Ridgefield Water Pollution Control Authority

Phase 1 & Phase 2
Wastewater Facilities Plan

Public Hearing

May 3, 2017
Outline

• Introduction
  • WPCA Function and Responsibilities
  • Facilities Plan Drivers & Objective
  • Sewer District Service Areas
  • District 1 South Street WWTF & District 2 Route 7 WWTF

• Facilities Planning Approach and Recommendations

• Project Estimated Cost and Funding

• Schedule

• Next Steps

• Comments
WPCA Function and Responsibilities

From the Town Charter:

- “The WPCA shall be responsible for supervision of the Town's sewer plants”.
- “The WPCA shall formulate and approve a fee schedule”.
- “The WPCA shall formulate and periodically update a water pollution control plan for the Town. Such plan shall designate and delineate the boundary of: areas served by municipal sewerage systems; areas where sewerage facilities are planned and the schedule of design and construction anticipated or proposed; areas where sewers are to be avoided; areas served by community sewerage systems not owned by the Town and areas to be served by any proposed community sewerage system not owned by the Town”.
Facilities Plan Drivers

• National Pollutant Discharge Elimination System Permit
  ▪ State (DEEP) issues Town permits for treated effluent discharge under Federal Clean Water Act
  ▪ South Street WWTF
    • 3.5 mg/L Total Nitrogen annual target concentration
    • 0.06 mg/L Total Phosphorus seasonal average (April-October)
  ▪ Route 7 WWTF
    • 1.0 mg/L Total Phosphorus seasonal average (April-October)

• Aging Systems and Equipment
  ▪ South Street WWTF
    • Last major upgrade in early 1990
    • Equipment at or approaching end of useful life
  ▪ Route 7 WWTF
    • Majority of equipment original from 1985
    • Equipment at end of useful life
Wastewater Facilities Plan Objectives

- Assess current conditions and identify upgrade needs
- Develop recommended plan to address wastewater needs through 2035
- Meet more stringent nitrogen and phosphorus limits
- Identify required capital improvements
- Estimate cost and prepare implementation schedule
Why Undertake Project Now (Why Do We Have To Do It)?

- New NPDES permits have compliance schedules
- Aging equipment runs 24/7 in damp, corrosive, and abrasive conditions
- Decreased reliability and increasing operating costs
- Increase energy efficiency
- Improve water quality
Town Sewer Districts
District 1 - Collection System

90,000 feet of gravity sewers
Serves the village and downtown

Six Pump Stations
• South Street WWTF Influent PS
• Copps Hill PS
• Ramapoo Road PS
• Quail Ridge PS
• Fox Hill PS
• High School/SR Middle School PS

Oldest sewers date from early 1900’s – various pipe materials

System flows affected by precipitation and groundwater
Conveys wastewater to the South Street Wastewater Treatment Facility (WWTF)
District 1 - South Street WWTF

Design capacity:
- Average daily flow: 1.0 mgd

Provides secondary treatment and partial nitrogen and phosphorus removal

Discharges treated effluent to the Great Swamp (headwaters of the Norwalk River)

Last major upgrade 1990
District 2 - Collection System

6,000 feet of gravity sewers
Serves Route 7/35 area
One pump station
Entire sewer system built 1985
- PVC pipe
System flows not significantly affected by precipitation and groundwater
Conveys wastewater to the Route 7 WWTF
District 2 - Route 7 WWTF and Influent Pump Station
District 2 – Route 7 WWTF

Design capacity:
• Average daily flow: 0.12 mgd
Provides secondary treatment
Discharges treated effluent to the Norwalk River
Built in 1985
Two Phase Facilities Planning Process

The Facilities Plan was Undertaken in Two Phases

Phase 1:

- Identified current and projected future flows and loadings for both sewer districts
- Conducted smoke testing to locate inflow sources in District 1
- Evaluated the capacities of the two WWTFs
Two Phase Facilities Planning Process (continued)

Phase 2:
- Evaluated the condition and upgrade needs of the two WWTFs
- Developed/evaluated alternatives for the upgrade of both WWTFs, including the potential to eliminate the Route 7 WWTF by pumping to the South Street WWTF
- Conducted further Infiltration/Inflow investigations, such as house to house inspections for sump pumps, to locate inflow sources
- Recommended upgrade program for the two WWTFs
EXISTING AND PROJECTED FUTURE FLOWS
Existing Wastewater Flows

• Review and Analyze 3 Years (2010-2013) of Flow Data

• Existing Wastewater Flows:

  • South Street WWTF: 850,000 gallons per day out of the 1,000,000 gallons per day design capacity
  • Route 7 WWTF: 54,000 gallons per day out of design capacity of 120,000 gallons per day
Future Flow Identification - Sewer District 1

- Infilling of Properties in District
  - Approximately 140 parcels out of 1,500 currently unconnected
  - Redevelopment of parcels under current zoning

- Expansion of District
  - Address health and septic issues
Future Flow Identification Summary

- Sewer District 1
  - Some Infilling
    - 70% of buildout under current zoning
  - Potential District Expansion
    - Marcardon/Soundview Area
    - New Street area
# Future Flow Identification - Sewer District 1

<table>
<thead>
<tr>
<th>FLOW COMPONENT</th>
<th>ESTIMATED FLOW (GALLONS PER DAY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Average Daily Flow</td>
<td>850,000</td>
</tr>
<tr>
<td>Projected Flow From Infilling</td>
<td>112,000</td>
</tr>
<tr>
<td>Projected Flow from Sewer Needs Areas</td>
<td>38,000</td>
</tr>
<tr>
<td>Total Projected Future Average Daily Flow</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Total Projected Future Peak Flow</td>
<td>5,300,000</td>
</tr>
</tbody>
</table>
Future Flow Identification Summary

- Sewer District 2
  - Current WWTF capacity of 120,000 gallons per day allocated to existing properties in District 2
  - No identified sewer needs areas
# Future Flow Identification - Sewer District 2

<table>
<thead>
<tr>
<th>FLOW COMPONENT</th>
<th>ESTIMATED FLOW (GALLONS PER DAY)</th>
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<tbody>
<tr>
<td>Existing Average Daily Flow</td>
<td>54,000</td>
</tr>
<tr>
<td>Potential Flow Increases Within District</td>
<td>66,000</td>
</tr>
<tr>
<td>Total Projected Future Average Daily Flow</td>
<td>120,000</td>
</tr>
<tr>
<td>Total Projected Future Peak Flow</td>
<td>720,000</td>
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</tbody>
</table>
Sewer District 1 Infiltration and Inflow (I/I) Evaluations

- Wet Weather Flows Have Infrequently Exceeded WWTF Peak Flow Capacity
- Recent activities to locate sources:
  - I/I investigations and rehabilitation efforts
    - Yearly TV inspections of select areas
    - 2010 Sewer Rehabilitation Contract addressed specific pipe defects
  - Phase 1 wastewater facilities planning efforts (2015)
    - Sewer District 1 smoke testing
    - Limited manhole inspections
  - Phase 2 wastewater facilities planning efforts (2017)
    - Dyed water testing
    - Dyed water tracing
    - CCTV of selected mainline and lateral sewers
    - Completion of manhole inspections
    - House to house inspections
Sewer District 1 Peak Flow Management Recommendations

- Future Peak Flow Management
  - Collection system inflow reduction efforts
    - Redirect 105 sump pumps connected to the sewer system.
    - Conduct building inspections on Main Street to locate roof drains connected to sewer system within the limits of the DOT Main Street Reconstruction Project and work with DOT on integrating redirecting roof drain connections into the DOT Main Street Reconstruction project.
  - Eliminate 44 private and 5 public inflow sources identified through smoke testing
CONDITION ASSESSMENTS - EXISTING TREATMENT SYSTEMS
District 2 - Route 7 WWTF - Built 1985

GRIT CHAMBER  EQUALIZATION TANK  UV DISINFECTION SYSTEM

ELECTRICAL TRANSFORMER  SLUDGE STORAGE TANKS

This equipment runs 24/7 in damp, corrosive, and abrasive conditions
WWTF Capacity Evaluation

- Evaluated hydraulic capacity
- Evaluated pollutant treatment capacity
- Evaluations identified limitations to be addressed in upgrade
UPGRADE NEEDS, EVALUATION APPROACH, AND RECOMMENDED PLAN
Upgrade Needs

• **Phosphorus Limits - Both WWTFs cannot meet limits**
  ▪ Phosphorus – naturally occurring nutrient, controlling nutrient in fresh water
  ▪ Control needed to improve water quality
  ▪ DEEP issued limits

• **Nitrogen Limits - SS WWTF cannot meet limit**
  ▪ Nitrogen – naturally occurring nutrient, aquatic “fertilizer” in salt water
  ▪ Nitrogen impacts to Long Island Sound
  ▪ Control needed to improve water quality
  ▪ DEEP issued limits

• **Aging Equipment**
  ▪ Equipment operates continuously in damp, corrosive, abrasive conditions
  ▪ Service life is 20 years
    o South Street WWTF: 27 years
    o Route 7 WWTF: 32 years
  ▪ Increasing costs for repair and maintenance
  ▪ Decreasing reliability and increasing potential for failure
Facilities Planning Alternatives

- Keep Both WWTFs in Operation
  - Consider treatment process alternatives for each WWTF to meet new NPDES permit limits and improve energy efficiency

- Decommission Route 7 WWTF and Treat All Wastewater at the South Street WWTF
# Current and Anticipated WWTF Permit Limits Summary

<table>
<thead>
<tr>
<th>Effluent Parameter</th>
<th>SOUTH STREET WWTF PERMIT LIMITS</th>
<th>ROUTE 7 WWTF PERMIT LIMITS</th>
<th>ANTICIPATED SOUTH STREET WWTF PERMIT LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewer District 1 Flows</td>
<td>1.0 mgd</td>
<td>0.12 mgd</td>
<td>1.12 mgd</td>
</tr>
<tr>
<td>Sewer District 2 Flows</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Day 2035 Design Flow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Nitrogen Target Annual Average at Design Flow</td>
<td>3.5 mg/l</td>
<td>No Limit</td>
<td>3.4 mg/l</td>
</tr>
<tr>
<td>Total Phosphorus Seasonal Average at Design Flow</td>
<td>0.062 mg/l (Apr-Oct)</td>
<td>1.0 mg/l (Apr-Oct)</td>
<td>0.055 mg/l (Apr-Oct)</td>
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Facilities Planning Methodology

- Identify Alternatives for Evaluation Based on:
  - Experience with other WWTFs
  - Town/Suez recommendations

- Narrow Alternatives for Evaluation with Town/Suez

- Evaluate Selected Alternatives Based on:
  - Costs including:
    - Capital
    - Annual O&M costs
    - Life cycle costs, 20 year period
  - Advantages / disadvantages
Route 7 WWTF Decommissioning Alternative

- Treat All Wastewater at the South Street WWTF and Decommission Route 7 WWTF
  - Convey Sewer District 2 to South Street WWTF
    - New Route 7 Pump Station
    - New Force Main
  - Upgrade South Street WWTF for:
    - Additional flows and loads
    - More restrictive permit requirements
- Demolish Route 7 WWTF and Reclaim Site
Route 7 Force Main Alternatives to South Street WWTF

- Route 35 Alternative (Red)
- Local Road Alternative (Blue)
- Preferred Route To Be Determined
Benefits of Combining both WWTFs at South Street

- Lower Capital Cost
- Lower Operating Cost
- Lower Life-Cycle Cost
- Consolidates all WWTF Operations to One Facility
- Improved Water Quality
- Allows for Sale or Repurposing of Route 7 WWTF Property
South Street WWTF Recommended Upgrades
PROJECT ESTIMATED COST AND FUNDING
# Estimated Conceptual Project Cost and Grant Funding Cost Summary

<table>
<thead>
<tr>
<th>FACILITIES</th>
<th>DEEP CLEAN WATER FUND ELIGIBLE GRANT (%)</th>
</tr>
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<tbody>
<tr>
<td>Phosphorus Treatment</td>
<td>50</td>
</tr>
<tr>
<td>Nitrogen Treatment</td>
<td>30</td>
</tr>
<tr>
<td>All Other Work</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOTAL ESTIMATED CAPITAL COST</th>
<th>ESTIMATED GRANT AMOUNT</th>
<th>ESTIMATED LOAN AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$41,900,000</td>
<td>$9,800,000</td>
<td>$32,100,000</td>
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SCHEDULE
Schedule Drivers

- NPDES Permits require new facilities to be operational and permit compliance by September 2020

- Eligibility for 50% DEEP phosphorus removal grant requires construction contract award by **July 1, 2019**
## Proposed Project Schedule

<table>
<thead>
<tr>
<th>Wastewater Facilities Upgrade Project Milestone</th>
<th>Milestone Date</th>
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<tbody>
<tr>
<td>Start Design</td>
<td>Spring 2017</td>
</tr>
<tr>
<td>WWTFs Upgrade Design Complete</td>
<td>Summer 2018</td>
</tr>
<tr>
<td>WWTFs Upgrade Town Funding Referendum</td>
<td>Fall 2018</td>
</tr>
<tr>
<td>Advertise Upgrade Project for Bid</td>
<td>Winter 2018/2019</td>
</tr>
<tr>
<td>Award Project and Begin Construction</td>
<td>Spring 2019</td>
</tr>
<tr>
<td>Complete Construction</td>
<td>Fall 2021</td>
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NEXT STEPS
Next Steps

- Comments received tonight are being documented and will be submitted to DEEP
- There is a 7 day public comment period following the hearing. Comments will be accepted until May 10, 2017
- Submit public comments to the WPCA:
  » Via mail to: WPCA, 66 Prospect Street, Ridgefield CT 06877
  » Via email:dvanness@ridgefieldct.org
- DEEP completes the Facilities Plan review process
- Design of Upgrades Initiated