

Exeter-Stratham Intermunicipal Water and Wastewater Study Public Presentation August 21, 2012

Prepared By Kleinfelder For The
Rockingham Planning Commission



Background

Both Exeter and Stratham face significant short and long term capital expenditures for water and sewer.

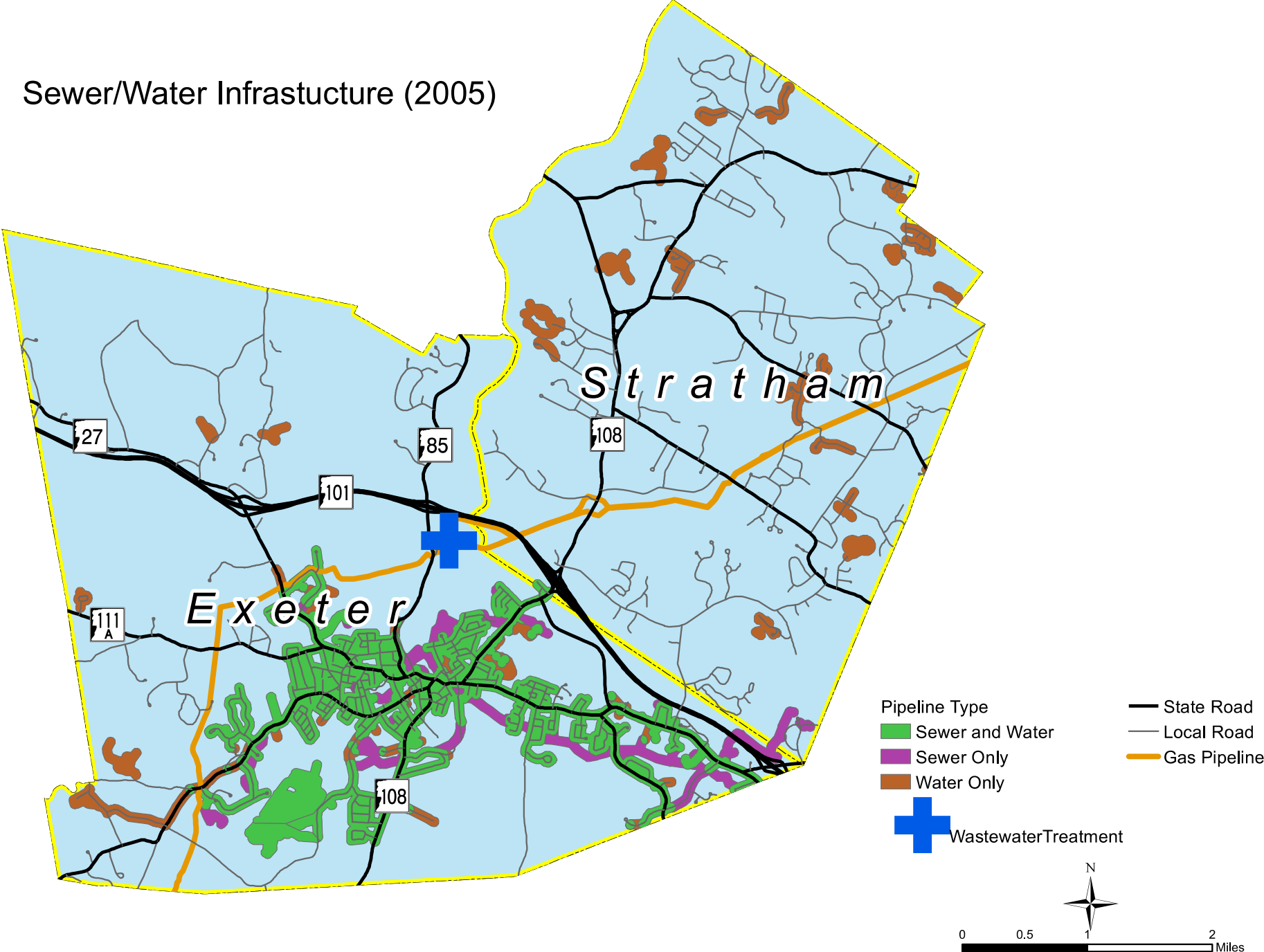
- Exeter:

- Water supply & treatment (~\$ 6.6M)
- Sewage collection, permitting and treatment (~\$42.6M-\$59.1M)
- Relatively static user base

- Stratham:

- Full implementation of Gateway District will require both water (~\$9.7M) and sewer (~15.0M) services
- Small existing user base in District

Sewer/Water Infrastucture (2005)



Proposed:
"Gateway Commercial Business District
Regulating Plan"
Town of Stratham, NH
[revised Dec 22, 2009]

Legend

Proposed Gateway District Boundary
[Red outline]

Proposed Roads
— Roadway
— Street
— Avenue
--- Existing Waterway
--- Existing Road

Proposed Gateway Zones
Outer Zone
Central Zone
Open Space Zone
Open Space Zone (Private)

Town Parcels
[Yellow outline]

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THE BOUNDARY OF THE DISTRICT IS NOT A GUARANTEE OF THE TOWN'S ABILITY TO ENFORCE THE DISTRICT REGULATIONS. THE TOWN OF STRATHAM IS NOT RESPONSIBLE FOR THE ACTIONS OF ANY INDIVIDUAL OR ENTITY. THE TOWN OF STRATHAM IS NOT RESPONSIBLE FOR THE ACTIONS OF ANY INDIVIDUAL OR ENTITY. THE TOWN OF STRATHAM IS NOT RESPONSIBLE FOR THE ACTIONS OF ANY INDIVIDUAL OR ENTITY.

DATE REVISION
The proposed Gateway District Boundary with minimum and maximum lot sizes and the proposed maximum lot sizes provided by a zoning committee and the town of Stratham.
The town of Stratham is not responsible for the actions of any individual or entity. The town of Stratham is not responsible for the actions of any individual or entity. The town of Stratham is not responsible for the actions of any individual or entity.



Central Zone (blue)

(Most intense development)

- Mixed Use
- Commercial
- Business/Retail

Outer Zone (red)

(Less intense development)

- Mixed Use
- Commercial
- Business/Retail
- Residential

Open Space Zone

- Natural areas
- Parks, commons, walking paths, gardens

The Start

October 7, 2010, Cooperative Middle School:

***“Community Discussion on the Future of Stratham
and Exeter Water and Waste Water Systems”***

- Detailed Presentations from Exeter and Stratham on specific facility needs and expenditures
- Initial discussion of options for collaboration
- OUTCOME: Consensus to explore feasibility of cooperative effort.

Timeline

- **Spring 2011:** Towns ask RPC to act as facilitator, to develop scope for a feasibility study and seek CZP Grant;
- **Summer 2011:** CZP Grant denied; Towns continue with scaled back study scope;
- **Fall 2011:** RPC issues RFP to 7 engineering firms; joint Exeter/Stratham/RPC committee selects Kleinfelder/SEA;
- **January – May, 2012:** study proceeds; three workshops held: Technical Feasibility; Infrastructure Cost; Financial Collaboration.
- **August 2012:** Draft Study released
- **Sept – Oct 2012:** Study Concludes; Towns consider next steps

Study Objectives

To answer these questions:

1. *Will Exeter have **sufficient capacity** to share water and/or sewer services?*
2. *Is it **feasible**, from a technical and engineering standpoint, to share water and/or sewer services?*
3. *Will it be **less expensive or more expensive to cooperate** than to proceed independently?*
4. *If feasible and cost effective, what types of **intermunicipal agreements** and cost sharing approaches can be used?*

FIGURE 3-1
STRATHAM POTABLE WATER
STAGING

To Interconnection
with Exeter

Scope of Initial
Project (in blue)

Water
Tank

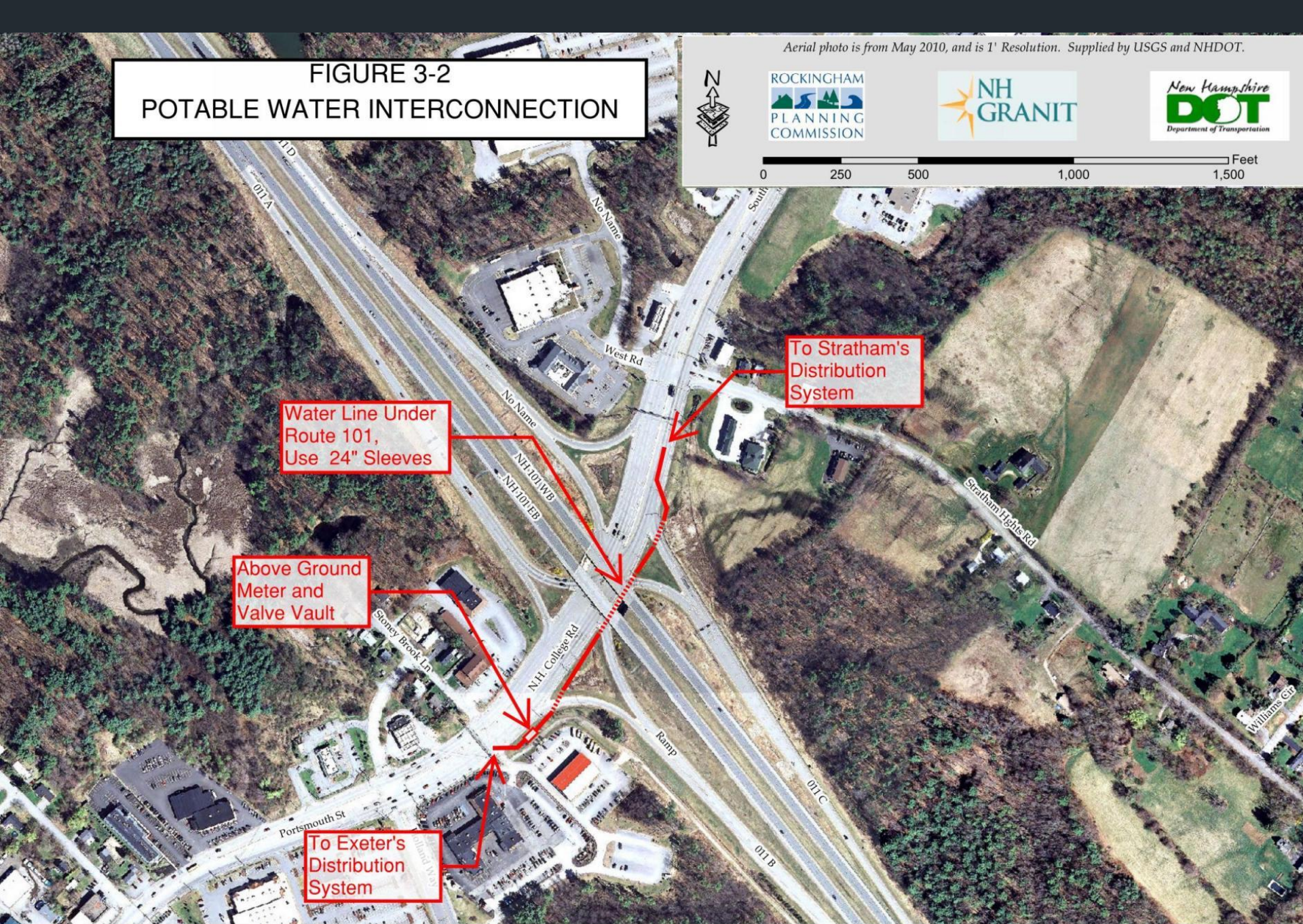
Scope of Future
Project (in red)

FIGURE 3-2
POTABLE WATER INTERCONNECTION

Aerial photo is from May 2010, and is 1' Resolution. Supplied by USGS and NHDOT.



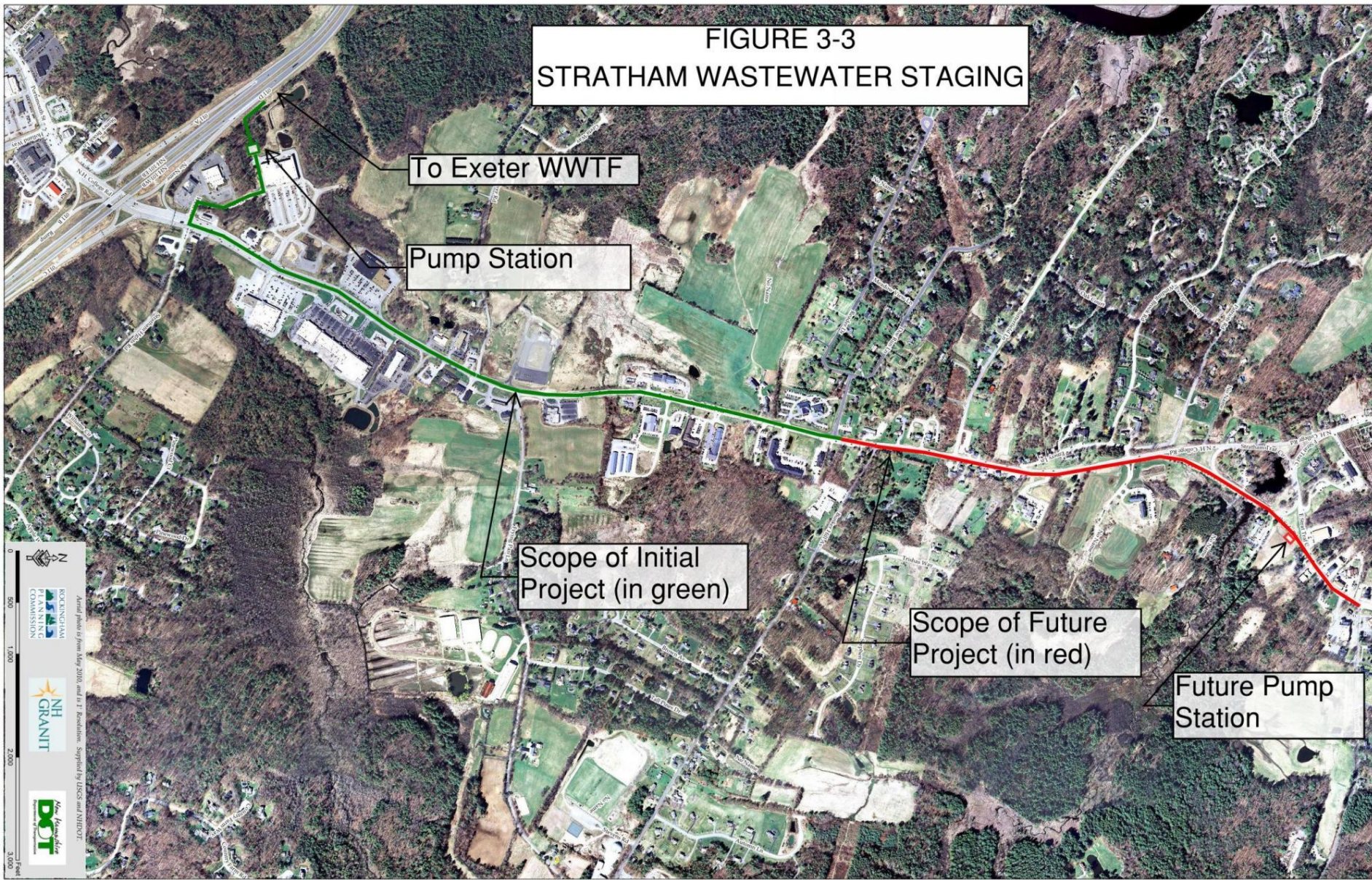
0 250 500 1,000 1,500 Feet



Summary of Water Evaluation

- ✓ Exeter has spare production capacity to meet Phases 1 & 2 of Stratham water system expansion (with new GW treatment plant).
- ✓ Future groundwater supply in Stratham could augment future capacity for both communities
- ✓ Providing peak fire flows to Stratham requires new 1.0 MG storage tank at Bunker Hill.
- ✓ Water interconnection via existing conduit sleeves under east side of Rte. 108 / Rte 101 interchange. (Good planning!)

FIGURE 3-3
STRATHAM WASTEWATER STAGING



Summary of Wastewater Evaluation

- Exeter's WWTF has **sufficient average daily capacity** (after 40% reserved for future growth in Exeter) to fully meet Stratham Phase 1 Buildout and most of Phase 2.
- Exeter's WWTF currently has **insufficient existing peak flow capacity** to meet Stratham Phase 1 or Phase 2 needs, however:
 - It will have sufficient capacity to meet *initial* Phase 1 needs after implementing Jady Hill sewer ***inflow/ infiltration*** project
 - Sufficient capacity to meet *full* Phase 1 buildout (20 year horizon) will require further I&I projects or change in WWTP design flow
 - Exeter has I/I of approx. 1.0 MGD.
- A direct interconnection between Stratham and Exeter WWTF (pump station in Stratham and dedicated force main to WWTF) is required and feasible.

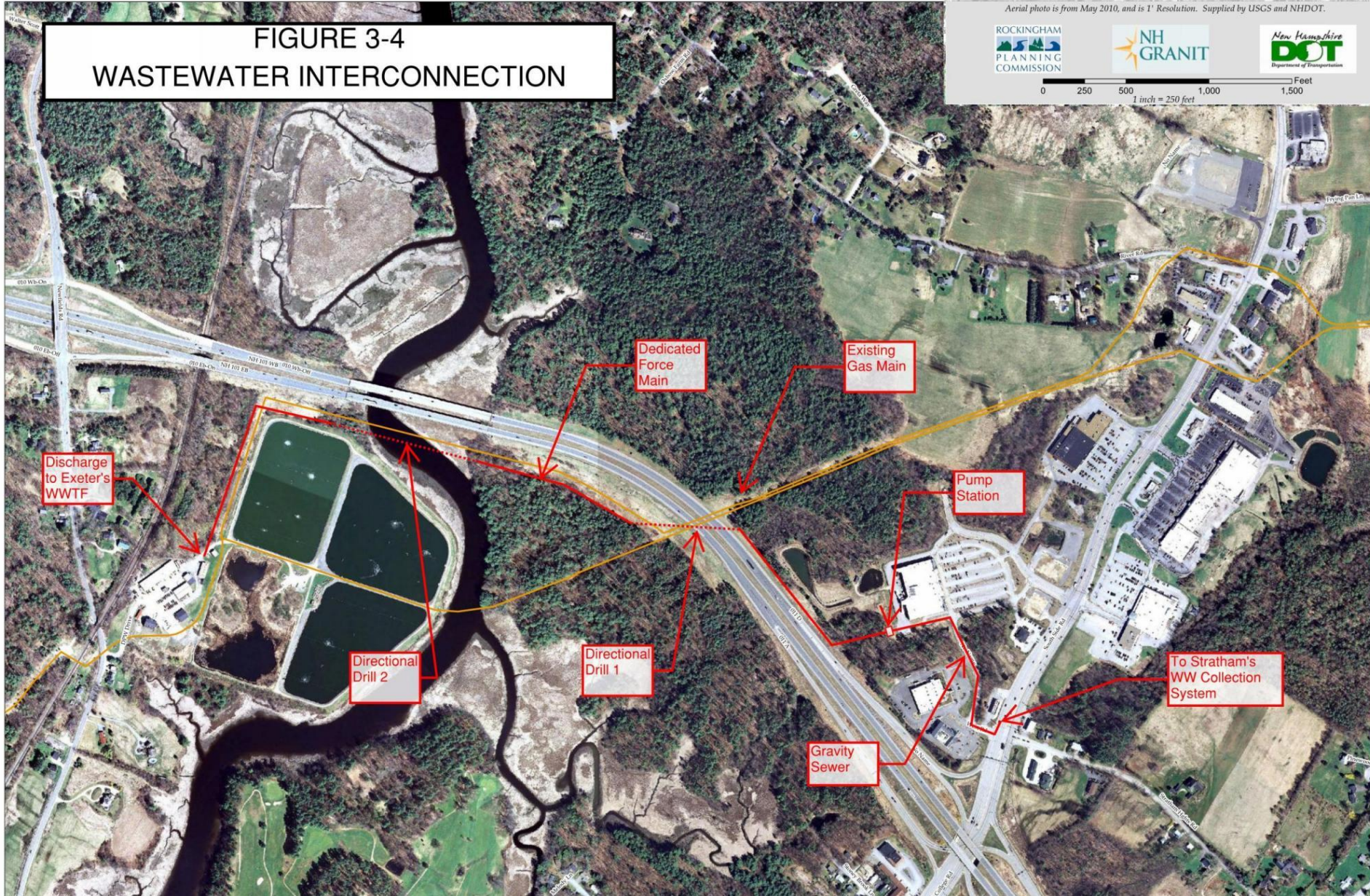
Inflow and Infiltration (“I&I”)

Infiltration: ground water that seeps into the sanitary sewer through cracks or joints.

Inflow: rain water that enters the sanitary sewer through holes in manhole covers, catch basins, or improper plumbing connections.



FIGURE 3-4 WASTEWATER INTERCONNECTION



Wastewater: Peak Capacity & Flows

Description	Flow/Capacity (MGD)	
	Existing	Future
Exeter WWTF Capacity (Peak Flow)	7.5	7.5
Exeter Peak Flow	-6.0	-7.4
Exeter Spare WWTF Capacity (Peak Flow)	1.5	0.1
Stratham Peak Flow – Phase 1 (Initial)	-	-0.45^a
Peak I/I Removal from Jady Hill Improvements	-	0.36
Exeter Spare WWTF Capacity (Peak Flow following Stratham Phase 1/Initial)	-	0.01
Stratham Peak Flow – Phase 1 (Buildout)	-	-0.94^a
Additional Peak I/I Removal Required for Stratham Phase 1 (Buildout)	-	0.48
Stratham Peak Flow - Phase 1 & 2 (Buildout)	-	1.52

a. Stratham peak flows determined by applying appropriate peaking factors to avg. flows from previous slide).

Economic Model Development

- Financial Collaboration Workshop held to discuss and evaluate possible ownership options (i.e. cost sharing principles)
- 3 Modeled ownership options:
 - *Independent Option*
 - *Collaborative/Capital Investment Option*
 - *District Option*

EXETER/STRATHAM WATER AND WASTEWATER STUDY

SUMMARY OF ECONOMIC MODEL RESULTS

Description of Approach	Annual Unit Cost of Operation (\$/1000 gallons)				Approx. 20 Year Savings Over Independent Approach (\$)	
	Initial		Future		Exeter	Stratham
	Exeter	Stratham	Exeter	Stratham		
Water:						
Independent Option	\$8.83	\$20.91	\$6.30	\$10.11	-	-
Collaborative - Capital Investment Option ¹	\$8.48	\$17.15	\$5.74	\$8.41	\$3,809,117	\$4,229,827
District Option ²	\$8.40	\$16.46	\$5.62	\$9.08	\$4,660,844	\$3,756,795
Wastewater (8 mg/l Assumption):						
Independent Option	\$7.41	\$29.59	\$5.83	\$13.38	-	-
Collaborative - Capital Investment Option ¹	\$7.13	\$13.31	\$5.28	\$7.43	\$6,866,229	\$18,268,842
District Option ²	\$7.05	\$13.65	\$5.20	\$8.00	\$8,157,484	\$17,261,570
Wastewater (3 mg/l Assumption):						
Independent Option	\$10.18	\$29.59	\$8.40	\$13.38	-	-
Collaborative - Capital Investment Option ¹	\$9.72	\$15.44	\$7.50	\$9.39	\$11,175,797	\$14,203,650
District Option ²	\$9.60	\$16.21	\$7.41	\$10.20	\$12,838,747	\$12,580,306

Cost Savings - summary

Scenario		20 Year Cost Savings		% Savings in Unit Cost of Oper	
WATER		Exeter	Stratham	Exeter	Stratham
Collaborative		\$3.8M	\$4.2M	~8-10%	~11-17%
District		\$4.7M	\$3.8M		
WASTEWATER		Exeter	Stratham		
Collaborative		\$11.1M	\$14.2M	~9-11%	~39-45%
District		\$12.8M	\$12.5M		
BOTH		Exeter	Stratham		
Collaborative		\$14.9M	\$18.4M	NA	NA
District		\$17.5M	\$16.3M		

Recommendations

- Develop Exeter/Stratham Working Group to:
 - Reach consensus regarding whether to proceed and preferred ownership option
 - Confirm/modify Capital and O&M cost sharing rationale and assumptions
 - Initiate discussions regarding framework for a potential Intermunicipal Agreement (IMA)
- Initiate discussions with NHDES and USEPA re: permitting ramifications
- Explore potential avenues for funding



Comments & Questions?





Kleinfelder Scope of Study

- Assess the feasibility and costs of cooperative approach
- Perform demand/capacity analysis
- Identify infrastructure required for interconnections
- Develop capital and O&M costs
- Assess feasibility of different ownership alternatives
- Develop economic model
- Issue summary report, including recommendations

- 
- ## Wrap Up / Next Steps
- Solicit written public comments within the next 30 days. Submit comments to:

Theresa Walker
Rockingham Planning Commission
156 Water Street, Exeter, NH 03833
twalker@rpc-nh.org

- Finalize Report (end of September)
- Hold future joint meeting(s) with governing bodies of Stratham and Exeter to determine preferred option



Exeter Water System

- Surface water treatment plant
 - 2.0 MGD capacity (2.3 in winter)
- Three (3) existing groundwater wells
 - Stadium and Gilman wells not currently active
 - Lary Lane well active, though use is limited
- New groundwater treatment plant
 - 1.4 MGD capacity
- Combined capacity = 3.4 MGD

Water: Avg. Capacity & Demand



	Demand/Capacity (MGD)	
Description	Existing	Future
Exeter Combined Treatment Capacity	2.0	3.4
Exeter Avg. Day Demand	-1.1 ^a	-1.25 ^b
Exeter Spare Production Capacity (Avg. Day)	0.9	2.15
Stratham Avg. Day Demand – Phase 1 (Initial)	NA	-0.15
Stratham Avg. Day Demand – Phase 1 (Buildout)	NA	-0.35
Stratham Avg. Day Demand - Phase 1 & 2 (Buildout)	NA	-0.35

a. Exeter Water Supply Alternatives Study by Weston and Sampson, 2010

b. Demand Projections Study referenced in Exeter Water Supply Alternatives Study by Weston and Sampson, 2010

c. Buildout of Exeter Water Supply Alternatives Study by Wright-Pierce, 2010

Water: Max Capacity & Demand



	Demand/Capacity (MGD)	
Description	Existing	Future
Exeter Combined Treatment Capacity	2.0	3.4
Exeter Max Day Demand	-1.7 ^a	-2.0 ^b
Exeter Spare Production Capacity (Max Day)	0.3	1.4
Stratham Max Day Demand – Phase 1 (Initial)	NA	-0.27
Stratham Max Day Demand – Phase 1 (Buildout)	NA	-0.63
Stratham Max Day Demand - Phase 1 & 2 (Buildout)	NA	1.00 ^c

a. Exeter Water Supply Alternatives Study by Weston and Sampson, 2010

b. Demand Projections Study referenced in Exeter Water Supply Alternatives Study by Weston and Sampson, 2010

c. Stratham City Water Department average day peaking factor = 1.8



Stratham Future Water System

- No existing municipal water system
 - Rte. 108 corridor currently served by private wells
- Initial phases of new system require:
 - New groundwater well and treatment system
 - New water storage tank off Bunker Hill Ave.
- Assumed Phase 1 includes new water main in Rte. 108 from Exeter town line to Bunker Hill Ave.
- Assumed Phase 2 includes extension of water main in Rte. 108 from Bunker Hill Ave. to Town Center

Previous Studies

- Stratham - Fire Suppression System and Potable Water System Study (Wright-Pierce, 2010)
- Stratham – Overview of Water and Wastewater Systems (Stratham Public Works, 2010)
- Stratham – Wastewater Management Concept Plan (Wright-Pierce, 2011)
- Stratham – Groundwater Supply Investigation (Wright-Pierce, 2011)
- Exeter – Water Efficiency and Management Plan (Weston and Sampson, 2011)
- Exeter – Water Supply Alternatives Study (Weston and Sampson, 2010)
- Exeter – Safe Yield Analysis (Aquarion, 2003)
- Exeter – Water System Evaluation Study (CDM, 2002)



Exeter Wastewater System

- Wastewater treatment facility (WWTF)
 - 3.0 MGD capacity (avg. day)
 - 7.5 MGD capacity (peak)
 - Major plant upgrade required soon to address new nutrient permit limits
- Infiltration/inflow (I/I) significant source of flow at WWTF
- Current Jady Hill Improvements Project will reduce I/I



/S

Description	Flow/Capacity (MGD)	
	Existing	Future
Exeter WWTF Capacity (Avg. Day Flow)	3.0	3.0
Exeter Avg. Daily Flow	-2.0 ^a	-2.4 ^b
Exeter Spare WWTF Capacity (Avg. Day Flow)	1.0	0.6
Stratham Avg. Day Flow – Phase 1 (Initial)	NA	-0.17^c
Stratham Avg. Day Flow – Phase 1 (Buildout)	NA	-0.39^c
Stratham Avg. Day Flow – Phase 1 & 2 (Buildout)	NA	-0.66 ^c

a. WWTF operating data for 2010 and 2011

b. Wastewater growth assumed 20% (water growth + 5%)

c. Projected Stratham wastewater flows = projected Stratham water demands + 10% allowance for I/I



Stratham Future Wastewater System

- No existing municipal wastewater system
 - Rte. 108 corridor currently served by private septic systems
- Initial phases of new system require:
 - Main pumping station and force main
 - Wastewater treatment and groundwater discharge facility
- Assumed Phase 1 includes new sewer in Rte. 108 from Exeter town line to Bunker Hill Ave.
- Assumed Phase 2 includes extension of sewer in Rte. 108 from Bunker Hill Ave. to Town Center