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## Executive Summary

This study focuses on the six largest of the Town of Stratford's thirteen wastewater pumping stations which are of the wet pit/dry pit style. The primary drivers for this study are the age of the stations which are over 35 years old, and the Town's desire to develop a capital improvement plan (CIP) to identify the improvements necessary to maintain the reliability of the stations.

The six pump stations are built-in-place concrete structures with wet pit's designed for routine human access to maintain bar racks and a wet well for the wastewater. The dry pits share a common wall with the wet pit and are three level structures with pumps at the lower level and electrical equipment at the upper level.

While some of the pumping stations have received some interim improvements such as newer pumps, generators, or control systems, the stations are aging and in need of an upgrade to allow them to continue to serve the Town well into the future. To determine the appropriate upgrades, the pumping stations were visited by an engineering team to assess current conditions and develop capital improvement recommendations in accordance with the following "Recommended Action Categories":

- **Immediate** items represent those issues associated with safety, industry guidelines, electrical codes, and critical equipment and support system conditions.
- **Category A** represents items that have an expected remaining service life of 5 or fewer years (replacement recommended prior to 2019).
- **Category B** represents items that have an expected remaining service life between 6 and 10 years (replacement recommended between 2020 and 2024).
- **Category C** represents items that have an expected remaining service life between 11 and 20 years (replacement recommended between 2025 and 2034).

After reviewing the recommended strategy with the Town and adjusting the recommended action categories based upon the Town's input, the result of this effort is a \$10,288,000 capital improvement plan for the pumping stations as summarized below.

Summary of Recommended Improvement Costs<sup>1</sup>

Potential Project Tasks	Immediate	Category A	Category B	Category C	Total
Remote Telemetry	\$ 0	\$ 260,000	\$ 0	\$ 0	\$ 260,000
Ryders Lane PS	\$ 28,000	\$ 450,000	\$ 608,000	\$ 551,000	\$1,637,000
Pecks Mill PS	\$242,000	\$1,214,000	\$ 217,000	\$ 16,000	\$1,689,000
Ryans Lane PS	\$ 28,000	\$ 992,000	\$ 458,000	\$ 90,000	\$1,568,000
Benton Street PS	\$ 33,000	\$ 954,000	\$ 709,000	\$ 70,000	\$1,766,000
Oak Bluffs PS	\$ 28,000	\$ 829,000	\$ 428,000	\$ 319,000	\$1,604,000
Short Beach PS	\$ 28,000	\$ 741,000	\$ 436,000	\$ 559,000	\$1,764,000
<b>Total</b>	<b>\$387,000</b>	<b>\$5,440,000</b>	<b>\$2,856,000</b>	<b>1,605,000</b>	<b>\$10,288,000</b>

We note in the report that the State of Connecticut has rolled out a new grant and loan funding program for pumping stations that could reduce the cost of implementing these improvements.

## Section 3

# Recommended Improvements

While the six evaluated pumping stations appear to be operating well for their age, they are in need of an upgrade. Since the stations were generally found to be in structurally sound condition, the upgrades will be focus on equipment replacement/upgrades and minor structural and site repairs. None of the stations is being recommended for full replacement.

Table 3-1, provided at the end of this section, presents a summary of recommended upgrades for each station based upon the observations discussed in the previous sections. We also included costs to upgrade to new telemetry systems at all of the Town's 13 pumping stations. Included in the table for each recommended upgrade are the "Recommended Action Category" and costs in December 2014 dollars. The item number in the first column of Table 3-1 is a reference to more detailed costs estimates.

Recommended improvements for each pumping station are organized as follows:

- Process (process recommendations designated as P1, P2, etc.)
- Mechanical/HVAC (mechanical and HVAC recommendations designated as M1, M2, etc.)
- Instrumentation and Controls (I1, I2, etc.)
- Electrical and standby power (E1, E2, etc.)
- Site/Civil (C1, C2, etc.)
- Structural/Architectural (S1, S2, etc.)

The "Recommended Action Category" for the equipment/facility improvements are as follows:

- **Immediate** items represent those issues associated with safety, industry guidelines, electrical codes, and critical equipment and support system conditions.
- **Category A** represents items that have an expected remaining service life of 5 or fewer years (replacement recommended prior to 2019).
- **Category B** represents items that have an expected remaining service life between 6 and 10 years (replacement recommended between 2020 and 2024).
- **Category C** represents items that have an expected remaining service life between 11 and 20 years (replacement recommended between 2025 and 2034).

While one approach is to perform all of the recommended improvements in one large project for each station (and perhaps another project related to telemetry at all the stations), fiscal constraints may preclude this. The priority of some improvements are

also higher than others and improvements at each station may need to be phased in over time.

The "Recommended Action Category" prioritizes the recommended improvements and is useful in formulating a capital improvement plan for the stations. Table 3-1 represents our recommendations which have been reviewed and discussed with Town Staff.

A list of recommended improvements, estimated budgetary costs, and prioritization (using the recommended action categories) are presented in Table 3-1 at the end of the section. A brief summary of the prioritized projects is provided in Table 3-2 for each pumping station.

**TABLE 3-2**  
Summary of Recommended Improvement Costs<sup>1</sup>

Potential Tasks	Project	Category Immediate	Category A	Category B	Category C	Total
Remote Telemetry		\$ 0	\$ 260,000	\$ 0	\$ 0	\$ 260,000
Ryders Lane PS		\$ 28,000	\$ 450,000	\$ 608,000	\$ 551,000	\$1,637,000
Pecks Mill PS		\$242,000	\$1,214,000	\$ 217,000	\$ 16,000	\$1,689,000
Ryans Lane PS		\$ 28,000	\$ 992,000	\$ 458,000	\$ 90,000	\$1,568,000
Benton Street PS		\$ 33,000	\$ 954,000	\$ 709,000	\$ 70,000	\$1,766,000
Oak Bluffs PS		\$ 28,000	\$ 829,000	\$ 428,000	\$ 319,000	\$1,604,000
Short Beach PS		\$ 28,000	\$ 741,000	\$ 436,000	\$ 559,000	\$1,764,000
<b>Total</b>		<b>\$387,000</b>	<b>\$5,440,000</b>	<b>\$2,856,000</b>	<b>1,605,000</b>	<b>\$10,288,000</b>

1. The costs presented in Table 3-2 are based on the most expensive option when tasks have a choice. Refer to Table 3-1 for a comparison of task costs.

The costs presented in this report are based upon the following:

- Budgetary cost estimates for each item were developed for consideration in the Town's capital improvement planning budgets. Budgetary costs include equipment costs, demolition/removal of equipment (if applicable), allowances for contractor markup, installation, general conditions, and engineering and contingency. An engineering and contingency allowance of 40% was used in the development of the total project costs. The budgetary costs are based upon the December 2014 ENR 20-City National Average Construction Cost Index of 9936.
- The conceptual level budgetary cost estimates are based upon Class 5 level construction cost estimates, as defined by the Association for the Advancement of Cost Engineering (AACE) International Recommended Practices and Standards. According to AACE International Recommended Practices and Standards, the estimate class designators are labeled Class 1, 2, 3, 4, and 5, where a Class 5 estimate is based upon the lowest level of project definition and a Class 1 estimate is closest to full project definition and maturity. The end usage for a Class 5 estimate is project screening or feasibility purposes. The expected accuracy range of a Class 5 estimate is between +100% to -50%. We note that the Connecticut Department of Energy and Environmental Protection (CT DEEP) which manages the Clean Water Fund (CWF), has recently modified the CWF program in a manner that may benefit the renovation of Stratford's pumping stations. For fiscal years 2014 and 2015, a reserve for the Construction of Pump

Station Rehabilitation Projects was setup in the amount of \$30,000,000. This is a new reserve to be used for replacing aging infrastructure, reducing hydraulic overloading, incorporating energy efficient equipment, and providing standby power. There is also \$4,000,000 in funding for coastal resiliency projects that could apply to certain improvements. These monies are distributed on a first come, first serve basis as opposed to the priority list ranking which was previously the case. The benefit is that the Town is now potentially eligible to receive a grant of twenty percent of the total project cost and a loan for the remainder of the project costs. The loans are paid back over twenty years at two percent interest. This potentially available funding should be investigated when planning for the proposed projects.

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TABLE 3-1  
Prioritized Improvements - Wastewater Division  
Town of Stratford: Evaluation of Pump Stations

Item No.	Item Description	Proposed Improvement Details	Opinion of Probable Capital Cost	Recommended Action Category (1)	Opinion of Probable Cost for Each Action Category (1)		
					Immediate	Category A 0 - 5 yrs	Category B 6 - 10 yrs
<b>All Pump Stations</b>							
I 0001	Remote Telemetry System	Remote monitoring system across all 13 pump stations	\$260,000	A	\$0	\$260,000	\$0
<b>Rydens Lane Pump Station</b>					<b>Total:</b>	<b>\$260,000</b>	<b>\$0</b>
P 100	Process - Replace Pumps and Valves	Replace 3 pumps (bases, check valves, isolation valves and pressure gauges on suction and discharge). This should occur during bypass pumping. Included in P102.	\$480,000	C	\$0	\$0	\$480,000
P 101	Process - Misc Process Improvements	Replace / update a sump pump in the dry pit. Paint pump bases. Install Pump Monitoring devices and related Alarms	\$29,000	A	\$0	\$29,000	\$0
P 102	Process - Rehabilitation Wet Pit Equipment	Bypass Pumping, Replace Splitter gates, Remove abandoned comminutor, Replace isolation gate, and install two new manual bar racks. Install new wye and valve for future bypass connection.	\$130,000	B	\$0	\$0	\$130,000
P 103A	Process - Install Solids Handling Equipment (Option A)	Reduce Ragging Problems by installing a single Mechanical Bar Screen in one of the channels (no washer / compactor included).	\$430,000	Not recommended due to costs.	\$0	\$0	\$0
P 103B	Process - Install Solids Handling Equipment (Option B)	Reduce Ragging Problems by installing a single channel grinder in one of the channels.	\$200,000	B	\$0	\$0	\$200,000
M 104	Odor Control - Utilize Activated Carbon System	New activated carbon units, new dedicated odor control fan, ducts, concrete pad/structural improvements for system, install channel & wet well covers. (Demo existing.) This should occur during bypass pumping. Included in P102.	\$90,000	B	\$0	\$0	\$90,000
M 105	Mechanical - HVAC and Misc Plumbing System Upgrades Wet Pit	Replace existing ventilation. Add exhaust/supply fans; ductwork and ventilation control. Modify louver openings as necessary. Small Unit Heater. Install frost proof hydrant and misc plumbing (Drain piping) replacement. This should occur during bypass pumping. Included in P102.	\$38,000	B	\$0	\$0	\$38,000
M 106	Mechanical - HVAC and Misc Plumbing System Upgrades Dry Pit	Replace existing ventilation and heating including makeup air heating units, exhaust fans, ductwork, unit heaters, dehumidification and control system in dry pit. Modify louver openings as necessary. Misc plumbing modifications.	\$100,000	B	\$0	\$0	\$100,000
M 107	Mechanical - Update hazardous gas monitoring to industry standards	Install hazard gas sensors (LEL, H2S and Oxygen) in wet pit and dry pit with appropriate announcement at entry doors and interlocks with HVAC system (this should be done with wet pit HVAC system upgrades).	\$50,000	B	\$0	\$0	\$50,000
E 108	Electrical - Wet pit lighting and emergency lighting and misc elec	Replace lighting and emergency lighting in wet pit. Install intrinsically safe barriers in controls / alarm wiring.	\$28,000	Immediate	\$28,000	\$0	\$0
E 109	Electrical - Dry pit lighting	Replace lighting in dry pit.	\$50,000	A	\$0	\$50,000	\$0
E 110	Electrical - Update emergency lighting Dry pit	Install dry pit emergency lighting.	\$9,000	A	\$0	\$9,000	\$0
E 111	Electrical - MCC and Control System Replacement	Replace MCC: Main breakers, motor starters, panel boards, control panels, install new power transformer into the MCC, PLC based control system, soft starters for each pump, back up float control panel, and demo old MCC.	\$180,000	A	\$0	\$180,000	\$0
C 113	Miscellaneous Demolition	Remove abandoned generator, duct and louvers. Close building openings.	\$28,000	C	\$0	\$0	\$28,000
C 114	Site / Drainage Improvements	Demolish all misc conduit and abandoned bubbler components, dehumidification systems and related items, seal water system.	\$27,000	C	\$0	\$0	\$27,000
C 115	Site - Fencing Improvements	Re-grade and repave the driveway access to pump station. Adjust height to stairways to meet code.	\$16,000	C	\$0	\$0	\$16,000
S 116	Structural / Architectural Improvements - Roof	Replace the asbestos shingles on the pump station and built up roof over the wet pit.	\$40,000	A	\$0	\$40,000	\$0
S 117	Structural / Architectural Improvements - Masonry Repairs	Repair the deteriorated louver lintels at top of chimney, mortar and brick masonry at top of chimney. Replace the building exterior at the lintels above the doors, windows and louvers. Repair the building exterior joint sealant around doors, windows and louvers.	\$59,000	A	\$0	\$59,000	\$0
S 118	Structural / Architectural Improvements - Handrail / guard rail replacement	Corroded guardrail at front step, aluminum guardrail at stair opening.	\$25,000	A	\$0	\$25,000	\$0
S 119	Structural Improvements - Wet pit rehabilitation	Wet blast and paint epoxy to the concrete surfaces in the wet pit. This should occur during bypass pumping. Included in P102.	\$49,000	A	\$0	\$49,000	\$0
S 120	Architectural Improvements: Replace Doors and Frames	Replace the door and frame to the wet pit.	\$9,000	A	\$0	\$9,000	\$0
S 122	Structural / Architectural Improvements - Miscellaneous	Paint the deteriorated coating systems on the walls. Replace window glass in broken windows. Cover the wet pit hatch. Analyze/Mark rated load on monorail beam.	\$0	B	\$0	\$0	\$0
<b>Total:</b>					<b>\$28,000</b>	<b>\$450,000</b>	<b>\$608,000</b>



TABLE 3-1  
Prioritized Improvements - Wastewater Division  
Town of Stratford: Evaluation of Pump Stations

Item No.	Item Description	Proposed Improvement Details	Opinion of Probable Capital Cost	Opinion of Probable Cost for Each Action Category <sup>(1)</sup>				
				Recommended Action Category <sup>(1)</sup>	Immediate	Category A 0 - 5 yrs	Category B 6 - 10 yrs	Category C 11 - 20 yrs
<b>Pecks Mill Pond Pump Station</b>								
P 200	Process - Replace Pumps and Valves	Replace 3 pumps (bases, check valves, isolation valves and pressure gauges on suction and discharge, corroded piping stands). This should occur during bypass pumping, included in P202.	\$650,000	A	\$650,000	\$0	\$0	
P 201	Process - Misc Process Improvements	Replace / update a sump pump in the dry pit.	\$7,000	C	\$0	\$0	\$7,000	
P 202	Process - Rehabilitation Wet Pit Equipment	Bypass Pumping, Replace Splitter gates, Remove abandoned comminutor, Replace isolation gate, and install two new manual bar racks. Install new wye and valve for future bypass connection.	\$130,000	B	\$0	\$130,000	\$0	
M 204	Odor Control - Utilize Activated Carbon System	New activated carbon units, new dedicated odor control fan, ducts, concrete pad/structural improvements for system, install channel & wet well covers. (Demo existing). This should occur during bypass pumping, included in P202.	\$120,000	Immediate	\$120,000	\$0	\$0	
M 205	Mechanical - HVAC and Misc Plumbing System Upgrades Wet Pit	Replace existing ventilation. Add AHU, exhaust/supply fans; ductwork. Install frost proof hydrant and misc plumbing (Drain piping) replacement. Modify/louwer openings as necessary. Small Unit Heater. Replace corroded plumbing systems.	\$44,000	Immediate	\$44,000	\$0	\$0	
M 206	Mechanical - HVAC and Misc Plumbing System Upgrades Dry Pit	Replace existing ventilation and heating including makeup air heating units, exhaust/supply fans, ductwork, unit heaters, dehumidification and control system in dry pit. Modify/louwer openings as necessary. Misc plumbing modifications. Install hazard gas sensors (LEL, H2S and Oxygen) in wet pit and dry pit with appropriate announcement at entry doors and interlocks with HVAC system (this should be done with wet pit HVAC system upgrades).	\$110,000	A	\$110,000	\$0	\$0	
M 207	Mechanical - Update hazardous gas monitoring to industry standards	Replace lighting and emergency lighting in wet pit. Install intrinsically safe barriers in controls / alarm wiring.	\$50,000	Immediate	\$50,000	\$0	\$0	
E 208	Electrical - Dry pit lighting	Replace lighting in dry pit.	\$44,000	A	\$44,000	\$0	\$0	
E 209	Electrical - Wet pit lighting and emergency lighting and misc elec	Replace lighting and emergency lighting in wet pit. Install intrinsically safe barriers in controls / alarm wiring.	\$28,000	Immediate	\$28,000	\$0	\$0	
E 210	Electrical - Update emergency lighting Dry Pit	Install dry pit emergency lighting	\$9,000	A	\$9,000	\$0	\$0	
E 211	Electrical - MCC and Controls System Replacement	Replace MCC; Main breakers, motor starters, panel boards, control panels; install new power transformer into the MCC, PLC based control system, soft starters for each pump, back up float control panel, and demo old MCC.	\$190,000	A	\$190,000	\$0	\$0	
E 213	Miscellaneous Demolition	Demolish all misc conduit and abandoned bubbler components, dehumidification systems and related items, and seal water system.	\$9,000	C	\$0	\$0	\$9,000	
C 214	Site / Drainage Improvements	Re-grade and repave the driveway access to pump station. Adjust height to stairways to meet code.	\$19,000	B	\$0	\$19,000	\$0	
C 215	Site - Fencing Improvements	Replace fencing and gate to the pump station.	\$20,000	B	\$0	\$20,000	\$0	
S 217	Structural / Architectural Improvements - Masonry Repairs	Replace deteriorated louwer lintels and mortar and brick masonry, repair deteriorated roof flashing at top of the chimney; replace the damaged brick at the corner of the building. Replace the deteriorated joint sealant around floors, windows and louvers.	\$36,000	A	\$36,000	\$0	\$0	
S 218	Structural / Architectural Improvements - Handrail / guard rail replacement	Replace guardrail at front step and open stairway. Replace deteriorated architectural wood at front door.	\$16,000	A	\$16,000	\$0	\$0	
S 219	Structural Improvements - Wet pit rehabilitation	Medium pressure blast and paint epoxy to the concrete surfaces in the wet pit. This should occur during bypass pumping, included in P202.	\$49,000	A	\$49,000	\$0	\$0	
S 220	Architectural Improvements: Replace Doors and Frames	Replace the door, frames, and hardware to the wet pit.	\$6,000	A	\$6,000	\$0	\$0	
S 221	Structural Improvements - Concrete Repairs	Repair spalling in lower level of dry pit; repair exposed rebar in drainage trough.	\$4,000	A	\$4,000	\$0	\$0	
S 222	Structural / Architectural Improvements - Miscellaneous	Dry pit surface prep and paint epoxy system. Mark rated load on monorail beam.	\$48,000	B	\$0	\$48,000	\$0	
S 223	Structural / Architectural Improvements - Flood Hardening	Modifications to the doors, louvers, and hatches for hardening the pumping station against a 100-year flood.	\$100,000	A	\$100,000	\$0	\$0	
<b>Total:</b>					<b>\$242,000</b>	<b>\$1,214,000</b>	<b>\$217,000</b>	<b>\$16,000</b>

TABLE 3-1  
 Prioritized Improvements - Wastewater Division  
 Town of Stratford: Evaluation of Pump Stations

Item No.	Item Description	Proposed Improvement Details	Opinion of Probable Capital Cost	Recommended Action Category <sup>(1)</sup>	Opinion of Probable Cost for Each Action Category <sup>(1)</sup>		
					Immediate	Category A 0 - 5 yrs	Category B 6 - 10 yrs
<b>Ryans Lane Pump Station</b>							
P 300	Process - Replace Pumps and Valves	Replace 2 pumps (bases, check valves, isolation valves and pressure gauges on suction and discharge ). This should occur during bypass pumping, included in P302.	\$270,000	A	\$0	\$270,000	\$0
P 301	Process - Misc Process Improvements	Replace / update a sump pump in the dry pit. Install hard piping to sump pump. Seal water piping between dry and wet pit. Paint piping and bases.	\$44,000	A	\$0	\$44,000	\$0
P 302	Process - Rehabilitation Wet Pit Equipment	Bypass Pumping, Replace Splitter Gates, Remove abandoned comminutor, install two new manual bar racks and install new magnetic meter. Install new we and valve for future bypass connection.	\$100,000	A	\$0	\$100,000	\$0
M 304	Odor Control - Utilize Activated Carbon	New activated carbon units, new dedicated odor control fan, ducts, concrete pad/structural improvements for system, install channel & wet well covers. (Demo existing.) This should occur during bypass pumping, included in P302.	\$96,000	B	\$0	\$0	\$96,000
M 305	Mechanical - HVAC and Misc Plumbing System Upgrades Wet Pit	Replace existing ventilation. Add exhaust/supply fans; ductwork and ventilation control. Modify louver openings as necessary. Small Unit Heater. Install frost proof hydrant and misc plumbing (Drain piping) replacement.	\$40,000	B	\$0	\$0	\$40,000
M 306	Mechanical - HVAC and Misc Plumbing System Upgrades Dry Pit	Replace existing ventilation and heating including makeup air heating units, exhaust fans, ductwork, unit heaters, dehumidification and control system in dry pit. Modify louver openings as necessary. Misc plumbing modifications.	\$120,000	B	\$0	\$0	\$120,000
M 307	Mechanical - Update hazardous gas monitoring to industry standards	Install hazard gas sensors (LEL, H2S and Oxygen) in wet pit and dry pit with appropriate announcement at entry doors and interlocks with HVAC system (this should be done with wet pit HVAC system upgrades).	\$50,000	B	\$0	\$0	\$50,000
E 308	Electrical - Wet pit lighting and emergency lighting and misc elec	Replace lighting and emergency lighting in wet pit. Install intrinsically safe barriers in controls / alarm wiring.	\$28,000	Immediate	\$28,000	\$0	\$0
E 309	Electrical - Dry pit lighting	Replace lighting in dry pit.	\$44,000	B	\$0	\$0	\$44,000
E 310	Electrical - Update emergency lighting Dry pit	Install dry pit emergency lighting.	\$9,000	B	\$0	\$0	\$9,000
E 311	Electrical - MCC and Control System Replacement	Replace MCC: Main breakers, motor starters, panel boards, control panels, install new power transformer into the MCC, PLC based control system, soft starters for each pump, back up float control panel, and demo old MCC.	\$180,000	A	\$0	\$180,000	\$0
E 312	Emergency Generator	Demolish generator and replace generator and automatic transfer switch, concrete pad, Conduit and wiring, block heaters, diesel fuel piping.	\$160,000	A	\$0	\$160,000	\$0
C 313	Miscellaneous Demolition	Demolish all misc conduit and abandoned bubbler components, dehumidification systems and related items, and seal water system. Demolish water heater system.	\$31,000	C	\$0	\$0	\$0
C 314	Site / Drainage Improvements	Re-grade and repave the driveway access to pump station. Adjust height to stairways to meet code.	\$23,000	A	\$0	\$23,000	\$0
C 315	Site - Fencing Improvements	Replace fencing and gate to the pump station.	\$20,000	C	\$0	\$0	\$20,000
S 316	Structural / Architectural Improvements - Roof	Replace the roof on the pump station and built up roof over the wet pit.	\$39,000	C	\$0	\$0	\$39,000
S 317	Structural / Architectural Improvements - Masonry Repairs	Replace deteriorated lintels above doors, windows and louvers. Deteriorated joint sealant around doors, windows and louvers.	\$32,000	B	\$0	\$0	\$32,000
S 319	Structural Improvements - Wet pit rehabilitation	Med pressure blast, surface prep, minor concrete repair and epoxy interior painting. This should occur during bypass pumping, included in P302.	\$49,000	A	\$0	\$49,000	\$0
S 320	Architectural Improvements: Replace Doors and Frames	Replace the door and frames to the wet pit.	\$6,000	A	\$0	\$6,000	\$0
S 322	Structural / Architectural Improvements - Miscellaneous	Dry pit prep and paint walls with epoxy system. Replace paint on framing and structural steel framing. Mark rated load on monorail beam.	\$67,000	B	\$0	\$0	\$67,000
S 323	Structural / Architectural Improvements - Flood Hardening	Modifications to the doors, louvers, hatches and transformer for hardening the pumping station against a 100-year flood.	\$160,000	A	\$0	\$160,000	\$0
<b>Total:</b>					<b>\$28,000</b>	<b>\$992,000</b>	<b>\$458,000</b>

TABLE 3-1  
 Prioritized Improvements - Wastewater Division  
 Town of Stratford: Evaluation of Pump Stations

Item No.	Item Description	Proposed Improvement Details	Opinion of Probable Capital Cost	Recommended Action Category <sup>(1)</sup>	Opinion of Probable Cost for Each Action Category <sup>(1)</sup>		
					Immediate	Category A 0 - 5 yrs	Category B 6 - 10 yrs
<b>Benton Street Pump Station</b>							
P 400	Process - Replace Pumps and Valves	Replace 3 pumps (bases, check valves, isolation valves and pressure gauges on suction and discharge ). This should occur during bypass pumping, included in P402.	\$500,000	A	\$0	\$500,000	\$0
P 401	Process - Misc Process Improvements	Replace / update a sump pump in the dry pit. Paint process piping.	\$30,000	A	\$0	\$30,000	\$0
P 402	Process - Rehabilitation Wet Pit Equipment	Bypass pumping, replace splitter gates, and isolation gate. Remove abandoned comminutor. Install two new manual bar racks and install new flow meter. Install new weye and valve for future bypass connection.	\$160,000	B	\$0	\$0	\$160,000
P 403A	Process - Install Solids Handling Equipment (Option A)	Reduce ragging Problems by installing a single Mechanical Bar Screen in one of the channels (no washer / compactor included).	\$430,000	Not Recommended Due to Cost	\$0	\$0	\$0
P 403B	Process - Install Solids Handling Equipment (Option B)	Reduce Ragging Problems by installing a single channel grinder in one of the channels.	\$200,000	B	\$0	\$0	\$200,000
M 404	Odor Control - Utilize Activated Carbon System	New activated carbon units, new dedicated odor control fan, ducts, concrete pad/structural improvements for system, install channel & wet well covers. (Demo existing). This should occur during bypass pumping, included in P402.	\$96,000	B	\$0	\$0	\$96,000
M 405	Mechanical - HVAC and Misc Plumbing System Upgrades Wet Pit	Replace existing ventilation. Add exhaust/supply fans: ductwork and ventilation control. Modify louver openings as necessary. Small Unit Heater. Install frost proof hydrant and misc plumbing (Drain piping) replacement.	\$38,000	B	\$0	\$0	\$38,000
M 406	Mechanical - HVAC and Misc Plumbing System Upgrades Dry Pit	Replace existing ventilation and heating including makeup air heating units, exhaust fans, ductwork, unit heaters, dehumidification and control system in dry pit. Modify louver openings as necessary. Misc plumbing modifications.	\$110,000	B	\$0	\$0	\$110,000
M 407	Mechanical - Update hazardous gas monitoring to industry standards	Install hazard gas sensors (LEL, H2S and Oxygen) in wet pit and dry pit with appropriate announcement at entry doors and interlocks with HVAC system (this should be done with wet pit HVAC system upgrades).	\$50,000	B	\$0	\$0	\$50,000
E 408	Electrical - Wet pit lighting and emergency lighting and misc elec	Replace lighting and emergency lighting in wet pit. Install intrinsically safe barriers in controls / alarm wiring.	\$33,000	Immediate	\$33,000	\$0	\$0
E 409	Electrical - Dry pit lighting	Replace lighting in dry pit.	\$53,000	A	\$0	\$53,000	\$0
E 410	Electrical - Update emergency lighting Dry pit	Install dry pit emergency lighting.	\$9,000	A	\$0	\$9,000	\$0
E 411	Electrical - MCC and Controls System Replacement	Replace MCC: Main breakers, motor starters, panel boards, control panels, install new power transformer into the MCC, PLC based control system, soft starters for each pump, back up float control panel, and demo old MCC.	\$210,000	A	\$0	\$210,000	\$0
C 413	Miscellaneous Demolition	Demolish all misc conduit and abandoned bubbler components, dehumidification systems and related items, and seal water system.	\$28,000	C	\$0	\$0	\$28,000
C 414	Site / Drainage Improvements	Re-grade and repave the driveway access to pump station. Adjust height to stairways to meet code.	\$22,000	C	\$0	\$0	\$22,000
C 415	Site - Fencing Improvements	Replace fencing and gate to the pump station.	\$20,000	C	\$0	\$0	\$20,000
S 416	Structural / Architectural Improvements - Roof	Replace roof with flat roof. Replace shingles with metal cladding. Replace skylight.	\$81,000	A	\$0	\$81,000	\$0
S 419	Structural Improvements - Wet pit rehabilitation	Wet blast and paint epoxy to the concrete surfaces in the wet pit. This should occur during bypass pumping, included in P402.	\$55,000	B	\$0	\$0	\$55,000
S 420	Architectural Improvements: Replace Doors and Frames	Replace the door, frames and hardware to the wet pit.	\$6,000	A	\$0	\$6,000	\$0
S 423	Structural / Architectural Improvements - Flood Hardening	Modifications to the doors, louvers, and hatches for hardening the pumping station against a 100-year flood.	\$65,000	A	\$0	\$65,000	\$0
<b>Total:</b>					<b>\$33,000</b>	<b>\$954,000</b>	<b>\$709,000</b>

TABLE 3-1  
 Prioritized Improvements - Wastewater Division  
 Town of Stratford: Evaluation of Pump Stations

Item No.	Item Description	Proposed Improvement Details	Opinion of Probable Capital Cost	Opinion of Probable Cost for Each Action Category <sup>(1)</sup>			
				Recommended Action Category <sup>(1)</sup>	Immediate	Category A 0 - 5 yrs	Category B 6 - 10 yrs
<b>Oak Bluffs Pump Station</b>							
P 500	Process - Replace Pumps and Valves	Replace 3 pumps (bases, check valves, isolation valves and pressure gauges on suction and discharge, corroded piping stands). Replace a sump pump in the dry pit. This should occur during bypass pumping, included in P502.	\$270,000	C	\$0	\$0	\$270,000
P 501	Process - Misc Process Improvements	Paint process piping and pump base. Replace / update a sump pump in the dry pit. Install Pump Monitoring devices and related Alarms	\$26,000	C	\$0	\$0	\$26,000
P 502	Process - Rehabilitation Wet Pit Equipment	Bypass Pumping, Replace Splitter gates, Remove abandoned comminutor, Replace isolation gate. Install two new manual bar racks and install new magnetic meter. Install new we and valve for future bypass connection.	\$120,000	B	\$0	\$0	\$120,000
M 504	Odor Control - Utilize Activated Carbon System	New activated carbon units, new dedicated odor control fan, ducts, concrete pad/structural improvements for system, install channel & wet well covers. (Demo existing). This should occur during bypass pumping, included in P502.	\$96,000	A	\$0	\$96,000	\$0
M 505	Mechanical - HVAC and Misc Plumbing System Upgrades Wet Pit	Replace existing ventilation. Add AHU, exhaust/supply fans; ductwork. Modify louver openings as necessary. Install frost proof hydrant and misc plumbing (Drain piping) replacement.	\$39,000	B	\$0	\$0	\$39,000
M 506	Mechanical - HVAC and Misc Plumbing System Upgrades Dry Pit	Replace existing ventilation and heating including makeup air heating units exhaust/supply fans, ductwork, unit heaters, dehumidification and control system in dry pit. Modify louver openings as necessary. Misc plumbing modifications.	\$120,000	B	\$0	\$0	\$120,000
M 507	Mechanical - Update hazardous gas monitoring to industry standards	Install hazard gas sensors (LEL, H2S and Oxygen) in wet pit and dry pit with appropriate announcement at entry doors and interlocks with HVAC system (this should be done with wet pit HVAC system upgrades).	\$44,000	B	\$0	\$0	\$44,000
E 508	Electrical - Dry pit lighting	Replace lighting in dry pit.	\$48,000	B	\$0	\$0	\$48,000
E 509	Electrical - Wet pit lighting and emergency lighting and misc elec	Replace lighting and emergency lighting in wet pit. Install intrinsically safe barriers in controls / alarm wiring.	\$28,000	Immediate	\$28,000	\$0	\$0
E 510	Electrical - Update emergency lighting Dry Pit	Install dry pit emergency lighting	\$9,000	A	\$0	\$9,000	\$0
E 511	Electrical - MCC and Controls System Replacement	Replace MCC: Main breakers, motor starters, panel boards, control panels, install new power transformer into the MCC, PLC based control system, soft starters for each pump, back up float control panel, and demo old MCC.	\$200,000	A	\$0	\$200,000	\$0
E 512	Emergency Generator	Demolish generator and replace generator and automatic transfer switch, concrete pad; Conduit and wiring; block heaters; diesel fuel piping.	\$240,000	A	\$0	\$240,000	\$0
E 513	Miscellaneous Demolition	Demolish all misc conduit and abandoned bubbler components, dehumidification systems and related items, and seal water system. Demolish ozone generator and water heater.	\$23,000	C	\$0	\$0	\$23,000
C 514	Site / Drainage Improvements	Re-grade and repave the driveway access to pump station. Adjust height to stairways to meet code.	\$30,000	B	\$0	\$0	\$30,000
C 515	Site - Fencing Improvements	Replace fencing and gate to the pump station.	\$27,000	B	\$0	\$0	\$27,000
S 516	Structural / Architectural Improvements - Roof	Replace with standing seam metal roof.	\$39,000	A	\$0	\$39,000	\$0
S 517	Structural / Architectural Improvements - Masonry Repairs	Repointing and replacing masonry	\$70,000	A	\$0	\$70,000	\$0
S 519	Structural Improvements - Wet pit rehabilitation	Hydroblast, surface prep, minor concrete repairs and epoxy paint interior. This should occur during bypass pumping, included in P502.	\$49,000	A	\$0	\$49,000	\$0
S 520	Architectural Improvements: Replace Doors and Frames	Replace the dry pit door, frame and hardware.	\$2,000	A	\$0	\$2,000	\$0
S 522	Structural / Architectural Improvements - Miscellaneous	Surface prep and paint walls for dry pit. Provide new loading dock bumpers. Mark load rating on monorail beam.	\$51,000	A	\$0	\$51,000	\$0
S 523	Structural / Architectural Improvements - Flood Hardening	Modifications to the doors, louvers, and hatches for hardening the pumping station against a 100-year flood.	\$73,000	A	\$0	\$73,000	\$0
<b>Total:</b>				<b>\$28,000</b>	<b>\$829,000</b>	<b>\$428,000</b>	<b>\$319,000</b>

**TABLE 3-1**  
 Prioritized Improvements - Wastewater Division  
 Town of Stratford: Evaluation of Pump Stations

Item No.	Item Description	Proposed Improvement Details	Opinion of Probable Capital Cost	Recommended Action Category <sup>(1)</sup>	Opinion of Probable Cost for Each Action Category <sup>(1)</sup>		
					Immediate	Category A 0 - 5 yrs	Category B 6 - 10 yrs
<b>Short Beach Pump Station</b>							
P 600	Process - Replace Pumps and Valves	Replace 3 pumps (bases, check valves, isolation valves and pressure gauges on suction and discharge, corroded piping stands). This should occur during bypass pumping, included in P602.	\$500,000	C	\$0	\$0	\$500,000
P 601	Process - Misc Process Improvements	Paint process piping and pump base. Replace / update a sump pump in the dry pit. Install Pump Monitoring devices and related Alarms	\$26,000	A	\$0	\$26,000	\$0
P 602	Process - Rehabilitation Wet Pit Equipment	Bypass Pumping, Replace Splitter gates, Remove abandoned comminutor, Replace isolation gate. Install two new manual bar racks and install new magnetic meter. Install new eye and valve for future bypass connection.	\$120,000	B	\$0	\$0	\$120,000
M 604	Odor Control - Utilize Activated Carbon System	New activated carbon units, new dedicated odor control fan, ducts, concrete pad/structural improvements for system, install channel & wet well covers. (Demo existing). This should occur during bypass pumping, included in P602.	\$96,000	B	\$0	\$0	\$96,000
M 605	Mechanical - HVAC and Misc Plumbing System Upgrades Wet Pit	Replace existing ventilation. Add AHU, exhaust/supply fans; ductwork. Modify louver openings as necessary. Small Unit Heater. Install frost proof hydrant and misc plumbing (Drain piping) replacement.	\$36,000	B	\$0	\$0	\$36,000
M 606	Mechanical - HVAC and Misc Plumbing System Upgrades Dry Pit	Replace existing ventilation and heating including makeup air heating units exhaust/supply fans, ductwork, unit heaters, dehumidification and control system in dry pit. Modify louver openings as necessary. Misc plumbing modifications.	\$130,000	B	\$0	\$0	\$130,000
M 607	Mechanical - Update hazardous gas monitoring to industry standards	Install hazard gas sensors (LEL, H2S and Oxygen) in wet pit and dry pit with appropriate announcement at entry doors and interlocks with HVAC system (this should be done with wet pit HVAC system upgrades).	\$44,000	A	\$0	\$44,000	\$0
E 608	Electrical - Dry pit lighting	Replace lighting in dry pit.	\$54,000	B	\$0	\$0	\$54,000
E 609	Electrical - Wet pit lighting and emergency lighting and misc elec	Replace lighting and emergency lighting in wet pit. Install intrinsically safe barriers in controls / alarm wiring.	\$28,000	Immediate	\$28,000	\$0	\$0
E 610	Electrical - Update emergency lighting Dry Pit	Install dry pit emergency lighting	\$9,000	A	\$0	\$9,000	\$0
E 611	Electrical - MCC and Controls System Replacement	Replace MCC: Main breakers, motor starters, panel boards, control panels, install new power transformer into the MCC, PLC based control system, soft starters for each pump, back up float control panel, and demo old MCC.	\$210,000	A	\$0	\$210,000	\$0
E 612	Emergency Generator	Demolish generator and replace generator and automatic transfer switch, concrete pad (above 100 year flood plain); Conduit and wiring; block heaters; diesel fuel piping.	\$230,000	A	\$0	\$230,000	\$0
E 613	Miscellaneous Demolition	Demolish all misc conduit and abandoned bubbler components, dehumidification systems and related items, and seal water system.	\$29,000	C	\$0	\$0	\$29,000
C 614	Site / Drainage Improvements	Re-grade and repave the driveway access to pump station. Adjust height to stairways to meet code.	\$30,000	C	\$0	\$0	\$30,000
S 616	Structural / Architectural Improvements - Roof	Replace the roof	\$0	A	\$0	\$0	\$0
S 617	Structural / Architectural Improvements - Masonry Repairs	Remove and replace lintels with galv steel lintels, reinstall masonry on chimney. Repoint and repair masonry at the top of the chimney. Remove and replace mortar. Remove and replace joint sealant.	\$55,000	A	\$0	\$55,000	\$0
S 619	Structural Improvements - Wet pit rehabilitation	Wet blast and paint epoxy to the concrete surfaces in the wet pit. This should occur during bypass pumping, included in P602.	\$49,000	A	\$0	\$49,000	\$0
S 620	Architectural Improvements: Replace Doors and Frames	Replace the door, frames and hardware to the wet pit.	\$6,000	A	\$0	\$6,000	\$0
S 622	Structural / Architectural Improvements - Miscellaneous	Loading dock bumper replacement. Analyze & Mark monorail with loaded capacity. Modifications to the doors, louvers, and hatches for hardening the pumping station against a 100-year flood.	\$12,000	A	\$0	\$12,000	\$0
S 623	Structural / Architectural Improvements - Flood Hardening		\$100,000	A	\$0	\$100,000	\$0
<b>Total:</b>					<b>\$28,000</b>	<b>\$741,000</b>	<b>\$559,000</b>

Notes:

- (1) Action Category Definitions:  
**Immediate** - Items that have an immediate need for repair or replacement because of their condition or importance. Items that were safety or code concerns were included in this category.  
**Category A** - Items that have an expected remaining service life of 5 or fewer years - repair or replacement is expected to be necessary during this period.  
**Category B** - Items that have an expected remaining service life of 6 to 10 years - repair or replacement is expected to be necessary between 6 and 10 years from now.  
**Category C** - Items that have an expected remaining service life of 11 to 20 years - repair or replacement is expected to be necessary between 11 and 20 years from now.  
 (2) Cost includes installation, 15% Contractor overhead and profit, 15% general conditions and 40% engineering and contingency.  
 (3) Costs are December 2014 (ENR 20-City National Average Construction Cost Index of 9536)