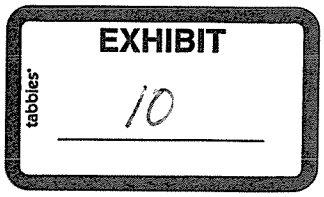
DG 15-289 Hearing Exhibit ____



STATE OF NEW HAMPSHIRE

PUBLIC UTILITIES COMMISSION

DG 15-289

In the Matter of:
Liberty Utilities (EnergyNorth Natural Gas) Corp., d/b/a Liberty Utilities
Petition for Franchise Authority in Lebanon and Hanover

Direct Testimony

of

Stephen P. Frink
Assistant Director – Gas & Water Division

January 22, 2016

New Hampshire Public Utilities Commission

Liberty Utilities (EnergyNorth Natural Gas) Corp., d/b/a Liberty Utilities

Petition for Franchise Authority in Lebanon and Hanover

DG 15-289

Testimony of
Stephen P. Frink

Q. Please state your name, occupation and business address.

A. My name is Stephen P. Frink and I am employed by the New Hampshire Public Utilities Commission (Commission) as Assistant Director of the Gas & Water Division. My business address is 21 S. Fruit Street, Suite 10, Concord, New Hampshire 03301.

Q. Please summarize your educational and professional experience.

A. See ***Attachment SPF-1.***

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is to provide Staff's recommendations on whether Liberty should be granted the franchise to provide natural gas utility service in Lebanon and Hanover. My testimony examines the methodology and underlying assumptions used by Liberty to financially evaluate the merits of providing natural gas utility to serve Lebanon and Hanover.

Q. Please summarize Staff's findings on these issues.

A. Staff recommends that the Commission deny Liberty's request at this time and suspend the proceeding until Liberty has submitted a comprehensive and detailed business plan, performed a Discounted Cash Flow (DCF) analysis to determine the economic costs and benefits and obtained customer commitments as evidenced by written agreements.

Liberty has demonstrated its managerial and engineering expertise in safely and

reliably operating and maintaining LNG facilities and a natural gas distribution system. That said, as a condition of the settlement agreement approved in Liberty's last rate case, Order No. 25,797 issued June 26, 2015 in Docket No. DG 14-180, an independent audit of Liberty's financial reporting/accounting and customer service areas is being conducted and an audit report expected within a few months. Staff recommends a copy of the audit report be filed in the immediate docket for the Commissioner's consideration regarding Liberty's expertise to operate the proposed system.

Q. Briefly describe the current filing.

A. On July 24, 2015, Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities (Liberty or Company) filed a petition with the New Hampshire Public Utilities Commission (Commission) for approval of a gas franchise in Lebanon and Hanover, New Hampshire. Liberty proposes to operate an "off pipeline" and self-contained natural gas distribution system to serve the franchise area and intends to finance, construct, install, manage, operate and own the facilities and infrastructure. The Company plans to construct an LNG storage and vaporization facility along with a CNG decompression facility in Lebanon to supply the natural gas to the distribution system and will procure both LNG and CNG through a competitive bidding process. The Company plans to install gas mains from the LNG/CNG facilities to prospective anchor customers, Dartmouth College, Dartmouth-Hitchcock Medical Center, Hypertherm and Kleen. Liberty also intends to provide vehicle refueling and remote customer service to customers not yet connected to distribution lines. Lebanon and Hanover customers would be subject to terms and conditions of Liberty's natural gas tariff, other than cost of gas (COG) rates, which will be separately calculated and a separate provision added to

the tariff. Liberty expects to commence construction of the supply facilities and distribution system in 2016.

Methodology to Evaluate Financial Merits of Large System Expansion Projects

Q. Are there investment criteria that must be satisfied for a natural gas utility to expand its distribution system?

A. Yes, New Hampshire's two natural gas utilities have tariff terms and conditions that address line extension requests. The line extension policies compare expected revenues from new customers to determine if they are adequate to justify the investment. If the expected revenues are inadequate, customers are required to make a contribution-in-aid-of-construction (CIAC) if necessary to satisfy the investment criteria.

Q. What constitutes adequate justification for a proposed system expansion?

A. An expansion is justified if the incremental system investment required to extend distribution service are borne by the customers to be served and not subsidized by existing customers.

Q. Are the investment criteria the same for both utilities?

A. Both utilities have roughly the same investment criteria.

For many years both utilities used the same investment criteria when considering a line extension request, applying a 25 percent test to determine if a customer contribution in aid of construction was required. Under the 25 percent test, net annual revenue had to equal or exceed 25 percent of the cost of the extension. The current line extension policies differ but both are intended to recover capital costs from new residential customers within approximately 20 years and new commercial and industrial (C&I) within approximately 10

years.

Q. How do the line extension policies differ?

A. Northern Utilities, Inc.'s (Northern) line extension policy explicitly states that the DCF methodology will be used to determine the CIAC requirement, if any, to satisfy a 10 payback for C&I customers and a 20 year payback for residential customers.

Liberty's line extension policy uses a revenue test to determine if the customer contribution is required, and if so, the amount. The revenue test for residential customer is estimated annual margin equal or exceed one-eighth of the estimated construction cost, and for a C&I customer estimated annual margin equal or exceed one-sixth of the estimated construction cost. Liberty's line extension policy was approved by Order No. 25,624 issued January 24, 2014 in Docket No. DG 13-198. Although the Liberty line extension policy does not cite a payback period, the implicit payback is similar to Northern's as explained at hearing (DG 13-198 transcript p. 37, lines 9-18, Staff witness Frink): "I would note that the – looking at the residential customers, using the discounted cash flow analysis that Northern currently uses, if they were going to go to a similar test as what we're proposing for Liberty, it would be a seven-year revenue test, as opposed to an eight-year test. So, it's in the ballpark. The expectation is that, under this proposed line extension policy, that the payback will be similar for both Liberty and Northern, that they will be 10 years for C&I and 20 years for residential."

Q. Does the Commission have a preferred methodology for evaluating the financial viability of major capital projects?

A. Yes, the Commission found that the DCF methodology is the appropriate framework in which

to evaluate the financial viability of large system expansion projects. [1]

Q. Did Liberty undertake a DCF analysis to evaluate the financial merits of serving Lebanon and Hanover?

A. No. In response to Staff Data Request 3-8 asking Liberty to perform a DCF analysis the Company refused to do so on the grounds that its tariff does not provide for a different analysis for main and service extensions that are not physically connected to the existing distribution system, or that exceed a particular total cost, and that Liberty must adhere to the provisions of its tariff to ensure that customers and potential customers are informed as to the analysis that will be performed when considering taking service from the Company. See ***Attachment SPF-2.***

Q. What financial analysis did Liberty use to justify the Lebanon and Hanover project?

A. Liberty used the revenue test from its line extension policy, which assumes that 60 percent of potential customers along the main will convert to natural gas.

Q. Does Liberty's tariff preclude it from performing a DCF analysis?

A. No. As previously stated, the Commission has found that the DCF methodology is the appropriate methodology to employ when considering major expansions. It is worth noting that even though both natural gas utilities had a line extension policy requiring application of the 25 percent test for line extension requests during their last major expansions, both used the DCF methodology to justify the expansions when petitioning the Commission for approval.

The cost to serve Lebanon and Hanover is large enough to warrant a detailed business

1. Order No. 22,297 (August 28, 1996) Approving Northern Utilities, Inc. expansion into the towns for Durham and Madbury, New Hampshire. Order No. 22,667 (July 22, 1997) approving EnergyNorth Natural Gas, Inc. expansion into Milford, New Hampshire.

plan and discounted cash flow analysis in determining if Liberty should proceed with the proposed expansion.

Furthermore, since Lebanon and Hanover are outside of Liberty's franchise area the Liberty's tariff does not apply in this instance and Liberty is not required to adhere to the revenue test for its financial analysis of the Lebanon/Hanover expansion.

Q. Why is use the revenue test as prescribed by Liberty's tariff not appropriate when evaluating the financial merits of a major expansion?

A. A revenue test is appropriate for evaluating smaller projects that entail a limited investment and require a customer commitment with financial penalties if the customer(s) requesting service fail to take service within nine months. The revenue test is a simple and straight forward calculation that serves as a proxy for the DCF methodology, intended to roughly satisfy the payback the Commission desires. It is not appropriate for evaluating a large expansion that poses a significant financial risk.

Q. Why should the DCF methodology superior to the revenue test?

A. The DCF methodology is a far better framework than a revenue test for evaluating the efficacy (and hence prudence) of a major capital project for the following reasons: 1) the DCF analysis uses a much longer time horizon (the life of the project); 2) the DCF uses a more inclusive set of revenue and cost variables, encompassing revenue and cost savings, capital costs not covered by customer contributions, and incremental operating costs; and, 3) allows for an apples-to-apples comparison of costs and benefits that occur at different times by discounting the revenue and cost streams at the company's weighted cost of capital to determine the 'present value' of each and the 'net present value' of the project.

Q. Should Liberty be required to undertake a DCF analysis in this proceeding?

A. Yes. Not only is the DCF analysis superior to a simple revenue test, the revenue test may no longer be appropriate for smaller projects given the dramatic drop in oil and propane prices since the Commission approved Liberty's line extension policy (Order No. 25,624 issued January 24, 2014 in Docket No. DG 13-198).

Q. Why is it that the revenue test in Liberty's tariff may no longer be appropriate?

A. Whereas the prior revenue test only included annual margins from customers requesting service, the current revenue test includes anticipated margins from 60 percent of the potential customers along the line that have no commitment to take service but expected to convert to natural gas. The assumptions used in developing the current revenue test were explained at the December 4, 2013 hearing in DG 13-198. The 60 percent conversion rate was based on several factors: a study done in October 2012 (transcript p. 20, lines 14-24); average customer energy saving of 50 to 60 percent when converting from oil to natural gas; (transcript p. 26, lines 1-3); and, an estimated cost of $7 to $12,000 for a customer to convert from an oil heating to a gas heating system (transcript p. 23, lines 21-24).

At that time oil prices were almost double natural gas prices and even then Liberty acknowledged that it would have to actively market those potential customers to achieve the anticipated margins, '...the onus is on the Company to actively market and hook up customers to that gas service' (transcript p. 25, line 23 thru p. 26, line 1). At current prices the financial incentive to convert to natural gas is greatly reduced and even active marketing is unlikely to achieve the expected conversions along a new main.

Q. If the DCF analysis is undertaken and the results satisfy the Commission's investment

criteria, should the Liberty petition be approved?

A. Not necessarily. A clear understanding of the assumptions underlying the revenue and cost streams is vital in the evaluation of the specific application of the DCF methodology. The assumptions underlying the analysis need to be reasonable and should be based on a comprehensive business plan that includes an in-depth analysis and detailed plans for marketing, engineering, operations and finance.

Q. Did Liberty provide a comprehensive business plan in its petition?

A. No. Liberty's filing describes its marketing, engineering, supply and operating plans for serving Lebanon and Hanover but the information contained in the filing and provided in response to discovery does not qualify as a comprehensive business plan.

Comprehensive Business Plan

Q. Was the last major expansion approved by the Commission supported by a comprehensive business plan?

A. Yes. The last major expansion by a natural gas utility in New Hampshire was by EnergyNorth Natural Gas, Inc. (ENGI, a predecessor company of Liberty) into Milford New Hampshire (Docket No. DR 97-057). ENGI's filing included a comprehensive business plan (ENGI plan) that clearly explained the costs and benefits and demonstrated the financial merits of the expansion.

Q. Does Staff consider the ENGI plan to be a comprehensive business plan?

A. Yes. The ENGI plan contained a section for each key area and each section includes detailed analysis, exhibits and a narrative discussion.

Attached is a copy of my working copy of the ENGI plan from that docket, which includes my notes and what was confidential company and customer information at that time. Liberty was provided a copy and reviewed the company information and does not object to disclosing that information at this time. The confidential customer information has been blacked out, which is limited and not relevant to this proceeding, as the ENGI plan is being provided as an example of what constitutes a comprehensive business. See ***Attachment SPF-3.***

Q. Please provide a brief description of the ENGI plan?

A. Along with the Executive Summary and Appendices, the plan includes four major sections covering marketing, operations and engineering and financial plans. The ENGI plan also includes a section on public and community relations.

The marketing plan details the primary expansion 'anchor' customer that informed ENGI that it was going to change its fuel source and its preferred fuel choice was natural gas and an assessment of the other potential customers within the planned compact corridor during the first five years of the planning horizon. ENGI collected supporting demographic data and performed a comprehensive study to determine market potential. Data was collected from numerous sources and included such details as current fuel use of targeted customers and vintage of the housing units (pre-1940 considered prime targets for new heating systems). The marketing section also includes initial and long term marketing action plans.

The operating and engineering plan considered feasible routes and proposed routing to serve Milford, identified the pipeline reinforcements needed to support the expansion, supply requirements for both base load and peaking, and provided detailed cost estimates and timing

of the costs.

The financial plan summarized financial goals, described and presented the financial analysis, which included both a base case and sensitivity analysis and covered financing alternatives.

The public and community relations plan describes initial community contacts and post-decision action plans, including meetings with key political and appointed officials at both the local and state levels, and the formation of a five member Milford communications team.

Q. Did the Milford expansion meet the goals set forth in the ENGI plan?

A. The project exceeded its financial target. The Commission required ENGI to track actual project costs and revenues until the project reached its breakeven point, which it did in 1999, three years earlier than the projected breakeven point of 2002 in the Base Case Scenario of the ENGI plan.

Q. Should Liberty prepare a business plan similar to the ENGI plan?

A. Yes. The ENGI plan should be used as a template by Liberty in developing and evaluating the benefits and cost of serving Lebanon and Hanover. A comprehensive business plan in the format of the ENGI plan would be extremely informative and greatly the aid the Commission in determining whether Liberty should be granted its franchise request.

Financial Viability of the Proposed Expansion

Q. Does Staff believe the Lebanon/Hanover project will breakeven within 10 years?

A. No. Staff believes actual sales will fall far short of Liberty's projected sales over both the

short and intermediate term, resulting in less revenues than Liberty is anticipating and a breakeven point beyond 10 years.

Q. Is there sufficient demand to recoup the cost to serve?

A. That is very much in question. One potential customer, Dartmouth College, dwarfs all others and if a system is built to serve that load and Dartmouth College does not take service that could have an adverse impact on rate payers and/or shareholders. If the system is designed to serve only the potential non-Dartmouth College demand, fixed costs would be spread over lower sales and failure to sign anchor customers. In either instance, Liberty's existing customers may wind up subsidizing the Lebanon/Hanover operations.

Recent developments in the energy market are further exacerbating that risk, as there has been a precipitous drop in oil and propane prices. Potential anchor customers may have entered multi-year contracts to lock in lower prices and potential energy savings from converting to natural gas may not justify the up-front costs of conversion.

Q. How do current oil and natural prices compare?

A. I heat my Manchester home with No. 2 fuel oil and received a delivery on December 28, 2015 priced at $1.92 per gallon. The equivalent delivered natural gas price is $1.53 per therm. The average residential heating customer per them rate for New Hampshire's two natural gas utilities are $1.46 and $1.40 based on rates in effect on November 1, 2015. See ***Attachment SPF-4***.

Q. How do current propane and natural prices compare?

A. A Staff employee recently received a propane delivery priced at $1.99 per gallon. The equivalent delivered natural gas price is $2.41 per therm. The average residential heating

customer per them rate for New Hampshire's two natural gas utilities are $1.46 and $1.40 based on rates in effect on November 1, 2015. See ***Attachment SPF-4***.

Q. What are your expectations as to how Liberty's Lebanon/Hanover all-in-rate will compare to current oil and gas prices?

A. Liberty's all-in-rate for Lebanon and Hanover, which includes a Lebanon/Hanover specific COG rate, will almost certainly be higher than those cited above and the oil and propane prices C&I customers are currently paying are most likely lower than cited above. C&I customers converting to natural gas utility service at this time can expect limited, if any, immediate energy savings.

As noted above, New Hampshire's natural gas utilities rates are only slightly above what residential oil customers are currently paying and Liberty's Lebanon/Hanover COG rate is almost certain to be higher than that of Liberty's other natural gas customers. The supply portfolios of New Hampshire's natural gas utilities include natural gas delivered by pipeline to meet base load requirements and LNG to meet peaking requirements. Liberty's supply portfolio is designed to meet total demand requirements at least cost. Lebanon and Hanover do not have access to an interstate natural gas pipeline and Liberty will have to that demand with trucked LNG and/or CNG, possibly supplemented with landfill gas.

The oil and propane prices used in the above price comparison are those being offered residential heating customers in the Manchester and Concord area. C&I customers with significant usage should be able to negotiate much better prices and Lebanon and Hanover are only an hour north by truck.

Q. What other factors besides 'burner tip' price might potential customers take into

account when considering natural gas utility service?

A. Other factors could include: lower emissions that could reduce air permitting fees; reduction in wear and tear on equipment from using a cleaner fuel, which could reduce maintenance costs and extend equipment life; pipeline delivery, thereby eliminating truck deliveries and on-site storage requirements; reliability, both as a base load supply and to back up renewables; and, reduced greenhouse gas emissions compared to other fossil fuels.

It is worth noting that the Dartmouth College energy working group's draft findings include getting off #6 fuel oil by 2016 as part of its efforts to reduce greenhouse gas emissions. See ***Attachment SPF-5***.

Q. Is there a 'demonstrated need' requirement for approval a major expansion?

A. Not per se. Unlike the Federal Energy Regulatory Commission, where approval of a new pipeline is highly contingent upon demonstrated market need as evidenced by long-term contracted customer commitments, there is no such requirement for New Hampshire utilities regarding a major expansion.

The line extension policies for New Hampshire's natural utilities are predicated on having sufficient demand and customer commitment(s) to take service that ensures the investment is recovered over reasonable time period. For major expansions a reasonable timer period is one where the breakeven is achieved within 10 years as determined using a DCF analysis and where an anchor customer has committed to take service.

Q. What would be the consequences if annual demand in Lebanon and Hanover turns out to be significantly below Liberty's sales projections?

A. Liberty's existing customers may wind up subsidizing the Lebanon/Hanover operations

and/or the Commission could find that the certain of the certain of the assets are not used and useful and deny recover of the costs associated with those assets when Liberty seeks recovery.

Q. What analysis has been undertaken to determine if Liberty's rates would be fair and reasonable?

A. Liberty calculated a revenue requirement for the first and fifth years of operations using a revenue requirement template provide by Staff based on several scenarios. The scenarios and revenue calculations were provided in the Company's confidential response to Staff Data Requests 3-9. The revenue requirement is based on expected rate base, revenue, expense and rate of return. The data response also includes the number of customers, billed sales and average per therm rate by customer class. Because the information is confidential and Staff's recommendations are not dependent on that information, the Company's data response is not attached to my testimony. Staff will request the response be entered as a confidential exhibit at hearing.

Q. Are the assumptions used in the Liberty's rate analysis reasonable?

A. Projected demand does not appear to be reasonable based on current energy prices. Converting customers to natural gas at this time will be challenging, especially large C&I customers that may have multiyear contracts with current suppliers and for which the projected energy savings from converting may not satisfy the return on investment that would incent large C&I customers to convert.

Q. Can a customer contract for utility service with Liberty prior to franchise approval?

A. Yes, there is nothing to prevent Liberty from entering an agreement with potential customers, agreements would be subject to Commission approval of the franchise request, tariffs and, if

the terms of service differed from the approved tariff, approval of the special contract.

Q. What are the financial risks if the Commission were to approve the Liberty petition at this time?

A. Capital and operating costs are largely dependent on serving a specific load, without a reasonable assurance targeted customers will take service the supply facilities and distribution system may be over or under built which could impact rates, for both the Lebanon/Hanover and existing customers. To some extent customers are protected through the rate process, as cost recovery will be addressed in a future proceeding and Liberty will carry the burden of proof in its rate filing that the investments were prudent and used and useful. Even with that protection, existing ratepayers could be harmed if Liberty were denied recovery of a substantial portion of its investment from utility customers that resulted in a higher cost of capital.

There is also the risk that a rates and services to be provided by Liberty may be less favorable that what Lebanon and Hanover ratepayers might see if the franchise were granted to another entity.

Q. Do you see any other risks in approving the petition?

A. Liberty would hold exclusive rights to the franchise territory and could delay the provision of utility service indefinitely, denying potential customers the possibility of obtaining utility service at an earlier date, or at all, from a competing entity.

Q. Are there advantages in approving Liberty's petition at this time?

A. Yes. Liberty will have the legal authority to provide utility service which could make it easier to attain customer commitments and residences and business in Lebanon and Hanover

desiring utility gas service will have no other option.

Q. What kind of contract would demonstrate customer commitment?

A. A signed contract between Liberty and a customer that requires a financial commitment from the customer, such as a deposit, CIAC or a special contract with must take provisions. If it is a special contract, Liberty would have to demonstrate that the terms of the contract cover Liberty's marginal and embedded costs to serve the customer.

Q. What level of customer commitments does Staff recommend for Commission approval?

A. Expected margins from customer commitments should be sufficient to demonstrate the project is economically feasible. Given the limited price advantage, if any, of natural gas utility service with current oil and propane prices, customer commitments will need to be significant to demonstrate economic feasibility. How significant depends on the strength of the supporting business plan, a strong business plan that provides a reasonable assurance that the sales targets will be met reduces the level of customer commitments needed to demonstrate economic feasibility. In this instance, Staff recommends estimated margins from customer commitments meet or exceed fifty percent of the required margins necessary to achieve a ten year payback.

Conclusion and Recommendation

Q. Are Liberty's assumptions used in its financial analysis reasonable?

A. No, projected sales appear to be far too optimistic given the limited energy savings, if any, that customers might realize from converting to natural gas at this time. The assumptions Liberty used in developing its sales projections lack sufficient supporting data, as Liberty did

not provide a comprehensive business plan targeting a narrow corridor and taking into account such things as the fuel type currently in use and age of the heating systems.

Q. Are Liberty's design, construction and financing plans reasonable?

A. Absent a reliable sales forecast, Staff is not in a position to render an opinion as to whether the design, construction and financing plans are reasonable.

Q. Is Liberty's financial analysis adequate?

A. No, in addition to the questionable sale projections, Liberty applied a simple revenue test to determine that the project satisfies the Commission's financial criteria for expansion. Due to the significant investment needed to serve the proposed franchise area, the DCF methodology is the appropriate financial tool to be used in evaluating the costs and benefits of this project.

Q. What is Staff recommendation regarding Liberty's petition?

A. The Commission should deny the petition at this time and suspend the proceeding to allow Liberty to conduct and file a comprehensive business plan, a discounted cash flow analysis using updated sales and cost data from the business plan, and attain customer commitments as evidenced by written agreements that satisfy at least 50 percent of the projected revenue requirement.

Q. Does that conclude your testimony?

A. Yes.

Attachment SPF-1

Stephen P. Frink

Educational & Professional Experience

Mr. Frink graduated from the University of New Hampshire with a Bachelor of Arts degree in Sociology in 1977 and a Masters in Business Administration in 1980. He attended and completed Depreciation Programs sponsored by Depreciation Programs, Inc. at Grand Rapids, Michigan in 1992, 1993, 1994 and is a member in good standing of the Society of Depreciation Professionals since 1994.

In 1981, Mr. Frink worked as a High School Math Teacher in Manchester, New Hampshire.

In 1982, Mr. Frink relocated to Texas and worked as an Auditor for Dallas County. He audited various county departments and performed monthly reconciliations of various fund accounts.

In 1985, Mr. Frink went to work for Schenley Industries, Inc., a wholesale liquor distributor located in Dallas, Texas, where he audited national and international manufacturing plants.

In 1986, Mr. Frink left Schenley to work for the City of Dallas as a Budget/Financial Analyst, where he prepared and monitored budgets, prepared pro forma statements, amortization schedules and performed cash flow analysis. He was promoted to Senior Analyst in 1987.

In 1988, Mr. Frink left the City of Dallas to work for the City of Austin as a Financial Analyst. There he prepared budgets and fiscal impact statements, developed a capital projects tracking and monitoring system, and provided training and technical assistance in the implementation of a new accounting system.

In 1990, Mr. Frink joined the Finance staff of the New Hampshire Public Utilities Commission. Working as a member of the PUC Audit Team, he conducted or participated in audits of the books and records of public utilities. He performed desk audits and determined rates of returns. He prepared schedules and exhibits supporting testimony in dockets involving rate increases and participated in settlement conferences. In 1995, Mr. Frink became a full time Analyst for the Finance Department and in 1996 was promoted to a Senior Analyst position, primarily responsible for analyzing and advising the Commission on issues of depreciation, cost of gas adjustment filings, special contracts, and finance and rate increase petitions. In 1998, Mr. Frink was promoted to Assistant Finance Director. As Assistant Finance Director, he assisted in the direction of all aspects of a department responsible for the audit, analysis and review of public utility financial operations, including financing, rate cases and various utility studies filings related to public utility regulation. In 2001, New Hampshire Public Utilities Commission operations were restructured and Mr. Frink became Assistant Director of the Gas & Water Division and now administers all aspects of regulation of gas utilities.

Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities

DG 15-289
Petition for Approval of a Gas Franchise for Lebanon and Hanover, New Hampshire

Staff Data Requests - Set 3

Date Request Received: 12/7/15
Request No. Staff 3-8

Date of Response: 12/17/15
Respondent: William J. Clark
Steven E. Mullen

REQUEST:

Please perform a discounted cash flow analysis under three scenarios: 1) expected annual sales (base case), 2) potential sales assuming anchor customers take service at earliest expected date and high conversion rates (best case) and 3) sales with no anchor customers and low conversion rates. Please use the approved (DG 14-180) weighted cost of capital for the Cast Iron Bare Steel replacement program for a discount rate and the first year in which there is a positive aggregate cash flow, the NPV in ten years and the NPV over the book life of the project. Explain supporting assumptions and provide the response in both hard and electronic (Microsoft Excel) formats, with all data and formulas intact.

RESPONSE:

EnergyNorth respectfully objects. The requested analysis has not been performed because, under Section 7 of EnergyNorth's tariff, Service and Main Extensions (which the tariff defines as "extensions that require the construction of a new gas main and a service from that new main in order to provide requested gas service to a customer") are analyzed based on the Estimated Annual Margin that EnergyNorth will receive after installation of the new main and service. EnergyNorth's tariff does not provide for a different analysis for main and service extensions that are not physically connected to the existing distribution system, or that exceed a particular total cost. EnergyNorth's tariff states that main extensions to serve new Commercial and Industrial customers are installed at no cost provided that the Estimated Annual Margin is at least one-sixth of the estimated cost of construction, and main extensions to serve new residential customers are installed at no cost provided that the Estimated Annual Margin is at least one-eighth of the estimated cost of construction.

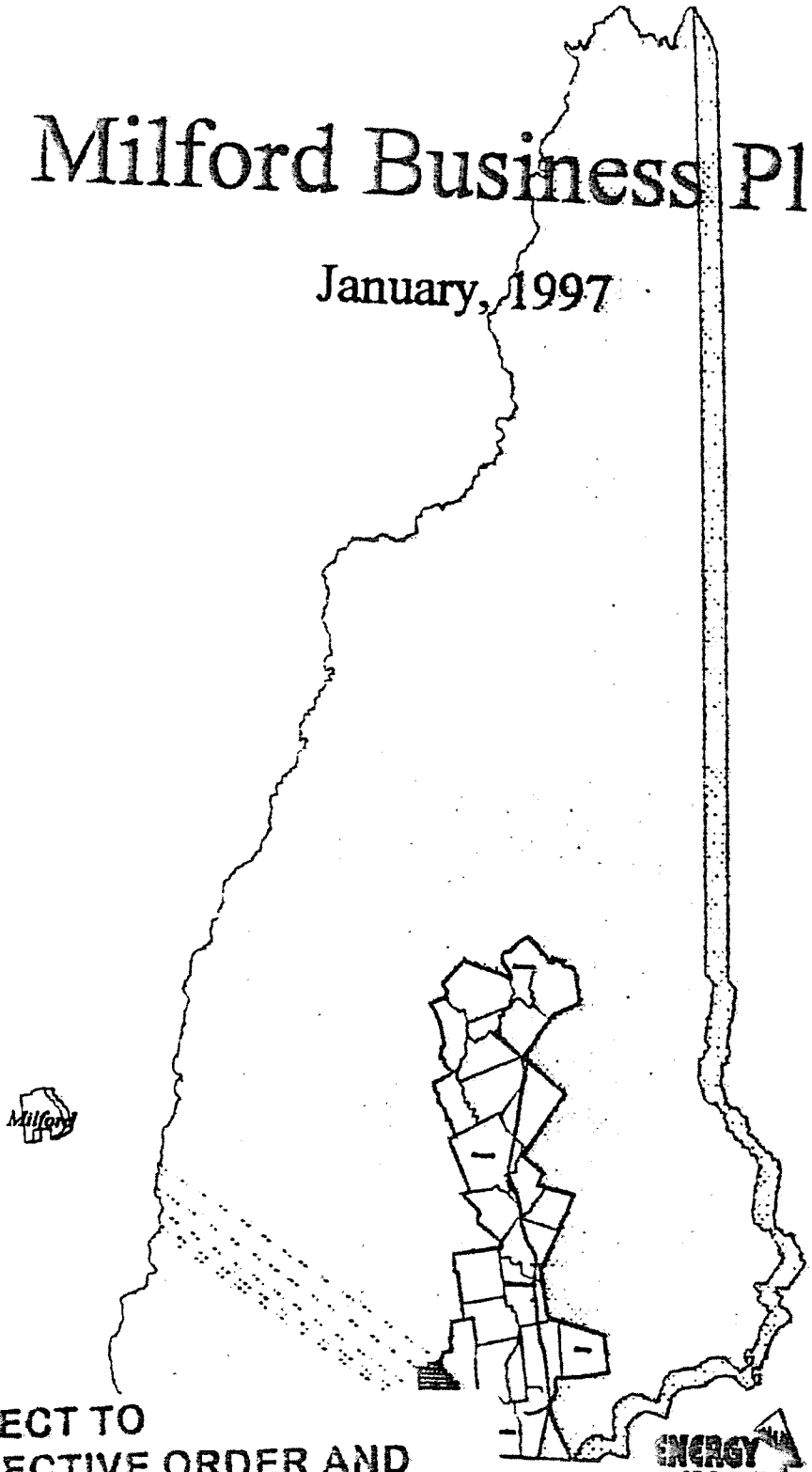
The Commission approved the tariff language described above in Order No. 25,624 (Jan. 24, 2014) in Docket No. DG 13-198. That order approved a settlement which incorporated a revised Service and Main Extensions provision to EnergyNorth's tariff. At the hearing on the settlement, Staff noted that the proposed tariff language would likely stimulate growth in EnergyNorth's customer base, was consistent with accepted accounting and financial standards, and was beneficial for existing EnergyNorth customers. Order at 5. Staff testified that using a discounted cash flow analysis for residential customers would result in a seven-year revenue test for those

main and service extensions as compared to the eight-year test specified under EnergyNorth's revised tariff language. Staff also stated that the payback for extensions under EnergyNorth's proposed line extension policy will be similar for both EnergyNorth and Northern (which uses a discounted cash flow analysis).

In view of the Commission-approved service and main extension policy, EnergyNorth does not utilize a discounted case flow analysis. EnergyNorth must adhere to the provisions of its tariff to ensure that customers and potential customers are informed as to the analysis that will be performed when considering taking service from the Company. Since the tariff does not provide for a discounted cash flow analysis. EnergyNorth cannot utilize a discounted cash flow analysis because its tariff does not provide for such an analysis to determine any required customer contribution in aid of construction for a main and service extension.

Milford Business Plan

January, 1997



SUBJECT TO
PROTECTIVE ORDER AND
CONFIDENTIAL TREATMENT

ENERGY NORTH Natural Gas

STATEMENT OF PURPOSE

SUBJECT TO
PROTECTIVE ORDER AND
CONFIDENTIAL TREATMENT

This business plan will provide EnergyNorth Natural Gas, Inc. (ENGI) with the marketing and engineering plans, feasibility analyses and recommendations necessary for successfully expanding natural gas service into the concentrated business and industrial areas in the town of Milford, New Hampshire.

Primary objectives adopted for this business plan and the future development of natural gas markets in Milford include:

- Continuing to meet ENGI's obligation to expand the availability of natural gas, when feasible, to franchised service areas.
- Providing positive benefits to existing customers by spreading fixed costs over an increasing customer base, resulting in reduced future revenue requirements and enhanced economies of scale.
- Providing increased earnings by expanding into unserved markets that have sound economic histories and significant natural gas market potential.
- Ensuring the financial viability of the expansion by first locking-in the largest industrial customer in Milford to "anchor" the project. This anchor's manufacturing process is energy intensive and operates at a high load factor.
- Maximizing net present value within the ten year planning horizon.
- Providing a superior level of services to our ENGI Milford customers.

The significance of the proposed expansion to Milford required that a business plan approach be adopted to: (1) ensure that the necessary detailed analyses were conducted which support the expansion and (2) enable management to summarize the key results to facilitate approval by the Board of Directors.

TABLE OF CONTENTS

EnergyNorth Natural Gas, Inc.
Milford Expansion Project
Business Plan

SUBJECT TO PROTECTIVE ORDER AND CONFIDENTIAL TREATMENT

Table of Contents:

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY

SUBJECT TO
PROTECTIVE ORDER AND
CONFIDENTIAL TREATMENT

Introduction

This Business Plan provides a summary of the analyses and plans proposed to expand natural gas service into the concentrated commercial and industrial areas of the town of Milford, New Hampshire, a town of approximately 12,500 residents. This concentrated target area is bounded by the Souhegan River and the Route 101 bypass.

The major sections of this Business Plan include :

- Marketing Plan
- Operations and Engineering Plan
- Financial Plan
- Public and Community Relations Plan

This major natural gas service expansion plan has been pursued to provide the benefits of natural gas to an area with a history of healthy and stable growth, and an excellent industrial and commercial base. Equally important, adjacent residential and multi-family housing areas will provide excellent opportunities for companion marketing strategies to enhance the financial strength of the expansion program.

The proposed expansion will be the largest construction project in ENGI's history. In an era of increasing deregulation in the utility business, traditional long-term regulated utility financial payback periods should no longer be relied upon to recover capital investments in plant assets. Therefore, a much shorter ten year NPV result was chosen as the planning "hurdle rate" for the Milford expansion project.

The Expansion Project

The proposed optimal route was selected from an evaluation of a number of alternative routes and alternate requirements for system reinforcements. The selected route will follow a main commercial and industrial corridor through the towns of Amherst and Milford.

1 EXECUTIVE SUMMARY

SUBJECT TO
PROTECTIVE ORDER AND
CONFIDENTIAL TREATMENT

The Milford extension will consist of approximately 38,000 linear feet (lft) of eight inch high density plastic main with a total estimated cost of $1.96 million. The route of the extension will be along Route 101A, Old Nashua Road and Route 122 in Amherst and Route 101A, Nashua Road, Elm Street and Old Wilton Road in Milford.

System pipeline reinforcements will be installed the first year along Manchester Street, Tinker Road and Thornton Road in Nashua to support the Milford expansion. These reinforcements consist of approximately 10,000 lft. of twelve inch steel main at a cost of $700,000.

A Liquefied Natural Gas (LNG) plant will be installed during the third year to eliminate any need for additional pipeline reinforcements during the remainder of the ten year planning horizon. The timing for this installation is driven by the projected Milford load and the elimination of further reinforcements in the Nashua area. The LNG plant will initially be installed with a capacity of 250 mcf per hour, expandable to 400 mcf per hour, and is estimated to cost $1.6 million.

The sections of this plan contain detailed analyses, exhibits and narrative discussions developed by the Milford expansion task force. The task force included: senior ENGI officers; ENGI employees in the area of Marketing, Engineering and Operations, Gas Supply, Energy Production, Finance, and Public and Community Relations; and an independent outside consultant.

Once the objectives, scope and project schedules were adopted by the task force and advisors, frequent meetings and progress reviews were conducted to coordinate detail analyses of the evolving expansion plan.

This business plan provides details on the many alternatives analyzed and results of numerous model runs.

1 EXECUTIVE SUMMARY

SUBJECT TO PROTECTIVE ORDER AND CONFIDENTIAL TREATMENT

Key Findings

- The primary expansion "anchor" is Hitchiner Manufacturing. Hitchiner employs over 2000 workers at four major divisions in the United States and Mexico, and licenses its investment casting technology throughout the world. Hitchiner's Milford location employees 700 workers. The availability of natural gas for Hitchiner, and the resulting reduction in its energy costs, will help retain their current level of operations and support future growth in Milford.

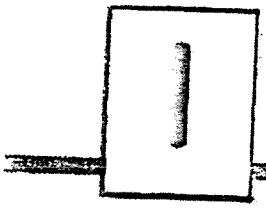
  In the summer of 1996, Hitchiner notified ENGI that it was going to make a change in its fuel supply and would prefer natural gas service. Additionally, Hitchiner will reach a decision on developing a second Milford foundry in early 1997. Including the second foundry, Hitchiner would constitute sixty percent (60%) of the natural gas load required for the financial success of the expansion.

- Assessments of the other potential industrial, commercial and residential customers in the target market indicate that the remaining loads required for financial success could be added within the planned compact corridor during the first five years of the planning horizon.

- The projected load in year ten of the planning horizon will amount to 5.4 million therms with 90% of the load captured during the first five years of the expansion. The ten year projected therm load is equal to five percent of the total ENGI FY96 firm sales and transportation loads. The forecast includes 238 industrial and commercial customers and 530 residential customers. II-7

- Feasible routes for required mains and reinforcements have been identified and analyzed. Needed gas supplies, including base load and peaking, are to be provided by system reinforcements and the construction of an expandable LNG facility at the western end of the proposed Milford system.

- Meetings with town officials, and business and community development organizations have been very positive and supportive. The economic



EXECUTIVE SUMMARY

development and environmental benefits of natural gas are well understood by these constituencies.

- Projected FY97 capital expenditures are $2,553,000, with total capital expenditures during the ten year planning horizon amounting to $6,135,000.

- The net present value (NPV) financial analyses of the "base case" for the proposed Milford expansion project produced a positive aggregate cash flow during the ninth year of the project. A variety of sensitivity analyses were conducted on the base case with the NPV results of those analyses ranging from six to fourteen years.

Recommendation

The Milford natural gas expansion task force has concluded that it is feasible to expand natural gas service to the Town of Milford by initially remaining within the proposed routing of the concentrated area of potential commercial and industrial customers.

With the appropriate approvals and a completed agreement with the "anchor", Hitchiner Manufacturing, ENGI is prepared to immediately begin implementation of this expansion with the goal of providing natural gas service to the anchor and other key customers in Milford by the fall of 1997.

SUBJECT TO
PROTECTIVE ORDER AND
CONFIDENTIAL TREATMENT

II EXPANSION COST & BENEFIT ANALYSES

SUBJECT TO
PROTECTIVE ORDER AND
CONFIDENTIAL TREATMENT

A. Marketing Plan

1. Introduction

"For all its traditional atmosphere, Milford is an important commercial and employment center for the smaller surrounding communities [of the 12 communities comprising the Nashua Region] .. *Milford is home to a number of manufacturing concerns including Hitchiner Manufacturing. A strong business base combined with small town charm make a home in Milford among the most desirable and affordable in the Nashua region."*[1]

a) This brief statement by the Nashua Regional Planning Commission succinctly captures the character of the town of Milford. It also contains many of the important elements that positively support the proposed Milford expansion:

- *"small town atmosphere"* .. congenial quality helpful in building relationships with town officials
- *"commercial and employment center"*.. excellent commercial and industrial base for gas conversion potential
- *"Hitchiner Manufacturing"* .. strong "anchor" gas customer required for an expansion of this magnitude
- *"homes in Milford most desirable"* .. displays excellent gas potential for the residential market

b) The proposed expansion into Milford has become the largest opportunity for significant growth for ENGI. This assessment is based on the following findings:

- Large existing propane customer base conversion potential
- Strong commercial and industrial base in the compact area
- Ten year marketing projections in excess of 5.4 million therms annually
- Ten year marketing projections of 238 commercial and 530 residential meters

[1] p.1-3, 1994 Profile of the Nashua Region published by the Nashua Regional Planning Commission

- "Anchor" of significant size to support the majority of expansion installation costs
- Favorable ENGI and EnergyNorth Propane, Inc. (ENPI) historical presence in Milford
- Modest economic growth projections
- Supporting positive demographic data

2. Market Assessment

Milford has Strong Market Potential with Significant Growth Opportunities

a) Prior Experience in the Town of Milford

EnergyNorth, Inc. (ENI), has had a presence and favorable experience in the town of Milford since 1969, earning the support of local business and town officials during this period. ENGI has maintained an existing propane tank farm and distribution system on Ridgefield Road and has served approximately 150 customers for more than twenty-five years. ENPI has been steadily gaining market share in Milford since 1990. Today ENPI serves 451 customers. ENPI's and ENGI's reputations for superior service and safety have provided a solid foundation for market receptiveness.

b) Market Type and Location

This natural gas system expansion will be supported by a heavy concentration of commercial and industrial customers located within the corridor of the proposed route. The target corridor is referred to as "The Urban Compact Area", and is bounded by the Souhegan River and Route 101 Bypass. This compact area of ten square miles is zoned almost entirely as commercial or industrial. The only exceptions are an adjacent residential neighborhood which ENGI plans to serve, and 153 customers presently served by an ENGI propane tank distribution system.

c) Future Growth Opportunities

The projected future economic forecast for this Amherst/Milford corridor is for modest and stable growth in housing, retail and employment. This growth should be sustainable and stable which will allow for organized and phased marketing efforts during the planning horizon.

d) Supporting Demographic Data

There are a number of supporting demographics that favor a natural gas expansion into Milford. These include increasing population trends, a large industrial base, large existing propane market, favorable housing unit profile, and above average income levels per household. (See appendices M-1.1, 1.2, 1.3).

e) The Milford Market Assessment

A comprehensive study was performed by the ENGI marketing department to determine the natural gas market potential. Data was collected using sources such as the NYNEX directory, discussions with town officials, prospective customer contacts, town assessor's mapping and tax information, local realtors and business leaders, U.S. Census Data and the New Hampshire Office of State Planning.

The existing market potential[2] and customer segments were assessed as follows:

Segment	Meters	Percent	Annual Therms 000's	Percent
Residential	1,339	74.5	1,473	23
Commercial & Municipal	435	24.2	1,387	22
Industrial	24	1.3	3,554	55
Totals	1,798	100.0	6,414	100

Projected 5.4 m in 10 yrs

[2] Located immediately adjacent to the mains.

11 EXPANSION COST & BENEFIT ANALYSES

As previously described, the targeted compact urban area contains the majority of potential commercial and industrial customers and approximately 75% of the potential therms. For a comparison with ENGI's existing customer base. (see appendix M-2.1).

f) Alternate Fuels Potential

The Milford urban compact area contains approximately 50% of the customers who presently utilize propane for one or more energy applications. This conversion potential is greatly enhanced due to recent high propane prices. As shown in appendix M-2.2, approximately 429 customers in the compact area utilize propane, 320 or 37.5% utilize oil. It is expected that 95% of existing propane customers will convert to natural gas within the first five years following market entry. Building on past experience in other ENGI franchise areas, it is expected that 2.5% of the existing fuel oil customers will convert to natural gas during the planning horizon. Emphasis will be placed on municipal buildings due to their history of utilizing fuel oil. Over the years, electric space heating has continued to be a shrinking market. Therefore, this target market is estimated at 105 customers or 12.3% of the conversion potential.

g) Residential Multi-Family Housing Potential

Existing multi-family duplexes, condominiums and apartments represent a potential of 941 meters and approximately 658,000 therms, all concentrated in nine major developments. Therms were estimated as follows:

Fuel	Total Boilers	Therms (000)	
Fuel oil	320	102	
Electric		138	
Propane	429	418	45
Total		658	

SUBJECT TO PROTECTIVE ORDER AND CONFIDENTIAL TREATMENT

II EXPANSION COST & BENEFIT ANALYSES

SUBJECT TO
PROTECTIVE ORDER AND
CONFIDENTIAL TREATMENT

3. Ten Year Load Forecast

a) Methodology

ENGI's marketing department performed an extensive and detailed marketing survey of potential customers within the urban compact area. A tax map approach identifying types of zoning, parcels, vacancies and owners of properties was used. Assessor's information was then correlated to the tax maps which provided information on fuel types, age of buildings, and square footage of structures. This analysis step also included numerous field visits to identify each parcel along the proposed routes.

Observations concerning propane tanks, building architectures, fuel types, and potential conversion barriers were recorded. Industrial users were interviewed due to their significant impact upon the market assessments.

Potential main laterals were identified and potential therms were assigned to each potential customer. Only those customers that were adjacent to the proposed route were considered. Those customers located a block or more away were not included in the near term forecast.

An average historical usage was assigned when similar structures and companies were located in other ENGI franchise communities. For example, similar structures such as bowling alleys, restaurants, banks, etc., were used in identifying projected annual consumption. A "Pizza Hut" was assigned therms based on averaging seven Pizza Hut locations in other ENGI franchise communities.

A strong emphasis was directed toward maintaining accuracy and gathering as much market data as possible. Close coordination with the engineering/construction department was maintained to identify and evaluate required railroad crossings, newly paved roads, town public works operating constraints and other routing concerns such as at the new town oval.

b) Ten Year Marketing Forecast Summary

The market forecast developed for the expansion is achievable. Approximately 80% of the entire market within the corridor containing the proposed route will be captured. The ten year marketing forecast amounts to more than 5.4 million therms annually with 90% of the projected therms captured within the first five years. In terms of meter counts, the ten year marketing forecast includes 238 commercial and industrial and 530 residential meters.

Propane conversions will be aggressively targeted during the initial market entry years, followed by emphasis on electric and fuel oil during the later years. These conversion strategies are based on ENGI's past experience in other franchise areas.

The multi-family projects represent a significant portion of the therms and revenues used to support the Milford expansion business plan.

Drawing highlights from the detail assessments provided in appendices M-3.1 & 3.2, the following projections are provided:

Market Capture Rates

- 60% of forecasted therms are to be captured in the first year.
- 80% by the third year
- 90% by the fifth year
- Appendix M-4 contains a detailed listing of sales goals by year

Total meters in forecast

- 238 Industrial and Commercial
- 530 Residential

Growth over the ten year planning horizon accounts for only five percent of the projected load in year ten.

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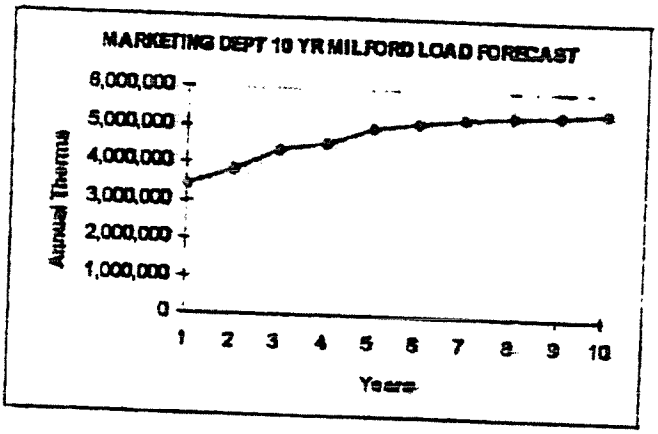
The market forecast is illustrated by the graph below:



4. Marketing Strategies

a) ENGI should achieve immediate and significant progress in capturing existing customers that use propane as the primary fuel. It is expected that within the first five years, 95% of existing propane users will convert to natural gas. It is expected that 95% of ENPI's customers will convert within the first two years. Customers who have signed multi-year contracts with other propane suppliers may cause an initial delay in their conversion to natural gas.

b) Customers who use propane as a secondary fuel will be introduced to the benefits and availability of natural gas. Many of these customers may use propane for cooking or water heating and oil as the primary heating fuel. This approach will provide opportunities for ENGI's conversion burner program.

c) Conversions from electricity will be the third area of marketing emphasis although it is recognized that electric heating is a shrinking market. Fuel oil and propane suppliers have already made significant progress in converting many existing electric heating customers.

d) Fuel oil conversions have exhibited a slower rate in other ENGI franchise communities because of the relative price of oil versus gas. In our analysis and based on past experience, it is estimated that 2.5% of existing fuel oil customers will convert to natural gas. Emphasis will be placed primarily on municipal buildings, where ENGI has had the greatest fuel oil conversion success. We have learned from past experience that natural gas has become the desired choice when planning for the future, therefore it is important to encourage town officials to consider natural gas for conversion in their future plans. Towns such as Hooksett, Nashua and Manchester have made natural gas their choice when confronted with underground storage tanks, environmental issues and maintenance concerns.

e) Once gas mains are installed, it is expected that 95% of new construction built near the corridor area will select natural gas as their fuel of choice. We have found this success rate to be true in other ENGI franchise communities. Efforts will be made to capture all new construction along ENGI's mains.

5. **Implementation Strategies**

a) **Initial Plan**

An initial extensive and comprehensive market development program will be initiated upon approval of the Milford expansion project.

Marketing and sales action plans will include:

- Immediate action to finalize agreements and service activation with the anchor and secondary industrial and commercial accounts.
- Implementation of residential multi-unit housing conversion incentive programs.
- Establishment of a temporary office in downtown Milford for an eight month period from March 1997 through October 1997. This temporary field office will be used as a base for marketing, construction and general customer information dissemination. This office presence will provide a local ENGI image within Milford's "small town atmosphere".

- Implementation of immediate action plans to convert 153 current ENGI propane distribution customers to natural gas.
- Direct mailings to prime prospects such as:
  - Condominium owners
  - Duplex owners
  - Multi-family unit management companies
  - Apartment owners
  - All residential customers in expansion corridor
- Direct mailings to large commercial and retail establishments
- Advertising in the local weekly paper, "Milford Cabinet"
- Advertising in and developing feature articles for trade and organization newsletters and publications
- Possible use of billboard advertising for high traffic flow areas
- Contacting local mechanical engineering firms, HVAC companies and architects concerning natural gas availability
- Contacting local plumbers and heating contractors. Also use NHPHCC affiliation for announcements

Planned community and public relations activities in support of market development are set forth in detail in the public and community relations section of this plan. (Section III).

Additional program support activities will include:

- Existing customer service personnel will support initial marketing efforts and assist with inquiries
- Construction coordination activities will be located in the temporary office.

b) Long Term Marketing Action Plan

The long term market development plan includes measures to ensure that ENGI:

- Meets yearly sales goals.
- Develops long-term relationships with key members of the community.

- Maintains a key account relationship with Hitchiner Manufacturing and provides service commensurate with ENGI's largest customer.
- Works with municipal leaders on all aspects of converting public buildings.
- Works with school superintendents and business administrators.
- Works with public works officials including the building inspector, road agent and town engineers.

c) Conversion Incentives

Although natural gas has distinct advantages over alternate fuels, the initial cost of conversion can be a significant obstacle to early upgrading to natural gas. Providing financial incentives will encourage property owners to upgrade to natural gas sooner than they would have otherwise. These conversion incentives will need to be flexible to match the individual circumstances of each project. In order to assure targeted projects convert in a timely manner, the marketing department plans to use the following multi-family incentive programs:

- Conversion Cost Incentive - Provide flexible incentives as needed; not to exceed one year's margin.
- Financing - Develop an attractive third party financing package.
- Shared Savings Programs - Refer prospects to companies experienced in participating in these programs.

The primary reason for offering conversion incentives is to move up conversions of properties sooner than would have been the case without the incentives. The revenues generated will have a far more positive impact on the economics of the entire expansion program if received early in the ten year planning horizon.

d) Required Market Entry Resources

The Milford expansion will occur simultaneously with other expected high growth within ENGI's franchise territory. Since the Milford market is

primarily C&I based, a C&I marketing representative will be dedicated to developing the C&I base and the residential marketing program for a period of three years. This dedicated marketing effort is expected to require an experienced marketing representative who is not currently a staff member.

Other marketing personnel will also assist as required. It is important that ENGI aggressively pursue the Milford market during the initial years to meet or exceed forecasted sales goals. During the first three years, the primary marketing responsibilities will be the conversion of major industrial customers and the attraction of large commercial customers.

Secondary goals will be: to gather and assemble a database of detailed information on the existing customer base, such as persons to contact, age of equipment, capital investments required, and market obstacles; and to develop relationships with municipal managers, such as school department heads, town officials and key chamber of commerce members. Following the initial three years of the concentrated market development effort, the Milford franchise territory activities can be incorporated into the ongoing southern division marketing programs.

It is estimated that the incremental marketing budget required during the first three years will be approximately $110,000 per year. These resources include:

- Advertising and promotion expenses
- An additional marketing representative
- Local office lease costs including utilities
- Direct mail costs
- Office and miscellaneous expenses
- Customer incentives

6. Large Industrial & Commercial Customers

a) Largest Anchor Customer

Project developers often attract and pre-sign "anchor" tenants prior to committing large capital investments associated with construction of an office

park, retail mall, medical complex, or entertainment complex. This "anchor" concept is directly applicable to major expansions of natural gas distribution systems. ENGI has received strong indications of interest for natural gas from many large customers located along the proposed route. ENGI has entered into preliminary negotiations with the major "anchor" necessary for this expansion. The anchor is Hitchiner Manufacturing Co., Inc., whose headquarters are based in Milford. (See appendix M-5)

Propane gas presently accounts for approximately 50% of Hitchiner's energy needs with the remaining 50% being electricity. Hitchiner's load would represent [redacted] of the potential market in the ten year market forecast. Its usage is estimated to be slightly over [redacted] therms annually and is expected to grow to more than [redacted] therms by 1998 with the addition of a new foundry, making Hitchiner ENGI's largest firm customer.

Hitchiner's main facility, located near Old Wilton Road in western Milford, consists of eight buildings. ENGI intends to master meter the complex and replace an existing underground gas piping system. This on-site distribution system will be paid for by Hitchiner and would become the property and responsibility of Hitchiner to maintain. ENGI will propose a special contract which would provide a margin identical to the current LV-70 rate margin.

Hitchiner is in the process of finalizing plans for a major foundry expansion at a nearby facility on Scarborough Lane, located within a half mile of their main facility. This new facility would also be included in the proposed special contract.

b) Other Major Prospective Industrial Customers

Approximately fourteen potential industrial customers are located in two industrial parks, located at each end of town. All of these industrial customers currently use propane and can be supplied with a single lateral off the primary main along the proposed route.

Projected annual usage at each industrial park is in excess of 75,000 therms.

II EXPANSION COST & BENEFIT ANALYSES

LV-90 Rate?

Brox Paving Plant currently uses ENGI supplied natural gas at two other facilities located in Hudson and Hooksett. Each facility consumes over [redacted] therms annually. Brox has expressed interest in converting their existing asphalt facility from #2 fuel oil. Todesca Asphalt, another customer similar to Brox, has already signed an agreement with ENGI to use natural gas at an estimated annual level of [redacted] therms.

yes per tech session

Within the past year, another potential customer has expressed interest in using natural gas for self-generation. This potential customer would qualify for ENGI's LV-90 rate.

c) Other Prospective Large Commercial Customers

Lorden Plaza, Granite Town Plaza and Howard Road Shopping Plaza are plazas which contain primarily retail establishments such as supermarkets, pharmacies, banks, hardware stores, etc. These customers have a combined estimated annual usage in excess of 109,000 therms.

SUBJECT TO PROTECTIVE ORDER AND CONFIDENTIAL TREATMENT

II EXPANSION COST & BENEFIT ANALYSES

B. Operations and Engineering Plan

1. Introduction

The engineering evaluation of the Milford Expansion Project involved the analysis and costing of the pipeline extension, as well as system capacity reinforcements required to serve the proposed new load, most of which will be located near the end of the main extension. The system capacity reinforcement alternatives analyzed were pipeline, propane air peakshaving and LNG peakshaving.

2 Milford Expansion Proposed Routing

The routing options for the Milford extension were reviewed with the New Hampshire Department of Transportation (NHDOT) and the Town of Milford Public Works Department to obtain their concerns and advice. Factors used in evaluating each route included customer potential, construction obstacles, railroad crossings, wetlands available rights-of-way and the potential for future construction activity.

a) The selected Milford extension will consist of approximately 38,000 lineal feet of 8" high-density, plastic main with a total estimated cost of $1.96 million. The main will follow the primary business corridor through the towns of Amherst and Milford.

b) The proposed route for the Milford extension was finalized early in the engineering and planning stage. The route of the Milford extension will begin on Rte. 101A at N. Hollis Road in Amherst and follow Rte. 101A, Old Nashua Road, and Rte. 122, in Amherst and Rte. 101A Nashua Road, Elm Street, and Old Wilton Road in Milford ending at Hitchiner Way. Reference maps are provided in the appendix.

3. System Pipeline Reinforcement

a) The Nashua distribution system has been analyzed to determine the optimal system reinforcements needed for the Milford Extension. The network model

analyses were based on a ten year forecast projecting a 3% annual growth for the Nashua system, plus Milford's annual forecasted load growth. The model inputs simulated design winter conditions. The pipeline system reinforcements identified during the network model runs were separated into two groups; Nashua for Nashua and Nashua for Milford.

b) The resulting optimal Nashua pipeline reinforcement for Milford will be installed in the project's first year. The planned reinforcement will consist of approximately 10,000 lineal feet of 12" steel main at a total estimated cost of $700,000. The pipeline reinforcement route selected is Manchester Street, Tinker Road and Thornton Road in Nashua where approximately 80% of the route currently has gas mains.

c) When conducting the network analyses, the team first forecasted annual Nashua pipeline reinforcements needed to meet the annual load growth for Nashua and Milford over the ten year planning horizon. The analyses, based on design winter conditions, started with 75 mcfh and 2,393 mcfh for Milford and Nashua respectively and forecasted to reach 225 mcfh and 3,123 mcfh in the tenth year. The analyses showed that $2.1 million of Nashua pipeline reinforcements would be required to provide the capacity necessary to meet Nashua and Milford design hour demands over the ten year planning horizon.

d) The next step in the network analysis included comparing a LNG peakshaving plant versus pipeline reinforcements for each year in the ten year planning horizon. The analysis results showed that the LNG plant, if installed in the third year, would eliminate the need for additional pipeline reinforcements for the remainder of the ten year planning horizon.

e) The proposed pipeline reinforcement for Milford consisting of 10,000 lineal feet of 12" main in year one, and the LNG plant installation in year three, have a combined total estimated cost of $2.3 million. The alternative of using only pipeline reinforcements required to meet design hour demand for Nashua and Milford over the ten year planning horizon is estimated to cost $2.7 million.

f) This optimum combination of pipeline reinforcement and the LNG plant will be more effective in meeting Nashua and Milford demand over the ten year planning horizon by providing peaking capacity and security of supply to Milford and part

of the Nashua system rather than building excess pipeline capacity that would not be used during off peak periods.

4. **LNG Plant Reinforcement**

a) As previously indicated, the LNG plant should be installed in year three, based on forecasted load projections in both Milford and Nashua, to provide the least cost and most secure reinforcement option. This option will eliminate the need for $1.4 million of pipeline reinforcements to the Nashua system for Milford during the remainder of the ten year planning horizon. The LNG plant will provide supply security and peakshaving capacity to both the new Milford system and portions of the Nashua system. During the tenth year design hour condition, the LNG plant will supply Milford's 225 mcfh demand and help meet Nashua's 3123 mcfh demand. This capacity gain to the Nashua system will eliminate a $600,000 system reinforcement for Nashua in the third year of the ten year planning horizon.

b) We have received external estimates of approximately $1.6 million to build a LNG facility including the cost of land. The cost estimates include a 15% contingency fee for potential "unknowns". The LNG plant would have a capacity of 250 mcfh and be expandable to 400 mcfh. The plant would be "prefabed" in a modular format making it mobile for any future considerations.

c) To date, it is important to note that we have developed this LNG project analysis in a confidential manner, as the project has not yet been officially approved. We have not involved local officials or potential abutters. We have asked our vendors for as much information as they could possibly provide without incurring cost to EnergyNorth. We have held preliminary discussions with town and chamber officials indicating that a LNG facility would be required as part of the Milford expansion. It appears that siting an LNG facility does not generate the same degree of "political sensitivities" as was common in the past.

5. **Propane Air Reinforcement Feasibility**

Our analyses indicated this reinforcement alternative is not feasible. In order to use propane air vapor in our system, the ratio of propane air to natural gas must be precisely controlled to produce a gas mixture that burns without causing customer

equipment problems. Propane air vapor can be utilized only at points in the distribution system where natural gas is maintained at sufficient pressures and volumes to assure no problems. In the southern division, the only two locations where it is feasible to inject propane air are 38 Bridge Street, Nashua, or the Hudson Take Station. The Amherst System, with a pressure of less than 35 psig, has no feasible locations.

6. Municipal Operating Standard

a) An operating/coordination agreement is being developed between ENGI and Milford Public Works for access to municipal rights-of-way to install gas mains and services and for reimbursement when ENGI is required to relocate its mains.

b) The agreement will identify the standards and specifications for excavating, installing and restoration of municipal rights-of-way when installing ENGI gas facilities. It will also address when and how relocation reimbursement will occur.

Summary

a) The Milford extension will consist of approximately 38,000 lineal feet of 8" high-density, plastic main with an estimated cost of $1.96 million. The main will follow the main business corridor through Amherst and Milford.

b) The Nashua system pipeline reinforcement for Milford will be installed in the project's first year. The planned reinforcement will consist of approximately 10,000 lineal feet of 12" steel main at a total estimated cost of $.7 million. The pipeline reinforcement route is Manchester Street, Tinker Road, and Thornton Road in Nashua where approximately 80% of the route currently has gas mains.

c) The LNG plant will be installed in year three to provide the least cost reinforcement option. The plant's installation and operation will eliminate the need for $1.4 million of pipeline reinforcements to the Nashua System for Milford during the remainder of the ten year planning horizon. It will also eliminate a $600,000 reinforcement for the Nashua System. The LNG plant will provide

supply security and peakshaving capacity to both the new Milford system and portions of the Nashua system. The LNG plant will have a capacity of 250 mcfh and be expandable to 400 mcfh. The current total cost estimate is $1.6 million.

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C. Financial Plan

1. Introduction

This business plan section summarizes the financial soundness of the Milford expansion project by using a net present value (NPV) analysis method. The analysis and its results are primarily driven by inputs provided by the operations and marketing task force members.

2. Summary of Financial Goals

The primary financial goal is to maximize NPV and, thus, enhance shareholder return. Existing customers should benefit from this expansion in the form of reduced future revenue requirements and economies of scale cost reductions.

The targeted payback period adopted for evaluation of this project is ten years.

3. Analysis Methodology and Base Case

As a method to evaluate the financial feasibility of the proposed Milford expansion, task force members provided forecasted sales, margins, capital and operating costs for a ten year period. After extensive analyses, a most probable scenario was adopted and utilized as the "base case". Alternative scenarios were conducted to test the sensitivity of the base case.

BASE CASE SCENARIO
Assumptions:

The financial base case scenario is driven by marketing and engineering department assessments and projections which were discussed in earlier sections of this plan. Key assumptions are:

- Revenue assumptions developed in the marketing plan.
- Capital costs included in the initial year total $2,553,000.

11 EXPANSION COST & BENEFIT ANALYSES

- Capital costs included in years one through ten consist of the cost of mains, laterals, railroad crossings and services. (see Appendix F-1 for detail)
- Year three includes $1.6 million to install an LNG facility in the west section of Milford.
- Total capital costs for the project over a ten year period are $5,535,000.
- Mains comprise approximately 80% of capital costs (excluding the LNG plant), therefore a book life of 37.5 years and a tax life of 20 years were used in the analysis for the depreciation expense. A book life of 22.5 years and a tax life of 15 years were used to calculate depreciation for the LNG plant.
- A weighted average property tax rate and assessment ratio were computed based on the capital investment located in each affected town to determine the appropriate levels of property tax expense. However, the analyses reflect the agreement with Milford to phase-in the initial investment of approximately $2 million over four years. Additionally, the tax rate was increased by 1.5% annually to account for inflation.
- The capital structure and cost of capital used in the analyses are those which were approved in the company's last rate case, DR 91-212. (see Appendix F-2 for summary of carrying charge calculation)
  The discount rate used in all NPV analyses was 9.83%, the cost of capital from the last rate case.
  No rate relief assumed. Any rate increases will only enhance the project economics.

RESULTS:

Attached, as appendix F-3.1 is a schedule that summarizes the NPV/revenue requirements model utilized for the base case scenario. Key results of the base case are:

- Positive aggregate cash flow achieved in year nine
- NPV = $191,000 in ten years
- NPV = $2.47MM over the book life of the project

4. Base Case Sensitivity Analyses

To test the stability and sensitivity of the base case scenario, a number of alternative outcomes were selected for analysis. Those alternative scenarios are summarized and set forth in more detail below:

SUMMARY OF SENSITIVITY TESTS			
		Net present value (NPV)	
	Aggregate Positive Cash Flow Achieved	Ten Years ($,000)	Project Life ($,000)
Base Case	9 years	191	2,470
Sensitivity Tests			
Delayed Foundry	10 years	61	2,349
10% Therm Reduction	14 years	(303)	1,590
10 % Therm Increase	6 years	687	3,370
Interest Rate Reduction	8 years	334	2,912

Refer to Appendices F-3.2 through F-3.5 for summaries of the sensitivity tests.

- **"Delayed Foundry" Sensitivity Test**

  Assumptions:

  Due to the importance of the planned *addition* in 1997 of a new foundry located near Hitchiner's main operations, the impact on the base case of a delay in the installation of the second foundry to year three versus one was analyzed [redacted] therms annually).

  Results:

  Positive aggregate cash flow achieved in year ten
  NPV = $61,000 in ten years
  NPV = $2.35MM over the book life of the project

- **"10% Therm Reduction" Sensitivity Test**

  Assumptions:

  This scenario was selected to test the impact of a 10% reduction of forecasted therms in the base case.

  Results:

  Positive aggregate cash flow achieved in year fourteen
  NPV = ($303,000) in ten years
  NPV = $1.59MM over the life of the project

- **"10 % Therm Increase" Sensitivity Test**

  Assumptions:

  This scenario was selected to test the impact of a 10% increase of forecasted therms in the base case.

  Results:

  Positive aggregate cash flow achieved in year six
  NPV = $687,000 in ten years
  NPV = $3.37MM over the life of the project

- **"Interest Rate Reduction" Sensitivity Test**

  Assumptions:

  This alternative scenario was applied to test the impact of obtaining a 1% reduction in long-term interest rates for financing this project.

  Results:

  Positive aggregate cash flow achieved in year eight
  NPV = $334,000 in ten years
  NPV = $2.91MM over the life of the project

  A graphical presentation of the base case and sensitivity tests results is provided in appendix F-4.

5. Financing Alternatives

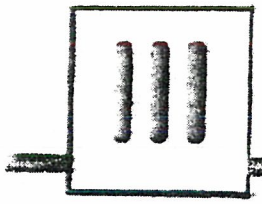
In preliminary discussions with legal counsel, it appears there may be two alternate financing options available to ENGI for this project, as compared to ENGI's normal long-term financing with private placement debt. These two alternatives are summarized below and may be further evaluated once the expansion project is approved.

- Private Activity Bond option:
  - Tax-exempt
  - Requires application to the Business Finance Authority (BFA)
  - Provides for local gas companies to expand within municipalities
  - *Possible* two county restriction
  - Variable bond rates start at 3%
  - Fixed bond rates range from 5 1/2% to 6%

- State Revolving Loan Account option:
  - 20 year maximum
  - Rate is approximately 4 1/2%
  - Requires legislation

6. Conclusions

The base case scenario is projected to result in an aggregate positive cash flow in nine years, achieving the financial goal adopted for this expansion. Sensitivity analyses show this scenario is affected by fluctuations in margin projections and interest rate changes. Although the sensitivity test scenarios are judged to have a low probability of occurring, the test results do not significantly impact the attractiveness of the expansion project. Three of the sensitivity tests identified achieved the financial goal of achieving aggregate positive cash flow by year ten, with the fourth test achieving that goal in year fourteen.



PUBLIC AND COMMUNITY RELATIONS PLAN

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A. Introduction

The proposed main extension will be routed through the principal commercial and industrial areas of the town of Milford. Therefore, ENGI must remain sensitive to the potential impact of street excavations, temporary business disruptions and resulting media exposure.

It is also important that town officials and community and business leaders clearly understand the economic development and environmental benefits of having natural gas available as an energy source. Utility costs are a major expense item for businesses, especially manufacturers, and some businesses have considered relocating to other states due to New Hampshire's high energy costs. Providing a more economical energy source to the Milford area will promote further economic stability and support future growth for the region.

B. Town Background

The town of Milford has a population of approximately 12,500. It is governed by a five-member Board of Selectmen. Milford employs a town administrator who is responsible for day-to-day municipal activities and reports to the Board. As is typical with most communities, civic and professional organizations include a chamber of commerce, a downtown merchants group and an industrial development organization.

C. Initial Community Contacts

Initial informational briefings have been conducted with the chairperson of the Milford Board of Selectmen and the Town Administrator, the Amherst Town Administrator and Zoning Administrator, the leadership of the Milford Downtown Ongoing Improvement Team (DO IT), the Milford Industrial Development Corporation (MIDC), the Milford/Amherst Chamber of Commerce and the New Hampshire Department of Resources and Economic Development. In each instance, key contacts have been established to exchange information as the project progresses. A detailed list of local and state officials either contacted or to be contacted is included in Appendix P-1. The preliminary themes presented in these briefings have centered on the importance of the town's support for the

project, the economic benefits provided by the availability of natural gas and EnergyNorth's desire to create a 'working partnership' with the town.
ENGI has also met with Milford's Chairman of the Board of Selectmen, Town Administrator and Assessor to request a phase-in of the initial plant investment for determination of the amount of property taxes to be paid to the Town of Milford. It appears that agreement has been reached for a four-year phase-in of the first year is investment of approximately $2 million in the town.

D. Post-Decision Action Plans

1. Promoting The Benefits Of Natural Gas Distribution

Once a determination has been made to proceed with the expansion, a press release will be issued. When ground breaking takes place in the spring, the Company will hold a news conference in Milford to kickoff the expansion of ENGI's natural gas distribution system to Milford. Local and state officials, along with members of the greater Milford business community, will be among those invited to the ground breaking. Following the issuance of the press release, the following public relations activities will be initiated during the first 2-3 months of project implementation to promote the positive benefits of this expansion:

- Meetings with key political and appointed officials (including the Milford & Amherst Boards of Selectmen, area state representatives and senators, the Governor and Executive Council, commissioners of the Department of Resources and Economic Development and the Public Utilities Commission; and staff representatives from congressional offices)
- Meetings with the Milford/Amherst Chamber of Commerce, DO IT and MIDC
- Media briefings with the Milford Cabinet and local radio stations (news releases will be sent to other regional media outlets)
- Training sessions for safety officials
- Tours of our operations facilities for Milford officials, firefighters, media, etc.
- Presentations before local civic and professional organizations

- Pursue opportunities to become actively involved in the town (e.g. membership in the Chamber and service clubs).
- Presentations in local schools.
- Development of a budget for volunteer and financial resources to benefit community projects and charitable organizations.

An information package containing a project fact sheet, drawings/map of the expansion, name of appropriate ENGI contact people and other general information on the Company will be developed for use in meetings with the various constituencies.

The format for meetings with any group should be to provide a consistent overall message. The overall theme should be that the availability of natural gas enhances economic development, provides an environmentally friendly fuel choice for consumers, is a reliable and safe fuel, and enhances the community's tax base.

2. Milford Communication Team

A Milford communication team of five members will be formed, headed by a senior company officer, who will coordinate all public and community relations activities related to this project. The team approach would, among other things, ensure there is optimum communication and coordination between EnergyNorth and the town, as well as between the various departments within ENGI. This team would remain in place through October 1997. Subsequently, day-to-day responsibility for public and community relations would be handled by ENI's Manager of Public/Investor Relations, as is the case with other communities.

The team members are set forth below:

"The Milford Communication Team"

Frank L. Childs, Vice President of Corporate Development & Energy Services

•

Richard P. Demers, Vice President of Marketing

•

William F. Ruoff, Vice President of Engineering & Operations

•

Michael J. Nethovick, Manager, Public and Investor Relations

•

Randall S. Knepper, Commercial and Industrial Sales Manager

•

Ronald M. Kelley, Residential Sales Manager

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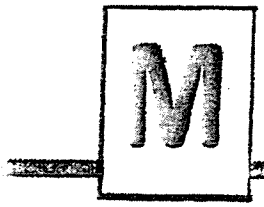
A APPENDIX

Introduction

This business plan section contains maps, reference data and results of analyses conducted in support of developing optimum strategies and plans.

The appendices are organized in a manner to match the business plan sections as follows and each section has its own index, as appropriate:

- Marketing Plan
- Operations and Engineering Plan
- Finance Plan
- Public and Community Relations Plan
- Milford Expansion Task Force



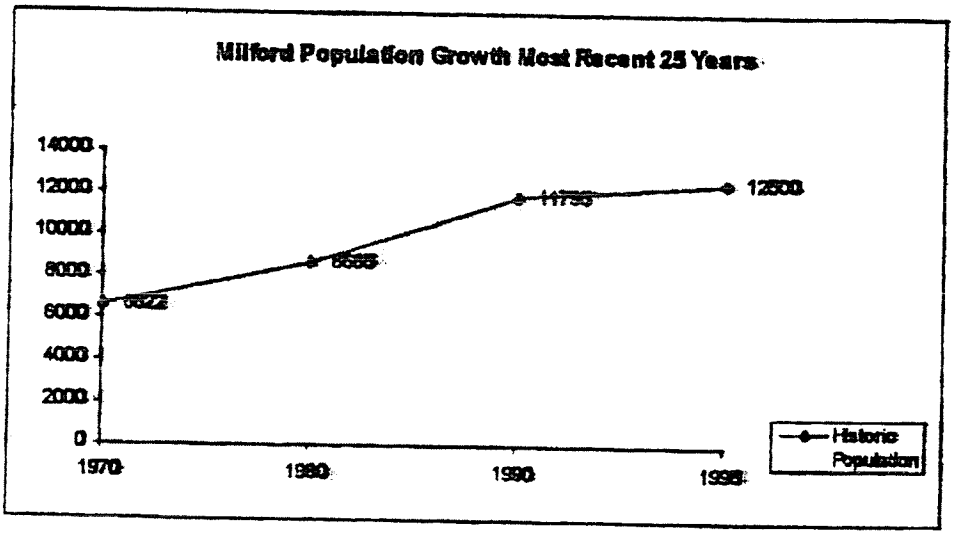
APPENDIX M

Index of Appendices

Marketing Plan

Target Market Demographics - Population Trends

Charts below show an increasing town population over the last twenty-five year period and the forecasted State of New Hampshire Office of State Planning (OSP), population projections. The Town of Milford is surpassing projections made by the OSP forecasts. These forecasts show moderate growth rates which are projected to be stable and sustainable over the next ten years. This moderate growth rate can be further characterized as 68% in-migration versus 32% resulting from natural increase. This growth source is important as many of those in-migrants move from other states where natural gas usage is made readily available and perhaps most preferred in homes and small businesses. This previous experience with natural gas helps support more rapid conversion to natural gas service in the target market.



Source: OSP Data 1995

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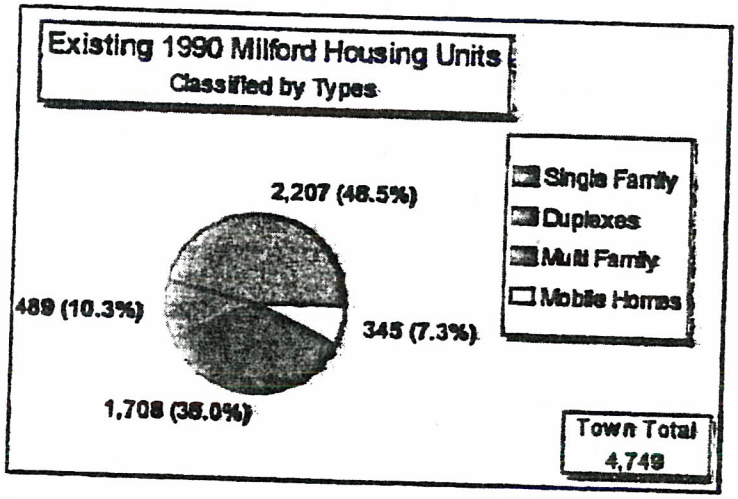
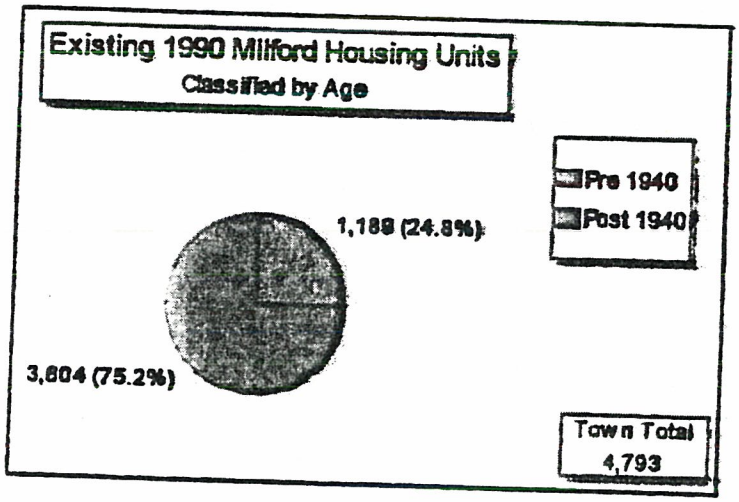
M

APPENDIX M-1.2

Target Market Demographics - Housing Statistics:

- Milford housing units consist of 46% duplexes or multi-family units which have a "lower cost to serve" than single family homes.
- 25% of Milford housing units are pre-1940 vintage which indicates these houses would be prime targets for new heating systems.





Sources: p. 3-5 NRPC Profile of Nashua Region 1994
p. 3-7 NRPC Profile of Nashua Region 1994

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APPENDIX M-1.3

Town of Milford Demographic Summary: Target Market

Population

- Growth was average during 1980's
- Modest growth projected for 1990's
- Slightly younger population than the national average
- An above average percentage of adult population have college degree

Households

- Typical household size is average at 2.54 persons
- Average household income is $52,497
- Average family income is $62,151

Age

- Median age is 33.0 years

Employment

- Unemployment rates are average
- Female labor force participation rates are high
- Large non-durable goods production employment

Source: Urban Decision Systems December 18, 1996

Other supportive demographics include:

- Population density of 455 persons per square mile is greater than neighboring Hillsborough County of 384 and the state average of 123.
- Less than 10% of the population is 65 years and older. Elderly residents are less likely to switch to new brands or convert their homes from an existing fuel to natural gas..
- 30% of the population is between 20 and 34 years of age. 32% are between 35 and 64 years of age. These are the prime age characteristics for potential conversions.
- 61% of the 4,793 total housing units in Milford are owner occupied and 39% are renter occupied. Less than 6.9 % of existing units are vacant.
- Hitchiner is the fourth largest employer in New Hampshire.
- Average daily traffic counts for Route 101A in Milford ranked third within the Nashua Regional Planning Commission (NRPC) region in 1992. The high traffic counts are desirable for new businesses relocating to the targeted expansion area where natural gas will support future growth.

Source: 1994 NRPC Profile of Nashua Region

M

APPENDIX M-2.1

Market Assessment

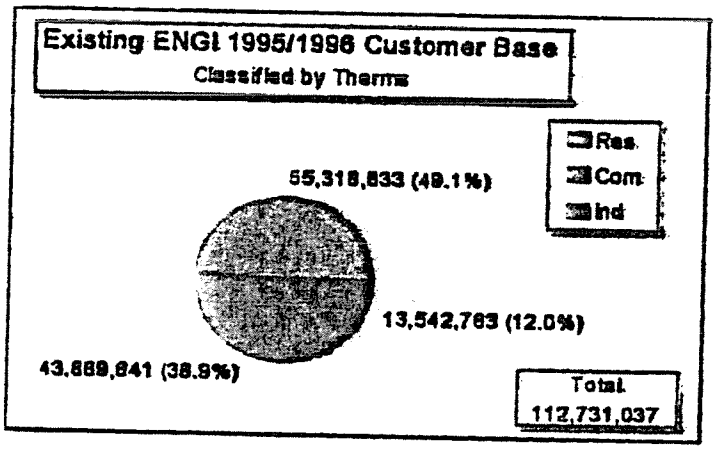
ENGI customer Base comparisons

Historically ENGI has been a residentially based company (see table) in terms of number of meters and usage.

Existing ENGI 1995/1996 Customer Base

Type	No. of Meters	Percent	Annual Therms	Percent
Residential	58,312	88.3%	55,318,633	49.1%
Commercial & Municipal	7,364	11.2%	869,641	38.9%
Industrial	306	.5%	13,542,763	12.0%
280 Day/Interruptible	20	0	N/A	
Total	66,002	100	112,731,037	100%

The Milford market is primarily commercial and heavily industrial based, which compliments ENGI's existing customer base. Charts below represent ENGI's existing customer base, in both therms and customer counts.



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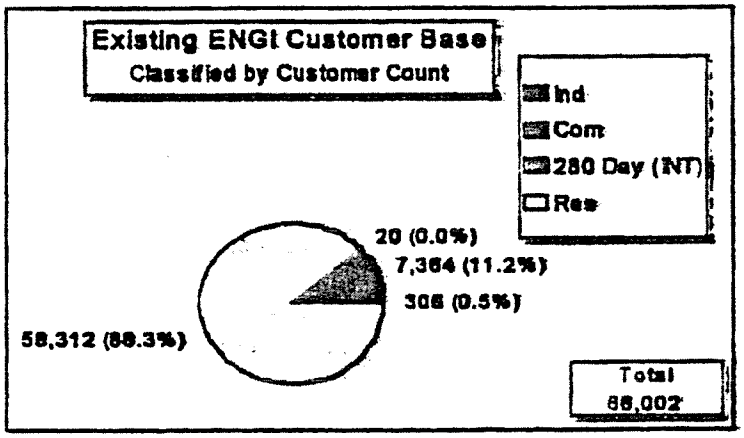
Market Assessment (continued)



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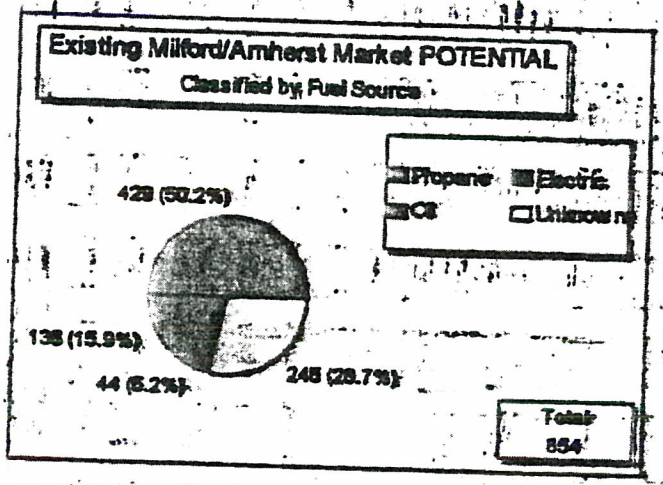
APPENDIX M-2.2

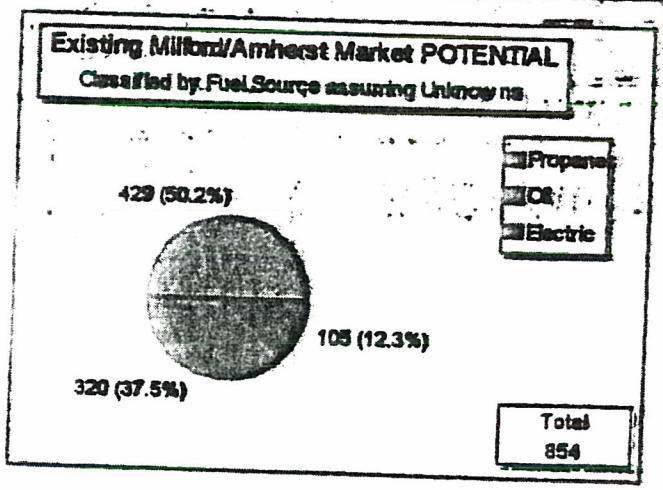
Market Assessment

Propane Conversion Potential

The Milford market within the urban compact area contains approximately 50% of customers who utilize propane for one or more energy applications.

As shown below, customers are classified by fuel source:





Source: Compilation from marketing field visits

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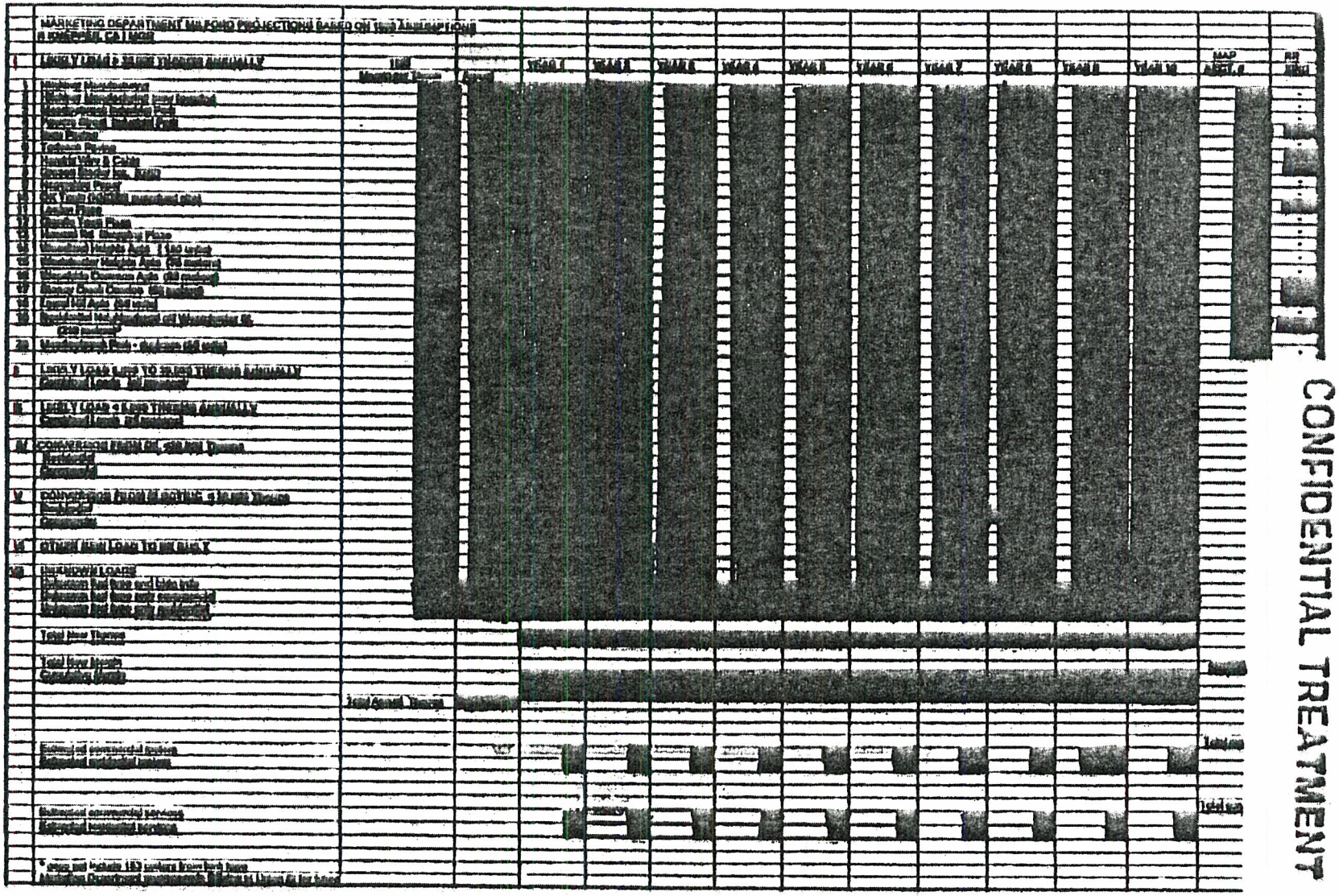
MILFORD/AMHERST EXPANSION PROJECT
MARKETING DEPARTMENT 10 YEAR FORECAST 1997-2006

Appendix M-3.1



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M

APPENDIX M-3.2

Detailed Methodology Of Ten Year Milford Load Forecast

The 10 Year Marketing Forecast was derived from analyzing the existing Marketing Potential and adding future growth projections. The forecast result is shown in Appendix M-3.1.

The existing Market was broken down into four major categories based primarily on fuel type. Because natural gas is primarily viewed as a commodity and pricing is a dominant factor, fuel type was found to be the single important factor in determining conversion rates.

A) The first 3 sections labeled I,II,III of Appendix M-3.1: Marketing Department 10 YR Forecast are related to existing propane users.

Section I identifies 20 large propane users with consumption greater than 30,000 therms annually. These customers are individually identified and consist of the industrial parks, large residential complexes such as apartment complexes and condominiums and large retailing complexes. The industrial customers within this category will be a top priority for converting and will be an intensely targeted segment of the market. A clearly defined incentive program specifically tailored for multi-family units should move forward the forecasted revenues for these identified multi-family projects. See the Incentive Program described in the Sales Strategy, 60 Day Action Plan section.

Section II contains a list of propane users who use between 5,000 and 30,000 therms annually. These customers are summarized as a single line item. It was assumed that 95% of these customers would convert to natural gas due to the competitive price advantages of natural gas over propane. Existing ENPI customers will be converted within the first year. Competing Propane Customers were assumed to be converted starting in Year 5 because many may be bound by 5 year contracts. It was also assumed that competing propane dealers would try to retain customers by offering lower margins to block ENGI conversion efforts. It is felt these potential competitor strategies could not be used for long periods without encountering financial difficulties.

Section III used the same methodology for developing the forecast and is applied for those customers with less than 5,000 therms annual usage.

B) The fourth and fifth sections labeled IV and V of Appendix M-3.1: Marketing Department 10 YR Forecast are related to existing alternative fuel users.

Section IV lists those potential customers that use less than 30,000 therms and currently use heating oil. This market segment is divided into residential and commercial users in summary totals. The assumed conversion rates for oil were 2.5% per year of the existing market. This equates to 1.1 residential units currently using heating oil converted per year from natural gas. Commercially, this equates to approximately one commercial establishment every two years converting to natural gas. These rates are consistent with conversion rates historically experienced within ENGI's other franchise territories. This assumes no targeted marketing efforts are made for conversion burners and that heating oil will continue to have a price advantage over natural gas.

Note: Conversion success for municipal buildings such as the schools, public works buildings, water treatment plants, libraries and town offices has not been forecast. A strong marketing effort combined with developing a good business relationship with the town can dramatically increase the conversion results from oil.

Section V lists conversions from electric heating. The electric heating market is a small and dwindling market. It is assumed that EnergyNorth will achieve a success rate of achieving 7.5% of the market per year or that 75% of the existing electric market will be converted to natural gas within 10 years. These conversion rates are consistent with conversion rates historically realized within ENGI's other franchise territories. The remaining electric conversion potential will either be too costly or will have some unique reason why conversion is not feasible. This equates to approximately 2 residential units per year of the existing market and commercially 1 unit every 5 years. Much of the existing electric market has already converted to either propane or oil. The remaining customers will present a serious marketing challenge. Most commercial establishments cannot afford electric heat and therefore the commercial electric market is limited.

c) The sixth section labeled VI of Appendix M-3.1: Marketing Department 10 YR Forecast refers to future growth for vacant properties as well as expected commercial growth within the next ten years. It is assumed all new buildings that will be built after the Milford expansion installation will use natural gas. Commercially, natural gas is highly favored over any alternative fuel source when available. The growth rate forecasted assumes approximately 4 new customers per year at 5,000 therms annual usage. Following discussions with the town planner to identify planned projects that are on the immediate horizon, identifiable projects were also included in the future forecast growth summary for the appropriate year. Some of the more notable future projects include:

- 20 home subdivision off of Elm St. in year 1999.
- Brox Paving plans for developing parcel in year 2000.
- New automotive parts store for 1997 along Route 101A
- New Rite Aid pharmacy store for 1997 along Route 101A
- New elderly care facility near Ponemah Rd in 1999

d) Section VII of Appendix M-3.1: Marketing Department 10 YR Forecast, is related to existing users whom the marketing department refers to as unknown at this time. This represents approximately 28% of the market.

Section VII lists those projects that are unknown at the time of this report. It is assumed that 80% of those unknowns use heating oil and 20% use electric. These "unknowns" were then divided into residential and commercial users in summary totals using the same conversion rates as used above for electric and oil. It was assumed that none of the "unknowns" were propane based upon the extensive field visits completed during the market assessment.

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APPENDIX M-4

Sales Goals By Years

By end of Year 1:

- 60% of total ten year forecasted therms (3.4 million annual therms) are achieved.
- All industrial parks and anchor are signed up.
- Begin conversions of residential neighborhood, Sunview II.
- All ENPT customers are converted. 153 existing propane tank farm conversions made.
- Initiate contact with large retailers, multi-family, municipal government leaders.

By end of Year 3:

- 80% of total ten year forecasted therms (4.4 million annual therms) are achieved.
- Most existing propane customers, including competitors, except for those with long term contracts have converted to natural gas.
- Initial multi-family units have begun conversion plans.
- 60% of Sunview II residential neighborhood converted.

By end of Year 5:

- 90% of total ten year forecasted therms (4.9 million annual therms) are achieved.
- All existing propane customers including competitors have converted to natural gas.
- Most multi-family units have completed conversion plans.
- Establish retail network and plan for ensuring additional gas uses from existing customer base.
- Blend in Milford market/goals into southern division market/goals.

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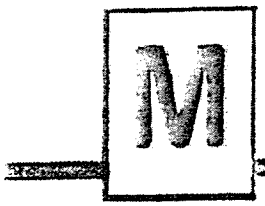

APPENDIX M-5

Hitchiner Manufacturing Company, Inc.
(Ferrous and noferrous investment castings)
Headquarters: Milford, N.H.

Profile

- Company founded in 1946 in Manchester
- Sales for 1994 were $112,730,000
- Highest unit production volume of any investment casting foundry in the world. There are approximately 300 investment casting firms.
- Approximately 2000 employees, with 700 in Milford.

Markets (1994)

Automotive	40 %
Golf	30 %
Military and Aerospace	20 %
Miscellaneous	10 %

Major Customers

- Callaway Golf
- General Motors
- BMW
- Pratt & Whitney
- B.F. Goodrich
- Taylor Made Golf
- Leatherman
- G.E.
- Chrysler
- Lockheed Martin

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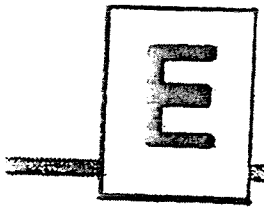
Structure

- Privately held corporation with significant stock ownership by company management



APPENDIX E

Index of Appendices

Engineering and Operations Plan

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APPENDIX E -

NASHUA IMPROVEMENTS FOR MILFORD

FORECAST YEAR	CALENDAR YEAR	NASHUA MAX HOUR SENDOUT (mscfh)	MILFORD MAX HOUR SEND OUT (mscfh)	TOTAL MAX HOUR SENDOUT (mscfh)	MILFORD E.O.M. (mile)	REINFORCEMENT SYSTEM AND OPTION	IMPROVEMENTS
1	97/98	2393	75	2468	29	OPTION 1* OPTION 1/1B NASHUA SYSTEM FOR MILFORD	TINKER, MANCHESTER ST. PARALLEL 4" WITH 4,088 LFT OF 12" PLUS TINKER, THORNTON 6,010 LFT OF 12" TINKER, MANCHESTER ST. PARALLEL 4" WITH 4,088 LFT OF 12" PLUS TINKER, CAMP SARGENT RD. 12,495 LFT OF 12"
1	97/98	2393	75	2468	23	OPTION 2 NASHUA SYSTEM FOR MILFORD	AMHERST ST. PARALLEL 6" WITH 6,535 LFT OF 12"
2	98/99	2465	100	2565	24	-------	NONE
3	99/00	3123	225	3348	39	MILFORD **	LNG PLANT PEAKSHAVING SENDOUT 225 MCFH AT 41 PSIG
3	99/00	2539	125	2664	28	OPTION 1A * NASHUA SYSTEM FOR MILFORD	AMHERST ST. PARALLEL 6" WITH 3,475 LFT OF 12"
3	99/00	2539	125	2664	22	OPTION 2 NASHUA SYSTEM FOR MILFORD	AMHERST ST. PARALLEL 6" WITH 6,040 LFT OF 12"
4	00/01	2615	150	2765	22	OPTION 1A * NASHUA SYSTEM FOR MILFORD	AMHERST ST. PARALLEL 6" WITH 3,095 LFT OF 12"
4	00/01	2615	150	2765	17	OPTION 2 NASHUA SYSTEM FOR MILFORD	AMHERST ST. PARALLEL 6" WITH 3,095 LFT OF 12"
5	01/02	2694	175	2869	19	NASHUA SYSTEM FOR MILFORD	TINKER RD. PARALLEL 8" WITH 6,735 LFT OF 12"
6	02/03	2774	185	2959	12	-------	NONE
7	03/04	2858	195	3053	14	NASHUA SYSTEM FOR MILFORD	CRAFTSMAN LANE PARALLEL 8" WITH 5,442 LFT OF 12"
8	04/05	2944	205	3149	20	MILFORD EXTENSION	MILFORD EXTENSION INSTALL 12,320 LFT OF 12" INSTEAD OF 8"
9	05/06	3032	215	3247	19	MILFORD EXTENSION	MILFORD EXTENSION INSTALL 3,954 LFT OF 12" INSTEAD OF 8"
10	06/07	3123	225	3348	14	———	NONE

* Option 1/1A and 1/1B have similar system reinforcement results.

** LNG Plant in year 3 eliminates system reinforcement scheduled after year 3.

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Appendix E-2 Map of Nashua Reinforcements

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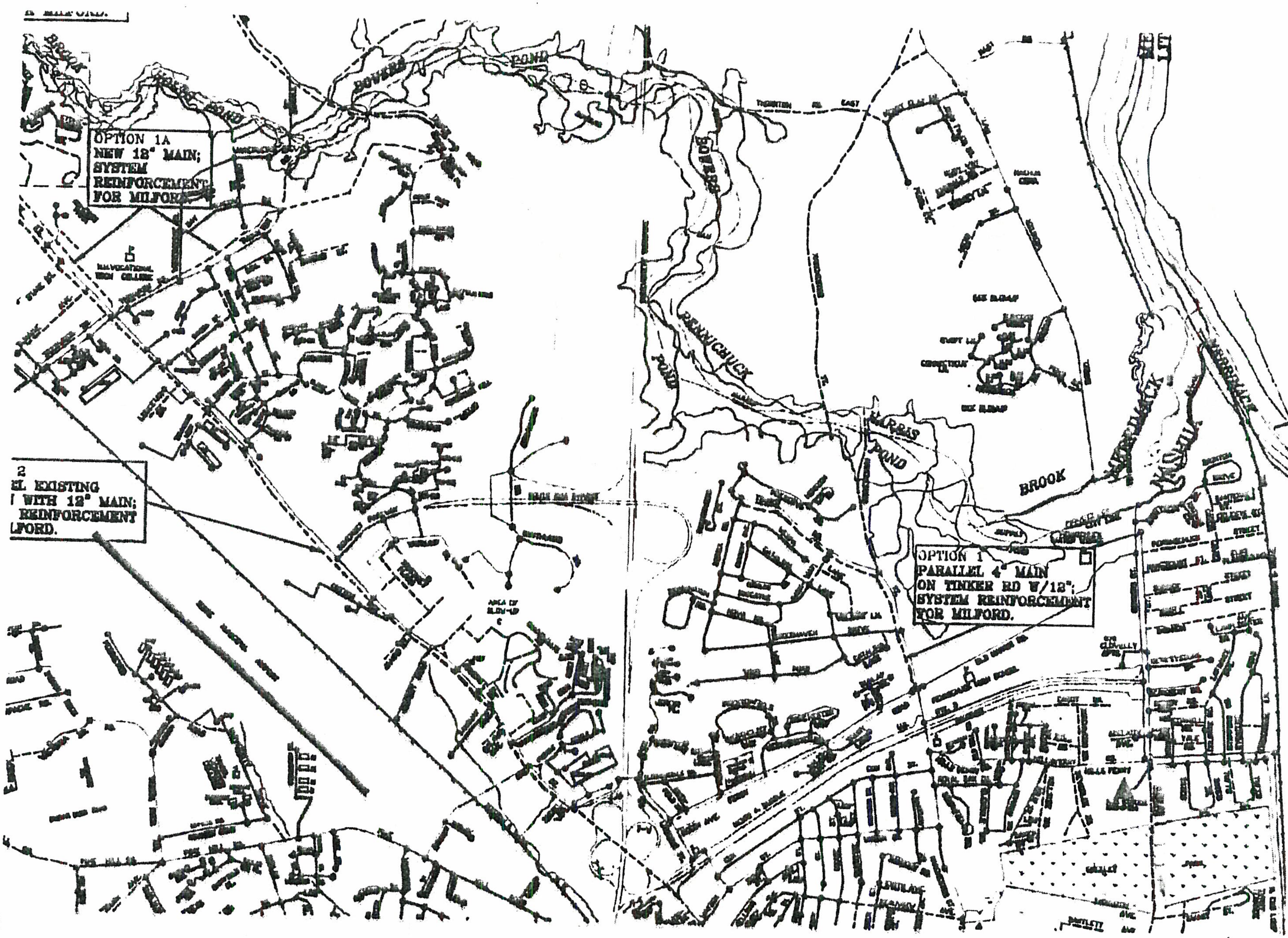
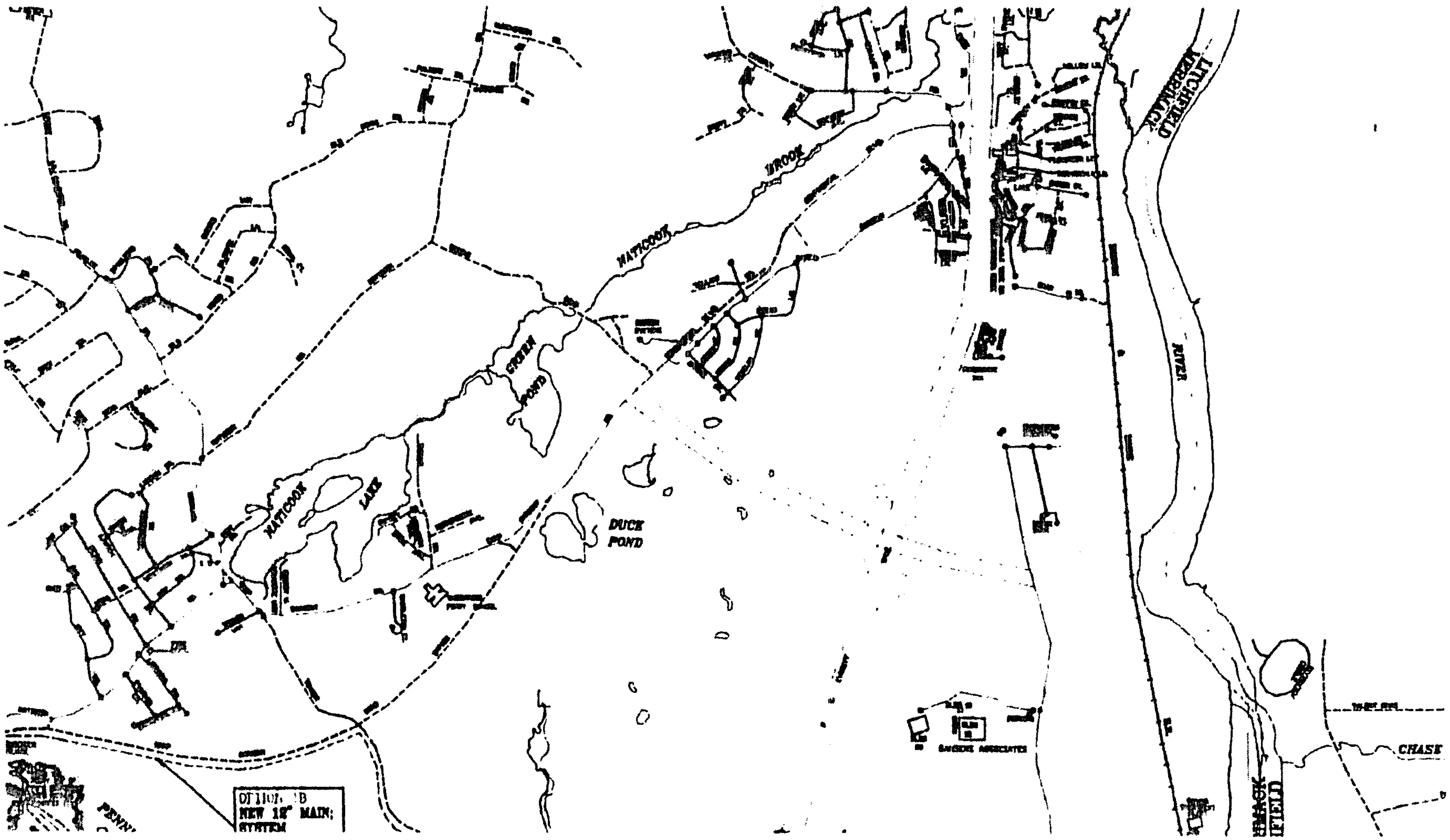

OPTION 1A
NEW 12" MAIN;
SYSTEM
REINFORCEMENT
FOR MILFOR
2
EL EXISTING
WITH 12" MAIN;
REINFORCEMENT
LFORD.
OPTION 1
PARALLEL 4" MAIN
ON TINKER RD W/12";
SYSTEM REINFORCEMENT
FOR MILFORD.
POND
BOWERS
PENNICHUCK
POND
HARRIS
POND
BROOK
MERRIMACK
NASHUA


OPTION 3B
NEW 12" MAIN;
SYSTEM
DUCK
POND
NATICOOK
LAKE
GREEN
POND
NATICOOK
BROOK
RIVER
LITCHFIELD
MERRIMACK
CHASE
BANSIDE ASSOCIATES

Appendix E-3 Map of Milford Extension

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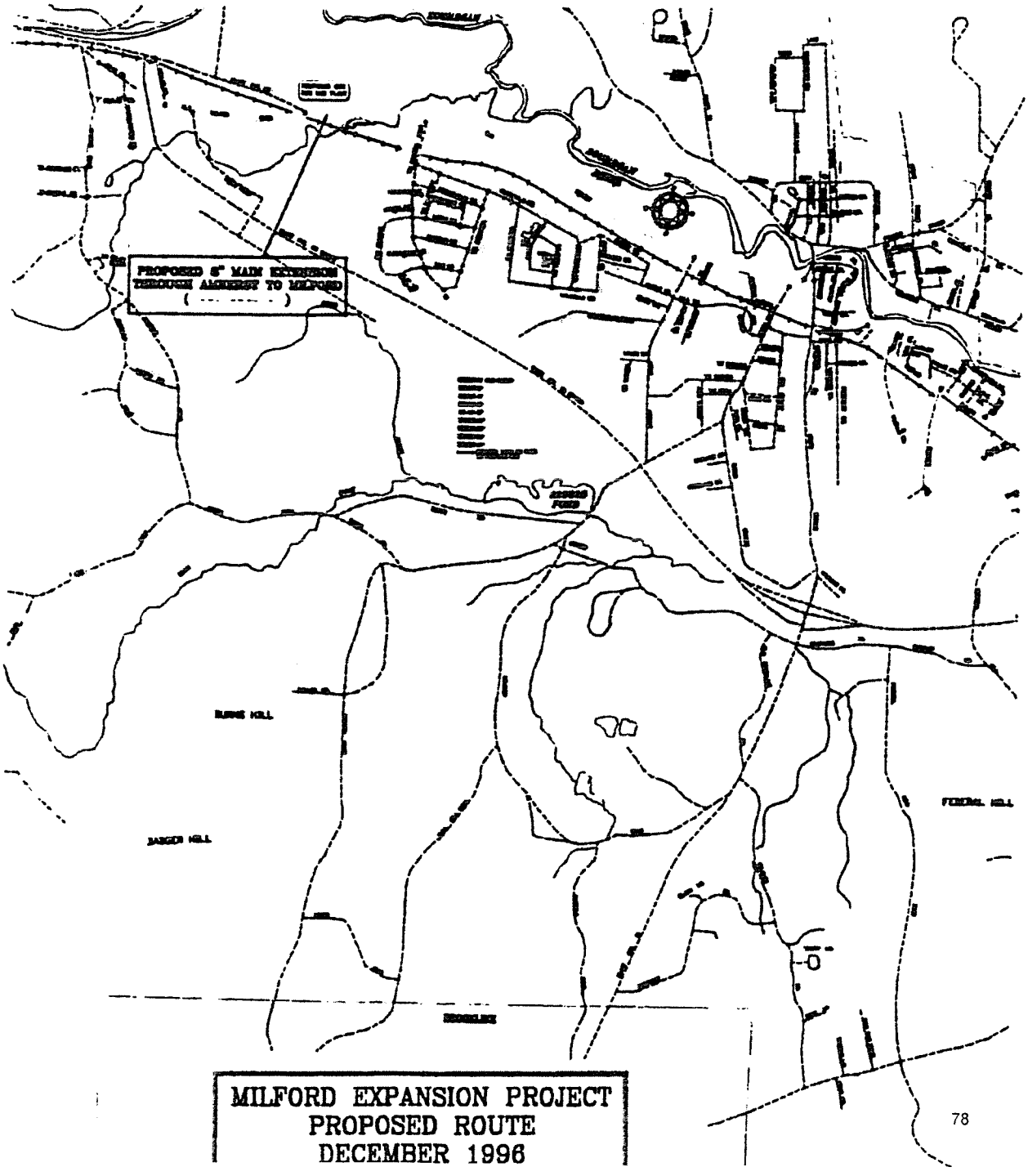
PROPOSED 8" MAIN EXTENSION
THROUGH AMHERST TO MILFORD
END OF EXISTING 8" MAIN
AMHERST
MILFORD
AMHERST
HOLLIS
MERRIMACK
AMHERST
MERRIMACK
AMHERST
MERRIMACK
HOLLIS



MILFORD EXPANSION PROJECT
PROPOSED ROUTE
DECEMBER 1996

APPENDIX E-4

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LNG Facility Vendor Pr

Description:

LNG facility turnkey installation, single tank, earthen impoundment, with cost estimates ranging from $1.5 million - $1.9 million.

Scope of Work (Vendor):

The vendor proposal includes all of the technical assistance required to obtain the local permits required for the project, including specific permit drawings. This proposal assumes that a FERC permit is not required.

The vendor includes all site work required for the installation of the plant, including LNG earthen spill impoundment, road and parking area paving, paved walkways and operating area which require snow removal, stone paving of balance of area inside the security enclosure, etc.

Schedules:

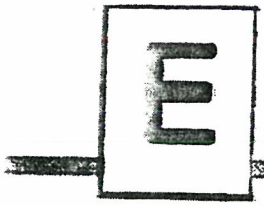
The normal schedule for permitting, design and installation of a typical non-FERC, LNG plant is about eleven months, with three months reserved for the permit process.

Operation:

The proposed plant will normally operate unattended with full time remote supervision and monitoring. During periods of LNG deliveries, one system operator will be required to operate the plant side valves while the truck operator/driver operates the truck side valves. Pressure control of the truck during unloading is controlled automatically, thus reducing the problems associated with operator/driver controlled truck pressure.

Construction:

The proposed plant will be designed, fabricated, installed, tested and started up in accordance with the best engineering practices for LNG plants and will meet all of the requirements of the codes and standards.



APPENDIX E-4

LNG Facility Vendor Proposal Summary

The principle codes and standards for LNG plants are:

49 CFR Part 193 - Liquefied Natural Gas Facilities: Federal Safety Standards

49 CFR Part 192 - Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards

49 CFR Part 192 - Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards

National Fire Protection Association (NFPA) 59A - Standard for the Production, Storage and handling of Liquefied Natural Gas (LNG)

The use of prefabricated modules reduces the effect of weather on the installation and reduces the facility cost.

Plant expansion plans have been considered and budgets are provided.

The construction includes the following:

Site Work and Spill Impoundment:

Security Enclosures

Main Plant

A security enclosure will include a seven foot high chain link fence with three strands of barbed wire on top, eight feet over all height. In addition, parts of the building will be included as part of the enclosure. Gates will be provided for normal operation and for emergency maintenance and egress. Remote gate locks will be provided as part of the security plan, with keypad access confirmed by the remote plant monitor. Emergency egress gates will be provided with outdoor panic bar operators on the inside.

Fire Protection Equipment

A security enclosure will be provided for the fire protection equipment located near the truck load area. This impoundment area will be sized for a hose break as per the minimum standard. The spill pit will be configured with a rain water sump pump, complete with controls.

APPENDIX E-4

SUBJECT TO PROTECTIVE ORDER AND CONFIDENTIAL TREATMENT

LNG Facility Vende

Grading

Grading will be rough and finish grading for the entire plant will be provided.

Paving

Bituminous concrete paving will be provided for all LNG truck operations and parking areas.

Landscaping

General landscaping will be provided; crushed stone inside the security enclosure and loam and grass outside the enclosure.

Area Lighting

Area lighting will be supplied in the form of elevated flood lights, orientated away from the public road.

Building

A small building will be provided; divided into three sections by fire walls.

LNG Storage

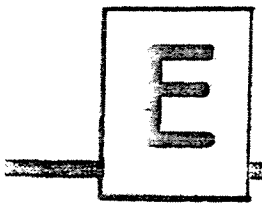
The LNG storage will be one 55,000 US gal horizontal vacuum insulated pressure vessel.

LNG Truck Unloading

The LNG truck unloading station will be configured with proprietary configuration of LNG hose, phase separator, LNG pump with automatic cooldown cycle and recycle control.

Boil-Off Handling

Although there is very little boil-off while the tank is in the "Holding" mode, (less than 0.5 mscf), there may be considerable boil-off during tank filling vaporization operations. Therefore a boil-off handling system is required.



APPENDIX E-4

Vaporization

The LNG vaporization system is designed to be completely automatic, where the remote system operator sets the desired flow rate via the RTU, and the plant control system maintains the set flow rate and the outlet gas temperature.

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CONFIDENTIAL TREATMENT

LNG Facility Vendor

Send Out and Odorization

The send out and odorization system consists of one turbine type meter to measure the flow out of the plant, one fuel gas meter to measure the fuel gas flow back into the plant, a backpressure valve to maintain the plant and measurement pressure at 70 psig, a wide open monitor valve, and a working regulator to maintain the system pressure at 60 psig, and an outlet block and check valve.

Instrumentation and Controls

The instrumentation and control system will consist of a programmable logic controller with PC supervision and networking as an RTU on the SCADA system.

Electrical

This proposal assumes that 460/3/60 electrical power is available on the street, and that the available short circuit will be limited by a utility supplied transformer with an impedance of Z=4.0.

Fire Protection

Fire Study: A fire study will be provided during the permitting phase of the project, consistent with the provisions of 49 CFR 193.

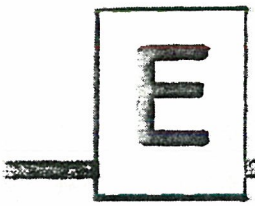
Fire Water: Fire water is not provided as it is not required for this size plant.

Procedures: Detailed fire prevention, protection and fighting procedures will be provided, including joint exercise procedures for the local responders.

Training: Detailed training outlines and modules will be provided for the fire protection, including the bi-annual training requirement.

Security

The proposed security system includes a security enclosure with dual entry requirements, key pad code at the gate and remote confirmation by the system control and monitoring entity. In addition, the security enclosure is configured with sensors which will indicate an unauthorized intrusion and send an alarm to the remote monitoring entity who will initiate response actions by the system operators, or local police.



APPENDIX E-4

LNG Facility Vendor Proposal Summary

Procedures

Detailed written security procedures are provided, including specific duties for the system operator, and the remote controller, computer log sheets, etc.

Training

Security training outlines and modules are provided for the system operators, the remote controllers, and the local responders.

Operations and Maintenance

The operation and maintenance of this type of LNG facility is simple and safe if the operators and maintainers have been properly trained and are provided with detailed written procedures.

Project Data Book

A project data book will be published after the initial operations so that is contains "As Built" data.

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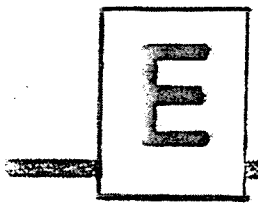

APPENDIX E-4

LNG Facility Vendor Proposal Summary

Assumptions:

The proposal assumes the following site conditions.

Topography

Flat, +/- 1 foot

Water Table

Depth to water table greater than 4 feet

Soils

An allowable soil bearing capacity of 4,000 lbs/sf, and non-compressible soils under the site.

Curb Cut(s)

The curb cuts, complete with street drainage are provided by others.

Percolation

The site has areas with suitable percolation as per New Hampshire regulations for installation of septic system, or there is town sewer at the site.

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PROTECTIVE ORDER AND
CONFIDENTIAL TREATMENT

APPENDIX E-4

MILFORD EXPANSION PROJECT

ENGINEERING PLANNING STATUS REPORT

DECEMBER 6, 1996

Construction Cost Estimates:

Milford Extension 40,000 lft 8" plastic main - $1,922,000.00

Milford System reinforcements 16,000 lft 12" steel main - $1,200,000.00

Milford 4" laterals 10,000 lft - $250,000.00

Milford 2" laterals 10,000 lft - $150,000.00

Railroad crossing for lateral mains (4) - $240,000.00

Milford residential services - $1,200.00/each

Milford commercial services - $1,600.00/each

LNG Plant sites in Milford - $1.5 - $1.9 million

Nashua System reinforcements 20,000 lft 8" & 12" - $1.3 million

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Milford Exp
Engineering Plan

Open Issues/Next Step:

- Complete new network analysis runs for 10 year growth projections for Milford Expansion.
- Finalize decision for system reinforcements for the Nashua System considering Milford Expansion.
- Finalize cost analysis of Milford 40,000 lft main extension.
- Finalize cost analysis of system reinforcement for Milford Expansion.
- Finalize cost analysis beyond Hitchiner to new foundry.
- Finalize cost analysis for Milford distribution laterals for various customers.
- Finalize working agreement with Milford Public Works for ENGI's construction activity in public ways for the next 10 years.
- Determine a site for the LNG facility.
- Involve vendors so that preliminary engineering of the LNG site can take place.
- Inform local officials and potential abutters of our intentions to site an LNG facility.
- Finalize cost estimates for siting LNG facility.
- Meeting with B&M Railroad officials to discuss requirements for each railroad crossing.
- Meeting with Amherst Public Works officials to discuss main extension through the Town of Amherst and requirements during construction.
- Test holes excavated at ramps for Rte 101A/Rte 101 interchange at the Amherst/Milford townline.
- Meeting with New Hampshire Department of Transportation to review requirements for boring across Rte 101 bypass at Old Wilton Road in Milford.

APPENDIX F

Index of Appendices

Finance Plan

Appendix Number	Short Title	Phase Number
F-1	Summary of Capital Investment	F-2
F-2	Carrying Charge Calculation	F-3
	Summary of Base Case Scenario and Sensitivity Tests Parameters & Outcomes:	
F-3.1	• Base Case	F-4
F-3.2	• Delayed Hitchiner Foundry	F-5
F-3.3	• Margin Reduction of 10%	F-6
F-3.4	• Margin Increase of 10%	F-7
F-3.5	• Interest Rate Reduction	F-8
F-4	Base case & Sensitivity Tests Graphs	F-9

SUBJECT TO
PROTECTIVE ORDER AND
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F

APPENDIX F-1

Summary of Capital Investment

Description	Initial Inv. FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	Total
Extension	$1,560,000	400,000									$1,960,000
Reinforcements	700,000										700,000
Main Laterals	133,000	611,625	115,875	22,500	-	20,000	20,000	20,000	20,000	20,000	983,000
Railroad Crossings	100,000										100,000
Services	40,000	164,800	144,400	73,600	90,400	60,000	27,200	93,600	24,000	54,000	772,000
Misc./General Conditions	20,000										20,000
LNG Facility *			1,600,000								1,600,000
Total Capital Investment	$2,553,000	$1,176,425	$1,860,275	$96,100	$90,400	$80,000	$47,200	$113,600	$44,000	$74,000	$6,135,000

* Financial analysis included $1MM investment ($1.6MM less $600,000 investment eliminated for Nashua reinforcement

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F

APPENDIX F-2

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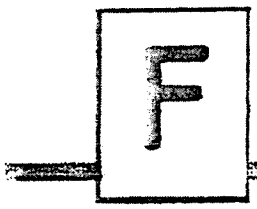
Carrying Charge Calculatio

Input Data

Plant Data	
Capital cost - Year 0	$2,553,000
Book life - Mains	37.5
Book life - LNG Plant	22.5
Salvage Cost	0
MACRS life - Mains	20
MACRS life - LNG Plant	15
Capital Structure (From DR 91-282)	
Long Term Debt (%)	49.33%
Prefered (%)	0.00%
Common (%)	46.96%
Short Term Debt (%)	3.72%
Cost of Capital (From DR 91-282)	
Long Term Debt (%)	9.55%
Preffered (%)	0.00%
Common (%)	10.39%
Short Term Debt (%)	6.00%
Tax Data	
Income Tax (%)	38.62%
Property Tax -Assessment Ratio (%)	127.5%
Property Tax - Tax Rate	$26.20
Miscellaneous Data	
Inflation (%)	3%
Property Tax Esc (%)	0
Return Basis	2
1 = beg. of year	
2 = ave. beg. & end	
3 = end of year	



APPENDIX F-3.1

Summary of Base Case Scenario

Fiscal Year	Capital Additions	Year End Rate Base	Revenue Requirement	Total Margins	Annual Surplus (Deficit)	Pv Of Annual Surplus (Deficit)	Aggregate Surplus (Deficit)
1997	$2,553,000	$2,553,000					
1998	1,176,425	3,644,892	$549,135	$495,600	($53,535)	($48,742)	($48,742)
1999	1,260,275	4,701,299	807,319	613,080	(194,239)	(161,016)	(209,758)
2000	96,100	4,562,523	927,604	786,359	(141,244)	(106,603)	(316,361)
2001	90,400	4,425,339	876,130	847,475	(28,655)	(19,691)	(336,052)
2002	80,000	4,284,660	848,955	928,443	79,488	49,731	(286,320)
2003	47,200	4,118,364	827,472	943,991	116,519	66,373	(219,947)
2004	113,600	4,024,241	808,768	970,192	161,424	83,720	(136,227)
2005	44,000	3,864,588	791,161	1,006,617	215,456	101,738	(34,489)
2006	74,000	3,734,309	770,667	1,022,164	251,497	108,125	73,636
2007	0	3,529,271	745,856	1,046,063	300,207	117,511	191,147
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2043	0	0	(88,945)	1,046,063	1,135,008	15,178	2,469,987
TOTAL	$5,535,000		$16,816,317			NPV =	2,469,987

APPENDIX F-3.2

Summary of "Delayed Foundry" Sensitivity Test

Fiscal Year	Capital Additions	Year End Rate Base	Revenue Requirement	Total Margins	Annual Surplus (Deficit)	Pv Of Annual Surplus (Deficit)	Aggregate Surplus (Deficit)
1997	$2,553,000	$2,553,000					
1998	1,114,800	3,584,664	$544,434	$416,105	($128,329)	($116,861)	($116,861)
1999	1,321,900	4,704,025	801,773	533,585	(268,187)	(222,396)	(339,257)
2000	96,100	4,565,120	926,972	786,359	(140,613)	(106,184)	(445,442)
2001	90,400	4,427,817	876,550	847,475	(29,075)	(19,994)	(465,436)
2002	80,000	4,287,028	849,357	928,443	79,087	49,525	(415,910)
2003	47,200	4,120,631	827,857	943.991	116,134	66,226	(349,684)
2004	113,600	4,026,413	809,138	970,192	161,055	83,635	(266,050)
2005	44,000	3,866,672	791,517	1,006,617	215,100	101,718	(164,331)
2006	74,000	3,736,379	771,014	1,022,164	251,150	108,152	(56,179)
2007	0	3,531,342	746,201	1,046,033	299,862	117,590	61,411
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.	.	.	.	.	.	.	.
2043	0	0	(88,945)	1,046,063	1,135,008	15,306	2,348,552
TOTAL	$5,535,000		$16,816,317			NPV =	2,348,552

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APPENDIX F-3.3

Summary of "10% Therm Reduction" Sensitivity Test

Fiscal Year	Capital Additions	Year End Rate Base	Revenue Requirement	Total Margins	Annual Surplus (Deficit)	PV Of Annual Surplus (Deficit)	Aggregate Surplus (Deficit)
1997	$2,553,000	$2,553,000					
1998	1,176,425	3,644,892	$549,135	$448,241	($100,895)	(91,879)	($91,879)
1999	1,260,275	4,701,299	807,319	553,973	(253,347)	(210,090)	(301,969)
2000	96,100	4,562,523	927,604	709,924	(217,680)	(164,382)	(466,351)
2001	90,400	4,425,339	876,130	764,928	(111,203)	(76,471)	(542,822)
2002	80,000	4,284,660	848,955	837,799	(11,156)	(6,986)	(549,808)
2003	47,200	4,118,364	827,472	851,793	24,320	13,869	(535,939)
2004	113,600	4,024,241	808,768	875,373	66,605	34,588	(501,352)
2005	44,000	3,864,588	791,161	908,156	116,994	55,325	(446,026)
2006	74,000	3,734,309	770,667	922,148	151,481	65,232	(380,794)
2007	0	3,529,271	745,856	943,657	197,801	77,567	(303,228)
2008	0	3,325,054	714,248	943,657	229,409	81,923	(221,305)
2009	0	3,121,427	681,108	943,657	262,549	85,378	(135,927)
2010	0	2,918,290	647,828	943,657	295,829	87,604	(48,323)
2011	0	2,715,490	614,380	943,657	329,276	88,795	40,472
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.	.	.	.	.	.	.	.
2043	0	0	(88,945)	943,657	1,032,601	13,925	1,589,926
TOTAL	$5,535,000		$16,816,317			NPV =	1,589,926

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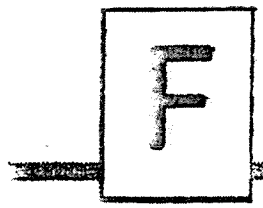

APPENDIX F-3.4

Summary of "10% Therm Increase" Sensitivity Test

Fiscal Year	Capital Additions	Year End Rate Base	Revenue Requirement	Total Margins	Annual Surplus (Deficit)	PV Of Annual Surplus (Deficit)	Aggregate Surplus (Deficit)
1997	$2,553,000	$2,553,000					
1998	1,176,425	3,644,892	$549,135	$542,961	($6,175)	($5,623)	($5,623)
1999	1,260,275	4,701,299	807,319	672,189	(135,131)	(112,058)	(117,682)
2000	96,100	4,562,523	927,604	862,796	(64,808)	(48,940)	(166,622)
2001	90,400	4,425,339	876,130	930,023	53,892	37,060	(129,562)
2002	80,000	4,284,660	848,955	1,019,089	170,133	106,540	(23,022)
2003	47,200	4,118,364	827,472	1,036,191	208,718	119,022	96,000
2004	113,600	4,024,241	808,768	1,065,012	256,244	133,066	229,066
2005	44,000	3,864,588	791,161	1,105,079	313,917	148,448	377,514
2006	74,000	3,734,309	770,667	1,122,181	351,514	151,372	528,886
2007	0	3,529,271	745,856	1,148,470	402,613	157,883	686,769
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.	.	.	.	.	.	.	.
2043	0	0	($8,945)	1,484,470	1,237,414	16,687	3,370,218
TOTAL	$5,535,000		$16,816,317			NPV =	3,370,218

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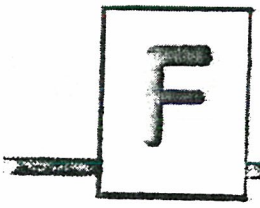

APPENDIX F-3.5

Summary of "Interest Rate Reduction" Sensitivity Test

Fiscal Year	Capital Additions	Year End Rate Base	Revenue Requirement	Total Margins	Annual Surplus (Deficit)	PV Of Annual Surplus (Deficit)	Aggregate Surplus (Deficit)
1997	$2,553,000	$2,553,000					
1998	1,176,425	3,644,892	$533,848	$495,600	($38,248)	($34,987)	($34,987)
1999	1,260,275	4,701,299	786,734	613,080	(173,653)	(145,306)	(180,293)
2000	96,100	4,562,523	904,754	786,359	(118,395)	(90,622)	(270,915)
2001	90,400	4,425,339	853,962	847,475	(6,487)	(4,542)	(275,457)
2002	80,000	4,284,660	827,472	928,443	100,971	64,669	(210,788)
2003	47,200	4,118,364	806,746	943,991	137,245	80,408	(130,380)
2004	113,600	4,024,241	788,684	970,192	181,508	97,274	(33,106)
2005	44,000	3,864,588	771,703	1,006,617	234,914	115,162	82,056
2006	74,000	3,734,309	751,925	1,022,164	270,240	121,185	203,242
2007	0	3,529,271	727,940	1,046,063	318,123	130,496	333,737
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.	.	.	.	.	.	.	.
2043	0	0	(88,947)	1,046,063	1,135,011	18,828	2,911,796
TOTAL	$5,535,000		$16,426,315			NPV =	2,911,796

SUBJECT TO
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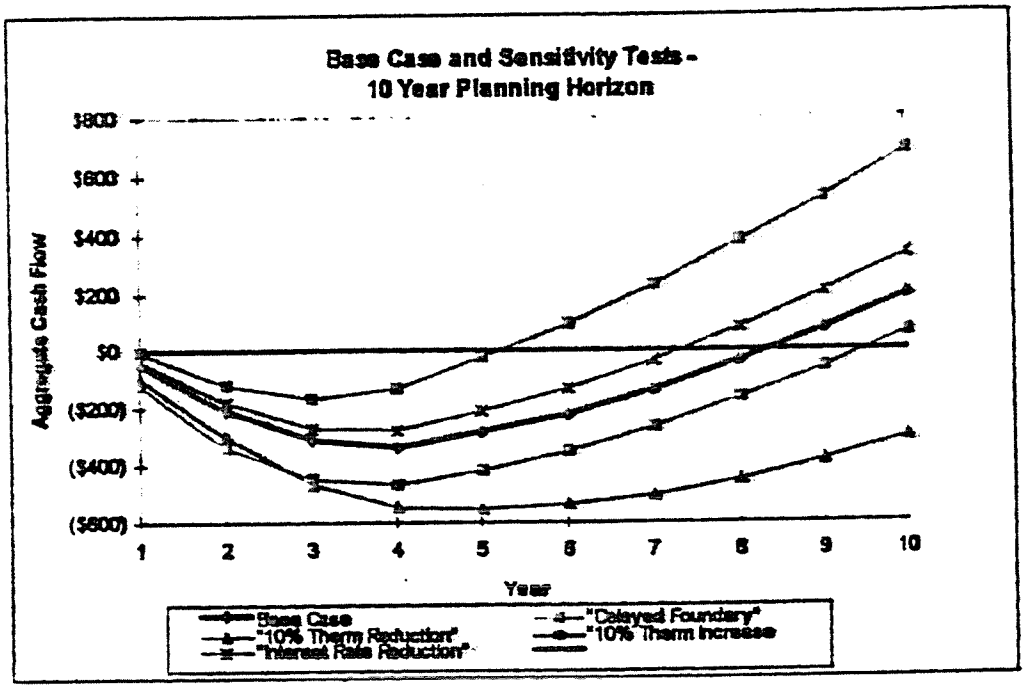
CONFIDENTIAL TREATMENT

F

APPENDIX F-4



SUBJECT TO
PROTECTIVE ORDER AND
CONFIDENTIAL TREATMENT

APPENDIX P-1

Key Contacts in Milford, Amherst and Concord

Milford Board of Selectman

Marilyn Kenison, 90 Amherst Street	673-2619	(Chairman)
George Infanti, North River Road	673-7100	
Rosario Ricciardi, 228 Osgood Road	673-2751	
Peter Leishman, 97 McGettigan Road	673-7181	
Jack Ruonala, 80 Webster Street	673-2498	

Milford Town Administrator

Lee Mayhew, 1 Union Square	673-2257

Milford Public Works Director

Robert Courage, 1 Union Square	673-1662

Milford Police Chief

Steven Sexton	673-1414

Milford Fire Chief

Richard Torterelli	673-0657

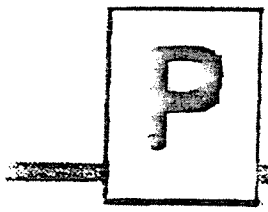
Milford-Amherst Chamber of Commerce

Carolyn Folgares, Executive Director	673-4369

DO-IT (Downtown Ongoing Improvement Team) (Milford)

Andrea Gallagher, President	672-4567

Key Contacts in Milford, Amherst and Concord (continued)



APPENDIX

State Representatives from Milford

Gary Daniels, 127 Whitten Road	673-3065
Charles Ferguson, 160 Foster Road	673-2279
Keith Herman, 529 Mason Road	673-0750
Keith Moncrief, 31 Purgatory Road	673-1624

State Senator from Milford

David Wheeler, 523 Mason Road	672-6062

Amherst Board of Selectmen

William Overholt	673-5171	(Chairman)
Robert Jackson	673-6274	
Marilyn Peterman	673-7732	
Richard Sherwood	673-9242	
Richard Verrochi	673-4221	

Amherst Town Administrator

Dana Crowell, P.O. Box 960	673-6041

Amherst Public Works Director

John Starkey	673-2317

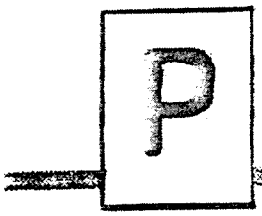
Amherst Police Chief

Gary McGuire	673-4900

Amherst Fire Chief

Ricky Crocker	673-8053

Key Contacts in Milford, Amherst and Concord (continued)



APPENDIX P-1

New Hampshire Office of Business and Industrial Development (Concord)

William Pillsbury, Director 271-2591 x103

New Hampshire Public Utilities Commission (Concord)

Douglas Patch, Chairman 271-2431

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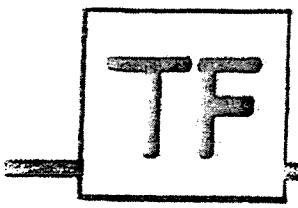

APPENDIX TF-1

Milford Expansion Task Force

Project Officer	F. Childs
Project Leader	K. Dean*
bject Specialist	
larketing/Demographics	R. Knepper J. Morin
Finance/Regulatory	P. Bourque
Engineering/Operations/Gas Supply	W. Ruoff J. Blanchard D. Carroll
Public & Community Relations	M. Netkovick
Senior Officer Advisors	R. Giordano A. Hanlon M. Chicoine R. Demers

SUBJECT TO PROTECTIVE ORDER AND CONFIDENTIAL TREATMENT

* Dr. Kenneth H. Dean, an independent utility consultant

Comparable Fuel Cost Calculator

At the current price of oil, $1.92 per gallon, the equivalent Natural Gas per therm rate is $1.38 per therm. Assuming typical boiler efficiency for oil and gas, the Natural Gas equivalent is $1.53 per therm.

Comparable Fuel Cost Calculator - Oil to Natural Gas				Efficiency Calculator	
Complete the following three steps:			Btu/Unit	Typical efficiency & unit cost	
1. Enter current fuel ID Code (1 - 6):	1	Fuel Oil	139,000	80.00%	
2. Enter current delivered fuel unit cost:	$1.9200	per gallon		$1.9200	per gallon
3. Enter Alternate fuel ID code (1 - 6):	6	Natural	100,000	90.00%	
Calculation Results:					
Alternate fuel equivalent delivered unit cost:	$1.3813	per Therm		$1.5348	per Therm

At the current price of propane, $1.99 per gallon, the equivalent Natural Gas per therm rate is $2.17 per therm. Assuming typical boiler efficiency for propane and gas, the Natural Gas equivalent is $2.41 per therm.

Comparable Fuel Cost Calculator - Propane to Natural Gas				Efficiency Calculator	
Complete the following three steps:			Btu/Unit	Typical efficiency & unit cost	
1. Enter current fuel ID Code (1 - 6):	2	Propane	91,600	80.00%	
2. Enter current delivered fuel unit cost:	$1.9900	per gallon		$1.9900	per gallon
3. Enter Alternate fuel ID code (1 - 6):	6	Natural	100,000	90.00%	
Calculation Results:					
Alternate fuel equivalent delivered unit cost:	$2.1725	per Therm		$2.4139	per Therm

Source: Equivalent pricing calculate using Fuel Cost Conversion Calculator on NHPUC website (http://www.puc.nh.gov/Gas-Steam/naturalgasvsalternativefuels.htm)

Northern and Liberty Natural Gas Rates effective November 1, 2015
Residential Heating Customer (average winter usage for customer class)

Per Therm Rate	Northern	Liberty
Cost of Gas	$0.6570	$0.7516
Local Distribution Adjustment Clause	$0.0374	$0.1014
Delivery (including customer charge)	$0.7641	$0.5522
Total	$1.4583	$1.4049

Source:

Order No. 25,836 issued October 30, 2015 approving Northern Utilities, Inc. Winter 2015-2016 Cost of Gas, p. 4 'Per Therm Rates (weighted average) & Bill Impacts (average usage) in Dollars'

Order No. 25,833 issued October 30, 2015 approving Liberty Utilities (EnergyNorth natural Gas) Corp. d/b/a Liberty Utilities Winter 2015-2016 Cost of Gas, p. 4 'Per Therm Rates (weighted average) & Bill Impacts (average usage) in Dollars'

Dartmouth College Energy Working Group - Draft Findings

ENERGY: VISION, GOALS AND METRICS
A vision for a brighter Dartmouth

By 2019, Dartmouth will achieve a sustainable energy system and be among the nation's leaders in energy awareness, conservation and technology.

Goals
1. Reduce energy consumption
2. Diversify our energy supply
3. Move to renewable sources
4. Embrace our energy system as part of the Dartmouth education and experience

Metrics
We will know we are making progress towards our goals if:
1. We do report our energy use in quantities of fuel, Btus and Joules of energy, and greenhouse gas emissions, in absolute and relative terms and in real time.
2. We express energy goals and projects in terms of dollar savings including net present value, energy savings and carbon emission savings per dollar expenditure.
3. Most occupants of the campus know what Dartmouth's energy goals are, where their energy comes from and how Dartmouth is taking actions to make energy
4. Most occupants of the campus are taking at least one action to improve energy sustainability.

ROAD MAP
immediate (0-2 years)
Process and Administration
1. Implement an ongoing procedure for reviewing and revising our energy strategy
2. Revise key job descriptions across campus to include sustainability criteria
3. Develop strategies and mechanisms to link student projects and faculty research to campus energy systems

Energy Supply
1. Get off #6 fuel oil by 2016
2. Increase operational flexibility
3. Reduce cost
4. Mitigate and reduce long term risk
5. Improve environmental, social and regional sustainability

Demand Side and Integrated Systems
1. Complete CEMS installation and develop access for campus users (Fall 2012)
2. Implement Revolving Loan Fund (Fall 2012)
3. Develop a list organized by dollar impact, GHG impact and payback, of demand-side energy priorities
4. Continue to aggressively pursue projects that reduce energy consumption among the largest energy users
5. Communicate demand side management priorities to the campus community

Sustainability Leadership

1. Develop a set of criteria to guide energy choices including innovation, energy security, life-cycle cost effectiveness, risk management, financial responsibility, educational benefit and environmental impact
2. Reduce fossil fuel consumption by 10% every year
3. Investigate and install onsite renewables on campus for electricity, thermal, and other applications
4. Use hedges (electricity and fuels) to reduce market exposure and GHG impacts (e.g. wind, solar, alternative oils, biomass pellets)
5. Establish mechanisms to communicate about energy supply systems

short term (2-10 years)

1. Enhance diversification of onsite heating fuel supply to achieve at least a 60% reduction in GHG emissions
2. Source energy from off-site renewable electric generation
3. Provide access to data so that our community can develop pilot projects for innovative energy solutions
4. Extend hedging period for 50% of our energy portfolio to 10-15 years
5. Expand Revolving Loan Fund size to increase number and impact of energy projects
6. Develop a robust behavior change energy conservation program
7. Develop energy performance standards for new buildings and renovations
8. Identify opportunities for system improvements such as but not limited to changes in heat delivery systems and utilization of waste heat
9. Provide access to data so that our community can develop pilot projects for innovative energy solutions

long term (10-50 years)

1. Aggressive diversification towards sustainable, place-based and practical energy supply with the expectation of reaching 100% renewable sources
2. Aggressive implementation of energy efficiency and conservation measures throughout campus including behavior change to reflect values

Source:
http://sustainability.dartmouth.edu/power/energy-working-group/energy-working-group-draft-findings