

STATE OF VERMONT
PUBLIC SERVICE BOARD

Docket No. 7970

Petition of Vermont Gas Systems, Inc.,)	
requesting a Certificate of Public Good pursuant)	
to 30 V.S.A. § 248, authorizing the construction)	Hearing at
of the "Addison Natural Gas Project" consisting)	Montpelier, Vermont
of approximately 43 miles of new natural gas)	September 16, 17, 18, 19 & 20, 2013
transmission pipeline in Chittenden and Addison)	
Counties, approximately 5 miles of new)	
distribution mainlines in Addison County,)	
together with three new gate stations in)	
Williston, New Haven and Middlebury,)	Order Entered:
Vermont)	

**PROPOSED DECISION SUBMITTED ON BEHALF OF
VERMONT GAS SYSTEMS, INC.**

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I. Introduction

This case involves a petition submitted by Vermont Gas Systems, Inc. (“Vermont Gas,” “VGS,” or the “Company”) seeking a certificate of public good (“CPG”) under 30 V.S.A. § 248 to construct the Addison Natural Gas Project (the “Project”). The Project will extend Vermont Gas’ existing natural gas transmission system approximately 41.2 miles from a point of interconnection in Colchester, Vermont to Middlebury, Vermont. As a result of the Project, natural gas service will be made available to seven Vermont communities—St. George, Monkton, Ferrisburgh, Vergennes, New Haven, Bristol, and Middlebury. In today’s Order, we conclude that the Project is needed, is in the general good of the state, and satisfies each of the applicable criteria of 30 V.S.A. § 248, subject to certain conditions set forth herein.

This Project is Vermont Gas’ first expansion into a new county in almost 50 years. The expansion of natural gas service in Vermont has long been a goal of Vermont energy policy, and will provide significant benefits to Vermont residential and business consumers in newly served areas through the introduction of a lower-cost and less carbon intensive fuel source.

The evidence in this proceeding demonstrates that the Project will result in over \$200 million in energy savings to Addison County residences and businesses over the next 20 years. Residents, communities, businesses, and community representatives in both Addison and Rutland Counties have expressed strong support for the expansion of natural gas to lower fuel bills and to sustain and promote economic growth in the region.

While we conclude that the Project satisfies the applicable Section 248 criteria, we also recognize that the construction and operation of infrastructure projects, such as this Project, will of necessity have impacts to the natural areas and landowners along the route. The conditions set forth in the Memoranda of Understanding (“MOU”) entered into between Vermont Gas and various parties, our Order and the CPG, below address these impacts.

II. Procedural History

On December 20, 2012, Vermont Gas filed prefiled testimony and exhibits with the Public Service Board (“Board”) pursuant to 30 V.S.A. § 248. At that time, copies of these materials were also duly served upon all parties specified in 30 V.S.A. § 248(a)(4)(C).

The Board held a prehearing conference at the Board’s hearing room in Montpelier, Vermont on January 30, 2013.

The Board granted the following parties' requests to intervene in the Docket: the Towns of Williston, Hinesburg, Monkton, New Haven, Middlebury, and Bristol, the City of Vergennes, the City of Rutland, the Addison County Regional Planning Commission ("ACRPC"), the Monkton Central School, the Agency of Agriculture, Food and Markets ("AAFM"), the Vermont Division for Historic Preservation ("DHP") of the Agency of Commerce and Community Development, the Vermont Housing and Conservation Board ("VHCB"), the Agency of Transportation ("Vtrans"), the Chittenden Solid Waste District ("CSWD"), Vermont Electric Power Company, Inc. and Vermont Transco LLC (collectively, "VELCO"), Vermont Land Trust ("VLT"), the Conservation Law Foundation ("CLF"), Middlebury College, Agri-Mark, Inc. ("Agri-Mark"), International Paper ("IP"), the Addison County Economic Development Corporation, the Rutland Economic Development Corporation ("REDC"), the Rutland Region Chamber of Commerce, International Business Machines, Inc. ("IBM"), and the Vermont Fuel Dealers Association ("VFDA"),¹ Robert and Shirley Johnson, Aldo and Mary Speroni, Matthew Taylor Baldwin, David Carse and Elizabeth Hazen, Nathan and Jane Palmer, David and Claudia Ambrose, Peter and Margaret Carothers, Herrick Hurlburt Sr., Michael Hurlburt, David Hurlburt, Herrick Hurlburt Jr., and Joshua Hurlburt.

We denied, without prejudice, a Motion to Intervene submitted by the Vermont Intergenerational Stewards ("VIS"), which the motions described as a "private, ad-hoc membership organization representing the interests and rights of youth and future generations in Vermont, with specific regard to issues involving energy, climate change, natural resource use, and planning." Because VIS failed to provide any specific information about who comprises its members, what specific interests those members have as individuals in this proceeding, and how VIS is organized (and thus the extent to which a designated representative for VIS in this proceeding has authority to advance the interests of its members), it made it impossible for us to evaluate its request. In denying its motion without prejudice, we invited VIS to resubmit a motion to intervene with the requisite information.²

The Board conducted one site visit and two public hearings. The first public hearing was held at the Hinesburg Middle School at 7:00 p.m. on the evening of March 21, 2013.

¹ The Board limited the motion of VFDA to intervene to exclude testimony and evidence regarding alleged anti-competitive impacts that the Project may have relative to fuel oil dealers. Docket No. 7970, Order of 4/12/13 at 12.

² Docket No. 7970, Order of 4/12/13 at 10.

The site visit was conducted on September 10, 2013 and included a stop to view the proposed pipeline location on the Palmers' property. A second public hearing was held at the Middlebury Middle School at 7:00 p.m. on the evening of September 10, 2013.

III. Public Comments

Hundreds of people attended each of the public hearings, many of whom spoke. Additionally, the Board has received numerous written comments both in support of and opposed to the proposed Project via post and e-mail.

Vermont law requires the Board to base its decision on the evidence presented by the parties during the evidentiary hearings. Even though the Board cannot rely on them as evidence, public comments played an important role in this Docket by offering perspectives and raising issues for the Board to consider. Specifically, the public comments assisted the Board in formulating questions to pose to the parties and witnesses during the technical hearings.

IV. Memoranda of Understanding

Unless mutually agreed to by the affected parties, VGS shall comply with the provisions of the MOUs entered with parties to this proceeding: the Town of Monkton; Monkton Central School; the Agricultural Interests Group comprised of VLT, AAFM, and VLT; ACRPC; ANR; VELCO; and CSWD.³ See exh. Monkton SP-2; exh. Pet. Reb. EMS-1; exh. AAFM-1; exh. ACRPC Supp. TB-2; exh. Pet. VGS-ANR-Joint-1; exh. VELCO-PWL-2.

V. Findings of Fact

1. The Current VGS System and the Planned Expansion of the VGS System

1. Vermont Gas is a "company" as defined by 30 V.S.A. § 201, and as such is subject to the Board's jurisdiction pursuant to 30 V.S.A. § 203. Petition at 1.

2. On November 7, 1963, the Board issued VGS a CPG to organize and operate as a natural gas utility authorized to provide natural gas service to customers in the State of Vermont. *Petition of Incorporators of Vermont Gas Systems, Inc.*, Docket No. 3029, Order of 11/7/63.

3. The initial expansion into Vermont was described by the Board in 1963 as the "first phase" of an overall plan to extend natural gas service to other areas in Vermont, when it would become economically feasible. *Id.*

³ The MOU between VGS and CSWD is dated October 10, 2013 and was filed with the Board on October 11, 2013.

4. In 1963, this Board found that the introduction of natural gas service to Vermont would permit Vermont to compete for and encourage the location of industries in the state which could not then be secured because natural gas was not available. *Petition of Incorporators of Vermont Gas Systems, Inc.*, Docket No. 3029, Order of 11/7/63 at 10.

5. In 1965, the Company constructed an approximately 45-mile, 10-inch natural gas transmission pipeline from the Canadian border to Burlington. Tr. 9/16/13 at 52 (Gilbert).

6. Today, Vermont Gas serves approximately 45,000 customers in Franklin and Chittenden Counties, but holds a Certificate of Public Good to serve the entire state. Petition at 1; exh. Pet. ADG-1.

7. Typically, Vermont Gas adds between about 1,000 and 1,500 new customers per year to its distribution system. A portion of these customers are located on or near VGS' existing distribution main lines. The balance of them are served from the extension of distribution mains lines. Gilbert 12/20/12 pf. at 7.

8. Over the past 6 years, Vermont Gas has expanded natural gas service to four new communities in Vermont—Jericho (2007), Underhill (2008), Hinesburg (2009), and Richmond (2012). Lyons 12/20/12 pf. at 3, 6.

9. Today, almost 70% of homes and businesses with access to natural gas service in those new communities are now using natural gas, lowering their fuel costs by an estimated \$2.5 million per year. Gilbert 12/20/12 pf. at 7.

10. Only 15% of Vermont homes heat with natural gas and about 64% heat with oil and propane. By comparison, nationally, about 50% of homes use natural gas for heating, and only 12% of homes use oil or propane. Gilbert 12/20/12 pf. at 6; exh. Pet. ADG-3.

11. The positive experience from the recent expansions to new communities in Chittenden County has contributed to the growing demand for natural gas in Vermont and has led Vermont Gas to explore how to achieve major expansions into new areas of Vermont. Gilbert 12/20/12 pf. at 8.

12. The expansion of natural gas service has long been a goal of Vermont energy policy. Expanded natural gas availability could provide significant benefits to Vermont residential and business consumers in newly served areas through the introduction of a lower-cost fuel source into those areas. *Request of Vermont Gas Systems, Inc. to establish a System Expansion and Reliability Fund with funds provided by reductions in the quarterly Purchase Gas*

Adjustment rate under the Alternative Regulation Plan, Docket No. 7712, Order of 9/28/11 (“SERF Order”) at 2. *See also* findings 14–32, below.

13. In 2011, this Board approved the establishment of the System Expansion and Reliability Fund (“SERF Fund” or “Expansion Fund”) for VGS for the purpose of facilitating the further build-out of its system into Addison County. *Serf Order* at 2.

14. There is significant demand for expanding natural gas service in Addison and Rutland Counties and throughout the entire state. Gilbert 12/20/12 pf. at 8; tr. 9/16/13 at 23–24, 55 (Gilbert).

15. The Project will make natural gas service available to several large businesses, including Agri-Mark Dairy Cooperative/Cabot Creamery (“Cabot Coop” or “Cabot”), Middlebury College, Porter Medical Center, and UTC Aerospace Systems (formerly, Goodrich). These businesses are very supportive of the Project and of having access to affordable, clean natural gas. Lyons 12/20/12 pf. at 6; exhs. Pet. TSL 3.1–3.4. *See also* findings 16–26, below.

16. Cabot has operated a cheese and whey product manufacturing plant in Middlebury, Vermont since 1994. This plant uses the milk of more than 200 local family dairy farms each day as well as the labors of approximately 115 employees to produce its products. Pcolar pf. at 2.

17. Cabot cheese from the Middlebury plant is stored in the area and then cut and wrapped at its facility in Cabot, Vermont. This involves hundreds of additional Vermont-based jobs as well. Pcolar pf. at 2.

18. Cabot’s dairy products compete with dozens of other brands throughout the country, and world, in a highly competitive marketplace. Fuel prices are a significant component of its production costs, and therefore impact its prices, sales, long-term production decisions, and returns to its dairy farmer owners. Pcolar pf. at 2–3.

19. In 2012, the plant received nearly 300 tanker-truck loads (1.8 million gallons) of boiler fuel (No. 6 fuel oil containing 1% sulfur) shipped from Tracy, Quebec, at a cost to Cabot of \$5 million. The plant also received 80 tanker-truck loads (750,000 gallons) of dryer fuel (propane) shipped from Selkirk, New York and Berlin, Vermont, at a cost of \$1 million. Pcolar pf. at 3.

20. By switching over to natural gas as a result of this Project, Cabot expects that the plant will realize annual savings in fuel costs that will exceed \$1 million initially and could

approach \$3 million per year in savings over time. It would also save Cabot about \$250,000 per year in trucking costs for fuel deliveries. Pcolar pf. at 4; tr. 9/17/13 at 158, 154–65 (Pcolar); exh. Pet. TSL-3.1.

21. The reduction in overall operating costs are expected to directly impact the cost-competitiveness of Cabot’s products, increase sales, and potentially impact long-term decisions on whether to increase production and employment at the plant. Pcolar pf. at 4.

22. Cleaner-burning natural gas also reduces maintenance costs for combustion equipment and opens doors for additional energy-efficiency projects, such as, in the future, heat recovery and combined heat and power. Pcolar pf. at 4.

23. Middlebury College has expressed a desire for receiving lower priced natural gas, service. Middlebury College is a residential college, with approximately 2,600 students, employing approximately 1,300 faculty and staff in Vermont. The College's campus consists of a significant number and a wide variety of buildings and facilities. As such, it is a significant consumer of energy resources. Middlebury College 3/28/13 Mot. to Intervene at 1.

24. Middlebury College also expressed that the Project would dovetail with its plans to transport bio-methane from cow manure from local farms. Exh. Pet. TSL-3.2.

25. Porter Medical Center in Middlebury expresses “enthusiastic and strong support” for the affordable and clean energy that the Project would provide to the medical center. Exh. Pet. TSL-3.3.

26. Goodrich Corporation has a plant located in Vergennes that produces products for the aerospace industry. Goodrich estimated that its fuel costs could be reduced by 59% by switching from No. 2 fuel oil to natural gas service from VGS. Exh. Pet. TSL-3.4.

27. A constant concern expressed by the business community in Rutland County is the competitive disadvantage it currently faces by not having a source of natural gas. Exh. Pet. SJW-4.11.

28. The Rutland Economic Development Corporation (“REDC”) has identified key business sectors that rely on natural gas as a baseline criteria for siting new facilities. Exh. Pet. SJW-4.11.

29. VGS’ plans for expanding natural gas service to Addison County is the first step towards a long-term plan to serve Rutland and eventually connect Vermont to the U.S. natural gas system. Gilbert 12/20/12 pf. at 9; *SERF Order* at 6.

30. VGS' preliminary review of the market indicates that an expansion to Rutland would make natural gas service available to over 11,000 homes and businesses in Rutland and 2,500 homes and businesses in Brandon, Pittsford, and Proctor (the largest communities between Middlebury and Rutland). Collectively, these 13,000 homes and businesses use approximately 2.6 Bcf annually. Lyons 12/20/12 pf. at 13.

31. Extending natural gas service to Rutland is an important goal for the State of Vermont and Vermont Gas as it represents the largest concentration of homes and businesses in the state that do not have access to natural gas. Lyons 12/20/12 pf. at 13.

32. Service to Rutland would make natural gas service available to several large businesses, including Omya, General Electric Aircraft, Carris Reels, and Rutland Regional Medical Center. Lyons 12/20/12 pf. at 13.

2. Project Description

33. Originally, VGS contemplated to pursue the Project as a 10-inch coated steel transmission pipeline ending in Monkton, with a 6-inch distribution mainline to Vergennes and a 10-inch distribution mainline to Middlebury. Howe 12/20/12 pf. at 15.

34. The preliminary analysis showed that this transmission configuration would adequately serve prospective load in Vergennes and Middlebury, but that any additional expansion south of Vergennes and Middlebury, for example to serve Rutland, would require upstream looping to serve additional demand. Howe 12/20/12 pf. at 15–16.

35. During a community meeting in late March 2012, the Company was asked by an International Paper Company ("IP") representative about the potential to expand the scope of the Project to include service to IP's mill in Ticonderoga, New York. Vermont Gas evaluated this idea and recognized its potential value to natural gas expansion in Vermont. Gilbert 12/20/12 pf. at 10.

36. In October of 2012, Vermont Gas and IP entered into two contracts relating to the provision of natural gas service by VGS to IP's Ticonderoga paper mill. First, VGS entered into a 27-year Facilities Development Agreement ("FDA") that contains the terms relating to extension of the Company's natural gas facilities to the mill in 2015. VGS also entered into an Interruptible Transportation Agreement ("Service Agreement") with IP pursuant to the Vermont Gas interruptible transportation tariff. Lyons 12/20/12 pf. at 12; exhs. Pet. TSL-7, TSL-8.

37. In the summer of 2012, Vermont Gas modified the Project to include a larger (12-inch) and longer (10.4 miles longer) natural gas transmission pipeline in Addison County in anticipation of service to the mill. The final Project that was submitted by VGS for approval includes these additions. Gilbert 12/20/12 pf. at 10–11.

38. As a result of these agreements, the extension to IP will result in IP's provision of a contribution towards the cost of the Project and will bring the VGS transmission network 17 miles closer to Rutland. Simollardes 12/20/12 pf. at 7; findings 273–283, below.

39. The Project facilities will be located within two Vermont counties (Addison County and Chittenden County) and eleven Vermont towns (Colchester, Essex, Williston, St. George, Hinesburg, Monkton, Ferrisburgh, Vergennes, New Haven, Middlebury, and Waltham). Wark 12/20/12 pf. at 6.

40. The Project includes the following principal components:

(1) Approximately 41.2 miles of new 12-inch transmission pipeline, extending from a new tie-in to be located at Vermont Gas' existing 10-inch mainline north of Severance Road in Colchester ("Colchester Tie-In"), Vermont, to just north of the intersection of U.S. Route 7 and Exchange Street in Middlebury, Vermont (the "Transmission Mainline");

(2) Approximately 5.1 miles of new six-inch distribution mainlines ("Distribution Mainlines") that will extend distribution service to Vergennes (3.73 miles) and Middlebury (1.35 mile); and

(3) Three new pressure regulation stations ("Stations" or "Gate Stations"), one located near Route 2 in Williston to reinforce the existing distribution system, one off Plank Road in New Haven, and the third north of the intersection of U.S. Route 7 and Exchange Street in Middlebury.

Heintz 2/28/13 pf. at 2.

a. Colchester Tie-In

41. The Colchester Tie-In will be configured with an approximately 40-foot by 85-foot fenced-in yard to enclose the valve and an area for utilizing a pipeline in-line cleaning or inspection tool or "PIG" launcher. Heintz 2/28/13 pf. at 7; Heintz 6/28/13 pf. at 10; exh. Pet. Supp. JH-4 (6/28/13).

42. A PIG is a tool used in the industry to clean the pipe or to inspect the integrity of the pipeline walls for things such as defects or corrosion. It moves down the pipeline by the

force of the natural gas pressure in the pipeline. Heintz 2/28/13 pf. at 7; exh. Pet. Supp. JH-4 (6/28/13).

43. The Colchester Tie-In will be fenced with a galvanized chain-link metal fence with barbed wire at the top. The fenced area will have a pervious crushed stone surface underlain by a geogrid to infiltrate rainwater and snowmelt. Heintz 2/28/13 pf. at 7–8; exh. Pet. Supp. JH-4 (6/28/13).

b. The Transmission Mainline

44. The Transmission Mainline will pass through the Towns of Colchester, Essex, Williston, St. George, Hinesburg, Monkton, New Haven, and Middlebury. Heintz 2/28/13 pf. at 2; exh. Pet. JH-3 (6/28/13).

45. Where possible, the Transmission Mainline corridor has been designed to be co-located within or adjacent to other utility and road infrastructure, in order to minimize impacts. The northern segment of the Transmission Mainline, from Colchester to Williston near Interstate 89, will generally be located within the right-of-way (“ROW”) of VT 289 (also referred to as the Circumferential Highway, “CCCH” or “CIRC”). This segment of the Project corridor is approximately 11 miles from the Colchester Tie-In, and extends through portions of the towns of Colchester, Essex and Williston, to a point east of Interstate 89 in Williston, near the intersection of Interstate 89 and U.S. Route 2. Heintz 2/28/13 pf. at 8; exh. Pet. Supp. JH-4 (6/28/13).

46. One significant re-route from the CIRC alignment was undertaken by VGS on the southern side of the Winooski River. There, rather than being located within the CIRC ROW, the Transmission Mainline will run parallel to Redmond Road in Williston and continue south and southeast along Redmond Road to a point where Mountain View Road in Williston meets up with the CIRC corridor. This re-route, the so-called “Redmond Road Re-route,” is approximately 1.9 miles in length. Heintz 2/28/13 pf. at 19–20; exh. Pet. Supp. JH-4 (6/28/13).

47. This change was undertaken by VGS prior to the December 20, 2012 filing following input from regulators and stakeholders in order to avoid and minimize potential impacts to forested wetlands and wetland habitat. Heintz 2/28/13 pf. at 19–20; exh. Pet. Supp. JH-4 (6/28/13).

48. Near the intersections of Interstate 89 and Route 2 in Williston, the Transmission Mainline will leave the CIRC corridor. From there it will, in many locations, be located approximately ten feet within or adjacent to an existing VELCO electric transmission line

corridor that extends between Williston and Middlebury, Vermont. This segment of the Transmission Mainline extends about 30 miles and crosses through portions of the Towns of Williston, St. George, Hinesburg, Monkton, New Haven, and Middlebury. Heintz 2/28/13 pf. at 8; exh. Pet. Supp. JH-4 (6/28/13).

49. The engineering design for the Project components was guided by applicable federal and state standards, including the following:

- U.S. Department of Transportation, Office of Pipeline Safety, Code of Federal Regulations Title 49, Part 192 – Transportation of Natural and Other Gas by Pipeline: Minimum Safety Standards (“Pipeline Safety Code” or “Code”);
- American Society of Mechanical Engineers (“ASME”) B31.8 – Gas Transmission and Distribution Piping Systems;
- Vermont Public Service Board General Order #43, Rules and Regulations Prescribing Standards for Gas Utilities;
- American Petroleum Institute (“API”) 5L, Specification for Line Pipe, 2009;
- API Specification 6D, Specification for Pipeline Valves, 2008;
- American Society for Testing and Materials (“ASTM”) A53/A53M-07, Standard Specification for Pipe, Steel, Black and Hot Dipped, Zinc Coated, Welded and Seamless;
- ASTM D2513-99, Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing and Fittings;
- MSS-Standard Practice SP-44-2006 Standard Practice, Steel Pipeline Flanges; and
- Vermont Public Service Board Rule 6.100.

Heintz 2/28/13 pf. at 15–16.

50. The Project will meet or exceed these codes and standards. Teixeira 12/20/12 pf. at 12–13; Heintz 12/20/12 pf. at 9–10. *See also* findings 287–317, below.

51. Under the Pipeline Safety Code, natural gas pipelines are given a Class location to designate the population density of the area in which the pipeline is located. 49 C.F.R. Part 192. A Class 1 designation applies to the lowest population density areas, and Class 4 applies to the most populated areas. The Code requires that pipe in higher Class locations be stronger and monitored more frequently. Teixeira 12/20/12 pf. at 14.

52. The majority of the Transmission Mainline -approximately 37 miles—is designated as Class 1 or Class 2. Less than 6 miles is designated as Class 3. There are no areas along the Project that qualify as Class 4 locations. Teixeira 12/20/12 pf. at 14.

53. The DPS recommended, and VGS has agreed, to build the Transmission Mainline to meet Class 3 standards, even in those areas where only Class 1 or Class 2 standards apply. Howe 6/28/13 pf. at 7; Berger reb. pf. at 2; Teixeira 6/28/13 pf. at 6; Heintz 6/28/13 pf. at 14.

54. The pipeline will have a wall thickness of 0.312 inches for the entire route, with a specified minimum yield strength of 65,000 psi. Heintz 6/28/13 pf. at 14.

55. As required under the Pipeline Safety Code, the Transmission Mainline will have an external, corrosion-control coating. The coating will vary dependent upon soil conditions but generally, it will consist of 15 mils thickness of fusion bond epoxy or Pritec. Teixeira 12/20/12 pf. at 16.

56. Segments of the pipeline installed by horizontal directional drilling (“HDD”) will have an additional abrasion resistant coating over the external corrosion control coating. A rectifier system will provide cathodic protection. Teixeira 12/20/12 pf. at 16.

57. The pipe will be hydrostatically tested at a pressure of at least 2,160 psi for a minimum of eight hours before being placed in service. The test will validate the Maximum Allowable Operating Pressure of 1,440 psi and prove that there are no leaks. Teixeira 12/20/12 pf. at 16.

58. The design calls for the installation of trench breakers at specified intervals along the pipeline, based on surface topography, as shown on sheet ANGP-T-G-015 of Exhibit Petitioner Supp. JH-3. The trench breakers will be filled with bentonite and will reduce the trench’s overall transmissibility while still allowing water to pass. Heintz 6/28/13 pf. at 22.

59. In addition, the design calls for bentonite trench breakers at the limits of each wetland. The bentonite trench breakers act as a plug in the trench to inhibit the migration of water from wetland areas. Heintz 6/28/13 pf. at 22.

60. The installation of these mitigation devices will minimize impacts associated with the installation of the pipeline trench. Heintz 6/28/13 pf. at 22.

c. Distribution Mainlines & Future Distribution Networks

61. The Distribution Mainline to Vergennes is an approximately 3.7-mile segment of 6-inch polyethylene (“PE”) pipe that will begin at the new Plank Road Gate Station in New

Haven, and will run through the Towns of New Haven, Ferrisburgh, and Waltham, to the intersection of Route 7 in Waltham, just east of Vergennes (the “Vergennes Distribution Mainline”). Heintz 2/28/13 pf. at 22; exh. Pet. Supp. JH-5 (6/28/13).

62. The distribution network for the City of Vergennes will begin at this point. Heintz 2/28/13 pf. at 22; exh. Pet. Supp. JH-5 (6/28/13).

63. The second Distribution Mainline is also 6-inch PE pipe that will run approximately 1.35 miles along Route 7 and Exchange Street in Middlebury, between the new Middlebury Station and into the Middlebury industrial park. Heintz 2/28/13 pf. at 22–23; exh. Pet. JH-5 (6/28/13).

64. The Project will initially make natural gas service available to approximately 3,000 homes and businesses in the Middlebury and Vergennes areas. Lyons 12/20/12 pf. at 4; exhs. Pet. TSL-1.1, TSL-1.2.

65. VGS plans to connect gas service to the Middlebury Industrial Park, where the largest customers are located, by late 2014, and then go back the following year to construct the distribution networks for the Middlebury area and the Vergennes area in 2015. Tr. 9/16/13 at 163 (Simollardes); Lyons 12/20/12 pf. at 4, 11; exhs. Pet. TSL-1.1, TSL-1.2.

66. The Project will help enable Vermont Gas to expand natural gas service to other communities in the future (such as Bristol, New Haven, Monkton and St. George). Bristol and New Haven can be served by extending distribution mains from the proposed Gate Station on Plank Road in New Haven. Lyons 12/20/12 pf. at 6.

67. Vermont Gas will use reasonable best efforts to extend gas service to Bristol, Monkton, and New Haven within two years following gasification of the Project. Based on current planning, these communities could receive natural gas service by 2016. Exh. ACRPC Supp. TB-2 at 3.

68. Vermont Gas will use reasonable best efforts extend gas service to East Middlebury within three years following gasification of the Project. Exh. ACRPC Supp. TB-2 at 3.

69. VGS will use reasonable best efforts to construct a distribution system within the Town of Monkton within two years of gasification of the Project. Exh. Monkton SP-2.

70. The specific build-out plan within each community will depend upon customer interest and construction considerations. Lyons 12/20/12 pf. at 11.

71. VGS has agreed to provide a connection to the Monkton Central School at the time distribution service is offered in Monkton, at no additional cost or expense to Monkton Central School. Exh. Pet. Reb. EMS-1.

d. Gate Stations

72. The Project will also include three Gate Stations. The purpose of a gate station is to reduce the higher pressure in the transmission pipeline to the lower pressure used in the distribution network. Heintz 2/28/13 pf. at 23–24; exh. Pet. Supp. JH-7 (6/28/13).

73. The first Gate Station will be located near Route 2 in Williston to reinforce the existing distribution system. Heintz 2/28/13 pf. at 23–24; exh. Pet. Supp. JH-7 (6/28/13).

74. A second Gate Station will be located on Plank Road in New Haven to provide natural gas service to Vergennes. Heintz 2/28/13 pf. at 25; exh. Pet. Supp. JH-8 (6/28/13).

75. The third Gate Station, the Middlebury Gate Station, will be located on the west side of Route 7 behind Paquette Enterprises Self Storage Facility in Middlebury. Heintz 2/28/13 pf. at 27; exh. Pet. Supp. JH-9 (6/28/13).

76. Project Gate Stations will be equipped with secondary relief valves, which provide overpressure protection for the distribution systems. These secondary valves exceed Pipeline Safety Code requirements. Teixeira 12/20/12 pf. at 16.

77. Each Gate Station will include an approximately 55-foot by 85-foot fenced-in yard with a small parking area, an approximately 12-foot wide by 32-foot long precast concrete meter and regulator building, an approximately 8-foot wide by 8-foot long SCADA⁴ building, and an approximately 8-foot wide by 12-foot long concrete pad on which the pipeline heater will be mounted. Heintz 2/28/13 pf. at 23–27; exh. Pet. Supp. JH-7 (6/28/13).

78. Each Gate Station will have a locked gate, will be surrounded by a galvanized chain-link fence with barbed wire at the top, will be equipped with gas detectors within the buildings, and the doors will have intrusion alarms that will be monitored by VGS' gas control. Additionally, each station will have redundant regulator runs with a working and monitor regulator set-up for over-pressure protection. Teixeira 12/20/12 pf. at 16–17; exhs. Pet. Supp. JH-7, JH-8, JH-9 (6/28/13).

⁴ The acronym SCADA stands for "supervisory control and data acquisition."

79. The enclosure buildings will house three major components of the Gate Station: (1) SCADA and telecommunications equipment, (2) the pressure regulation equipment, and (3) the meter. A Dry-Line heater system will be installed outside on the concrete pad. A Dry-Line heater works by producing steam within a vacuum, and heating the gas passing through pipes within the heater shell with low temperature steam. Heintz 2/28/13 pf. at 24–27; exh. Pet. Supp. JH-7 (6/28/13).

80. Access to each Gate Station will consist of a 15-foot wide stabilized pervious surface underlain by geogrid. The parking areas will be large enough for two vehicles and will consist of the same surface material as the access drive. Heintz 2/28/13 pf. at 30.

81. Each of the Gate Stations will be screened with landscape plantings in accordance with a revised plantings plan prepared by VGS following input received from DPS and the communities. Buscher 6/28/13 pf. at 3; exh. Pet. Supp. MJB-2.2, Appendix A (6/28/13); tr. 9/18/13 at 132 (Buscher); Raphael supp. pf. at 1–2; exh. DPS DR-1 at 9–10.

82. Based upon input received from the Town of New Haven and DPS, the color of the Gate Station building will be a dark earth tone. Buscher 6/28/13 pf. at 3; exh. DPS DR-1 at 10–11.

e. Valves

83. Eight sectionalizing mainline valves will be installed along the Transmission Mainline, as shown in the Project plans. Heintz 2/28/13 pf. at 31; exh. Pet. Supp. JH-3 (6/28/13).

84. Sectionalizing valves are installed to allow for isolation of pipeline segments in the event that they need maintenance or in the case of an incident. Valve spacing is dictated by the Pipeline Safety Code and is based on the class location of the pipeline. Heintz 2/28/13 pf. at 30.

85. The valve placement along the Transmission Mainline will exceed the requirements of the Code 49 C.F.R. Section 192.179 (Transmission Line Valves). Heintz 2/28/13 pf. at 30.

86. The Project is designed so that, generally, valves will be installed so that each point on the pipeline will be within four miles of a valve, resulting in valves placed at approximately eight mile intervals; this accommodates a Class 3 designation, even though much of the Transmission Mainline will be in Class 1 and Class 2 areas. Class 1 designations require

every point to be within 10 miles and Class 2 areas require every point to be within 7.5 miles. Teixeira 12/20/12 pf. at 15.

87. The valves will be located within fenced enclosures and locked in order to prevent tampering. The valves allow for isolation of pipeline segments for maintenance or in the case of an emergency. Teixeira 12/20/12 pf. at 15.

88. Valves will also be equipped so that they may be remotely controlled by VGS gas controllers, who are on duty 24/7 monitoring the entire gas system. Installing remote-controlled valves allows for rapid response to emergency situations. Teixeira 12/20/12 pf. at 15.

f. Project Re-routes and Adjustments

89. The original Project design, submitted on December 20, 2012, was subsequently revised in submissions filed by VGS on February 28, 2013 (the “2/28/13 Alignment”) and again on June 28, 2013 (the “6/28/13 Alignment”), to include both a number of re-routes and shifts in the corridor alignment, as well as construction design changes to avoid landowner, environmental or cultural resource impacts. *See findings 90–145, below.*

90. In its February 28, 2013 filing, VGS modified the Transmission Mainline with proposed re-routes from town roads in the Towns of Monkton, Hinesburg and New Haven, and into or adjacent to the VELCO corridor, to the extent possible, having considered constructability constraints and environmental resource considerations. Wark 2/28/13 pf. at 2; exh. Pet. Supp. JH-3 (2/28/13); exh. Pet. Supp. JH-3 (6/28/13).

91. A little over 10 miles of the Transmission Mainline will be located within the VELCO corridor. Tr. 9/18/13 at 66 (Lind).

g. Rotax Road Re-route

92. An exception to this shift into the VELCO corridor is the so-called Rotax Road Re-route in Monkton. In its 2/28/13 filings, VGS proposed to re-route the Transmission Mainline in the vicinity of Rotax Road in Monkton to cross lands owned by Nate and Jane Palmer. Exh. Pet. Supp. JH-3 (2/28/13); exh. Pet. Reb. EMS-1; tr. 9/16/13 at 96 (Simollardes).

93. With the December 20, 2012 alignment, the Transmission Mainline was sited on the VELCO right of way on the western side from roughly structure 181 through 189, and was planned to be horizontally directionally drilled in that segment. The pipeline then crossed to the east side of the VELCO corridor to about VELCO pole structure 190, and then crossed again back to the west side. Tr. 9/16/13 at 97 (Simollardes); exh. Pet. Reb. EMS-1.

94. Following the December 20, 2012 filing, VELCO requested VGS to modify the alignment out of the VELCO corridor in this location because the presence of the pipe would interfere with guy wires at structure 190, and also would interfere with future potential expansion on the eastern side of the VELCO corridor. VELCO also expressed concerns that the plans placed the pipe right in the middle of the VELCO corridor. Tr. 9/16/13 at 98 (Simollardes); tr. 9/18/13 at 66–73 (Lind); exh. Pet. Reb. EMS-1.

95. The western side of the VELCO corridor is not a preferred location for the pipeline because it is a very constrained area, with a meandering stream that runs parallel to the corridor, a deep ravine, wetlands, close proximity to homes, and sensitive archaeological resources. Tr. 9/16/13 at 98, 101–02, 105 (Simollardes); tr. 9/18/13 at 68–70 (Lind); exh. Pet. Reb. EMS-1.

96. VGS would have to horizontally directionally drill under these resources from approximately VELCO structures 181–184, and 185–190, at an increased cost of about \$1.2 to \$1.3 million more than it would cost to trench the pipeline in the area of the Rotax Road Re-route, as proposed by VGS. Tr. 9/16/13 at 98, 101–02, 105 (Simollardes); exh. Pet. Reb. EMS-1.

97. In addition, there are more residential structures within 300 feet of the pipeline on both the east and west side of the VELCO corridor than would be impacted by the Rotax Road Re-route. Tr. 9/17/13 at 24–26 (Pilcher); tr. 9/16/13 at 98 (Simollardes); exh. Pet. Reb. EMS-1.

98. The closest distance between the pipe and the Palmer residence is about 120 feet. If VGS installed the pipe using HDD near the Palmer residence, the distance would increase to approximately 160 feet. Tr. 9/16/13 at 111, 141(Simollardes); exh. Pet. Reb. EMS-1.

99. By contrast, if the pipe were installed 10 feet within the west side of the VELCO corridor, it would be within approximately 85 feet of one residence and 110 feet of another residence, and close to a residential well. Tr. 9/16/13 at 111, 141 (Simollardes); exh. Pet. Reb. EMS-1.

100. If it were located on the east side of the VELCO corridor, 10 feet inside the corridor, the pipeline would be even closer to two residences, approximately 45 feet from one residence and 25 feet from another residence. Tr. 9/16/13 at 142 (Simollardes); tr. 9/20/13 at 35 (Heintz); exh. Pet. Reb. EMS-1.

101. These facts, combined that with the Town of Monkton’s request that VGS place the Transmission Mainline, to the extent feasible, at least 300 feet from structures, caused VGS

to modify its original design and submit the Rotax Road Re-route. Tr. 9/16/13 at 98 (Simollardes); exh. Pet. Reb. EMS-1.

102. VGS entered into an MOU with the Town of Monkton that obligated it to advocate for the 2/28/13 Alignment, including the shift to the Palmer property. Tr. 9/16/13 at 99, 100 (Simollardes); tr. 9/17/13 at 44–45 (Pilcher).

103. Given the totality of circumstances, the Rotax Road Re-route alignment is better than an alignment in the VELCO corridor. Tr. 9/16/13 at 99, 100 (Simollardes); tr. 9/17/13 at 44–45 (Pilcher); *see* findings 92–102, above.

104. A concern raised by the Palmers was that if the pipeline were installed on their land it could impair the potential to be organically certified. Mr. Palmer describes their property as a small, un-certified organic farm, which they currently use for raising a few vegetables and livestock for their own consumption. Palmer pf. at 2.

105. In Vermont, certification for organic farming is administered by the Northeast Organic Farming Association (“NOFA”). NOFA requires that no prohibited substances be applied to those fields for a period of three years prior to certification. Tr. 9/18/13 at 91 (Nelson); exh. Pet. Reb. EMS-2 at 2.

106. VGS does not and will not use herbicides or other chemical controls in the maintenance of its pipeline. Exh. Pet. Reb. EMS-2 at 2.

107. There is no direct evidence that presence of a natural gas pipeline would impair certification of farmland as organic. In fact, an existing VGS pipeline runs across several certified organic farms located at the Intervale in Burlington. Tr. 9/16/13 at 175 (Simollardes); tr. 9/18/13 at 91 (Nelson).

108. The Palmers also presented testimony that asserted that trenching and the presence of equipment on agricultural lands during Project construction would cause compaction and adversely impact soils. Tr. 9/19/13 at 179–80 (Jensen).

109. No direct evidence was admitted supporting this concern, and Sylvia Jensen, the Land Use Administrator with the Vermont Agency of Agriculture, Foods & Markets testified that large farms with whom she is personally familiar have not reported production problems following trenching and installation of a VGS pipeline on their farms. Tr. 9/19/13 at 179–80 (Jensen). *See also* finding 437, below.

110. The Palmers also admitted into evidence a paper written by a lawyer in Minnesota in 2009 that includes a list of ten recommended actions that could be incorporated into a plan for gas pipeline developers working with organic farmers. The actions cited are consistent with the activities planned by VGS under its construction and EPSC Plans, including, but not limited to, removal and storage of organic soil and subsoil separately and replacing them in the proper sequence. Darby pf. at 2–3; exh. Palmer Reb. 2 at 33–34; tr. 9/18/13 at 102–03 (Nelson); *see* findings 433–453, below.

111. VGS looked at two potential alternatives to the location of the pipeline across the Palmer parcel. First, VGS evaluated the potential to place the pipeline in an area on the western side of the parcel that is subject to a federal conservation easement. The Palmers, however, would be required to apply with VGS to modify the easement to allow the pipeline to be placed in that location, and the Palmers have not agreed to do this. Tr. 9/16/13 at 106–07 (Simollardes); tr. 9/19/13 at 18–19 (Palmer).

112. In addition, because it would impact a protected wetland, VGS would need to HDD this alignment at an added cost of \$700,000 above the proposed alignment. More significantly, the process for obtaining a waiver or modification of the federal conservation easement could be time-consuming (from 1 to 3 years) and is very uncertain, creating substantial risk that this alignment could not be achieved even if the Palmers consented to this route. Tr. 9/16/13 at 106–08, 162 (Simollardes).

113. The second alternative VGS evaluated was to use HDD across a segment of the proposed route adjacent to the Palmer residence. This would avoid impacts to the soils, a concern of the Palmers, and would also allow VGS to move the pipeline approximately another 40 feet away from the Palmer residence, such that the distance between the pipeline and the residence would be about 160 feet, at an additional cost of about \$250,000–\$300,000. It would also allow VGS to avoid cutting trees adjacent to the Palmer residence. Tr. 9/16/13 at 111 (Simollardes).

114. The Town of Monkton is very concerned with any proposed late changes to the route alignment, such as deviating from the Rotax Road Re-route, because of the fact that new landowners would now be impacted by the Project. Tr. 9/17/13 at 50–52 (Pilcher).

Discussion

Siting linear energy infrastructure projects raises a number of often competing land use concerns and challenges that we must consider and balance, including environmental and cultural resource impacts, landowner impacts, and costs to ratepayers. Given the totality of the circumstances, we believe that the Rotax Road Re-route as proposed by VGS represents the best alternative alignment. However, to address the concerns raised by the Palmers, we will require as a condition of the CPG that VGS construct the pipeline using the HDD as suggested as a potential alternative by VGS.

h. VGS Has Made Numerous Changes Reflecting Input from Landowners and Communities

115. VGS modified the Project plans to reflect input from various communities and landowners, including the following:

- In its February 28, 2013 filing, VGS modified the Transmission Mainline in Middlebury and New Haven by shifting the pipeline alignment from the east side of Route 7 to the west side of Route 7 based upon requests from these communities. Wark 2/28/13 pf. at 2; exh. Pet. JH-3 (2/28/13); exh. Pet. JH-3 (6/28/13).
- In its February 28, 2013 filing, VGS modified the locations of the Middlebury and Williston Gate Stations based on feedback from the Middlebury Planning Commission. Wark 2/28/13 pf. at 3; exh. Pet. Supp. JH-3 (6/28/13); exh. Pet. Supp. JH-9 (6/28/13).
- In its June 28, 2013 filing, VGS modified the Transmission Mainline to partially move the alignment from land owned by Chittenden Solid Waste District (“CSWD”) and into Redmond Road to accommodate the requests of CSWD; VGS and CSWD have entered into an MOU reflecting this adjustment and addresses other concerns raised by CSWD. Heintz 6/28/13 pf. at 15–2; tr. 9/16/13 at 96 (Simollardes).

3. Project Construction

116. The process of pipeline construction involves a series of sequential steps that generally proceed in the following sequence:

1. The construction is expected to be sequenced from north to south although there will be multiple construction sections called “spreads.”

2. The route is first cleared and temporary work areas are prepared.
3. Perimeter erosion control measures, such as silt fences, are installed along sensitive resource areas such as stream edges and wetlands to control sediment.
4. For the Transmission Mainline, a four to five-foot wide trench will be excavated to a depth of approximately five-feet, and soil from the trench will be stockpiled adjacent to the trench within the construction corridor. There will be different construction configurations for each of the different types of areas to be crossed, including wetlands, agricultural areas and within the public highway ROW. Smaller trenches of approximately four-feet by five-feet will be used for the Distribution Mainlines.
5. Pipe lengths will be welded together, inspected, laid in the trench and warning tape will be laid over the line, and then the trench will be backfilled. The pipe will be covered by at least 36 inches of soil. The pipeline will have four-feet of cover in agricultural areas and within the VELCO ROW, generally five-feet of cover at road crossings, and seven of feet cover at open cut streams.
6. The landscape will be restored as close as possible to pre-construction conditions in accordance with applicable permit requirements.

Heintz 2/28/13 pf. at 31–32; exh. Pet. Supp. JH-3 (6/28/13).

117. VGS has identified on its plans locations where access to the Transmission Mainline corridor will be used as well as temporary work areas for equipment and materials staging areas. Heintz 2/28/13 pf. at 34; exh. Pet. Supp. JH-3 (6/28/13).

118. Generally, the Transmission Mainline corridor will occupy a 50-foot wide permanent ROW, together with a 25-five foot temporary easement area that will be used to complete construction. Heintz 2/28/13 pf. at 18; exh. Pet. Supp. JH-4 (6/28/13).

119. In areas where construction will parallel a public road ROW, VGS will utilize a 20-foot ROW on private land adjacent to the road ROW where possible. If obtaining a ROW on private land is not possible, the pipeline will be located in the public ROW and the construction crews will utilize the road as work space. Heintz 2/28/13 pf. at 18; exh. Pet. Supp. JH-4 (6/28/13).

120. The entire ROW on the side of the road where the pipeline will be located will be cleared of vegetation in order to allow for construction. After completion of construction, the disturbed ROW area will be graded back to its previous contours and restored consistent with the

Erosion Prevention and Sediment Control Plan. Heintz 2/28/13 pf. at 18; Attachment 1 to Exh. Pet. Supp. JAN-9 (6/28/13).

121. In addition, to avoid or reduce impacts to sensitive areas, VGS has narrowed the Project ROW needed for construction from 75 to 50 feet along approximately 7.6 miles of the Transmission Mainline. Heintz 2/28/13 pf. at 19; Heintz 6/28/13 pf. at 18; exh. Pet. Supp. JH-4 (6/28/13); exh. Pet. Supp. JH-15 (6/28/13), exh. Pet. Supp. JH-16 (6/28/13); Attachment 1 to Exh. Pet. Supp. JAN-9 (6/28/13).

122. Because of the nature of a long, linear pipeline expansion project such as this, complete avoidance of all environmental and cultural resource areas is not possible, but a number of precautions will be taken to minimize impacts. In wetlands and agricultural areas, where trenches are used, soil horizons will be removed in order and stockpiled so that horizons can be restored as closely as possible to pre-construction conditions. Heintz 2/28/13 pf. at 20.

123. In some areas VGS will employ coffer dams for stream crossings and we will use matting for all work in wetland areas. Heintz 2/28/13 pf. at 20.

124. Silt fences and other erosion control techniques will be used, as well as matting and construction limit barriers. Heintz 2/28/13 pf. at 20–21. *See* also finding 430, below.

125. To avoid and minimize impacts to certain streams, rivers, wetlands, and other sensitive resources, VGS will horizontally directional drill (“HDD”) at 15 locations at a total cost of approximately \$5.5 million. An additional two HDDs have been added as a result of the MOU with ANR, the cost of which has not yet been finalized. The HDDs areas are:

Indian Brook, MP⁵ 0.9;

Indian Brook, MP 1.3;

Winooski River, MP 6.7;

LaPlatte River, MP 19.6;

Resources near Drinkwater Road, MP 22.1;

Lewis Creek, MP 22.6;

Monkton Swamp, MP 27.2:

VT AD-1560&1561-Locus 1 and 2 (archaeological sites), South of Monkton Road, MP 28.2:

⁵ MP stands for mile-post. The engineering plans for the Transmission Mainline and the Distribution Mainline include MP markers.

VT AD-1562 (archaeological site), South of Monkton Road, MP 28.6;
VT AD 446 (archaeological site), North of Quarry Road, MP 33.2;
VT AD 793 (archaeological site), Locus 2 and 3, MP 33.7;
VT AD 806 (archaeological site) South of Town Hill Road, MP 35.8;
VT AD 808 (archaeological site), MP 36; and
New Haven River, MP 39.35.

Heintz 2/28/13 pf. at 19, 21–22; Heintz 6/28/13 pf. at 18; exh. Pet. Supp. JH-4 (6/28/13); exh. Pet. Supp. JH-15 (6/28/13); exh. Pet. Supp. JH-16 (6/28/13); Attachment 1 to Exh. Pet. Supp. JAN-9 (6/28/13).

126. As part of its MOU with ANR, to minimize impacts to natural resources, VGS agreed to HDD in two additional locations: an extension of the Indian Brook/Sandplain Forest, at approximately MP 0.82; and in the vicinity of Little Otter Creek, at approximately MP 32.1. Exh. Pet. VGS-ANR-Joint-1 at 3, 6; tr. 9/18/13 at 176, 181 (Sorenson).

127. Where HDD is utilized, excavation for trenching is not required, although VGS does require laydown areas to conduct the drill. Tr. 9/17/13 at 66–67 (Heintz).

128. HDD is not always a constructible alternative due to terrain constraints and accessibility. As an example, there are two locations where HDD was proposed for stream crossings in the 2/28/13 submittal, Indian Brook at MP 3.6 and Allen Brook at MP 10.3, that were determined to be un-constructible using HDD due to terrain limitations. Heintz 6/28/13 pf. at 18–19.

129. VGS has also agreed to maintain only a footpath over the pipe in the following communities where the Transmission Mainline will be installed using HDD: the Pine Oak Heath Sandplain Forest, LaPlatte River, Lewis Creek, Little Otter Creek, and New Haven River. Exh. Pet. VGS-ANR-Joint-1 at 3–6; tr. 9/18/13 at 176 (Sorenson); Attachment 1 of Exh. Pet. VGS-ANR-Joint-1 at 12–13.

130. In addition, to avoid or reduce impacts to sensitive areas, VGS has narrowed the Project ROW needed for construction from 75 to 50 feet along approximately 7.6 miles of the Transmission Mainline. Heintz 2/28/13 pf. at 19; Heintz 6/28/13 pf. at 18; exh. Pet. Supp. JH-4 (6/28/13); exh. Pet. Supp. JH-15 (6/28/13); exh. Pet. Supp. JH-16 (6/28/13); Attachment 1 to Exh. Pet. Supp. JAN-9 (6/28/13).

a. Blasting

131. Any blasting required for the Project will be performed by licensed professionals in accordance with all applicable blasting codes and local blasting requirements, the Blasting Plan submitted by VGS, and the Blasting BMPs agreed upon between VGS and ANR. Exh. Pet. Supp. JH-17 (6/28/13); exh. Pet. VGS-ANR-Joint-1, Appendix 2.

132. The Blasting Plan was submitted with Petitioner's testimony on June 28, 2013 and is hereby approved in our Order below. Exh. Pet. Supp. JH-17 (6/28/13).

133. Blasting will only occur Monday through Friday between the hours of 9 a.m. and 4:30 p.m. Tr. 9/17/13 at 88 (Heintz); exh. Monkton SP-2 at 5 (Mem. of Understanding between Town of Monkton and VGS (6/12/13)).

134. Vibration limits will follow industry limits as outlined in the U.S. Bureau of Mines RI-8507, Appendix B. VGS will conduct pre-blast inspections of nearby facilities and structures; install blasting mats to control the scattering of loose rock; use warning signals, flags and barricades to limit access to the blast area; and conduct post-blast surveys as necessary to assess damage. Heintz 12/20/12 pf. at 29.

135. VGS will not use perchlorates in the explosives. Heintz 6/28/13 pf. at 17; *see also* Exh. Pet. Supp. JH-17 (6/28/13).

136. VGS has agreed to provide the Town of Monkton, the Monkton Central School Principal, and the Addison Northeast Supervisory District Superintendent with one week's advance written notice, followed by 24-hour advance notice (by telephone and/or electronic mail), of any blasting within 300 feet of roads used for regular school bus routes. MCS shall provide VGS with a map of such routes and busing schedule. Exh. Pet. Reb. EMS-1.

4. Project Cost

137. The estimated cost of constructing the Project is approximately \$86.6 million dollars. Exh. Pet. Supp. JH-15 (2/28/13); tr. 9/16/13 at 165 (Simollardes).

138. The MOU between VGS and ANR will require VGS to construct more of the Transmission Mainline using HDD to avoid natural resources, at an incremental cost. These costs are not reflected in the estimate. Tr. 9/16/13 at 167 (Simollardes).

139. In addition, VGS will design and construct the Project to provide additional safety measures, as requested by DPS, including the use of a thicker and stronger pipe (*see* discussion

at finding 291, below). These measures will also likely result in increased Project costs. Tr. 9/16/13 at 167 (Simollardes).

140. The Board finds that the additional HDD and safety measures to be built into the Project design and construction, are in the best interests of the state.

141. The Project cost estimate does not include the cost of building the local distribution networks. VGS estimates that the cost of the initial distribution networks to be built in Vergennes and Middlebury will be approximately \$6.3 million, excluding the cost of meters and services. Tr. 9/16/13 at 167–68 (Simollardes).

5. Project Schedule

142. The Project schedule calls for construction of the Project to be completed by Fall 2014 in order to bring gas service to anchor customers in the Middlebury Industrial Park by late 2014.

143. VGS has requested that the Board issue a CPG before the end of 2013. This would permit VGS to commence HDD activities in early February 2014, as currently planned, and to meet the overall Project schedule. Tr. 9/17/13 at 124 (Heintz).

144. A failure to achieve this schedule will likely have adverse impacts on overall Project cost and result in delayed savings to Addison County customers. Tr. 9/17/13 at 124 (Heintz); *see also* findings herein relating to Project Need and Project Cost.

6. Orderly Development of the Region [30 V.S.A. § 248(b)(1)]

145. The Project will not unduly interfere with the orderly development of the region, with due consideration having been given to the recommendations of the municipal and regional planning commissions, the recommendations of municipal legislative bodies, and the land conservation measures contained in the plan of any affected municipality. This finding is supported by findings 146 through 204, below.

146. The municipalities directly affected by components of the Project include the Towns of Colchester, Essex, Hinesburg, St. George, and Williston (each of which is a member of the Chittenden County Regional Planning Commission); and Ferrisburgh, Middlebury, Monkton, New Haven, and Vergennes (each of which is a member of the Addison County Regional Commission). Wark 12/20/12 pf. at 6; Heintz 12/20/12 pf. at 3–4.

147. The Project will promote the orderly development of the region in that it either is consistent with the local and regional plans or deploys natural gas service in town centers, thus avoiding promotion of sprawl. Most towns along the Project route do not specifically reference natural gas transmission lines in their town plans. Wark 12/20/12 pf. at 8; Raphael pf. at 8–9.

a. Town of Colchester

148. The Colchester Town Plan, adopted in 2007, anticipates continued expansion within Colchester, expressly encourages the extension of natural gas service to areas not currently served, and recommends that infrastructure be appropriately sited and screened or underground when upgraded and expanded. Wark 12/20/12 pf. at 8–10.

149. The Town Plan also describes the need to protect natural resources and recommends that development outside the Village preserve connectivity of natural resources, minimize impacts to agriculture, maintain the natural corridors of Indian and Pond Brook, and keep deer wintering yards open. Wark 12/20/12 pf. at 8–10.

150. The Project is consistent with the Colchester Town Plan insofar as the Transmission Mainline in Colchester will be underground, and the Project is designed to minimize impacts to both natural and cultural resources. The Project will also provide additional reliability to the existing VGS system. Wark 12/20/12 pf. at 8, 10–11; Nelson 12/20/12 pf. at 5–8.

151. Vermont Gas engaged the Colchester Town Manager and Colchester Selectboard in order to describe the Project, respond to questions, and address concerns. The Colchester Town Manager expressed an interest in furthering natural gas service in the town, not unduly impacting the land areas where construction would occur, and ensuring that if the CIRC is not built, the land would be returned to the Town. The Colchester Selectboard approved the use of the CIRC right-of-way and wishes to install a paved linear path along the CIRC. Wark 12/20/12 pf. at 9–10; exh. Pet. SJW-4.2.

152. The Project is consistent with the Town recommendations insofar as Vermont Gas has made a significant effort to minimize impacts to land areas where construction of the Project will occur, and the Project does not preclude the addition of a bike path along the CIRC. Wark 12/20/12 pf. at 10–11.

153. The Town of Colchester has not intervened in these proceedings.

b. Town of Essex

154. The Essex Town Plan, adopted March 1, 2011, encourages expansion of gas utilities and recommends use of existing corridors to avoid undue adverse impact on residents. The Project is consistent with these goals. Wark 12/20/12 pf. at 11.

155. The Essex Town Engineer and Essex Selectboard did not raise any significant issues with the Project after Vermont Gas engaged the Town to describe the Project, respond to questions, and address concerns. Wark 12/20/12 pf. at 11.

c. Town of Williston

156. The Williston Comprehensive Plan (2011-2016) recognizes that energy costs and availability affect the health and vigor of the local economy and residents. The Plan supports goals of conserving and optimizing existing energy resources, obtaining power in ways that will not increase the carbon footprint of Vermont, and recommends that new regional transmission lines and similar facilities be located within existing utility corridors to minimize impacts to natural, scenic, and historic resources. Wark 12/20/12 pf. at 12.

157. The Project is consistent with the Town Plan insofar as the Project has been designed to accommodate sensitive environmental and cultural resources along the route and the Project will result in a reduction in carbon dioxide (“CO₂”) emissions. Wark 12/20/12 pf. at 12; Heintz 12/20/12 pf. at 13–16; Simollardes 12/20/13 pf. at 4–5.

158. The Williston Town Manager and Selectboard did not raise any significant issues with the Project after Vermont Gas engaged the Town in order to describe the Project, respond to questions, and address concerns. During this Process, while community members asked Vermont Gas to consider expanding service further into Williston. Wark 12/20/12 pf. at 13.

159. The Project is consistent with the recommendations and concerns raised by the Town insofar as Vermont Gas has relocated the Gate Station and modified the pipeline alignment to accommodate requests from Town officials and landowners. Wark 2/28/13 pf. at 2–3.

d. Town of St. George

160. The St. George Town Plan, adopted May 10, 2007, recommends locating new or expanded public utilities and infrastructure within existing highway or utility rights-of-way unless doing so would adversely impact special areas and resources identified in this plan. Wark 12/20/12 pf. at 13.

161. The Project is consistent with this goal insofar as the Transmission Mainline in St. George will be primarily located adjacent to roadways or electric utility corridors. Wark 12/20/12 pf. at 13; exh. Pet. JH-3.

162. The Town Selectboard did not raise any significant issues with the Project after Vermont Gas engaged the Town to describe the Project, respond to questions, and address concerns, but did express a strong interest in natural gas service to St. George to help residents reduce energy costs. Wark 12/20/12 pf. at 14.

163. The Project is consistent with this recommendation insofar the Project will enable the Company to provide service to St. George in the future through the installation of an access point for potential future service. This entails a future land purchase and installation of a “T” in the transmission pipeline to facilitate later gate station installation. Wark 12/20/12 pf. at 14.

e. Town of Hinesburg

164. The Hinesburg Town Plan, adopted May 16, 2011, expresses concerns regarding greenhouse gases and observes that natural gas burns more cleanly than fuel oil. Wark 12/20/12 pf. at 14–15.

165. The Project is consistent with this provision insofar as it will result in a reduction in CO₂ emissions. Simollardes 12/20/13 pf. at 4–5.

166. Vermont Gas engaged the Hinesburg Town Administrator, the Director of Planning and Zoning, and the Hinesburg Selectboard in order to describe the Project, respond to questions, and address concerns. Town officials and community members expressed a desire to extend service up through Richmond Road, raised concerns about the placement of the pipeline outside the existing utility corridor, and expressed concerns about the impacts along Baldwin Road. Wark 12/20/12 pf. at 15.

167. The Hinesburg Selectboard submitted a letter in general support of the Project, but requested that the pipeline be re-routed to the existing VELCO corridor. Wark 12/20/12 pf. at 15; Wark 2/28/13 pf. at 3–4; exh. Pet. SJW-4.14.

168. The Project is consistent with the recommendations and concerns raised by the Town. Limited customer demand and the existence of rock ledge along Richmond Road preclude an immediate extension in that area, but Vermont Gas is conducting ongoing feasibility studies to assess the potential for expansion along Richmond Road. Wark 12/20/12 pf. at 15–16; tr. 9/16/13 at 82 (Wark).

169. Vermont Gas has also relocated the transmission pipeline to the existing VELCO corridor where feasible due to constructability or environmental resource considerations. Wark 12/20/12 pf. at 15–16; tr. 9/16/13 at 82 (Wark); Wark 2/28/13 pf. at 4–5; exh. Pet. SJW-4.14a.

f. Town of Monkton

170. The Monkton Town Plan makes no mention of natural gas lines, but sets forth a goal to locate new distribution or transmission facilities in such a way as to not adversely affect the rural nature of the community and to protect the rural-residential atmosphere of the town. Wark 12/20/12 pf. at 15–16.

171. To the extent it applies to the Project, the Project is consistent with this provision insofar as the pipeline in Monkton will be placed underground. Wark 12/20/12 pf. at 15–16.

172. The Monkton Selectboard submitted a letter in which it did not oppose the Project, expressed a strong interest in extending natural gas service to the community, and strongly urged routing the Project through the VELCO corridor. Pilcher 6/14/13 pf. at 3–5; Wark 12/20/12 pf. at 17–18; Wark 2/28/13 pf. at 3–4; exh. Pet. SJW-4.15.

173. The Project is consistent with the recommendations and concerns raised by the Town insofar as the chosen route balances impacts to the environment, cultural resources, and private landowners, and the Project will enable the Company to provide service to Monkton in the future through the installation of an access point for potential future service. This entails a future land purchase and installation of a “T” in the transmission pipeline to facilitate later gate station installation. Wark 12/20/12 pf. at 18; Wark 2/28/13 supp. pf. at 3–6; exh. Pet. SJW-4.15a.

174. Vermont Gas will also work toward identifying a suitable location for a gate station in Monkton. Finally, Vermont Gas has also relocated the transmission pipeline to the existing VELCO corridor where feasible due to constructability or environmental resource considerations. Wark 12/20/12 pf. at 18; Wark 2/28/13 pf. at 3–6; exh. Pet. SJW-4.15a.

175. The Town of Monkton and Vermont Gas have entered into an MOU that substantially addresses the Town’s concerns with the Project and agree that the CPG should be conditioned to include the provisions of the MOU. Pilcher pf. at 4–5.

176. Steven Pilcher, the Chair of the Monkton Selectboard, testified that he believes VGS did everything it could to address the concerns of the Town of Monkton. Tr. 9/17/13 at 37 (Pilcher).

177. When the Town Selectboard negotiated the re-routes for Monkton that were ultimately reflected in the VGS 2/28/13 Alignment, the Town understood that ultimately some landowners, such as the Palmers, would be required to bear the burden of having the pipeline on their land. Tr. 9/17/13 at 40–42 (Pilcher).

g. Town of New Haven

178. The New Haven Town Plan, adopted March 1, 2011, does not specifically address natural gas, but sets forth a goal of limiting the need for expanded public utilities by promoting energy conservation and the use of local renewable resources. Wark 12/20/12 pf. at 19.

179. The Project is consistent with the Town Plan insofar as the Project will provide new opportunities for access to Vermont Gas’ thermal energy efficiency programs and the Project has been designed to avoid impacting specific natural resources. Wark 12/20/12 pf. at 19; Nelson 12/20/12 pf. at 5–8; Heintz 12/20/12 pf. at 20.

180. Vermont Gas engaged the New Haven Selectboard, the Development Review Board, and the Town in order to describe the Project, respond to questions, and address concerns. Town officials expressed concern over landowner impact, sprawl, and safety, while there was disagreement over whether the pipeline should be routed within and near the VELCO right-of-way or along the public right-of-way in the road. Wark 12/20/12 pf. at 19–20; exh. Pet. SJW-4.12; exh. Pet. Supp. SJW-5.

181. The New Haven Planning Commission provided a letter outlining route preferences for the Distribution Mainline, submitted prior to the decision to extend the transmission mainline to Middlebury. Wark 12/20/12 pf. at 19–20; exh. Pet. SJW-4.12; exh. Pet. Supp. SJW-5.

182. The Project is consistent with the recommendations and concerns raised by the Town insofar as the transmission pipeline has been relocated to accommodate the Town’s request. Wark 2/28/13 pf. at 2, 6; Heintz 12/20/12 pf. at 17; exh. Pet. JH-5.

h. Town of Ferrisburgh

183. The Ferrisburgh Town Plan, amended in 2007, makes no mention of natural gas. Wark 12/20/12 pf. at 20.

184. The Town did not offer any comments or testimony concerning the Project.

i. Town of Middlebury

185. The 2007 Middlebury Town Plan supports the use of technologies that will conserve energy and reduce emissions, together with the installation of cleaner and more efficient sources of energy such as natural gas. It requires consideration of safety, economic, and environmental issues, and suggests that the VELCO corridor is an appropriate route for such infrastructure. Wark 12/20/12 pf. at 20–21.

186. The Project is consistent with the Middlebury Town Plan insofar as the Project will provide both environmental and economic benefits and will protect public safety. Conversion from oil and propane to natural gas will result in significant savings in fuel costs to Middlebury homes and businesses and would significantly advance Vermont’s greenhouse gas reduction goals, as natural gas emits less CO₂ than oil on an energy equivalent basis. All pipeline systems and facilities will be built according to code, and the Gate Station will be situated near a location that houses significant business activity and energy use. Wark 12/20/12 pf. at 21–22.

187. Vermont Gas engaged the Middlebury Selectboard, the Town Planner, and the Town in order to describe the Project, including the extension of service to IP in Ticonderoga, New York, and to respond to questions and address concerns regarding pipeline safety, route alignment, and the impact of the Gate Station. The Town Planner also provided a letter from the Middlebury Planning Commission. Wark 12/20/12 pf. at 21–22; exh. Pet. SJW-4.13; exh. Pet. Supp. SJW-3; exh. Pet. Supp. SJW-4.

188. The Project is consistent with the recommendations and concerns raised by the Town insofar as the transmission pipeline has been relocated to accommodate the Town’s request, and the Gate Station has been relocated based on feedback from the Town Planning Commission. Wark 2/28/13 pf. at 2, 6; Heintz 2/28/13 pf. at 15, 23, 27–29; exh. Pet. Supp. JH-9 (6/28/13).

j. City of Vergennes

189. The Vergennes Municipal Development Plan (2009-2014) is silent on natural gas, but it encourages the use of energy efficiency. Wark 12/20/12 pf. at 22.

190. The Project is consistent with the Plan insofar as it will enable Vermont Gas to provide its energy efficiency programs to new natural gas customers. Wark 12/20/12 pf. at 22–23.

191. The Vergennes City Council and City Administrator did not raise any significant issues with the Project after Vermont Gas engaged the City to describe the Project, respond to questions, and address concerns. Wark 12/20/12 pf. at 22–23.

k. Town of Waltham

192. The Waltham Town Plan (2009) does not contain any policies regarding natural gas, but states that new or expanded public utilities should be located within existing highway or utility ROWs. The Plan also contains the goal of reducing emissions of greenhouse gases. Wark 12/20/12 pf. at 23.

193. The Project is consistent with the Plan insofar as a short segment of the Distribution Mainline will pass through Plank Road within the public road ROW, and the Plan will result in a reduction in CO₂ emissions. Wark 12/20/12 pf. at 23.

194. The Town of Waltham has not intervened in these proceedings.

l. Chittenden County Regional Plan

195. The 2006 Chittenden County Regional Plan (the “CCRP”) does not contain specific land conservation policies regarding natural gas pipelines, but encourages diverse, reliable, affordable, and environmentally responsible energy supplies and recommends that energy production, transmission, and distribution infrastructure be efficient, reliable, cost-effective, and environmentally responsible. The CCRP also advocates for energy efficiency and recognizes the authority of local planning with respect to land use. Wark 12/20/12 pf. at 24.

196. The Project is consistent with the CCRP insofar as it will allow Vermont Gas to continue to provide energy efficient options for a low-carbon, low-cost heating fuel to residents and businesses of Chittenden County, and it will also allow expansion of natural gas service to other areas of the state. Wark 12/20/12 pf. at 24–25.

m. Addison County Regional Plan

197. The Addison County Regional Plan (the “ACRP”) notes that there are no natural gas transmission lines in the Addison region and encourages utility companies to work with affected landowners, municipalities, and the Regional Planning Commission to develop appropriate aesthetic mitigation plans in connection with utility projects. The ACRP further states that energy transmission lines should be co-located in the same corridors or on the same

infrastructure if feasible to coordinate the delivery of services and reduce aesthetic impacts. Wark 12/20/12 pf. at 25.

198. The Project is consistent with the ACRP insofar as the Project will promote the use of energy efficiency and increase access to Vermont Gas' Energy Efficiency Program, will use existing corridors where feasible, and has been designed in collaboration with affected landowners and municipalities. Wark 12/20/12 pf. at 25.

199. Vermont Gas and the Addison County Regional Planning Commission ("ACRPC") reached a Memorandum of Agreement ("MOU") which substantially addresses the ACRPC's concerns with the Project, and also sets forth the distribution network locations expected to be served as a result of the Project. Exh. ACRPC Supp. TB-2.

200. The MOU provides that VGS will, subject to receipt of all necessary permits and approvals, construct and operate a distribution network to each of the municipalities through which the transmission line will pass. Vermont Gas will pay for all the costs associated with the construction and operation of the distribution networks in the locations specified in the ACRPC MOU. Exh. ACRPC Supp. TB-2 at 2.

201. The MOU provides that VGS' CPG should be conditioned to include all the provisions contained in the MOU. Exh. ACRPC Supp. TB-2.

202. ACRPC also thinks that Vermont Gas should provide methane detection meters and non-sparking tools to each community through which the transmission or distribution line will run. Bouton pf. at 8; Bouton reb. pf. at 4.

203. Tools for emergency shut-off should only be used by appropriately trained professionals, such as employees of Vermont Gas. Tr. 9/17/13 at 17 (Berger).

204. Similarly, methane gas detection meters should only be used by individuals with the appropriate expert training. Meters need to be calibrated and constantly refreshed. Use of a meter by an untrained person could result in inaccurate results. Tr. 9/17/13 at 17-18 (Berger).

Discussion

Section 248(b)(1) provides in pertinent part that, before the Board may issue a certificate of public good for an in-state facility, the Board shall find that the facility "will not unduly interfere with the orderly development of the region with due consideration having been given to the recommendations of the municipal and regional planning commissions, the recommendations

of the municipal legislative bodies, and the land conservation measures contained in the plan of any affected municipality.” 30 V.S.A. § 248(b)(1).

We conclude that the proposed Project will not unduly interfere with the orderly development of the region. We base this conclusion in part upon the examination, pursuant to Section 248(b)(1), of the local and regional plans for the affected communities as well as the testimony offered by impacted communities and the MOUs entered into between VGS and ACRPC as well as the Town of Monkton. It is important to note that under Section 248’s statutory language, the proposed Project does not need to conform to the requirements of these plans, only that this Board give due consideration to the land conservation measures in such plans and the recommendations of the affected local and regional planning commissions and legislative bodies.

The effects of the proposed Project on the orderly development of the region are reduced by the use of the existing CIRC and VELCO transmission corridors and road ROWs where feasible. *See* In re: Northwest Vt. Reliability Project, Docket No. 6860, Order of 1/28/05 at 203 citing Petition of VELCO, Docket No. 4381, Order of 3/6/80 at 4–5 (“By paralleling the existing corridor ... a proposed [transmission line] routing has been chosen that has already been considered in the developmental aspects of the community by both public and private endeavors.”)

7. Need for Present and Future Demand for Services [30 V.S.A. § 248(b)(2)]

205. The Project is required to meet the present and future demand for services which could not otherwise be provided in a more cost-effective manner through energy conservation programs and measures, energy efficiency, and load management measures. This finding is supported by findings 206 through 249, below.

206. There is significant demand for expanding natural gas service into Addison and Rutland Counties and throughout the entire state. Gilbert 12/20/12 pf. at 8; tr. 9/16/13 at 23–24, 55 (Gilbert).

207. The ANGP conceptual planning was closely linked to a four-year Project timeline, with Project completion planned for 2015 and service to large customers in Middlebury in 2014. While there may be many route options available, those that include unreasonably difficult construction could extend the Project timeline and affect successful completion of the Project. Howe 12/20/12 pf. at 5.

208. The Project design (pipe size, pressure, and configuration, and route selection) was developed utilizing the following set of guiding principles:

- The new system would be built and operated safely;
- Provide reliable service to existing customers as well as potential new customers;
- Minimize impact on the communities along the pipeline route;
- Minimize environmental impacts;
- Plan the system infrastructure so that it will meet the needs of the planned new market areas along the Project route, while also being mindful of future expansion opportunities, such as Rutland and surrounding towns;
- Minimize challenges to construction; and
- Control Costs.

Howe 12/20/12 pf. at 4–5.

209. System pressures and pipe diameters are the two main variables in the development of pipeline design configuration for system expansions such as this Project, and are dependent upon the anticipated peak-day gas demand. Howe 12/20/12 pf. at 5–6.

210. VGS designed the Project to provide the capacity needed to supply natural gas to all customers receiving firm service on the VGS system on a design-day basis, including those projected to be served by the expansion of service into Addison County as proposed in this proceeding. Design-day demand represents the peak load for firm customers on an 86 degree-day basis. Teixeira 12/20/12 pf. at 4–5.

211. VGS’ practice of planning and maintaining its system for peak load is a common planning principle for a natural gas company. *See* Docket No. 7456, Order of 9/3/2010 at 22. VGS evaluates peak customer demand from two different perspectives: peak-day load and peak-hour load. Teixeira 12/20/12 pf. at 5.

212. In addition, VGS services two distinct markets: firm customers, who are entitled to uninterrupted service year-round, and interruptible customers, who receive gas on an “as available” basis and are normally interrupted or curtailed during the coldest days of the year. Since the interruptible customers are normally curtailed during the peak-day and peak-hour, only firm customer load is considered for peak-day and peak-hour purposes. Teixeira 12/20/12 pf. at 5.

213. VGS' design-day methodology uses the coldest day experienced in the last thirty years. The current design-day of 86 heating degree-days ("DD") occurred on January 26, 1994. VGS further refines the 86 DD into 93 effective degree-days ("EDD") to incorporate the effect of wind speed on requirements and the use of a prior day EDD of 73. Teixeira 12/20/12 pf. at 5.

214. Peak hour is estimated to be 5% of the peak-day load, which is one twentieth of a total peak-day load. Using this calculation accounts for the fact that usage is not uniform throughout an entire day and that during certain hours of the day there is increased usage. Teixeira 12/20/12 pf. at 6.

215. Peak hours are typically when people wake up in the morning and when they arrive home in the evening. Utilizing a 5% peak hour factor is common in the industry. Teixeira 12/20/12 pf. at 6.

216. Since Vermont Gas' long range plan is to extend service to Rutland, the potential loads for serving the Rutland area customers were also modeled to optimize the pipe size for ANGP and to conceptualize future pipeline construction requirements. Teixeira 12/20/12 pf. at 4.

217. To frame the potential loads that would be served by the Project, VGS provided market analysis for potential natural gas demand in Middlebury, Vergennes, and Bristol, as well as potential future loads in Rutland, which would be the target anchor load for a future project, along with the smaller nearby towns of Brandon, Proctor, and Pittsford. Howe 12/20/12 pf. at 6.

218. VGS peak-day demand is forecasted to grow (including the ANGP load), from 65,367 Mcf in FY 2013 to 68,262 Mcf in FY 2017. Teixeira 12/20/12 pf. at 8.

219. In order to extend service to Addison County, a wide variety of possibilities were identified with combinations of transmission and distribution pipelines. Since distribution operates at a lower pressure than transmission, pipeline capacity, or the physical quantity of gas that can be delivered to customers, is more limited. Howe 12/20/12 pf. at 6-7.

220. VGS' existing system can be generally described as a long transmission lateral with a current minimum operating pressure of approximately 580 pounds per square inch ("psi"), which feeds multiple distribution systems that each have an operating pressure of approximately 100 psi. Howe 12/20/12 pf. at 6.

221. Pipe size was determined by analyzing the requirements to serve the estimated peak-day gas demands in Addison County while maintaining VGS' standards of service. In

general, pressure loss along the pipeline path occurs as gas demand is required by customers and can be estimated using pipeline hydraulic modeling software. The highest, or peak, gas demands tend to correlate with weather, with greater demand occurring during colder temperature periods. Howe 12/20/12 pf. at 12.

222. VGS must not only have sufficient supplies to serve peak-day demand, but it must also have sufficient capacity on its transmission system to deliver those supplies from the U.S./Canadian border to its customers. Factors that affect VGS' ability to deliver gas supplies on the transmission pipelines are:

- The size (diameter and length) of the transmission pipeline;
- TCPL's minimum, guaranteed delivery pressure (580 psi);
- The maximum operating pressure of VGS' 10 inch transmission pipeline (605 psi);
- The minimum operating pressure at the Middlebury Gate Station, the proposed southern terminus of the system (250 psi);
- The maximum acceptable gas velocity within the pipeline (60 ft/sec);
- The amount of propane-air mixture injected by VGS into the system at 30% propane/air (maximum) to 70% natural gas; and
- The distribution of load requirements for the system.

Teixeira 12/20/12 pf. at 8-9.

223. VGS prepared network modeling analyses using the GL Nobel Denton, Inc. SynerGEE Gas software to predict system pressures based on our future demand forecasts under varying piping configurations. The modeling software uses an algorithm that considers a variety of physical variables (pipe length, pressure, friction, etc.) and then applies the thermodynamic gas laws to analyze the effect of each piping design on delivered pressure at a point in the system. Teixeira 12/20/12 pf. at 9.

224. The results of the analysis represent the expected or observed pressure inside the pipe. A higher psi pressure reading generally reflects a better ability to serve customers during peak periods. Teixeira 12/20/12 pf. at 9.

225. VGS designs its distribution system to maintain a pressure level of 30 psi at the end points of the system based on the specifications of the service regulators and historical pipe

sizing methodology used for services. A pressure level of 30 psi is an acceptable standard for system-end-point pressure on a design day. *See* Docket No. 7456, Order of 9/3/2010 at 24.

226. Currently VGS monitors end point locations in the Burlington system at Jericho and Williston and in its most recent expansion area, Richmond. If system-end-point pressures drop too low and remain unaddressed, customers may experience problems with their gas equipment and, in extreme cases, suffer gas outages. Teixeira 12/20/12 pf. at 10.

227. The minimum allowable pressure that must be maintained for the transmission system in order to provide reliable service to all firm customers is 250 psi. Pipeline capacity, which is dependent on pressure, can be gained through larger pipeline size or through looping of the upstream transmission system. Howe 12/20/12 pf. at 12.

228. Alternative potential transmission pipeline sizes were evaluated as 8-inch, 10-inch, 12-inch, or 16-inch pipe with a minimum of 250 psi in the transmission pipeline at all times. Howe 12/20/12 pf. at 13.

229. All analyses were performed assuming the VGS Phase VI Looping Project planned for 2013 construction (Docket No. 7929) is in service, with a minimum pressure of 250 psi being maintained throughout the transmission system at all times. The analysis showed that at a minimum, a 10-inch transmission line would be required to serve Middlebury and Vergennes, because an 8-inch transmission pipe would result in such high pressure loss that Middlebury demand could not be served without extensive additional looping (68 miles of added looping). Howe 12/20/12 pf. at 13–14.

230. Based upon these design parameters and the peak-day forecast, VGS verified that the Project as proposed (12-inch transmission to Middlebury) will have adequate capacity to meet projected system peak-day demand. Teixeira 12/20/12 pf. at 10.

231. VGS also studied a larger, 16-inch pipe. A 16-inch transmission line would provide service to Middlebury and Vergennes and, if extended to Rutland, could serve the estimated demand there, plus the additional area towns of Bristol, Brandon, Proctor and Pittsford, with some additional capacity remaining for further expansion. While 16-inch transmission pipe would serve the entire prospective load in Addison and Rutland Counties, there are additional costs of materials and construction in order to install the significantly larger pipeline. Howe 12/20/12 pf. at 14.

232. Ultimately, a 12-inch transmission pipe to Middlebury was determined to be the most cost effective design configuration to support the existing and expanded system, and be adequate to support the expansion to Rutland and International Paper. Howe 12/20/12 pf. at 13, 16.

233. Energy efficiency could not serve as an alternative to meet the need for this Project. This Project need is driven by the desire to expand the availability of natural gas service to Addison County. Addison County does not have any natural gas infrastructure today; therefore, a complete network needs to be installed to serve the new emergent gas load of these communities. Teixeira 12/20/12 pf. at 8.

234. The need for the Project is based upon market demand to expand the system into a new geographic region. Teixeira 12/20/12 pf. at 4; *see* finding 206, above.

235. For example, Cabot Coop currently uses No. 6 fuel oil and propane for fuel at its Middlebury facility, and would intend to replace both with natural gas made available as a result of the Project. Tr. 9/17/13 at 158–59 (Pcolar).

236. Cabot operates a cheese manufacturing and whey powder drying plant in Middlebury. Its thermal energy demand is very intensive at times. Cabot needs to have both direct heat that it uses to dry its products and indirect heat to heat whey products. Renewable energy generation could possibly assist Cabot Coop with its electricity needs, but not the thermal needs used in its manufacturing processes. Tr. 9/17/13 at 159, 162, 164–65 (Pcolar).

237. The introduction of natural gas service to customers like Cabot Coop, who would use gas service for thermal applications, as opposed to electricity needs, would not delay future investments in renewable energy in Vermont. Tr. 9/17/13 at 164 (Pcolar).

238. Cabot has considered using compressed natural gas (“CNG”) if the Project is delayed, but would chose natural gas service from VGS over CNG. Tr. 9/17/13 at 160 (Pcolar).

239. One primary consideration was the number of trucks that would be required to be on the roads if CNG were used, and the implications that such traffic would have for an Act 250 permit. There would actually be more truck deliveries for CNG than for fuel oil. Tr. 9/17/13 at 164–65 (Pcolar).

240. Over 400 truckloads of fuel are delivered to the Middlebury plant each year. Exh. Pet. TSL-3.1.

241. VGS expansion would provide robust new opportunities for energy efficiency investment in the proposed service area, helping more Vermont homes and businesses reduce their energy costs and usage. Poor pf. at 5.

242. Because 30 V.S.A. §218c requires least cost planning from regulated utilities, the expansion of natural gas services to customers in Middlebury and Vergennes would increase the availability of energy efficiency programs, even in the absence of additional funding from the General Assembly. These additional efficiency programs would lead to an increase in the number of homes in which the energy fitness is improved, and where fuel bills are reduced. Commercial customers would be able to avail themselves of programs to increase efficiency investments as well. Poor pf. at 7.

243. Between 2004 and 2011, Vermont Gas' DSM programs avoided almost 3,800 Mcf on peak day. Teixeira 12/20/12 pf. at 8.

244. The expansion of natural gas provides opportunities to increase the efficiency level of appliances and equipment relative to other fossil fuel (e.g., propane and fuel oil) appliances and equipment. This opportunity occurs in two situations. First, new natural gas equipment installations will replace older equipment. Because the Annual Fuel Utilization Efficiency ("AFUE") of the new heating equipment is likely to be higher than the older heating equipment, and the replacement will often be completed prior to the end of the old equipment's useful life, less overall energy will be consumed. Second, the new equipment has the opportunity to be more efficient than the alternative. Poor pf. at 5-6.

245. Expansion of natural gas infrastructure in Vermont provides opportunities for further efficiency from whole building retrofit and other demand-side management measures. It also provides the opportunity for renewable resources, such as bio-methane resources, to have increased access to customers. Poor pf. at 5; exh. Pet. SJW-4.10.

246. Bio-methane is a renewable fuel produced by the digestion of organic matter that is identical in composition to natural gas. There is at least one bio-methane initiative planned that is expected to provide energy to Vermont customers. The proposed expansion of natural gas transmission service provides a market for this fuel. Poor pf. at 8.

247. The DPS Comprehensive Energy Plan ("CEP") recognizes that natural gas expansion encourages fuel choice for Vermonters. The expansion should also increase

competitiveness in the fuels market—applying downward pressure on prices and helping keep service quality high. Poor pf. at 5.

248. The DPS recommends that a study be undertaken in the context of Docket No. 7676 (establishing VGS as an Energy Efficiency Utility) to determine the reasonably available cost effective energy efficiency that could be employed in the new VGS markets in Addison County. Tr. 9/19/13 at 111 (Poor).

249. We agree that Docket No. 7676 is the appropriate forum in which to establish a budget and plan for VGS energy efficiency activities in Addison County.

8. System Stability and Reliability [30 V.S.A. § 248(b)(3)]

250. The Project will not adversely affect system stability and reliability; in fact, the Project will enhance system stability and reliability. This finding is supported by findings 251 through 254, below.

251. The Project is designed to provide the capacity needed to all VGS customers on the system, including those who are projected to be served by the expansion of service into Addison County, as well as future market demands beyond Addison County. Teixeira 12/20/12 pf. at 4, 11.

252. The Project will reduce the demand on the existing 10-inch line between Colchester and Burlington by looping the existing pipeline. This will result in stronger delivery pressures at the existing Burlington-area stations. Teixeira 12/20/12 pf. at 11.

253. The new Williston Gate Station will be able to supply some of the Burlington area demands by back-feeding into the Burlington system. The Gate Station will also add operating flexibility by enabling other stations to go off-line when needed for maintenance. Teixeira 12/20/12 pf. 11; tr. 9/17/13 at 229–30 (Teixeira).

254. As a result of the Project, the whole Burlington area distribution system will be stronger and more reliable as a result. The Project will provide “backfeed” capability to enhance the reliability of service to customers in Chittenden County. Teixeira 12/20/12 pf. at 11; Gilbert 12/20/12 pf. at 9.

9. Economic Benefit [30 V.S.A. § 248(b)(4)]

255. The Project will result in economic and social benefits to the state of Vermont and its residents. This finding is supported by findings 256 through 283, below.

256. Franklin County has been fortunate to have access to natural gas for decades. The positive economic impact to businesses and residents has been substantial. Franklin County has a diverse manufacturing base partly due to the access of natural gas. Exh. Pet. SJW-4.5.

257. The job loss in Franklin County during the recession of 2008–2010 was 1.6%, the lowest in all of Vermont. The unemployment rate has remained below the national average during this same period. The average household income for the region continues to rise as more jobs are created. Exh. Pet. SJW-4.5.

258. The Project will provide substantial economic benefits to Addison County and the state of Vermont. It will result in lowering Addison County energy bills by over \$200 million over the next 20 years and producing net energy bill savings of \$112.5 million. Simollardes 12/20/12 pf. at 2–3; Carr 12/20/12 pf. at 8; exh. Pet. JC-2 Table 1.

259. The Project will also result in carbon reduction savings of \$17.1 million, and property tax payments of \$23.5 million. Simollardes 12/20/12 pf. at 3.

260. The \$17 million greenhouse gas reduction value excludes monetizing any greenhouse gas reductions associated with reduced truck traffic as a result of removing fuel delivery trucks from Vermont’s roads. Simollardes 12/20/12 pf. at 3.

261. Savings to businesses translate into additional jobs within the Vermont economy, increased production capacity and therefore increased competitiveness for local businesses and industries. The Project will improve the competitive advantage of Vermont businesses located in Addison County relative to businesses in other U.S. regions, and better situate them to take advantage of opportunities in an increasingly competitive global economy. Carr 12/20/12 pf. at 12–13.

262. The approximately \$90 million capital investment being made by Vermont Gas for construction will result in indirect economic benefits. It will support pre-construction activities, including environmental assessments and mitigation, right-of-way acquisitions, and land purchases. Carr 12/20/12 pf. at 9.

263. Indirect economic benefits will also result when households and business inject money into the economy for equipment needed to switch to natural gas energy. These expenditures are expected to amount to an estimated \$21 million. Carr 12/20/12 pf. at 10.

264. Over the next 20 years, economic output will increase annually by between \$0.6 and \$21.9 million. Carr 5/30/13 pf. at 13.

265. Providing local businesses with a lower-cost source of energy has the potential to be beneficial for that economic development efforts. Tr. 9/17/13 at 201 (Carr).

266. The additional benefits that will accrue to the residents of Addison County above and beyond the overall benefits to the state include:

- Average energy bill savings per residential customer of between \$1,570 and \$1,910 per year;
- No longer needing to pre-pay for purchases of heating fuel;
- The convenience of having fuel delivered via a network of pipes, eliminating the worry of running out or the need to schedule deliveries;
- Access to Vermont Gas' energy efficiency programs to help manage energy use; and
- The security of regulated pricing.

Simollardes 12/20/12 pf. at 3.

267. The Project will make natural gas service available to several large businesses in Addison County, including Agri-Mark Dairy Cooperative (Cabot Cheese), Middlebury College, Porter Medical Center and UTC Aerospace Systems (formerly, Goodrich). These businesses are very supportive of the Project and of having access to affordable, clean natural gas. Exhs. Pet. TSL-3.1–TSL-3.4; Pcolar pf. at 2–3; *see findings 15–26, above.*

268. Energy is one of the areas that impacts home owners and business owners similarly. Lower energy costs results in increased capital expenditures and investment with money that would have otherwise gone into higher energy bills. Lower energy prices are also an incentive for new business growth. Exh. Pet. SJW-4.7.

269. As a regulated fuel, natural gas provides a beneficial level of price stability for Vermont homes and businesses. The dramatic price swings that took place in 2008 for unregulated fuels created significant hardships and uncertainty for Vermonters. Exh. Pet. SJW-4.8.

270. Vermont Gas offers a variety of programs and services that help customers convert their equipment to natural gas. The Company works closely with customers and local plumbing and heating contractors to help in the conversion to natural gas. Lyons 12/20/12 pf. at 8–9.

271. For those customers who decide to purchase a new heating system, the Company offers rebates, incentives (including low and no-cost financing), and services through its award-

winning energy efficiency program. This provides an incentive for customers to purchase energy efficient equipment. Lyons 12/20/12 pf. at 9.

272. We agree with VGS that its decision to reach an agreement with International Paper for future service also provides economic benefits to Vermont and VGS ratepayers. *See* findings 273–283, below.

273. The Facilities Development Agreement (FDA) entered into between VGS and IP will provide an economic benefit to Vermont. Three categories of Vermont Gas investments are required to provide natural gas service to IP. The first category relates to a portion of the facilities comprising this Project and is described as the “Addison Upgrade” in the FDA. The second category of investments will extend the natural gas facilities beyond what is required for the Addison Project. The investments will be used for service to IP and eventually Rutland. Those investments are referred to as the “Addison Extension” in the FDA. The third category of investments will be used to serve IP and are not necessary to serve Rutland or any other planned expansion in Vermont. Those are referred to as the “IP Lateral” in the FDA. The three categories of investments are collectively referred to as the “Additional Facilities.” Lyons 12/20/12 pf. at 13–14.

274. Because a portion of the transmission facilities necessary to serve Rutland will also support service to IP, IP will contribute towards the costs of this Project. Specifically, the FDA provides for recovery of 100% of the IP Lateral cost and 50% of the Addison Upgrade and Addison Extension cost. IP will pay for these facilities so Vermont customers will not have to. Lyons 12/20/12 pf. at 15.

275. The remaining costs will be recovered under the Service Agreement Transportation Charge (currently \$0.952/Mcf) when applied to the projected 2.5 Bcf/year consumption over the 27-year life of the agreement. Lyons 12/20/12 pf. at 15.

276. If gas service terminates before the end of the 27-year Service Agreement, then IP is responsible for 100% of the IP Lateral cost and at least 25% of the Addison Upgrade and Addison Extension cost, depending on when termination occurs. This pricing structure ensures that International Paper will be responsible for all costs associated with the IP Lateral and at a minimum, it will make a significant contribution towards the facilities needed to serve Rutland. Lyons 12/20/12 pf. at 15.

277. In such case where Additional Facilities are not completed, due to lack of permits (as an example) or significant increases in cost or significant delays in schedule (as provided for in Exhibit Petitioner TSL-10), Vermont Gas would be responsible for 100% of Addison Upgrade, IP would be responsible for 100% of the IP lateral costs, and the Addison Extension costs would be shared equally. Lyons 12/20/12 pf. at 15.

278. The FDA also provides that if International Paper cancels gas service for other reasons, it is responsible for 100% of all costs, subject to a cap based on IP's allocated costs if construction had been completed. These provisions ensure that Vermont customers do not incur costs related to the facilities that would serve only IP. In other words, in the event IP does not take gas service, then Vermont customers will be responsible for only those costs on facilities that are necessary for Addison and eventually Rutland. Lyons 12/20/12 pf. at 15–16.

279. It is appropriate to include facilities that are necessary for IP in this Project because it is a lower cost option for Vermont. By using 12-inch diameter pipeline at an incremental cost of approximately \$6.6 million, Vermont Gas will avoid \$46.75 million in future transmission expense⁶ that it would otherwise incur when it extends service further south. In other words, if Vermont Gas didn't construct the Project using 12-inch pipe, it would be a classic lost opportunity. While the Addison market could be adequately served using 10-inch diameter pipeline, doing so would require Vermont Gas to construct 25 more miles of 16-inch transmission system looping in order to serve future markets such as Rutland or IP. Simollardes 12/20/12 pf. at 7.

280. The Addison Upgrade and Addison Extension bring Vermont Gas transmission pipeline approximately 17 miles closer to Rutland and, because IP will be an interruptible customer, the Addison Upgrade and Addison Extension investments will result in design-day capacity and reliability benefits to Vermont Gas customers. Lyons 12/20/12 pf. at 14.

281. While IP is expected to pay for the incremental \$20 million cost associated with this upgrade, if for some reason expansion to IP does not occur, the Project would require between a 2.7% and 4.5% rate increase in 2015. Even in this scenario, the significant economic and environmental advantages of the Project outweigh the cost. Simollardes 12/20/12 pf. at 8.

⁶ Calculated as 25 miles of avoided transmission system looping at \$1.87 million per mile based on the cost per mile assumed in Docket No. 7929, Vermont Gas' current proceeding for Phase VI transmission system looping.

282. The expansion of natural gas to the Ticonderoga Mill will also reduce IP's energy cost, improving its economic strength in supporting 1,200 jobs in the region. It will support economic development in the region, including Vermont, which produces 20% of the wood used at the Mill. Therefore, the expansion not only supports the mill but also the regional economy. Lyons 12/20/12 pf. at 12.

283. In addition, and even more important to Vermont, the inclusion of the expansion to the Ticonderoga Mill will support the investment in additional natural gas infrastructure in Addison County which will make it possible for Vermont Gas to serve Rutland sooner. Lyons 12/20/12 pf. at 12.

Discussion

Pursuant to 30 V.S.A. § 248(b)(4), the Board must find that the proposed Project “will result in an economic benefit to the state and its residents” before issuing a certificate of public good. Construction of the Project will allow VGS to extend its service to new customers, providing them with access to a competitively-priced fuel which will strengthen the economic health of those customers and Vermont as a whole.

Section 248 does not require us to quantify exactly how much economic benefit the state would receive from the proposed project, but only determine that there will be some economic benefit.⁷ 30 V.S.A. § 248(b)(4) requires that we find a net economic benefit from a proposed project. It does not set a minimum amount or require that we be able to quantify benefits with any particular degree of specificity.⁸

The Project is expected to lower Addison County energy bills by over \$200 million over the next 20 years and provides additional significant direct and indirect benefits to Vermont. Even if IP does not take gas service, Vermont Gas customers will be responsible only for those costs to serve Addison County and eventually Rutland. Based on the evidence before us, we conclude that the proposed Project will create an economic benefit to the state and its residents.

⁷ Docket No. 7628 Page 36

⁸ *Id.*

10. Aesthetics, Historic Sites, Air and Water Purity, and the Natural Environment and Public Health and Safety [30 V.S.A. § 248(b)(5)]

284. The Project will not have an undue adverse effect on aesthetics, historic sites and air water purity, the use of natural resources, the natural environment, and the public health and safety. This finding is supported by findings 285 through 351 below, which give due consideration to the criteria specified in 10 V.S.A. §§ 1424a(d) and 6086(a)(1) through (8) and (9)(K), and greenhouse gas impacts.

a. Public Health and Safety [30 V.S.A. § 248(b)(5)]

285. The Project will not result in an undue adverse impact to public health or safety. *See* findings 286–317, below.

286. Pipeline construction, maintenance, and operation are subject to rigorous regulations. These stringent standards ensure that pipelines are constructed and operated in the safest way possible. Howe 6/28/13 pf. at 6.

287. Pipeline safety is established through the stringent federal regulations contained in the Pipeline Safety Code. This Code governs the construction and operation of all gas pipelines and includes standards designed to ensure the safe construction and operation of a pipeline system. Teixeira 12/20/12 pf. at 13; Heintz 12/20/12 pf. at 9–10.

288. The Pipeline Safety Code is administered by the Pipeline and Hazardous Materials Safety Administration (“PHMSA”) of the Department of Transportation (“DOT”). Teixeira 12/20/12 pf. at 12.

289. According to PHMSA, “[p]ipelines are by far the safest method for transporting energy products.” Exh. Pet. Reb. JBH-1.

290. The State of Vermont has also adopted the federal pipeline safety regulations, which are enforced through the Department of Public Service. Teixeira 12/20/12 pf. at 12–13.

291. Vermont Gas has agreed to adopt the additional safety measures recommended by the Department of Public Service. The design of the Project will exceed safety standards established by the Pipeline Safety Code in several important respects, including the following:

- The pipeline will be constructed to meet Class 3 design requirements in all areas along the pipeline;

- VGS will use a non-shielding cathodic protection coating on the pipeline and will use special coating on pipe used for trenchless installation to resist abrasions and other damage that could possibly occur during installation.
- VGS will have two types of over pressure protection at all Gate Stations
- VGS will install more valves along the Transmission Mainline than are required by the Pipeline Safety Code;
- VGS will install remotely operated shut off valves with SCADA control at mainline valves in a manner that exceeds the Pipeline Safety Code requirements;
- VGS will inspect welds via radiology (x-ray) before the pipeline becomes operational;
- All of the seams will be ultrasonically tested after cold expansion and mill hydrostatic testing; and
- VGS will use an appropriate in-line inspection device for identifying metal loss and irregular geometry, which will include out of round, dents, and other issues.

Berger pf. at 5; Berger reb. pf. at 2, 5; Teixeira 12/20/12 pf. at 15; tr. 9/17/13 at 226 (Teixeira).

292. The Project will also meet or exceed the standards set forth in the following:

- American Society of Mechanical Engineers (“ASME” B31.8 – Gas Transmission and Distribution Piping Systems;
- American Petroleum Institute (“API”) 5L, Specification for Line Pipe, product specification level 2 (*see* 49 C.F.R. § 192.7) for maximum operating pressures and minimum and maximum operating temperatures and other requirements;
- API Specification 6D, Specification for Pipeline Valves, 2008;
- American Society for Testing and Materials (“ASTM”) A53/A53M-07, Standard Specification for Pipe, Steel, Black and Hot Dipped, Zinc Coated, Welded and Seamless;
- ASTM D2513-99 Standard Specification for Thermoplastic Gas Pressure, Pipe, Tubing and Fittings; and

- MSS-SP-44-2006 Standard Practice, Manufactures Standardization Society – Steel Pipeline Flanges.

Teixeira 12/20/12 pf. at 13; Heintz 12/20/12 pf. at 9–10; Berger reb. pf. at 3.

293. The construction of the pipeline will be done under a quality assurance plan which addresses pipe inspection, hauling and stringing, field bending, welding, non-destructive examination of girth welds, applying and testing field applied coating, lowering of the pipeline into the ditch, padding and backfilling, and hydrostatic testing. Berger reb. pf. at 6.

294. Vermont Gas will have a quality assurance inspection and testing program for the pipe coating what will cover the surface quality of the bare pipe, surface cleanliness and chlorides, blast cleaning, application temperature control, adhesion, cathodic disbondment, moisture permeation, bending, coating thickness, holiday detection, and repair. Berger reb. pf. at 6.

295. Vermont Gas will have certification records for flanges, factory induction bends, and factory weld ells. Certification will address material properties such as chemistry, minimum yield strength, and minimum wall thickness to meet design conditions. If the carbon equivalents of flanges, bends, and ells are greater than 0.42% by weight, the qualified welding procedures will include a pre-heat procedure. Berger reb. pf. at 6.

296. Vermont Gas will employ at least 36 inches of cover or equivalent means to protect the pipeline from outside force damage. In areas where deep tilling or other activities could threaten the pipeline, the top of the pipeline must be installed at least one foot below the deepest expected penetration of the soil. Berger reb. pf. at 7.

297. In agricultural areas, Vermont Gas will install the pipe with a minimum of 4 feet of cover. Berger reb. pf. at 7.

298. With respect to initial strength testing (post-construction hydrostatic pressure testing), Vermont Gas will exceed Pipeline Safety Code requirements. Berger reb. pf. at 7.

299. Vermont Gas will only use suitable backfill material that will not shield the cathodic protection system or cause coating damage to the pipeline. Berger reb. pf. at 8.

300. Vermont Gas will install temporary odorant facilities at the Colchester Tie-In and at each Gate Station, adding additional odorant during pipeline purging and shut in for 24 hours to soak into new steel and other material. VGS will test for the presence of sufficient odorant at locations at the ends of the pipeline and distribution systems within the new service territories

monthly for the first year of operation. If sufficient odorant is not present, VGS will temporarily add extra odorant. Berger reb. pf. at 8–9.

301. Vermont Gas will patrol the right-of-way at intervals not exceeding approximately 135 days, but at least 4 times each calendar year, to inspect for excavation activities, ground movement, wash outs, leakage, or other activities or conditions affecting the safe operation of the pipeline. Berger reb. pf. at 9.

302. VGS will also develop and implement a plan to monitor for and mitigate occurrence of unstable soil and ground movement and if observed conditions indicate the possible loss of cover, perform a depth of cover study, and replace cover as necessary to restore the depth of cover or apply alternative means to provide protection equivalent to the originally-required depth of cover for both transmission and distribution pipes. Berger reb. pf. at 9.

303. Vermont Gas will also employ additional ROW protection measures, such as using line-of-sight line markers, reviewing the damage prevention program under 49 C.F.R. § 192.614(a), identifying standards and practices considered in the review, and meeting or exceeding those standards or practices by incorporating appropriate changes into the program. VGS will also develop and implement a right-of-way management plan to protect the pipeline segment from damage due to excavation activities. Berger reb. pf. at 9.

304. VGS will install line markers to mark the locations of the Project pipeline and provide contact information, which will help prevent third party damage or “dig-ins.” VGS is also a member of “Dig Safe,” a program that provides member companies notification when a party is excavating in the vicinity. Teixeira 12/20/12 pf. at 17.

305. VGS developed its Transmission Integrity Management Plan (“IMP”) based on requirements for Pipeline Operators introduced in the Pipeline Safety Improvement Act of 2002. Pipeline Integrity Management regulations pertain to High Consequence Areas (“HCAs”), which the Code defines as an area where a pipeline failure could have a greater impact on public health and safety. If the pipe is located in a Class 3 or Class 4 location, it is considered an HCA. Teixeira 12/20/12 pf. at 17; tr. 9/16/13 at 278 (Howe).

306. The Code requires more stringent integrity programs when a pipeline is located in an HCA, which include regular assessments of the physical condition of the pipeline segment. VGS collects, integrates, and analyzes pipeline data for the entire pipeline, not just the HCAs.

The IMP is regularly and periodically evaluated to identify where improvements may be applied to improve the safety and integrity of the transmission system. Teixeira 12/20/12 pf. at 17.

307. Under the Pipeline Safety Code, VGS must assess the condition of pipeline located in HCAs every seven years. VGS plans to assess the entire Project, not just the HCA areas, every seven years. Teixeira 12/20/12 pf. at 20.

308. VGS developed and implemented a Distribution Management Plan (“DIMP”) in accordance with PHMSA’s final rules establishing integrity management requirements for gas distribution pipeline systems. VGS’ DIMP gathers existing distribution system information to demonstrate that Vermont Gas has a thorough understanding of its system and with that information can identify potential threats that may impact the integrity of the system. Teixeira 12/20/12 pf. at 17–18.

309. The DIMP goes through regular, periodic evaluation to identify where improvements may be applied to improve the safety and integrity of the distribution system. Teixeira 12/20/12 pf. at 19.

310. VGS will hire additional operations personnel and will continue to utilize its Public Awareness Program, which provides natural gas safety information to the general public, emergency responders, public officials, and excavators of the presence of the gas pipelines and the significance of the pipeline to the community. Teixeira 12/20/12 pf. at 20–22.

311. VGS pipelines currently co-exist with other property uses throughout the state, including residential neighborhoods. Tr. 9/16/13 at 151–52 (Simollardes).

312. VGS employs on-going routine safety monitoring and maintenance of its pipeline system, including regular patrol of its pipelines using aircrafts and road and walking surveys along the route. VGS also conducts regular assessments of the pipeline’s corrosion protection system and condition of the pipes’ coating. It uses highly sensitive instrumentation to detect the presence of methane. Teixeira 12/20/12 pf. at 19.

313. ACRPC had requested that VGS be required to provide local first responders with non-spark tools and meters. We agree with the DPS’ safety expert and with VGS that only trained experts and professionals should be responding to shut of valves or read meters. Under the Pipeline Safety Code this requires that personnel be operator qualified. Tr. 9/17/13 at 14 (Berger).

314. This level of expertise is something that is best left to the VGS experts. Tr. 9/17/13 at 15–20 (Berger).

315. Several parties recommended that the pipeline be designed to meet a setback distance of 300 feet or more, based upon the potential impact radius. Palmer pf. at 47–48.

316. A setback of 300 feet throughout the Project is not feasible or appropriate. Setbacks are not utilized under the Pipeline Safety Code or implemented in other parts of the country. Tr. 9/17/13 at 67 (Heintz); tr. 9/16/13 at 282–83, 285 (Howe).

317. Pipeline safety is ensured through compliance with design standards and regulations, not setbacks. Howe 6/28/13 at 6; tr. 9/16/13 at 282–83 (Howe).

Discussion

Pursuant to 30 V.S.A. § 248(b)(5), the Board must find that the Project “will not have an undue adverse effect” on public health and safety before issuing a certificate of public good. 30 V.S.A. § 248(b)(5). The evidence presented in this docket leads us to conclude that there will be no undue health or safety effects as a result of the Project.

We recognize that there are potential risks associated with the installation and operation of a natural gas pipeline. However, we must consider these potential risks relative to the risks that individuals face daily in a technological society. As this Board held in *Northwest Reliability Project*, Docket No. 6860, “[e]very-day activities such as walking across a street or simply driving a car present health risks.” *Northwest Reliability Project*, Docket No. 6860 (1/28/2005) at 73. Further, pipelines are the safest method to transport energy products. When comparing the potential safety risks associated with a natural gas pipeline to those of current fuel delivery systems, like the transportation of fuel oil and propane in trucks on our roadways, this Project represents a safer alternative for the delivery of energy resources.

Moreover, we are assured by the fact that the Project complies with, and in many circumstances surpasses, applicable safety codes. As evidenced throughout the testimony, the Project will be built to meet or exceed the federal Pipeline Safety Code, as well as all applicable safety standards set forth by various third party organizations. The Project’s demonstrated

commitment to these design, construction, operation, and maintenance standards ensure there will be no undue adverse impact on safety.⁹

Specifically, with respect to the concerns raised by parties regarding the Project's distance from residential homes, we do not find it necessary or reasonable to adopt a required setback. In *Petition of Georgia Mountain Community Wind, LLC*, this Board held that the certification process in place for wind turbines and the particular protocols implemented during ice conditions were sufficient to obviate the need for substantial setbacks from the proposed wind project.¹⁰

Similarly here, we find that the fact that the Project complies with, and exceeds, the rigorous state and federal standards governing pipelines will minimize any potential risks associated with pipeline construction and operation. Vermont Gas has provided ample evidence and assurance that its design meets or exceeds all applicable federal and state standards and that it will implement robust operational and monitoring controls. Further, particular setbacks, like the one requested in the Memorandum of Understanding with the Town of Monkton are not feasible in the Project design and other necessary design considerations.

b. Outstanding Resource Waters [10 V.S.A. § 1414a(d) & 30 V.S.A. § 248(b)(8)]

318. There are no waters in the Project vicinity that have been designated as outstanding resource waters, and therefore, the Project will not result in an undue adverse impact under this criterion. Nelson 12/20/12 pf. at 10; Nelson 2/28/13 pf. at 13; exh. Pet. Supp. JAN-2 (2/28/13).

c. Air Pollution [10 V.S.A. § 6086(a)(1)]

319. The Project will not cause undue air pollution and noise. This finding is supported by findings 320 through 351, below.

⁹ See *Joint Petition of Central Vermont Public Service and Vermont Electric Power Company, Inc.*, Docket No. 6832 (2/4/2004) at 17 (finding that the proposed project will have no adverse effect on public safety because the project will be constructed consistently with "sound engineering and construction practices and in compliance with all safety and health standards"); see also *Vermont Electric Power Company, Inc.*, Docket No. 7452 (11/21/2008) (finding that the proposed project will not have an undue adverse impact on safety because the project was designed according to the applicable National Electric Safety Code requirements).

¹⁰ *Petition of Georgia Mountain Community Wind, LLC*, Docket No. 7508, Order of 6/11/10 at 7.

320. Based on the natural resources reports and impact assessments conducted by VGS consultant, VHB, the Project will not have an undue adverse effect on air purity. Nelson 2/28/13 pf. at 13.

321. During construction, small amounts of water usage may be used for dust suppression, in accordance with the EPSC Plan. Nelson 2/28/13 pf. at 19.

d. Greenhouse Gases [30 V.S.A. § 248(b)(5)]

322. The Project will not have an undue adverse effect on air purity, with due consideration having been given to greenhouse gas (“GHG”) impacts. This finding is supported by findings 323 through 342 below.

323. VGS, DPS and CLF witnesses all provided analyses and calculations that showed that the Project is expected to reduce greenhouse gas emissions. Tr. 9/19/13 at 105 (Poor); Poor pf. at 9; tr. 9/20/13 at 99 (Stanton); Bluestein 6/28/13 pf. at 3; exh. Pet. Reb. JB-2 at 2.

324. According to the Environmental Information Administration, natural gas at the point of combustion (i.e. the “burner tip”), produces less carbon dioxide equivalent emissions than oil or propane. Poor pf. at 9.¹¹

325. In addition, as mentioned above, new appliances that burn natural gas can be more efficient than new appliances that burn fuel oil or propane, and new heating equipment purchased to convert to natural gas will in most cases be more efficient than the older equipment it is replacing. Thus, any conversion from fuel oil or propane to natural gas will reduce greenhouse gas emissions at the burner tip—within the state. Poor pf. at 9.

326. VGS submitted a lifecycle analysis prepared by ICF International. ICF has been a leader in life-cycle analysis for many years and in particular in the analysis of methane emissions from the natural gas industry. ICF helped to develop the methodology for the U.S. EPA inventory of methane emissions from the natural gas sector and has developed the actual estimates for most of the years that the inventory has been produced. ICF also assisted the U.S. EPA in developing the reporting requirements for the EPA Greenhouse Gas Reporting Program. Bluestein 6/28/13 pf. at 2.

¹¹ Citing U.S. Energy Information Admin., Carbon Dioxide Emissions Coefficients.

327. Richard Sweetster, an expert offering testimony in this proceeding on behalf of the Vermont Fuel Dealers Association, relied upon two ICF reports for his testimony, and confirmed that ICF International is a credible research organization. Exh. Pet. Cross VFDA-12.

328. ICF's analysis determined that the life-cycle GHG emissions of CO₂ and methane from natural gas are 18% lower than for heating oil at the burner tip and 23% lower including the higher efficiency of a new natural gas furnace or boiler. Based on this differential, the Addison Natural Gas Project would reduce GHG emissions from oil-using customers by 13,901 short tons per year, and this would increase as the market penetration of natural gas grows. Bluestein 6/28/13 pf. at 3; exhs. Pet. Reb. JB-2, JB-3.

329. While agreeing with the conclusion that conversion of oil-using customers would result in a reduction in net life cycle emissions, CLF criticized the ICF analysis on a number of grounds, including an allegation that the analysis was based upon the U.S. EPA GHG Inventory emissions data. However, the major source of data used by ICF was based on a study prepared in 2012 by the U.S. Department of Energy, National Energy Technology Laboratory ("NETL") report on GHG emissions from oil and gas production, which ICF used because it is very detailed and is based upon data from a number of credible sources. Tr. 9/20/13 at 73 (Bluestein); Bluestein 6/28/13 pf. at 5; exh. Pet. Reb. JB-8.

330. The NETL study provides estimates of methane and carbon dioxide emissions for each segment of the gas production, processing and transmission chain. This allowed ICF to modify certain steps to customize the analysis for VGS. The three primary changes were related to shale gas completions and workovers due to recent emission regulations, emissions from pipeline operations, and emissions from local distribution companies. Bluestein 6/28/13 pf. at 5.

331. ICF's analysis is conservative for a number of reasons, including:

- Although studies indicate that venting is not a common practice in western Canada, ICF's life cycle analysis ("LCA") assumed that 25% of wells are vented. Bluestein 6/28/13 pf. at 5–6.
- ICF used a 0.3% leakage factor for delivery by VGS. This was based upon the U.S. average for distribution in the U.S. EPA 2013 Inventory. This is conservative because the highest-emitting systems are those with cast iron piping, whereas VGS does not have cast iron piping. The VGS gas distribution system is

a modern system with lower leakage than larger, older systems in the U.S.
Bluestein 6/28/13 pf. at 5–6.

- The study did not include higher emissions from oil production in the North Dakota Bakken shale. Exh. Pet. Reb. JB-2 at 7.

332. ICF supported the belief that its analysis overstated fugitive emissions from Canadian production. Based upon GHG reporting data provided by Canada and the Province of Alberta, where 70% of the VGS gas is sourced from, on a per BTU basis Canadian emissions are about 30% lower than emissions from U.S. natural gas production. Tr. 9/20/13 at 74–75 (Bluestein).

333. ICF’s assumed transmission pipeline emissions from Western Canada were the major driver for the upstream GHG emissions calculated by ICF, which make the GHG emissions of the Canadian gas almost twice as high as for gas sourced from the Northeastern U.S. Bluestein 6/28/13 pf. at 6.

334. The NETL baseline for pipeline emissions was 972 kilometers, roughly the distance from the Marcellus formation to Vermont. The Western Canadian resource is roughly four times farther away than the Marcellus resource and the transmission emissions were scaled linearly based on the distance. Bluestein 6/28/13 pf. at 6.

335. Approximately 85% of the gas delivered by VGS comes from Western Canada and 15% comes from the Northeastern U.S. If more of the gas were sourced from the Northeastern U.S., the weighted GHG emissions would be significantly lower. Bluestein 6/28/13 pf. at 6; exh. Pet. Reb. JB-2 at 7.

336. Throughout the proceedings, CLF cautioned that the uncertainty surrounding the exact magnitude of methane emissions from natural gas systems should give this Board pause to approve the Project before us. We disagree. There is almost always some uncertainty in science. Some suggest that there is uncertainty over human impacts on climate change that we should not address climate change. The fact that there is uncertainty does not mean that we should fail to take any action. Tr. 9/20/13 at 60 (Bluestein).

337. Environmental policy for other air pollutants, such as nitrogen oxide (“NO_x”) from combustion and hydrocarbons from various sources that are precursors to ground level ozone and smog, is not developed based upon direct measurements of the exhaust emitted from

every vehicle, every gas station, or every dry cleaner. It is based upon a variety of estimates and models. The same is true for GHG emissions. Tr. 9/20/13 at 60–61 (Bluestein).

338. The World Resources Institute recently published a work paper entitled: “Clearing the Air: Reducing Upstream Greenhouse Gases Emissions from U.S. Natural Gas Systems” (the “WRI Report”) that calculated two annual leakage rates for U.S. natural gas systems in 2010: 2.27% using 2012 EPA GHG Inventory data and 1.54% using 2013 draft inventory data. WRI estimates that new regulations under the New Source Performance Standards (“NSPS”) for so-called “green completions” will reduce methane emissions from the flow-back stage of all hydraulic fracturing operations, and are expected to reduce methane emissions enough to reduce all upstream GHG from shale gas operations by 30% beginning in 2013, and by 46% by 2035. Exh. CLF EAS-6 at 15, 23–24.

339. One of the key findings of the WRI report is that cutting the methane leakage rate from natural gas systems to less than 1% can be achieved through the widespread use of proven, cost-effective technologies. Exh. CLF EAS-6 at 5.

340. CLF’s concerns about the level of uncertainty in GHG emissions from natural gas systems are unpersuasive. Specifically, Dr. Stanton relied on a statement in an Office of Inspector General (“OIG”) February 2013 report that addressed data gaps in the EPA’s National Emissions Inventory (“NEI”) for criteria and toxic pollutants. The NEI is an entirely different inventory than the GHG Inventory and as such has no bearing on the GHG Inventory data. Exh. Pet. CLF Cross-33 at 3–4, 19–20; tr. 9/20/13 at 115–17 (Stanton).

341. WRI relied upon the EPA GHG Inventory data for its analyses, because the EPA methodologies for estimating emissions are developed through transparent processes that include expert reviews and public input, and due to the Inventory’s continual refinement over decades of peer review. WRI considers EPA data to be more reliable and comprehensive than other data sources. Exh. CLF EAS-6 at 22, 43.

342. A recently-released study sponsored by Environmental Defense Fund directly measured methane emissions from natural gas production and compared their results to the EPA data. The study reported that their direct measurement data for methane emissions from natural gas production is largely in line with EPA GHG Inventory data. Tr. 9/20/13 at 65–66 (Bluestein); exh. Pet. Surr. JLB-1.

e. **Noise [10 V.S.A. § 6086(a)(1)]**

343. During construction, the Project will produce general construction noise associated with construction vehicles and equipment. Heintz 2/28/13 pf. at 38.

344. Construction operation hours for normal pipeline operations will be limited to 7 a.m. to 7:00 p.m. Heintz 2/28/13 pf. at 19; tr. 9/17/13 at 89 (Heintz).

345. If the Board were to further limit hours of construction near residences, this would increase the cost of the Project because equipment and labor are paid in the industry on a daily, 12 x 12 rate. On a daily basis where hours were limited to 8:00 a.m. to 5:00 p.m. instead of 7:00 a.m. to 7:00 p.m., this would increase costs by 30%. Tr. 9/17/13 at 93–94 (Heintz).

346. Due to the large number of horizontal direction drills (“HDD”) associated with the Project, HDD may require operating for 24 hours to effectively complete the drills. Tr. 9/17/13 at 90 (Heintz).

347. The noise associated with HDD is comparable to a typical agricultural piece of equipment operating in a field. Tr. 9/17/13 at 92 (Heintz).

348. Blasting operations will be limited to 9:00 a.m. to 4:30 p.m., Monday through Friday. Tr. 9/17/13 at 88 (Heintz); exh. Monkton SP-2 at 5 (MOU between Town of Monkton and VGS (6/12/13)).

349. After construction, the Project pipelines will not generate any additional noise. Heintz 2/28/13 pf. at 38.

350. The sectionalizing valves also will not result in any additional noise. Heintz 2/28/13 pf. at 39.

351. During the peak hours of operation, the selected heater system for the Gate Stations will emit a noise level of approximately 50 dBA when measured at the fence line. The closest occupied structure to a Gate Station, which was relocated at the request of the community, is a bookstore in Middlebury that is approximately 150 feet from the Gate Station. At this distance, the noise is projected to drop well below the 45 dBA for nighttime and 55 dBA daytime noise levels at the nearest occupied structure required in other Board proceedings. Heintz 2/28/13 pf. at 39.

Discussion

It is standard practice for commercial construction hours to be based upon a twelve hour work day. Consistent with this, “nighttime,” for purposes of the Act 250 noise criterion (air

pollution), is defined as the period between 7:00 p.m. and 7:00 a.m.¹² Having more restrictive hours would result in a productivity loss to the contractor, resulting in increased Projects costs which would be passed on to Vermont Gas customers. It would also limit the contractor's ability to meet the proposed Project schedule and compromise VGS' ability to get gas service to the Middlebury Industrial Park by 2014.

In addition, there are no conditions that warrant the construction restrictions. In order to rise to the level of "undue" noise pollution, the construction noise would have to generate 'impacts rising above annoyance and aggravation to cause adverse health effect such as hearing damage.'"¹³ There is nothing to suggest that the noise associated with construction of the Project would rise above annoyance and aggravation to cause health effects.

Importantly, many large energy projects have been authorized to proceed with either no construction limits, or have been authorized to proceed with a twelve-hour construction day, even where construction was to occur in residential or densely populated areas.¹⁴ The *Southern Loop Project* involved substantial construction activities for one of the state's largest electric transmission upgrades, including the construction of over 52 miles of new 345 kV and 115 kV high voltage electric transmission lines with over 400 new supporting structures, and two new substations, spanning many communities.¹⁵ Despite the large-scale construction required for the project, the Board did not limit the hours of construction.¹⁶

¹² *Re: Hannaford Bros. Co. and Southland Enterprises*, Docket #791, #4C0238-5-EB, Findings of Fact, Conclusions of Law, and Order (Altered) (November 27, 2002).

¹³ *Re. Maclean Enterprises Corp.* #2S1147-1-EB, Findings of Fact, Conclusions of Law, and Order (November 24, 2004); citing *Re: Bull's Eye Sporting Center* #5W0743-2-EB, Findings of Fact, Conclusions of Law, and Order (Feb. 27, 1997).

¹⁴ *See, e.g., Joint Petition of Vermont Elec. Power Co., Inc. and Vermont Transco LLC and Central Vermont Pub. Serv. Corp.*, Docket No. 7763, Order of 8/17/12 at 39-40, 93 ("*Bennington Substation Project*"); *Joint Petition of Vermont Transco LLC, Vermont, Elec. Power C., Inc., and Central Vermont Pub. Serv. Corp.*, Docket No. 7751, Order of 4/6/12 at 44,45 ("*Ascutney Substation Project*"); *Petition of Central Vermont Pub. Serv. Corp. and Joint Petition of Central Vermont Pub. Serv. Corp. and Vermont Elec. Power Co., Inc., and Vermont Transco LLC*, Dockets 7596 and 7597, Order of 8/20/2010 at 29, 66 ("*Middlebury Projects*"); *Joint Petition of Vermont Elec. Power Co., Inc., Vermont Transco LLC, and Green Mtn. Power Corp.*, Docket No. 7460, Order of 11/23/09 at 32 ("*Gorge Project*"); *Joint Petition of Vermont Elec. Power Co., Inc., Vermont Transco LLC, and Central Vermont Pub. Service Corp.*, Docket 7373, Order of 2/11/09 ("*Southern Loop*"); *Joint Petition of Vermont Transco, LLC, Vermont Elec. Power Co., Inc., City of Burlington Elec. Dept. ("BED") and Green Mtn. Power Corp.*, Docket No. 7314, Order of 5/29/08 at 45 ("*East Avenue Loop Project*").

¹⁵ *Southern Loop Project*, Order of 2/11/09 at 99.

¹⁶ *See id.*

The *Ascutney Substation Project* directly abutted a residential neighborhood, the Tenney Hill neighborhood.¹⁷ Nevertheless, we did not impose any limitations on construction times.¹⁸ The *Kingdom Wind Project* was not conditioned to limit hours of construction, except with respect to blasting.¹⁹

We have frequently allowed a twelve hour workday. In the *East Avenue Loop Project*, for example, we allowed a 7:00 a.m. to 7:00 p.m. construction day. Notably, *East Avenue Loop* involved construction of 115 kV transmission lines in dense residential neighborhoods in and around Burlington, South Burlington and Winooski, including the construction of a 115 kV substation upgrade and new 115 kV transmission lines directly adjacent to the Queen City Park residential neighborhood in South Burlington.²⁰

In the *Gorge Area Reinforcement Project*, we allowed construction to take place between 7:00 a.m. and 7:00 p.m. “so as to not impact residential and commercial areas.”²¹

In the *Bennington Substation Project*, we authorized construction from 6:00 a.m. to 6 p.m., finding persuasive VELCO’s position that a greater restriction would be very restrictive.²²

In *Salisbury Hydro*, we permitted construction during “daylight hours” and non-holiday weekends, but limited blasting to 9:00 a.m. to 5:00 p.m., Monday through Friday, thus making clear that the restriction of general construction to “daylight hours” necessarily means a longer time frame.²³

Based upon the facts presented and this precedent, we will authorize VGS to construct²⁴ the Project between 7:00 a.m. to 7:00 p.m., Monday through Friday, and Saturday 8:00 a.m. to 5:00 p.m., with hours of blasting limited to 9 a.m. to 4:30 p.m., Monday through Friday.

¹⁷ *Ascutney Substation Project*, Order of 4/6/12 at 20.

¹⁸ *See id.*

¹⁹ *See Joint Petition of Green Mountain Power Corp., Vermont Electric Cooperative, Inc., and Vermont Electric Power Co., Inc.*, Docket No. 7628, Order of 5/31/11 at 177 (“*Kingdom Wind Project*”).

²⁰ *East Avenue Loop Project*, Docket No. 7314, Order of 5/29/08.

²¹ *Gorge Project*, Docket No. 7460, Order of 11/23/09 at 32.

²² *Bennington Substation Project*, Order of 8/17/12 at 39

²³ *Salisbury Hydro*, Order of 11/23/11 at 2.

²⁴ For purposes of all day and time restrictions set forth in this Order, the terms “construct” or “construction” shall mean activities requiring the use of Heavy Construction Equipment. Activities that do not include Heavy Construction Equipment but require the use of equipment that is utilized in a support function (pickup, trailer, bobcat mini-excavator, etc.) for maintenance and EPSC work (e.g. Erosion, Prevention and Sediment Control review and maintenance, seeding and mulching, survey and layout) are not “construction” activities for purposes of the day and time limitations imposed herein.

Construction will not be allowed on Sundays or Federal or State Holidays except as required to continue an HDD.

Where VGS is conducting an HDD, VGS will be allowed to continue the drill beyond these hours and up to 24 hours per day, including weekends and holidays, as necessary to complete a drill. Where VGS is working in close proximity to residences, consideration in planning and executing the construction work shall attempt to minimize the overall duration of the impact on the residences.

f. Water Pollution [10 V.S.A. § 6086(a)(1)]

352. The Project will not cause undue water pollution. This finding is supported by findings 353 through 423, below.

g. Headwaters [10 V.S.A. § 6086(a)(1)(A)]

353. The Project will not have an undue adverse impact on headwaters. This finding is supported by finding 354, below.

354. Portions of the Project meet one or two of the headwaters criteria, as described in Section 5.0 of the Natural Resources Report, Exhibit Petitioner Supp. JAN-2 (2/28/13). In these areas the Project's design must conform to applicable regulations including Vermont Department of Environment Conservation ("DEC") rules and the 2011 VWQS. Nelson 2/28/13 pf. at 14–15.

h. Waste Disposal [10 V.S.A. § 6086(a)(1)(B)]

355. The Project will meet applicable health and environmental conservation department regulations regarding the disposal of waste, and will not involve the injection of waste materials into groundwater or wells. This finding is supported by findings 356 through 369, below.

356. With regards to the Project's permitting for construction stormwater discharges associated with the Project, the Project has applied for an Individual Discharge Permit concurrently with this Section 248 permit. Nelson 2/28/13 pf. at 15; Calvi pf. at 3.

357. The overall design of the Project minimizes the construction of new impervious surfaces, protects natural drainage patterns, and maximizes infiltration of stormwater in order to protect water quality of receiving waters. Nelson 2/28/13 pf. at 18.

358. The Project's operational phase will not result in the creation of new, redeveloped, or expanded impervious surface that triggers the need for permit coverage pursuant to 10 V.S.A. § 1264. Nelson 2/28/13 pf. at 15.

359. The Project will result in the creation of less than one acre of new, expanded, or developed impervious surface. The total amount of increased impervious surfaces associated with the Project does not rise to the level to trigger the need for an operational phase stormwater discharge permit. Nelson 2/28/13 pf. at 17.

360. The majority of the Project involves the installation of underground infrastructure with restoration of the ground surface to pre-construction contours with permanent vegetative cover, and these components do not result in the creation of any new impervious surfaces. Nelson 2/28/13 pf. at 17.

361. There will be no new impervious surface associated with the six proposed valve sites. Nelson 2/28/13 pf. at 17.

362. Permanent impervious surfaces that will be generated by the Project include infrastructure at the Colchester Tie-In and at the three Gate Stations. At each Gate Station, the new impervious area will be 544 square feet (0.01 acres), resulting in a Project total of 1,632 square feet (0.04 acres). Nelson 2/28/13 pf. at 17; exh. Pet. Supp. JAN-9 (6/28/13).

363. Within each Gate Station enclosure, infrastructure will be situated upon a pervious 12-inch thick minimum crushed stone surface underlain by a geosynthetic material. The access roads and parking areas for the Gate Stations and pull-offs for the valve sites will be constructed of stabilized pervious surfaces to maximize infiltration and reduce the runoff of rainfall and snowmelt. Nelson 2/28/13 pf. at 17–18; exh. Pet. Supp. JAN-9 (6/28/13).

364. The Project will require a construction phase stormwater discharge permit. Stormwater runoff management during construction is regulated under the National Pollutant Discharge Elimination System ("NPDES") Construction Stormwater Discharge program, which is administered by the DEC. VGS filed an Individual NPDES Construction Stormwater Discharge Permit Application on December 20, 2012, and supplemented this application on May 3, 2013. Nelson 2/28/13 pf. at 15; Nelson 6/28/13 pf. at 4.

365. The Project will incorporate DEC's Best Management Practices ("BMPs") to protect water quality during construction, by implementing a comprehensive Erosion Prevention and Sediment Control ("EPSC") Plan. Nelson 2/28/13 pf. at 15.

366. With the incorporation of the BMPs and adherence to the approved EPSC plan as part of the Project's Individual Discharge authorization, the Project will meet the applicable DEC regulations regarding any impacts on the quality of ground or surface waters in a headwaters area. Nelson 2/28/13 pf. at 16; Calvi reb.pf. at 5.

367. During construction, water will be used for pressure testing of pipeline segments. The disposal of this water will be governed by the construction phase EPSC plan, which requires the implementation of BMPs at the proposed dewatering site in Colchester, such as stacked hay bale dike structures and filter fabric, which allow for dispersal and infiltration of flows to prevent erosive conditions. Nelson 12/20/12 pf. at 13; Nelson 2/28/13 pf. at 16–17; exh. Pet. Supp. JAN-9 (6/28/13).

368. With respect to sanitary wastewater, portable toilets will be used on site during construction of the Project and will be serviced by a licensed septic hauler. Nelson 12/20/12 pf. at 13; Nelson 2/28/13 pf. at 16.

369. Once the Project is operational, no sanitary facilities will be required. Nelson 12/20/12 pf. at 13; Nelson 2/28/13 pf. at 16.

i. **Water Conservation and Sufficiency of Water and Burden on Existing Water Supply [10 V.S.A. § 6086(a)(1)(C), (a)(2) and (a)(3)]**

370. The Project design considers water conservation and the Project will not cause an unreasonable burden on an existing water supply. This finding is supported by findings 371 through 378, below.

371. The Project involves temporary and very limited water usage. Nelson 2/28/13 pf. at 19.

372. During construction, small amounts of water usage may be necessary for dust suppression, in accordance with the EPSC Plan, as well as for pressure testing of the pipeline. Nelson 2/28/13 pf. at 19.

373. The construction water needs for dust control will be supplied by Project contractors from approved sources. Water needs for the hydrostatic testing of the Transmission Mainline, at the completion of construction, can be provided by the Colchester Fire District #3. Therefore, there will be sufficient water available for the temporary needs of the Project. Nelson 2/28/13 pf. at 31.

374. Once operational, there will be no ongoing water use associated with the Project. Nelson 2/28/13 pf. at 19; Nelson 2/28/13 pf. at 31.

375. Sufficient water will be available for the Project. Nelson 2/28/13 pf. at 31.

376. The Project is not expected to cause any burden to existing water supplies. Where blasting is required, the blasting will be conducted in a manner that conforms with industry standards and practices and follow the Blasting Plan, as described in Exhibit Petitioner Supp. JH-17 (6/28/13) as well as the Best Management Practices for Blasting to Avoid Environmental Contamination (The Blasting BMPs) (Attachment 2 to Exh. Pet. VGS-ANR-Joint-1). The Blasting Plan is intended to ensure that explosives are properly managed to avoid off-site blast impacts to existing water supplies. Nelson 2/28/13 pf. at 31.

377. The Project will cross through several designated source protection areas (“SPAs”) for public water supplies or in the vicinity of public water supplies, including four water systems using groundwater sources and one water system using a surface water source. The Project will also pass by various existing private water supplies, including drilled bedrock wells. Nelson 2/28/13 pf. at 31–32.

378. The Project has sufficient water available for its needs and will not cause an unreasonable burden on existing water supplies. Nelson 2/28/13 pf. at 32; Nelson 6/28/13 pf. at 11.

j. Floodways [10 V.S.A. § 6086(a)(1)(D)]

379. The Project will not restrict or divert the flow of floodwaters or increase the peak discharge of the streams and endanger the health, safety, and welfare of the public or of riparian owners during flooding. This finding is supported by findings 380 through 388, below.

380. The 6/28/13 Alignment includes 21 crossings of streams/rivers with greater than 1.0 square miles watershed area. Fourteen of these are unchanged from the 2/28/13 Alignment. For the 7 which have been revised, supplemental analyses are presented in Exhibit Petitioner Supp. JAN-7 (6/28/13). Nelson 6/28/13 pf. at 5.

381. To evaluate the floodway criterion, both flooding due to inundation and flooding due to the lateral migration of stream and river channels over time, known as “fluvial erosion,” must be examined. Nelson 2/28/13 pf. at 20.

382. To assess inundation flooding, VHB used available Federal Emergency Management Agency (“FEMA”) Flood Insurance Rate Maps to determine the locations of FEMA-mapped floodways within the Project area. Nelson 2/28/13 pf. at 20.

383. Fluvial erosion hazards (“FEH”) zones have been identified by ANR for certain streams and rivers. FEH zones have been established by DEC for most perennial streams and rivers within the project area. The FEH area is the lateral width of a stream corridor that may be subject to fluvial erosion from stream channel lateral migration over time. Nelson 2/28/13 pf. at 20.

384. All floodways, floodway fringes, or FEH zones that will be crossed by the Project’s alignment are depicted within the Natural Resources Report (*see* Exh. Pet. Supp. JAN-2, Section 6.0 (2/28/13)). Construction impacts, however, have been avoided through the use of HDD where feasible. Nelson 2/28/13 pf. at 20.

385. Additionally, there are no anticipated permanent alterations to waterways, flood elevations, or the ability of the land to hold water. Underground infrastructure within floodways or floodway fringes will include buoyancy compensation to provide additional weight to prevent the pipe from migrating upwards. Nelson 2/28/13 pf. at 20–21.

386. The FEMA maps for the Project components are contained in Exhibit Petitioner Supp. JAN-2 (2/28/13). Gate Stations and other ancillary facilities associated with the Project are located outside of FEMA Zone A designated areas and, thus, these facilities will not impact floodways or floodway fringes. Nelson 2/28/13 pf. at 21.

387. At the request of ANR, VHB evaluated locations or stream segments at which the proposed transmission line is adjacent to streams/rivers, but does not actually cross the water body. The analyses indicated that the Project has been designed in a way that avoids the pipeline being located within FEH zones, except where there are necessary stream/river crossings, which were previously described. Nelson 6/28/13 pf. at 5–6.

388. The Project will not permanently restrict or divert the flow of flood waters, or endanger the health, safety, and welfare of the public or of riparian owners during flooding. Additionally, the Project work within a floodway fringe will not increase the peak discharge of the river or stream within or downstream of the Project area or endanger the health, safety, or welfare of the public or riparian owners during flooding. Nelson 2/28/13 pf. at 21; Nelson 6/28/13 pf. at 6.

k. Streams [10 V.S.A. § 6086(a)(1)(E)]

389. The Project will maintain the natural condition of involved streams and will not endanger the health, safety, or welfare of the public or adjoining landowners. This finding is supported by findings 390 through 406, below.

390. Portions of the Project will necessitate location in the vicinity of streams, however, the natural condition of the streams will be maintained. Nelson 2/28/13 pf. at 21.

391. The Project is located within the Champlain Valley, and Project lands are within the Otter Creek, Upper Lake Champlain, and Winooski River ANR River Basins (Basins 3, 5, and 8, respectively). Within the Project area, all delineated streams and rivers are Class B waters as designated pursuant to the 2011 VWQS. Nelson 2/28/13 pf. at 22.

392. The Project will involve buried pipeline crossings (either through the use of HDD or open-cut trenching, as presented in Exhibit Petitioner Supp. JAN-7 (2/28/13)) of the following waters that would ordinarily be under DEC Stream Alteration Permit jurisdiction: Winooski River, LaPlatte River, Lewis Creek, Little Otter Creek, and New Haven River. Nelson 2/28/13 pf. at 22–23.

393. The Project will also cross several brooks, streams, and riparian buffer zones. Nelson 2/28/13 pf. at 23; Nelson 6/28/13 pf. at 5; exh. Pet. Supp. JAN-2 (2/28/13).

394. For all perennial and intermittent streams, riparian buffer zones have been determined based on the ANR Buffer Guidance (as further described in the Natural Resources Report, Exhibit Petitioner Supp. JAN-2 (2/28/13)). Nelson 2/28/13 pf. at 23.

395. The Project design carefully considered the protection of streams by delineating all streams within the Project corridor, including the mapping of riparian buffers. The Project design implemented construction practices that would avoid and minimize impacts by:

- a. Completely avoiding any permanent stream channel impacts;
- b. Minimizing the number of buried pipeline crossings of streams;
- c. Using FEH data as a tool to plan and design stream crossings to prevent pipeline exposure;
- d. Using HDD where feasible to avoid direct impacts to stream channels;
- e. Implementing stringent EPSC measures to protect water quality during construction;

- f. Using temporary bridges to cross perennial streams;
- g. Implementing prompt restoration and revegetation at all stream crossings; and
- h. Developing specific long-term management protocol for implementation within riparian buffer areas that will be crossed by the Project.

Nelson 2/28/13 pf. at 25–26.

396. The Project is designed to avoid any permanent impacts to streams. Nelson 2/28/13 pf. at 23.

397. Temporary construction impacts have been avoided where feasible, and where not feasible, the Project has been designed to minimize impacts to these resources. Specifically, the construction of the pipeline involves using HDD techniques for larger stream/river crossings. Nelson 2/28/13 pf. at 23–24.

398. Site-specific characterizations of all proposed stream crossing locations, the proposed methodology of crossing (HDD vs. open trench), and all stream crossing protocols have been reviewed with DEC personnel. Nelson 2/28/13 pf. at 24.

399. The design considered the mapped extent of FEH zones to ensure that the pipeline segments installed by HDD were extended to a sufficient depth and lateral extent to minimize the potential for the pipeline to become exposed over time. *See* Exh. Pet. Supp. JAN-7 (2/28/13) (providing a listing and description of these locations); Nelson 2/28/13 pf. at 24.

400. During the construction phase, temporary stream work road crossings are expected to be necessary for construction phase access to work areas. Temporary bridges will be used for access points for perennial streams; these crossings have been designed in accordance with the 2006 Vermont Standards and Specifications for Erosion Prevention and Sediment Control which, along with the comprehensive EPSC Plan that has been developed for construction activities, will protect and mitigate against secondary stream channel impacts from erosion and sedimentation, as well as ensure prompt natural revegetation of these areas. Nelson 2/28/13 pf. at 24.

401. Consistent with the ANR Buffer Guidance, riparian buffers have been designated adjacent to perennial and intermittent streams. Within perennial stream riparian buffers, where other existing management practices are not currently occurring, a special vegetation management protocol will be implemented on a permanent basis to ensure protection of riparian

functions and values. Nelson 2/28/13 pf. at 24–25; *see also* Attachment 1 to Exh. Pet. VGS-ANR-Joint-1 (the Vegetation Management Plan).

402. Vermont Gas will protect the riparian corridors adjacent to perennial streams by minimizing the width of the pipeline corridor which would be maintained as herbaceous vegetation to approximately 20 feet centered on the pipe. Attachment 1 of Exh. Pet. VGS-ANR-Joint-1 at 10–11.

403. For approximately 15 feet on each side of the 20-foot wide herbaceous corridor, woody vegetation would be allowed to grow or be maintained in graduated heights (or “feathered”), back to the edge of the corridor to the edge of the ROW, where the management zone ends at existing mature forest. Attachment 1 of Exh. Pet. VGS-ANR-Joint-1 at 11.

404. As necessary, VGS will remove selected trees with roots that are determined to pose a risk to pipeline integrity. Attachment 1 of Exh. Pet. VGS-ANR-Joint-1 at 11.

405. VGS has submitted applications for a Department of the Army Section 404 Permit and a Vermont State Section 401 Water Quality Certification. Nelson 2/28/13 pf. at 25; Nelson 6/28/13 pf. at 7.

406. The design and implementation measures will protect the natural condition of streams, and will not result in endangerment to the health, safety, or welfare of adjoining or downstream landowners from stream channel impacts. Nelson 2/28/13 pf. at 26; Nelson 6/28/13 pf. at 8.

I. Shorelines [10 V.S.A. § 6086(a)(1)(F)]

407. The Project will retain all shorelines and waters in their natural condition, allow continued access to the waters and recreational opportunities provided by the waters, retain or provide vegetation which will screen the Project from the waters, and stabilize the bank from erosion. This finding is supported by findings 408 through 412, below.

408. The only water bodies which constitute shorelines under the definitions provided in Act 250 and Section 248 are the Winooski River, LaPlatte River, Lewis Creek, and New Haven River. While the number of crossing locations of these water bodies has been minimized, the crossings are necessary to meet the overall Project purpose. Nelson 2/28/13 pf. at 27.

409. The Vegetation Management Plan establishes specific vegetation management types (“VMT”) for these riparian areas, designated as VMT B2 (Winooski River) and VMT B5

(LaPlatte River, Lewis Creek, New Haven River). Attachment 1 of Exh. Pet. VGS-ANR-Joint-1 at 11–12.

410. The Project will result in no undue adverse impact, particularly because the impacts will be temporary during construction of the Project. Where crossings do occur, the Project will cross each of these water bodies by using the HDD method, which will avoid direct impacts altogether. The HDD design has been based on the width of the FEH zones for these waters, so as to provide reasonable assurance that the pipeline will not become exposed or damaged by anticipated future changes in river channel configuration. The design also ensures that the shorelines associated with these waters will remain undisturbed, both during and following construction, except for the necessary maintenance clearing over the pipeline corridor. Nelson 2/28/13 pf. at 27–28.

411. Prompt soil stabilization and natural revegetation are incorporated in the Project EPSC plans to further minimize impacts. Nelson 2/28/13 pf. at 28.

412. Accordingly, there will be no undue or adverse impacts to shorelines as a result of the Project. Nelson 2/28/13 pf. at 28; Nelson 6/28/13 pf. at 9.

m. Wetlands [10 V.S.A. § 6086(a)(1)(G)]

413. The Project will not create an undue, adverse impact upon significant wetlands. This finding is supported by findings 414 through 423, below.

414. Vermont Gas has established proposed classifications of all delineated wetlands in accordance with Vermont Wetland Rules (“VWR”) procedures and has reviewed these classifications with DEC wetland scientists. Exh. Pet. Supp. JAN-2 (2/28/13); Nelson 2/28/13 pf. at 28–29.

415. Several planning and design considerations have been applied to mitigate against undue adverse effects to Class II wetlands and buffers. Nelson 2/28/13 pf. at 29; *see also* exh. Pet. VGS-ANR-Joint-1 at 7.

416. These measures include: modifying the pipeline alignment where possible to avoid significant wetlands or minimize impacts; using HDD at specific locations to avoid or minimize impacts (EX. Monkton Swamp and Wet Clayplain Forest/Northern White Cedar Swamp/Little Otter Creek in New Haven); narrowing of temporary construction work spaces where possible within wetlands/buffers to minimize forested wetland clearing; using timber mats during construction to minimize wetland disturbance; choosing temporary access routes to

minimize wetland and buffer impacts; implementing the Blasting BMPs; and avoiding vernal pools and minimizing terrestrial envelope impacts. Nelson 2/28/13 pf. at 29; exh. Pet. VGS-ANR-Joint-1 at 6; tr. 9/18/13 at 62–63 (Nelson).

417. Vermont Gas has continued to work with VT DEC and U.S. Army Corps of Engineers to assist in their review of the application materials and to identify any further feasible opportunities for impact avoidance and minimization. Changes to the Project are reflected in Exhibit Petitioner Supp. JAN-4 (6/28/13). Nelson 6/28/13 pf. at 9. The Memorandum of Agreement entered into between VGS and the Vermont Agency of Agriculture, Food and Markets (“AAFM”), the Vermont Land Trust, Inc. (“VLT”), and the Vermont Housing and Conservation Board (“VHCB”), on June 13, 2013, resulted in further impact avoidance and minimization. Exh. Agricultural Interests Group 1-AAFM-1.

418. The Project will result in zero permanent impacts to Class II wetlands; all Project impacts will either be temporary (e.g., construction related) or secondary (conversion of forested area to other vegetated areas). Nelson 2/28/13 pf. at 30.

419. The 6/28/13 Alignment reduces Class II wetland impacts from 6.68 acres in the 2/28/13 Alignment to 5.29 acres. Direct fill impacts to Class II wetlands will be fully avoided. Nelson 6/28/13 pf. at 10.

420. All proposed wetland impacts (Class II and Class III) will be reviewed by ANR for Section 401 WQC. Nelson 2/28/13 pf. at 30.

421. Where bedrock is encountered during construction of the Project within Class II wetlands, buffers, or vernal pools, Vermont Gas will install a bentonite plug at the base of the trench, through the blasted segment of the wetland. Exh. Pet. VGS-ANR-Joint-1 at 7.

422. With regards to wetland breeding bird habitats, three wetlands of potential concern have been identified. The Agency of Natural Resource’s specific concerns have been addressed as provided in the Memorandum of Agreement between VGS and ANR, entered into on September 13, 2013. *See* exh. Pet. VGS-ANR-Joint-1 at 7.

423. The design and implementation measures will ensure that there will be no undue adverse effects to significant Vermont wetlands. Nelson 2/28/13 pf. at 29–30; Nelson 6/28/13 pf. at 10; exh. Pet. VGS-ANR-Joint-1 at 2.

n. Soil Erosion [10 V.S.A. § 6086(a)(4)]

424. The Project will not cause unreasonable soil erosion or reduction of the land to hold water so that a dangerous or unhealthy condition may result. This finding is supported by findings 425 through 453, below.

425. The Project is required to obtain an Individual Discharge Permit for Stormwater Runoff from Construction Sites (“Individual Permit”). The management of construction phase stormwater runoff is described in greater detail in Exhibit Petitioner Supp. JAN-9 (2/28/13). Nelson 2/28/13 pf. at 33.

426. As part of the Individual Permit application process, Project-specific EPSC Plans have been prepared utilizing BMPs selected and designed in compliance with The Vermont Standards and Specifications for Erosion Prevention and Sediment Control (VT DEC, amended 2008). Nelson 2/28/13 pf. at 33.

427. Specifically, as part of the EPSC Plan design, particular attention has been given to: (1) minimizing disturbance, (2) managing runoff, (3) stabilizing promptly, and (4) monitoring, maintaining, and, if necessary, adapting EPSC measures to evolving site conditions. Nelson 2/28/13 pf. at 33.

428. Minimizing disturbance involves, to the extent practicable, maintaining existing topography, phasing major disturbance activities, and maintaining existing vegetation. Nelson 2/28/13 pf. at 33.

429. With respect to managing runoff and stabilizing promptly, VGS will take actions such as: maintaining existing areas of concentrated flow (e.g., ditches), diverting potential runoff, stabilizing flow paths, dispersing concentrated flows through EPSC measures, and stabilizing areas of disturbed soil within a specified time frame. Nelson 2/28/13 pf. at 33–34.

430. With regard to phasing major disturbance activities, the general approach will involve, for example, the follow sequence of activities:

- a. Installation of specified EPSC measures (e.g., limits of disturbance barrier tape and fence, stabilized construction entrance, silt fence, sediment basis, sediment traps) prior to disturbance of any work area.
- b. Clearing of vegetation with earth disturbance (e.g., removal of stumps) within work areas.
- c. Construction of temporary access roads, lay down/staging areas.

- d. Trench excavation and installation of transmission and distribution main lines.
- e. Final stabilization and clean up.

Nelson 2/28/13 pf. at 34.

431. Generally, the Project will be segmented into specific work areas, with limited disturbance occurring in sequence within those work areas, to ensure the maximum allowable concurrent area of earth disturbance, as specified by the approved Individual Permit, is not exceeded. Nelson 2/28/13 pf. at 34.

432. As earthwork is completed, the area will be stabilized by means of gravel, seed/mulch, etc., in order to limit unstabilized soils which will be subject to potential erosion, as required by the approved Individual Permit. The areas will then be cleaned up and permanently stabilized. Construction activities and EPSC measures will be inspected at least as often as required by the Individual Permit. Nelson 2/28/13 pf. at 35.

433. Approximately 23 of the 41 miles of the Transmission Mainline will be constructed under Primary Agricultural Soils (“PAS”). PAS are soils with the potential to support agricultural activity and have an agricultural value between 1 and 7 in the Natural Resource Conservation Service (“NRCS”) rating system, or soils with a “local” agricultural significance and an agricultural value of 8. Nelson 2/28/13 pf. at 35.

434. The Project will primarily consist of underground infrastructure that, in areas of farming and PAS, will be buried 4 feet deep, and is expected to cause only temporary disturbance. Nelson 2/28/13 pf. at 35; exh. Pet. Supp. JAN-11 (2/28/13); tr. 9/18/13 at 73 (Nelson); exh. Agricultural Interests Group 1-AAFM-1 at 3.

435. In specifically identified areas, the construction methodology will involve the segregation of soils such that the topsoil is placed back at the ground surface and subsoil placed beneath as the pipeline trench is refilled. The EPSC plans denote all the areas of prime agricultural soils, whether they are used actively for farming or not, are subject to the topsoil segregation procedure. Nelson 2/28/13 pf. at 35; tr. 9/18/13 at 81 (Nelson).

436. Consequently, the pipelines will not result in a reduction of the agricultural potential of agricultural soils. Nelson 2/28/13 pf. at 35–36.

437. Farmers in Franklin County whose land is bisected by pipelines have not experienced difficulties with farming as a result of the presence of a pipeline. Tr. 9/17/13 at 179–80 (Jensen).

438. Currently, VGS maintains many miles of pipeline underneath agricultural fields, which has not impacted the ability of the farmers to conduct their business. Nelson 2/28/13 pf. at 36.

439. Permanent PAS impacts will occur at the Williston, New Haven, and Middlebury Gate Stations, as well as the Colchester Tie-In and 4 valve sites. In total, there is approximately 1.0 acre of resulting PAS impact, which is dispersed among these eight locations. The PAS impacts associated with the Project will be mitigated in accordance with the procedures set forth above to protect agricultural soils. Exh. Agricultural Interests Group 1-AAFM-1 at 3; Nelson 2/28/13 pf. at 36; *see* findings 110–11, above.

440. Following construction, no activities are proposed by VGS that would result in any interference or interruption with production methods, whether organic or conventional, being practiced by any farming operation located on lands through which the proposed transmission line would pass. Tr. 9/19/13 at 79–80 (Nelson); exh. Pet. Reb. EMS-2 (6/28/13) at 1.

441. The likelihood of a change in surface water impacting organic farming soils is negligible because the land will be returned to its existing slope and contours. Tr. 9/19/13 at 86 (Nelson).

442. Groundwater changes due to the pipeline will be minimal, and also unlikely to pose a problem for agricultural activities. The design calls for the installation of trench breakers at specified intervals along the pipeline, based on surface topography, as shown on sheet ANGP-T-G-015 of Exhibit Petitioner Supp. JH-3. The trench breakers are filled with bentonite and will reduce the trench's overall transmissibility while still allowing water to pass. Trench breakers are designed to maintain the status quo for ground water flow, preventing the pipeline from becoming a conduit for the movement of water that was not moving through a given location prior to the pipeline's installation. Tr. 9/19/13 at 86–89 (Nelson); Heintz 6/28/13 pf. at 22; exh. Pet. Supp. JH-3 (6/28/13) at ANGP-T-G-015.

443. In addition, the design calls for bentonite trench breakers at the limits of each wetland. The bentonite trench breakers act as a plug in the trench to inhibit the migration of

water from wetland areas. The installation of these mitigation devices will minimize impacts associated with the installation of the pipeline trench. Heintz 6/28/13 pf. at 22.

444. If there was an emergence of water at a location that was problematic for a landowner, this could be readily remedied by measures such as excavating and installing an additional trench breaker or creating a groundwater drain. Tr. 9/19/13 at 86–87 (Nelson).

445. Vergennes clay is a heavy clay soil which is found in a number of places along the pipeline route, including the Palmers' property. Due to its density, this type of soil does not transmit large quantities of groundwater. Given this, trench breakers located in this type of soil are not likely to create problems by causing a back-up of water flow that then causes surface water to appear. Tr. 9/19/13 at 87 (Nelson).

446. Horizontal drilling is an alternative that would alleviate concerns about alteration of groundwater migration on the Palmers property. Tr. 9/18/13 at 32 (Heindel).

447. If part of a property was drilled and part was trenched, another possible alternative for mitigation in the trenched area would be to design both a subsurface diversion and (above it) a shallow, unperforated surface water drainage swale that would pick up any collected groundwater at a low spot—the low point of the pipeline—and divert it. The groundwater collection point would need to be higher than the discharge point so that the water would flow by gravity. In the case of the Palmers, this method could be used to divert both surface water and shallow groundwater away from the agricultural operations of the Palmers and into the wetland to the west. Tr. 9/18/13 at 34–38 (Heindel).

448. The impact of a possible change in groundwater flow caused by the project can be mitigated so that it does not compromise farming activities. For example, the EPSC plans require that any tile drains that are intersected by the construction of the project need to be restored so that they continue to function. If this is followed, there would not be a new, post-pipeline installation flow of water from a non-organic parcel to an adjacent parcel that is organically certified. Tr. 9/19/13 at 91–92 (Nelson).

449. The organic farming criterion in Palmer Rebuttal-2 (*see* the bulleted list of 10 items at pages 33 and 34) would, if adopted, be largely redundant of the measures already proposed to be taken by Vermont Gas per the EPSC plan and Vegetation Management Plan. Tr. 9/19/13 at 102–03 (Nelson).

450. The MOU entered into by Vermont Gas and the Agricultural Interests Group on June 13, 2013, indicates that the Project may, subject to Board approval by issuing a Certificate of Public Good, temporarily and/or permanently be located on land subject to these farmland conservation easements (“Conserved Areas”), because it will not adversely impact the purposes of the conservation easements to an undue degree if approved, installed, and maintained in accordance with the Petition, including the MOU and appendices. Exh. AAFM-1 at 2.

451. The reclamation of primary agricultural soils to a physical and biological state that is comparable to the soil quality prior to the extraction activities is feasible. Exh. AAFM-1, Appendix 4 at 1.

452. No herbicides will be used by VGS for vegetation management. VGS plans to brush hog its ROW, including the area within the Conserved Areas, approximately every three years, or more frequently as required to maintain herbaceous growth in the ROW. Special Vegetation Management shall be utilized in the Conserved Areas where the VGS corridor crosses riparian buffers and corridors, significant natural plant communities, and Special Treatment Areas, all as delineated in the conservation easements. Exh. AAFM-1 at 3–4.

453. Agricultural crops and activity within the Project corridor will be permitted, except for tree farming, unless VGS and the landowner agree in writing that such tree farming will not interfere with VGS' right as defined herein. Exh. AAFM-1 at 4.

o. Transportation Systems [10 V.S.A. § 6086(a)(5)]

454. The Project will not cause unreasonable congestion or unsafe conditions with respect to the use of the highways, waterways, railways, airports and airways, and other means of transportation existing or proposed. This finding is supported by finding 455 through 458, below.

455. Vermont Gas plans to conduct HDD or boring under a number of street and railway crossings. HDD allows Vermont Gas to avoid direct impacts to those particular areas. Heintz 2/28/13 pf. at 39–41.

456. In the areas of the Project where Vermont Gas will install pipe with traditional open-cut methods across roadways, it will employ standard traffic control measures to maintain at least one lane of traffic during installation. In areas where Vermont Gas will be installing pipe within the road ROW or shoulder, it will also employ traffic control measures and maintain one lane of traffic during construction. Heintz 2/28/13 pf. at 41.

457. Road surfaces will be protected and restored to original or better condition if impacted by construction. Heintz 2/28/13 pf. at 41.

458. During construction in these areas, Vermont Gas will utilize traffic control methods that comply with the Vermont Agency of Transportation (“VTrans”) standards, which includes employment of appropriate signage and the services of sheriffs or other traffic control personnel to manage traffic flow. VGS will obtain highway permits from VTrans and local municipalities for work in state and local roadways. Heintz 2/28/13 pf. at 41.

p. Educational and Municipal Services [10 V.S.A. § 6086(a)(6) and (7)]

459. The Project will have no impact upon educational services provided by local school systems. The Project will involve temporary construction activities and the addition of three permanent employees during initial operations and therefore will not unduly impact educational services. Wark 12/20/12 pf. at 26–27.

460. The Project will not place an unreasonable burden on the ability of the affected local governments to provide municipal or governmental services. The Project will require some coordination with local law and traffic enforcement services to coordinate the safe delivery of equipment to staging areas and the corridor. Wark 12/20/12 pf. at 26.

461. The Project will be constructed and maintained to meet or exceed applicable safety codes. Wark 12/20/12 pf. at 26.

462. Vermont Gas will obtain state and local highway permits and is coordinating with utilities in the areas where construction will occur. Wark 12/20/12 pf. at 26.

463. Vermont Gas also has an existing public awareness program that it will implement in new communities associated with the Project. Wark 12/20/12 pf. at 26.

q. Rare and Irreplaceable Natural Areas [10 V.S.A. § 6086(a)(8)]

464. The Project will not have an undue adverse effect on any rare and irreplaceable natural areas. This finding is supported by findings 465 through 474.

465. Gilman and Briggs Environmental (“GBE”) conducted surveys to determine natural communities that may be considered significant and therefore, potentially subject to designation as a rare and irreplaceable natural area (“RINA”), as described in Section 10.0 of Exhibit Petitioner Supp. JAN-2 (2/28/13) and as Attachments 4 and 5 to Exhibit Petitioner Supp. JAN-2 (6/28/13). Nelson 2/28/13 pf. at 36; Nelson 6/28/13 pf. at 11.

466. Natural communities can be considered significant by the Vermont Wildlife Diversity Program (“WDP”) based on an evaluation of the community occurrence ranking, which includes ranking of current condition, landscape context, and size, in order to estimate an overall quality rank. Once a community is considered significant, the Vermont WDP can recommend that, based on the combination of the natural community rarity and quality ranking, the community be deemed a RINA under Act 250 Criterion 8. Nelson 2/28/13 pf. at 37.

467. The Project will pass through or in the vicinity of 7 state significant natural communities. Exh. Pet. VGS-ANR-Joint-1 at 2.

468. These significant natural communities include: a Pine Oak Heath Sandplain Forest in Colchester and Essex; a Wet Clayplain Forest adjacent to LaPlatte River in Hinesburg; a potential Wet Clayplain Forest south of Lewis Creek in Hinesburg (which cannot currently be verified due to lack of landowner permission); a potential Wet Clayplain Forest south of Rotax Road in Monkton; a Red Maple-Black Ash Seepage Swamp/Northern White Cedar Swamp and large open wetland complex in Monkton; a Red/Silver Maple Green Ash Swamp at the Monkton-New Haven town line; and a Wet Clayplain Forest and Northern White Cedar Swamp at Little Otter Creek in New Haven. Exh. Pet. VGS-ANR-Joint-1 at 2.

469. VGS will undertake particular construction and operational phase activities for each of the state significant communities, including HDD, narrowed construction corridors, invasive species monitoring/control, and special vegetation management practices. Exh. Pet. VGS-ANR-Joint-1 at 3.

470. Vermont Gas will comply with the vegetation management practices outlined in the Vegetation Management Plan, Attachment 1 of Exh. Pet. VGS-ANR-Joint-1.

471. Vermont Gas will conduct an invasive species baseline survey during Spring 2014, prior to commencing clearing for construction. The survey will include plants on the noxious weed quarantine list and certain watch list plants as listed in the VMP. Exh. Pet. VGS-ANR-Joint-1 at 8.

472. VGS will conduct ongoing monitoring and management of invasive plants in accordance with Section 4.0 of the revised Vegetation Management Plan, included as Attachment 1 of Exh. Pet. VGS-ANR-Joint-1. Exh. Pet. VGS-ANR-Joint-1 at 8.

473. The invasive species monitoring plan incorporated into the Vegetation Management Plan adequately monitors and controls invasive species. Tr. 9/18/13 at 182 (Sorenson).

474. Given these mitigation measures, we conclude that the impacts to these communities will not be undue. We also find it unnecessary to determine whether these natural plant communities qualify as a “RINA.”

r. **Necessary Wildlife Habitat & Endangered Species [10 V.S.A. § 6086(a)(8)(A)]**

475. The Project will not have an undue adverse impact on any necessary wildlife habitat or any endangered species. This finding is supported by findings 476 through 488, below.

476. VGS inventoried Vermont rare, threatened, and endangered plants and animals within the Project footprint and surrounding area. The survey included necessary wildlife habitat (“NWH”), which typically include deer wintering area (“DWA”), black bear habitat (forage or travel), or in some cases, moose overwintering areas. Nelson 2/28/13 pf. at 36; Popp pf. at 3.

477. The Vermont Fish and Wildlife Department (“FWD”) biologists and Wildlife Diversity Program (“WDP”) staff were consulted to review the surveys and Project. Nelson 2/28/13 pf. at 36–37; Popp pf. at 3.

478. Several areas within the Project corridor would be considered deer wintering areas (“DWA”); there are no necessary black bear or moose habitats in the Project corridor. Exh. Pet. Supp. JAN-2 (2/28/13), Section 10.0; Nelson 2/28/13 pf. at 49.

479. The pipeline alignment has been designed to avoid or minimize impacts (tree clearing) to DWA, but approximately 3.9 acres of DWA will require clearing for the Project, representing approximately 4.6 percent of the DWA mapped within the Project areas studied. Three of these acres will be permanently cleared, and 0.9 acres will be temporarily cleared for construction. Nelson 2/28/13 pf. at 49–50.

480. Since the Project only results in limited clearing, the Project will not significantly impact the shelter value of the overall mapped DWA or any individual functioning DWA. Nelson 2/28/13 pf. at 50.

481. Minor clearing within the shelter should create edge habitat, enhancing the amount of available tree regeneration for deer to browse upon during the winter. Nelson 2/28/13 pf. at 50.

482. The minimal required clearing width and in some circumstances, habitat benefits of introduction of forest edge and browse created by the cleared corridor, will reduce the impacts to the DWA. Nelson 2/28/13 pf. at 50.

483. Due to the Project's avoidance and minimization of clearing within the DWA, undue adverse impacts to the DWA will not occur. Nelson 2/28/13 pf. at 50.

484. The Project will result in no impacts to rare, threatened or endangered ("RTE") animal species. Nelson 6/28/13 pf. at 12; *see* Nelson 2/28/13 pf. at 48–49 (discussing two protected species that were potentially within the Project corridor and concluding that neither species was present).

485. There are no threatened or endangered plant species that have been identified along the Project corridor. Exh. Pet. VGS-ANR-Joint-1 at 8; Popp pf. at 9.

486. The Harsh Sunflower, a Vermont threatened plant species, has previously been identified in the VELCO corridor in the area of MP 26.2, however, neither VGS or ANR has had access to the property where the plant may occur. Exh. Pet. VGS-ANR-Joint-1 at 8.

487. VGS will perform a follow up survey at an appropriate time when the plant would be recognizable, prior to construction in that area. VGS will re-align the pipe if feasible to avoid the plant species if it is present in the Project corridor to be impacted during construction. If the species cannot be avoided, VGS will obtain a Takings permit prior to construction in this location. Exh. Pet. VGS-ANR-Joint-1 at 8.

488. There are 19 locations on the Project route that contain rare plant species. All but 8 of these occurrences are avoided by the Project or less than 20% of the population would be impacted. The MOU between ANR and VGS addresses how construction and on-going maintenance will occur in areas potentially containing rare plant species. Given the mitigation measure for rare plants set forth in the MOU between VGS and ANR, the Project will not result in an undue adverse impact to any RTE species. Exh. Pet. VGS-ANR-Joint-1 at 8.

s. Development Affecting Public Investments [10 V.S.A. § 6086(a)(9)(K)]

489. The Project will not materially jeopardize or interfere with the function, efficiency, safety, or the public's use of, access to, or enjoyment of public resources, facilities, services or lands. This finding is supported by findings 490 through 495, below.

490. “[G]as pipelines” are included in the definition public investments under Criterion (9)(K). *See* 10 V.S.A. § 6086(a)(9)(K).

491. As a result of the Project, the whole Burlington area natural gas distribution system will be stronger and more reliable. The Project will provide “backfeed” capability to enhance the reliability of service to customers in Chittenden County. Teixeira 12/20/12 pf. at 11; Gilbert 12/20/12 pf. at 9.

492. The Project will bring natural gas service to the Porter Hospital, Middlebury College, the Monkton Central School, municipal buildings, and other public facilities in Addison Country, providing a less expensive, cleaner and more efficient fuel source for these facilities. *See* findings 15–26, 64–71, above. *See also* exh. ACRPC Supp. TB-2.

493. Vermont Gas will obtain state and local highway permits and approvals for use of state and municipal roadways, and will coordinate with utilities and railroads in the areas where construction will occur. Wark 12/20/12 pf. at 26.

494. VGS has designed and will construct, operate, and maintain its Project in a manner that will be safe and minimize impacts to communities, the natural environment, and cultural resources. *See* findings above.

495. Vermont Gas has an existing public awareness program which it will implement in the new communities associated with the Project. Wark 12/20/12 pf. at 26.

t. Aesthetics [10 V.S.A. § 6086(a)(8)]

496. The Project will not have an undue adverse effect on aesthetics or on the scenic or natural beauty of the area. This finding is supported by findings 497 through 504, below.

497. The Project will be located entirely within the Vermont Lowlands physiographic region. This region is characterized by flat to gently rolling land west of the Green Mountains. The line will pass through a variety of land uses, including rural, residential, agricultural, commercial, and industrial uses. Buscher 12/20/12 pf. at 4.

498. The Project mostly consists of underground infrastructure that generally will not be visible. Buscher 12/20/12 pf. at 4; Raphael pf. at 5.

499. There are a limited number of locations where above-ground components will exist, including the Colchester Tie-In, three Gate Stations, and mainline valve locations. These items are limited in size and low in profile. At areas where above-ground components will be visible, landscape mitigation plantings have been proposed to soften and screen views of the facilities. Buscher 12/20/12 pf. at 4; Raphael pf. at 5.

500. Clearing for the permanent corridor required along the Transmission Mainline may result in adverse impacts from public views in some areas, but these impacts will not be unduly adverse. Buscher 12/20/12 pf. at 5–6; Raphael pf. at 5.

501. VGS has already responded, at several areas of concern, by shifting the pipeline alignment to minimize or avoid vegetation and tree removal to the extent possible. This includes the 2/28/13 Alignment changes that will move the Project away from roadways and into the VELCO corridor in Monkton and Hinesburg. Buscher 12/20/12 pf. at 4–6; exh. Pet. Supp. MJB-2.1 (2/28/13) at 40.

502. Overall, the Project will avoid most areas where tree removal would result in adverse impacts. Buscher 12/20/12 pf. at 4–6.

503. VGS agreed to alter its planting plans based on recommendations made by DPS' aesthetic consultant, David Raphael. The plantings plans submitted by VGS on 6/28/13 address Mr. Raphael's concerns. Tr. 9/18/13 at 132–33 (Buscher).

504. The Project does not violate any clear, written community standard intended to preserve the aesthetics or scenic beauty of the area, considering the goals and policies outlined in the applicable town and regional plans. Raphael pf. at 5.

u. Historic Sites [10 V.S.A. § 6086(a)(8)]

505. The proposed Project will not have an undue adverse effect on historic resources. This finding is supported by findings 506 through 518, below.

506. VGS retained the University of Vermont Consulting Archeology Program (“UVM CAP”) to assess the potential impacts of the Project. UVM CAP conducted Archaeological Resource Assessments (“ARA”) within the Project’s Area of Potential Effect (“APE”) and prepared a Scope of Work (“SOW”), End-of-Field letter, and Historic Resources Report. Crock 12/20/12 pf. at 3–4.

507. ARAs were conducted to evaluate whether the Project contained significant preContact Native American and/or historic Euroamerican archaeological sites. Crock 12/20/12 pf. at 4.

508. The Phase I and Phase II studies of the archaeologically sensitive areas within the December 2012 Alignment APEs resulted in the investigation of 32 preContact era Native American archaeological sites. Fourteen of these sites were newly identified as a result of the Project investigation, while 18 of these sites were previously recorded in the Vermont Archaeological Inventory (“VAI”). Crock 6/28/13 pf. at 2.

509. Due to Project realignments, 5 loci within 4 of the 32 sites investigated are no longer in the current 6/28/13 Project Alignment. Crock 6/28/13 pf. at 3.

510. Phase II site evaluations indicated that 10 loci within 8 separate sites in the Project APE are significant and eligible for listing on the State and National Register of Historic Places under Criterion D. VGS plans to avoid these significant site loci by using horizontal directional drilling (“HDD”). Crock 6/28/13 pf. at 3.

511. With HDD, VGS will drill the pipeline several feet beneath the maximum possible depth of archaeological deposits. Crock supp. pf. at 3. Alternatively, the sites could be archaeologically mitigated (Phase III data recovery) to the satisfaction of the Vermont Division of Historic Preservation (“VDHP”) prior to construction. Consequently, there will be no adverse effect on these properties. Crock 6/28/13 pf. at 3.

512. There was an additional single locus at a seventh potentially significant site identified along the current Alignment that consisted of a very small component within the Project APE; it was completely mitigated during the Phase II site evaluation and thus, there is no adverse effect on this property. Crock 6/28/13 pf. at 4.

513. There are 20 loci at 15 sites within the Project Alignment APE, along with 5 loci of 5 sites that also had significant components, that were determined not to be significant following Phase II site evaluations. Phase II testing did not indicate that these sites contained information that would make them eligible for the State or National Registers of Historic Places. They require no further archaeological work and there is no adverse effect for these properties. Crock 6/28/13 pf. at 4.

514. As of 6/28/13, 27 sensitive areas on 27 parcels had not been studied. Crock 6/28/13 pf. at 5.

515. If these or additional significant sites or components are identified within the Project APE, then they will either be avoided through HDD or by redesign that removes the sites from the permit area and shifts the Project corridor into that area that is not archaeologically sensitive. Crock 6/28/13 pf. at 5.

516. If the proposed Phase I and Phase II site identification and site evaluation work are completed, as well as all other appropriate archaeological or mitigation work, the Project will not have an undue adverse impact on archaeological historic sites. Dillon pf. at 5; tr. 9/18/13 at 13–14 (Dillon).

517. As a result of the 2/28/13 Alignment, there are no potential impact to above-ground historic properties. Crock 6/28/13 pf. at 6.

518. The Vermont Division for Historic Preservation has no concern with the Project's effect on above-ground historic sites. Dillon pf. at 2.

Discussion

We are satisfied that VGS has met its burden of proof under Criterion 8 for archeological resources and historic sites by undertaking a professional evaluation of archaeologically sensitive areas and potential impacts on historic properties and by demonstrating that there are no undue adverse effects on historic sites. While UVM CAP's investigation did reveal that there are 10 loci within 8 sites that are significant and eligible for listing on the State and National Register of Historic Places, VGS plans to avoid these with either horizontal directional drilling ("HDD") or archaeologically mitigating the sites to the satisfaction of the Vermont Division of Historic Preservation. With respect to the sensitive areas which have not yet been studied and any additional archaeological sites that have not been investigated, Dr. Crock's testimony establishes that VGS has an appropriate plan in place to ensure that if a newly identified historic site is identified, it will be avoided to prevent an undue adverse effect as required by statute. Further, Mr. Dillon, a survey archaeologist for the Division for Historic Preservation, provides further assurance that "as long as the approved methodologies are undertaken, sites are avoided or mitigated, and any future investigation follows those [approved] methodologies, this project will have no adverse effect on archaeological resources." Tr. 9/18/13 at 13–14 (Dillon).

11. Least-Cost Integrated Resource Plan [30 V.S.A. § 248(b)(6)]

519. The Project is consistent with the least-cost integrated resource plan ("IRP") that VGS submitted to the Board in November 2012. Simollardes 12/20/12 pf. at 10; Poor pf. at 12.

520. Although the least-cost integrated resource plan is not yet approved, in Docket No. 7456, this Board found that Vermont law does not prohibit the Board from granting a CPG under Section 248 to a utility that does not have an approved least-cost integrated resource plan, so long as the Board considers in its review the environmental effects which the utility must consider in developing its least-cost integrated plan.²⁵

521. The Project is consistent with least-cost planning, including environmental considerations, as it:

- Results in lower energy costs to Vermont regardless of whether any future expansion projects are constructed;
- Reduces lost opportunity costs by constructing a 12-inch diameter pipeline rather than a 10-inch diameter pipeline;
- Considers future growth by constructing transmission-pressure pipe to Middlebury;
- Will be required for service regardless of the degree of energy efficiency assumed;
- Will bring Vermont Gas' energy efficiency programs to a currently under-served market; and
- Results in an overall reduction in greenhouse gas emissions associated with customers' fuel use.

Simollardes 12/20/12 pf. at 10–11.

522. Vermont Gas' supply portfolio is also a least-cost supply portfolio after consideration of the Project. Simollardes 12/20/12 pf. at 11.

12. Compliance with Electric Energy Plan [30 V.S.A. § 248(b)(7)]

523. This criterion is not applicable to the Project because the Project is a natural gas facility that is not part of or incidental to an electric generating facility.²⁶

524. Although this criterion is not applicable to the Project, evidence was nonetheless presented with respect to the Project's compliance with the Vermont Comprehensive Energy

²⁵ Vermont Gas Systems, Inc., Docket No. 7456 (9/3/2010) at 39.

²⁶ See 30 V.S.A. § 248(b)(7).

Plan (“CEP”). The purpose of the CEP is to provide a framework for implementing the goals established by the Vermont General Assembly. Poor pf. at 2.

525. The CEP specifically sets a target “to eliminate Vermont’s reliance upon oil by mid-century by moving toward enhanced efficiency measures, greater use of clean, renewable sources for electricity, heating and transportation, and electric vehicle adoption, while increasing our use of natural gas and biofuel blends where nonrenewable fuels remain necessary.” Poor pf. at 4 (quoting 2011 CEP, vol. 1., p. 3, available at http://publicservice.vermont.gov/publications/energy_plan/2011_plan).

526. The expansion of natural gas would not threaten the CEP’s goal to achieve 90% renewables by 2050. Tr. 9/19/13 at 97–99 (Poor).

527. For some industrial customers, like Cabot, the investment in the conversion to natural gas will not delay future investments in renewable energy because natural gas will be used primarily for heat energy, whereas renewable energy has application for electric uses. Tr. 9/17/13 at 163–64 (Pcolar).

528. The CEP further states that “[t]he moves must be deliberate and measured to ensure overall energy costs for our businesses and residents remain regionally competitive.” Poor pf. at 4 (quoting 2011 CEP, vol. 1., p. 3).

529. The Project will result in an average energy savings per residential customer of \$1,570 to \$1,910 per year. Simollardes 12/20/12 pf. at 3.

530. The Project should increase the competitiveness in Vermont’s fuel markets by applying downward pressure on prices and helping maintain a high quality of service. Poor pf. at 5.

531. The Project will also result in substantial energy savings for Vermont businesses. *See, e.g.*, Pcolar pf. at 4 (stating that the Agri-Mark/Cabot Creamery facility in Middlebury expects annual savings in fuel costs to exceed \$1 million per year and could approach \$3 million per year in savings over time).

532. The Project provides Vermont consumers with choice; a customer has the option to take service if the particular consumer determines that the potential benefits of natural gas service outweigh their potential concerns. Poor pf. at 5.

533. Particularly, in regards to natural gas, the CEP states: “Vermont should encourage the increased use of natural gas by supporting economically viable expansion of the natural gas

service territory, promoting attachments to the current distribution system ... and promoting the use of natural gas vehicles.” Poor pf. at 5 (quoting 2011 CEP, vol. 2, p. 220).

13. Waste-to-Energy Facilities [30 V.S.A. § 248(b)(9)]

534. The Project does not involve the construction of a waste to energy facility; therefore, this criterion is inapplicable.

14. Existing Transmission Facilities [30 V.S.A. § 248(b)(10)]

535. This criterion is not applicable to the Project because the Project is a natural gas facility that is not part of or incidental to an electric generating facility.²⁷

VI. Conclusion

For the reasons set forth above, we conclude that the proposed Project will promote the general good of the state with the conditions that we have included in our Order, below.

²⁷ See 30 V.S.A. § 248(b)(10).

ORDER

IT IS HEREBY ORDERED, ADJUDGED AND DECREED by the Public Service Board of the State of Vermont that the proposed Project, in accordance with the evidence and plans submitted in this proceeding, and as modified and conditioned by this Order, will promote the public good of the State of Vermont in accordance with 30 V.S.A. § 248, and a certificate of public good to that effect shall be issued with the conditions set forth below.

1. Construction, operation, and maintenance of the proposed Project shall be in accordance with the findings and requirements set forth in the Order.
2. Prior to proceeding with construction in any given area, the Petitioner shall obtain all necessary permits and approvals, as required for the proposed construction activities in that area. Construction, operation and maintenance of the proposed Project shall be in accordance with such permits and approvals, and with all other applicable regulations, including those of the Vermont Agency of Natural Resources and the U.S. Army Corps of Engineers.
3. The Certificate of Public Good shall not be transferred without prior approval of the Board.
4. The hours of construction shall be limited to 7:00 a.m. to 7:00 pm, Monday through Friday, and Saturday 8:00 a.m. to 5:00 p.m., with hours of blasting limited to 9 a.m. to 4:30 p.m., Monday through Friday. Construction will not be allowed on Sundays or Federal or State Holidays. Where VGS is conducting an HDD, VGS will be allowed to continue the drill beyond these hours and up to 24 hours per day, including weekends and holidays, as necessary to complete a drill.
5. The Blasting Plan provided as Exh. Pet. Supp. JH-17 (6/28/13) is approved and all blasting associated with the Project shall be conducted in accordance with this Plan.
6. Unless mutually agreed to by the affected parties, VGS shall comply with the provisions of the MOUs entered with parties to this proceeding: the Town of Monkton; Monkton Central School; the Agricultural Interests Group comprised of VLT, AAFM, and VLT; ACRPC; ANR; VELCO; and CSWD.

7. VGS shall file an HDD plan for the Palmer property. Affected Parties will have two weeks from date of submittal to comment on VGS' proposed plan. VGS cannot commence construction on the Palmer property until the HDD plan is approved by the Board.

Dated at Montpelier, Vermont, this __ day of _____, 2014.

_____) PUBLIC SERVICE
_____)
_____) BOARD OF
_____)
_____) VERMONT

OFFICE OF THE CLERK
FILED: _____
ATTEST: _____

**STATE OF VERMONT
PUBLIC SERVICE BOARD**

Petition of Vermont Gas Systems, Inc.,)	
requesting a Certificate of Public Good pursuant)	
to 30 V.S.A. § 248, authorizing the construction)	
of the “Addison Natural Gas Project” consisting)	
of approximately 43 miles of new natural gas)	
transmission pipeline in Chittenden and Addison)	Docket No. 7970
Counties, approximately 5 miles of new)	
distribution mainlines in Addison County,)	
together with three new gate stations in)	
Williston, New Haven and Middlebury,)	
Vermont)	

CERTIFICATE OF PUBLIC GOOD PURSUANT TO 30 V.S.A § 248

IT IS HEREBY CERTIFIED that the Public Service Board of the State of Vermont (“Board”) this day found and adjudged that the Addison Natural Gas Project, described in the Board’s _____ Order in this Docket (the “Order”), will promote the general good of the State of Vermont, and a Certificate of Public Good is hereby issued to Vermont Gas Systems, Inc. (the “Petitioner”), subject to the following conditions:

1. Construction, operation, and maintenance of the proposed Project shall be in accordance with the findings and requirements set forth in the Order.
2. Prior to proceeding with construction in any given area, the Petitioner shall obtain all necessary permits and approvals, as required for the proposed construction activities in that area. Construction, operation and maintenance of the proposed Project shall be in accordance with such permits and approvals, and with all other applicable regulations, including those of the Vermont Agency of Natural Resources and the U.S. Army Corps of Engineers.
3. The Certificate of Public Good shall not be transferred without prior approval of the Board.
4. The hours of construction shall be limited to 7:00 a.m. to 7:00 pm, Monday through Friday, and Saturday 8:00 a.m. to 5:00 p.m., with hours of blasting

limited to 9 a.m. to 4:30 p.m., Monday through Friday. Construction will not be allowed on Sundays or Federal or State Holidays. Where VGS is conducting an HDD, VGS will be allowed to continue the drill beyond these hours and up to 24 hours per day, including weekends and holidays, as necessary to complete a drill.

- 5. The Blasting Plan provided as Exh. Pet. Supp. JH-17 (6/28/13) is approved and all blasting associated with the Project shall be conducted in accordance with this Plan.
- 6. Unless mutually agreed to by the affected parties, VGS shall comply with the provisions of the MOUs entered with parties to this proceeding: the Town of Monkton; Monkton Central School; the Agricultural Interests Group comprised of VLT, AAFM, and VLT; ACRPC; ANR; VELCO; and CSWD.
- 7. VGS shall file an HDD plan for the Palmer property. Affected Parties will have two weeks from date of submittal to comment on VGS' proposed plan. VGS cannot commence construction on the Palmer property until the HDD plan is approved by the Board.

DATED at Montpelier, Vermont, this ___ day of _____, 2013.

_____) PUBLIC SERVICE
 _____)
 _____) BOARD OF
 _____)
 _____) VERMONT

OFFICE OF THE CLERK
 FILED:
 ATTEST: _____
 Clerk of the Board