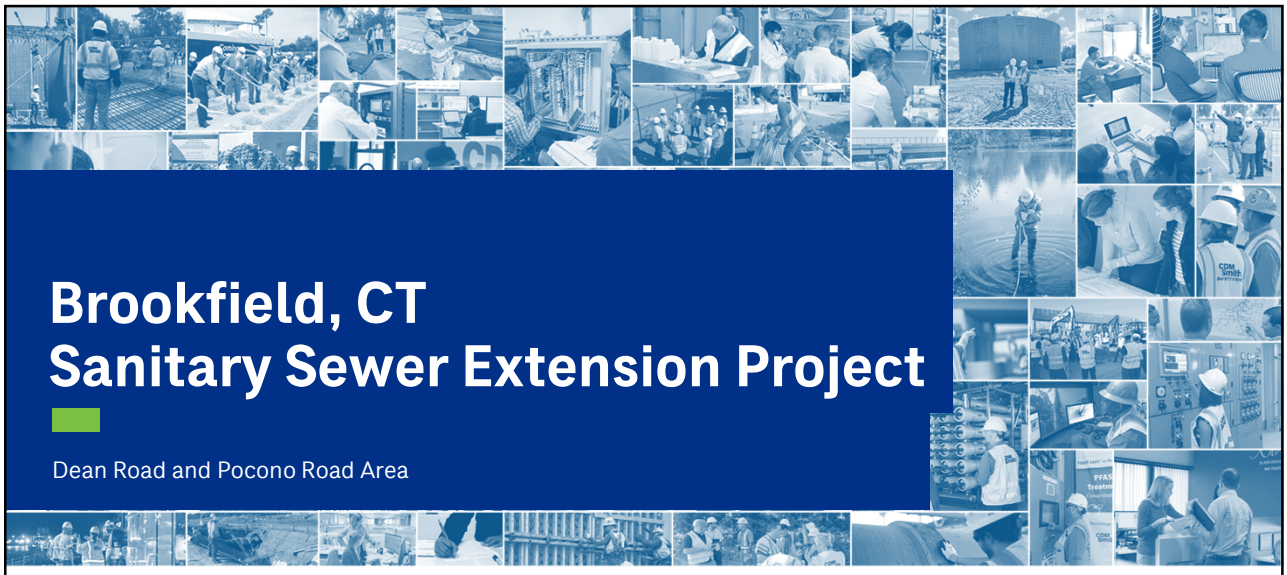


Brookfield, CT
Sanitary Sewer Extension Project

Dean Road and Pocono Road Area

November 21, 2024 Public Information Meeting

CDM Smith

Presentation and Report Outline

1. Project Background and Study Area
2. Septic System Concerns
3. Wastewater Management Alternatives
4. Recent Activities and Funding
5. Design Activities
6. Cost Analysis
7. Schedule and Next Steps
8. Public Comments and Discussion

Project Background and Study Area

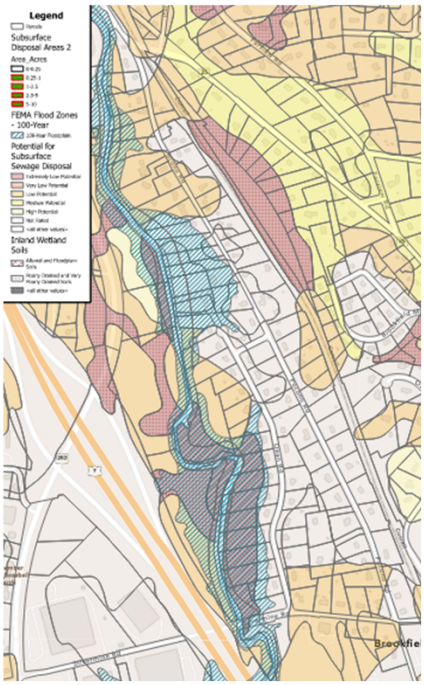
Project Background and Study Area

- Current Brookfield Sewer Collection System:
  - 17 miles gravity sewers; 14 pump stations, 7 miles force main – Approximately 2,300 connected customers
  - Treatment at Danbury Water Pollution Control Facility (WPCF)
- Dean & Pocono Roads area includes approximately 91 residential properties and the Municipal Center
- 2020 Dean & Pocono Roads *Wastewater Management Plan* study recommended sanitary sewer extension

Septic System Concerns

Septic System Concerns

- Soil and Groundwater Conditions
  - Approximately 50% of parcels are in the floodplain; numerous parcels with wetlands present
  - National Resources Conservation Service (NRCS) classification of soils in the area are “low, very low, or extremely low” regarding potential for subsurface sewer disposal
    - Low percolation rate, seasonal high groundwater table, flooding concerns
    - Soil and ground conditions not conducive to nutrient removal from septic systems
  - Portions of Still River considered Impaired as Habitat for Fish, Aquatic Life, Wildlife (2022 EPA List of Impaired Waters for Connecticut)



Septic System Concerns

- Septic System Records and Age
  - Brookfield Board of Health Data on approximately 57% of properties in the Dean and Pocono Roads Area (43% no information)
    - Age information on approximately 34% of properties
    - Of those: 65% greater than 20 years old, 35% greater than 30 years old, and 16% greater than 40 years old
    - Many properties constructed in the 1960s – some may still have original systems
  - Typical septic system life 30 to 40 years when constructed in good conditions
- Area reliant on drinking water wells - separation distance constraints

Wastewater Management Alternatives

Wastewater Management Alternatives

- Sanitary Sewer System Extension
  - Traditional gravity sewer system
    - All gravity connections or limited number of private grinder pumps
    - Brookfield owned/maintained community pump station where topography requires
  - Low-pressure sewer system where every property is served by a grinder pump
- Septic System Maintenance
  - Maintain Septic Systems with Program of Inspections and Improvements as Needed

Traditional Gravity Sewer with All Gravity Connections or Limited Number of Private Grinder Pumps

- All septic tanks would be replaced with a connection to a gravity sewer
  - Majority gravity connections; some private grinder pumps depending on elevation of lowest properties
  - Requires one Brookfield owned/maintained community pump station to serve area
- Pros
  - Low energy requirement; gravity conveys flow during power outages
  - Least amount of long-term system maintenance
  - Can handle seasonal flow fluctuations
  - Simple to expand to adjacent areas
  - Brookfield operations staff familiar with infrastructure
- Cons
  - Topography may result in deep sewers
  - Potentially high construction costs associated with dewatering and bedrock removal
    - Preliminary geotechnical explorations indicate shallow groundwater
  - Need to site pump station
  - Potential for infiltration into gravity pipes as system ages

Low-Pressure Sewer System

- All septic tanks would be replaced with a grinder pump; system is pressurized
  - One grinder pump per residential property; commercial properties may need multiple pumps
  - Project area is pumped to an existing gravity sanitary sewer

- Pros
  - Typically less expensive construction than gravity - smaller diameter pipes at shallower depth
  - Piping has fused joints; more watertight than gravity sewer, limiting future concerns about infiltration
  - Easily service areas with very flat or undulating topography
  - Shorter construction duration and less disruption
  - No need to site Brookfield owned/maintained pump station

- Cons
  - Requires a mechanical component (pump) at every property
  - Higher energy use compared to gravity system
  - Requires specialized operator training for system and regular maintenance of grinder pump units (whether by homeowner or Brookfield WPCA)
  - More sensitive to wastewater flow fluctuations
  - Prolonged power outages can lead to backups where standby power is not provided

Septic System Maintenance/ Upgrades/ Replacement

- Continued use of septic systems throughout study area
- Systematic program of inspection and improvements (possibly by Brookfield Health Department, not Brookfield WPCA)

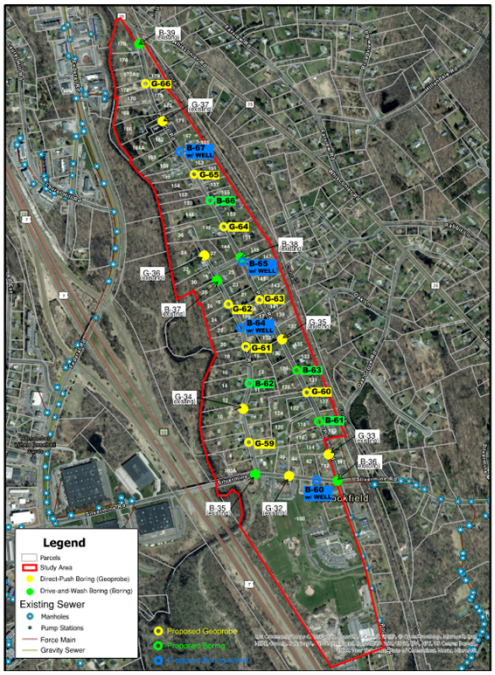
- Pros
  - No capital construction project for the Brookfield WPCA
  - No/low disruption to roads and low construction traffic
  - Some systems compliant, would not need short-term improvements
  - No annual sewer user fees (though there is a cost for pumping and inspection program)
  - No change in practice for homeowners (other than systematic inspection program)

- Cons
  - Similar potential for failure as current systems based on existing ground conditions and system age
  - Engineered and elevated/mounded septic solutions raise the system replacement cost
  - Areas with poor soils, presence of wetlands, flood hazards, shallow groundwater, and those reliant on wells for water supply would remain areas of environmental concern
  - Life cycle costs will remain the responsibility of property owners

Recent Activities and Funding

Survey and Geotechnical Explorations

- Survey and Wetlands Delineation
- Geotechnical Investigations
  - 13 borings including 4 groundwater monitoring wells
  - 14 geoprobes with environmental sampling
  - Confirmed shallow groundwater through much of the study area (4’ to 5’ deep typical)
  - Laboratory analysis for soil handling and excavation support requirements



Funding to Date

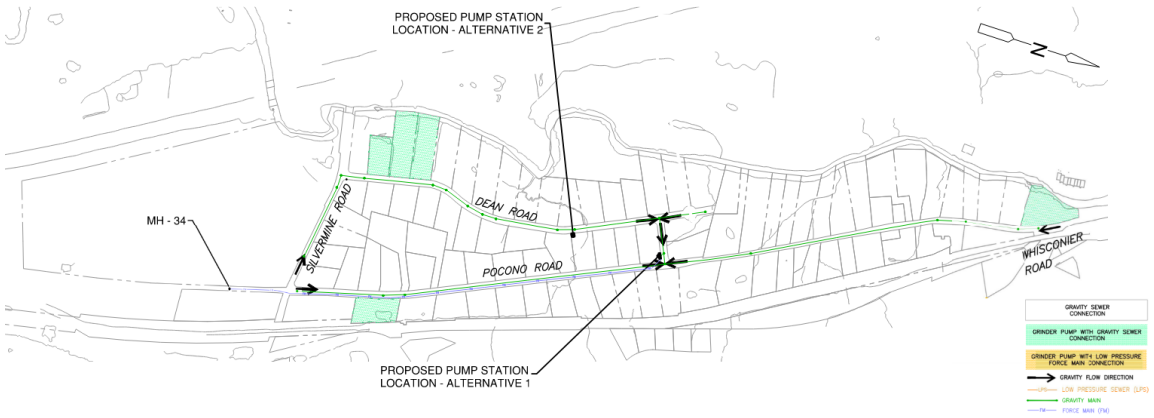
- Study Phase including recent survey and geotechnical work funded with 55% Planning Grant from CT DEEP Clean Water Fund

- Design Phase being funded with $300K Long Island Sound Futures Fund (LISFF) grant from the National Fish and Wildlife Foundation (with $75K match by BWPCA)
  - "Project will produce a pathway to improve water quality by reducing bacteria, nitrogen and phosphorus into the Still River and Long Island Sound"

Design Activities

Gravity Sewer with One Pump Station

- Majority of homes would connect by gravity; few low-lying parcels likely to need grinder pump
- Two possible locations for Brookfield WPCA Pump Station (outside of flood plain)
- Connect to existing gravity sewer on Pocono Road



Low-Pressure Sewer System

- All properties will receive their own grinder pump
- Small-diameter low-pressure sewers will be installed approximately 5 feet below ground surface
- Connect to existing gravity sewer on Pocono Road

Overall Design Activities

- Design underway for both the gravity sewer and low-pressure sewer options
- Preparation of design drawings including finalizing alignment, slope, depths, utility crossings, connections to each property
- Evaluation of constructability requirements including excavation support, soil handling and dewatering
- Design of pump station including site layout and screening, mechanical, electrical, control equipment
- Local permitting
- Updating Opinions of Probable Construction Cost (OPCCs)
- Contract and bidding documents including multiple alternatives

Cost Analysis

Dean and Pocono Roads Area – Life Cycle Cost Summary

- 50-year Life Cycle costs include both Brookfield WPCA and residents' costs
  - Initial Project "Capital" Costs include:
    - Engineer's OPCC: sewer infrastructure construction (pipes/MHs in road; stubs to property line; purchase of grinder pumps) including labor, equipment, materials, contractor general conditions, overhead and profit, construction estimating contingency
    - Escalation to end of 2025, engineering and implementation costs, and project contingency
  - Life Cycle (50-year) Costs include:
    - Capital project costs outlined above (20% CWF grant assumed for sewer projects)
    - Gravity sewer system expected life >50 years (salvage value not credited); pump station equipment replacement every 20 years; grinder pump replacement every 15 years
    - Approximate septic life 30 to 40 years (3% replaced per year) at $35,000 each replacement
    - For septic option, $400 every 3 years for tank pumping and $600 every 5 years for inspection program
    - For sewer options, user bill of $520 per year and average of $10,000 per property to connect to the system
    - Utility power costs for Brookfield WPCA pump stations and grinder pump electricity at $0.25/kWh
    - 4% annual escalation; 2023 EPA discount rate of 2.5% for present value calculation

Dean and Pocono Roads Area– Life Cycle Cost Summary

Alternative	Initial Project Capital Cost ($)	Initial Project Capital Cost ($) (after 20% CWF Grant)	50 Year Estimated Life Cycle Cost	Approximate Annual Cost, $/year per property
Dean and Pocono Alternative 1 Gravity Sewer with One BWPCA Pump station	$6,700,000	$ 5,400,000	$ 9,700,000	$ 2,100
Dean and Pocono Alternative 2 Low-Pressure Sewer System	$3,400,000	$ 2,700,000	$ 9,200,000	$ 2,000
Dean and Pocono Alternative 3 Septic System Maintenance/ Upgrades/ Replacement	n/a	n/a	$ 9,300,000	$ 2,000

- Overall life cycle costs +/- 10 % for all options
  - Septic System Maintenance not recommended due to poor soils, shallow groundwater, and reliance on drinking water wells
- Capital costs being refined as part of sewer extension design process
- **Additional grants would lower capital costs**
  - Design currently being funded with Long Island Sound Futures Fund (LISFF) Grant
  - BWPCA applied for LISFF Grant towards construction
- BWPCA evaluating cost and financing options

Schedule and Next Steps

Schedule and Next Steps

- Submitted application for LISFF grant for construction phase (up to $1.5M)
- Complete planning phase (survey, geotechnical and environmental evaluations) anticipated before end of 2024
- Complete design- anticipated by July 2025
- Future public meeting in spring 2025: updated costs, grant status, and public input

Public Comments and Discussion