lincourt@tiverton.ri.gov if you have any questions or comments.

Sincerely,

Town of Tiverton
Wastewater Management Commission

John P. Lincourt, Superintendent

cc: Mr. Leroy Kendricks, Chairman
Mr. Thomas Parece, P.E., AECOM

enclosure

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Rhode Island Department of Transportation
ENGINEERING DIVISION
Two Capitol Hill, Rm. 226
Providence, RI 02903-1124
PHONE 401-222-2023
FAX 401-222-3006; TDD 401-222-4971

October 17, 2013

Mr. John P. Lincourt, Superintendent
Town of Tiverton
343 Highland Road
Tiverton, RI 02878-4499

Subject: 2013 Wastewater Facilities Plan Update

Dear Mr. Lincourt,

We have reviewed your request of October 9, 2013 at the subject location. Based on our review of your proposal, you will need to file a Utility Permit with our Maintenance Division. This is required for any work proposed on Riverside Drive or any other State Highway

If you have any further questions, please do not hesitate to contact this office.

Very truly yours,

Robert A. Smith, P.E.
Deputy Chief Engineer

cad
cc: Messrs. Farhoumand, Smith, Baker, and File (PAPA)

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
235 Promenade Street, Providence, RI 02908-5767 TDD 401-222-4462

October 18, 2013

Mr. John Lincourt, Superintendent
Wastewater Management Commission
Tiverton Town Hall
343 Highland Road
Tiverton, RI 02878-4499

RE: Review of the Town's Wastewater Facilities Plan Update (DEM file #13-A)
Tiverton, Rhode Island

Dear Mr. Lincourt,

The Rhode Island Department of Environmental Management, Office of Water Resources (OWR) has reviewed the above referenced Facilities Plan Update (FPU) and has the following comments which must be addressed prior to OWR issuing a final approval:

1. On page 22, should the 3rd paragraph be deleted? It is shown as italicized, but the text indicates outdated information. Please delete/strikethrough if necessary.

2. Page 26, Section 3.3.1 presents the existing flow as 94,000 gpd. The paragraph above Section 3.3.1 states that existing flow data and OWR's Flow Estimation Policy were used to estimate the existing and future flows. Please explain in the text how you determined the existing flow of 94,000 gpd. Was it from data from the meter at the State line? Water use records from all 125 +/- parcels (page 67 Section 5.3 states that "initial" flows were based on actual water use records)? OWR's Flow Estimation Policy? Or a combination of any of these or some other method? The text states that there are 550 existing connections to the wastewater collection system which would result in approximately 171 gallons per connection per day (94,000 gpd/550 connections = 171 gpcd).

3. On page 27, the existing sewered area build out flow is presented as 345,000 gpd. OWR believes this is calculated by taking the existing connections (550) and adding the future potential connections (600) within the existing sewered area, then multiplying that number (1150) by OWR's Flow Estimation Policy value of 300 gphd, which results in 345,000 gpd. However, page 26 indicates the average daily flow is currently 94,000 gpd so it wouldn't be correct to assume the existing 550 connections would contribute 300 gphd. The 300 gphd should only be used for future connections. Back calculating the flow per connection based on existing wastewater records, the per connection flow would be 94,000 gpd/550 connections = 171 gallons per connection per day. So, applying the 171 gpcd to the potential 600 connections within the existing sewered area would result in 171 x 600 = 102,600 gpd. Therefore, the total flow from the existing sewered area should be: 94,000 + 102,600 + 50,000 (I/I) = 246,600 gpd. The calculations for the flows in the Planning Area presented in Section 3.3.2 are correctly calculated using the OWR Flow Estimation Policy. If you agree with this assessment of the existing sewered area flows, then please revise the text and any Tables or Figures accordingly throughout the FPU to account for the revised flow.

4. On page 30, Section 3.3.2.7, the Riverside Drive area is to be served predominantly by low pressure sewers. Therefore, is the I/I value of 15,000 gpd too high? Typically, low pressure sewers and force mains do not exhibit appreciable levels of infiltration. Based on this very preliminary estimate, is the 32,000 l.f. of pipe mostly low pressure or is it mostly gravity pipe? Please explain and revise the I/I value if necessary.

5. On page 32, Table 1 contains a mathematical error. The total wastewater flow with the peaking factor of 3.0 should be 3,514,000 gpd, not 3,541,500 gpd as shown. Also, the Total Flow should be 3,640,000 gpd, not 3,667,100 gpd as shown. Please revise Table 1 accordingly and if these flow values are presented in other sections of the FPU, then revise those sections as well.

6. On page 72, Table 8 indicates the ultimate average daily wastewater flow to be 1,060,174 gpd. However, throughout the FPU (it is stated on pages 31 and 69 and may be presented elsewhere) the ultimate average daily flow is presented as 1,300,000 gpd. Please explain and revise either the text or Table 8 as necessary.

7. On page 74, under Section 6.2 Land Use, shouldn't the first sentence in the italicized section be deleted, as it is outdated? 'Demographics' is now found in Section 6.3 in this FPU. Additionally, the first sentence refers to year 2010 in the future tense. Please delete this sentence if appropriate.

8. On page 79, Table 10 presents the Total financial characteristics for the Town as $33,444,000, but in the sentence following Table 10 the FY2012 expenditure appropriations are presented as $39,323,584. Please explain this discrepancy and revise if necessary.

9. On page 80, please revise the last sentence "*Wastewater Generation is discussed in Refer to Section 3 and Section 7 for a detailed discussion on wastewater generation.*"

10. On page 97, please revise the first sentence "*As part of the development of this planning document an order-of-magnitude estimates.*"

11. Although the future flows will not exceed the IMA's allotment for Tiverton of 2.0 MGD, please provide a letter from the City of Fall River acknowledging the recommendations in this FPU and clearly stating that the City currently has the capability to accept, transport and treat the future flows presented in the FPU.

12. Although not a requirement for approval, the FPU should indicate whether the Town has or intends to establish a mandatory tie-in requirement.

13. As discussed with you earlier, an Intergovernmental Review must be performed in order for the recommended sewering alternatives to be eligible for the State Revolving Fund loan program. Please submit copies of any letters sent, received and responses issued as a result of the Intergovernmental Review process.

14. On page 133, it states that the Public Hearing was held on June 17, 2013. Should any substantive comments come from the Intergovernmental Review process (or from any other person, agency or organization) that necessitate substantial revisions to the FPU's recommendations, then another Public Hearing will be required.

Mr. John Lincourt
October 18, 2013
Page 3 of 3

15. The Office of Water Resources has also reviewed the 2013 Facilities Plan Update for consistency with the Mt Hope Bay Bacteria TMDL (RIDEM, 2010) and determined that it is consistent with the requirement that the Town commit to a schedule to commence the design and construction of sewers for both Robert Gray and Summerfield Lane drainage areas.

Please provide a written response to the above comments and submit revised pages as necessary. If you respond to all other comments but need additional time to complete the Intergovernmental Review process, then please append the Intergovernmental Review documents to the final FPU. Once OWR has determined that the Town has satisfactorily addressed the comments, OWR will advertise its Public Notice of Intent to Issue a Finding of No Significant Impact (FONSI) for 30 days in the Providence Journal. Once the 30 day Public Notice period expires, and barring any comments on the FONSI, OWR will instruct you to submit two (2) hard copies and one (1) electronic copy of the final FPU. Once those are received, the FPU will be approved and one stamped-approved hard copy will be returned to the Town.

Please contact me at (401) 222-4700, x7251 or at art.zeman@dem.ri.gov if you have any questions.

Thank you,

Art Zeman, P.E., Principal Engineer
Wastewater Treatment Facilities Program
Office of Water Resources

AGZ/agz

pc: Jim Goncalo, Tiverton Town Administrator
Steve Berlucci, Tiverton DPW Director
Leroy Kendricks Jr., P.E., Chairman, Wastewater Management Commission

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

COASTAL RESOURCES MANAGEMENT COUNCIL
Oliver H. Stedman Government Center
4808 Tower Hill Road, Suite 3
Wakefield, R.I. 02879-1900

(401) 783-3370
FAX: (401) 783-3767

October 31, 2013

Mr. John P. Lincourt, Superintendent
Town of Tiverton
Wastewater Management Commission
343 Highland Road
Tiverton, Rhode Island 02878-4499

Re: **Town of Tiverton 2013 Wastewater Facilities Plan Update**
CRMC File 2013-10-071 – Intergovernmental Review

Dear Mr. Lincourt:

Thank you for submitting the Town of Tiverton 2013 Wastewater Facilities Plan Update (Plan) document consisting of the Executive Summary, and providing the URL for online access of the full plan. The document was received in this office on October 10, 2013. You have requested the Coastal Resources Management Council (CRMC) to conduct an intergovernmental review of this plan for conformance with the State coastal zone management program. The CRMC has authority for such a review pursuant to Section 320 of the Coastal Resources Management Plan to determine whether the proposed project may pose any adverse impact to the coastal resources of the State of Rhode Island.

The Plan indicates that the Town is seeking to expand the existing sewer system into northern portions of the Town to address high priority areas subject to the 2007 Cesspool Phase-out Act. Specifically, the proposed sewer extension would affect the following areas: Bay Street; Church Street; Garden Heights; Lepes Road; Mill Street; North Stafford Road; Riverside Drive; and Robert Gray. The RI Department of Environmental Management (RIDEM) last approved the Town's Wastewater Facilities Plan in 2000. The Plan further indicates that the update is necessary to address new state onsite wastewater treatment system (OWTS) rules.

According to the Plan, the number of potential new sewer connections would increase from the existing 550 to 4000 and the average daily flow would increase from 90,000 GPD to 1.3 million GPD. All wastewater collected by the Town's sewer system is conveyed to the municipal wastewater treatment facility (WWTF) located in Fall River, MA and treated effluent is discharged into Mount Hope Bay. The Plan indicates that the preferred treatment method is for all existing and future wastewater to be processed at the Fall River WWTF, as this is much more cost effective than an alternative approach to construct and operate a WWTF within the Town of Tiverton. Moreover, the Town has an Inter-Municipal Agreement with the City Of Fall River for the treatment of an average daily flow of 2 million gallons, more than adequate to serve the Town's projected need of 1.3 million GPD.

John P. Lincourt, Superintendent
Town of Tiverton Wastewater Management Commission
October 31, 2013
Page Two

Portions of the sewer service area within the Town directly abut coastal waters of the Sakonnet River. Accordingly, any portion of the construction of new sewers or pump stations that are located within 200 feet of tidal waters or CRMC-designated shoreline features will require a permit from the CRMC.

Based on the documentation provided we have concluded that there will be no adverse impact to coastal resources of the State from the proposed Town of Tiverton 2013 Wastewater Facilities Plan Update, provided all necessary authorizations are obtained and the project is constructed, operated, and maintained in strict accordance with all applicable State and Federal rules and regulations.

Please contact me should you have any questions concerning this determination.

Sincerely,

James Boyd

James Boyd, Coastal Policy Analyst
Coastal Resources Management Council

/lat
cc: Grover Fugate, CRMC Executive Director
Jeffrey M. Willis, CRMC Deputy Director
Arthur Zeman, RIDEM
Nancy Hess, Statewide Planning

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
HISTORICAL PRESERVATION & HERITAGE COMMISSION
Old State House • 150 Benefit Street • Providence, R.I. 02903-1209
TEL (401) 222-2678 FAX (401) 222-2968
TTY / Relay 711 Website www.preservation.ri.gov

4 November 2013

John P. Lincourt, Superintendent
Town of Tiverton Wastewater Management Commission
Tiverton Town Hall
343 Highland Road
Tiverton, Rhode Island 02878-4499

Re: 2013 Draft Wastewater Facilities Plan Update
Tiverton, Rhode Island

Dear Mr. Lincourt:

The Rhode Island Historical Preservation and Heritage Commission staff has received your letter requesting comments about the 2013 Draft Wastewater Facilities Plan Update. The plan recommends six action items, five of which are planning-related. The sole item with which we are concerned is the expansion of the wastewater collection system into eight new areas.

We have reviewed available resources and determined that the expansion of the system into the Bay Street, Church Street, and Lepes Road Areas will have no effect on historic properties. We cannot determine effects for the expansion into the Garden Heights and Robert Gray Areas because location information was not supplied for these areas. Please provide maps that indicates where these areas are located so that we many continue our review.

The Riverside Drive Area contains the Bay View House/Tiverton Yacht Club property, which has been determined to be eligible for listing in the National Register of Historic Places. The Mill Street Area contains the Bourne Mill, which is listed in the National Register. We will need to see location information, and potentially construction information, for these areas in order to determine potential effects to these historic resources.

These comments are provided in accordance with Section 106 of the National Historic Preservation Act. If you have any questions, please contact Jeffrey Emidy, Project Review Coordinator of this office.

Very truly yours,

for Edward F. Sanderson
Executive Director
Deputy State Historic Preservation Officer

131104.06jde

Division of Planning
Statewide Planning Program – Land Use
One Capitol Hill
Providence, Rhode Island 02908
(401) 222-6480

MEMORANDUM

To: John P. Lincourt, Superintendent, Tiverton Wastewater Management Commission

CC: Art Zeman, RI DEM

Subject: Request for State Guide Plan Consistency - 2013 Tiverton Wastewater Facilities Management Plan

Date: 11.15.13

From: Nancy Hess, Supervising Land Use Planner

I reviewed the documents dated October 9, 2013 concerning the proposed update to the wastewater treatment facility plan for consistency with the Rhode Island State Guide Plan (SGP) and intergovernmental review purposes. The purpose of the update is to expand the existing sewer system into the areas of Tiverton which would provide public health benefits. The study area for the Plan is entirely within the Urban Services Boundary of *Land Use 2025*. Based upon review of the various technical and financial information provided in Update, the revised Plan is found to be consistent with the SGP policies concerning providing infrastructure support as needed for remediation of existing water quality concerns. Additionally, by expanding the sewer system into northern portions of the Town with high priority for the areas which are affected by the 2007 Cesspool Phase-Out Act is consistent with the appropriate elements of the SGP related to waste quality protection, land use, outdoor recreation, and water resources.

Thank you for providing the URL to enable access to the full plan. Should you have any questions about this review, please feel free to contact me at the number above.

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
235 Promenade Street, Providence, RI 02908-5767 TDD 401-222-4462

To: owner

November 22, 2013

RE: site address, town, RI

Based on the information previously provided to RIDEM, your property is served by a cesspool that is subject to the R.I. Cesspool Act of 2007, RIGL § 23-19.15 (the Act). The General Assembly enacted this law because cesspools contribute to contamination of both surface water and groundwater and can be a threat to public health. As the deadline specified in the Act approaches, the Department offers this reminder of your obligations. The law requires any cesspool subject to the Act to be removed from service no later than January 1, 2014, and either replaced with an onsite wastewater treatment system (OWTS) or connected to a sewer line if one is available.

The Department will begin enforcement activities after January 1, 2014, and you may be subject to penalties including fines and/or compliance orders recorded against the property's deed. To avoid enforcement, if you have not done so already, you must submit an OWTS application no later than January 1, 2014. The replacement system must then be installed within one year of issuance of the approved permit. If your property is served by a public sewer line, you must connect by January 1, 2014.

For more information on how to proceed with your cesspool replacement, refer to the fact sheets available on DEM's web site: http://www.dem.ri.gov/programs/benviron/water/permits/isds/fixowts.htm

A list of licensed OWTS designers is available here:
http://www.dem.ri.gov/programs/benviron/water/licenses/isds/pdfs/deslist.pdf

If your property is served by a public sewer line, contact your local sewer department for more information on how to connect to the sewer system.

Hardship Extension: A hardship extension is available to property owners in unsewered areas who meet certain financial requirements. If granted, the property owner would have until January 1, 2019 to replace the cesspool. **You must have your cesspool inspected to qualify and failed cesspools are not eligible for any extension. Hardship extension applications must be received no later than January 1, 2014.** For more information on how to apply for a hardship extension, see DEM's web site:
http://www.dem.ri.gov/programs/benviron/water/permits/isds/pdfs/cessextn.pdf.

For more information, see: http://www.dem.ri.gov/programs/benviron/water/permits/isds/cessfaze.htm.
You can also email questions to Jon Zwarg (jonathan.zwarg@dem.ri.gov) or call (401)222-4700 x7205.

DEM is responsible for implementing the R.I. Cesspool Act, a law that includes specific requirements that affect you and other property owners. Our goal in contacting you is to ensure that you comply with this law that protects public health and the environment.

Sincerely,

Brian Moore, P.E.
Supervisor, Onsite Wastewater Treatment System Permitting

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
235 Promenade Street, Providence, RI 02908-5767 TDD 401-222-4462

SENT VIA CERTIFIED MAIL, RETURN RECEIPT REQUESTED

November 22, 2013

To: owner

RE: site address, town, RI

FINAL NOTICE

You are receiving this notification because your property identified above may be subject to the Rhode Island Cesspool Act of 2007, RIGL § 23-19.15 (the Act). The Act mandates that all cesspools located within 200 feet of the inland edge of a coastal shoreline feature bordering a tidal water area or within 200 feet of a public well or drinking water reservoir must be removed from service no later than January 1, 2014. The cesspool must be replaced with a septic system or the property connected to a sewer line if one is available. The General Assembly enacted this law because cesspools contribute to contamination of both surface water and groundwater and can be a threat to public health.

The Rhode Island Department of Environmental Management (DEM) has conducted an analysis of properties in your area. No records were found of your property having a permitted onsite wastewater treatment system (OWTS) or being connected to a municipal or private sewer line. Accordingly, DEM has determined that you are likely to have a cesspool and you must comply with the requirements described below. If you disagree with this determination, you can present information showing that your property is not subject to the Cesspool Act.

This is the third and final notice mailed to your address, please note that a response is required. You must either acknowledge that your property is subject to the Act or you must submit evidence that your property is exempt from the Act. Based on DEM's due diligence and your failure to respond to the two previous notification letters, the Department considers your property to be subject to the Act unless you demonstrate otherwise. The Department will begin enforcement activities after January 1, 2014, and you may be subject to penalties including fines and/or compliance orders recorded against the property's deed if you fail to meet these deadlines. To avoid enforcement, if you have not done so already, you must submit an OWTS application no later than January 1, 2014. The replacement system must then be installed within one year of issuance of the approved permit. If your property is served by a public sewer line, you must connect by January 1, 2014.

WHAT YOU NEED TO DO: You must complete and return the enclosed Owner's Response Form according to the instructions below. Failure to respond to this notice may result in the Department taking enforcement action.

If your property is served by a cesspool subject to the law:
Complete and return the Owner's Response Form no later than January 1, 2014. Initial the form where indicated to acknowledge that your cesspool is subject to the law and sign the certification. You must also submit an OWTS application no later than January 1, 2014. The replacement system must then be installed within one year of issuance of the approved permit. If your property is served by a public sewer line, you must connect by January 1, 2014.

If you have reason to believe that your property is NOT subject to the Act either because the property is not served by a cesspool or the cesspool is not located within one of the 200-foot zones described above:

(Over, please)

You must complete and return the enclosed Owner's Response Form and any documentation supporting your claim to DEM no later than January 1, 2014. You may self-certify that your property is not subject to the Act but you must submit substantive evidence to support your certification. DEM reserves the right to conduct inspections of your property to verify the validity of any claims. You may be subject to DEM compliance orders and administrative penalties if you submit a false claim that your cesspool is not subject to the Act and DEM later determines that your cesspool is subject to the Act.

To show that your property is not served by a cesspool, submit a copy of **one** of the following for the property:

- A recent **sewer bill,** a **letter from sewer system owner**, or other documentation of connection to a public sewer system or other state-approved off-site sewage treatment system;
- A DEM-issued, **conformed OWTS permit (permit search tool at www.dem.ri.gov)**;
- An **inspection report** for the OWTS clearly stating that the OWTS is not a cesspool; or
- **Self Certification:** Provide a brief explanation in your own words.

To show that the cesspool is not within one of the 200-foot zones described above, submit a copy of **one** of the following:

- A **survey report** from a licensed surveyor showing the distance to the cesspool from the public drinking water well, public drinking water reservoir, or inland edge of a coastal shoreline feature;
- Other substantive evidence, such as an **engineering plan** or other **professionally prepared drawing** definitively showing the location of the cesspool beyond one of the 200-foot zones; or
- **Self Certification:** Provide a brief explanation in your own words along with a sketch or aerial photograph showing the location of the cesspool in relation to your home and the coastal shoreline feature, well, or reservoir.

Note: In many cases the inland edge of the coastal shoreline feature is not the same as the boundary of open water. (For more information see:
http://www.crmc.ri.gov/guidesreports/CRMC_Coastal%20Shoreline_Features.pdf)
A **Preliminary Determination** from the R.I. Coastal Resources Management Council (CRMC) may be necessary to verify the location of the inland edge of a coastal shoreline feature.

Hardship Extension: A hardship extension is available to property owners in unsewered areas who meet certain financial requirements. If granted, the property owner would have until January 1, 2019 to replace the cesspool. **You must have your cesspool inspected to qualify and failed cesspools are not eligible for any extension. Hardship extension applications must be received no later than January 1, 2014.** For more information on how to apply for a hardship extension, see DEM's web site: http://www.dem.ri.gov/programs/benviron/water/permits/isds/pdfs/cessextn.pdf.

Return the Owner's Response Form and any accompanying documentation by January 1, 2014 to:
RIDEM, Office of Water Resources, attn: Cesspool Phase-out, 235 Promenade Street, Providence, RI 02908

For more information, see: http://www.dem.ri.gov/programs/benviron/water/permits/isds/cessfaze.htm.
You can also email questions to Jon Zwarg (jonathan.zwarg@dem.ri.gov) or call (401)222-4700 x7205.
For more information about the Preliminary Determination Process contact CRMC at (401)783-3370.

DEM is responsible for implementing the R.I. Cesspool Act, a law that includes specific requirements that affect you and other property owners. Our goal in contacting you is to ensure that you comply with this law that protects public health and the environment.

Brian Moore, P.E.
Supervisor, Onsite Wastewater Treatment System Permitting

Enclosure

City of Fall River
Massachusetts
Department of Community Utilities
WATER • SEWER

WILLIAM A. FLANAGAN
Mayor

TERRANCE SULLIVAN
Administrator

December 10, 2013

Mr. John Lincourt,
Superintendent
Tiverton Wastewater Management Commission
345 Highland Road
Tiverton, RI 02878

RE: Wastewater Capacity

Dear Mr. Lincourt

This letter is in response to your request dated November 4, 2013.

I have reviewed the Draft Wastewater Facilities Plan Update (Draft FPU) you included with the request and acknowledge that the Draft FPU recommends that the Town continues to discharge their wastewater to the City of Fall River (the City) for Treatment. The Draft FPU has stated that Wastewater Flows projected over the next 20 years will be 1,060,174 GPD.

The City and the Town of Tiverton currently have an Intermunicipal Agreement in which the City has agreed to reserve an average of 2,000,000 GPD of capacity for the Town. The City currently maintains the capacity to accept, transport and treat the full 2,000,000 GPD stated in the agreement. We therefore maintain the capacity to accept the reach flows anticipated within the Draft FPU.

If you require any further information on this subject, please feel free to contact this office.

Regards,

Terrance J. Sullivan
Administrator of Community Utilities

One Government Center • Fall River, MA 02722 • TEL (508) 324-2320
WATER (508) 324-2330 • SEWER (508) 324-2320 • EMAIL tsullivan@fallriverma.org

APPENDIX 9 – TWIN RIVER CASINO AND HOTEL – WASTER WATER FLOWS

MEMORANDUM

Date:	**May 15, 2017**	cc:	K. Kern J. Anderson G. Avenia R. Talbot
To:	**Sarah Stearns, PE, District Engineer/Superintendent,** Tiverton Wastewater District **Stephen Berlucchi, General Manager,** Tiverton Wastewater District		
From:	**Christine Shea**		
Subject:	**Basis of Design, Revision 01** **Wastewater Collection System** **Twin River Tiverton Casino and Hotel**		

1. PURPOSE

The purpose of this memorandum is to present the design for:

1. the wastewater collection system and pump station for the Twin River Casino and Hotel (Project) in Tiverton, Rhode Island, and
2. the improvements to the TivertonWastewater District (TWWD) collection system to accept these flows.

This document updates the memorandum issued on February 27, 2017, with respect to sanitary sewer design based on subsequent discussions with the TWWD. This document will include design details for the sanitary sewers and wastewater pump station, including the pumps, building, controls, and utility requirements. The Project will be served by the TWWD, which transmits, through gravity sewers and pump stations, its wastewater to the City of Fall River for treatment. The 2015 Agreement between the City of Fall River and the Tiverton Wastewater District allocates 2,000,000 gallons per day (gpd) for the TWWD. The highest current month is 85,000 gpd.

2. BACKGROUND

Twin River-Tiverton, LLC proposes to construct a new casino and hotel development. The Project includes the construction of a 100,000± square foot casino, a 45,400± square foot hotel with 84 guest rooms, a two-level parking structure, additional surface parking areas, main access road, emergency access road, loading area, utilities, and stormwater management systems.

The February 27, 2017 memo entitled "DRAFT - Twin River Casino Design Water Demand and Wastewater Flows", (Design Memorandum) written by Amec Foster Wheeler, provides the design wastewater flows based on the proposed use of the site (Amec Foster Wheeler, 2017). It is expected that the Project will produce 40,641 gpd of wastewater with a peak hourly flow of 192 gallons per minute (gpm). Calculations are provided in Attachment 1.

3. WASTEWATER FLOW BASIS OF DESIGN

The following assumptions were used to define the uses of areas within the casino-hotel:

1. Casino (all areas and number of seats are approximate)
    a. Casino Gaming Area [(1)]
        i. 945 slot machines, one seat per machine

ii. 226 seats, table games
b. Dining: 147 seats [1]
c. Food Court: 88 seats [1]
d. Bar and VIP Lounge: 86 seats [1]
e. Offices/Back of House (BOH): 45,320 sq ft [2]

2. Hotel
a. Rooms: 84[1]
b. Offices/BOH: 3,970 sq ft [2]
c. Meeting rooms (4): 2,596 sq ft [1]

Source of information:

[1] Progress Set Drawings (not for construction) prepared by JCJ Architecture, February 06, 2017
a. IF-110 – Interior Furnishings Plan – First Floor Overall
b. A-120 – Second Floor Overall

[2] Tiverton Casino & Hotel MEP/FP/TP Basis of Design Report prepared by exp US Services, Inc., December 16, 2016

The wastewater flow rates are based on building use and square footage. Wastewater unit values are taken from the 2015 Agreement (Appendix A) between the City of Fall River and the TWWD. Appendix A is based on Massachusetts State Environmental Code, Title 5 (310 CMR 15.203). Peak hourly flow rate was provided by TWWD based on information in TR-16 - Guides for the Design of Wastewater Treatment Works, New England Interstate Water Pollution Control Commission, Revised 2011 Edition (TR-16). Because the Project flow is below the charted range in Figure 2- 1 of TR-16, the peaking factor was extrapolated for project use.

Table 1. Twin River Wastewater Flow Projections

Building Use and Wastewater Flow				Wastewater Flow		
Building Use [1]	**Area of Use (sq ft)**	**Quantity** [2]	**Unit** [3]	**Wastewater Design Flow per Unit** [4] **(gpd)**	**Average Daily Flow (gpd)**	**Pump Design Flow Rate (gpm)**
Casino - Table Games		226	Seat	15	3,390	16.0
Casino - Slots		945	Seat	15	14,175	66.9
Dining (Restaurant)		147	Seat	35	5,145	24.3
Food Court (Restaurant)		88	Seat	35	3,080	14.5
Bar/VIP Lounge (Restaurant, kitchen flow)		86	Seat	20	1,720	8.1
Offices/Back of House (BOH) (Office Building)	45,320	45.32	1,000 sq ft	75	3,399	16.1
Hotel – Rooms (Single and Multiple Dwelling Units)		84	Room	110	9,240	43.6
Hotel – BOH (Office Building)	3,970	3.97	1,000 sq ft	75	298	1.4
Hotel - Meeting (Office Building)	4,450	2.596	1,000 sq ft	75	195	0.9
Subtotal					**40,641**	
Infiltration [6]					**305**	
Total					**40,946**	**192**

NOTES:

(1) Hotel/Casino Use - corresponding use type designation in City of Fall River and Tiverton Wastewater District Agreement, Appendix A in parentheses

(2) Number of Seats based on drawing: Interior Furnishings Plan-First Floor Overall, Progress set 02/06/2017

(3) Area of Use based on: December 16, 2016 MEP Basis of Design Report

(4) Units and flow rate per unit based on City of Fall River and Tiverton Wastewater District Agreement, Appendix A

(5) Peaking factor used to determine peak hourly flow rate was estimated to be 6.8 as provided by the TWWD based on TR-16

(6) Assumed to be 300 gallons per day per inch-diameter of pipe per mile of gravity sanitary sewer pipe (gpd/in-mile). TR-16 range of infiltration flows: 250-500 gpd/in-mile

4. SANITARY SEWER DESIGN

The Project will be served by a 595-foot, 8-inch diameter gravity sewer. There are three discharge points to the sanitary sewer from the project: two discharges from the casino and one discharge from the hotel. There are two kitchens in the casino. Grease interceptors are installed on the discharge from each kitchen prior to discharge to the sanitary sewer. The sanitary sewer will be designed in accordance with TR-16 requirements. The design will specify 30-inch diameter

manhole covers, recycled HDPE manhole adjusting rings, and manhole encapsulation system, as required by the TWWD.

5. TWIN RIVER WASTEWATER PUMP STATION DESIGN

The Twin River pump station will be a duplex submersible pump station with an above ground enclosure (to avoid confined space entry) that will house piping, valves and flow meter. The Flow Meter Enclosure will be insulated and heated and have removable doors for access. The wet well will be an eight-foot-diameter, precast concrete manhole. The submersible pumps will be on slide rail assemblies for removal.

5.1. WET WELL DESIGN

Effective storage capacity of a wet well is defined by the volume above the pump intake that fills prior to activation of the pump. TR-16 recommends sizing the effective storage capacity for a total filling time of 30 minutes based on the average daily flow for the system. The average daily flow is 40,946 gpd so the effective storage capacity is calculated to be approximately 847 gallons. The required depth of the effective storage capacity in an 8-foot wet well is determined using the volume of the wet well per vertical foot, a parameter calculated using the cross-sectional area of the wet well. For an 8-foot wet well, there are 376 gallons per vertical foot, which equates to a depth of 2.25 feet for the effective storage capacity of the wet well.

Total wet well depth is determined as a function of the influent sanitary sewer elevation, instrumentation and level controls, and effective storage capacity. The wastewater pumps will be controlled by a pressure transducer. Float switches will be used for high-high and low level alarms. The high-high level float alarm is set at 0.4 feet below the invert of the influent sanitary sewer. A high-level alarm, activated by the pressure transducer, is set one foot below the high- high float switch, and a low-level float switch will be installed 3.25 feet below the high-level alarm set point, approximately two feet above the volute of the submersible pump. The pump inlet will be installed 6" above the floor of the wet well. Based on these design criteria, the elevation of the bottom of the wet well will be 198.23 ft. The following are the preliminary control and alarm elevations in feet:

Finished Grade	211.00
Influent Pipe Invert	205.41
High-High Level Alarm (float)	205.00
Standby Pump On	204.50
High Level Alarm	204.00
Duty Pump On	203.50
All Pumps Off	201.25
Low Level Alarm and All Pumps Off (float)	200.73
Bottom of wet well	198.23
Base elevation of wet well	197.59

A buoyancy analysis was performed to determine whether the wet well would require an oversized concrete base to counteract buoyancy forces. Based on the volume and weight of the wet well and the expected downward forces due to friction, the wet well will require an oversized base, as the ratio of downward forces to upward buoyancy forces in a fully saturated

condition is 0.89, indicating that the wet well would likely float in that condition. Installing an additional two feet of concrete around the circumference of the base (for a total width of concrete at the base of 13.32 feet) provides enough downward force to satisfy a ratio of 2:1 of downward forces to buoyant forces, providing a sufficient safety factor to ensure the wet well will not float in a fully flooded condition.

5.2. TOTAL SYSTEM HEAD

The design of the wastewater pump is based on the total head loss (static and friction) based on the design pumping rate. Static head loss is the elevation difference between of the terminus manhole invert and the minimum water elevation above the submersible pump. The invert of the discharge pipe in the terminus manhole is 247± and the minimum water elevation in the wet well is 201.25. Static head is calculated to be approximately 46 feet.

The length of the 4-inch diameter DR 11 HDPE from the pump station to the terminus manhole is 2,690 feet. Using the Hazen-Williams equation with a roughness coefficient of 150 (smooth pipe), the pipe frictional head loss including valves, fittings, etc. is 63 feet.

Total system head (46+63) equals 109 feet.

Based on the total system head and the expected maximum peak hourly flow rate of 192 gpm, duplex Flygt NP 3153 SH 275 submersible pumps are recommended for the site. The selected submersible pumps will operate at the design flow rate and head condition, and will operate in the event of an increased flow rate or head condition.

5.3. INSTRUMENTATION AND CONTROLS

The Twin River wastewater pump station is designed to operate continuously with minimal operator attention. To accomplish this, the pumps will be controlled using a programmable logic controller (PLC) programmed to communicate with pump-related instrumentation, including float switches, a pressure transducer, and a flowmeter. The Allen-Bradley Micrologic 1000 with 12 digital 120VAC inputs, four analog inputs, eight relay outputs and one analog (Catalog No. 1761-L20AWA-5A) will communicate alarms, status, and flow rate to a Mission Communications M800 Series, as specified by the TWWD. The wet well will be installed with a pressure transducer calibrated to provide continuous depth of the wet well. The wet well will be equipped with two alarm-activating float switches.

A magnetic flow meter on the pump station effluent will provide continuous flow measurement and totalize flow. This instrument will provide necessary flow reporting information and be accessible by the TWWD.

5.4. ELECTRICAL REQUIREMENTS

The proposed pump for the wastewater pump station has a maximum power output of 23 horsepower, and is wired for 480-volt three-phase power. The enclosure will also require 110-volt single- phase power for associated instrumentation, enclosure ventilation and heat. Emergency power to the pump station will be provided by a generator used by the casino/hotel.

5.5. FLOW METER ENCLOSURE

The flow meter enclosure will be a removable aluminum or fiberglass enclosure equipped with ventilation, heat, and lighting. The enclosure will house the flow meter, check valves, isolation valves, and air release valve. By installing these items above ground, confined space entry is avoided. A floor drain, with trap, will discharge to the wet well.

5.6. TWIN RIVER PUMP STATION DESIGN SUMMARY

This memo provides information on the design of the wastewater pump station for the Twin River Casino in Tiverton, Rhode Island. The pump station is expected to be a removable aluminum and fiberglass enclosure providing cover and access to the valves and controls associated with the submersible sewage pump.

The pump station wet well will be eight feet in diameter and 14.5 feet deep. The effective storage capacity of the wet well will be 847 gallons and will provide 30 minutes of wastewater filling time prior to pump activation.

The submersible pumps will be programmed to provide continuous operation without operator input. In the event of a system failure, the PLC will provide alarm callouts to site personnel. The pump station will include a flowmeter to provide necessary reporting information to the TWWD.

6. CONNECTION TO TWWD SYSTEM

6.1. EXISTING PUMP STATION

The Twin River Pump Station will discharge to the North Stafford Road Area as described in the "Wastewater Facilities Plan Update", prepared by AECOM Technical Services, Inc., dated February 2014. This document estimated future flows for the North Stafford Road Area, but did not include flows for the casino/hotel. The existing sewers in the North Stafford Road area are served by the Hurst Lane Pump Station. Future wastewater flows will be served by gravity sewers discharging directly to the City of Fall River or through the Hurst Lane Pump Station.

The Hurst Lane Pump Station discharges to the City of Fall River through a 6-inch diameter force main to a manhole located on Hancock Street. The addition of the casino/hotel will increase the current and estimated future flows to the Hurst Lane Pump Station. A recent topographic survey provides pipeline inverts at the Hurst Lane Pump Station and the invert of the City of Fall River's manhole on Hancock Street. Using the updated inverts and pipe sizing based on the design flows, it was determined that this area could be served by a 15-inch diameter gravity sanitary sewer on Lee Way and that the Hurst Lane Pump Station could be eliminated. The gravity sanitary sewer option is preferred over upgrading the Hurst Lane Pump Station because has a much lower operation and maintenance cost. When these two options were discussed with the TWWD, their preference was for the gravity sanity sewer.

6.2. WASTEWATER DESIGN FLOWS

This section provides flow estimates for the combined existing and estimated future TWWD flows and the casino/hotel flows. Information provided by TWWD estimates current wastewater flow to

be approximately 50,000 gpd. Based on the Wastewater Facilities Plan and AmendmentIt is estimated that average daily flow will increase from 50,000 to approximately 139,000 gpd, after inclusion of the Project and other newly connected TWWD customers. The table below details the calculation steps taken to develop these design estimates.

Table 2. Hurst Lane Sanitary Sewer Wastewater Flow Projections

Wastewater Flow Source	Average Flow (gpd)	Infiltration (1) (gpd)	Average Daily Design Flow (gpd)
Hurst Lane Pump Station – Existing (2)	50,000	NA	50,000
Twin River Pump Station	40,641	305	40,946
Hurst Lane/ Lee Way Residences	3,300	1,136	4,436
North Stafford Road Area – Projected Future Flows	44,700	2,864	47,564
Total Design Flows	**138,641**	**4,305**	**142,946**
Peaking Factor (3)	**5.29**		
Peak Design Flow (gpd/gpm)	**733,400/509**		
Minimum Flow Factor	**0.15**		
Minimum Design Flow (gpd/gpm)	**27,800/76**		

NOTES:

(1) Assumed to be 300 gpd/in-mile. TR-16 range of infiltration flows: 250-500 gpd/in-mile

(2) Existing average flow based on information provided by the TWWD

(3) Peaking and minimum flow factors from TR-16, based on average daily flow

6.3. LEE WAY SANITARY SEWER

The proposed Lee Way sanitary sewer is shown on the attached drawings. The sanitary sewer will be 15-inches in diameter and install at a 0.15% slope. There will be a Parshall flume in a fiberglass manhole on Lee Way south of Hancock Street for metering flow. This manhole will contain a nested Parshall flume with a 3"/6" throat width constructed of fiberglass-reinforced plastic. Because of the wide range of projected peak and minimum flows and available head, neither the 3-inch or the 6-inch Parshall can meet the required design flows. Therefore, a nested flume will be used. The 3-inch Parshall flume will be used until the flows have increase so that that flume can be removed and switched over to the 6-inch Parshall flume.

Table 3 – Parshall Flume Capacities

Parshall Flume	Minimum Flow (gpd/gpm)	Maximum Flow (gpd/gpm)
3-inch	18,000/12.8	743,000/516
6-inch	35,000/24.3	2,530,000/1,750

The Parshall flume will be equipped with an ultrasonic level sensor for measuring flow elevation. Data from the sensor will be transmitted to recording flow rate and total flow. Data will be accessible remotely through a Mission 800 SCADA system located in a control panel mounted off the street. The control panel will also house local readouts for system flow rate and total flow.

amec foster wheeler Amec Foster Wheeler Environment and Infrastructure	JOB #		TASK	
	3653170013		Pump Station Design Calculations	
	PROJECT			
	Twin River Casino			
	BY	JDA	DATE	5/12/2017
	CHECKED BY	RET	DATE	5/12/2017

Purpose:

1. Develop design criteria for wet well based on expected flow rates.
2. Develop an expected total head, including static and total dynamic head.
3. Develop the diameter of base necessary to counteract wetwell buoyancy forces

Method:

Hazen-Williams friction loss equation

Assumptions:

	Parameter	Source
1. Pump type: submersible		Design Decision
2. Pipe material of construction: HDPE DR 11		Design Decision
3. Dimensions of pump skid as provided by		Flygt
4. Wetwell effective storage capacity filling time (min):	30	TR-16
5. Minimum wet well floor slope (unitless)	1:1	TR-16
6. Depth of pipe inlet = 2 ft below depth of pump activating float switch - low		
7. Atmospheric Pressure assumed as at sea level (ft):	33.9	
8. All elevations are provided in NAVD-88		
9. Active lateral earth pressure =	0.33	
10. Friction factor for fill material =	0.25	
11. Unitweight of clean sand =	120	lb/ft^3
12. Soil specific gravity =	2.75	

Constants and Inputs:

1. Site Conditions	Parameter	Source
a. Pump station influent invert elevation (ft):	205.41	Drawings
b. Terminus Manhole invert elevation (ft):	247.33	Drawings
c. Length of force main (ft):	2,689	Drawings
d. Average Daily Flow Rate (gpd):	40,946	Demand Memo
e. Peak Hourly Flow Rate (gpm):	192	Demand Memo
g. Density of water ([γ] lb/ft^3)	62.4	Constant

2. Wet well dimensions		
a. Inner Diameter (ft):	8	
b. Outer Diameter (ft):	9.32	
c. Pump influent centerline elevation (ft):	199.15	
d. Grade elevation (ft amsl):	210.5	
e. Pump station influent invert elevation (ft):	205.41	
f. High high float switch elevation (ft):	205	
g. Lag pump ON elevation (ft):	204.5	
h. High level alarm elevation (ft):	204	
i. Lead pump ON elevation (ft):	203.5	
j. Pumps OFF elevation (ft):	201.23	Calculated below
k. Low Level Alarm and All Pumps Off (float) elevation (ft):	200.73	
l. Bottom elevation of wetwell (ft)	198.23	
m. Thickness of wet well base (ft)	0.66	
l. Base elevation of wetwell (ft)	197.59	Calculated below
n. Weight of wetwell cap (lb)	3,940	Manufacturer info
o. Weight of wet well walls (lb/ft)	1,785	Manufacturer info
p. Density of wet well base (lb/ft^2)	101	Manufacturer info

References:

1. New England Interstate Water Pollution Control Commission (NEIWPCC), 2016. "TR-16: Guides for the Design of Wastewater Treatment Works". Lowell, MA.
2. Amec Foster Wheeler, 2017a. Water and Wastewater Demand Memo

amec foster wheeler **Amec Foster Wheeler Environment and Infrastructure**	**JOB #** 3653170013 **PROJECT** **Twin River Casino**		**TASK** Pump Station Design Calculations	
	BY	JDA	DATE	4/27/2017
	CHECKED BY	RET	DATE	4/27/2017

3. Amec Foster Wheeler Design Drawings

Calculations:

1. Develop design criteria for wetwell based on expected flow rates:
   a. effective storage capacity of wet well (main pump on to pump off):

TR-16 recommends an effective storage capacity sized using a maximum 30-minute filling time based on design average daily-flow rates.

*Effective storage capacity of wet well = Average daily flow (gpd) / 1440 minutes per day * 30 minutes filling time*
40946 gpd / 1440 minutes per day * 30 minutes = 853 gallons

Develop depth of wet well effective storage capacity based on wet well dimensions
*Cross-sectional area of 8 ft diameter wet well = π * diameter of wet well² / 4*
π * 8 feet² / 4 = 50.3 ft²

*Volume of wet well per vertical foot = Cross-sectional area * 1 ft * 7.48 gallons per ft³*
50.3 ft² * 1 ft * 7.48 gallons per ft³ = 376 gallons per vertical foot

Vertical length of effective storage capacity = effective storage capacity / volume of wet well per vertical foot
847 gallons / 376 gallons per vertical foot = 2.27 ft

Calculate depth of low level alarm and all pumps off:
Lead pump ON elevation - vertical length of effective storage capacity
203.5 ft - 2.27 ft = 201.23 ft

Calculate depth of bottom of wetwell:
All pumps off elevation - submersion depth of pump (2ft) - pump intake to well floor (0.5ft)
201.23 - 2.5 ft - 0.5 ft 198.23 ft

2. Develop an expected total head, including static and total dynamic head.

		Station to Terminus	
PIPE RUN NO.		3	
RUN LENGTH (FT.)		2689	
FLOW (GPM)		192	
PIPE SIZE (IN.)		4	
PIPE I.D. (IN.)		3.928	
VELOCITY (FT./S)		5.08	
REYNOLDS NUMBER		166405.87	
FLOW REGIME		transition	
FRICTION FACTOR (SMOOTH PIPE)		0.0161	
FITTINGS	K	No.	Hf
90° ELLS STANDARD	0.9	6	2.17
45° ELLS	0.4	8	1.28
TEE-STRAIGHT	0.9	3	1.08
TEE-BRANCH	1.8	1	0.72
PIPE EXIT	1	1	0.40
INCREASER (1 TO 2 AREA RATIO)	0.25	1	0.10
VALVE-GATE FULLY OPEN	0.2	1	0.05
VALVE- CHECK	0.25	1	0.10
TOTAL FITTING HEAD (FT.)			5.91
TOTAL PIPE LENGTH (FT.)			2694.91
CALCULATED C VALUE FROM FRICTION FACTOR			156.57
C VALUE USED IN HAZEN-WILLIAMS			150.00
PIPE FRICTION HEAD (FT.) (HAZEN-WILLIAMS)			57.47
STATIC HEAD (FT)			46.10
TOTAL HEAD (FT.)			109.48

	JOB #	TASK
amec foster wheeler	3653170013	Pump Station Design Calculations
	PROJECT	
	Twin River Casino	

a. Static head:

Total static head = Elevation of highest point in force main (ft) - Minimum water level in wet well

247.33 201.23 46.1 ft static head

b. Friction loss:

Calculation accounts for head loss due to pipe friction and expected installed fittings.

Final result at 192 gpm 63.4 ft total friction headloss

c. Total head:

Total head = Static head (ft) + friction loss (ft)

46.1 ft + 63.3 ft= 109.5 ft total dynamic head

3. Develop the diameter of base necessary to counteract wet well buoyancy forces

a. Calculate the buoyant force created by the displacement of water by the precast wet well:

$$B = \gamma_W \left(\pi \frac{D_d^2}{4} \right) H$$

*Buoyant force = Density of water (pi * (Diameter of wet well)^2 / 4) * height of the wet well*

62.4 lb/ft3 * (PI * 9.32 ft ^2 / 4) * 12.91 ft 54,958 lb

b. Calculate the total sliding resistance force:

$$\gamma_{sub} = \gamma_s \left[1 - \frac{1}{S.G._s} \right]$$

$$P = \left[K_a \gamma_{sub(soil)} H \right] \left(\frac{H}{2} \right)$$

$$R_{sliding} = P(f)(\pi)(D_d)$$

*Weight of submerged soil = unit weight of clean sand * (1 - [1 / specific gravity of soil])*

120 lb/ft3 * (1 - [1 / 2.75]) 76.36 lb/ft^3

*P = ([Active lateral earth pressure * effective weight of submerged soil solids * height of wet well]) * (height of wet well / 2)*

0.33 * 76.36 lb/ft3 * 12.91 ft * 12.91 ft / 2 2,100 lb/ft

*Rsliding = P * friction factor * PI * diameter of wet well*

2100 lb/ft * 0.25 * PI * 9.32 ft 15,371 lb

c. Calculate the weight of the wet well:

*Total wet well weight (lb) = Base density (lb/ft^2) * Area of base [PI* Diameter of wet well (ft) ^2 / 4 + Cap weight (lb) + weight of 1 ft of wall (lb/ft) * height of wet well (ft)*

3940 + 100.5 lb/ft2 * PI * 9.32 ft ^2 / 4 + 1785 lb * 12.27 ft 33,841 lb

If total wet well weight + Rsliding > Buoyant force, then no extended base necessary:

33841 lb + 15371 lb < 54958 lb

Safety factor (goal of 2.0) = Total wet well weight + Rsliding / Buoyant force

33841 lb + 15371 lb / 54958 lb 0.90

c. Determine the necessary diameter of the extended base precast wetwell base to counteract buoyant forces:

*Total weight of soil necessary for safety factor of 2.0 = 2 * Buoyant force*

54958 lb * 2 = 109,916 lb

$$W = \pi r^2 \gamma_{soil} H$$

Amec Foster Wheeler Environment and Infrastructure	JOB #		TASK	
	3553170013		Pump Station Design Calculations	
	PROJECT			
	Twin River Casino			
	BY	JDA	DATE	5/12/2017
	CHECKED BY	RET	DATE	5/12/2017

$$W_{soil} = \pi\left[\left(\frac{D_b}{2}\right)^2 - \left(\frac{D_c}{2}\right)^2\right](H - t_b)\,\gamma_{sub}$$

Assume a 2 ft lip on base for total diameter: 13.32

*Weight of the base = (PI/4 * (Diameter of base (ft))^2 * Depth of Base (ft) * density of concrete (lb/ft2))*

PI / 4 * 13.32^2 * 0.66 ft base * 100.5 9,243 lb

*Weight of the soil above the base = PI * ((Diameter of base (ft)^2/ 2) - (Diameter of wet well (ft))^2/ 2) * (wet well height (ft) - height of base (ft))*
**Weight of submerged soil (lb)*

PI * (13.32 ft / 2)^2 - 13.32 ft / 2)^2) (12.91 ft - 0.66 ft) * 76.36 lb/f 66,532 lb

Safety Factor = (Wbase + Wsoil + Wcap + Wwalls + Rsliding) / Buoyant force
2.1

TIVERTON CASINO-HOTEL
FACT SHEET

SITE

- Total Acreage – 45
- Developable Acreage – 23
- Surface parking – 1,100 Customer Parking Spaces
  200 Employee Parking Spaces

CASINO

- Total Area: ~ 85,000 sf
- Gaming Floor ~ 38,000 sf
  - Slot Machines – 1,000
  - Table Games – 32 (blackjack, roulette, craps, etc.)
- Food & Beverage – 15,500 sf
  - Bar with entertainment stage
  - Sit-down restaurant – owner operated
  - Take-away restaurants – 2-3 branded third-party
  - Total F&B Seating Capacity – 290
- Other Amenities include:
  - Smoking and non-smoking sections
  - Valet parking
  - Connected hotel and casino
  - Covered porte-cochère
  - Retail logo store
  - Players reward center
- Back of House and Support – 32,000 sf
- Employment – 550-600 licensed employees; 350-400 FTEs
  - 330 Construction jobs

PROJECTED REVENUE

- Tiverton Revenue – $4M annually – minimum of $3M in gaming revenue and approximately $1M in property taxes and other fees
- State General Fund Revenue – approx. $50M annually

HOTEL

- Separate hotel lobby in casino entry
- Guest Rooms – 84 Rooms
- Meeting Space – 3 Rooms
- Food & Beverage – breakfast room only
- Small Fitness Center
- Total Area: 53,000 sf

DESIGN ELEMENTS

- Inspired by the local historical shoreline context and recent buildings built in the area that have successfully bridged time, creating a facility which is comfortable, familiar and modern
- All public facing elements – entry and public parking – face northwest, away from residential areas
- Casino and hotel not visible from surrounding roads
- Community input shaped the design of the facility
- Nature walks and wetland overlooks
- No neon signs on the property or on Route 24

INVESTMENT

- ~ $75M which includes site work, construction of hotel and casino, land costs and other project expenses
- The Town will not provide subsidies, tax breaks or other special considerations to the casino and hotel

DEVELOPMENT PROGRAM REQUIREMENTS

- Roundabout at William S. Canning Blvd., Stafford Road and Hurst Lane must be complete before Casino can open
- Restricted wetland areas to be maintained as buffer
- Casino to install on-site water storage for domestic use and fire protection
- Casino to complete off-site sewer improvements and connection
- Casino to install storm water management system compatible with local and state regulations
- Casino to provide a safety and security plan to Tiverton Police and Fire
- Casino to cooperate with local officials to expedite permitting to complete construction by July of 2018

PROJECT TEAM

- Architecture – JCJ Architecture
- Civil Engineering – Cherenzia & Associates, Ltd.
- Traffic – Bryant Associates
- Wetland and Wildlife – Natural Resource Services, Inc.
- Legal – Ferrucci Russo P.C.

ABOUT TRMG

- Twin River Management Group, Inc. ("TRMG") owns and manages two casinos in Rhode Island and one in Mississippi, as well as a Colorado horse racetrack that possesses 13 OTB licenses. Properties include Twin River Casino (Lincoln, RI), Newport Grand Casino (Newport, RI), Hard Rock Hotel & Casino (Biloxi, MS) and Arapahoe Park (Aurora, CO). TRMG's expertise spans various casino markets, including regional, destination & resort environments. Their casinos range in size from 1,100 slots-only facilities to properties with over 4,200 slots and 108 table games, along with hotel and resort amenities. TRMG, Inc. is a wholly-owned subsidiary of Twin River Worldwide Holdings, Inc. TRMG headquarters are located at 100 Twin River Road, Lincoln, Rhode Island 02865. For more information, visit www.twinrivermanagementgroup.com