

# *Utilizing two trenchless rehabilitation technologies to reduce wet weather flows in the Bear Brook Watershed*

**Matt Timberlake-Ted Berry Company, Inc.**

**NEWEA Sustainability & Collection Systems Specialty Conference  
& Exhibit**

**DoubleTree by Hilton Hotel in Westborough, MA**

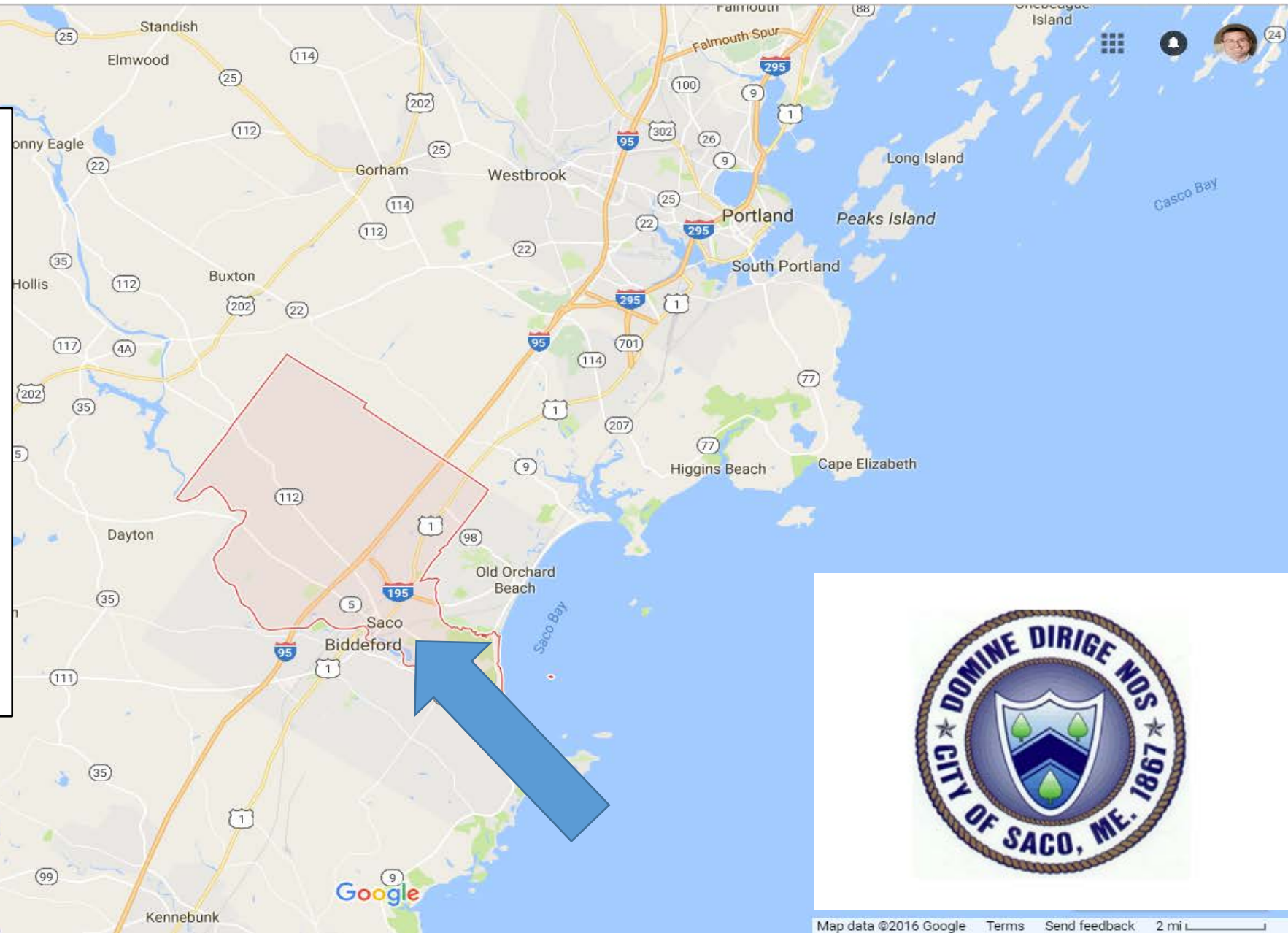




# Saco Maine USA

## Facts

- 53 Square Miles of Prime Real Estate along Saco River and Casco Bay
- Early 1800's Ship Building and Lumbering Industries
- Mid 1800's Saco River Energy was used for Saco Iron Works and Saco Manufacturing which produced fine linens
- 2010 Census – 18,500 residents
- Original Sewer System was a Combined Sewer





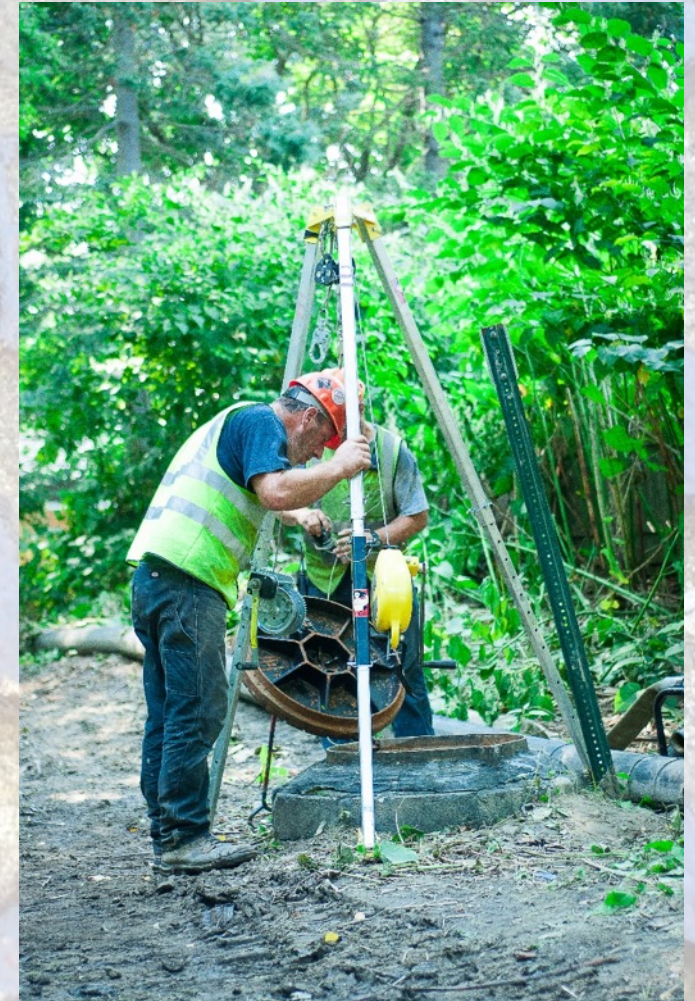
# Saco Wastewater System

- 1971 Construction of WWTF on the Saco River
- 1988 Upgraded the Water Resource Recovery Facility (WRRF)
- Since 1995 – Sewer Separation Program to eliminate CSO's
- Collection System
  - 69 Miles of gravity sewer/interceptor (brick, clay, CI, RCP, AC, PVC and HDPE)
  - 20 Miles of pressure pipe
  - 31 Pumping Stations
- Water Resource Recovery Facility
  - Design Capacity-4.2 MGD
  - Peak Wet Weather Flow -12 MGD



# 2014 Micro-Metering Study

- Performed by ADS Environmental Services
- Identified the Bear Brook Sewershed
- Bear Brook Sewershed
  - 109,000 linear feet
  - 8-inch to 24-inch gravity sewers
  - Wet Weather flows 4-6 times base flow
- Bear Brook Interceptor
  - Cross Country Easement
  - Depths ranging from 8 feet to over 15 feet
  - Directly adjacent to Bear Brook
  - High Groundwater





# Project Planning – Bear Brook Project

- Collaboration with Saco WRRF, Saco PW/Saco Engineering/Ted Berry Company
  - CCTV Assessment to confirm existing pipe materials/conditions
  - Site assessment
  - Replace/Rehabilitate approximately 1,760' of existing 12", 15" and 16" gravity sewer
  - Evaluation of trenchless alternatives
    - Hydraulic considerations
    - Site Access
    - Bypass pumping
    - In-house excavation capabilities
1. MH 1068.109 and 1068.108 (481')
  2. MH 1068.108 and 1068.107 (308')
  3. MH 1068.107 and 1183.114 (382')
  4. MH 1183.115 and 1388.107 (Estimated 50')
  5. MH 1388.107 and 1388.108 (39')
  6. MH 1388.108 and 1388.110 (Estimated 120')
  7. MH 1388.110 and 1203.108 (Estimated 190')
  8. MH 1183.114 and 1183.106 (Estimated 133')
  9. MH 1203.108 and 1203.101 (57')



# Recommended Rehabilitation

- Pipe Bursting
  - 1,570 feet of 16-inch IPS DR 17 HDPE pipe bursting
  - Burst lengths ranged from 39 feet to over 450 feet
  - Insertion and Burst pits located at existing brick manholes
- CIPP
  - 190 feet of UV CIPP using Reline America Alphaliner



# Project site challenges

- Remote project site and easements
- Limited access
- Crossings under brook
- Heavy groundwater infiltration
- MH's and access across private property and close proximity to homes





# CCTV Inspection and cleaning

- Pipe inspected to confirm condition and geometry
- Pre-cleaning performed prior to lining





# By-pass



- Remote bypass
- (2) 6" self priming trash pumps
- HDPE fused discharge main
- Isolation daily using pneumatic pipe plugs and overseen by dedicated technician



# HDPE pipe handling



- Use McElroy “Polyhorse” fusion racks
- 16-inch IPS DR 17 HDPE
- Pull into woods and easement using winches, pulleys, and Yankee ingenuity





# Pipe bursting

- Selected static pipe bursting system
- Replace existing 12", 15" and 16" pipe with new 16" HDPE
- Ted Berry owned HB100 ton rod system (Hammerhead)
- Upsize existing mains (combined into (5) bursts)
  1. MH 1068.109 and 1068.108 (481') 16"
  2. MH 1068.108 and 1068.107 (308') 16"
  3. MH 1068.107 and 1183.114 (382') 16"
  4. MH 1183.115 and 1388.107 (Estimated 50') 12"
  5. MH 1388.107 and 1388.108 (39') 12"
  6. MH 1388.108 and 1388.110 (Estimated 120') 12"
  7. MH 1388.110 and 1203.108 (Estimated 190') 15"



# UV CIPP



- Use pull in place method for (2) runs
  1. MH 1183.114 and 1183.106 (Estimated 133') 16" pipe
  2. MH 1203.108 and 1203.101 (57') 16" pipe
- CIPP material design
  - Multiple spiral wound layers of composite
  - Woven pulling bands
  - Inner film (Styrene barrier)
  - Outer film (preliner) (Styrene barrier)
- CCTV prior to curing



# UV CIPP



Calibration of UV cure "train"



# Conclusion



*“ The project provides an excellent example of both interdepartmental cooperation by the Water Resource Recovery Department and the Public Works Department, coupled with Ted Berry’s expertise in trenchless technologies to save the community scarce rehabilitation monies.*

*The City of Saco could not be happier with the outcome of the project.”*

Howard Carter City of Saco, Maine



# Questions

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