

DOCKETS IN WHICH RANDALL S. KNEPPER HAS TESTIFIED

DW 04-048

City of Nashua, New Hampshire Petition For Valuation Pursuant To RSA 38:9

DG 08-048

Unitil Corporation and Northern Utilities Natural Gas
Joint Petition for Approval for Stock Acquisition

DG 11-040

National Grid USA, et al
Joint Petition for Authority to Transfer Ownership of Granite State Electric and EnergyNorth Natural
Gas, Inc. to Liberty Energy Utilities Corp.

DG 11-106

National Grid
Cast Iron/Bare Steel Replacement Program Results

DG 11-196

Unitil Corporation and Northern Utilities, Inc
Show Cause Proceeding

DG 12-128

National Grid
Cast Iron/Bare Steel Replacement Program Results

DG 13-149

EnergyNorth Natural Gas, Inc. d/b/a Liberty Utilities, Inc.
2013 Cast Iron/Bare Steel Replacement Program Results

DG 14-041

Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities
2014 Cast Iron/Bare Steel Replacement Program Results

DG 14-155

Liberty Utilities (EnergyNorth Natural Gas) Corp. and Iberdrola USA Enterprises, Inc. Joint Petition
for Authority to Transfer Ownership of New Hampshire Gas Corporation to Liberty Utilities
(EnergyNorth Natural Gas) Corp.

DG 15-104

Liberty Utilities (EnergyNorth Natural Gas) Corp d/b/a Liberty Utilities
2015 Cast Iron/Bare Steel Replacement Program Results

DG 15-121

Northern Utilities, Inc.
Request for Hearing on Notices of Violations PS1501NU and PS1502NU

DE 15-459

Northern Pass Transmission LLC
Petition to Commence Business as a Public Utility

DOCKETS IN WHICH RANDALL S. KNEPPER HAS TESTIFIED

DE 15-460

Northern Pass Transmission LLC

Petition to Cross Public Waters in Pittsburg, Clarksville, Stark, Lancaster, Dalton, Bethlehem, Franconia, Easton, Plymouth, Woodstock, Ashland, Bridgewater, New Hampton, Hill, Bristol, Franklin, Northfield, Concord, Pembroke, Allenstown and Deerfield

DE 15-461

Northern Pass Transmission LLC

Petition to Cross Land Owned by the State in Stark Northumberland, Lancaster, Dalton, Bethlehem, New Hampton, Hill, Franklin, Canterbury, Pembroke and Allenstown

DE 15-462

Public Service Company of New Hampshire d/b/a Eversource Energy

Petition for Licenses to Construct and Maintain Electric Lines over and across Public Waters in Bridgewater, Bristol, Dalton, Deerfield, Hill, Lancaster, New Hampton, Northfield, Pembroke, Stark, Concord and Franklin

DE 15-463

Public Service Company of New Hampshire d/b/a Eversource Energy

Petition for Licenses to Construct and Maintain Electric Lines over and across Lands Owned by the State in Stark, Northumberland, Lancaster, Dalton, New Hampton, Canterbury, Pembroke and Franklin

DG 16-449

Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities
2016 Cast Iron/Bare Steel Replacement Program Results

DG 17-048

Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities
Request for Change in Rates

DG 17-063

Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities
2017 Cast Iron/Bare Steel Replacement Program Results

DG 18-064

Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities
2018 Cast Iron/Bare Steel Replacement Program Results

DG 18-092

Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities
Petition for a License to Construct and Maintain a Natural Gas Pipeline Beneath the Ashuelot River in Keene

DG 18-140

Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities
Renewable Natural Gas Supply and Transportation Contract

DG 19-054

Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities
2019 Cast Iron/Bare Steel Replacement Program Results

DOCKETS IN WHICH RANDALL S. KNEPPER HAS TESTIFIED

RULEMAKING PROCEEDINGS DIRECTOR KNEPPER HAS PARTICIPATED IN:

DRM 04-149

RULEMAKING

Puc 500, Gas Service and Gas Safety, Proposed Readoption with Admendment

DRM 08-004

RULEMAKING

Puc 1300 Pole Attachments-Regular Rules

DRM 08-087

RULEMAKING

Puc 800 Rules

DRM 08-091

RULEMAKING

Puc 800, Underground Utility Damage Prevention Program Repromulgating Regular Rules

DRM 11-077

RULEMAKING

Puc 500 - Rules for Gas Service

DRM 12-298

RULEMAKING

Rules for Pipeline Public Utilities - Puc 1400

DRM 13-090

RULEMAKING

Puc 300 - Rules for Electric Service

DRM 16-508

RULEMAKING

All Utilities - Puc 800, Underground Utility Damage Prevention Program (DigSafe)

DRM 17-139

RULEMAKING

N.H. Code Admin. Rules Puc 1300, Utility Pole Attachment Rules Readoption and Amendment

DOCKETS IN WHICH RANDALL S. KNEPPER HAS TESTIFIED

INVESTIGATIONS

Liberty Keene Plant Malfunction Investigation 2015

Unitil Hampton Locke Road Investigation 2015

December 2008 Ice Storm After Action Review

October 2011 Snowstorm After Action Review

2014 Thanksgiving Storm After Action Review

Benton Logging Incident 2015

Eversource Keene Fatality 2014

Eversource Phase 2 System Investigation 2016

TABLE 1

GENERAL CONVERSION FIGURES			
1 LNG Gallon = 82.6 SCF Nat Gas			
1 LNG Gallon = 82,644 BTU			
1MMBTU/82,644 BTU/GALLON = 12.1 LNG gallons per MMBTU			
10,000 Gallons = 826 MCF			
1 LNG Road Tanker= 9,500 LNG Gallons =33,370 lbs of LNG = 785 MCF			
1.68 Gallons of LNG = 1 Gallon of Diesel			
1 LNG Gallon weighs 3.5 lbs			
LNG Composition = 97% Methane, 1.5% Ethan, less than .25% Propane, balance is Nitrogen			
Comparison Between LNG and Other Fuels			
	<u>LNG</u>	<u>Propane</u>	<u>Diesel</u>
Btu Per Gallon	82,644	91,000	139,000
Gallons Per MMBTU	12.1	10.99	7.19
Relative Energy Density	1.00	1.10	1.68
Ignition Temperature deg F	1004	842	437
Leaks & Spills	Vaporizes to Atmosphere	Gathers in Low Spots	Puddles on the Ground
Boiling Point	-260	-44	370+
GRANITE BRIDGE LNG FACILITY	(Cost = approximately \$246 million as of 3/15/2019)		
DG 17-198	(\$220 million on 12/2017)		
Site Location			
Overall Site:	140.67 Acres (Epping Tax Map 34 Lot 42) - 6,127,584 sq ft		
Site (facility footprint):	15 Acres - 653,400 sq ft		
LNG Storage (tank footprint)	1.5 Acres - 65,340 sq ft		
Storage Tank			
Dimensions:	200 ft diameter x 160' high		
Type:	double wall - Full containment		
LNG Facility Stats			
LNG Storage Capacity:	2 BCF = 2,000,000 MCF = 2,000,000,000 CF		
Vaporization Capacity:	.15 BCF/day = 150,000 MCF/day = 150,000,000 CF/day		
	Approximately: 13.3 days to deplete from full @ .15 BCF/day		
Liquification Capacity:	.010 BCF/day = 10,000 MCF/day = 10,000,000 CF/day		
	Approximately: 200 days to fill from empty @ .010 BCF/day		
GRANITE BRIDGE PIPELINE	(Cost = approximately \$168 million as of 3/15/2019)		
	(\$110 million on 12/2017)		
Pipeline			
Dimensions:	API5L X42/52 SCH 40 ; 15" ID x16" OD ; .5" wall		
Description:	Full x-ray of all pipeline welds		
	buried 48 inches underground within NHDOT ROW		
Approximate Length:	27 miles ; 7 towns		
Towns project goes through:	Manchester, Auburn, Candia, Raymond, Epping, Brentwood, Exeter		
MAOP:	950 psig		
MOP:	750 psig		
Capacity:	150,000 MCF/day = .15 BCF/day		
Expected usage all of Liberty:	5,200,000 DTH/6 month winter		
	(Normal): 5,200,000 MCF/6 month winter		
	(Design): 5,700,000 DTH/6 month winter		
Incremental Design/day:	73,000 DTH/day		



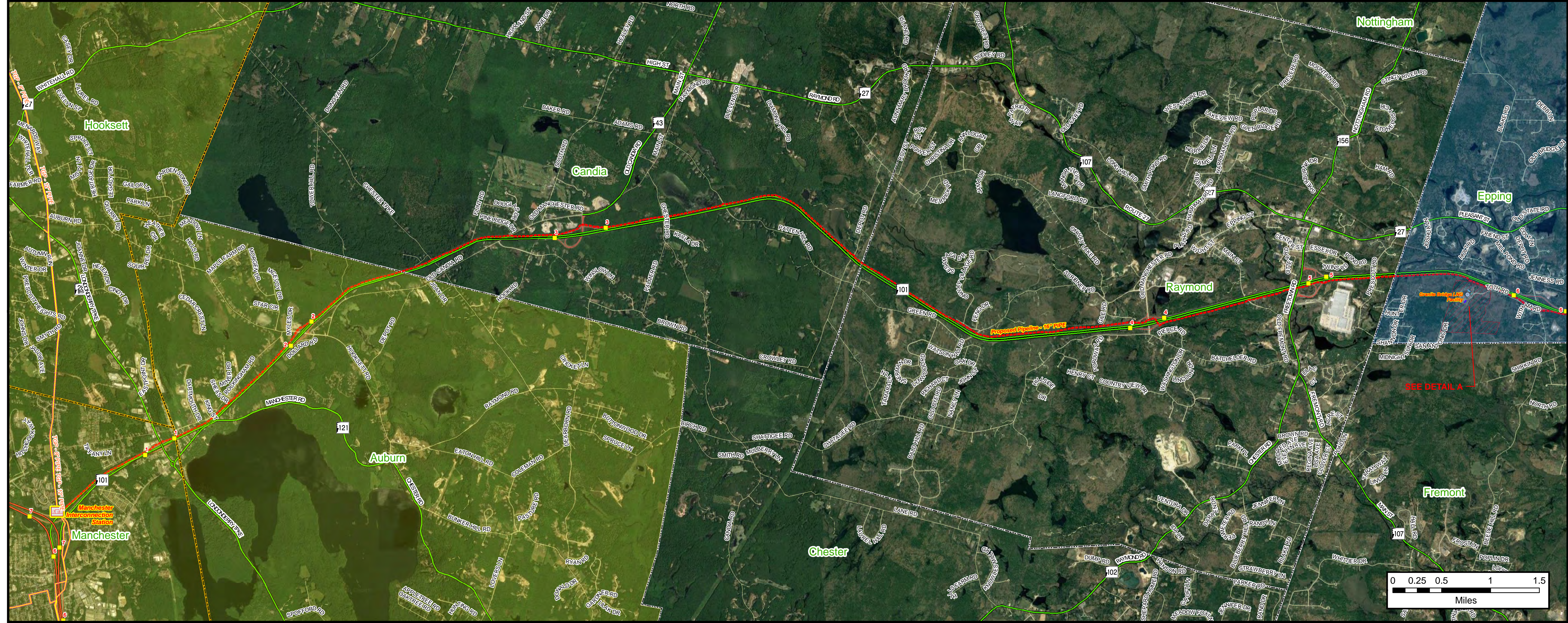
GRANITE BRIDGE PIPELINE PROJECT

PROPOSED

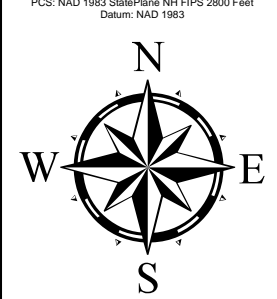
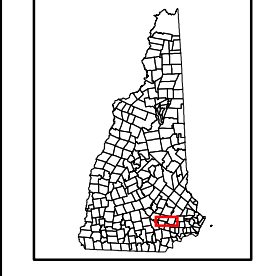
FOR OFFICIAL USE ONLY



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Vaporization Capacity:	15 BCF/day = 150,000 MCF/day = 150,000,000 CF/day		
Approximately:	13.3 days to deplete from full @ 15 BCF/day		
Liquidification Capacity:	0.10 BCF/day = 10,000 MCF/day = 10,000,000 CF/day		
Approximately:	300 days to fill from empty @ 0.10 BCF/day		
GRANITE BRIDGE PIPELINE	(Cost = approximately \$168 million as of 3/15/2019)		
Pipeline			
Dimensions:	APISI X42/52 SCH 40 - 15" ID x 16" OD - 5" wall		
Description:	Full x-ray of all pipeline welds buried 48 inches underground within NHDOT ROW		
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(Design):	5,700,000 DTH/6 month winter		
Incremental Design/day:	73,000 DTH/day		



NOTES:
1. This map is for informational purposes only and does not constitute an offer of insurance or any other financial product.
2. The information on this map is derived from public records and is not guaranteed to be accurate or complete.
3. The information on this map is not intended to be used for any purpose other than that for which it was prepared.
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PROPOSED
FOR OFFICIAL USE ONLY

- Interconnect Station
- Granite Bridge Pipeline
- Natural Gas Pipeline
- Utility Service Area
- Liberty Service Area

- Interstate
- State Road
- Public Road
- Diversity/Private
- Road/Overseer
- County Boundary
- State Boundary
- Exit

Granite Bridge Pipeline Project

Prepared By:
NH Public Utilities Commission
Safety Division
GIS Section
March 14, 2019