

NEW BRITAIN WATER CO. SUMMIT: PAST, PRESENT, & FUTURE



JANUARY 28, 2019

2019 NEW BRITAIN WATER SUMMIT

OVERVIEW

AGENDA

Session 2 – Sanitary and Storm Sewer Systems

(10:15 a.m. to 11:00 a.m.)

- * **Overview** – Mayor Erin Stewart
- * **Sanitary Sewer Collection System** – Mark Moriarty, Director of Public Works
 - * Sanitary Sewer Collection
 - * Sanitary Sewer Systems Related Programs
 - * General Maintenance
 - * Fats, Oils, and Grease (FOG) Program
 - * Infiltration and Inflow (I&I)
 - * US EPA Capacity, Management, Operations, and Maintenance (CMOM) Order
- * **Storm Water Sewer Collection System** – Brief Overview
- * **The Mattabassett District** – Michelle Ryan, District Engineer



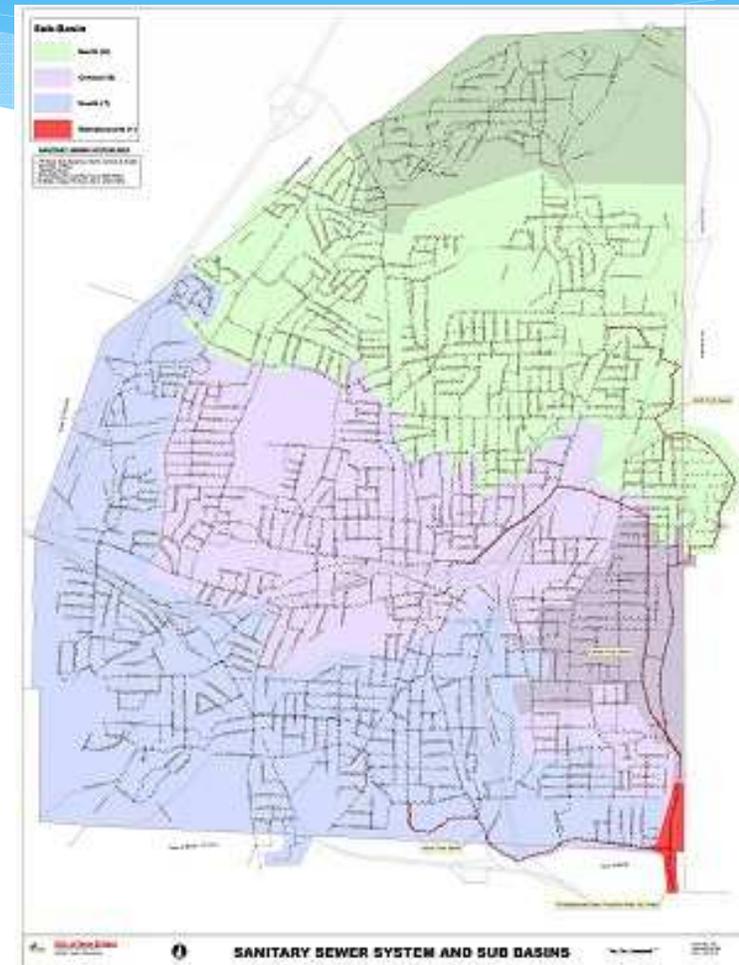
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SANITARY SEWER SYSTEM

Sanitary Sewer Collection System

- * Separated System (as opposed to combined which collects both storm and sanitary sewer)
- * 179 Miles of Pipe
- * 3,616 Sanitary Sewer Manholes
- * 3 Sub-Systems & Trunk Lines (North, South, and Central)
- * Gravity System (1 pump station – Nancy Road)
- * 68 Miles (38%) of sewer piping 75 year or older
- * Pipes types: Older: Vitrified Clay, Orangeburg (bitumenized fiber), Newer: PVC
- * Sanitary Sewer Laterals privates owned and maintained
- * System includes a section of Newington (MDC), Kensington (KFD), and a few customers in Berlin and Farmington

9.5 Mile Trunk-line delivers Sewage from New Britain to Mattabassett District's treatment Plant in Cromwell



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SANITARY SEWER SYSTEM

Tree Root Damage

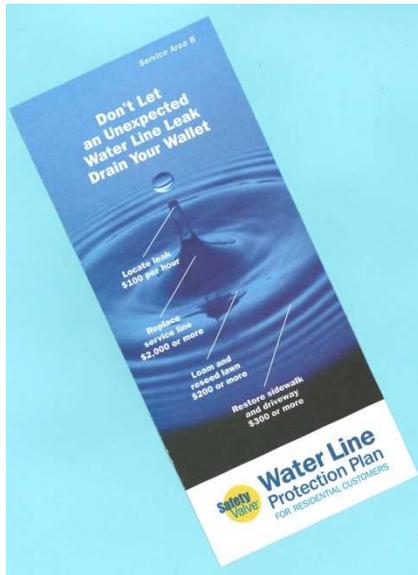


Typical Examples Sanitary Sewer System Tree Root Damage

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SANITARY SEWER SYSTEM

PURCHASE SAFETY VALVE WATER & SEWER LATERAL INSURANCE REMINDER!!!!



(Brochures available here today or go to the City's Website)



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SANITARY SEWER SYSTEM

Fats, Oils, and Grease Program (FOG)

- * Fats, Oils and Grease (FOG) is a leading cause of sewer backups into basements. FOG occurs when cooking fats are poured down the drain and coat the inside of the pipes, eventually forming a blockage.



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SANITARY SEWER SYSTEM

Fats, Oils, and Grease Program (FOG)

- * Joint effort between Public Works & Health Departments
- * Combined inspection to ensure proper FOG prevention devices installed (grease traps)
- * Approx. 250 Food Establishments (mostly restaurants)
- * CT DEEP / EPA Req'd Program

**DON'T
CLOG
WITH
FOG**
[FATS OIL GREASE]

PLEASE dispose of your Fats Oil & Grease the right way and prevent sewer lines from overflowing.



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SANITARY SEWER SYSTEM

Sanitary Sewer - Regular Maintenance & Activities

- * Jet Rodding – Trouble Spots
- * Fats, Oils, and Grease Program (F.O.G.)
- * Tree Root Control
- * Structure Repairs and Adjustments
- * Illicit Discharge Detection and Elimination (MS4 Program)
- * Inflow and Infiltration (I&I)



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SANITARY SEWER SYSTEM

Sewer Maintenance - Jet Rodding & Related

- * Monthly, Quarterly, and Tri-Annual Jetting Location
- * Primary issues FOG, flat mains, sags in the mains, non-flushable products
- * Tree root issues – added attachment to jet rodder that cuts tree roots, roots treated with chemical to inhibit re-growth



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SANITARY SEWER SYSTEM

Illicit Discharge Detection and Elimination

- * On-going program
- * Program detects and eliminates illegal sanitary sewer lateral connections into the City's Storm Water System & other similar illicit connections
- * Environmental concern for polluting water bodies
- * Involves dry weather and wet weather testing of storm and sanitary lines, field investigation, smoke and dye testing, and pipe removal and relocation
- * CT DEEP MS4 Program Requirement



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SANITARY SEWER SYSTEM

Inflow & Infiltration (I&I)

- * The Big Issue with older sanitary sewer collection systems
- * Involves “**already clean water**” getting into the sanitary sewer system, and getting routed to a sewage treatment plant to get treated “cleaned”
- * Problematic environmentally because Sewage Treatment Plants only have limited capacity to treat sewage flows & when that capacity is exceeded untreated, or only partially sewage, get discharged into water bodies
- * Problematic fiscally for NB because we’re billed based on sewage flows sent to the Mattabassett District’s Sewer Treatment Plant in Cromwell
- * About ½ of the sewage NB sends to the Mattabassett District treatment Plant is from I&I = **about 6 MGD on average**
- * The City is under a consent order from the US EPA to reduce our I&I flows



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SANITARY SEWER SYSTEM

Inflow & Infiltration (I&I)



Sewer Cover Coming off due Excessive I&I



Sewer Main Infiltration



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SANITARY SEWER SYSTEM

Inflow & Infiltration (I&I)

Infiltration

- * Bigger issue, **Estimated at 5 MGD** for NB an average day
- * Groundwater seeps into cracks and joints in the sewer lines.
- * Water enters via holes caused by tree root penetration.
- * Water enters via manhole covers that have holes or gaps due to a poor fit.
- * Water is forced from the storm to sanitary lines when both are in the same trench, without proper separation.
- * Infiltration increases during rain storms & periods of high ground water



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SANITARY SEWER SYSTEM

Inflow & Infiltration (I&I)

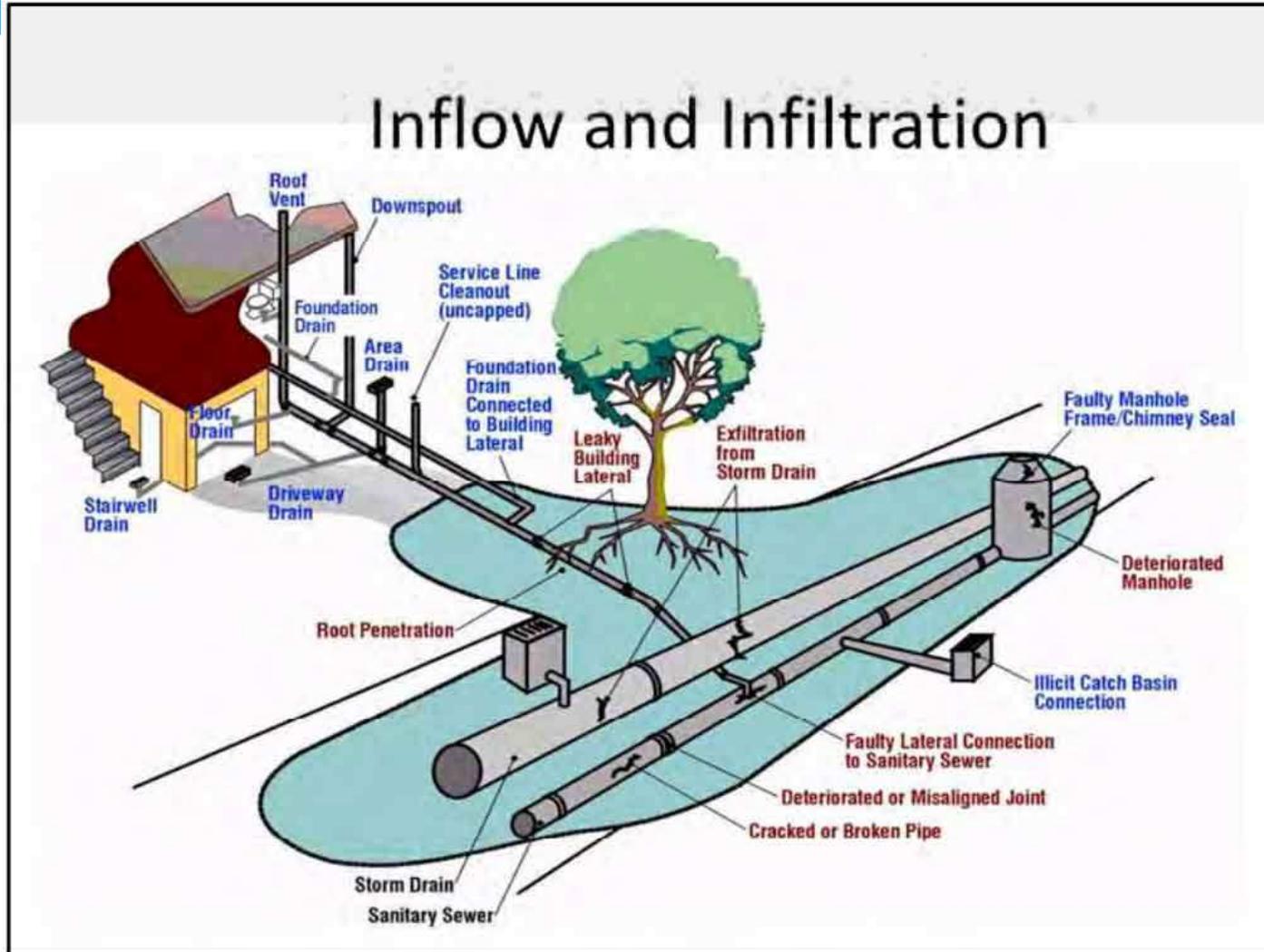
Inflow

- * Lesser Issue but still significant, Estimated at 1.0 MGD for NB an average day
- * Inflow is when a storm drain is improperly or illegally connected directly into a sewer line.
- * Inflow sources include: sump pumps, downspouts, and drains for roofs, foundations, window wells, basement stairs, and driveways.



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SANITARY SEWER SYSTEM

Inflow & Infiltration (I&I)

PEAK FLOW - Environmental Concern

- * 2018 NB Peak Flow – 45.8 MGD

Mattabassett District Treatment Plant

- * Primary Treatment Flow (*removes solids, greases, and oils*) – 110 MGD
- * Secondary Treatment (*biological treatment*) – 55 MGD

AVERAGE DAILY FLOW- Financial Concern

- * 2018 Average Daily Flow – 12.24 MGD & 62.7% Total Matt. District Flow
- * 2019 New Britain Mattabassett District Cost - \$6,123,989 (55% of City's Sewer Budget)



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SANITARY SEWER SYSTEM

Inflow & Infiltration (I&I) – Flow Metering

- * Performed to determine most problematic areas in the system
- * Needed to help determine where you get the most bang for your buck



Sanitary Sewer Manhole Flow Meter



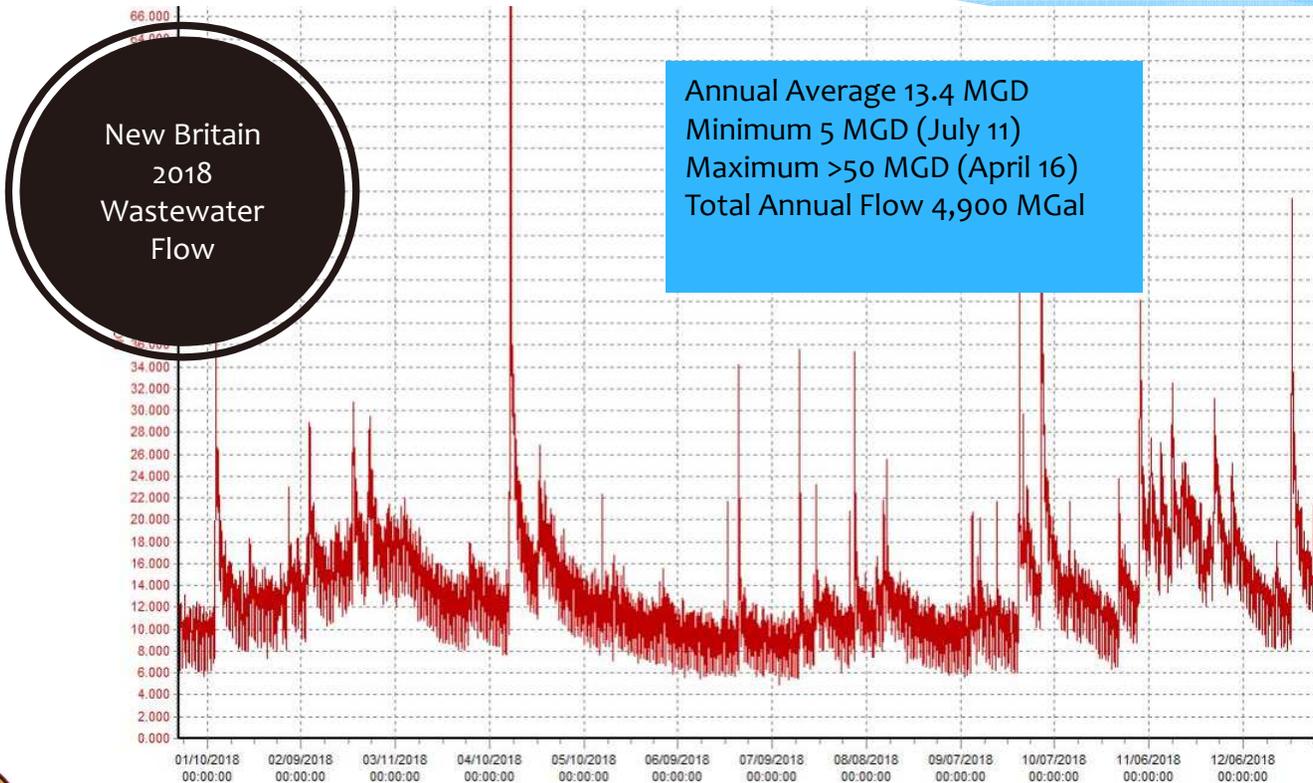
Sewer Main Flow Meter



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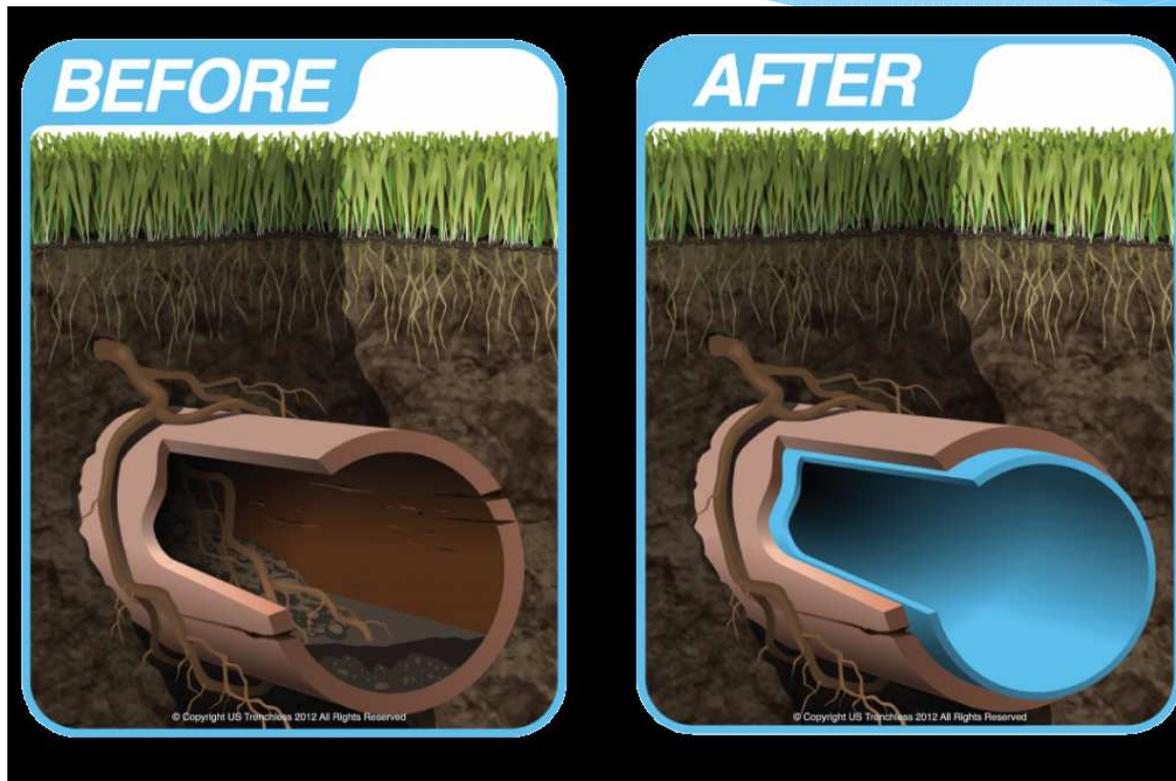
Inflow & Infiltration (I&I) – Sewer Flows



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SANITARY SEWER SYSTEM

Inflow & Infiltration (I&I) Elimination



Sewer Lining Includes:

- * Sewer Mains
- * Sewer Manholes
- * Sewer Laterals



Sewer Lining – Primary Method of Eliminating I&I

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SANITARY SEWER SYSTEM

Inflow & Infiltration (I&I) - Elimination



** Added benefit to lining is that also serves as a structural repair



Sewer Lining – Cured-in Place Sewer Lining

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SANITARY SEWER SYSTEM

Inflow & Infiltration (I&I) - Elimination



Comprehensive Sewer Rehabilitation Process:

1. Sewer Main Lining
2. Sewer Lateral Lining
3. Sump Pump Reduction
4. Manhole Lining



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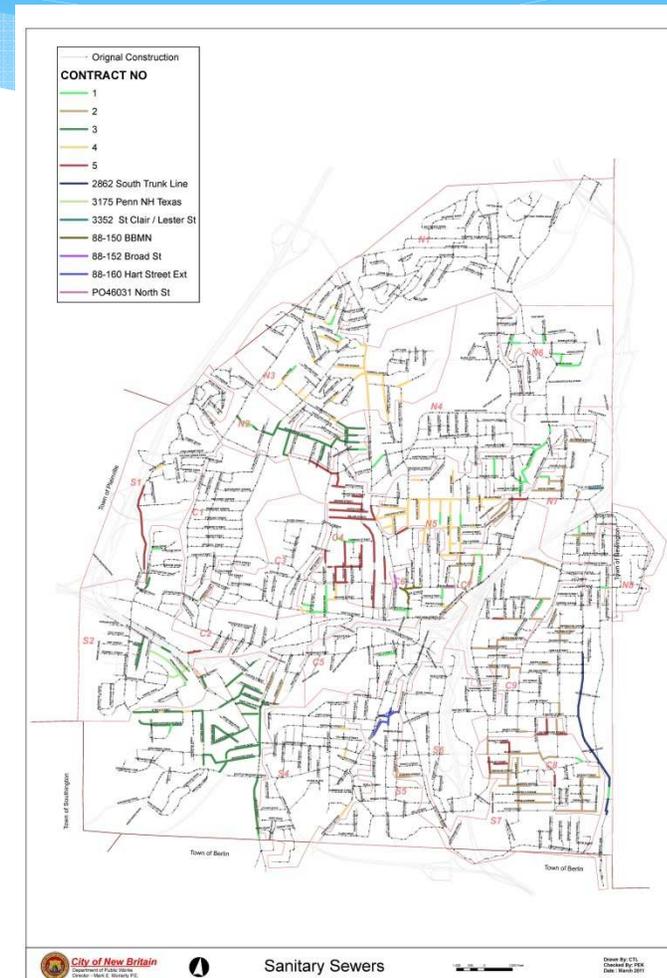
SANITARY SEWER SYSTEM

Sanitary Sewer Rehabilitation History

- * 7 specific projects between 2000 & 2012
- * 5 street projects with sewer system upgrades
- * 28.15 miles lined (16%)
- * Over a \$15 Mil. investment

2018 Sewer Rehabilitation Project

- * 1st Comprehensive Rehab. Project (includes service laterals)
- * Focus on Areas C9 and N1
- * Public Bid 3940, \$2.5 Mil. Construction
- * Green Mountain Pipeline Services Contractor



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SANITARY SEWER SYSTEM

US EPA CMOM Order

- * CMOM stands for “Capacity, Management, Operations and Maintenance”
- * New Britain wasn’t targeted –
 - * US EPA investigated the Sanitary Sewer Systems for the primary Mattabassett District Communities (New Britain, Berlin, Cromwell and Middletown)
 - * Investigations were related to the federal funding the Mattabassett District received for the recent upgrades to the treatment plant (approx. \$100 Mil)
 - * CMOM Compliance Orders issued for all four communities
 - * Biggest impact is the specific I&I reductions targets established
 - * Will require a \$20 Mil. investment in the City’s Sanitary Sewer System over the next 10 years
 - * City required to file annual report to the US EPA



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WATER RATE COMPARISON

FY-19 Sewer Rates Comparison

Community	Sewer Rate per Hundred Cubic Feet (\$/hcf)
Manchester	\$5.11 / HCF
Meriden	\$4.69 / HCF
MDC Communities (Hartford, East Hartford, Newington, Wethersfield, Rocky Hill, Bloomfield, Windsor, West Hartford)	\$4.64 / HCF (mostly paid "Ad Valorem as part of their property taxes)
Berlin	\$5.72 / HCF
New Britain	\$4.30 / HCF



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SANITARY SEWER SYSTEM

The Sanitary Sewer System – Moving Forward

- * Our aging sanitary system will continue to require a lot maintenance & investment to sustain
- * Taking steps to achieve compliance US EPA CMOM Order
- * Aggressive Comprehensive Sewer Rehabilitation Process planned that involves:
 1. Sewer Main Lining
 2. Sewer Lateral Lining
 3. Sump Pump Reduction
 4. Manhole Lining
- * Trying to achieve EPA Compliance without overly burdening the City's residents and businesses with sewer rate increases

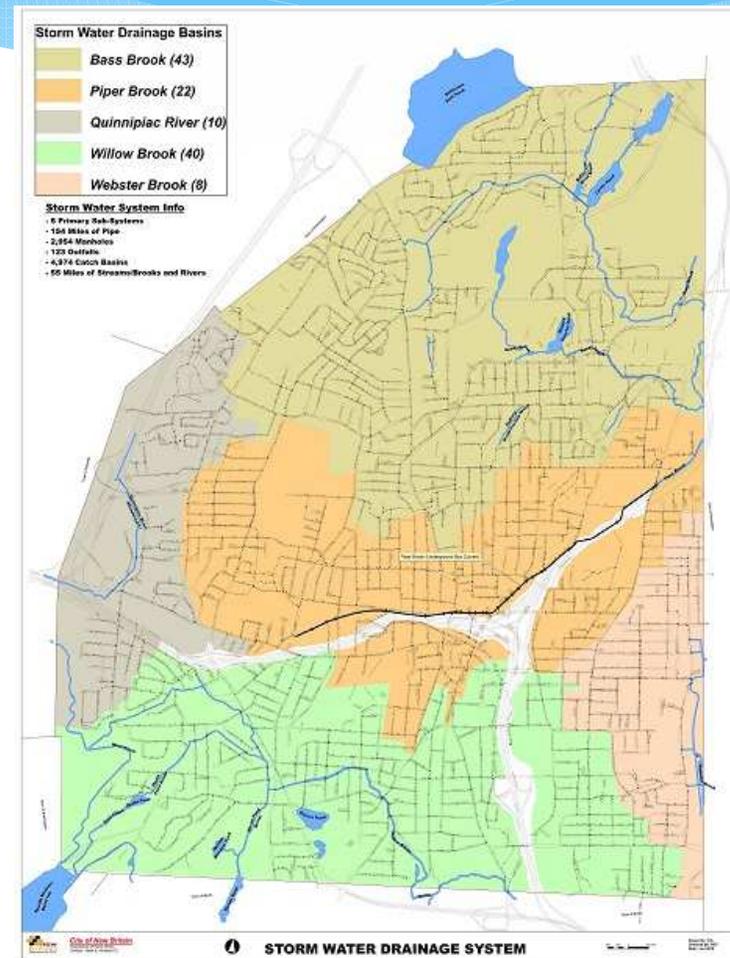


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STORM WATER COLLECTION SYSTEM

Storm Water Drainage Collection System

- * 5 Sub-basins:
 - Bass Brook
 - Piper Brook
 - Quinnipiac River
 - Willow Brook
 - Webster Brook
- * 123 Systems & Outfalls
- * 154 Miles of Pipe
- * 2,954 Storm Sewer Manholes
- * 4,974 Catch Basins
- * 55 Miles of Streams & Brooks



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STORM WATER COLLECTION SYSTEM

Storm Sewer Regular Maintenance & Activities

- * Catch Basin Cleaning Program
 - * Approx. 100 Priority Catch Basins in Areas prone to Flooding (clear grate)
 - * Catch Basin interior cleaning, Performed by Snow Route, Completed approx. 350 in 2018
- * Structure Repairs, Adjustments, and Replacement
- * Annual Paving Program Related Structure Work
- * Tree Root Related Cutting & Cutting
- * Right-of-Way Maintenance
- * CT DEEP MS4 Permit Compliance
 - Illicit Discharge Detection and Elimination
 - Dry weather and Wet weather storm runoff sampling
 - Stream & Brook maintenance (flooding related)



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STORM WATER COLLECTION SYSTEM



[City Mason Installing New Catch Basin Top](#)



[PW Utility Worker Clearing Blocked Storm Drain During Flooding](#)



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STORM WATER COLLECTION SYSTEM



Sand Bagging on the West Canal that feeds Shuttle Meadow Reservoir (January 24, 2019)



Flooding Frequency Increasing
Sign of the Times