Granite State Gas Transmission Study Results Presented to the New Hampshire Public Utilities Commission

February 18, 2011

Unitil

Agenda

- Introduction
- Executive Summary
- Granite State Gas Transmission ("GSGT" or "Granite") – System Overview
- Granite Key Projects Overview
- Granite Study
  - Overview
  - Analysis
  - Findings
  - Regulatory and Legal Analysis
- Conclusion

Executive Summary - Background

- Pursuant to Orders approving Unitil's acquisition of Northern, Unitil agreed to perform a comprehensive collaborative study of the structure and operations of Granite and Northern in coordination with the other parties and Staff.
- The stated purpose of the study was to assess *whether the customers of Northern and Granite would be better served by integrating them or otherwise reorganizing them and their operations.*
- Commission Staff's in NH and ME were concerned about three things:
  1. Transparency and safety oversight of Granite
  2. Costs of Integrity Management
  3. Unitil's experience managing a transmission pipeline
- Jurisdictional issues:
  - Jurisdiction for ratemaking purposes (currently FERC)
  - Jurisdictional implications under federal pipeline safety rules (PHMSA)

Executive Summary - Study Areas and Outcomes

Areas of Inquiry

- Network Planning
- Transmission Integrity Management (IM) Costs
- Operational Impacts
- Supply Contracts
- Marketers/Suppliers
- Legal/ Regulatory

Actions Following Outcome of Study

Should this study lead to a conclusion that de-rating the pipeline and filing for an exemption from PHMSA regulation and FERC jurisdiction is the most effective long term solution for Northern and Granite, given due consideration to factors including planning, costs, operations, management of supply, access for third party suppliers, reliability, safety, and the public interest, Unitil agrees to file an appropriate plan with the Maine and New Hampshire Public Utilities Commissions and, if consistent with the findings of the Commissions of Maine and New Hampshire, to cooperate in seeking approval of the plan from the federal agencies.

Executive Summary - Conclusions

- De-rating the pipeline is not a feasible or cost effective alternative.
- Maintaining the Granite pipeline in its current operating configuration, and at its current operating pressure, provides the greatest benefits to customers.
- With all factors considered (planning, costs, operations, management of supply, access for third party suppliers, reliability, safety), no other alternative provides comparable economic or operational benefits to customers
- Several projects addressed in the GSGT Study have deadlines that require action.

Pressing Deadlines

2011 – Final Solution for Little Bay Bridge Crossing.

2012 – All remaining Integrity Management (IM) work including baseline assessments of HCA's must be complete.

2013 – Construction to remove pipeline from Little Bay Bridge.

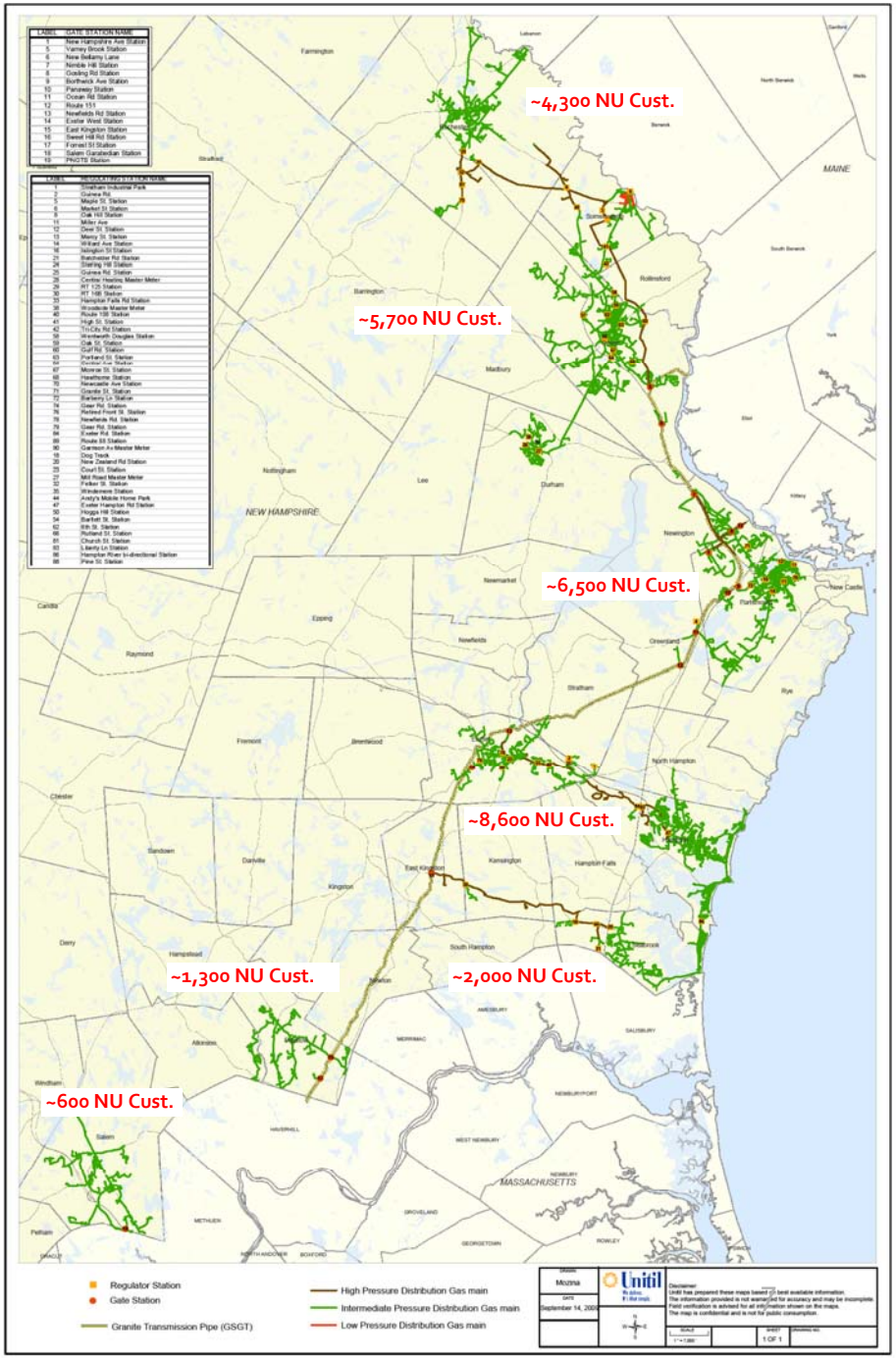
Granite System Overview

Granite System Overview

- Metrics: 87 miles of gas transmission pipeline in NH, ME and MA
  - Initial seven mile segment built in NH in 1950's
  - Began operation in 1956 and additional 76 miles installed by 1966 (MA&ME)
  - 97% of installed pipe is 10" or less in diameter
- Granite Customers
  - LDCs
  - Marketers
  - End users
- Reliable Configuration
  - Multiple Delivery Points (North, South and Mid-Point)
  - Operational and Supply Flexibility
  - Redundancy for Loss of Supply Point
- Current Operation: GSGT, from an engineering, IM, and gas supply perspective is managed as an integrated pipeline operated at transmission pressures

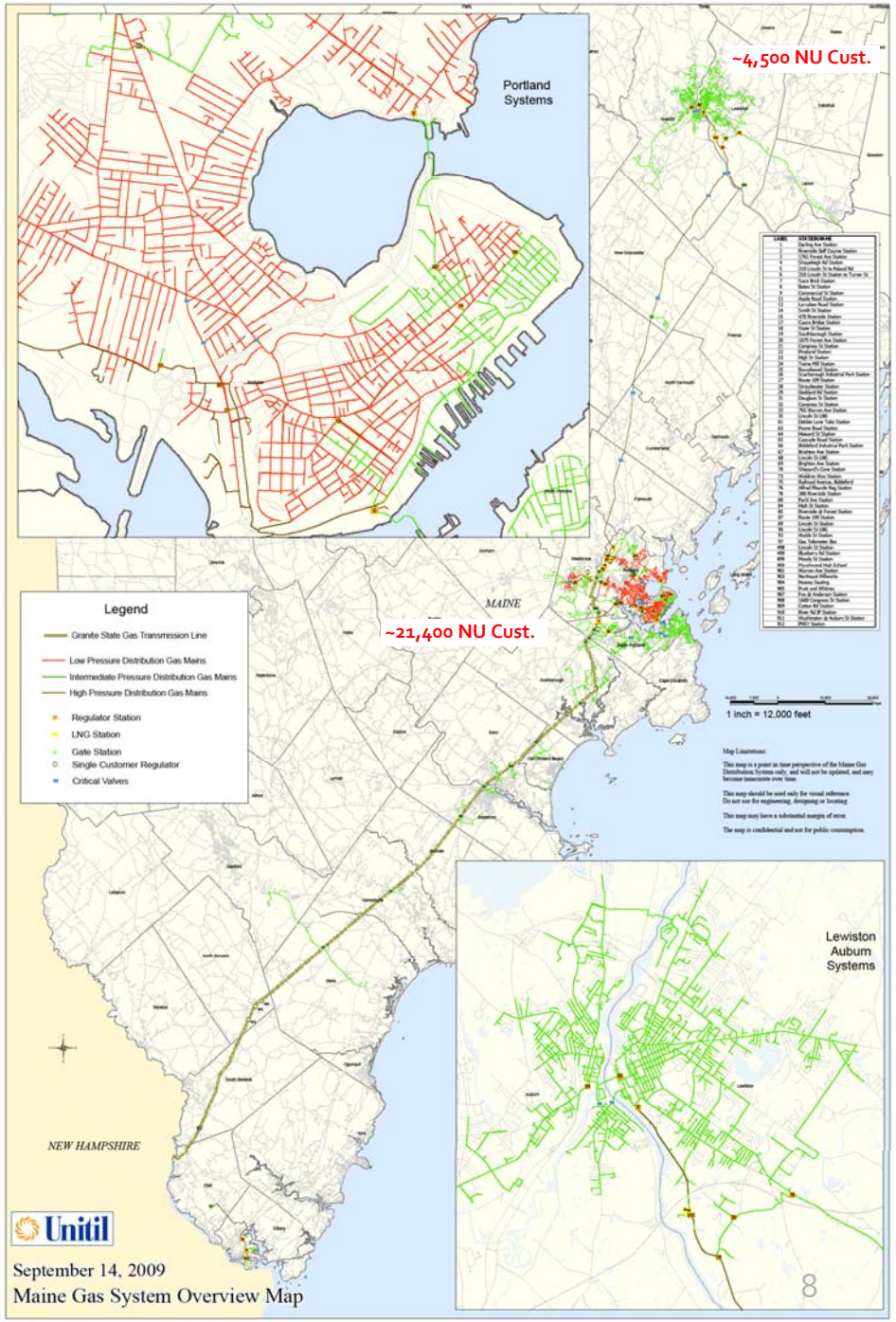
GSGT – NH & MA

- Gate Station in Newington, NH
  - Interconnection: Portland Natural Gas Transmission (PNGTS) - 50,000 Dth
- Gate Station in Haverhill, MA
  - Interconnection: Tennessee Gas Pipeline (TGP) – 35,800 Dth
- 39 Pipeline miles (<1 mile in MA)
- 19 Regulator Stations
- ~29,000 NU customers
- MAOP 492 psig
  - (750 psig between Haverhill and Plaistow)



GSGT - ME

- Gate Station in Westbrook, ME
  - Interconnection: Joint Facilities – 69,000 Dth
- 47 Pipeline miles
- 19 Regulator Stations
- ~26,000 NU customers
- MAOP 492 psig



Granite Key Projects Overview

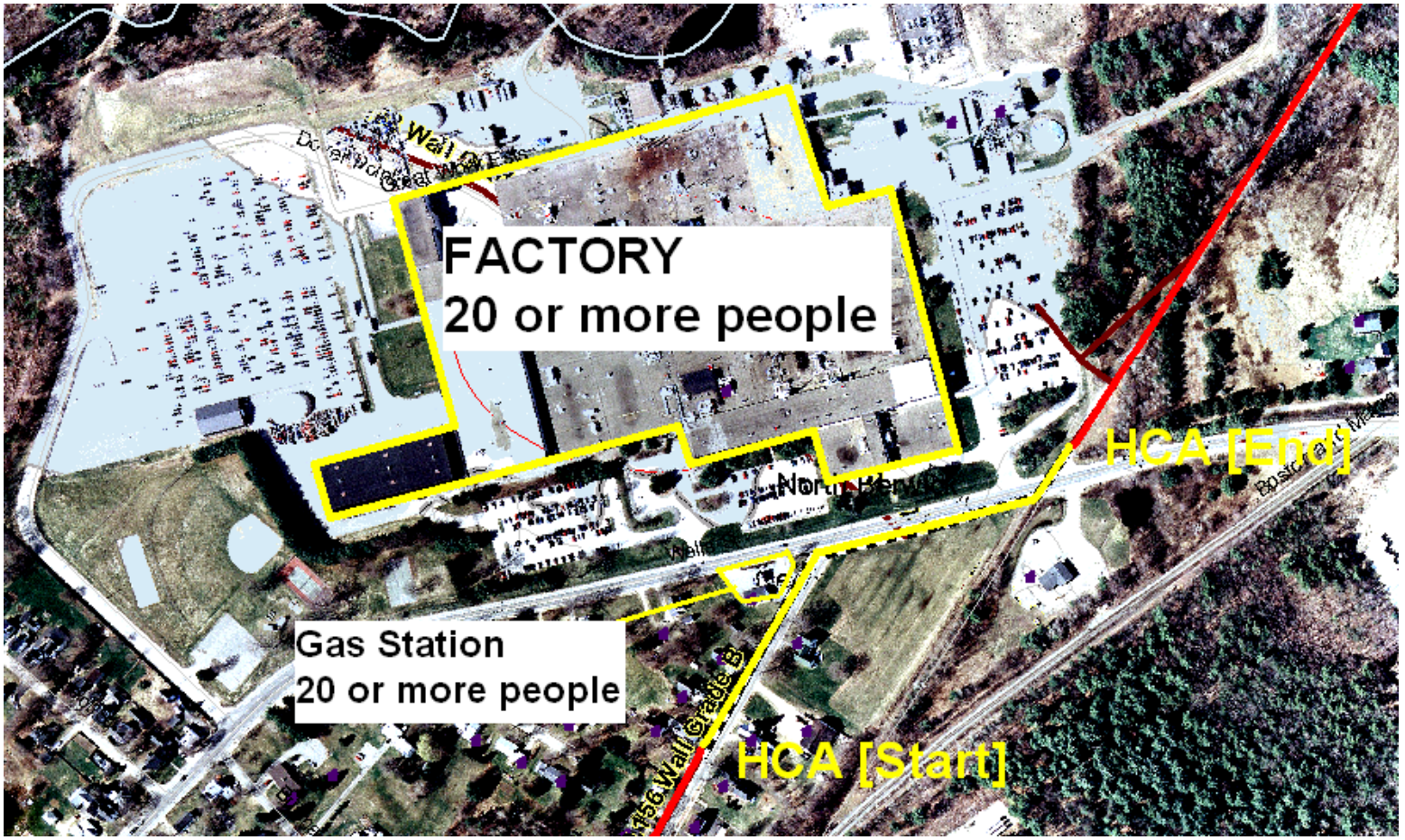
GSGT – IM Status

- In compliance with the Gas IM Rule, GSGT has identified 41 HCAs
- There is approximately 10.5 miles of GSGT pipeline located in the identified HCAs
- The table below is a summary of the GSGT baseline assessment:

Years	Total HCA Assessed		Location
	Feet	Percent	
2003 - 2005	4,872	9%	New Hampshire
2006 - 2007	31,788	57%	Maine
2010 - 2011	19,204	34%	Maine: 3,199 feet (17% of total remaining) New Hampshire: 16,005 feet (83% of total remaining)
Total	55,864	100%	

Integrity Management Plan

Example of an HCA: Pratt & Whitney, North Berwick, ME



Integrity Management Plan

Unitil

Example of Upgrade work to Prepare for Pigging

Disbonded Coating

What is Disbondment:

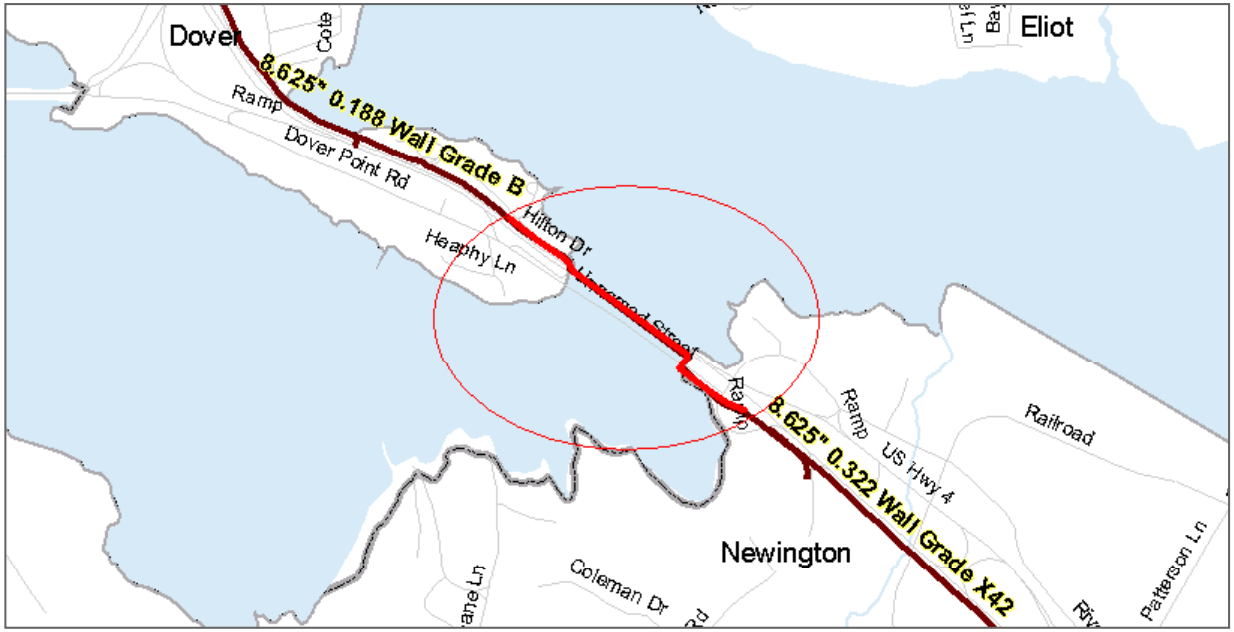
- The separation of the pipe coating from the substrate (steel pipe)
- Caused by:
  - Improper surface preparation,
  - by poor application of the coating in the factory or in the field,
  - non compatible coatings and adhesives,
  - by an inferior adhesive, or
  - by bacterial degradation due to improper installation of certain types of binders and fillers used in the coating.
- Common result of damage
  - Water absorption affects cathodic protection
  - Shielding affects cathodic protection
  - Corrosion testing cannot determine protected pipe from unprotected pipe.
  - History is developed at excavation sites where condition exists

<u>Alternatives</u>

- Replace
- Re-apply coating
- Remove from service

Little Bay Bridge

- Relocate the existing pipeline that spans Little Bay Bridge
  - 2010 – Relocate existing pipeline on the bridge
  - 2013 – Install new river crossing using Horizontal Directional Bore (HDD) technology (approximately 2,500 feet)
- Benefits of the HDD solution for Little Bay Bridge:
  - Lower maintenance costs compared to conventional bridge span
  - Maintain system integrity and reliability of supply
  - Remove uncertainties of siting a gate station
  - Lower total cost solution than adding a gate station



Little Bay Bridge

HORIZONTAL DIRECTIONAL BORE:

BEFORE

AFTER

Granite Projects Overview

- Three engineering projects that Granite needs to address:
  - Integrity Management
  - Disbonded Coating Pipe Replacement
  - Little Bay Bridge Reconstruction by NH DOT
- Cost Estimates

	Unloaded Cost Estimates			Fully Loaded Cost Estimates		
Unloaded Cost Estimates (Dollars)	GSGT Study Report	Current Estimates	Difference	GSGT Study Report	Current Estimates	Difference
IMP Capital Costs	1,440,000	1,911,360	471,360	1,656,000	2,198,064	542,064
Disbonded Pipe Replacement	4,750,000	4,739,130	(10,870)	5,462,500	5,450,000	(12,500)
Little Bay Bridge (2011 - 2013)	2,725,000	2,750,435	25,435	3,133,750	3,163,000	29,250
Total	8,915,000	9,400,925	485,925	10,252,250	10,811,064	558,814

Notes

1) The estimates in the GSGT Final Study Report were "unloaded" costs. Fully loaded costs were not provided as part of the study. The fully loaded costs here correspond to the unloaded costs shown in the GSGT Study.

2) The rate case estimates are the revised estimates discussed in settlement, not the numbers provided in the original filing.

3) Spending on Little Bay Bridge in 2010 is not included, as this was necessary under all scenarios, and hence was excluded from consideration in the GSGT study.

Granite Study Overview

GSGT Study Overview

- Objective
- Process/Timeline/Participants
- Analysis Framework
- Analysis Areas
  - Engineering/IM Approach
  - Gas Supply/Marketers
- New GSGT Scenarios
- Financial Model
- Conclusions

GSGT Study Objective

- Pursuant to the stipulations and settlement agreements signed by Unitil, NH PUC Staff, Maine OPA and New Hampshire OCA, in proceedings opened to consider petitions to allow Unitil to acquire Northern, Unitil agreed to conduct a study regarding the potential integration and/or reorganization of GSGT and Northern
- The study was to be a collaborative process
- The following areas were identified for review:
  - Network planning – reliability and cost implications with a GSGT pressure reduction
  - Integrity management – IM cost that could be avoided if GSGT was de-rated
  - Operational impacts – changes to GSGT operations if pressure was reduced or the pipeline was reconfigured
  - Supply contracts – cost, impacts, loss of flexibility
  - Marketers/suppliers – affect on customers and marketers
  - Legal/regulatory – PHMSA and FERC decertification
- The study addressed the identified issue by analyzing:
  - Impacts on GSGT if the operating pressure was reduced
  - Impacts on GSGT if the pipeline was physically reconfigured
  - The costs associated with integrity management
  - Implications associated with gas supply, marketers, regulatory issues

GSGT Study Timeline

- The Commission Orders established December 1, 2009 as the deadline for the submission of the GSGT study (one year after the Unitil acquisition of Northern)
  - First extension: Deadline extended to January 11, 2010 pursuant to Unitil's request which was submitted on behalf of all stakeholders
  - Second extension: Deadline extended pursuant to consultation with all stakeholders
    - MPUC set the deadline for the GSGT study as February 26, 2010
- Collaborative Process utilized to inform stakeholders, receive feedback and discuss issues – the table below does not reflect direct communication between the parties (e.g., conversations between Unitil engineers and Maine/New Hampshire Staff engineers)

Date of meeting / Conference Call	Participants
May 29, 2009	All parties
July 2, 2009	All parties
August 13, 2009	All parties
September 8, 2009	PUC, Unitil Engineers
September 23, 2009	PUC, Unitil Engineers
October 13, 2009	PUC, Unitil Engineers
October 14, 2009	All parties
November 10, 2009	All parties
January 5, 2010	PUC, Unitil Engineers
February 9, 2010	All parties

GSGT Report submitted on February 26, 2010

GSGT Study Participants

- The following is a list of GSGT Study participants:

Unitil
- Engineering
- Network Planning
- Operations
- Finance
- Gas Supply
- Regulatory
- Legal
- Senior Management

Stakeholders
- NH PUC Staff
- ME PUC Staff
- ME Public Advocate
- NH Consumer Advocate

- Given the complexity of the analysis, at various times Unitil had over 20 employees participating in aspects of this study (Please see the Appendix for a full listing of the GSGT study participants)
- Unitil developed and maintained a dedicated website for the posting of meeting minutes, presentations and other study-related information
- Detailed engineering information distributed via FedEx to New Hampshire and Maine PUC Staff engineers
- All party meeting to review the report on February 9, 2010

Engineering Analysis

Engineering Analysis

Unitil

Objectives:

- Documentation of existing pipeline capacity/operations
- Determine the GSGT system improvements, pipeline capacity, and cost associated with each potential system modification
- Evaluate the reliability of each alternative

Approach:

- Research and collect GSGT operating history
- Complete review of Bay State pipeline model
  - Major differences in engineering development and physical pipeline construction
- Prepare and develop hydraulic model
- Calibrate and validate hydraulic model
- Evaluate pipeline components to determine operating pressure
- Research future municipal projects and pipeline projects impacting GSGT system
- Complete analysis based on objectives as defined for this report

System Reliability Considerations

- Single-supply supporting a system having multiple distribution points
- Elimination of certain two-way feeds
- Gas industry standards and protocols
- Supply flexibility, reliability and management
- Uncertainties and Unknowns with reconfigurations
- Risk evaluated as a combination of probability and consequence

Engineering Analysis

The following matrix is a summary of the various case studies evaluated for this study:

Group 1	Transmission Pressure	–	Integrated Pipeline
	Transmission Pressure	–	Separated at NH/ME Border
	Transmission Pressure	–	Separated at Little Bay Bridge
Group 2	Distribution Pressure	–	Integrated Pipeline
	Distribution Pressure	–	Separated at NH/ME Border
	Distribution Pressure	–	Separated at Little Bay Bridge
Group 3	Hybrid	–	Integrated Pipeline
	Hybrid	–	Separated at NH/ME Border
	Hybrid	–	Separated at Little Bay Bridge

Engineering Analysis

- Based on the case studies discussed, GSGT developed a hydraulic model to evaluate the various scenarios, estimated engineering and IM costs, and evaluated system growth
  - Engineering Costs
    - Abandon Pipeline
    - New Gate Station
    - Ball valve regulator additions
    - Pipeline replacement costs
    - Little Bay Bridge crossing costs
  - Integrity Management Costs
    - Capital and O&M costs – Prior to 2012
    - Capital and O&M costs – Seven year cycle
  - Growth
    - Depending on the scenario and the cost implications, growth capability was determined by growing system demand until system instability occurred
  - Replacement of disbonded pipeline
    - GSGT has identified sections of pipe where the coating has separated from the steel pipeline, known in the industry as disbonded pipeline
    - Disbonding interferes with cathodic protection thus causing increased risk of corrosion – pipeline must be replaced in all scenarios – estimated cost $4,750,000 – not included in the GSGT study as the cost is incurred in all scenarios

- Only direct engineering costs were included in the GSGT Study – no adders or overhead

Engineering Analysis

Using the defined case studies and developing specific engineering cost estimates (e.g., gate station costs), the following table is a summary of the estimated engineering costs and growth capability for each scenario.

(Cost: $millions)		Integrated	Split at the Border	Split at Little Bay Bridge
Transmission		**Baseline 1, 2**	**Scenario 2**	**Scenario 13A**
	Cost	$2.7/$3.4	$5.0	$2.35
	Growth	20%/40%	NH 50% ME 30%	70%
Distribution		**Scenario 10**	**Scenario 3A**	**Scenario 12**
	Cost	$13.1	$16.1	$11.1
	Growth	No growth	10%	No growth
Hybrid		**Scenario 7**	**Scenario 11A**	**Scenario 5**
	Cost	$7.1	$9.1/$10.9	$4.56
	Growth	35%	0%/10%	35%

- Engineering Cost Observations
  - The four best cases:
    - Transmission – Integrated (Baseline 1 and 2)
    - Transmission – Split at Little Bay Bridge (Scenario 13A)
    - Hybrid – Split at Little Bay Bridge (Scenario 5)

Gas Supply Analysis

Gas Supply/Marketers – Current Situation

- Northern contracts for service on GSGT, and on the following pipelines that are upstream of GSGT:
  - Tennessee Gas Pipeline
  - Algonquin Gas Transmission
  - Portland Natural Gas Transmission
  - Texas Eastern Gas Transmission
  - Iroquois Gas Transmission
  - TransCanada Pipeline
  - Vector Pipeline
- Northern's capacity portfolio provides for firm delivery from upstream pipelines to GSGT at points located in Massachusetts, New Hampshire and Maine
- Northern's capacity portfolio was developed on an integrated basis. The portfolio is dispatched to meet the aggregate (New Hampshire and Maine) load
- The integrated nature of the portfolio provides reliability since Northern can utilize all of the pipeline interconnects to provide significant redundancy should one of the pipelines upstream of GSGT experience a failure
- The portfolio provides access to numerous supply areas and provides for operational flexibility, allowing Northern to optimize dispatch, reducing costs to customers

Gas Supply/Marketers – Current Situation

- As shown by the table below, the GSGT firm shippers include marketers (e.g., Shell), end users (e.g., National Gypsum) and LDCs

Customer	Contracted MDQ (Dth)	Receipt Point(s)	Delivery Point(s)
National Gypsum Co.	2,200	Pleasant Street	Gosling Road
Global Montello Group	3,500	Pleasant Street	Warren Avenue
Shell Energy NA US LP	7,050	Pleasant Street	Newington
Glacial Natural Gas	500	Pleasant Street	Forrest Street
Bay State Gas	7,000	Pleasant Street, Newington, Westbrook	6 Points
Northern Utilities	100,000	Pleasant Street, Newington, Westbrook	31 Points

- The LDC segment is the largest customer segment on GSGT
- The non-affiliated shippers hold 20,250 Dth of firm capacity and contribute approximately $700,000 in annual revenue
- GSGT also receives approximately $300,000 in discretionary service revenue from marketers such as Santa Buckley, Sprague, Hess and MetroMedia

Northern Gas Supply Implications

- Northern Gas Supply implications if GSGT is reconfigured (e.g., separated at the NH/ME border)
  - Reduced overall flexibility in the gas supply portfolio
  - Reduced reliability
    - Northern's Maine division would only be served by suppliers and capacity from the North, delivered to receipt points connected with the Joint Facilities
    - Dispatch would be more challenging and opportunities to optimize costs would be lost
  - Increased administrative/contract activity/supply cost
    - Loss of OBA flexibility – currently flows can be controlled at Pleasant Street, Newington, Westbrook and Cotton Road
    - Several GSGT scenarios require a new gate station that in turn would require contract adjustments or new contracts
    - Bay State Exchange Agreement – more complicated to implement as the exchange volume may need to be determined by the separated service areas
    - Administratively more challenging if GSGT becomes segmented, as evaluated under various scenarios
    - Under various scenarios, Northern would have less access to TGP supplies, which are generally less expensive, and significant portions of Northern's load could only be served from supplies delivered on the Joint Facilities, which are generally more expensive
    - These factors taken together increase cost and risk to customers

Marketer Gas Supply Implications

- Marketer implications if GSGT is reconfigured (e.g., separated at the NH/ME border)
  - All the third-party shippers have Pleasant Street as the receipt point. The delivery points for these contracts include locations downstream of the identified GSGT separation points (i.e., Little Bay Bridge, Maine/New Hampshire border, disbonded pipeline), as a result all these contracts would need to be amended; more importantly, upstream contract arrangements would also be impacted
  - Given the need to adjust the marketer contracts, the underlying economics that supported that contract may be changed, resulting in increased costs to our retail transportation customers
  - Currently, GSGT offers open access service to any customer that signs a firm service agreement and abides by the tariff. A reduction in GSGT value (i.e., segmented pipeline with more administrative burden) would reduce the likelihood of more GSGT third-party contracts
  - A GSGT physical separation would require third-party marketers to deliver to the specific Northern division. Currently, in New Hampshire, marketers may deliver to any GSGT point to serve New Hampshire load due to the integrated nature of GSGT
  - Administratively more challenging if GSGT becomes segmented, as evaluated under various scenarios
  - These factors could discourage marketers from serving our customers; reduced competition would likely increase costs to our transportation customers

Post-GSGT Study Scenarios (Request by NH PUC)

Post-GSGT Study - Scenarios 15 and 16

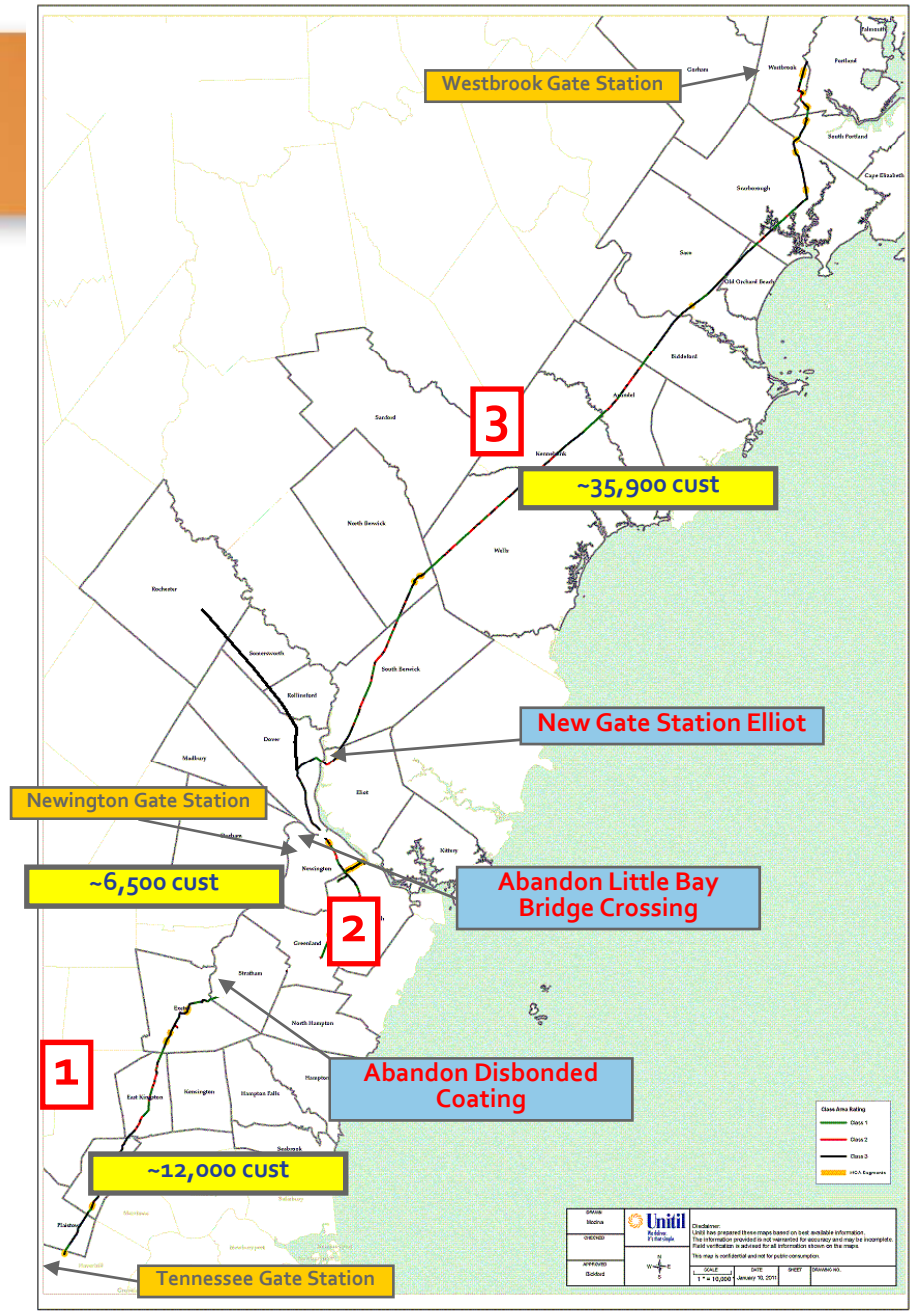
Scenario 15 (Requested by NH PUC Staff)

Three separate/stand-alone segments:

1. Pleasant Street, MA to Exeter (abandon disbonded pipeline)
2. Greenland, NH to Little Bay Bridge (abandon Little Bay Bridge crossing)
3. Little Bay Bridge to Westbrook, ME (including NU Line serving Dover, Sommersworth and Rochester)

Scenario 16 (Requested by NH PUC Staff)

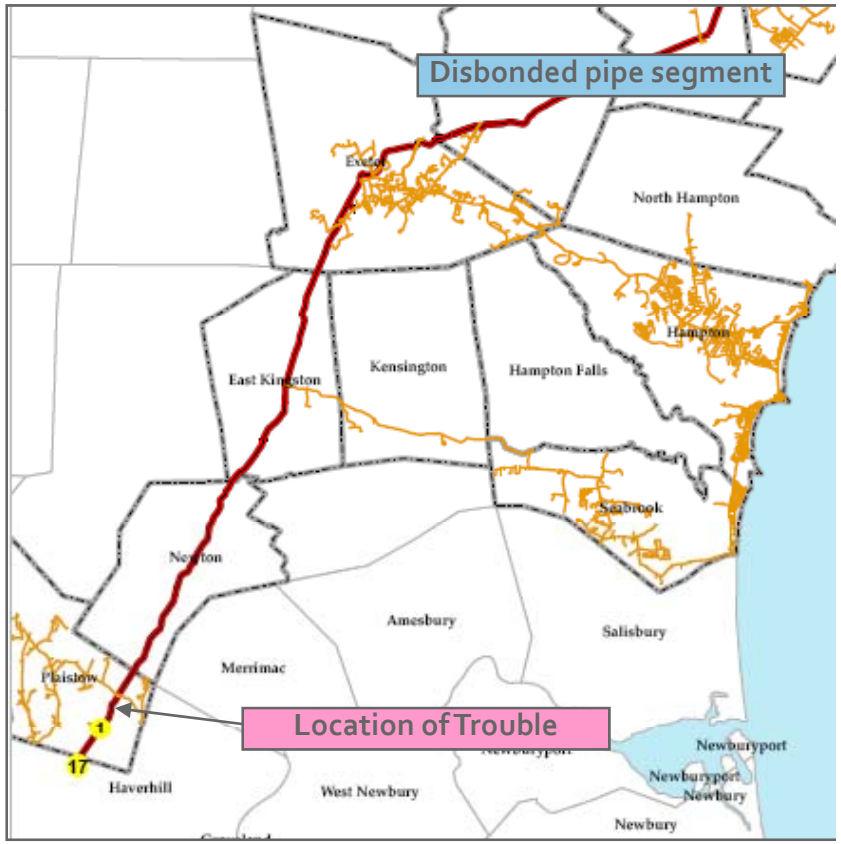
- Same assumptions as Scenario 15, but distribution pressures not transmission pressures



Post-GSGT Study - Scenarios 15 and 16

Emergency Event – Scenario 15 and 16 Configuration

- Southern most segment of GSGT serves ~12,000 customers
- Disbonded pipe segment removed - 1 way feed from Haverhill, MA
- Emergency Event (pipeline split)
  - Unitil relight crews
  - Plus 200 mutual assistance crews
  - 7-10 Day Restoration
  - Cost
    - $2.5 - $3.5 M for mutual aid crews
    - Cost of repair
- Emergency Event (existing configuration)
  - Pipeline sectionalized using valves
  - Dual feed - no customer outages
  - Cost to repair



Post-GSGT Study - Scenarios 15 and 16

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Planned Event – Portable LNG

- One Large Portable LNG Unit in Northeast
- Limited to 600 MCFH per hour peak (400-500 MCFH average)
    - Load of segregated Exeter system (700 MCFH avg, 236 MCFH min)
- Only available at certain times of the year (this winter at Virginia Beach)
- Typical space required 400’ x 400’ – between 6 (min load) and 18 trucks per day
- Cost of Portable LNG for 5 Days

Description	Cost
Portable LNG Equipment Rental	$236,057
Contract Labor Cost to Operate	$309,792
Cost of LNG	$832,000
Deduct Pipeline Cost	$(291,000)
Total	**$1,086,849**

Post-GSGT Study – Split at Little Bay Bridge (i.e. , Scenario 13A)

Scenario 13A

- Staff requested Unitil revisit Scenario 13A:
  - Transmission pressure
  - Split at Little Bay Bridge with new take station in Eliot
  - IMP and disbonded pipe projects included

Analysis

- Scenario 13A Considerations
  - Gas supply costs not currently in Scenario 13A – will increase the cost
  - Decrease in reliability and redundancy
    - Loss of Eliot station – lose 10,000 customers in NH and southern Maine
  - IMP Assessment challenges for Piscataqua River Crossing
  - Siting Eliot Station in 2 years is almost impossible
    - Risks associated with land acquisition, permitting, construction
    - Risk of delaying the Little Bay Bridge project

Post-GSGT Study Scenarios Summary

Unitil

Scenario 15 and 16

- The risks for splitting the pipeline into three segments are too great:
  - Emergency Event – 7-10 days and $2.5M - $3.5M
  - Planned Maintenance - $1 M per event
- The largest portable LNG unit in the northeast cannot serve peak load
  - Siting portable LNG in residential neighborhoods will be extremely difficult
- Availability of appropriate LNG equipment for emergency and/or planned events
- Operational flexibility for construction would be lost
- Reduced flexibility to conduct Integrity Management activities
- Increased gas supply cost
  - Stranded capacity charge on TGP of approximately $1.0 million
  - Reduces the ability to use less expensive gas from TGP (approximately $2.5 million)

Scenario 13A

- Reduced reliability and operational flexibility
- Add risks to the pipeline that do not currently exist with the current operations (i.e., Baseline)
- Increased gas supply costs

Financial Model Analysis

GSGT Study – Financial Model Analysis

- The financial model uses a Discounted Cash Flow approach to arrange and organize the capital and O&M expenses for each scenario in a manner that allows for an economically valid comparison of all the scenarios
- The major cost inputs are the system capital and IM cost estimates for each year, for each scenario
- The financial model calculates the net present value of the annual revenue requirement for each scenario
  - Scenario-specific annual revenue requirements through 2075 reflect net plant and O&M for each year
  - The scenarios are ranked by cumulative net present value of the annual revenue requirements
- The annual revenue requirements calculations include:
  - Expenses
  - Depreciation
  - Interest expense
  - Return
  - Taxes

Financial Model – Updated Results

- Unitil has made several updates and revisions to the Financial Model since the February 2010 Report was prepared.
  - Scenarios were added to consider the impact of separating GSGT at the disbonded sections (Scenarios 15 and 16)
  - Costs of replacing disbonded pipe have been added to all but Scenarios 15 and 16
  - All Engineering projects that had been assumed to occur in 2010 in the February 2010 Report are now assumed to occur in 2011
  - Deferred Income Tax formulas were modified to include deduction of state income tax from federal taxable amount
- GSGT Updated Results
  - The "Status Quo" (Baseline 1) is the lowest cost scenario.
  - The results for the "Split at LBB" Scenarios (13A and 5) are understated - the results do not include estimated incremental gas costs

	Transmission Pipeline			Hybrid Pipeline	
Configuration	**Integrated**	**Integrated**	**Split at LBB**	**Integrated**	**Split at LBB**
Scenario	**Baseline 1**	**Baseline 2**	**Scenario 13A**	**Scenario 7**	**Scenario 5**
Cumulative Net Present Value: Revenue Requirement					
2020	$8,058,027	$8,210,193	$8,502,782	$10,440,819	$8,875,686
2030	$10,797,463	$11,190,929	$11,071,388	$13,826,626	$11,536,687
Rank of Cumulative Net Present Value: Revenue Requirement					
2020	1	2	3	6	4
2030	1	3	2	6	4

Legal and Regulatory Analysis

GSGT – Legal and Regulatory Considerations

- Jurisdiction: FERC and PHMSA
- "Should this study lead to a conclusion that de-rating the pipeline and filing for an exemption from PHMSA regulation and FERC jurisdiction, or some other result, is the most effective long term solution for Northern's and Granite's customers, given due consideration to factors including planning, costs, operations, management of supply, access for third party suppliers, reliability, safety, and the public interest, Unitil agrees to propose an appropriate plan to the New Hampshire and Maine Public Utilities Commissions." DG 08-048, Settlement Agreement, Attachment B
- Section 7(f) and Hinshaw
- Regulatory Costs
  - State v. Federal
  - State v. State

Conclusion

Conclusions

Continue to operate GSGT as an integrated transmission pipeline

- Cost
  - Integrated pipeline is the least cost solution with the least risk
- Reliability
  - Integrated pipeline is the most reliable solution
  - Segregating the pipeline increases the overall risk of an event and will increase the complexity of managing an event
  - If GSGT is separated into radial segments, the consequences of an event or problem will result in increased costs and extended interruptions
- Operational
  - Integrated system allows flexibility for maintenance and emergency situations
  - Strategically placed valves allow Granite to minimize the impact of an event
- Supply
  - Less commercial disruption for marketers
  - Diversity of supply from a cost and reliability standpoint
  - Lowest gas supply cost when maximizing TGP supply
- New Scenarios
  - As illustrated by the analyses results, the incremental scenarios outlined by the NH PUC Staff do not change the conclusions of the GSGT Study

Appendix

Integrity Management Plan

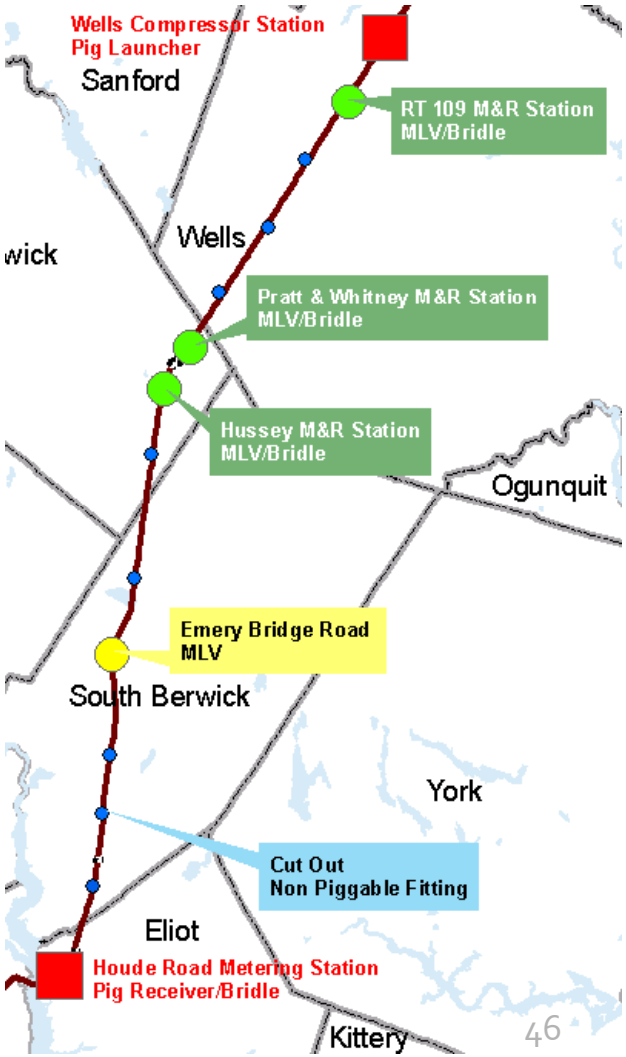
Example of IMP Project:

Project: Wells to Eliot In-Line Inspection

Purpose: To upgrade a 17 mile section of pipeline containing 4 HCAs so that it can be internally inspected with a gas pig (ILI)

Scope: This project is completed in four phases:

1. Install Pig Launcher/Receivers, Bridles and Mainline Valves
2. Remove ALL non-piggable fittings
3. Perform ILI and analyze results
4. Perform any necessary remedial work



GSGT Study IM Compliance Assumptions

The following is a summary of the transmission IM compliance assumptions utilized in the GSGT study:

Transmission

- Remaining GSGT pipeline segments that are located in HCAs will need to be assessed prior to December 2012
  - Approximately 3.6 miles (19,204 feet)
- On-going seven year cycle assessments

Hybrid

- Generally, the pipeline that has already been assessed for IM will remain at transmission pressures and will need to be assessed every seven years
- Certain other GSGT segments will be de-rated to distribution pressures – no transmission IM costs
- Distribution IM costs assumed to be $0 for this study

Distribution

- GSGT pipeline is de-rated – no transmission IM costs
- Distribution IM costs assumed to be $0 for this study

Appendix: Study Participants

Unitil Study Participants

Name	Department
Tim Bickford	Engineering
Kevin Sprague	Engineering
Mark Dupuis	Engineering
Lynn Best	Engineering
Helen Ayotte	Engineering
Roger Barhan	Engineering
Rob Furino	Gas Supply
Fran Wells	Gas Supply
Fred Stewart	Regulatory
Gary Epler	Regulatory/Legal
Justin Eisfeller	Measurement and Control
Chris LeBlanc	Gas Operations
Jon Pfister	Gas Operations
David Chong	Finance
Tom Meissner	Senior Management
Mark Collin	Senior Management
Chris Mozinal	GIS
Charlie Kickham	GIS
Jon Hedman	Consultant
Concentric Energy Advisors	
Process Pipeline Services	

Maine PUC	
Carol MacLennan	Senior Staff Attorney
Gary Farmer	Consultant to the Commission Staff
Thomas Austin	Senior Utility Analyst
Lucretia Smith	Utility Analyst
Gary Kenny	Gas Safety Manager
Christine R. Cook	Utility Analyst/Attorney
Maine Public Advocate Office	
Wayne R. Jortner	Senior Counsel
William Black	Deputy Public Advocate
New Hampshire PUC	
Edward Damon	Staff Attorney
Stephen P. Frink	Assistant Director, Gas & Water Division
Matthew Fossum	Hearings Examiner
Randy Knepper	Director, Safety Division
Robert Wyatt	Utility Analyst
New Hampshire OCA	
Ken Traum	Assistant Consumer Advocate

Financial Model - Assumptions

There are certain assumptions that are common to all the scenarios:

- Capital Structure

	Structure	Cost Rate	Weighted Cost
Debt	55.00%	7.50%	4.13%
Equity	45.00%	11.00%	4.95%
Total	100.00%		9.08%

- Tax Rates

NH State Income Tax	8.50%
ME State Income Tax	8.93%
Weighted State Income Tax	8.72%
Federal Income Tax	34.00%
Effective Income Tax Rate	39.75%
Property Tax Rate (% of net plant)	1.71%

- Other parameters
  - Depreciation rate (Pipe): 2.25%; or 44.4 years useful life
  - Net salvage value: $0
  - NPV Discount rate: 9.08%, equal to the assumed cost of capital
  - For purposes of calculating tax depreciation and deferred income taxes, the MACRS tax deprecation period is assumed to be 15 years

GSGT Study – Financial Model Analysis 2011 Update

- Unitil has made several updates and revisions to the Financial Model since the February 2010 Report was submitted to the MPUC and NHPUC, most of the major changes were recommended by the NHPUC

	Revision or Update to GSGT Study Financial Analysis
1	Revenue Requirement formulas modified to include booked depreciation
2	Deferred Income Tax formulas modified to include deduction of state income tax from federal taxable amount.
3	Costs to cross Little Bay updated and planned for 2013.
4	Estimates of stranded TGP demand costs and incremental commodity costs prepared for Scenarios 15, 16
5	Estimated Disbonded Costs added to all scenarios but 15, 16
6	All scenarios have been updated to reflect latest estimates of IMP related costs.
7	Scenarios 15 and 16 added
8	All Engineering projects that had been assumed to occur in 2010 are now assumed to occur in 2011, except for actual LBB 2010 costs.
9	For NPV calculations, Year "0" revised to be 2011; costs incurred in 2010 are not part of analysis
10	Booked depreciation formulas modified so that total book depreciation for lifetime of a projects equal s plant in service for that project

- These changes have not materially affected the ranking of the lowest cost alternatives

Financial Model – February 2010 Results

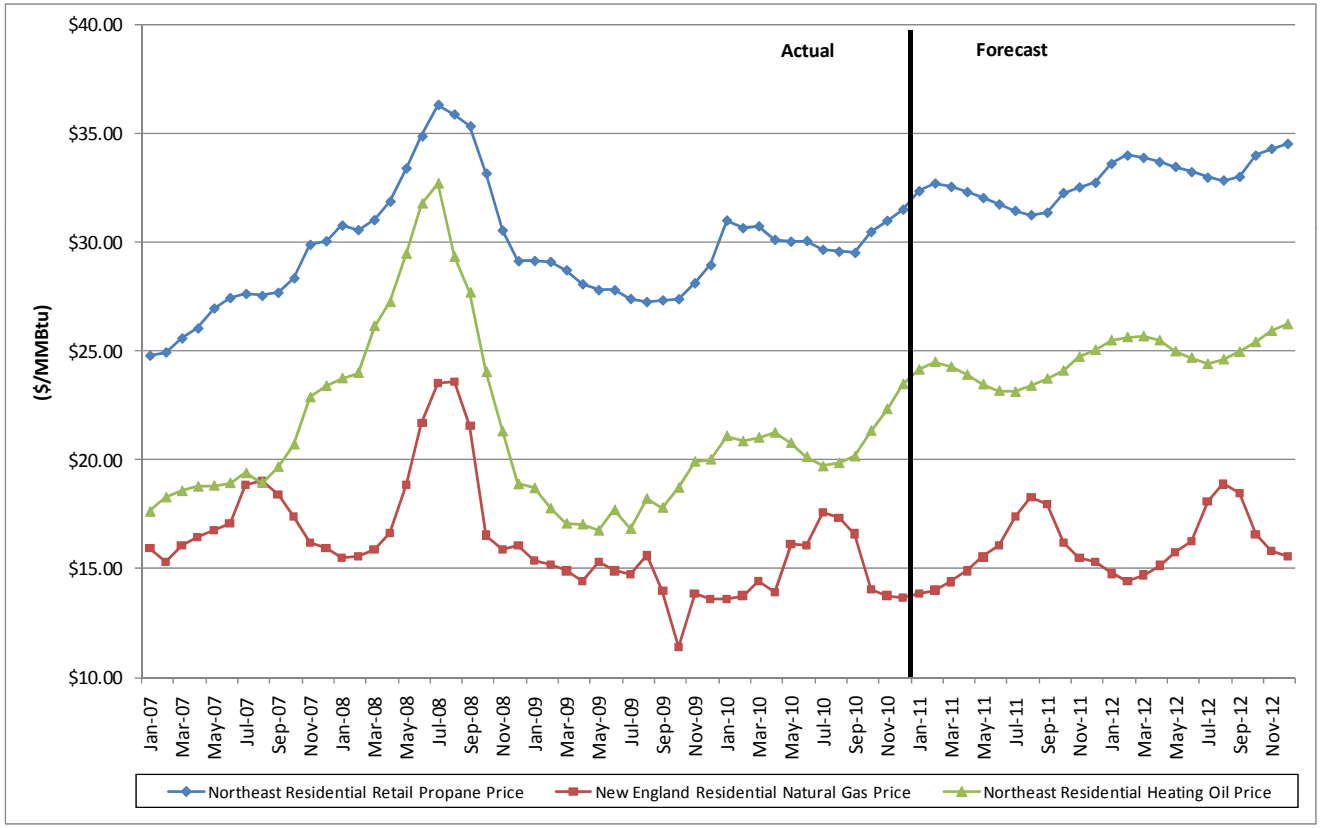
- February 2010 GSGT Report – Results

	Transmission Pipeline			Hybrid Pipeline	
Configuration	**Integrated**	**Integrated**	**Split at LBB**	**Integrated**	**Split at LBB**
Scenario	**Baseline 1**	**Baseline 2**	**Scenario 13A**	**Scenario 7**	**Scenario 5**
Cumulative Net Present Value: Revenue Requirement					
2020	$5,156,909	$5,278,843	$4,992,942	$6,996,976	$5,073,300
2030	$6,350,631	$6,650,262	$6,125,473	$8,487,063	$6,155,579
Rank of Cumulative Net Present Value: Revenue Requirement					
2020	3	4	1	5	2
2030	3	4	1	5	2

- In the February 2010 Report, the three lowest cost scenarios were: Scenario 13A, Baseline 1 and Scenario 5
- The three lowest cost scenarios are: Scenario 13A, Baseline 1 and Scenario 5
- The top 4 scenarios are all within $250,000 (about 5%) while Scenario 7 is approximately $2.0 million higher
- In the GSGT revised results the top 2 scenarios assume that GSGT operates at transmission pressures
- The financial model results do not include the Gas Supply/Marketer implications
- None of the lower cost scenarios are the distribution pressure scenarios – as the IM savings do not offset the high system improvement cost (also the distribution scenarios have limited growth)

GSGT Analysis Framework – Growth Metric

The importance of the GSGT system to support growth is illustrated by the fuel price comparison in the chart and table below



($/MMBtu)	2007	2008	2009	2010	2011
Avg. Residential Retail Propane Price - Northeast	27.26	32.75	28.10	30.37	32.12
Avg. Residential Retail Heating Oil Price - Northeast	19.67	26.37	18.05	21.01	21.33
Avg. Residential Natural Gas Price - New England	16.96	18.45	14.44	15.08	15.80
Difference (Propane - Gas)	**10.30**	**14.30**	**13.66**	**15.30**	**16.33**
Difference (Heating Oil - Gas)	**2.72**	**7.92**	**3.61**	**5.93**	**5.54**