Exhibit VGS-AG-014

STATE OF VERMONT
PUBLIC SERVICE BOARD

Docket No. 7970

Petition of Vermont Gas Systems, Inc., for a certificate of public good, pursuant to 30 V.S.A. Section 248, authorizing the construction of the "Addison Natural Gas Pipeline" consisting of approximately 43 miles of new natural gas transmission pipeline in Chittenden and Addison Counties, approximately 5 new distribution mainlines in Addison County, together with three new gate stations in Williston, New Haven, and Middlebury, Vermont	)	Hearings at Montpelier, Vermont September 16, 17, 18, 19 & 20, 2013

Order entered: 12/23/2013

PRESENT: James Volz, Chairman
David C. Coen, Board Member
John D. Burke, Board Member

APPEARANCES: *See Appendix A*

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I. INTRODUCTION

In this Order, the Vermont Public Service Board ("Board") approves, with conditions, Vermont Gas Systems, Inc.'s ("Vermont Gas," "VGS," or the "Company") extension of its transmission and distribution system to Vergennes and Middlebury.[1] We find this expansion of natural gas service to Addison County will provide significant economic benefits to the state, can be accomplished without undue adverse environmental impacts, and will promote the general good of the state. Accordingly, we are issuing a Certificate of Public Good ("CPG") pursuant to 30 V.S.A. § 248 authorizing VGS to construct the requested facilities, subject to conditions set out in this Order and the CPG.

For decades, VGS has offered natural gas service to customers exclusively in Chittenden and Franklin counties. The construction of the Project will make natural gas service available to many Vermont consumers in Addison County for the first time. This expansion will enable VGS to begin serving Addison County industrial customers in late 2014. VGS has committed to construct distribution facilities in Middlebury and Vergennes in 2015 and to use reasonable best efforts to extend natural gas service to other communities that now lack such access — Bristol, St. George, New Haven, Ferrisburgh, and Monkton.[2] We strongly support VGS's efforts to build out these distribution systems and condition our approval of the Project on the Company following through on these commitments.

The evidence in this case persuades us that this expansion will create substantial benefits for the state of Vermont. Natural gas presently has a price advantage of more than 40% over either fuel oil or propane, so that once introduced, it is likely over time to displace the consumption of these more costly fossil fuels. Based on projections of customers switching to natural gas service, VGS anticipates that over $200 million in direct and indirect savings (including greenhouse gas emission benefits) will be realized over the next 20 years. These

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1. VGS refers to this expansion as the Addison Natural Gas Project ("ANGP" or "the Project").

2. VGS has committed to use reasonable best efforts to extend gas service to Bristol, Monkton, and New Haven within two years following gasification of the Project, and to East Middlebury within three years. VGS has also committed to examine the possibility of extending its natural gas distribution in Hinesburg. Exh. ACRPC Supp. TB-2 at 3; exh. Monkton SP-2.

direct economic savings are far in excess of the estimated $86 million cost of the Project. The Project will also provide incremental tax revenue to towns along the route, thus increasing the direct economic benefits for those towns and the state. Overall, the Project is expected to afford Vermonters in the new service areas lower energy costs than under the current fuel options and any presently known alternatives; thus, we conclude that the Project is needed.

The displacement of fuel oil and propane consumption by natural gas is also likely to reduce greenhouse gas emissions. It is well-known that many Vermont residences could reduce heating costs by implementing measures that improve the thermal efficiency of their homes.[3] The expansion of VGS's footprint will enable customers in the newly served areas to participate in the Company's energy efficiency programs. Access to VGS's energy efficiency programs will facilitate these customers' ability to address thermal efficiency in their homes as well as promote increased efficiency in the heating units themselves through retrofitting of heating equipment. In turn, implementation of such efficiency measures will result in lower energy costs for consumers. The introduction of natural gas service and VGS's energy efficiency programs in Addison County presents a unique opportunity to maximize energy efficiency at the time when customers switch services. Such maximized energy efficiency will further serve to reduce greenhouse gas emissions relative to what they may have been if oil or propane were utilized. This Project thus provides a double greenhouse gas benefit by (1) switching to the lower emitting natural gas from propane and fuel oil, and (2) increasing the availability of energy efficiency programs to a new customer base. Therefore, as a condition of this Order, we adopt the recommendation of the Department of Public Service ("Department" or "DPS") that the Board require VGS to enhance its program offerings in the newly served areas.

Over the last decade, VGS has extended gas service to Hinesburg, Jericho, Richmond, and Enosburg in furtherance of meeting the state's expansion goals. The Project represents a substantial additional expansion, and a significant additional step toward realizing one of Vermont's long-standing energy policy goals — the expansion of natural gas service to unserved

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3. The state has been actively examining how to implement and fund energy efficiency, including thermal efficiency, in areas in which utility sponsored thermal efficiency programs are unavailable because the customers does not use electricity or natural gas for heating. 2013, Act No. 89, Section 29.

areas of the state where possible. This goal is specifically set forth in the Comprehensive Energy Plan ("CEP") prepared by the Department. The Project is also consistent with explicit and implicit actions taken by the Board to provide VGS with appropriate incentives to cost-effectively expand its natural gas service beyond the Company's existing service territory.

Some parties to this proceeding have raised questions about some of these benefits. The Vermont Fuel Dealers Association ("VFDA") and Conservation Law Foundation ("CLF") question the magnitude of the benefits, whether there will actually be reductions in greenhouse gas emissions, and whether introduction of natural gas will have a negative impact on the state making progress toward increased use of renewable energy. CLF argues that natural gas is a fossil fuel that emits greenhouse gases when used and throughout the process of production and transportation. CLF further emphasizes that natural gas is methane, which has substantially more impact on climate change than does carbon dioxide (CO_2). However, at the same time, combustion of natural gas tends to be more efficient, so less of it is used in the heating process. After examining the evidence on the relative greenhouse gas effects of natural gas compared to the fuels it is likely to displace (fuel oil and propane), we are not persuaded by CLF's arguments. To the contrary, the evidence shows there is a reasonable basis to conclude that the increased use of natural gas in substitution for fuel oil or propane will result in less greenhouse gas emissions than the fuels it would displace.

Nor are we convinced that increasing the use of natural gas runs counter to the state's goals of using more renewable energy for electricity production. As we have stated above, natural gas would largely displace fuel oil and propane, not renewable energy. At least in the residential market, heating is likely to be the major use for natural gas. For the most part, renewable energy sources produce electricity, which plays a very small role in heating Vermont. homes.[4] Thus, judging by the current uses of renewable energy, the introduction of natural gas is unlikely to displace the use of more renewable energy to generate electricity.

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4. Natural gas may displace some heating based upon biomass, such as woodstoves. But the evidence does not indicate that this effect would be material.

Other parties have expressed concern about the route of the Project pipeline and the likely environmental impacts of the construction. To its credit, VGS has attempted to work with most of these parties. These efforts resulted in substantial route modifications in February and further route modifications and alterations of construction plans throughout the process, including some alterations that were made after the close of evidentiary hearings. VGS has entered into eight Memoranda of Understanding ("MOUs") that address the Agency of Natural Resources' ("ANR") environmental concerns, effects on agricultural land, location of the pipeline and specific commitments to expand natural gas distribution service within affected communities. The result is a Project that meets the requirements for approval under Section 248(b)(5) in that it will not have an "undue adverse effect upon esthetics, historic sites, air and water purity, the natural environment and the public health and safety."

Nonetheless, some concerns remain about the Project's pipeline route. In particular, Nathan and Jane Palmer, landowners in Monkton, assert that construction of the pipeline on their property (1) would adversely affect the potential for their land to be certified as an organic farm, (2) result in the pipeline being located only 125 feet from their house, and (3) require removal of trees. VGS has proposed to mitigate these concerns by using horizontal directional drilling instead of trenching for a portion of the route through the Palmer property, avoiding surface disruption and allowing the line to be at a greater depth and farther from the Palmer residence. In this Order, we have addressed the Palmers' concerns by requiring that VGS use horizontal directional drilling for the entire route through the Palmer property.

We are also persuaded that, based on the record before us, it is appropriate to adjust the route along Old Stage Road in Monkton to address the concerns of other landowners, the Hurlburts. VGS's proposed route would have resulted in removal of forest, including a large section of maple trees. By contrast, locating the line on the opposite side of the road will place it adjacent to or within the existing right-of-way owned by Vermont Electric Power Company, Inc. ("VELCO") on which a 115 kv transmission line is already located. This will reduce the impact of the new line. It will also move the line onto the property of landowners who did not have prior notice that the line might be placed on their properties and thus had no reason to comment earlier in the proceeding. Therefore, the Board will provide notice to the newly affected

landowners and afford those landowners an opportunity for comment and additional process as warranted.

Finally, two other issues remain to be discussed regarding the scope of this proceeding. First, the specific proposal before the Board entails the construction of transmission and distributions facilities between VGS's current system in Chittenden County and Middlebury. However, VGS presented some evidence on what it refers to as Phase II of the Project — the extension of its transmission and distribution system to Ticonderoga, New York, to serve the International Paper ("IP") facility there. During the time the Board has been preparing this Order, VGS has filed a CPG Petition under Section 248 seeking approval of Phase II. VGS has maintained in this docket that the Project would promote the general good even if Phase II were not constructed because the Phase I design would facilitate future expansion to Rutland even if Phase II were not constructed.

In this Order, we have examined the Project strictly based upon the petition before us now for approval of Phase I. We have not considered the potential additional revenues or benefits that VGS might derive from extension of its facilities to the IP Ticonderoga Mill. This approach to our review is essential because other than the testimony on some of the incremental revenues, no evidentiary record has been developed on the merits of Phase II under the Section 248 criteria, nor has any notice been provided in this case to any landowners and communities that would be affected by Phase II. We have therefore reached the conclusion that the Project promotes the general good based on the merits of Phase I alone, and upon the assumption that VGS will construct the Project as proposed in Phase I, which includes design modifications that could accommodate future expansion, whether to Rutland or to IP. Specifically, in our findings and conclusions in this Order we have not included any of the future potential benefits or impacts of Phase II cited by VGS.

The second issue concerning scope is the relationship of the Project to natural gas collected as a result of hydraulic fracturing, an issue raised in many public comments we have received regarding Phase I. We address these concerns in more depth later in this Order. As an initial matter, though, we observe the Board has limited jurisdiction in a Section 248 proceeding to consider extraterritorial impacts, such as the environmental effects of hydraulic fracturing in

Alberta, Canada, unless those impacts materially affect the general good of Vermont.[5] In this proceeding, no party has demonstrated that the use of gas derived from hydraulic fracturing is inconsistent with Vermont law or that the effects of hydraulic fracturing in other locations materially affect the general good of Vermont. Accordingly, we have declined to withhold approval of the Project on that basis.

II. PROCEDURAL HISTORY

On December 20, 2012, Vermont Gas filed a petition seeking approval of the Project. The petition was accompanied by prefiled direct testimony and exhibits pursuant to 30 V.S.A. § 248. At that time, VGS represents that copies of these materials were also duly served upon all parties specified in 30 V.S.A. § 248(a)(4)(C).

On January 30, 2013, a pre-hearing conference was held in the Public Service Board hearing Room in Montpelier, Vermont. That same day, motions to intervene were filed by VELCO and the Town of New Haven ("New Haven").

A Prehearing Conference Memorandum and Scheduling Order was issued on February 5, 2013. In response to VGS's discussion at the prehearing conference of potential re-routes to the Project, the Board directed VGS to file an amended petition by February 28, 2013, documenting proposed re-routes.

On February 28, 2013, VGS filed an amended petition with supplemental testimony and exhibits.

On March 7, 2013, the Clerk of the Board provided a memorandum to adjoining landowners addressing the procedures for participating in this case and advising them of the March 29, 2013, deadline for intervention.

On March 20, 2013, the Vermont Housing and Conservation Board ("VHCB") and CLF filed motions to intervene.

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5. Docket 5330, *Application of twenty-four electric utilities for a certificate of public good authorizing execution and performance of a firm power and energy contract with Hydro-Quebec and a Hydro-Quebec Participation Agreement*, Order of 09/21/89 at 4-10.

On March 21, 2013, a public hearing was held in the Champlain Valley Union Theater at Champlain Valley Union High School, in Hinesburg, Vermont.

On March 26, 2013, Michael Hurlburt, Herrick Hurlburt, Sr., David Hurlburt, Herrick Hurlburt, Jr. and Joshua Hurlburt ("the Hurlburts") and Aldo E. and Mary Speroni filed motions to intervene *pro se*.

On March 27, 2013, Nathan B. Palmer filed a motion to intervene *pro se* representing himself and Jane Palmer ("the Palmers"), Laughing Tree Farm, and Raymond and Beverly Latreille, Frog Hollow Farm; Vermont Agency of Agriculture, Food and Markets ("AAFM") filed a motion to intervene; and, Chittenden Solid Waste District ("CSWD") filed a motion to intervene.

On March 28, 2013, motions to intervene were filed by Vermont Department of Transportation ("VTrans"), Dr. Robert Johnson and Shirley Johnson ("the Johnsons"), the Monkton Central School ("MCS"), Addison County Economic Development Corporation ("ACEDC"), and the Vermont Intergenerational Stewards ("VIS").

On March 29, 2013, motions to intervene were filed by the Town of Bristol ("Bristol"), Matthew T. Baldwin *pro se* on behalf of himself and his family, the Rutland Economic Development Corporation ("REDC"), the Rutland Region Chamber of Commerce ("RRCC"), Middlebury College, the City of Rutland ("Rutland"), the International Paper Company, David Carse and Elizabeth Hazen, David and Claudia Ambrose *pro se,* Vermont Division for Historic Preservation ("DHP"), the Town of Monkton ("Monkton"), the City of Vergennes ("Vergennes"), Agri-Mark Inc./Cabot Creamery ("Agri-Mark").

In an Order entered on April 12, 2013, the Board granted intervenor status to the following individuals and entities: the Towns of Williston ("Williston"), Hinesburg ("Hinesburg"), Monkton ("Monkton"), New Haven, Middlebury ("Middlebury"), and Bristol ("Bristol"); and Vergennes and the City of Rutland ("Rutland"); the Addison County Regional Planning Commission ("ACRPC"), MCS, AAFM, DHP, VHCB, VTrans, CSWD, VELCO, the Vermont Land Trust ("VLT"), CLF, Middlebury College, Agri-Mark, IP, ACEDC, REDC, RRCC, International Business Machines Corporation ("IBM"), the Johnsons, Aldo and Mary Speroni, Matthew Taylor Baldwin, David Carse and Elizabeth Hazen, the Palmers, David and

Claudia Ambrose, Peter and Margaret Carothers, the Hurlburts, and the Vermont Fuel Dealers Association ("VFDA").[6]

We denied, without prejudice to refile, the motion to intervene submitted by VIS, which is 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 comprised its members, what specific interests those members had as individuals in this proceeding, and how VIS was 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.[7]

On April 30, 2013, the Board held an informal workshop for intervenors in the Board's Hearing Room on the Third Floor of the People's United Bank Building at 112 State Street in Montpelier, Vermont. The Board took this step in order to afford intervenors, in particular *pro se* intervenors, the opportunity to obtain answers to their questions about how to participate in our process. In particular, the participants learned about the various stages of the petition review process including discovery, grouping of parties, and the projected schedule. The workshop also introduced the parties to each other to facilitate the formal and informal exchange of information throughout the review process.

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6. The Board limited the scope of VFDA's intervention to its stated intention of addressing claims about the emissions, prices, supply and efficiencies of the proposed Project compared to oil. Docket No. 7970, Order of 4/12/13 at 12. The Board also limited the scope of representation for Mr. Palmer who had sought to represent himself, his wife, and the Latreilles *pro se*. PSB Rule 2.201(B) does not permit individuals to be represented in Board proceedings by a non-attorney. Accordingly, to the extent Mr. Palmer has sought to move on behalf of Mr. and Ms. Latreille for intervenor status, that part of Mr. Palmer's intervention motion was denied. Mr. and Ms. Latreille were offered the opportunity themselves to file an intervention motion but chose not to do so. The Latreilles did file numerous comments with the Board which were treated as public comments. Additionally, the Board also deemed it necessary to group the parties according to their interests, much as we did in 2003 when we reviewed a proposed electric transmission line of comparable scope geographically in the *Northwest Vermont Reliability Project*, Docket 6860, Order of 10/17/03 ("NRP Intervention Order") at 9-12.

7. Docket No. 7970, Order of 4/12/13 at 11.

Between April 19, 2013, and September 16, 2013, the Board oversaw the exchanges of requests for information, discovery, and prefiled testimony between the parties. On May 24, 2013, the Board entered an order approving a protective agreement at the request of VGS to preserve the confidentiality of allegedly confidential information and critical energy infrastructure information.

On September 10, 2013, the Board and the parties conducted a site visit that consisted of a bus tour that began at the Town Offices in Middlebury at 12:30 p.m. Later that day, the Board held a second public hearing commencing at 7:00 p.m., in the Gymnasium at the Middlebury Union Middle School, located at 48 Deerfield Lane in Middlebury, Vermont.

The Board conducted technical hearings on September 16-20, 2013, at the Capitol Plaza Hotel in Montpelier, Vermont.[8]

On October 11 and 25, 2013, the parties filed briefs and reply briefs, respectively, addressing the petition.

Memoranda of Understanding (MOUs)

VGS separately entered into eight MOUs with different parties to this proceeding. VGS shall comply with the provisions of these MOUs as a condition of our approval of this Order and CPG.

VGS-VELCO MOU

On June 12, 2013, VGS and VELCO entered into an MOU (exh. VELCO PWL-2) which addresses the terms and conditions under which VELCO will allow VGS to co-locate various lengths of the Project within the existing VELCO bulk transmission line right-of-way ("VELCO ROW" or "VELCO Corridor") granted to VELCO in easements in Chittenden and Addison counties. The VGS-VELCO MOU does not establish whether the co-location will be documented with a lease, license, or an easement, nor does the MOU address any specific terms of payment. The VGS-VELCO MOU does, however, commit the parties to certain safety and

8. The large number of parties could not be accommodated by the Board's hearing room.

emergency standards and binds both parties to negotiate in good faith in an iterative process as the final form of Project plan is resolved. VGS and VELCO have targeted December 31, 2013, as the date for finalizing an operating agreement addressing procedures to be used by the parties in implementing the terms of their MOU.

VGS-Monkton MOU

On June 12, 2013, VGS and Monkton entered into an MOU (exh. Monkton SP-2) that addresses environmental, safety, and economic impacts of the Project and Monkton's desire to have VGS extend natural gas service to the Town. Along with these general concerns, the VGS-Monkton MOU specifically addresses pipeline capacity, blasting, and easement requirements and siting concerns in Monkton including VGS's construction of a Monkton distribution system. These siting concerns include moving the location of the pipeline out of the VELCO ROW in the vicinity of Rotax Road. It is this re-route that results in the transmission line being located on the Palmers' property. VGS's Project modifications as documented in the MOU, including the objective of pipeline set back from residential homes and wells by 300 feet, is reflected in town articles passed by the Monkton electorate in a special town meeting format. VGS and Monkton agree that the MOU terms should be incorporated as conditions in this Order and CPG.

VGS-Agricultural Interests Group ("AIG") MOU

On June 13, 2013, VGS and the AIG (comprised of VLT, AAFM, and VHCB) entered into an MOU (exh. AAFM-1). The VGS-AIG MOU memorializes modifications to the Project plan made by VGS in response to discussions with the AIG. The MOU includes a stipulation of fact regarding farmland conservation easements impacted by the Project plan and sets conditions for VGS to observe during Project construction. The AIG agrees that if these conditions are observed and incorporated into this Order and CPG then the Project will not adversely impact the interests protected by the conservation easements.

VGS-MCS MOU

On June 14, 2013, VGS and MCS entered into an MOU (exh. pet. reb. EMS-1) pursuant to which VGS has agreed, among other things, to construct and operate a distribution connection to the Monkton Central School at no additional cost or expense to the school. The MOU further addresses other safety and training considerations. VGS and MCS agree that these terms should be incorporated as conditions in this Order and CPG.

VGS-ACRPC MOU

On August 13, 2013, VGS and ACRPC entered into an MOU (exh. ACRPC supp. TB-2) which reflects ACRPC's support for the Project conditioned upon specific agreements by VGS. The terms of the VGS-ACRPC MOU include siting and distribution system costs and schedule, emergency management training, set backs from water resources, and a community liaison program. Upon the inclusion of the MOU's conditions in this Order and CPG, ACRPC agrees that the Project promotes the general good of the state and will not unduly interfere with the orderly development of the region, and therefore supports the approval of the Project by the Board.

VGS-ANR MOU

On September 13, 2013, VGS and ANR entered into an MOU (exh. pet. VGS-ANR-Joint-1) which memorializes their ongoing discussions regarding the Project and VGS's subsequent modifications to the Project plans to minimize potential natural resource impacts of the Project. On October 11, 2013, VGS provided two corrections to the MOU consented to by VGS and ANR. The VGS-ANR MOU includes a stipulation of fact that identifies state significant natural communities. The MOU further imposes conditions on the Project plan that relate to: (1) construction and operational concerns at specific sites along the Project route: (2) wetlands issues; (3) vegetation management including restoration of the construction right-of-way and mitigation of the long term impacts of the Project on the flora of the construction right-of-way; (4) permit requirements; (5) invasive species; (6) rare and threatened plants; (7) sites where horizontal directional drilling would be used; and (8) greenhouse gas emission reporting.

VGS and ANR agree that with the implementation of the conditions outlined and required in their MOU that the Project will not result in an undue adverse impact to the natural environment and request that the Board adopt the terms and conditions of the MOU in any Order and CPG issued for the Project.

VGS-CSWD MOU

On October 10, 2013, VGS and the CSWD executed an MOU, that was filed with the Clerk of the Board on October 11, 2013 ("VGS-CSWD MOU") and is hereby entered into the record of this proceeding.[9] The VGS-CSWD MOU addresses re-routing of the Project and limitation of Project impacts on CSWD's Redmond Road properties in Williston, Vermont, in return for CSWD support for the Project's CPG. CSWD and VGS recommend that this Order and CPG be conditioned on the terms of the MOU.

VGS-Middlebury MOU

On October 29, 2013, VGS and Middlebury executed an MOU that was filed with the Clerk of the Board on November 7, 2013 ("VGS-Middlebury MOU") and is hereby entered into the record.[10] The VGS-Middlebury MOU reflects Middlebury's support for the Project

9. This MOU was filed by VGS and reviewed by the Board after the evidentiary record of this proceeding was closed. As such, there was no opportunity for objection by the parties prior to our consideration of the MOU and its late entry into the record of this proceeding. Generally, material received after closure of the evidentiary record is not considered by the Board, but in this instance the Board finds good cause to reopen the record and incorporate this MOU. In particular, this will serve to encourage the development of MOUs that address issues before the Board, thus justifying deviation from the general rule. Moreover, if we were not to incorporate the MOU into the record, we would be basing our decision on a route that we know is opposed by CSWD and that VGS has already agreed to modify. Nonetheless, consistent with the fact that this MOU is being introduced into the record after the close of evidence, we now give the parties ten days from the date of this Order to state any objection to the entry of this MOU into the record. Any objection shall: (1) be in writing with notice to all the parties; (2) clearly state the evidentiary basis for the objection; and (3) articulate how the objecting party's interests are negatively impacted by its entry into the record.

10. As with the VGS CSWD MOU, this MOU was filed by VGS and reviewed by the Board after the evidentiary record of the this proceeding was closed. Therefore, consistent with the fact that this MOU is being introduced into the record after the close of evidence, we now give the parties ten days from the date of this Order to state any objection to the entry of this MOU into the record. Any objection shall: (1) be in writing with notice to all the

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conditioned upon specific concerns agreed to by VGS. The terms of the VGS-Middlebury MOU address: (1) siting, distribution system costs, and construction schedule; (2) emergency management training; (3) Project aesthetics: and (4) traffic concerns. Upon the inclusion of the MOU's conditions in this Order and CPG, Middlebury agrees that the Project promotes the general good of the state and will not unduly interfere with the orderly development of the region.

III. EVIDENTIARY ISSUES

After the technical hearings the Board ruled on four evidentiary issues arising from, but after, the technical hearings. In this section of the Order we summarize our rulings.

VGS's Filing Regarding the Hearing Transcripts

On October 4, 2013, VGS filed a letter detailing for the benefit of the Board and the Parties several "transcript corrections and clarifications." The Company cited 36 transcription notations. In some instances VGS has pointed out what appear to be simple stenographic errors, while in other instances the Company apparently wishes to change words that were recorded by the court reporter. Finally, there are two instances where VGS simply indicates a desire to correct two mistaken statements made under oath by its witness, Mr. Heintz. The Company's filing contained no request to reopen the evidentiary record, nor did it otherwise indicate what remedial action, if any, VGS was seeking in making this filing.

VGS's request is somewhat unclear. To the extent that VGS was attempting to substantively change the hearing transcripts, the Company should have filed a motion pursuant to V.R.C.P. 60(a), which provides for the correction of errors in the record due to "oversight or omission." In the absence of a duly-supported Rule 60(a) motion, and in the absence of any indication in VGS's filing that (1) the alleged errors are material in nature and (2) the Company has first attempted to address its transcription concerns to the court reporter who transcribed the

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10. (...continued)
parties; (2) clearly state the evidentiary basis for the objection; and (3) articulate how the objecting party's interests are negatively impacted by its entry into the record.

testimony at issue, we decline to review all of the transcript citations identified by the Company to determine whether or not the alleged errors are sufficiently material to warrant reopening the evidentiary record to make any corrections. Nor would it be fair to other parties if we were to unilaterally alter the evidentiary record based on VGS's representations to introduce changes that other parties have had no opportunity to test through cross-examination. Our ruling is made without prejudice to any party's ability to file a motion for reconsideration in the event that any one of the allegedly errors identified by VGS proves to be material to either our findings or our decision.

To the extent that VGS seeks to correct the transcript because it has identified a location in which the written transcript does not match the oral testimony, VGS needs to direct its request to the court reporter. Each official transcript of a technical hearing is certified by the court reporter to be the testimony stenographically recorded by that court reporter, and transcribed to the best of his or her ability. The court reporter's transcript certification is a personal act on the part of the court reporter — it is not an act we can simply undo by consenting to adopt the Company's after-the-fact proposed corrections or amendments to the testimony given. Thus, in the first instance, it is for the court reporters in our proceedings to determine whether, based on their stenographic notes, it would be appropriate to accept requests for corrections and clarifications from the parties prior to certifying the transcript. The court reporter is responsible for the accuracy of the transcript in Board proceedings and must certify to the accuracy of the transcript.

The Cornell Report and the Rhodes Report

During the technical hearings, Dr. Heather M. Darby appeared as a witness for Mr. Palmer and testified live to supplement her prefiled direct testimony. In her testimony at the hearing, Dr. Darby referred to a document identified as the "Cornell Report." After the technical hearings, on September 18, 2013, Mr. Palmer provided written answers from his witness, Mr. Curt Freedman, to questions posed by the Board by memorandum issued during the technical hearings in lieu of requiring Mr. Freedman to appear in person to offer prefiled direct

testimony.[11] In his written answers, Mr. Freedman provided a citation to a document identified as the "Rhodes Report." Mr. Palmer has not sought to enter either the Cornell Report or the Rhodes Report into evidence. Nor were these reports produced to the other parties before Mr. Freedman's supplemental written testimony was conveyed to the Board or before Dr. Darby took the stand during the technical hearings. However, the Rhodes report was mentioned in Mr. Freedman's prefiled testimony, so VGS had the opportunity to obtain it through discovery. No party objected to the testimony of Dr. Darby or the written answers from Mr. Freedman to the Board's questions.

On October 7, 2013, VGS requested that the Board exercise its discretion and enter into evidence both the Cornell Report and the Rhodes Report. The Company attached to this filing a copy of the Cornell report, *Using Soil Health Indicators to Follow Carbon Dynamics in Disturbed Urban Environments – A Case Study of Gas Pipeline Right-of-Way Construction,* R.R. Schindelbeck and H.M. van Es, rrs3@cornell.edu.

On October 9, 2013, Mr. Palmer objected to VGS's motion to admit the Cornell Report and the Rhodes Report into evidence.

We deny VGS's' motion to admit the Cornell and the Rhodes reports. We have not examined either document and have not relied upon them as evidence in this proceeding.

IV. POSITIONS OF THE PARTIES

The summaries below reflect positions of the parties articulated in written briefs and reply briefs submitted after the technical hearing and the closing of the evidentiary record.

Vermont Gas

Vermont Gas contends that the Project is needed and will promote the general good of the state for the following reasons:

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11. Mr. Freedman submitted prefiled testimony. No party sought to cross-examine him, however, so the parties proposed that Mr. Freedman's testimony be admitted without requiring him to appear. The Board agreed to this process, subject to the condition that he respond in writing to certain questions from the Board and that his responses would be entered into the evidentiary record. No party objected to this procedure. The Rhodes report itself was incorporated by reference into these responses.

- This Project is the Company's 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.
- The construction and operation of infrastructure projects, such as this Project, will have impacts to the natural areas and landowners along the route but these impacts have been effectively addressed by VGS's proposed construction plans and the MOUs entered into between Vermont Gas and the various parties.

The Vermont Department of Public Service

The Department maintains that the pipeline and associated infrastructure at issue in this proceeding constitute an important addition to the service territory of Vermont Gas, and that the Project is needed to provide significant economic and environmental benefits to the state. The Department contends that with appropriate conditions and post-certification review procedures, construction of the Project will not have undue adverse effects, will satisfy the criteria set forth in 30 V.S.A. § 248, and will promote the general good of the state. Accordingly, the Department recommends that the Board issue a CPG with the following conditions and post-certification review procedures: (1) VGS filing a petition for approval of a petition addressing bio-methane development; (2) VGS filing a revised map with supporting testimony of the final Rotax Road re-route plan; (3) VGS conducting a post-construction assessment with the Department of all landscape mitigation 30 days after completing all construction; (4) VGS filing a report with the Board highlighting the results of its mitigation efforts and including any disagreements requiring

Board resolution; (5) VGS conducting post-construction noise monitoring; (6) VGS construction of the New Haven gate station reflecting site-specific mitigation requirements including paint scheme and human-operated lighting; and (7) VGS using all additional safety measures recommended by the Department.

ANR

ANR maintains that with the mitigation measures and terms and conditions outlined in the VGS-ANR MOU, exh. VGS-ANR-Joint-1, the Project will not result in an undue adverse impact to the natural environment. In addition, ANR recommends that the Board impose as a condition of any CPG issued for this Project, that VGS be required to obtain all necessary state and federal permits for the entire Project (not segments of the Project) before commencement of construction or ground clearing, including the Vermont Stream Alteration Permit, the Vermont Wetland Permit, the 401 Water Quality Certification, the National Pollutant Discharge Elimination System ("NPDES") Stormwater Permit, and the Army Corps of Engineers Section 404 Permit.

VTrans

VTrans does not object to the Project, but maintains that its position is conditioned upon VGS meeting whatever conditions may be imposed by the right-of-way permit applied for by VGS pursuant to 19 V.S.A. § 1111 on November 28, 2012, and on VTrans reaching agreement with respect to the amount of compensation to be paid by VGS to VTrans for locating Project facilities within the VT 289 (also referred to as the Circumferential Highway or "CIRC") right-of-way.

CLF

CLF contends that the supporters of the proposed project have failed to demonstrate that the Project will promote the general good of the state, or that it satisfies all the 30 V.S.A. § 248 criteria. CLF maintains that by presenting a very narrow and far too limited analysis of the Project's impacts, both VGS and the Department have supported a project that will not allow

Vermont to meet its aggressive and necessary clean energy goals. CLF insists that the Project as proposed cannot advance the general good of Vermont because it consists of major new fossil fuel infrastructure that will be in place for decades, will cost over $90 million, and will add greenhouse gas emissions to the atmosphere. CLF recommends that the Board deny VGS a certificate of public good for the Project. In the alternative, CLF recommends that the Board approve the Project only with specific conditions that reduce gas and overall fossil fuel use commensurate with the requirements of meeting 90% of Vermont's energy needs with renewable energy.

ACRPC

ACRPC states it has spent considerable time and resources evaluating the Project's benefits to and impacts on the Addison region. ACRPC recommends that the Board issue VGS a CPG for the Project, subject to appropriate conditions including those contained within the VGS-ACRPC MOU (exh. ACRPC supp. TB-2). ACRPC contends that prior to allowing VGS to operate the Project, the Board should require VGS to provide local responders with the equipment and training necessary to detect, and if appropriate, shut off gas within the distribution system. To this end, ACRPC specifically recommends that, along with the terms of the VGS-ACRPC MOU, the Board should require VGS to supply each local emergency response agency operating in the Project area with (1) dedicated methane gas detection meters and the ancillary equipment necessary to maintain and calibrate those meters, and (2) non-sparking wrenches to allow responders to shut off gas at the meter, if they deem that action appropriate. Finally, ACRPC recommends that the Board find that the Project will support the development of bio-methane in the region, but refrain from requiring further action by VGS supporting any particular pricing model for bio-methane.

New Haven

The Town of New Haven does not object to the issuance of a CPG to VGS for the Project, provided that certain conditions are included relative to the New Haven gate station and the route within the Town of New Haven. In particular, New Haven is concerned that noise

generated by the gate station be strictly limited, and that post-construction testing be required to ensure compliance with the noise standards imposed. Further, New Haven recommends that the Board condition its approval of the CPG on aesthetic and design elements including those made by the Department and summarized above.

Monkton

Monkton requests that the Board condition this Order and approval of the CPG upon (1) VGS's compliance with the VGS-Monkton MOU (exh. Monkton SP-2) and (2) the use of horizontal directional drilling for Project construction on the Palmer property. Monkton states that one of its major goals in negotiating the MOU was to achieve a 300-foot setback of the pipeline from residential properties. Monkton contends that it is not possible to achieve this setback goal at all residences, in particular the Palmer property, but that the siting plan agreed upon in the MOU, rather than use of the VELCO corridor, most closely achieves Monkton's major goals while mitigating the Project's negative impacts.

CSWD

CSWD contends that, given the public interest in CSWD's solid waste management activities and responsibilities, the Board should require that the terms of any CPG issued to VGS in this docket and the siting of any pipeline in or on CSWD's properties at Redmond Road be fully consistent with the VGS-CSWD MOU so as to address CSWD's current use and proposed use of such properties for solid waste management purposes.

VELCO

VELCO requests that if a CPG is issued, then the Board should approve the siting of the pipeline in the Rotax Road area as set forth in VGS's February 2013 filing, with such modifications as the Board deems necessary to promote the public good. In the alternative, if the Board decides to site the Project in the VELCO ROW despite the additional landowner impacts, significant additional cost, inherent physical constraints, Monkton's opposition, and electric transmission system impacts, then the Board should require that the pipeline be sited (with the

exception of the necessary ROW crossings) ten feet in from the edge of VELCO's ROW with a minimum fifty-foot clearance from VELCO's current and future electric transmission structures, and otherwise in accordance with the VGS-VELCO MOU (exh. VELCO PWL 2). VELCO further recommends that the Board reject the Department's suggestion that the evidentiary record be re-opened to explore intra-VELCO corridor siting alternatives and rely instead upon VGS's February 2013 filing.

VFDA

VFDA notes that its participation was limited to issues of environment and economics and contends that, on these issues alone, the petition should be denied. VFDA maintains that VGS failed to show convincingly that: (1) the Project is likely to bring net economic benefits to Vermont; (2) the goals of the Vermont Comprehensive Energy Plan can coexist with the operation of the pipeline; and (3) the Project will meet the greenhouse gas reduction goals articulated by the legislature in 10 V.S.A. § 578.

The Palmers

The Palmers oppose the Project both because they contend it will not serve the public good of the state and because the Project will have undue adverse impacts to the aesthetics, soil health, water content of the soil, and future development of their land. They maintain that the Project will not serve the public good for three reasons. First, the Project is inconsistent with the Vermont law that prohibits hydraulic fracturing as a means of obtaining natural gas within the state. Though the Project does not involve hydraulic fracturing in Vermont, the Palmers contend that the Project relies upon hydraulic fracturing in that it will serve to deliver natural gas derived from hydraulic fracturing from Canada. Second, the Project is not a good investment for Vermont because it is contrary to the stated goals of the Vermont CEP and benefits only a few Vermonters in Addison County who will save money on their heating bills. And finally, the Project will not serve the public good because it will dampen efforts at creating alternate renewable, sustainable energy sources. As to the undue adverse impacts on their property, the

Palmers maintain that they cannot accept the pipeline on their property and that the Board should direct a Project re-route wholly within the VELCO ROW in the Rotax Road area.

The Hurlburts

The Hurlburts recommend that the Board deny the petition because it relies upon natural gas from western Canada that is extracted by hydraulic fracturing. Alternatively, the Hurlburts recommend that the Board delay any decision in the matter until all of the contract negotiations and final agreements between VGS and private landowners have been completed. These efforts will finalize the Old Stage re-route, outlined in exh. Pet. Surr. JH-1, that mitigates impacts on the Hurlburts' property by removing the pipeline from a maple forest into the VELCO ROW on the other side of the road. The Hurlburts maintain that there are still many issues that have not been resolved, including the final re-routing plan which the Hurlburts recommend should be in the VELCO ROW.

David Carse and Elizabeth Hazen

David Carse and Elizabeth Hazen reiterate the request of the Hinesburg Selectboard and the recommendation of the Department and request that VGS and the Board consider and encourage the co-location of the Project in or adjacent to the VELCO ROW.

V. PUBLIC COMMENT

We have received hundreds of comments regarding the proposed Project. We take this opportunity to express our gratitude to the many members of the public who took time and attention away from their families and personal pursuits to provide us with feedback — whether in writing or by speaking at our public hearings — that helps inform our review and judgment in this case. The large number of comments we received reflects the scope of the Project and its significance to the people of our State.

Under Vermont law, the Board is required to base its decision upon the formal evidentiary record compiled pursuant to the contested case process, the hallmarks of which are sworn testimony and cross-examination during the technical hearings. Public comments do not

constitute formal evidence because they are not delivered under oath, and they are not subject to cross-examination pursuant to the Vermont Rules of Evidence or the Vermont Rules of Civil Procedure, both of which we are required by law to apply in this contested case proceeding.

Nonetheless, we wish to assure the public that the comments they have taken the time and care to provide to us in fact did play an important role in drawing our attention to significant issues and perspectives that we have considered in reaching our conclusions in this case. Though these comments cannot and did not form the basis of our judgment, we emphasize that they have been of considerable help to us in identifying and exploring issues not raised by the parties and in evaluating and considering how our decision and its impacts will affect the lives of citizens throughout Vermont.

What follows is a summary of the remarks and impressions that have been conveyed to us in this case through the public comment and hearing process:

Economic Benefits

- Comments have been made that the Project will deliver significant economic benefits: the increased availability of natural gas will provide more Vermonters with a lower-cost, efficient and cleaner source of fuel for residential and commercial uses; it will promote vital development for the economy of Addison County by attracting and growing businesses; it will facilitate eventual economic expansion in Rutland County, where as of now, Vermont communities fail to attract new businesses because natural gas is not available as a fuel source for production; it will increase tax revenues for local communities that host the pipeline; it will reduce the noise and air pollution of truck traffic along congested highways and through villages; it will create and preserve high paying jobs in the region.
- Concerns have been expressed that the economic benefits of the pipeline are not as high as the proponents of the Project claim. It is said the Company's assertion that natural gas is inexpensive compared to other fuels has been made at a moment in time when the price of natural gas has hit its low point, and ignores forecasts of dramatic price increase. Alternatively, there have been comments to the effect that the anticipated switch to natural gas by new VGS customers in Addison County will force up prices for other fuels as the fixed costs of delivering these alternative fuels will have to be borne by the reduced number of remaining customers who use them.

Low-income assistance

- There were comments observing that making natural gas available for low-income Vermonters in Addison County will help these citizens keep their families and homes warm by making their bills more affordable because they will have access to the low-income rate discount program offered by Vermont Gas.

Environmental impacts

- Many Vermonters have expressed the view that there is an urgent, present need to shift away from continued reliance upon fossil fuels, and that the Project will detract from addressing this need by increasing fossil fuel consumption and diverting resources away from investment in energy efficiency measures and the development and deployment of renewable energy resources and technologies in Vermont.
- Other Vermonters have expressed the view that increasing the availability of natural gas as a fuel source is an improvement for the environment as it will displace the use of other fossil fuels with more negative environmental impacts and will serve as a bridge to greater use of renewable energy as these resources and technologies become more robust and available in Vermont.

- There is concern that the construction of the Project and the subsequent presence of its pipe infrastructure on some lands will disturb agricultural soils and will have adverse impacts upon wetlands and water resources.
- Some concerns have been raised about the need for environmental monitoring during and after construction of the Project to ensure that it is not needlessly destructive of the lands where it is sited, and that the Project does not introduce or spread invasive species in ecologically sensitive areas such as the swamp lands in Monkton; the Board also received detailed comments about the legal requirements that exist to protect shade trees and the need for VGS to be duly mindful of these constraints in planning and implementing the Project.

Greenhouse gas emissions

- We have received comments supporting the Project because it will reduce greenhouse gas emissions, specifically, through the use of clean, efficient and less expensive natural gas as a fuel source for residential and commercial purposes, as well as by reducing existing heavy truck traffic for fuel delivery and making natural gas available to fuel trucks that haul waste.

- Other comments have opposed the Project, stating that its potential to reduce green house gas emissions is overstated, if not outweighed by the detrimental environmental impacts of natural gas production, transportation and distribution.

Hydraulic Fracturing

- In 2012, the Vermont Legislature passed a law banning the practice of hydraulic fracturing, a process for extracting natural gas from underground that entails using pressurized water to create fissures through which natural gas emerges and is then brought to the surface for movement to market. (H.464, May 16, 2012). Several public comments received by the Board have shared concerns about the safety of this practice, in particular its potential to contaminate ground water. The fuel that Vermont Gas proposes to import into Vermont and to distribute through the Project pipelines is likely to be the product of hydraulic fracturing in other jurisdictions such as Alberta, Canada. To some Vermonters it seems unethical and immoral for the State of Vermont to ban the practice within its borders, while nonetheless permitting the purchase of hydraulically-fractured gas produced in other jurisdictions to be imported and used within Vermont.

Pipeline Siting

- Several comments expressed the view that the Project should be sited within the existing transmission corridor that is presently occupied by VELCO pursuant to a right-of-way easement, preferably on the west side of the corridor in some places. Others maintain that the line should not be sited through town centers or along Vermont Route 7, a transportation corridor along the western side of the state that is heavily traveled and congested in some places. Yet others insist we should decline to site the pipeline altogether.

Safety

- Safety concerns have been expressed, particularly by individual property owners who either demand that set-backs be required from the Project pipeline or who would prefer not to be near the pipeline at all. More generally, some comments have emphasized the view that the transmission and distribution of natural gas — a hazardous material that is not "natural" in the conventional sense of the word — is an activity that inherently is not safe and therefore should not be encouraged through construction of the Project.

Fairness of the Process

- Questions have been raised about the conduct of Vermont Gas in pursuing the Project. The Board has received comments maintaining that there have been unauthorized entries upon private property, and that the Company has communicated poorly about its vision and plans for siting and construction.
- Some comments have suggested that there is a need for the Board to order VGS to provide funding for lawyers to represent landowners in the Board's review process and in right-of-way easement negotiations with the Company.
- We have received comments stating that our public hearing process has not been well explained or well conducted, and that there were Vermonters who had no opportunity to address themselves to the Board because too much of the public hearing time was allotted to individuals from outside of Vermont.

Fairness of the Project

- Concerns have been raised about the fairness of the Project. There are affected landowners along the route of the Project who anticipate their property value will decrease and who question whether they will receive fair compensation for assuming the burden of the pipeline's presence, while others insist that no fair compensation is possible because they do not consent to the presence of the pipeline on their property.
- Other comments state that it is unfair to impose the burdens of the Project on landowners who will not receive natural gas service because it is too expensive to tap the pipeline for distribution to them. More generally, some comments question whether it is right to compel Vermonters to accommodate the costs and disruption of the pipeline so that corporate interests such as International Paper may have access to inexpensive fuel to generate profit for its shareholders.

Although it is not possible for us to respond to each concern individually, we find it may be productive to address the public comments we have received in general terms. As today's Order reflects, most of the issues raised by the public were pursued at length and in detail by the parties who participated in this proceeding. Thus, today's Order details how we have weighed the facts and arguments surrounding these issues, and our ultimate judgments as to how best to resolve them. We have made every effort to state our findings and to explain our conclusions transparently, recognizing that reasonable minds no doubt can and will differ with the judgments we have made and the ultimate outcome we have reached.

In some instances, however, the public comments have raised important points that we simply cannot properly address as part of the merits of the case. Instead, on these topics we offer the following observations.

Fairness of the Project

After a searching review of the evidence and legal arguments in this case, we find the Project will promote the general good of the state with the conditions that we have included in this Order. We are persuaded by the evidence that the Project can be constructed, with the alterations required by the Order, without undue adverse impacts on Vermont's natural and built environment, and without posing a risk to the health and safety of Vermonters. We recognize the significant likelihood that this Board has never made a siting decision for the benefit of Vermonters at large without causing a degree of individual loss, pain or frustration for at least some Vermonters who are negatively affected by the reach of our decision. We regret these individual impacts very deeply. In this case, where possible, we have sought to narrow and otherwise mitigate these individual impacts when it has been feasible to do so by modifying the Project without undermining the general good to be achieved by granting a CPG for its construction.

It is important to keep in mind that the Public Service Board is a quasi-judicial entity that is limited in its jurisdiction and powers of decision. At times, these limitations are obscured by the prolific nature of the cases the Board is called upon to review and resolve through contested case proceedings. The Board does not have unlimited discretion, and the Board is not permitted by law to decide all matters of consequence that may attend any given project that is proposed for review. Rather, as in this case, it is our duty to apply 30 V.S.A. § 248 in good faith as we seek to determine whether the Project will "promote the general good of the state." By its terms, this statutory charge neither permits nor contemplates placing individual needs or individual impacts before the public good. Therefore, it is not within our discretion to deny a CPG for this Project — which we have found will promote the general good of the state — in order to avoid burdening individual landowners and communities in the path of the Project that may not directly benefit today from the infrastructure to be built for the long-desired expansion of natural gas

service into Addison County. However other mechanisms exist outside of Section 248 to address and redress these more particularized impacts, such as civic engagement to effect statutory changes, and the legal process by which fair compensation is awarded for the taking of individual property for public use.

Fairness of the Process

With regard to the several comments we have received from landowners who have complained of unauthorized entries upon their lands by VGS employees and/or subcontractors, we note the Company has frankly acknowledged that such misconduct occurred.[12] Such candor is a welcome and indispensable first step toward restoring trust, but we are disappointed that the Company's behavior gave rise to any need for an apology to begin with. We expect Vermont utilities to be sensitive to the dignity of Vermonters and to respect their rights, particularly when dealing with those individuals whose lands and communities are likely to be burdened by the physical impacts of energy infrastructure that is constructed — sometimes over their objection — to serve the greater public good.

As members of the Vermont Public Service Board, we are ever mindful of the extraordinary public trust vested in discharging our duties to the citizens of Vermont. For this reason, we make every effort to proceed with respect and care in meeting the public and providing a forum for decision for the parties who participate in the proceedings we conduct under the auspices of Vermont law. Our state enjoys a proud heritage of robust participation in spirited debates about public policy, particularly in its everyday applications. It is a privilege and an honor to receive our fellow citizens when they seek to engage these questions in our proceedings, and we take seriously our legislative charge to ensure that Vermonters receive fair opportunity to impart their views to us. This is why, at our public hearings, we insist that the public do the talking, while we listen. This is why, in the face of the limited time available for public hearings, we urge the public to share their views with us in detail in writing, which we then review and carefully consider. Our desire to hear all views is also why at the second public

12. Tr. 9/16/13 at 146 (Simollardes).

hearing we encouraged those who had been heard at the first public hearing to wait until after we heard from those whose views had not yet been heard by us to go first.

It is important to note that the public hearings we conduct are not the equivalent of trials or our technical hearings, where testimony becomes evidence to be used in rendering legal decisions. Nor are our public hearings the equivalent of town meetings, where statements and motions become calls for action by elected officials and on which votes are taken. The processes for conducting trials and town meetings are governed by very strict rules for notice and participation — a reflection of the gravity of the consequences and actions that are apt to result from these processes. By comparison our public hearings are conducted with less formality, because, by law, they are more modest in purpose and more limited in scope. Above all, the success of our public comment process depends on our fellow citizens' willingness to participate in good faith, with the mutual respect for differences and the cordiality that characterize a functional public forum.

In our institutional experience, no two cases before the Board are ever the same. Therefore, flexibility and informality in how we conduct our public hearings is desirable, because it allows us, among other things, to take into account the magnitude of the public interest and the degree of controversy that attends any given case as we endeavor to provide Vermonters with a fair and meaningful opportunity to speak their minds while we listen. This flexibility and informality does mean, though, that our processes for our hearings are not always the same — this is a reflection of adjustments we make as we learn more from the public about the case we are considering.

For instance, as is our custom, we conducted the March of 2013 public hearing in this case on a "first come first serve" basis for speakers. However, following that hearing, we received criticism indicating that too many supporters of the Project were permitted to speak early in the hearing, when there was more media coverage, and that the effect was to distort public perception of the Project by overemphasizing its positive attributes. Some of this criticism resonated with our own perception — and disappointment — that the proponents of the Project had engaged in deliberate "front loading" when signing up to speak. In response, we attempted to adjust our process for the public hearing in September of 2013 to ensure that the

diversity of views about the Project would find an improved distribution of expression as we listened to the public — hence our decision to employ the alternating "pro-then-con" rule for taking comments, an approach often used in the Legislature when public hearings are held. As it turned out, this adjustment produced fresh criticism that our public hearing process had created a false impression of parity among the competing views about the Project. Our adjustment also brought us more cause for disappointment when some members of the public shouted down speakers and engaged in other disruptive conduct that intimidated and deterred their neighbors from speaking their minds.

Just as we are mindful of the public trust we hold, we are also mindful that there is always room for improvement in how we do what we do. Accordingly, we welcome all of the input and feedback we have received from the public. We have taken it to heart, and we assure our fellow Vermonters that these experiences will guide us in the future as we continue to administer our public hearing process. At the same time, we would be remiss if we did not reiterate that our public hearings function best when participants speak plainly and keep to the Vermont way by treating each other with dignity and respect, however deep their differences may run. Attempts to orchestrate the content or impressions of our public hearings simply are not effective. Rather, they are offensive to the public spirit and unhelpful to the public discourse in our state.

VI. FINDINGS

Based on the petition, accompanying documents, and testimony, the Board makes the following findings in this matter.

A. Description of the Project

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. 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).

4. Today, Vermont Gas serves approximately 45,000 customers in Franklin and Chittenden counties, but holds a CPG to serve the entire state. Petition at 1; exh. Pet. ADG-1.

5. VGS's plan for expanding natural gas service to Addison County is the first step toward a long-term plan to serve Rutland and eventually connect Vermont to the U.S. natural gas system. Gilbert pf. at 9.

6. Originally, VGS contemplated 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. James B. Howe, VGS ("Howe") pf. at 15.

7. 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 pf. at 15–16.

8. 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 to allow for potential future extension of the pipeline to Rutland. A. Donald Gilbert, VGS ("Gilbert") pf. at 9; Howe pf. at 16.

9. 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). Stephen J. Wark ("Wark") pf. at 6.

10. The Project includes the following principal components:

- 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");
- 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

- Three new pressure regulation stations ("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.

John Heintz, VGS ("Heintz") pf. supp. at 2-3.

11. 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 reduce landowner, environmental or cultural resource impacts. Tr. 9/17/13 at 54-56 (Heintz).

12. The Project schedule calls for construction to be completed by Fall 2014 in order to bring gas service to anchor customers in the Middlebury Industrial Park by late 2014. VGS has requested that the Board issue a CPG before the end of 2013. This would permit VGS to commence horizontal directional drilling ("HDD") activities in early February 2014, as currently planned, and to meet the overall Project schedule. Tr. 9/17/13 at 124 (Heintz).

13. VGS projects that a failure to achieve this schedule will likely have adverse impacts on overall Project cost. Tr. 9/17/13 at 55 and 124 (Heintz).

The Colchester Tie-In

14. 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"[13] launcher. Heintz pf. supp. at 7; Heintz pf. reb. at 10; exh. Pet. Supp. JH-4.

15. 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 pf. supp. at 7; exh. Pet. Supp. JH-4 .

13. A PIG ("pipeline inspection/intervention gauge") 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.

The Transmission Mainline

16. The Transmission Mainline will pass through the Towns of Colchester, Essex, Williston, St. George, Hinesburg, Monkton, New Haven, and finally Middlebury. Heintz pf. supp. at 2; exh. Pet. JH-3.

17. 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 CIRC ROW. This segment of the Project corridor is approximately 11 miles from the Colchester Tie-In, and extends though 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 pf. supp. at 8; exh. Pet. Supp. JH-3.

18. VGS re-routed the Project from the CIRC alignment on the southern side of the Winooski River. Thus, rather than being located at that point 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 pf. supp. at 19-20; exh. Pet. Supp. JH-3.

19. This change was undertaken by VGS prior to the December 20, 2012, filing following input from regulators and stakeholders in order to avoid some and to minimize other potential impacts to forested wetlands and wetland habitat. Heintz pf. supp. at 19-20; exh. Pet. Supp. JH-3.

20. In the VGS-CSWD MOU, VGS agreed to the re-route of the Project on Redmond Road in Williston to mitigate the potential economic and future development impact of the CSWD properties located there. VGS-CSWD MOU.

21. 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 pf. supp. at 8; exh. Pet. Supp. JH-3 (6/28/13).

22. 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 having considered construction constraints and environmental resource considerations. Wark pf. supp. at 2; exh. Pet. Supp. JH-3.

23. A little over 10 miles of the Transmission Mainline will be located within the VELCO corridor. Tr. 9/19/13 at 66 (Lind).

24. Under the Pipeline Safety Code, 49 C.F.R. Part 192, natural gas pipelines are given a Class location from 1 through 4 to designate the population density of the area in which the pipeline is located. 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. Jean-Marc Teixeira, VGS ("Teixeira") pf. at 14.

25. 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 pf. at 14.

26. 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 pf. reb. at 7; David Berger, DPS ("Berger") pf. reb. at 2; Teixeira pf. reb. at 6; Heintz pf. reb. at 14.

27. The pipeline will have a wall thickness of 0.312 inches for the entire route, with a specified minimum yield strength of 65,000 pounds per square inch ("psi"). Heintz pf. reb. at 14.

28. 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. Pritec is a two-layer anti-corrosion coating designed to protect pipes used in oil and gas and water and waste water pipelines. This coating combines the proven protective qualities of a polyethylene outer coating with a special butyl rubber adhesive. Teixeira pf. at 16.

29. Those segments of the pipeline installed by horizontal directional drilling will have an additional abrasion resistant coating over the external corrosion control coating. A rectifier system will provide cathodic protection. Teixeira pf. at 16.

30. 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 pf. at 16.

31. The design calls for the installation of trench breakers at specified intervals along the pipeline, based on surface topography. The trench breakers will be filled with bentonite and will reduce the trench's overall transmissibility of water while still allowing some water to pass. Heintz pf. reb. at 22; *see* sheet ANGP-T-G-015 of exh. Pet. Supp. JH-3.

32. 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 pf. at 22.

33. The installation of these mitigation devices will minimize impacts associated with the installation of the pipeline trench. Heintz pf. at 22.

Distribution Mainlines

34. The Distribution Mainline to Vergennes is an approximately 3.7-mile segment of 6-inch polyethylene 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. Heintz pf. supp. at 22; exh. Pet. Supp. JH-5.

35. The distribution network for the City of Vergennes will begin at this point. Heintz pf. supp. at 22; exh. Pet. Supp. JH-5.

36. 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 pf. supp. at 22–23; exh. Pet. JH-5.

37. The Project will initially make natural gas service available to approximately 3,000

homes and businesses in the Middlebury and Vergennes areas. Timothy S. Lyons, VGS[14] ("Lyons") pf. at 4; exhs. Pet. TSL-1.1, TSL-1.2.

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

39. The Project will help enable VGS 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 pf. at 6.

40. VGS will exercise reasonable best efforts to extend gas service to Bristol, Monkton, and New Haven within two years following the operational start of the Project. Based on current planning, these communities could receive natural gas service by 2017. Exh. ACRPC Supp. TB-2 at 3.

41. VGS will exercise reasonable best efforts to extend gas service to East Middlebury within three years following the operational start of the Project. Exh. ACRPC Supp. TB-2 at 3; VGS-Middlebury MOU.

42. 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.

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

44. 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.

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14. After Mr. Lyons submitted his prefiled testimony and exhibits, he left the employ of VGS. His testimony and exhibits were sponsored by VGS's witness Eileen Simollardes.

Gate Stations

45. 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 pf. supp. at 23-24; exh. Pet. Supp. JH-7, 8 and 9.

46. The first gate station will be located near Route 2 in Williston to reinforce the existing distribution system. Heintz pf. supp. at 23-24; exh. Pet. Supp. JH-7.

47. A second gate station will be located on Plank Road in New Haven to provide natural gas service to Vergennes. Heintz pf. supp. at 25; exh. Pet. Supp. JH-8.

48. 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 pf. supp. at 27; exh. Pet. Supp. JH-9.

49. 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 pf. at 16.

50. 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 SCADA[15] building, and an approximately 8-foot wide by 12-foot long concrete pad on which the pipeline heater will be mounted. Heintz pf. supp. at 23-27; exh. Pet. Supp. JH-7.

51. 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's gas controllers. Additionally, each station will have redundant regulator runs with a working and monitor regulator set-up for over-pressure protection. Teixeira pf. at 16-17; exhs. Pet. Supp. JH-7, JH-8, JH-9.

52. 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

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

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 pf. supp. at 24-27; exh. Pet. Supp. JH-7.

53. Access to each gate station will consist of a 15-foot wide stabilized pervious surface underlain by geogrids to reinforce the soil. The parking areas will be large enough for two vehicles and will consist of the same surface material as the access drive. Heintz pf. supp. at 30.

54. 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 the DPS and the communities. Michael J. Buscher ("Buscher") pf. supp. at 3; exh. Pet. Supp. MJB-2.2, Appendix A; tr. 9/18/13 at 132 (Buscher); David Raphael, DPS ("Raphael") pf. supp. at 1-2; exh. DPS DR-1 at 9-10.

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

Valves

56. Eight sectionalizing mainline valves will be installed along the Transmission Mainline. Heintz pf. supp. at 30-31; exh. Pet. Supp. JH-3 (6/28/13).

57. 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 pf. supp. at 30.

58. The valve placement along the Transmission Mainline will exceed the requirements of Code 49 C.F.R. Section 192.179 (Transmission Line Valves). Heintz pf. supp. at 30.

59. 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 pf. at 15.

60. 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 pf. at 15.

61. 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 pf. at 15.

Project Construction

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

a. The construction is expected to be sequenced from north to south although there will be multiple construction sections called "spreads."

b. The route is first cleared and temporary work areas are prepared.

c. Perimeter erosion control measures, such as silt fences, are installed along sensitive resource areas such as stream edges and wetlands to control sediment.

d. In the elements of the Project that do not involve horizontal directional drilling, a trenching process will be used. 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.

e. 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 feet of cover at open cut streams.

f. The landscape will be restored as close as possible to pre-construction conditions in accordance with applicable permit requirements.

Heintz pf. supp. at 31-32; exh. Pet. Supp. JH-3.

63. VGS has identified locations where construction crews will have access to the Transmission Mainline corridor as well as temporary work areas for equipment and materials

staging areas. Heintz pf. supp. at 33-34; exh. Pet. Supp. JH-3.

64. 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 during construction. Heintz pf. supp. at 17-18; exh. Pet. Supp. JH-4.

65. 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 pf. at 18; exh. Pet. Supp. JH-3.

66. 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 ("EPSCP"). Heintz pf. supp. at 18; Attachment 1 to Exh. Pet. Supp. JAN-9.

67. 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 pf. supp. at 19-20; Heintz pf. reb. at 18; exh. Pet. Supp. JH-4; exh. Pet. Supp. JH-15, exh. Pet. Supp. JH-16; Attachment 1 to exh. Pet. Supp. JAN-9.

68. 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. A soil horizon is a layer parallel to the soil surface, whose physical characteristics differ from the layers above and beneath. Each soil type usually has three or four horizons. Horizons are defined in most cases by obvious physical features, chiefly color and texture. Water dissolves and removes nutrients as it passes through the soil horizon. Heintz pf. supp. at 20.

69. In some areas, VGS will employ coffer dams for stream crossings and will use matting for all work in wetland areas. Heintz pf. supp. at 20.

70. Silt fences and other erosion control techniques will be used, as well as matting and construction limit barriers. Heintz pf. supp. at 20-21.

Horizontal Directional Drilling

71. To avoid or minimize impacts to certain streams, rivers, wetlands, and other sensitive resources, VGS will employ HDD at a minimum of 15 locations at a total cost of approximately $5.5 million. HDD is a steerable system by which pipes, conduits, and cables are installed in a shallow arc using a surfaced launched drilling rig rather than by trenching. Traditionally HDD is applied to large scale crossings such as rivers in which a fluid-filled pilot hole is drilled without rotating the drill string, and this is then enlarged by a wash over pipe and back reamer to the size required by the product. This technology has been in existence since the 1970's. It is currently an efficient, safe, cost-effective method for utility bores and is the current industry standard for trenchless technology for bores between 2- and 48-inch diameters and 600 ft. to 1800 ft. in length. The HDD areas that VGS has identified are:

Indian Brook, Mile-Post ("MP") 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:
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 pf. supp. at 19, 21-22; Heintz pf. reb. at 18; exh. Pet. Supp. JH-3; exh. Pet. Supp. JH-15 ; exh. Pet. Supp. JH-16; attachment 1 to exh. Pet. Supp. JAN-9.

72. 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. VGS has not yet determined the costs of these additional HDD locations. Exh. Pet. VGS-ANR-Joint-1 at 3, 6; tr. 9/18/13 at 176, 181 (Sorenson).

73. 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).

74. HDD is not always a construction option due to terrain constraints and accessibility. As an example, there are two locations where HDD was proposed for stream crossings in the February 2013 submittal – Indian Brook at MP 3.6 and Allen Brook at MP 10.3 – that were determined to be not feasible for HDD due to terrain limitations. Heintz pf. reb. at 18-19.

75. VGS has also agreed to maintain only a footpath (rather than a fifty-foot cleared right-of way) 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; tr. 9/18/13 at 176 (Sorenson); Attachment 1 of Exh. Pet. VGS-ANR-Joint-1 at 12-13.

Discussion

For most of the Project, VGS plans to employ trenching. This is consistent with past practices in Vermont.

HDD and trenching have costs that vary based on a number of factors. Chief among these are the physical features of the pipeline site and the costs of site restoration. Industry analysts suggest that either trenching or HDD may be the most cost effective depending upon the nature of the site and the cost of restoration. The trenching procedure to be utilized in the Project, including segregation and layered restoration of agricultural quality top soil, increases the costs. The evidence suggests that, in Vermont, HDD adds costs to the Project. These additional costs are quantified above at $5.5 million, which does not include the $900,000 that

VGS assumed for using HDD on a portion of the Palmers' property.[16]

Based upon the evidence, it appears that the use of HDD at sites with unique archeological, wetland, topographical, and economic issues has been appropriately limited to manage the cost. Though HDD does require specialized equipment and operator training, these costs may be balanced with the costs of effective restoration. This is especially the case in areas such as certain streams, rivers, wetlands, and other sensitive resources where restoration after trenching may be impractical or more costly than using HDD.

On balance, the Project planners, stakeholders, and regulators appear to have engaged in a reasoned dialog resulting in the use of the most cost-effective method, either HDD or trenching, given the varying site characteristics along the Project route. We therefore condition our approval of this Order and CPG upon the use of HDD as articulated in VGS's February 2013 Project plan (as amended to reflect the use of HDD to cross the entire route through the Palmer property) and the VGS-ANR and VGS-Monkton MOUs.

Blasting

76. VGS submitted a Blasting Plan that addressed surveys and notification, monitoring, the sequence of blasting, procedures, security, explosives, qualifications, personnel, licenses and permits, vibration, reports, and blast design. Exh. Pet. Supp. JH-17.

77. Blasting required for the Project (thirty-five percent of the route will require some blasting) 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 best management practices ("BMPs") agreed upon between VGS and ANR. Heintz pf. at 28; Heintz pf. reb. at 17; exh. Pet. Supp. JH-17; exh. Pet. VGS-ANR-Joint-1 at 5 and Attachment 2.

78. 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.

79. VGS will conduct pre-blast inspections of nearby facilities and structures, install

16. This figure also does not include the costs of compliance with the VGS-ANR MOU. There is no evidence in the record that any added HDD costs would alter our judgment that this Project will promote the general good. *See also* Finding 72.

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 pf. at 29.

80. VGS will not use perchlorates in the explosives.[17] Heintz pf. reb. at 17; exh. Pet. Supp. JH-17.

81. 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 at 2.

Discussion

Our approval of this Order and CPG are conditioned on VGS's compliance with all of the procedures in the Blasting Plan, which is hereby adopted. Additionally, along with complying with the Monkton notification agreement in finding 81 above, VGS shall conduct notifications of all the affected municipalities and their school principals or the principals' designees using the same procedures stated in finding 81, above.

B. Review of the Project under the Section 248 Criteria

1. Orderly Development of the Region

[30 V.S.A. § 248(b)(1)]

82. 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 the municipal legislative bodies, and the land conservation measures contained in the plan of any affected municipality. This finding is supported by findings 83 through 183, below.

83. Prior to its initial filing ("December 2012 Filing"), Vermont Gas held meetings with

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17. Perchlorates are defined as contaminants in the Safe Drinking Water Act and are characterized as ignitable hazardous wastes in the Comprehensive Environmental Response, Compensation, and Liability Act.

representatives of each of the affected towns and regional planning commissions. Vermont Gas received feedback at those meetings. Wark pf. at 8.

84. Subsequent to its December 2012 Filing,Vermont Gas undertook additional community outreach efforts and sought additional stakeholder input. VGS then proposed a number of alignment revisions in its February 28, 2013, supplemental filing. Wark pf. supp. at l-2.

85. 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, Waltham, and Vergennes (each of which is a member of the Addison County Regional Commission). Wark pf. at 6; Heintz pf. at 3-4.

86. 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. Wark pf. at 8; Raphael pf. at 8-9.

Town of Colchester

87. VGS currently provides natural gas service to the Town of Colchester. Wark pf. at 8.

88. The Colchester Town Plan, adopted in 2007, anticipates continued expansion of natural gas service 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 pf. at 8-10.

89. The Colchester 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 pf. at 8–10.

90. 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. Wark pf. at 8, 10-11; Jeffrey A. Nelson, VGS ("Nelson") pf. at 5-8.

91. The Colchester Town Manager expressed an interest in furthering natural gas service in

the town, provided their would be no undue impact on the areas where construction would occur, and ensuring that if the CIRC is not built, then 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 pf. at 10; exh. Pet. SJW-4.2.

92. The Project is consistent with the Town of Colchester's recommendations insofar as VGS 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 pf. at 10-11.

Town of Essex

93. VGS currently provides natural gas service in the Town of Essex. Wark pf. at 11.

94. The Essex Town Plan, adopted March 1, 2011, encourages expansion of gas utilities and recommends using existing corridors to avoid undue adverse impact on residents. Wark pf. at 11.

Town of Williston

95. VGS currently delivers natural gas service in the Town of Williston. Wark pf. at 12.

96. The Williston Comprehensive Plan (2011-2016) recognizes that energy costs and availability are important to maintaining the health and vigor of the local economy. 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 pf. at 12.

97. The Williston Town Manager and Selectboard did not raise any significant issues with the Project after Vermont Gas consulted with the Town. During this process, community members asked Vermont Gas to consider expanding service further into Williston. Wark pf. at 13.

98. Vermont Gas has relocated the gate station in Williston and modified the pipeline alignment to accommodate requests from Town officials and landowners. Wark pf. supp. at 2-3.

Chittenden Solid Waste District

99. On October 10, 2013, VGS and the CSWD executed an MOU under which VGS agreed to re-route the Project and to limit the Project's impacts on CSWD's Redmond Road properties in Williston, Vermont, in return for CSWD support for the Project's CPG. VGS-CSWD MOU at 1.

100. CSWD was formed in 1987 and operates as a municality under a Charter approved by the voters of each Chittenden County municipality. Brian Wright,[18] CSWD ("Wright") pf. at 3.

101. CSWD is the largest solid waste district in Vermont servicing a population of about 153,000. Wright pf. at 3.

102. CSWD acquired the Redmond Road properties in the 1990s and developed several of those parcels into CSWD's main office, a wetlands mitigation areas, and a stockpile for sand from Site 231, the designated but still undeveloped landfill site. Wright pf. at 4.

103. Included within CSWD's Redmond Road properties also are a drop-off center for trash and recycling, a special waste facility, a maintenance facility, a compost facility, a closed landfill, and a lined sanitary landfill currently in use. Wright pf. at 5.

104. The CSWD parcels on Redmond Road will be impacted by the Project. Wright pf. at 5; Heintz pf. reb at 17.

105. The VGS design team was able to shift the alignment within the Redmond Road ROW and modified portions of its 12/20/12 Transmission Mainline Engineering Plans. This alignment shifted the Project route from the east side of Redmond Road to the west side and was later reflected in the VGS-CSWD MOU. Heintz supp. pf. at 16-17; exhs. Pet. JH-2 and JH-3; VGS-CSWD MOU.

Town of St. George

106. 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

18. Mr. Wright's pre-filed testimony and exhibits were sponsored by CSWD's witness Thomas E. Moreau.

pf. at 13.

107. 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 pf. at 13; exh. Pet. JH-3.

108. VGS representatives attended a Selectboard meeting ate which the Town Selectboard did express an interest in natural gas service to St. George to help residents reduce energy costs. Wark pf. at 14.

109. The Project is consistent with this recommendation insofar as 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 pf. at 14.

Town of Hinesburg

110. 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 pf. at 14-15.

111. Vermont Gas consulted with the Hinesburg Town Administrator, the Director of Planning and Zoning, and the Hinesburg Selectboard. Town officials and community members discussed the extension of 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 pf. at 15.

112. The Hinesburg Selectboard submitted a letter question several aspects of the Project proposal, including making a request that the pipeline be re-routed to the existing VELCO corridor, but concluded by rendering its support of VGS expanding its service. Wark pf. at 15; Wark pf. supp. at 3-4; exh. Pet. SJW-4.14.

113. 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 pf. at 15-16; tr. 9/16/13 at 82 (Wark).

114. Vermont Gas has relocated the transmission pipeline to the existing VELCO corridor where feasible based on constructability or environmental resource considerations. Wark pf. at 15-16; Wark pf. supp. at 4-5; exh. Pet. SJW-4.14a.

Town of Monkton

115. Monkton has a number of concerns regarding the proposed transmission pipeline by VGS. These concerns include, but are not limited to, the environment, safety, and the economic impacts of the natural gas transmission pipeline. The proposed natural gas transmission pipeline will cross public lands. It will run through private property and come within close proximity to the residences of Monkton's citizens. The Project will impact agricultural lands, wetlands, and other ecologically sensitive areas within the Town of Monkton. The construction of a high pressure natural gas transmission pipeline through the Town of Monkton has the potential to affect the safety of its residents, the water quality of the wells that provide potable water to the Town's citizens, and the use and value of the property within the Town of Monkton. Stephen Pilcher, Town of Monkton ("Pilcher") pf. at 3.

116. 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 pf. at 15-16.

117. The Project is consistent with this provision insofar as the pipeline in Monkton will be placed underground. Wark pf. at 15-16.

118. The Monkton Selectboard 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 pf. at 3-5; Wark pf. at 17–18; Wark pf. supp. at 3-4; exh. Pet. SJW-4.15.

119. One goal that was important to Monkton was to achieve 300-foot setbacks from residential homes and wells to the location of the transmission pipeline. Pilcher pf. at 3; Pilcher pf. supp. at 4.

120. The 300-foot setback is based on the impact radius of the proposed pipeline. The impact

radius, or the area subject to catastrophic harm to both property and person, caused by a catastrophic breach of the transmission pipeline as designed by VGS is approximately 320 feet. Pilcher pf. supp. at 4; Monkton Exh. SP-3.

121. To address these concerns, the Town of Monkton entered into a MOU with VGS. The MOU contains agreements in the following areas:

a. Siting and route of the natural gas transmission line;

b. Construction of the distribution network.

c. Capacity and methods of construction.

d. Environmental protection; and

e. Easements and other miscellaneous items.

Pilcher pf. at 4-5; Monkton Exh. SP-2.

122. In the VGS-Monkton MOU both parties agree that the CPG should be conditioned to include the provisions of the MOU. In return for agreeing to support the petition for a CPG, the Town of Monkton received assurances from VGS that the company will develop a distribution network to deliver natural gas to some Monkton residences, businesses, municipal buildings, and school. Pilcher pf. at 4-5.

123. VGS addressed the concerns of the Town of Monkton. Tr. 9/17/13 at 37 (Pilcher).

124. The Town of Monkton requests that any CPG issued in this docket be also conditioned upon VGS's compliance with the recommendations of the Addison County Local Emergency Planning Committee. Timothy Bouton, ACRPC ("Bouton") pf. at p. 8-9.

125. The Project is generally 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 pf. at 18; Wark pf. supp. at 3-6; exh. Pet. SJW-4.15a.

126. Vermont Gas will work toward identifying a suitable location for a gate station in Monkton. Vermont Gas has also relocated the transmission pipeline to the existing VELCO corridor where feasible due to construction constraints or environmental resource considerations.

Wark pf. at 18; Wark pf. supp. at 3-6; exh. Pet. SJW-4.15a.

Rotax Road Re-Route

127. In response to the negotiation of the MOU between VGS and the Town of Monkton and its discussions with VELCO about that section of the VELCO ROW, in its February 23, 2013, filings, VGS proposed to depart from the VELCO ROW a

128. .nd re-route the Transmission Mainline in the vicinity of Rotax Road in Monkton. As a result of the re-route, the pipeline will cross different properties than in the original petition including the land owned by Nathan and Jane Palmer. Exh. Pet. Supp. JH-3 (2/28/13); exh. Pet. Reb. EMS-1; tr. 9/16/13 at 96 (Simollardes).

129. The parties to the VGS-Monkton MOU balanced the impacts of several factors and concluded that the re-route was a better option than the original filing's alignment in the VELCO corridor. Tr. 9/16/13 at 99, 100 ( ); tr. 9/17/13 at 44-45 (Pilcher).

130. VELCO opposed the use by VGS of its ROW in the vicinity of Rotax Road for a variety of engineering and planning reasons. Following the December 20, 2012 filing, VELCO requested that VGS 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.

131. The western side of the VELCO corridor in this area 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.

132. 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.

133. In addition, there are more residential structures within 300 feet of the pipeline on both the east and west sides 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.

134. If VGS used trenching, the closest distance between the pipeline and the Palmer residence would be about 120 feet. If VGS installed the pipeline 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.

135. By contrast, if the pipeline was 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.

136. If the pipeline was 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.

137. VELCO recommends that the Board approve the Rotax Road re-route as reflected in VGS's February 25, 2013, filing and the VGS-Monkton MOU. Letter from S. Mark Sciorrotta, Esq., on behalf of VELCO to Susan Hudson, Clerk of the Board, dated October 14, 2013 ("VELCO Brief").

138. In the alternative, VELCO recommends that if the Board does not approve the Rotax Road re-route despite the additional landowner impacts, significant additional cost, inherent physical constraints, the Town of Monkton's opposition, and electric transmission impacts, but instead sites the Project within the VELCO ROW, the Board should require that the pipeline be sited (with the exception of necessary ROW crossings) ten feet inside the edge of VELCO's ROW with a minimum of fifty feet of clearance from VELCO's current and future electric transmission system structures, and otherwise in accordance with the parties' MOU. Exh. VELCO-PWL-2; VELCO Brief at 6.

139. Sandwiching a pipeline between electric transmission lines is a risky and uncertain approach for which there is no engineering precedent. Tr. 9/20/13 at 22-23 (Heintz).

140. Installing the pipeline at the bend of VELCO ROW at Rotax Road could result in construction delays, safety clearance issues, additional expense, and line outages that could compromise grid reliability. Tr. 9/20/2013 at 62-63, 80 (Dunn).

141. These facts, combined 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 to submit the Rotax Road Re-route. Tr. 9/16/13 at 98 (Simollardes); exh. Pet. Reb. EMS-1.

142. Mr. Palmer objects to the location of the Project as agreed upon in the Monkton MOU because it will directly pass through and encumber his residential property and farm. Among other things, it will fall within 120 to 160 feet of his residence. Mr. Palmer avers that if the pipeline is approved, the appropriate place for the pipeline is in the VELCO "utility corridor." Nathan Palmer ("Palmer") pf. at 3.

143. It is not possible to achieve a 300-foot setback for all Monkton's Rotax Road property owners. Crossing the Palmer property minimizes the overall community impact while burdening the Palmers. Tr. 9/17/13 at 42 (Pilcher).

144. If the Project were to be relocated from the Palmer property back into the VELCO ROW, the transmission pipeline would fall within less than 150 feet of the residences and/or wells of four additional property owners. Tr. 9/20/13 at 31-41 (Heintz); VGS Exh. EMS-Supp.-1.

145. The four property owners who would be impacted by a re-route have not had an opportunity to participate in these proceedings because they reasonably believed based on the VGS-Monkton MOU that the pipeline route would not be located upon their properties. Tr. 9/17/13 at 34 (Pilcher).

146. VGS plans to minimize the impact of the re-route through the Palmer property to the extent possible thereby mitigating potential organic farming use and wetlands concerns. Mr. Palmer's concerns about the continued use of his land and impacts caused by water migration and soil disturbance will be mitigated by having VGS perform horizontal direct drilling through his property. Exh. Pet. EMS-Supp.-1.

147. VGS has agreed to using HDD at the Palmer property to achieve a 165-foot set off from

the residence and minimize the soil and wetland impacts. Tr. 9/16/2013 at 220 (Simollardes).

148. Mr. Palmer has agreed that if the pipeline has to be built and has to go through his property, it should be horizontally drilled. Tr. 9/19/2013 at 28 (Palmer).

Discussion

The Palmers have raised concerns about the re-route. They contend that the Project with the re-route will cause undue harm to their organic farm, by disrupting soils and altering the current compaction of the soil. They also observe that a portion of their property slopes toward a wetland so that constructing a trench following the slope will alter drainage flows, further harming their ability to effectively farm organically. The Palmers assert that the pipeline is located too close to their residence, within 120 feet, a distance that is much smaller than the 300-foot setback VGS and the Town of Monkton set as a goal in the VGS-Monkton MOU. And finally, they express concern over the removal of several trees that help stabilize the area near the wetland.

Siting the proposed transmission line in this area reflects a challenging puzzle involving pieces that include property rights, engineering, land-use, and environmental concerns. In addressing issues of the public good, we strive to satisfy the concerns of all the affected parties. However, we are seldom presented with options which eliminate all impacts on all parties. Therefore, we endeavor to minimize and mitigate such impacts when possible bearing in mind that our statutory charge is to make decisions that best provide for the overall public good of the people and ratepayers of the State of Vermont.

The re-route cannot satisfy everyone, but overall, it results in fewer impacts of the Project in this area. First, VGS presented evidence that the original route in the VELCO corridor presented what the Company described as "constructability issues."[19] These issues, including more challenging terrain, meant that the VELCO corridor option was more expensive.[20] VGS

19. Tr. 9/16/13 at 98-101 (Simollardes).

20. *Id*. at 102, estimating the increased cost at $1.2 to $1.3 million. VGS subsequently reduced this estimate. Tr. 9/20/13 at 13-14 (Heintz). Even if VGS were to employ HDD through all of the Palmers' property, the Rotax Road

(continued...)

would have to employ HDD in several sections of the route following the VELCO corridor due to the terrain and the need to avoid an archeological area.[21] Using the route in the VELCO corridor would also result in the transmission line being located close to four other residences, one within 85 feet and another 110 feet.[22] As a result, more residents would have the pipeline sited within 300 feet of their homes than does the re-route.

VELCO also presented testimony demonstrating that siting the route in the corridor could raise some operational issues. VGS has proposed siting much of the transmission line adjacent to or within the VELCO corridor to reduce impacts and avoid the need for a new utility corridor. In those areas where the pipeline is sited within the corridor, VGS has located the pipeline near the edge of the corridor (usually the western edge). Such siting would have been difficult in the Rotax Road area and brought the line very close to residences and one well. Using other portions of the VELCO corridor in this area could have significant negative effects on VELCO's ability to propose siting a second, parallel transmission line within its ROW.

On balance, we are persuaded that the re-route proposed by VGS in its February 2013 filing is reasonable and should be accepted. The re-route avoids the concerns about the Project's impact discussed above, reducing the negative effects of the pipeline for VELCO, the Town of Monkton and its residents, and four landowners along the route. Unfortunately, this outcome imposes a burden upon the land of other property owners along the re-route, including the Palmers, who would not otherwise have been directly affected by the original routing plan.

The Department has recommended that the Board condition approval of the Project upon a post-CPG filing by VGS that would site the transmission line within the VELCO corridor in the Rotax Road area, after which there would be an opportunity for further comment. We do not accept this recommendation for such a post-CPG review process. The Rotax Road routing issue consumed a large part of the technical hearing and the issues and competing interests have been

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20. (...continued)
re-route outside of the VELCO corridor would be less expensive by $300,000. Tr. 9/20/13 at 53 (Heintz).

21. Tr. 9/16/13 at 99-101 (Simollardes).

22. *Id.* at 98. Subsequent testimony suggested that using the VELCO corridor could have resulted in the pipeline being event closer to residences. Tr. 9/20/13 at 17-18 (Heintz).

fully aired. The Department has not presented any argument that suggests that the evaluation of the VELCO corridor option during hearings was somehow inadequate and would benefit from a further examination. We will, however, require VGS to make a compliance filing that consists of a diagram reflecting the final re-route plan, consistent with this Order.

As to the Palmer property, they have demonstrated that the siting of the proposed transmission line across their property could have some adverse impacts. VGS has proposed to address some of these impacts by employing HDD for a portion of the route across their land. This would result in the transmission line being sited 160 feet from the Palmer residence, as opposed to the originally proposed 120 feet, and the line being buried at a 10-foot depth (compared to a 4 to 5-foot depth associated with trenching). VGS's proposal represents a good example of the multi-factor assessment of the potential application of HDD.

Nonetheless, we are approving the Rotax Road re-routing plan with the condition that the impacts on the Palmers' property be minimized by the use of HDD rather than open trenching across the entire property for the installation of that section of the pipeline. On balance, the re-route plan with the addition of using HDD at the Palmers remains less expensive than use of the VELCO corridor. The use of HDD to cross the whole of the Palmers' property will also reduce several of the potential negative impacts of constructing the Project using trenching. In particular, this method will largely avoid harming the potential for the Palmers' land to be farmed organically, reduce the potential for water migration, and minimize effects upon the neighboring wetland (that is subject to a conservation easement), due to specific site restoration challenges.[23] We further adopt the VGS-Monkton MOU (with the exception of the Old Stage Road re-route discussed below) and condition this Order and CPG on the fulfilment of its terms and conditions.

Old Stage Road Re-Route

149. At the request of the Board, at the technical hearings VGS presented an alternative route at Old Stage Road in Monkton. The Old Stage Road re-route shifts the pipeline from the east side of the road (in the Hurlburt property) to the west side of the road (and into the VELCO

23. We discuss the potential water migration issues in more depth below.

ROW). Exh. Pet. Surr. JH-1; tr. 9/17/13 at 81-82 (Heintz).

150. The Old Stage Road re-route has the same construction cost as the original plan but does not impact higher value agricultural land and takes advantage of the existing VELCO ROW. The two landowners of the properties on this re-route were not noticed of the potential re-route at the time of the hearing. Tr. 9/17/13 at 82-84 (Heintz); tr. 9/17/13 at 15 (Hurlburt).

Discussion

The Old Stage Road re-route is a change with no projected increase in construction costs that reduces impacts on agricultural properties while taking advantage of the VELCO ROW. For these reasons, we are conditioning our approval of the petition on VGS following this re-route. The Board will ensure the two landowners (otherwise encumbered by the VELCO ROW) will be notified of the re-route plan and be given an opportunity for comment and additional process as warranted.

Town of New Haven

151. 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 pf. at 19.

152. 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 pf. at 19; Nelson pf. at 5-8; Heintz pf. at 20.

153. Vermont Gas consulted with 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 pf. at 19-20; exh. Pet. SJW-4.12; exh. Pet. Supp. SJW-5.

154. 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 pf. at 19-20; exh. Pet. SJW-4.12; exh. Pet. Supp. SJW-5.

155. The Project is generally 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 pf. supp. at 2, 6; Heintz pf. at 17; exh. Pet. JH-5.

Town of Ferrisburgh

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

157. Though consulted with by VGS, the Town did not submit any comments or testimony concerning the Project. Wark pf. at 8.

Town of Middlebury

158. 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 pf. at 20–21.

159. The Project is consistent with the Middlebury Town Plan insofar as the Project will provide both environmental and economic benefits and has been designed to protect public safety. 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 pf. at 21-22.

160. Vermont Gas consulted with the Middlebury Selectboard, the Middlebury Town Planner, and the Town of Middlebury 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 pf. at 21-22; exh. Pet. SJW-4.13; exh. Pet. Supp. SJW-3; exh. Pet. Supp. SJW-4.

161. The Project is generally consistent with the recommendations and concerns raised by the Town of Middlebury 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 pf. supp. at 2, 6; Heintz pf. at 15, 23, 27-29; exh. Pet. Supp. JH-9 (6/28/13).

162. The Town of Middlebury submitted an MOU to the Clerk of the Board on November 7, 2013, reflecting its agreement with VGS and support for the Project plan as addressed therein. VGS-Middlebury MOU.

City of Vergennes

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

164. 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 pf. at 22-23.

165. The Vergennes City Council and City Administrator did not raise any significant issues with the Project after Vermont Gas consulted with the City to describe the Project, respond to questions, and address concerns. Wark pf. at 22-23.

Town of Waltham

166. 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 pf. at 23.

167. 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 CO_2 emissions. Wark pf. at 23.

Chittenden County Regional Plan

168. 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 pf. at 24.

169. The Project is generally 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. Wark pf. at 24-25.

Addison County Regional Plan

170. 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 pf. at 25.

171. The Project is generally consistent with the ACRP insofar as the Project will use existing corridors where feasible, and has been designed in collaboration with affected landowners and municipalities. Wark pf. at 25.

172. The Addison County Regional Planning Commission ("ACRPC") engaged in a thorough analysis of the Project including separate review by four of its subcommittees. These committee reviews were provided to the Full Commission at its December 12, 2012, public meeting. The minutes of this public meeting are appended to the record of this proceeding. As a result of this Project review, the ACRPC intervened as a party and was represented by counsel. VGS and ACRCP engaged in thorough discussions of the Project and executed a MOU on August 12, 2013. Timothy Bouton, ACRPC ("Bouton"), pf. at 7; exh. ACRCP TB-4; exh. ACRCP Supp TB-2.

173. With the inclusion in the CPG of the conditions set forth in the ACRPC MOU, ACRPC agrees that the construction of the Project promotes the general good of the state and that

it will not unduly interfere with the orderly development of the region. *See* Exh. ACRPC Supp. TB-1 at 5.174. The VGS-ACRPC MOU contains 15 conditions that the parties to the MOU jointly ask the Board to adopt as conditions to this Order and CPG. Among other things, these conditions address both the timing of future distribution system development and emergency response training. Exh. ACRCP Supp TB-2.

175. When responding to a natural gas pipeline leak, trained first responders require calibrated methane monitors and non-sparking tools to secure the flow of gas and conduct effective damage control. Bouton pf. at 10-11.

176. VGS and ACRPC did not come to agreement regarding proper equipment for first responders, specifically the availability, training, and use of methane detectors and non-sparking tools. Tr. 9/17/13 at 17-18 (Berger); Bouton pf. at 8; Bouton reb. pf. at 4.

Discussion

ACRPC and VGS reached agreement on a number of issues, as reflected in the MOU which they have submitted and we accept. They disagreed, however, on two conditions recommended by the ACRPC: that VGS provide methane detectors and non-sparking tools that would permit shutoff of distribution service in an emergency. VGS believes that these materials should not be provided because in the absence of proper training, emergency responders may face too much risk.

The Board appreciates ACRPC's interest in emergency response personnel being provided methane gas detectors and non-sparking tools. We are also mindful that federal regulatory and industry standards guide the use of that equipment. Nonetheless, local emergency officials are responsible for planning, coordinating, and conducting emergency preparedness drills. Pipeline operators are required to share relevant information, to maintain communication with local emergency officials and coordinate planned and actual responses during emergencies. Consistent with these federal statutory responsibilities, *see* the Pipeline Safety Act, P.L. 112-90, Jan. 3, 2013, and the VGS public awareness and outreach program, VGS has agreed to train relevant emergency response personnel in Addison County on issues related to natural gas. We conclude that this training should encompass the use of non-sparking tools for distribution system shutoff

and methane gas detection meters. Upon completion of relevant training, VGS shall equip these emergency personnel with this equipment including the regular calibration of the meters and appropriate refresher training following the same regulatory and industry standards followed by VGS personnel. Further discussion between VGS and ACRPC should exist in the emergency response planning context regarding the timing and deployment of trained personnel from both VGS and local response organizations to both distribution and transmission pipeline emergencies. With this additional condition, the Board adopts the VGS-ACRPC MOU and conditions its approval of this Order and CPG on its observance.

177. 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. Wark pf. at 8; David Raphael, DPS ("Raphael") pf. at 8-9.

178. The energy goals and land use plans for each of the eleven towns affected by the Project, as well as the plans for the two regional planning commissions, were reviewed and summarized by Department witness Raphael. Exh. DPS-DR-1 at 11-14; Wark pf. at 8-26.

179. Of the towns along the corridor whose town plans specifically reference natural gas transmission lines, they usually want lines to be placed in the existing right-of-way and/or placed underground where feasible. Co-location is desirable as it tends to minimize impacts overall and it is the preferred approach when considering aesthetics and land use impacts as it eliminates the need for acquiring and developing new utility corridors. Exh. DPS-DR-1 at 11; Raphael pf. at 7; tr. 9/18/13 at 139 (Raphael).

180. The Project is primarily located within three different types of rights-of-way, with approximately 27.2 miles within or immediately adjacent to an existing VELCO ROW. *See* Exh. DPS-DR-1 at 1.

181. After ensuring that VELCO's interests are protected, VELCO believes that it makes sense to accommodate this Project in its rights of way. Peter Lind, VELCO ("Lind") pf. at 2.

182. VELCO believes that such accommodation is generally consistent with the public policy of using existing utility rights-of-way versus developing new ones. Id. at 2-3.

183. The VELCO right-of-way is an electric transmission corridor that has additional space,

not presently being used, but which can accommodate a second electric transmission line. Tr. 9/20/13 at 166 (Dunn).

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 Towns of Monkton and Middlebury. It is important to note that under Section 248's statutory language, the proposed Project is not required to conform strictly to the terms of these plans. Rather, the statute requires the Board to 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.

Aside from the gate stations and mainline valves, the Project will be located underground, and a large portion of the Project will be sited within existing, public use rights-of-way. As the Board has recognized in the past, utilization of existing public use corridors to site new transmission facilities can minimize local impacts.[24]

As discussed above, the considered use of HDD to reduce impacts and overcome site

24. *See Re Vermont Transco, LLC*, Docket No. 7295, Order of 10/13/08, at 13 (finding that co-location of an electric transmission line along an existing railway corridor is consistent with orderly development); and *see In re: Northwest Vt. Reliability Projec*t, 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 communities by both public and private endeavors.")

restoration costs and impracticability serves to mitigate any undue interference to the orderly development of the region. 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.

2. Need for Present and Future Demand for Services

[30 V.S.A. § 248(b)(2)]

184. The Project would meet a need for present and future demand for service which could not otherwise be provided in a more cost-effective manner through energy conservation programs and measures and energy efficiency load management measures, including but not limited to those developed pursuant to the provisions of subsection 209(d), section 218c, and subsection 218(b) of Title 30. This finding is supported by findings 185 through 235, below.

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

186. Energy conservation, load management, and energy efficiency measures alone would likely not provide the advantages that would be realized through the expanded natural gas usage that would result from the Project. Jatinder Kumar, DPS ("Kumar") pf. at 9.

187. The Project will result in increased competition in fuel prices in Addison County and expand access to existing efficiency programs. Kumar pf. at 10.

188. Natural gas burns more efficiently than other fossil fuels, resulting in lower quantities of the fuel to produce an equivalent amount of energy needed for heating, cooking, drying, etc., than is the case with other fossil fuels. Kumar pf. at 10.

189. Significant quantities of natural gas exist to assure a price advantage for natural gas over other fossil fuels for a long time. Kumar pf. 11-12.

190. 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. Walter (TJ) Poor, DPS ("Poor") pf. at 7.

191. In Vermont, about 64 percent of homes heat with oil or propane; only 15 percent are heated with natural gas. By comparison, nationally, only 12 percent of homes use oil or propane while about 50 percent of homes use natural gas for heating. Gilbert pf. at 6.

192. Given its limited availability in Vermont, natural gas is currently underutilized as a heating source in the State. Kumar pf. at 8.

193. The Project 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 pf. at 5.

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

- Construct and operate the new system 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 to Rutland and surrounding towns;
- Minimize challenges to construction; and
- Control Costs.

Howe pf. at 4-5.

195. 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 pf. at 5-6.

196. VGS designed the Project to provide the capacity needed to supply natural gas to all firm customers receiving 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 pf. at 4-5.

197. VGS's 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 9/3/10 at 22.

198. VGS evaluates peak customer demand from two different perspectives: peak-day load and peak-hour load. Teixeira pf. at 5.

199. In addition, VGS serves 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 pf. at 5.

200. VGS's design-day methodology uses the coldest day experienced in the last thirty years. The current design-day of 86 heating degree-days occurred on January 26, 1994. Teixeira pf. at 5.

201. 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 pf. at 6.

202. 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 pf. at 6.

203. 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 pf. at 4.

204. 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 pf. at 6.

205. VGS peak-day demand is forecasted to grow (including the ANGP load), from 65,367

Mcf[25] in FY 2013 to 68,262 Mcf in FY 2017. Teixeira pf. at 8.

206. 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 pf. at 6-7.

207. VGS's existing system generally can be described as a long transmission lateral with a current minimum operating pressure of approximately 580 psi, which feeds multiple distribution systems that each have an operating pressure of approximately 100 psi. Howe pf. at 6.

208. Pipe size was determined by analyzing the requirements to serve the estimated peak-day gas demands in Addison County while maintaining VGS's standards of service. In general, pressure loss along the pipeline path occurs as gas 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 pf. at 12.

209. 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's ability to deliver gas supplies on the transmission pipelines are:

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

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25. Mcf is an abbreviation denoting a thousand cubic feet of natural gas. A natural gas well that produces 400 Mcf of gas per day operates with a daily production rate of 400,000 cubic feet.

Teixeira pf. at 8-9.

210. VGS prepared network modeling analyses using the GL Nobel Denton, Inc. SynerGEE Gas software to predict system pressures based on 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 pf. at 9.

211. 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 pf. at 9.

212. 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 9/3/10 at 24.

213. 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 pf. at 10.

214. 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 pf. at 12.

215. 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 pf. at 13.

216. 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 pf. at 13-14.

217. 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 pf. at 10.

218. 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 pf. at 14-15.

219. 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, including any anticipated future expansion. Howe pf. at 13, 16.

220. Energy efficiency and demand-side management 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 pf. at 8.

221. The need for the Project is based upon market demand to expand the system into a new geographic region. 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. Teixeira pf. at 4; tr. 9/17/13 at 158-59 (Pcolar).

222. 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).

223. 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).

224. 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).

225. 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).

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

227. 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 5-6.

228. Between 2004 and 2011, Vermont Gas' demand-side management programs avoided almost 3,800 Mcf on peak day. Teixeira pf. at 8.

229. As a least-cost planning matter required by 30 V.S.A. § 218c, the expansion of natural gas services to customers in Middlebury and Vergennes would likely reduce costs by increasing 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.

230. It is possible that the Project may slow the transition to energy efficiency technology in those areas where new natural gas service will be available. The increased availability of natural gas may thus hinder Vermont's ability to achieve its 90% renewable energy goal. Tr. 9/17/13 at 127 (Wolfe).

231. 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 some renewable resources, such as bio-methane resources, to have increased access to customers. Poor pf. at 6; exh. Pet. SJW-4.10.

232. 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.

233. The Project provides a market for renewable bio-methane. While the known resources are only estimated to be 1 percent of Vermont Gas' sales, the Project can foster more of these opportunities, both geographically and with respect to increased market demand, thereby reducing the amount of fossil fuels used in the state. Poor pf. at 8.

234. The Comprehensive Energy Plan 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.

235. Investment of a substantial portion of VGS's expected $200 million savings in energy bills from the Addison Pipeline expansion in the thermal efficiency efforts contemplated in the Thermal Efficiency Task Force report would be one way to offset the increased emissions from the expansion. Eileen Simollardes, VGS ("Simollardes") pf. at 2; Elizabeth A. Stanton, CLF ("Stanton") pf. at 23.

Discussion

Vermont Gas contends that the Project meets the statutory requirements of Section 248(b)(2) because (1) there is demonstrated demand for natural gas service, (2) the Project is reasonably sized to meet that demand and potential future demand, (3) the customer demand for natural gas service could not reasonably be achieved more cost-effectively through energy efficiency, and (4) the Project is consistent with least-cost planning principles. In addition, VGS observes that construction of the Project would bring energy efficiency programs to newly served areas and thus enable the implementation of more cost-effective efficiency than is now occurring.

In support of VGS's position, the Department argues that the Board cannot employ a traditional need analysis to the Project. Instead, the Department contends that the definition of need is different in the context of a system expansion than in the more typical situation where a utility is proposing a system upgrade to address reliability concerns. The Department asserts that for expansions, the analysis need not be "as exhaustive as a traditional least-cost analysis because (1) the need is based on a projected new market demand and (2) the absence of an initial obligation to build inhibits the Board's ability to order a fundamentally different 'alternative' to the proposed Project."[26] Under this standard, the Department concludes that VGS has met the need test for the same reasons as expressed by VGS.

CLF maintains that the Board should reject the Department's "unfounded statutory revision of the least cost standard."[27] CLF argues that the Department essentially requests that the Board ignore the statutory standard. CLF urges us to reject this argument and instead to find that neither VGS nor the Department has demonstrated that the proposed project is needed to meet current or expected demand that could not otherwise be met with efficiency."[28]

The Palmers raise similar arguments. The Palmers fault the Department for failing to include any analysis showing that the Project is the least-cost option as compared to energy conservation, load management, energy efficiency or renewable sources. The Palmers also argue that Vermont Gas does not even allege that it has prepared a full life-cycle analysis of the costs and benefits of the proposed pipeline and its alternatives. The Palmers contend that Section 248(b)(2) applies equally to expansion and reliability projects.[29]

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26. DPS Brief at 8-9.

27. CLF Reply Brief at 8.

28. *Id.*

29. The Palmers raise two additional analyses as part of their discussion of the need criterion. First, they argue that the Project would impermissibly result in cross-subsidization among customers. Second, the Palmers contend that the Board is being inappropriately requested to engage in segmented review of the Project by not including Phase II in its review at this time.

We discuss the first of these two issues below in our analysis of the overall public good of the Project. As for the segmentation, we disagree with the Palmers. As we explained at the outset, Phase II is a separate project that

(continued...)

Section 248(b)(2) of Title 30 requires that the Board find that the Project:

> is required to meet the need for present and future demand for service which could not otherwise be provided in a more cost-effective manner through energy conservation programs and measures and energy-efficiency and load management measures, including those developed pursuant to the provisions of subsection 209(d), section 218c, and subsection 218(b) of this title. In determining whether this criterion is met, the Board shall assess the environmental and economic costs of the purchase, investment, or construction in the manner set out under subdivision 218c(a)(1)(least cost integrated plan) of this title and, as to a generation facility, shall consider whether the facility will avoid, reduce, or defer transmission or distribution system investments.

The plain language of this provision makes no distinction between expansion projects and proposals to enhance reliability. Thus, we agree with CLF and the Palmers that there is no basis for the Department's assertion that somehow the statute applies differently in the context of a project that is expanding service to areas in which such service had not previously existed. Nonetheless, this determination does not lead to the conclusion urged upon us by CLF and the Palmers.

Section 248(b)(2) requires that we make two separate determinations: (1) the Project is needed to meet present or future demand for service; (2) this demand could not otherwise be met more cost-effectively through energy efficiency measures. Under the last sentence of Section 248(b)(2) that was recently added by the legislature, we must consider these investments from a least-cost perspective.

Based upon the record, we conclude that VGS has met the Section 248(b)(2) criterion. VGS reasonably estimated the Addison County market, planned the Project for that present market, as well as future markets to be served by subsequent expansions, and did so in a reasonable manner showing that the need could not be eliminated by efficiency measures or demand-side management.

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29. (...continued)
is not before us at this time. As a result, our review in this Docket does not include either the costs or, more importantly, the benefits of that separate project. We also do not find that the two are really one project. As this Order explains, our analysis has required that Phase I meet the statutory requirements for approval under Section 248 on its own merits, without any consideration of Phase II. In turn, Phase II will have to meet the same standard when we consider it.

Vermont Gas describes the "need" for this Project as primarily the demand for natural gas in Addison County. We agree. Natural gas is not currently available in Addison County (or in the Chittenden County town of St. George). Instead, consumers in those communities must rely upon other fuels, primarily fuel oil and propane, for heating. Businesses also must rely upon other fuels for their needs. Introduction of natural gas into the market would enable these customers to switch to a fuel that, at present, has more than a 40% price advantage over the energy sources it would displace. Over the next twenty years, VGS estimates that this is likely to produce substantial savings — over $200 million — for consumers in the newly served areas. The anticipated switch of many customers to a less expensive fuel source demonstrates a clear demand for natural gas service in Addison County, thus meeting the first part of the standard.

The next question is whether the demand could be met more cost-effectively through demand-side management measures (including energy efficiency). Here, we conclude that this demand cannot realistically be met by efficiency or demand-side management measures to reduce the demand for natural gas to a level that would make the Project unwise or meet all of the customer demand. At the present time, the Energy Efficiency Utility offers efficiency services that aid customers in reducing their electrical uses. Because very little electricity is used for heating in Vermont, these programs do little to improve thermal efficiency of buildings. In its service territory, Vermont Gas offers such services, directed at improving the efficiency of natural gas. These include thermal efficiency measures such as weatherization. In areas not served by VGS, energy efficiency programs that address fuels other than electricity are limited. Some weatherization of low-income residences is performed by the regional Offices of Economic Opportunity, funded in part through a weatherization tax. Customers may also pursue efficiency on their own, but we have required energy efficiency programs because it is well-established that market barriers exist to customers deploying efficiency measures.

Vermont lawmakers also have established the framework for extending efficiency programs to unregulated fuels. However, little funding exists for this purpose at the present time. The legislature has directed the Board to further examine funding options.

Thus, at the present time, there is no evidence that would suggest that any entity could or would be willing to provide a level of energy efficiency measures to Addison County at a

quantity or pace that would cost-effectively meet the demand for natural gas that the project would address in the Addison County market. Nor is there evidence that present efficiency levels are adequate to address the demand. By comparison, there was testimony that showed natural gas burns more efficiently than other fossil fuels, resulting in lower quantities of the fuel being used to produce an equivalent amount of energy needed for heating, cooking, drying, etc., than is the case with other fossil fuels. The projected availability, greater efficiency, and lower cost of natural gas lead to the conclusion that there is a demand for natural gas service that cannot be met by energy efficiency.

The Department provided an analysis that evaluated the costs and benefits associated with a number of different scenarios. This analysis showed the Project to be more cost-effective than other potential options (specifically, a scenario in which the Project is not built and Addison County industrial customers are served by compressed natural gas and another scenario where these customers are served by liquefied natural gas).[30] One scenario — in which the Project is constructed and aggressive efficiency programs are implemented — did demonstrate a greater benefit than the benefit to be realized from the Project alone. The Board has accepted that this "Project plus efficiency" scenario is what is under consideration here, as the expansion to Addison County will open that region to Vermont Gas's provision of efficiency services.

While it is not reasonable to hold out efficiency services or another demand-side measure as an alternative to the Project, we note that a significant benefit associated with this Project is that, by extending Vermont Gas's service territory into the Addison County market, the Project will bring with it Vermont Gas's obligation to provide energy efficiency services to Addison County customers.

We acknowledge that adding a lower cost fuel to a consumer's energy options has the potential to cause some customers not to pursue energy efficiency investments because there are less savings from improving thermal efficiency when heating costs are decreased. However, we will require VGS to address this potential Project outcome by conditioning our approval of this Order and CPG on Vermont Gas developing aggressive energy efficiency programs and budgets

30. Poor pf. reb. at 10-11.

for those programs for its new customers in Addison county. One goal of these new efficiency programs will be to leverage the anticipated $200 million dollar savings to customers into energy efficiency transitions that will help use the newly introduced natural gas as efficiently as possible. Making these programs available aggressively at the outset of service will aid customers and minimize the lost opportunities that arise if the cost-effective energy efficiency is not achieved at the outset. Vermont Gas's obligations as an energy efficiency utility are presently under review in Docket No. 7676. The manner and extent of the energy efficiency services Vermont Gas should provide in Addison County are best addressed in that docket and its context of studying the efficiency potential and setting efficiency budgets.

Section 248(b)(2) as it now exists also requires that the Board assess environmental impacts in the manner set out in Section 218c(a)(1) which governs least cost integrated plans.[31] VGS has shown that the proposed transmission line meets the standard of a least-cost analysis. Vermont Gas explored a number of different project designs to serve this market, including the use of different size pipelines at both the transmission and distribution levels. Ultimately, Vermont Gas decided to use the proposed 12-inch transmission pipeline to meet not just the demand in the specific communities that are likely to be served by this Project, but also the future market to be served by reasonably anticipated and planned expansions. While other, smaller pipelines could have been used to serve the Phase I market, the use of a 12-inch transmission line will make future expansion more feasible and efficient by reducing the need for future looping

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31. Section 218c(a)(1) provides as follows:

> (a)(1) A "least cost integrated plan" for a regulated electric or gas utility is a plan for meeting the public's need for energy services, after safety concerns are addressed, at the lowest present value life-cycle cost, including environmental and economic costs, through a strategy combining investments and expenditures on energy supply, transmission, and distribution capacity, transmission and distribution efficiency, and comprehensive energy efficiency programs. Economic costs shall be assessed with due regard to:
> (A) the greenhouse gas inventory developed under the provisions of 10 V.S.A. § 582;
> (B) the State's progress in meeting its greenhouse gas reduction goals;
> (C) the value of the financial risks associated with greenhouse gas emissions from various power sources; and
> (D) consistency with section 8001 (renewable energy goals) of this title.

that would otherwise be necessary.[32]

As we discuss below, we find that the Project is also consistent with the greenhouse gas reduction goals. The expansion of the transmission pipeline would introduce a new fossil fuel into Addison County. That fuel is likely to displace other fossil fuels, and due to the greater efficiency of natural gas relative to fuel oil and propane as well as its lower CO_2 emissions, the Project is expected to result in a net reduction in greenhouse gases.

Section 218c(a)(1) also requires consistency with renewable energy goals. The Palmers and CLF suggest that VGS has failed to make this showing. We disagree. As the findings, the evidence, and our above discussion make clear, in the short run, the Project is unlikely to displace material amounts of renewable energy for heating purposes. It is possible some consumers will switch from biomass to natural gas, particularly considering the price advantage. However, the renewable energy goals in Sections 8001 and 8005 focus on the use of renewable energy in electricity production, so such displacement is not likely to impede the attainment of those goals. Considering the small amount of electric heat in Vermont, natural gas is unlikely to have any material effect on the electric generation mix and progress toward meeting renewable goals. We recognize that renewable technologies are becoming more cost-effective and that this comparison may change in the future. The price of solar panels continues to decline. If they become inexpensive enough, electricity may become cost-effective as a source of heat. The efficiency of heat pumps at cold temperatures also continues to improve. But there is no evidence suggesting that the introduction of natural gas will affect deployment of these technologies or renewables generally.

Nonetheless, expansion of the gas transmission line offers the potential for greater use of a fuel that has been used for renewable energy — methane derived from biomass. A number of farms have installed digesters and generators to convert the bio-methane into electricity, rather than allowing it to escape into the atmosphere. Other farms have not taken this step, principally

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32. In reaching this conclusion, we have examined the specific aspects of VGS's proposal and the incremental cost of various options. It should not be read as endorsing the concept of automatically including added capacity simply on the possibility that it might be needed in the future. It also does not mean that future expansions will be approved. It is prudent business practice to build in this kind of flexibility now.

due to their smaller size. With the expansion of VGS's system, it is possible that VGS could extend distribution pipes to these farms, allowing cost effective collection of the bio-methane that has been produced. Accordingly, we condition our approval of the Project on VGS developing a proposal to foster bio-methane projects in Addison county.

With the conditions noted above, the Project is consistent with the 2011 Comprehensive Energy Plan, which expressly encourages the expansion of natural gas infrastructure to, among other things, expand natural gas service to more Vermonters.[33] Accordingly, the need for the Project is sufficiently demonstrated by the findings and discussion set forth above.

3. System Stability and Reliability

[30 V.S.A. § 248(b)(3)]

236. The Project will not have an adverse impact on system stability and reliability. This finding is supported by findings 237 through 242, below.

237. The Project provides benefits to existing Vermont Gas customers by increasing the reliability of the existing system. These reliability benefits will be achieved through looping the system through Williston to south of Burlington, and by the construction of a gate station in Williston, which will provide the capability to backfeed Burlington. Tr. 9/I7/13 at 229 (Teixeira); Teixeira pf. at 11.

238. 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 pf. at 4, 11.

239. 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 pf. at 11.

240. 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 pf. at

33. 2011 CEP, vol. 2, at 222.

11; tr. 9/17/13 at 229-30 (Teixeira).

241. The Project is sized in such away to provide substantial excess capacity to serve the projected Addison County load, and it will not have an adverse impact on stability and reliability with respect to service to other customers. Kumar pf. at 13-14.

242. Along with establishing a reliable backbone for service in Addison County, as a result of the Project, the whole Burlington area distribution system will be stronger and more reliable as well. The Project will provide "backfeed" capability to enhance the reliability of service to customers in Chittenden County. Teixeira pf. at 11; Gilbert pf. at 9.

4. Economic Benefit to the State

[30 V.S.A. § 248(b)(4)]

243. The Project would result in an economic benefit to the state and its residents. This finding is supported by findings 244 through 256, below.

244. Vermont Gas initially calculated the Project's economic benefits as follows:

a. Net energy bill savings of $112.5 million;

b. Carbon reduction savings of $17.1 million; and

c. Property tax payments of $23.5 million.

Simollardes pf. at 3.

245. Current estimates of the Project cost are $86.6 million for the transmission mainline and the distribution mainlines to Vergennes and Middlebury, and an additional $6.3 million for the distribution networks inside those communities (exclusive of the cost of services and meters). Tr. 9/16/13 at 167-68 (Simollardes).

246. The following table sets forth the net present value of the costs and benefits of the Project and three alternatives on Vermont GDP through 2031 (before greenhouse gas emissions are quantified and monetized). The alternatives are the Project as proposed, the Project plus a scenario where an aggressive efficiency program is imposed, no Project and service to industrial customers using LNG, and no Project with service to industrial customers using CNG. This table also sets forth the economic impact without any assumptions concerning the sale of natural gas to International Paper (i.e., the anticipated Phase II project).

Net Economic Impact of the Project GDP (NPV $ millions 2012)			
Discount Rate	3.00%	7.69%	9.75%
VGS Baseline	$89.79	$60.35	$52.09
VGS+Efficiency	$140.57	$86.96	$72.40
Industrial LNG	$82.26	$47.76	$38.37
Industrial CNG	$80.79	$47.21	$38.04

George Nagle, DPS ("Nagle") pf. reb. at 3-5; Poor pf. reb. at 12; tr 9/19/13 at 119 (Poor).

247. The following economic benefits associated with the Project comprise both direct and indirect benefits:

1. Direct benefits include construction and conversion capital expenditures of households and businesses, and the availability of natural gas in Addison County. Vermont Gas estimates that over the 20-year period from 2011 - 213l, Addison County customers will reduce their collective energy bills by a total present value of $210 million (2012 dollars using a discount rate of 3 percent). Those customers will incur approximately $19 million in conversion costs for an overall direct benefit of approximately $191 million.
2. Indirect benefits include the increased number of jobs and income resulting from the construction of the pipeline.
3. The Project should result in Addison County households having more disposable income (as a result of the cheaper fuel source) whereas Chittenden and Franklin County households will have slightly less (as a result of their system expansion fund contributions).
4. Some negative impacts will be felt by competitors in the form of lost sales for other heating fuels such as fuel oil and propane.
5. Businesses (both existing and prospective) in Addison County should stand to gain significantly by having a new, lower cost, cleaner burning fuel source available to them. On average, VGS projects that during the 20-year period ending 2031, the Project will indirectly result in more than 20 jobs added to the state economy, increased annual economic output of between $2.1 million and $14.1 million, and increased annual personal disposable income of between $1.1 million and $4.0 million after conversions have been completed.

Jeffrey Carr, VGS ("Carr") pf. at 6-12.

248. In the event that the Project is built but Phase II is not, Vermont Gas projects a 2.6 to 4.5 percent rate increase for existing Vermont Gas customers, but nonetheless still results in a positive economic benefit to Vermont. Carr pf. at 12-13.

249. Over the next 20 years, the Project is expected to result in an increase in economic output of between $0.6 and $21.9 million annually. Carr pf. at 13.

250. The Project has the potential of benefitting strategic economic development efforts in Addison County and the region by providing local businesses with a lower-cost source of energy. Tr. 9/17/13 at 200-202 (Carr).

251. VGS projects that the following additional benefits will accrue to the residents of Addison County:

1. Average energy bill savings per residential customer of between $1,570 and $1,910 per year.
2. Elimination of the need for heating oil customers to pre-pay for purchases of fuel.
3. The convenience of having fuel delivered via a network of pipes, thereby eliminating the potential for running out of fuel or the need to schedule fuel deliveries.
4. Access to VGS's energy efficiency programs to help manage energy use.
5. The security of regulated pricing.

Simollardes pf. at 3.

252. 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 have expressed interest in having access to natural gas and support the Project. Exhs. Pet. TSL-3.1–TSL-3.4; Edward Pcolar, Agri-Mark ("Pcolar") pf. at 2-3.

253. The lower energy costs provided by the Project could potentially result in increased capital expenditures and investment with money that would have otherwise gone into higher energy bills. Lower energy prices also provide an incentive for new business growth. Exh. Pet. SJW-4.7.

254. As a regulated fuel, natural gas may provide price stability for Vermont homes and

businesses at times when the pricing of other fuels experience extreme volatility. For example, the dramatic price swings that took place in 2008 for unregulated fuels created significant economic hardships and uncertainty for Vermonters. Exh. Pet. SJW- 4.8.

255. 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 pf. at 8-9.

256. 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 energy efficiency program. This provides an incentive for customers to purchase energy efficient equipment. Lyons pf. at 9.

Discussion

Under this criterion of Section 248, the Board is required to find that the Project would result in an economic benefit to the State of Vermont. Section 248 does not require us to quantify exactly how much economic benefit the State would receive from the Project but only determine that there will be some economic benefit.[34] However, Section 248 also requires the Board to make an overall determination as to whether the Project promotes the general good of the State. In making this determination, we must weigh the impacts and benefits of the Project and find that the benefits outweigh the impacts.[35] Those parties opposed to the Project presented essentially four arguments to show that any economic benefits of the Project, as proposed, do not outweigh the impacts.

First, the opposing parties contend that VGS has not presented sufficient evidence to demonstrate that the Project will result in an economic benefit to Addison County or Vermont. Upon review of the substantial record established in this proceeding, in particular the direct and indirect economic impacts of the Project, we conclude that VGS has provided sufficient evidence for us to find that the Project will result in a net economic benefit. In reaching this conclusion,

34. Docket 6812, Order of 3/15/04 at 45.

35. This balancing of the general good of the state is discussed below.

we are persuaded by the Department's independent economic analysis which appears to corroborate much of the testimony and analysis provided by VGS's expert witness Jeffrey Carr. Overall, Mr. Carr's economic modeling demonstrates that tangible benefits will accrue to households and businesses in Addison County primarily as a result of access to lower cost thermal energy provided by natural gas.[36] The Department's outside expert Jatinder Kumar, performed a more conservative analysis by reviewing the Project's economic benefits net of construction costs and net of any withdrawals from the System Expansion and Reliability Fund. Mr. Kumar also used different discount rates in his analysis (the highest one being 9.75 percent) and calculated the project impact with and without Phase II and service to International Paper. All of the scenarios evaluated by Mr. Kumar show a net economic benefit resulting from the Project.[37] Moreover, this benefit exists without taking the Project's reasonably forecasted greenhouse gas reductions into consideration. The Department also conducted its own economic analysis to further test VGS's assumptions, and again found that the Project would result in an economic benefit. While estimating the Project's impact on greenhouse gas emissions involves significant uncertainty (discussed below), the best estimate provided in this case shows a net greenhouse gas reduction from this Project, which has the effect of further increasing the economic benefit. The benefit also exists without taking into account the impact of the Project's reasonably forecasted energy efficiency programs.

Palmer witness Mr. Wolfe critiques the adequacy of VGS's study and suggests that Vermont Gas should be required to perform additional modeling that studies, among other things, renewable electric resources as an alternative to the Project.[38] We find no reason to require such an additional study and therefore reject the Palmers' argument on this issue. As we discuss above in our analysis of criterion (b)(2), there is sufficient evidence to conclude that the Project will not displace renewable resources in the short term. In particular, this results from the fact that the renewable resources serve a different demand (for electricity) than does natural gas

36. Carr pf. at 4-6.

37. Kumar pf. at 17.

38. Jeffrey Wolfe, Mr. Palmer ("Wolfe") pf. at 7-8.

(heating and process fuel). This is reflective of the fact that for the uses that natural gas serves, electricity is not presently competitive on price. Most renewable energy still costs above the market price for electric power, so if electricity is not price competitive with natural gas now, unless renewable prices drop or new technologies develop, the two energy sources are likely to meet different demands. No party has presented any evidence suggesting that changes in the renewables marketplace are reasonably likely to alter this relationship. Thus, we find no basis to require that VGS perform a further study.[39]

Second, the opposing parties challenge VGS's projections of natural gas prices as too low. This argument was exemplified by the Vermont Fuel Dealers Association which expressed "grave reservations" about VGS's fuel price projections in light of historical fluctuations in energy prices and other drivers such as rig counts and increased domestic and international demand for natural gas.[40] This argument is also unpersuasive. As described by VGS witness Carr at the technical hearing, the basis for VGS's price projections is the United States Energy Information Agency's ("EIA") forecasts.[41] These projections are considered by experts to be transparent and credible, and they account for myriad supply and demand-side considerations both domestically and internationally. The Department's economic forecasts also were based on EIA data, utilizing the 2013 Annual Economic Outlook as the source of its analysis (which updated Vermont Gas's earlier use of 2012 EIA data).[42] Given that EIA's price forecasts are informed by an extremely wide range of information, we find no reason to second guess those projections and adjust them simply because one party asserts, without evidence, that EIA improperly weighted one factor more than others.

Third, CLF argues that greenhouse gas impacts associated with the Project result in real

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39. Department Brief at 15-16.

40. Eugene A. Guilford, Jr., VFDA ("Guilford") pf. at 7-12,15-16.

41. Tr. 9/17/13 at 214-217 (Carr).

42. Nagle pf. reb. at 3.

economic costs that outweigh any potential economic benefits.[43] On this issue, we agree with the Department's assessment that while witnesses for VGS, CLF, and the Department testified that a net greenhouse gas reduction is the most likely scenario for the Project, it must be acknowledged that there is some degree of uncertainty inherent in this conclusion.[44] Nevertheless, based on the evidence presented, we find that the economic benefit of the Project remains significant, even when the projected greenhouse gas reductions are not included in the analysis. To the extent natural gas becomes too expensive (either due to market conditions or through the addition of some sort of carbon tax or other fee), we agree with the Department that no one is required to take service from Vermont Gas. Quite the contrary, this Project represents an additional fuel choice to Vermonters.[45]

Lastly, CLF asserts that greater efficiency requirements should be required in the event the Project is approved by the Board.[46] On this issue, we find that the Project is likely to have a markedly greater benefit when it is combined with an aggressive energy efficiency program. Accordingly, we agree with the Department that it is appropriate to condition the Order today on VGS undertaking aggressive energy efficiency programs in the newly served areas to minimize the possibility of lost opportunities and optimize benefits. At this time, however, we do not adopt specific requirements. As the Department contends, in the absence of information concerning efficiency opportunities, costs, and rate impacts, unknown negative consequences could arise affecting the efficient use of potentially scarce efficiency dollars.[47] Therefore, we will defer adoption of specific requirements for efficiency programs to Docket No. 7676.[48] In that docket, we will consider energy efficiency potential for VGS, as well as rate impacts and

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43. CLF Brief at 7,11.

44. Department Brief at 16.

45. *Id*. at 16-17.

46. CLF Brief at 17-19.

47. Department Brief at 17.

48. Department Brief at 17.

other factors, to determine what efficiency opportunities exist and to set budgets and plans to take advantage of those opportunities.[49]

5. Aesthetics, Historic Sites, Air and Water Purity, the Natural Environment and Public Health and Safety

[30 V.S.A. § 248(b)(5)]

257. The Project, subject to its compliance with the conditions recommended below, would not have an undue adverse effect on aesthetics, historic sites, air and water purity, the natural environment or the public health and safety, with due consideration having been given to the criteria specified in 10 V.S.A. §§ 1424a(d) and 6086(a)(1) through (8) and (9)(K). This finding is supported by findings 258 through 498, below.

Public Health and Safety

[30 V.S.A. § 248(b)(5)]

258. The proposed Project will not have an undue adverse impact on public health and safety. This finding is supported by findings 259 through 284, below.

259. The Project has been designed and will be constructed and operated to meet or exceed all applicable state and federal codes and standards, including Part 192 of Title 49 of the Code of Federal Regulations (the safety standards of the Office of Pipeline Safety at the U.S. Department of Transportation), the 831.8 Code of the American Society of Mechanical Engineers (governing the design of gas transmission and distribution piping systems), and PSB Rule 6.100 pipeline safety). Teixeira pf. at 12-13.

260. The Pipeline Safety Code is administered by the Pipeline and Hazardous Materials Safety Administration ("PHMSA") of the federal Department of Transportation. According to PHMSA, "[p]ipelines are by far the safest method for transporting energy products." Teixeira pf. at 12.; exh. Pet. Reb. JBH-1

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

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49. Tr. 9/19/13 at 114-115 (Poor).

262. Vermont Gas has agreed to adopt the additional safety measures recommended by the Department. 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 pf. at 15; tr. 9/17/13 at 226 (Teixeira).

263. The Project will also meet or exceed the following standards:

- American Society of Mechanical Engineers 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 pf. at 13; Heintz pf. at 9–10; Berger reb. pf. at 3.

264. 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.

265. Vermont Gas will have a quality assurance inspection and testing program for the pipe coating that 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.

266. 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.

267. 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.

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

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

270. 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.

271. 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.

272. 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.

273. 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.

274. Vermont Gas will also employ additional right-of-way 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.

275. 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 pf. at 17.

276. VGS developed its Transmission Integrity Management Plan ("TIMP") 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. 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. Teixeira pf. at 17; tr. 9/16/13 at 278 (Howe).

277. The TIMP is regularly and periodically evaluated to identify where improvements may be applied to improve the safety and integrity of the transmission system. Teixeira pf. at 18.

278. 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 pf. at 20.

279. VGS developed and implemented a Distribution Integrity Management Plan ("DIMP") in accordance with PHMSA's final rules establishing integrity management requirements for gas distribution pipeline systems. VGS's 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 pf. at 17-18.

280. 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 pf. at 19.

281. 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 pf. at 20-22.

282. VGS employs 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 pf. at 19.

283. A setback of 300 feet throughout the Project, as recommended by several parties, 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).

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

Discussion

The evidence in this proceeding persuasively demonstrates that public health and safety will not be adversely affected by the design, construction and operation of the Project. Vermont Gas has designed and will construct and operate the Project in a manner which meets or exceeds all applicable state and federal codes and standards. Furthermore, the expert consultant retained by the Department, Mr. Berger, has thoroughly reviewed the Project as proposed by Vermont Gas and has heightened and expanded the design, construction, operation, maintenance and testing standards which will apply. We therefore conclude that the Project will not have an adverse effect on public health and safety.

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.[50] Pipelines are an acceptably safe method for transporting energy products. Furthermore, it is worth noting that, when compared to the potential safety risks associated with other current fuel delivery systems, such as the transportation of fuel oil and propane in trucks on our roadways, this Project represents a safer alternative to these accepted methods for the delivery of energy resources.

Moreover, our assessment of the safety and health complication of the Project is further supported by the fact that the Project complies with, and in many circumstances surpasses, applicable safety codes. The evidence shows that 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. Vermont Gas's demonstrated commitment to these design, construction, operation, and maintenance standards ensure there will be no undue adverse impact from the Project on safety or public health.[51]

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50. "Every-day activities such as walking across a street or simply driving a car present health risks." *Northwest Reliability Project,* Docket No. 6860 (1/28/05) at 73.

51. *See Joint Petition of Central Vermont Public Service and Vermont Electric Power Company, Inc.,* Docket No. 6832 (2/4/04) 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, Order of

(continued...)

Specifically, with respect to the concerns raised by the Palmers and Monkton regarding the Project's distance from residential homes, we do not find it necessary to impose a setback requirement. We find that the Project's safety compliance with pertinent state and federal standards governing pipelines will serve to appropriately guard against any potential risks associated with pipeline construction and operation. Vermont Gas has provided ample evidence that its design for the Project meets or exceeds all applicable federal and state standards and that the Company will implement robust operational and monitoring controls.

Inasmuch as it is a safety measure, we also take this opportunity to reiterate our comments about emergency response personnel being provided methane gas detectors and non-sparking tools. As addressed above at our discussion after finding 175, we are directing VGS to train relevant emergency response personnel in Addison County in the use of non-sparking tools and methane gas detection meters. Upon completion of this training, VGS shall equip these emergency personnel with this equipment free of charge, and shall arrange for the regular calibration of the meters and appropriate refresher training following the same regulatory and industry standards followed by VGS personnel. VGS shall further ensure that ongoing communication and coordination with ACRPC occurs for purposes of emergency response planning, in particular with regard to the timing and deployment of trained personnel from both VGS and local response organizations as warranted in distribution and transmission pipeline emergencies. With these additional conditions, the Board adopts the VGS-ACRPC MOU as conditions required for the approval of this Order and CPG.

Outstanding Resource Waters

[10 V.S.A. § 1424(a)(d); 30 V.S.A. § 248(b)(8)]

285. There are no waters in the immediate Project vicinity that have been designated as outstanding resource waters. Therefore the construction and operation of the Project would not result in an undue adverse impact under this criterion. Jeffrey A. Nelson, VGS ("Nelson") pf. at

51. (...continued)
11/21/08 at 8 (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; exh. Pet. JAN-2 at 9.

Air and Water Pollution and Greenhouse Gas Impacts

[30 V.S.A. § 248(b)(5); 10 V.S.A. § 6086 (a)(1)]

286. The Project, subject to the conditions recommended below, would not result in undue air or water pollution or greenhouse gas impacts. This finding is supported by findings 287 through 333, below.

Air Pollution - Project Emissions

287. Based on the natural resources reports and impact assessments conducted by VGS's consultant, Vanasse Hangen Brustlin, Inc. ("VHB") , the Project will not have an undue adverse effect on air purity. Nelson pf. at 13.

Air Pollution - Noise

288. Construction will take place between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday, and Saturday 8:00 a.m. to 5:00 p.m. No construction will take place on Sundays or state and federal holidays. This will minimize the effects of noise at neighboring properties. During construction, the Project will produce general construction noise associated with construction vehicles and equipment. Heintz pf. at 37.

289. Equipment and labor are paid in the industry on a daily, 12-hour x 12-hour rate. The Project costs would increase by 30% if, on a daily basis, hours were limited to 8:00 a.m. to 5:00 p.m. instead of 7:00 a.m. to 7:00 p.m. Tr. 9/17/13 at 93-94 (Heintz).

290. Due to the large number of horizontal direction drills contemplated, the Project may require construction for 24-hour periods in order to effectively complete the drilling activity. Tr. 9/17/13 at 90 (Heintz).

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

292. Blasting operations for the Project 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; exh. Pet. Supp. JH-17 at 3.

293. After construction, the Project pipelines will not generate any additional noise. Heintz pf. at 37.

294. The sectionalizing valves also will not result in any additional noise. Heintz pf. at 33.

295. During the peak hours of operation, the selected heater system for the gate stations will emit noise levels of approximately 50 dBA when measured at the fence line. The closest occupied structure to a Project gate station is a bookstore in Middlebury that will be approximately 150 feet from a gate station. At this distance, the noise is projected to drop well below the acceptable standards of 45 dBA for nighttime and 55 dBA daytime noise levels at the nearest occupied structure. Heintz pf. at 33.

296. There will be sound associated with the gate station sites in New Haven, Middlebury and Williston. Post-construction noise monitoring at these gate station sites will document the noise generated at those locations and provide some basis for determining whether additional mitigation is required. Testing should be conducted at the sites to ensure that the noise levels do not exceed 55 dBA in the daytime or 45 dBA at night, as measured at the exterior of the closest occupied structure. Exh. DPS-DR-I at 8, 10; Heintz pf. supp. at 33; tr. 9/18/13 at 142-44 (Raphael).

Discussion

We recognize that it is standard practice for commercial construction hours to be based upon a twelve-hour work day. Having more restrictive hours can result in a productivity loss to the contractor, which in turn will result in increased Project costs to be passed on to Vermont Gas customers. In this case, more restrictive work hours could also limit the ability of the Company's contractors to meet the proposed Project schedule and thus compromise VGS's ability to get gas service to the Middlebury Industrial Park by 2014.

Based upon the facts presented in this case, we will authorize VGS to construct[52] the Project between 7:00 a.m. to 7:00 p.m., Monday through Friday, Saturday 8:00 a.m. to 5:00 p.m. and with hours of blasting limited to 9 a.m. to 4:30 p.m., Monday through Friday.

52. 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 EPSCP 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.

In regard to the proposed drilling operations on a 24-hour-a-day schedule, we recognize the cost savings associated with this work schedule and the relatively low noise levels associated with this activity. We are concerned, nonetheless, about the current uncertainty over the extent to which this unique work activity will occur and its impact on people in residences in its proximity. Therefore, where VGS is conducting horizontal directional drilling activities, we will allow VGS to work up to 24 hours per day, including on weekends and holidays, as necessary, to complete a drill. Where VGS is working in close proximity to residences, the Company shall execute the construction work in a manner that attempts to minimize the overall duration of the impact on the residences, and VGS shall provide residents of reasonable advance notice when 24-hour drilling operations are due to occur.

Finally, we will require VGS to conduct noise level monitoring at all of the gate stations. Testing must be conducted at the sites, before and after construction, to ensure that the noise levels do not exceed 55 dB in the daytime or 45 dB at night, as measured outside the closest occupied structure. If test results exceed these levels, follow-on testing shall occur at the nearest residence. Test results shall be reported to DPS, for purposes of developing any mitigation steps necessary to achieve those maximum noise levels.

Water Pollution

297. With the conditions recommended below, the Project will not result in undue water pollution. This finding is supported by findings 298 through 303, below, and by the specific findings under the criteria of 10 V.S.A. §§ 6086(a)(1)(A) through (G), below.

298. VGS has applied for an Individual Construction Stormwater Discharge Permit (Project Number 6949-INDC), which is administered in Vermont by the Department of Environmental Conservation ("DEC"). Nelson pf. supp. at 15; Jenna Calvi ("Calvi") pf. at 3.

299. The design and construction of the Project will incorporate DEC's best management practices to protect water quality during construction and will implement a comprehensive EPSCP. Nelson pf. supp. at 15.

300. 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 pf. supp. at 18.

301. During construction, water will be used for pressure testing of pipeline segments. The disposal of this water will be governed by the construction phase EPSCP, 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 pf. supp. at 16-17; exh. Pet. Supp. JAN-9 (6/28/13).

302. 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 pf. supp. at 16.

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

Greenhouse Gas ("GhG") Impacts

304. Natural gas is a nonrenewable, carbon-based fuel. Jon D. Erickson, CLF ("Erickson") pf. at 6.

305. The extraction and delivery of natural gas results in methane emissions to the atmosphere. Erickson pf. at 6.

306. Warming of the earth's climate system is unequivocal and with over 90% certainty is due to the increase in human-caused GhG emissions. Erickson pf. at 4-5.

307. The main human-caused GhG are carbon dioxide, methane, and nitrous oxide. Erickson pf. at 5.

308. In its petition, Vermont Gas initially projected that the Project would reduce GhG emissions in Vermont by approximately 296,000 tons over a 20-year period, with an associated carbon reduction savings of $17.1 million. Simollardes pf. at 3-5.

309. Vermont Gas's initial projection of greenhouse gas emissions was a "burner tip" analysis. A burner tip analysis compares the emissions of different types of fuels (i.e., fuel oil vs. natural gas) as they are expended through use. This analysis relies on several assumptions, among them the type and amount of fuel utilized prior to switching to natural gas, the rate of

conversions, and the efficiency of current and newly installed equipment. Poor pf. at 9.

310. Adding assumptions, such as the lower carbon content of natural gas and the higher efficiency of gas appliances, would lead to different burner tip emissions savings estimates but would not change the result that "burner tip" greenhouse gas emissions yield reductions in GhG emissions. Poor pf. at 9-10.

311. The "burner tip" analysis does not account for GhG releases at various other stages along the entire life-cycle of natural gas in the environment, including the extraction and production of the fuel, the fugitive (i.e., uncaptured or uncontrolled discharges to the air) natural gas leakage from transmission and distribution pipes and other system components such as gate valves, residential/commercial distribution hookups, etc., or natural gas releases from scheduled maintenance and new construction activities, or from natural gas releases from unscheduled events (e.g., historical estimate of accidental releases, relief valve releases due to overpressure events, etc.). Jeff Merrell, ANR ("Merrell") pf. at 5.

312. There is significant uncertainty regarding the accuracy of the emissions data and leak rates for natural gas systems. Stanton pf. reb. at 3.

313. Two experts, Dr. Elizabeth Stanton for CLF and ICF International for VGS, provided natural gas emissions analyses attributable to the Project that sought to capture life-cycle impacts. Though the testimony diverged based on different assumptions and methodologies used, both analyses concluded that the Project would likely produce some net reduction in GhG emissions. Poor pf. reb. at 4-5; tr. 9/19/13 at 85-87 (Poor); tr. 9/20/13 at 94-144 (Stanton); Joel Bluestein, VGS ("Bluestein") pf. reb at 3-6.

314. A significant source of emissions from natural gas is from methane leaks over the total life-cycle of natural gas. Stanton pf. at 10.

315. Life-cycle methane leakage rates range from 1.3 to 5.75 percent. Stanton pf. at 10; Poor pf. at 8; Bluestein pf. reb at 4-6.

316. CLF's analysis used an upstream methane leak rate of 3 percent, which represents the average of conventional and unconventional leakage estimates in the four studies reviewed in Exhibit CLF-EAS-6, World Resources Institute, Clearing the Air: Reducing *Upstream Greenhouse Gas Emissions from U.S. Natural Gas Systems*, Washington, DC (2013). Stanton

pf. at 12-13.

317. There is significant uncertainty regarding the accuracy of the emission factors and leak rates for natural gas systems. Stanton pf. at 3.

318. Vermont Gas provided an analysis from Mr. Bluestein comparing the life-cycle emissions of fuel oil and biofuel to natural gas. Poor pf. reb. at 5.

319. A comparison of these life-cycle GhG emissions estimates from natural gas versus heating oil versus 7% biofuel suggests that natural gas may have the lowest life-cycle GHG emissions of the fuels compared. Merrell pf. reb. at 2.

320. Vermont Gas's study indicated that life-cycle GhG emissions for gas delivered by Vermont Gas is 18 percent lower than oil at the point of delivery and 13 percent lower than 7 percent biofuel. These emissions savings increase when including the higher efficiency for gas equipment. Bluestein pf. reb. at 8.

321. Neither VGS's nor CLF's studies represents a full life-cycle GhG analysis of the Project. Poor pf. reb. at 2.

322. The Department's witness conducted a revised analysis using elements of both CLF's and Vermont Gas' studies. The Department's analysis is structured based on Stanton's study but corrects that study to use the correct density value of methane.[53] The Department's study also includes upstream emissions from fuel oil as estimated by Mr. Bluestein. Poor pf. reb. at 6-7 .

323. The results of the Department's analysis (after being corrected for a calculation error) show the following greenhouse gas impacts associated with the Project:

53. In her initial analysis, Dr. Stanton used the incorrect density of methane from 77.5 lbs/Mcf. In her surrebuttal testimony, Dr. Stanton acknowledged her error and revised the density to 42.0 lbs/Mcf, as recommended by the Department. Stanton pf. sur. at 2.

Emissions Impacts of the Project

Case	*20 year cumulative Impact (tons/CO2e)*	*100 year cumulative Impact (tons/CO2e)*
Adjusted Density Only	(38,281)	(176,616)
Adjusted Density + VGS estimate upstream fuel oil	(220, 439)	(1,138,851)

Stanton pf. sur. at 4.[54]

324. This analysis, which shows a net greenhouse gas reduction in all cases, provides a range of emissions impacts that may result from the Project. Poor pf. reb. at 8.

325. The first row corrects Dr. Stanton's study to use the appropriate methane density. It does not include any upstream greenhouse gas impacts from fuel oil or propane. Therefore, the first row is on the high side of the range of greenhouse gas estimates. Poor pf. reb. at 8.

326. The second row includes the upstream emissions from fuel oil (but not propane), and is therefore a better estimate of greenhouse gas emissions from the Project. Stanton pf. sur. at 4.

327. Given the variability of fugitive emissions from different natural gas operations, it is important to continue to collect more project-relevant data to better understand the actual life-cycle GhG emissions characteristics. Merrell pf. reb. at 3.

328. In response to this lack of data and lack of certainty as to the impact of natural gas expansion on achieving GhG reduction, as part of the VGS-ANR MOU, VGS will provide the following information annually to the ANR:

a. The amount of natural gas purchased at each market point for the prior twelve months.

b. The estimated greenhouse gas emissions as reported by Vermont Gas to the U.S. Environmental Protection Agency through the electronic greenhouse gas reporting system known as "e-GGRT."

c. The unaccounted for gas as reported to the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration.

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54. "Carbon dioxide equivalent" or "CO2e" is a term for describing different greenhouse gases in a common unit. For any quantity and type of greenhouse gas, CO2e signifies the amount of CO2 which would have the equivalent global warming impact. Furthermore, the numbers in parentheses in the table are negative numbers.

d. VGS will provide updates on the GhG reporting requirements for the natural gas industry and shall report to ANR annually on changes in those requirements. When new or updated GhG emissions data associated with VGS's suppliers' of natural gas production becomes available to VGS or publically available, VGS shall provide it to ANR along with other information described in a, b, and c above.

VGS-ANR-Joint 1 at 10.

329. The proposed Project is larger than is needed to meet the anticipated demand of customers in Addison County. Tr. 9/16/13 at 21 (Gilbert).

330. Approximately one-third of the project's capacity will be excess capacity. Stanton pf. reb. at 5; Teixeira pf. at 10.

331. The available excess capacity is sufficient to supply a gas-fired electric generating facility or additional manufacturing. Stanton pf. reb. at 5; Stanton pf. sur. at 5.

332. No VGS policy measure precludes use of the gas in the proposed Project for new generation or manufacturing. Stanton pf. reb. at 5.

333. VGS has proposed no limit on the use of gas in its proposed Project. Tr. 9/16/13 at 26 (Gilbert).

Discussion

Section 248(b)(5) requires that the Board give due consideration to the greenhouse gas impacts of the Project. The parties have presented differing views of the effect of the Project on greenhouse gas emissions. However, while the amount of greenhouse gas reductions that will result from the Project cannot be precisely determined, the evidence indicates that the Project is likely to result in a net reduction in greenhouse gases.

The dynamic nature of the growing natural gas production in the United States in recent years past has outpaced the scientific assessment of the impact of this expanding industry on greenhouse gas emissions. Accurate measurement of the greenhouse gas impacts of the consumption of fuel are possible. Measured at the burner tip, natural gas has less emission of carbon dioxide than do the fuels it is likely to displace — fuel oil and propane. This holds true even when methane, a more potent greenhouse gas, is included in the analysis.

There are questions, however, about the relative emissions from the various fuels over

their entire life-cycle, including production, transportation, and consumption. VGS, the Department, VFDA, and CLF all presented some analyses that sought to compare the emissions from the different fuels and to thereby measure the effect of the Project on greenhouse gas emissions. Collectively, the weight of the evidence from the studies leads us to conclude that the Project will reduce greenhouse gases relative to the emissions that are occurring today, although we cannot precisely quantify the greenhouse gas impacts.

The Vermont Fuel Dealers Association have taken this uncertainty and stressed that we will know more in the years to come about these impacts. As a result, VFDA recommends that we delay approval of the Project until more refined data exists and the impacts can be better understood. We decline to accept VFDA's recommendation. The analyses in the evidentiary record support the conclusion that the Project will result in a net reduction of GhG emissions.

We note that the VGS-ANR MOU requires VGS to gather data that will help us better understand the greenhouse gas effects of the Project and more accurately determine the reductions that have occurred going forward. We appreciate the efforts of ANR to capture the future data as agreed to in the VGS-ANR MOU and condition this Order and CPG upon VGS's compliance with that MOU, including the GhG data-gathering elements addressed above.

CLF also asserts that, notwithstanding the greenhouse gas effects arising from the displacement of fuel oil and propane, approximately one-third of the Project's capacity will be excess capacity. According to CLF, this creates the potential not only for expansion, but also for the introduction of new uses of natural gas, such as an electric generating station or a new industrial customer. VGS has argued that the pipeline will make the areas served by the Project more competitive for siting new industry with large energy needs. This growth introduces the possibility that the increased availability of natural gas will supplant the investment in energy efficiency, renewable energy, and no or low GhG energy alternatives by new and existing business and industrial customers, as well as residential customers.[55]

At this time, the concern raised by CLF is speculative, if not premature. No evidence has

55. For example, a witness for Agri-Mark testified during the technical hearing in support of the pipeline and the use of natural gas in his industry now, but saw that renewable energy alternatives would only be an opportunity for his industry to use at some point in the future if the return on investment was more promising. Tr. 9/17/13 at 158-164 (Pcolar).

been adduced in this proceeding that new industrial development is likely to occur much less any evidence of any additional resulting greenhouse gas emissions.

The possibility of new industrial development that would be facilitated by the pipeline reinforces our previous conclusion that VGS needs to aggressively pursue energy efficiency programs in the newly served areas, and, to specifically address the potential incremental additions cited by CLF, we will require VGS to develop a robust proposal for engaging new industrial natural gas users to promote energy efficiency alternatives. At a minimum, VGS in its proposal shall address three matters: (1) reaching out to new industrial (and residential) natural gas customers in Addison County and planning for the role of efficiency in their energy future; (2) identifying and promoting the opportunity for savings by industrial customers through the use of energy efficiency technology as they invest in conversion to natural gas (e.g., replacing old technology with more efficient technology rather than simply converting it to natural gas); and (3) ensuring that the investment of VGS ratepayers in the ANGP results in not only reliability and greater availability of natural gas to new customers but also greater energy efficiency (and reduced GhG emissions) for new and existing customers.

Headwaters

[10 V.S.A. § 6086(a)(1)(A)]

334. The Project will not have an undue adverse impact on headwaters. Portions of the Project include drainage areas of less than 20 square miles and watersheds of public water supplies. These are two of the 10 V.S.A. § 6086(a)(1)(A) headwaters criteria. These areas are 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 will conform to applicable regulations including DEC rules and the 2011 Vermont Water Quality Standards. Nelson pf. supp. at 14–15.

Waste Disposal

[10 V.S.A. § 6086(a)(1)(B)]

335. With the conditions recommended below, 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 336 through 349, below.

336. VGS has applied for an Individual Discharge Permit concurrently with this Section 248 permit. Nelson pf. supp. at 15; Calvi pf. at 3.

337. 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 pf. supp. at 18.

338. 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 pf. supp. at 15.

339. 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 pf. supp. at 17.

340. 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 pf. supp. at 17.

341. There will be no new impervious surface associated with the six proposed valve sites. Nelson pf. supp. at 17.

342. 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 pf. supp. at 17; exh. Pet. Supp. JAN-9 (6/28/13).

343. Within each gate station enclosure, infrastructure will be situated upon a pervious 12-inch thick minimum crushed stone surface, underlying which there will be 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 pf. supp. at 17-18; exh. Pet. Supp. JAN-9 (6/28/13).

344. 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 NPDES Construction Stormwater Discharge Permit Application on December 20, 2012, and supplemented this application on May 3, 2013. Nelson pf. supp. at 15; Nelson pf. reb. at 4.

345. The Project will incorporate DEC's Best Management Practices ("BMPs") to protect water quality during construction, by implementing a comprehensive EPSCP to manage erosion and sediment issues. Nelson pf. supp. at 15 .

346. With the incorporation of the DEC BMPs and adherence to the approved EPSCP, the Project will meet the applicable DEC regulations regarding any impacts on the quality of ground or surface waters in a headwaters area. Nelson pf. supp. at 16; Calvi pf. reb. at 5.

347. During construction, water will be used for pressure testing of pipeline segments. The disposal of this water will be governed by the construction phase EPSCP, 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 pf. at 13; Nelson pf. supp. at 16-17; exh. Pet. Supp. JAN-9 (6/28/13).

348. 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 pf. at 13; Nelson pf. supp. at 16.

349. Once the Project is operational, no sanitary facilities will be required. Nelson pf. at 13; Nelson pf. supp. at 16.

Water Conservation

[10 V.S.A. § 6086(a)(1)(C)]

350. 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 351 through 357, below.

351. The Project involves temporary and very limited water usage. Nelson pf. supp. at 19.

352. During construction, small amounts of water usage may be necessary for dust suppression, in accordance with the EPSCP, as well as for pressure testing of the pipeline. Nelson pf. supp. at 19.

353. 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 pf. supp. at 31.

354. Once operational, there will be no ongoing water use associated with the Project. Nelson pf. supp. at 19 and 31.

355. Sufficient water will be available for the Project. Nelson pf. supp. at 31.

356. 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). The Blasting Plan is intended to ensure that explosives are properly managed to avoid off-site blast impacts to existing water supplies. Attachment 2 to Exh. Pet. VGS-ANR-Joint-1; Nelson pf. supp. at 31.

357. The Project will cross through but not impact 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 pf. supp. at 31-32.

Floodways

[10 V.S.A. § 6086(a)(1)(D)]

358. 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 359 through 366, below.

359. 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 seven which have been revised, supplemental analyses are presented in Exhibit Petitioner Supp. JAN-7 (6/28/13). Nelson pf. reb. at 5.

360. 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 pf. supp. at 20.

361. To evaluate the floodway criterion, it is necessary to evaluate both flooding due to inundation and flooding due to the lateral migration of stream and river channels over time, a process known as "fluvial erosion." 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 pf. supp. at 20.

362. All floodways, floodway fringes, or FEH zones that will be crossed by the Project's alignment are depicted within the Natural Resources Report. Construction impacts, however, have been avoided through the use of HDD where feasible. There are no anticipated permanent alterations to waterways, flood elevations, or the ability of the land to hold water. Nelson pf. supp. at 20; *see* exh. Pet. Supp. JAN-2, Section 6.0 (2/28/13).

363. Underground infrastructure within floodways or floodway fringes will include buoyancy compensation to provide additional weight to prevent the pipe from migrating upwards. Nelson pf. supp. at 20-21.

364. 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 pf. supp. at 21.

365. 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 pf. reb. at 5-6.

366. 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 pf. supp. at 21; Nelson pf. reb. at 6.

Streams

[10 V.S.A. § 6086(a)(1)(E)]

367. We find that 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 368 through 385, below.

368. Portions of the Project will necessitate location in the vicinity of streams, however, the natural condition of the streams will be maintained. The Project will cross 17 unique streams or rivers at 22 discrete locations that have been mapped by the ANR/DEC with watershed sizes greater than one (1) square mile which are subject to review and comment by DEC personnel. Nelson pf. supp. at 21 and 23.

369. 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 Vermont Water Quality Standards. Nelson pf. supp. at 22.

370. 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 pf. supp. at 22-23.

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

372. 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 Pet. Supp. JAN-2 (2/28/13). Nelson pf. supp. at 23.

373. The Project design 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 EPSCP 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 pf. supp. at 25-26.

374. The Project is designed to avoid any permanent impacts to streams. Nelson pf. supp. at 23.

375. 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 pf. supp. at 23-24.

376. 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 pf. supp. at 24.

377. The design considered the mapped extent of FEH zones to ensure that the pipeline segments installed by HDD will be 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 pf. supp. at 24.

378. 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 EPSCP 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 pf. supp. at 24.

379. Consistent with the ANR Buffer Guidance, riparian buffers have been designated adjacent to perennial and intermittent steams. 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 pf. supp. at 24-25; *see also,* Attachment 1 to exh. Pet. VGS-ANR-Joint-1 (the Vegetation Management Plan).

380. 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.

381. 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.

382. 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.

383. VGS has submitted applications for a Department of the Army Section 404 Permit and a Vermont State Section 401 Water Quality Certification. Nelson pf. supp. at 25; Nelson pf. sur. at 7.

384. 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 pf. supp. at 26; Nelson pf. sur. at 8.

385. VGS has applied for a stream alteration permit from ANR/DEC. Exh. Pet. VGS-ANR-Joint 1 at 2.

Discussion

Our approval of this Project is conditioned upon VGS obtaining a stream alteration permit prior to construction of the Project. With this condition, we find that 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.

Shorelines

[10 V.S.A. § 6086(a)(1)(F)]

386. There will be no undue or adverse impacts to shorelines as a result of the Project. This finding is supported by findings 387 though 391, below.

387. The Project will impact the shorelines of 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 pf. supp. at 27.

388. 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.

389. 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 horizontal directional drilling method, which will avoid direct impacts altogether. The drilling 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 pf. supp. at 27-28.

390. Prompt soil stabilization and natural revegetation are incorporated in the Project EPSCPs to further minimize impacts. Nelson pf. supp. at 28.

391. 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. Nelson pf. supp. at 27.

Wetlands

[10 V.S.A. § 6086(a)(1)(G)]

392. The Project will not create an undue adverse effect on wetlands. This finding is supported by findings 393 through 408, below.

393. There are at least 51 Class II wetlands or wetland complexes along the proposed route. Class II wetlands are those wetlands deemed "significant" under the Vermont Wetland Rules ("VWR"). Alan Quackenbush, ANR ("Quackenbush") pf. at 3.

394. There are also Class III wetlands along the route. Class III wetlands are not considered "significant" under the VWR. Quackenbush pf. at 3.

395. A wetland impact is any alteration to wetland vegetation, soil, or hydrology. Quackenbush pf. reb. at 4.

396. The Project requires both a Department of the Army Section 404 permit (for Class II wetlands) and a Vermont Section 401 Water Quality Certification (for Class III wetlands). Quackenbush pf. at 4; Nelson pf. sup. at 25.

397. VGS has filed a wetland permit application and 401 Water Quality Certification Application with ANR. Quackenbush pf. at 4.

398. VGS has filed a Department of the Army Section 404 Permit application. Nelson pf. supp. at 25.

399. Vermont Gas has established proposed classifications of all delineated wetlands in accordance with VWR procedures and has reviewed these classifications with DEC wetland scientists. Exh. Pet. Supp. JAN-2; Nelson pf. supp. at 28-29.

400. Several planning and design considerations have been applied to mitigate undue adverse effects from the Project upon Class II wetlands and buffers. These mitigation 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 (e.g., 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 pf. supp. at 29; exh. Pet. VGS-ANR-Joint-1 at 6-7; tr. 9/18/13 at 62-63 (Nelson).

401. 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 exh. Pet. Supp. JAN-4. Nelson pf. reb. at 9.

402. The MOU entered into between VGS and the AAFM, VLT, and the VHCB, on June 13, 2013, resulted in further impact avoidance and minimization. Exh. Agricultural Interests Group 1-AAFM-1.

403. 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 pf. supp. at 30.

404. 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 pf. reb. at 10.

405. All proposed wetland impacts (Class II and Class III) will be reviewed by ANR for Section 401 water quality certification. Nelson pf. supp. at 30.

406. 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.

407. With regard to wetland breeding bird habitats, three wetlands of potential concern have been identified. ANR's specific concerns have been addressed as provided in the Memorandum of Agreement between VGS and ANR, entered into on September 13, 2013. Exh. Pet. VGS-ANR-Joint-1 at 7.

408. The design and implementation measures are intended to ensure that there will be no undue adverse effects to significant Vermont wetlands. Nelson pf. supp. at 29-30; Nelson pf. reb. at 10; exh. Pet. VGS-ANR-Joint-1 at 2.

Discussion

Our approval of the Project is conditioned upon VGS compliance with the VGS-ANR MOU in which, among other things, VGS agreed to obtain all necessary permits for the Project. This included the following four permits from ANR:

- the NPDES construction stormwater discharge permit;
- the ANR wetland permit;
- the ANR 401 water quality certification; and,
- the ANR stream alteration permit.

VGS also must obtain the following permits for this Project:

- the ACOE 404 permit; and
- the Vermont Department of Transportation ("VTrans") permit.

In its Proposal for Decision, VGS recommended that the Board adopt the following condition:

> 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.

ANR recommended a similar condition in its Brief that stated:

> [the] Petitioner shall obtain all necessary state and federal permits before commencement of construction or ground clearing, including Vermont Stream Alteration Permit, Vermont Wetland Permit, 401 Water Quality Certification, NPDES Stormwater Permit, Army Corps of Engineers 404 Permit.

These parties explained their disagreement in Reply Briefs. According to ANR, each of the ANR permits cover or authorize activity for the entire project, rather than having separate permits for each wetland or stream crossing. ANR states that it "cannot agree to allow construction to commence on one segment of the project before it has issued its permits for the entire project."[56] Moreover, ANR contends that the Section 404 permit and VTrans permit are tied to one or more of the ANR permits or certifications.

For its part, VGS states that it does not object to ANR's proposed condition, but requests that "it be appropriately tailored to the specific activities that are the subject of the collateral permits."[57] VGS's "tailoring" does not actually modify ANR's proposal, but instead requests that the Board adopt VGS's original language. VGS explains that considering the size of the Project, "not all portions of the project may be subject to the same set of collateral permits." VGS maintains that ANR's condition would unduly delay construction by requiring receipt of all collateral permits before construction may begin. VGS asks that, if a collateral permit has not been issued (such as for a municipal road crossing), that the Board not limit construction in other areas in which the permit is not applicable.

Assuming ANR is correct that it will issue only the four specified permits (each encompassing the entire project) — and the Board has no basis not to accept ANR's assertions — VGS will not receive the required environmental permits in stages. This includes the stormwater permit that would apply to all site preparation and construction activities. As a result, VGS would not have the requisite permits for one area that would be necessary to trigger the operative language in VGS's proposal that would authorize phased construction. Furthermore, under the assumption that ANR correctly states its policies and those of VTrans, VGS would also not have the VTrans permit under this scenario. Practically, for the environmental permits, it appears that there is little likelihood of a material difference in the outcome irrespective of which proposed

56. ANR Reply Brief at 2.

57. VGS Reply Brief at 2.

condition we adopt.

Setting aside the practical effect, however, the parties' disagreement raises broader questions concerning whether a phased construction such as that proposed by VGS is either legally permissible or sound policy. Under the requirements of Section 248(b)(5), before issuing a CPG, the Board must find that a project will not have an undue adverse impact upon the environment, with due consideration given to specified standards of Section 6086 of Title 10 that apply to Act 250 proceedings. The Board has previously ruled that the due consideration requirement mandates consideration of each of the specified criteria in Title 10.

A party seeking to demonstrate that it has met the requirements of Section 248(b)(5) has two choices. The party may elect to present evidence demonstrating that each of the criteria has been met. This evidence is then weighed during the hearing process and the Board may make findings based upon it. Alternatively, for a number of the criteria specified in Section 6086, a party may rely upon compliance with a permit issued by ANR that regulates the activity. For example, soil erosion concerns about a construction project are often addressed (at least partially) through a stormwater permit. Similarly, an NPDES permit may be part of the proof supporting the conclusion that there will not be undue water pollution. Under this option, however, the permit itself is part of the evidentiary basis for issuing the CPG. Once filed, the permit enjoys a rebuttable presumption. The Board has explained this standard previously:

> to the extent the applicant relies upon permits issued by other agencies or outside studies to form the evidentiary basis for its petition (in effect relying upon them as a rebuttable presumption), the Board cannot issue a certificate until those documents are submitted and other parties have had an opportunity to rebut them. In some cases, this may require further evidentiary hearings, which could have the effect of delaying a project. An applicant that chooses to rely upon such permits (rather than presenting direct evidence) must bear this risk.[58]

The Board can still make an affirmative finding that the Section 248(b)(5) criterion has been met, relying upon compliance with the to-be-filed permit. Of necessity, however, this requirement

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58. *Joint Petition of Vermont Electric Power Company, Inc. ("VELCO"), and Citizens Communications Company, d/b/a Citizens Energy Services ("Citizens")*, Docket 6792, Order of 7/17/03 at 37. *See also*, *Petition of Vermont Electric Power Company, Inc. and Green Mountain Power Corporation for a certificate of public good pursuant to 30 V.S.A. Section 248 authorizing VELCO to construct the so-called Northwest Reliability Project*, Docket 6860, Order of 1/28/05 at 214–216 (where the Board concluded that the Petitioners had presented sufficient evidence on the Section 248(b)(5) criteria without reliance on the permits).

that the permit be filed and other parties are provided an opportunity for comment and to request further proceedings, is a condition precedent to the applicant receiving the legal right to begin site preparation or construction. The compliance filing of the permit is a necessary part of the Board's decision.

In this proceeding, VGS has presented some direct evidence on environmental criteria, but the Company has also presented testimony that it intended to rely upon the underlying environmental permit to demonstrate compliance. Accordingly, VGS must obtain the environmental permits prior to being authorized to commence site preparation or construction. Requiring receipt of all environmental permits avoids a situation in which an applicant commences construction, then receives an environmental permit with conditions that materially impact the decision to construct the project at all.

Our conclusion in this case that a permit must be received prior to commencement of any construction applies only to permits on which the Board relies as part of the evidentiary basis for our decision. Thus, it does not apply to municipal road crossing permits that the Company will need to obtain for the Project. However, it does apply to the environmental permits issued by ANR and the Army Corps of Engineers, as well as to the VTrans permit. Accordingly, we hereby adopt the following condition:

> The Petitioner shall obtain all necessary permits from the Agency of Natural Resources, the U.S. Army Corps of Engineers, and the Vermont Agency of Transportation before commencement of construction or site preparation. This includes the Vermont Stream Alteration Permit, Vermont Wetland Permit, Section 401 Water Quality Certification, NPDES Stormwater Permit, and Army Corps of Engineers Section 404 Permit. Prior to proceeding with construction in any given area, the Petitioner shall also obtain all other necessary permits and approvals 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.

Sufficiency of Water and Burden on Existing Water Supply

[10 V.S.A. §§ 6086(a)(2)&(3)]

409. Sufficient water exists to meet the needs of the Project and the Project will not cause an

unreasonable burden on an existing water supply. Nelson pf. supp. at 32; Nelson pf. reb. at 11.

Soil Erosion

[10 V.S.A. § 6086(a)(4)]

410. With the conditions recommended below, the Project will not cause unreasonable soil erosion or a reduction in the capacity of the land to hold water so that a dangerous or unhealthy condition may result. This finding is supported by findings 411 through 437, below.

411. The Project will require a construction stormwater discharge permit (NPDES) for the discharge of stormwater runoff from construction activities. Calvi pf. at 3; finding 309, above.

412. On December 20, 2012, VGS applied for an Individual Construction Stormwater Discharge Permit. The stormwater permit application is under review by the Agency. Calvi pf. at 3.

413. VGS provided revised application materials on May 3, 2013. Nelson pf. reb. at 13.

414. ANR has requested and VGS has provided additional information about the Project and the proposed EPSCP for the project. Calvi pf. reb. at 2.

415. If the Agency issues a Permit for the Project and VGS adheres to the terms and conditions of the Permit, and the approved EPSCP, the project will not cause or contribute to a violation of the Vermont Water Quality standards. Calvi pf. reb. at 4.

416. As part of the EPSCP design, particular attention has been given to: (1) minimizing disturbance; (2) managing runoff; (3) stabilizing promptly; and (4) monitoring, maintaining, and, if necessary, adapting EPSCP measures to evolving site conditions. Nelson pf. supp. at 33.

417. Minimizing disturbance involves, to the extent practicable, maintaining existing topography, phasing major disturbance activities, and maintaining existing vegetation. Nelson pf. supp. at 33.

418. 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 run-on, stabilizing flow paths, dispersing concentrated flows through EPSCP measures, and stabilizing areas of disturbed soil within a specified time frame. Nelson pf. supp. at 33-34.

419. With regard to phasing major disturbance activities, the general approach will involve

the following sequence of activities:

a. Installation of specified EPSCP 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 pf. supp. at 34.

420. Generally, the Project will be segmented into specific work areas, with 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 pf. supp. at 34.

421. 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 EPSCP measures will be inspected at least as often as required by the Individual Permit. Nelson pf. supp. at 35.

422. 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 pf. supp. at 35.

423. 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 pf. supp. at 35; exh. Pet. Supp. JAN-11 (2/28/13); exh. Agricultural Interests Group 1-AAFM-1 at 3.

424. 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 EPSCP denote that all the areas of prime agricultural soils, whether they are used actively for farming or not, are subject to the topsoil segregation procedure. Consequently, the pipelines will not result in a reduction of the farming potential of agricultural soils. Nelson pf. supp. at 35-36; tr. 9/18/13 at 81 (Nelson).

425. Currently, VGS maintains many miles of pipeline underneath agricultural fields, which has not impacted the ability of the farmers to conduct their business. Nelson pf. supp. at 36.

426. 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 pf. supp. at 36.

427. 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).

428. 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. 9/18/13 at 79-80 (Nelson); exh. Pet. Reb. EMS-2 at 1.

429. Groundwater changes due to the pipeline will be minimal and 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. 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. 9/18/13 at 86-89 (Nelson); Heintz pf. reb. at 22; exh. Pet. Supp. JH-3 at ANGP-T-G-015.

430. 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 pf. supp. at 22.

431. If the Project were to cause 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. 9/18/13 at 86-87 (Nelson).

432. 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 fact, 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).

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

434. The VGS-AIG MOU indicates that the Project may either temporarily 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 VGS-AIG MOU and attachments thereto. Exh. AAFM-1 at 2.

435. The reclamation of primary agricultural soils through restoration 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.

436. No herbicides will be used by VGS for vegetation management related to the Project. VGS plans to brush hog its right-of-way, including the area within the Conserved Areas, approximately every three years, or more frequently as required to maintain herbaceous growth in the right-of-way. 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 existing conservation easements. Exh. AAFM-1 at 3-4.

437. 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's right as defined herein. Exh. AAFM-1 at 4.

Discussion

The Palmers raised several concerns about soil erosion on their property, which they contend would adversely affect their ability to have their farm certified as organic. Witnesses for the Palmers and witnesses for VGS disagreed as to the magnitude of any such effect. As we noted in our discussion of the Rotax Road re-route above, we are persuaded that VGS should be required to employ HDD through the entire route across the Palmers' property. This will serve to mitigate various impacts, including the Palmers' concern regarding soil erosion and the adequacy of trench breakers to mitigate or eliminate that concern. For example, the Palmers are concerned that the use of trench breakers in responding to groundwater may only exacerbate, rather than mitigate, any groundwater issues on their property attributable to the Project. With the condition we will impose to require the use of HDD across the whole of the Palmers' property and the other conditions agreed upon in the VGS-AIG MOU — in particular the potential conditions mitigating the impacts on both conventional and organic farming — we find that the Project will not cause unreasonable soil erosion or a reduction in the capacity of the land to hold water so that a dangerous or unhealthy condition may result. We therefore condition this Order and CPG upon VGS's compliance with these requirements.

Transportation Systems

[10 V.S.A. § 6086(a)(5)]

438. With the conditions recommended below, the Project will not cause unreasonable congestion or unsafe conditions with respect to transportation. This finding is supported by findings 439 through 442, below.

439. Vermont Gas plans to conduct horizontal directional drilling or boring under several street and railway crossings. Such drilling allows Vermont Gas to avoid direct impacts to those particular areas. Heintz pf. supp. at 39-41.

440. 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 right-of-way or shoulder, it will also employ traffic control measures and maintain one lane of traffic during construction. Heintz pf. supp. at 41.

441. Road surfaces will be protected and restored to original or better condition if impacted by the Project construction. Heintz pf. supp. at 41.

442. 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 pf. supp. at 41.

Discussion

This Project will extend over forty miles and will impact several major traffic arteries. There will be effects on traffic that will impact businesses, municipal services, and residences. Our approval of this petition is conditioned upon VGS mitigating the traffic impacts by meeting the VTrans and municipal standards, permit, and notice requirements addressed in our findings above.

Educational Services

[10 V.S.A. § 6086(a)(6)]

443. The Project will not cause an unreasonable burden on the ability of a municipality to provide educational services. 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 pf. at 26-27.

Municipal Services

[10 V.S.A. § 6086(a)(7)]

444. The Project will not place an unreasonable burden on the ability of the local governments to provide municipal or governmental services. This finding is supported by

findings 445 through 447, below.

445. The Project will be constructed and maintained to meet or exceed applicable safety codes. Wark pf. at 26.

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

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

Aesthetics

[10 V.S.A. § 6086(a)(8)]

448. The Project will not have an undue adverse impact on aesthetics or on the scenic or natural beauty of the area. This finding is supported by findings 449 through 458, below.

449. 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. Michael J. Buscher, VGS ("Buscher") pf. at 4.

450. The Project mostly consists of underground infrastructure that generally will not be visible. Buscher pf. at 4; David Raphael, DPS ("Raphael") pf. at 5.

451. 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 pf. at 4; Raphael pf. at 5.

452. One key location where there are concerns is at the proposed gate station site in New Haven off of Plank Road. This gate station will be sited in an existing agricultural area, on a field currently planted for corn. It is set off from the background woodlands and accessed from Plank Road via a dirt and gravel farm road. This gate station, despite the presence of the VELCO corridor, will be an incompatible land use and visual element in this agrarian landscape and thus can be considered to have an adverse impact to the aesthetics of the surrounding rural agricultural

landscape. Raphael pf. at 7.

453. In consultation with the DPS and the Town of New Haven, VGS modified the initial siting plan to address landscaping, site offset, and site appearance concerns to mitigate the visual impact of the gate station within its agricultural setting. These changes include the color and dimensions of the structure, the type and color of fencing and gravel, manual lighting for the facility, and landscaping modifications. Tr. 9/18/13 at 137-138 (Raphael) .

454. 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 pf. at 5-6; Raphael pf. at 5.

455. VGS has responded to several of the 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 pf. reb. at 4-6; exh. Pet. Supp. MJB-2.1 at 40.

456. Overall, the Project will avoid most areas where tree removal would result in adverse impacts. Buscher pf. at 4-6.

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

458. 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.

Discussion

In determining whether a proposed project would have an undue adverse impact on aesthetics, the Board has adopted the Environmental Board's Quechee test. The Board has previously summarized the Quechee analysis:

> In order to reach a determination as to whether the project will have an undue adverse effect on the aesthetics of the area, the Board employs the two-part test first outlined by the Vermont Environmental Board in Quechee, and further defined in numerous other decisions.

> The next step in the two-part test, once a conclusion as to the adverse effect of the project has been reached, is to determine whether the adverse effect of the project is "undue." The adverse effect is considered undue when a positive finding is reached regarding any one of the following factors:
>
> 1. Does the project violate a clear, written community standard intended to preserve the aesthetics or scenic beauty of the area?
> 2. Have the applicants failed to take generally available mitigating steps which a reasonable person would take to improve the harmony of the project with its surroundings?
> 3. Does the project offend the sensibilities of the average person? Is it offensive or shocking because it is out of character with its surroundings or significantly diminishes the scenic qualities of the area?[59]

In addition to the Quechee analysis, the Board's consideration of aesthetics under Section 248 is "significantly informed by overall societal benefits of the project."[60]

In the current proceeding, no party disputes that the Project would result in an adverse aesthetic impact. Accordingly, an analysis of whether that adverse impact would also be undue must be performed under the second part of the Quechee test.

The first step in evaluating whether the Project would have an undue adverse aesthetic impact is to determine whether the Project would violate a clear, written community standard intended to preserve the aesthetics or scenic beauty of the area. The evidence shows that the Project does not violate any standards of the affected communities considering the goals and policies outlined in the applicable town and regional plans.[61]

The second step in evaluating whether the Project would have an undue adverse aesthetic impact is to determine whether VGS has taken generally available mitigating steps which a reasonable person would take to improve the harmony of the Project with its surroundings. We conclude that VGS meets this requirement.[62] VGS has relocated the New Haven Gate station to address the aesthetic concerns raised by the Department and the Town of New Haven. VGS has

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59. *Amended Petition of UPC Vermont Wind*, Docket 7156, Order of 8/8/07 at 64-65.

60. *In Re: Northern Loop Project*, Docket 6792, Order of 7/17/03 at 28.

61. *See* findings 83 through 183, above.

62. *See* findings 54, 55, 62.f, 67, 70, 75, 336, 373, 374, 377-381, 384, 387-381, 400, 408, 416-418, 421, 428, 431, 451-453, 455-457, above.

also agreed to other mitigation measures at the gate station and has taken steps to relocate the pipeline and minimize vegetation removal.

Additionally, we condition our approval of the Project order upon VGS executing the mitigation plan noted above at findings 451, 453, and 455. We further condition our approval upon VGS undertaking a post-construction aesthetic review of the Project with the Department within 120 days of the completion of the Project.

The final step under the Quechee analysis is to determine whether the Project would be shocking or offensive to the average person. No persuasive evidence has been presented demonstrating that this Project would have such an impact on the average person. Therefore, in total, we conclude that any undue adverse impacts of the Project will be appropriately mitigated and the Project meets the standards set in the Quechee analysis.

Historic Sites

[10 V.S.A. § 6086(a)(8)]

459. The Project would not have an undue adverse effect on historic resources. This finding is supported by findings 460 through 468, below.

460. VGS retained the University of Vermont Consulting Archeology Program ("UVM CAP") to assess the potential impacts of the Project. UVM CAP conducted Archaeological Sensitivity Assessments ("ASA") within the Project's Area of Potential Effect ("APE") and prepared a Scope of Work ("SOW"), End-of-Field letter, and Historic Resources Report. John Gordon Crock, VGS ("Crock") pf. at 3-4.

461. ASAs were conducted to evaluate whether the Project contained significant pre-contact Native American and/or historic Euroamerican archaeological sites. Crock pf. at 4.

462. The studies of the archaeologically sensitive areas within the December 2012 Alignment APEs resulted in the investigation of 32 pre-contact 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. Crock pf. supp. at 2.

463. 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 pf. supp. at 3.

464. 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. VGS plans to avoid these significant site loci by using horizontal directional drilling. Crock pf. supp. at 3.

465. With horizontal directional drilling, VGS will drill the pipeline several feet beneath the maximum possible depth of archaeological deposits. Crock pf. supp. at 3.

466. There are 20 loci at 15 sites within the Project APE, along with 5 loci of 5 sites that also have significant components, that were determined not to be significant following site evaluations. They require no further archaeological work and there is no adverse effect for these properties. Crock pf. supp. at 4.

467. Those sites that are not avoided using drilling will be archaeologically mitigated to the satisfaction of the Vermont Division of Historic Preservation prior to construction. Consequently, there will be no adverse effect on these properties. Crock pf. supp. at 3.

468. 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).

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 undue adverse impacts on the sites either by drilling or by archaeologically mitigating the sites to the satisfaction of the DHP. Our approval of the Project is conditioned upon VGS following through on its commitment to avoid undue adverse impacts on archaeological resources by either drilling or undertaking archaeological mitigation. In either instance, VGS shall perform these activities to the satisfaction of the DHP.

Rare and Irreplaceable Natural Areas

[10 V.S.A. § 6086(a)(8)]

469. The built footprint of the Project would not have an undue adverse effect on any rare and irreplaceable natural areas ("RINAs"). This finding is supported by findings 470 through 482, below.

470. Gilman and Briggs Environmental conducted surveys to determine natural communities that may be considered significant and therefore, potentially subject to designation as a RINA. Exh. pet. supp. JAN-2 at 22-24; Nelson pf. supp. at 36; Nelson pf. reb. at 11.

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

472. Natural communities are 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 pf. supp. at 37.

473. The determination that a particular example of a natural community is state significant is made by the Department of Fish and Wildlife ("DFW") based on established Department guidelines. Eric Sorenson, ANR ("Sorenson") pf. at 5.

474. The significant natural communities located along the Project route 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. VGS-ANR-Joint-1 at 2.

475. Pipeline construction that results in landscape scale habitat fragmentation is considered an adverse effect on the natural environment. Pipeline construction that results in alteration of a state-significant natural community may also be considered an adverse effect on the natural environment but also may be an adverse effect on a RINA. Sorenson pf. at 9.

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

477. Vermont Gas will comply with the vegetation management practices outlined in the Vegetation Management Plan ("VMP"). Exh. VGS-ANR-Joint-1.

478. 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 plans as listed in the VMP. Exh. VGS-ANR-Joint-1 at 8.

479. There are 19 locations along the Project corridor that contain rare plant species. Of these, at all but 8 locations impacts are avoided or less than 20% of the population is impacted. Exh. VGS-ANR-Joint-1, § 12.

480. With respect to rare plant occurrences, mat placement for greater than six days during the growing season could result in plant mortality. Further, an area of impact of 20% or greater is a reasonable threshold for the imposition of follow up monitoring and mitigation. The specific monitoring and mitigation protocols are presented in the amended VMP. VGS agrees to use reasonable best efforts to minimize the duration of matting in areas of known rare plant occurrences during the growing season. Exh. VGS-ANR-Joint-1, § 12 & 13.

481. VGS will conduct ongoing monitoring and management of invasive plants in accordance with Section 4.0 of the revised VMP. Exh. VGS-ANR-Joint-1 at 8.

482. The invasive species monitoring plan incorporated into the VMP adequately monitors and controls invasive species. Tr. 9/18/13 at 182 (Sorenson).

Discussion

With the mitigation measures and terms and condition set out in the VGS-ANR MOU, the Project will not result in an undue adverse impact to the natural environment. Therefore our approval of the Project is conditioned upon VGS's compliance with the terms of that agreement.

Wildlife, Including Necessary Wildlife Habitat and Endangered Species

[10 V.S.A. § 6086(a)(8)(A)]

483. The Project will not have an undue adverse impact on any necessary wildlife habitat or any endangered species. This finding is supported by findings 484 through 493, below.

484. 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 pf. at 33; Robert Popp, ANR ("Popp") pf. at 3.

485. The ANR DFW biologists and WDP staff were consulted to review the surveys and Project. Nelson pf. at 36-37; Popp pf. at 3.

486. Several areas within the Project corridor are considered to be DWAs; there are no necessary black bear or moose habitats in the Project corridor. Exh. Pet. Supp. JAN-2, Section 10.0; Nelson pf. supp. at 49.

487. 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 and restored in accordance with the Vegetation Management Plan. Nelson pf. supp. at 49-50.

488. 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 pf. supp. at 50.

489. 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 pf. supp. at 50.

490. 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. Due to the Project's avoidance and minimization of clearing within the DWA, undue adverse impacts to the DWA will not occur. Nelson pf. at supp. 50.

491. The Project will result in no impacts to rare, threatened or endangered animal species. Nelson pf. reb. at 12; *see* Nelson pf. supp. at 48-49 (discussing two protected species that were potentially within the Project corridor and concluding that neither species was present).

492. There are no threatened or endangered plant species that have been identified along the Project corridor. Exh. VGS-ANR-Joint-1 at 8.

493. VGS will re-align the pipe if feasible to avoid a threatened plant species previously not identified 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. VGS-ANR-Joint-1 at 8.

Discussion

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 rare, threatened, or endangered species. Therefore, our approval of the Project is conditioned upon VGS's compliance with the terms of that agreement.

Development Affecting Public Investments

[10 V.S.A. § 6086(a)(9)(K)]

494. The Project will not unnecessarily or unreasonably endanger the public or quasi-public investment in public facilities, services or lands, or materially jeopardize or interfere with the function, efficiency or safety of, or public's use or enjoyment of or access to the public facility, service or lands. This finding is supported by findings 495 through 498, below.

495. As a result of the Project, the whole Burlington area natural gas distribution system will be stronger and more reliable. "[G]as pipelines" are included in the definition public investments

under Criterion (9)(K). *See* 10 V.S.A. § 6086(a)(9)(K). The Project will provide "backfeed" capability to enhance the reliability of service to customers in Chittenden County. Teixeira pf. at 11; Gilbert pf. at 9.

496. 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 County. Exh. ACRPC Supp. TB-2.

497. 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 pf. at 26.

498. Vermont Gas has an existing public awareness program which it will implement in the new communities associated with the Project. An element of this program is partnering with emergency response organizations to facilitate safe and rapid response activities. Wark pf. at 26.

6. Least-Cost Integrated Resource Plan

[30 V.S.A. § 248(b)(6)]

499. The Project is consistent with the least-cost integrated resource plan ("Plan") that VGS submitted to the Board in Docket 7980. Simollardes pf. at 10-11; Poor pf. at 12-13.

500. The Plan models expansion to the Middlebury and Vergennes communities. Poor pf. at 13.

501. The Plan sets forth a decision-making framework that is largely based on VGS's competitive position relative to alternative consumer choices, noting that if the competitive position remains significant, VGS will propose to expand to Middlebury and Vergennes. Poor pf. at 13.

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

- Is projected to result in lower energy costs in Vermont;
- Reduces future capacity development costs by constructing a 12-inch diameter pipeline rather than a 10-inch diameter pipeline;

- Considers future growth by constructing transmission-pressure piping to Middlebury;
- Will bring VGS's energy efficiency programs to a new, currently under-served, market;
- Is projected to result in a reduction of greenhouse gas emissions.

Simollardes pf. at 10-11; findings 5, 7, 39, 188-190, 192, 203, 204, 218-220, 227, 231, 241, 252-254, 309-311, 324, above.

503. The Project will allow VGS to expand its service and is thus consistent with the recommendation in the 2011 Comprehensive Energy Plan adopted by the DPS. Poor pf. at 2.

Discussion

In order to issue a CPG in this proceeding, subsection (b)(6) of Section 248 requires the Board to determine that construction of the Addison Natural Gas Pipeline "is consistent with the principles for resource selection expressed in [VGS's] approved least cost integrated plan." Based on findings 500 through 503, above, we find that the Project is consistent with the (b)(6) criterion of Section 248.

It is reasonable to assume that the additional demand to be met by the Project will displace the use of other fossil fuels with a greater carbon footprint. The Project is consistent with the Comprehensive Energy Plan adopted by the Department, which has determined that the Project merits approval under the (b)(6) criterion because it is consistent with the least-cost plan under review in Docket 7980 and endorsed by the Department in revised form.[63] In these circumstances, the record supports a determination that the Project meets the (b)(6) criterion.

7. Compliance with Electric Energy Plan

[30 V.S.A. § 248(b)(7)]

504. 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.

63. After the evidentiary record in this Docket was closed, the revised version of the IRP that VGS submitted for review in Docket 7980 was approved without further change by the Board on December 9, 2013. Docket 7980, Order of 12/9/13.

8. Waste-to-Energy Facility

[30 V.S.A. § 248(b)(9)]

505. The Project does not involve the construction of a waste-to-energy facility. Therefore, this criterion is inapplicable.

9. Existing or Planned Transmission Facilities

[30 V.S.A. § 248(b)(10)]

506. 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.

VII. General Good of the State

[Section 248(a)(3)]

507. The Project will promote the general good of the state. This finding is supported generally by the findings above throughout this Order, and specifically by findings 508 through 521, below.

508. The Project is consistent with the state's 2011 Comprehensive Energy Plan which states that "Vermont should encourage the increased use of natural gas by supporting economically viable expansion of the natural gas service territory." Poor pf. at 11; 2011 CEP, vol. 2, p. 220.

509. The 2011 CEP recognizes the advantages and disadvantages of natural gas, as well as the fact that natural gas expansion encourages fuel choice for Vermonters, which should increase competitiveness in the fuels market-applying downward pressure on prices and helping keep service quality high. Poor pf. at 5.

510. The 2011 CEP is a document that reflects significant stakeholder engagement and expresses the sometimes competing desires of a wide variety of Vermonters. Poor pf. at 3-4.

511. The 2011 CEP specifies a goal of acquiring 90 percent of the state's energy needs from renewable resources by 2050. Stanton pf. supp. at 23; Poor pf. at 5-6.

512. The 2011 CEP seeks "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." 2011 CEP, vol. 1, p. 3.

513. The expansion of natural gas infrastructure provides: (1) opportunities to increase the efficiency level of appliances and equipment relative to other fossil fuel (e.g., propane and fuel oil) appliances and equipment; (2) opportunities for further efficiency from whole building retrofit and other demand-side management measures; and (3) the opportunity for customers to have increased access to renewable resources, such as bio-methane resources. Poor pf. at 5-6.

514. The proposed Project would increase the natural gas share of total Vermont energy consumption from 5.9 percent to 6.6 percent and is anticipated to displace other fossil fuel usage (i.e., fuel oil and propane) rather than increase fossil fuel use. Poor pf. at 6.

515. The Project will foster the development of bio-methane resources and availability for consumer distribution. Poor pf. at 8; Simollardes pf. reb. at 6-7.

516. Bio-methane is a renewable fuel produced by the digestion of organic matter that in its final form is identical in composition to natural gas. Poor pf. at 8.

517. Comprehensive and rapid weatherization of Vermont's buildings brings significant benefits including reducing vulnerability to the volatility in the fuel market and keeping more money in the Vermont economy. Stanton pf. at 21-22.

518. Energy efficiency is the cleanest and lowest cost means to reduce greenhouse gas emissions. Stanton pf. reb. at 13.

519. The Project will increase the availability of energy efficiency services provided by VGS to a new customer base. Poor pf. at 7.

520. The Project will likely result in a net reduction of greenhouse gas emissions. Poor pf. at 4; findings 310 and 324, above.

521. The Project will provide customers with an additional heating fuel choice including the potential option of renewable natural gas in the form of bio-methane. Poor pf. at 5-6.

Discussion

Before the Board may issue a Section 248 CPG for a project, it must make determinations on each of the eleven criteria specified in Section 248(b) (although, as we find above, certain of

those criteria do not apply to the Project). In addition, Section 248(a)(3) provides that the construction of a natural gas facility cannot begin unless the Board also finds that such construction will promote the general good of the state. Under this broader, general good standard, the Board must weigh the overall merits of a proposal.[64] We also consider positive and negative attributes of a proposal that do not clearly fit within the specified criteria.

Based on our findings and conclusions set out above in this Order, the Project meets the applicable substantive criteria of section 248(b). The Project will provide substantial economic benefit, is needed to meet a demand for natural gas service that cannot be more cost effectively met through demand-side management measures, and, if constructed in compliance with VGS's plans and the conditions set out in this Order, will not have an undue adverse environmental impact.

The evidence further demonstrates that the Project is consistent with the 2011 iteration of the State's Comprehensive Energy Plan as it will help realize the goal of expanded natural gas service in Vermont, and will likely result in a net reduction of greenhouse gas emissions.

Certain parties have suggested that, notwithstanding the benefits of the Project and the fact that it may meet each of the applicable criteria set forth in Section 248(b), we should nonetheless reject VGS's petition because it is not consistent with the public good or other principles of Vermont law. The Palmers, CLF, and the VFDA (and members of the public) have raised several arguments concerning the relationship of the transmission line to hydraulic fracturing and have urged us to reject VGS's petition because of these concerns over hydraulic fracturing. The Palmers further assert that the Project should be denied a CPG because it would result in an impermissible geographic cross-subsidy. We address both of those arguments below.

In 2011, the Vermont Legislature adopted a ban on hydraulic fracturing within the state. This law appears to have created the impression for some individuals that the Legislature also has banned the sale and consumption of hydraulically-fractured gas in Vermont. Therefore, these individuals insist that the Board cannot find that the public good will be promoted by approving

64. For example, in Docket 7250, the Board found that the proposed Deerfield Wind facility met each of the criteria, but also concluded that the economic benefit was not sufficient in light of the environmental impacts, and imposed conditions to ensure that approval of that project would provide sufficient benefit to Vermont. *Amended Petition of Deerfield Wind*, Docket 7250, Order of 4/16/09 at 43.

the Project which, from their point of view, effectively will shift the ill effects of hydraulic fracturing to other people and communities outside of Vermont. However ethical and well-intentioned, this position is premised upon misconceptions about Vermont law and the powers of this Board.

The practice of hydraulic fracturing for the extraction of oil and gas is not new.[65] However, hydraulic fracturing has been used more extensively in recent years, largely through the advent of the ability to drill horizontally, which has facilitated production access to more areas.[66] Gas extracted through hydraulic fracturing has long been a portion of the energy supply mix generally, and no doubt has been a part of VGS's supply mix as well.

The legislative ban that was enacted in 2011 consists of the following single sentence: "No person may engage in hydraulic fracturing in the State."[67] By its terms, Section 571(a) neither bans nor otherwise refers to natural gas as a commodity that has been extracted through hydraulic fracturing and imported for use in Vermont. Instead, it applies only to the activity of hydraulic fracturing within the state. Therefore, it would be plain error for this Board to construe this statute as a ban in Vermont on the transportation, sale or use of natural gas that has been extracted outside of Vermont through hydraulic fracturing. It further follows that Section 571(a) provides no basis for the Board to withhold approval of the Project as a means of preventing a Vermont utility from provisioning gas derived from hydraulic fracturing in Vermont, or to otherwise interfere with Vermonters purchasing this fuel for their commercial or personal uses.

The Board is a quasi-judicial agency that was created to administer the laws as enacted by the General Assembly. In applying and construing Vermont law, the Board members are vested with neither the power nor a mandate from the Legislature to impose their individual moral or ethical sensibilities upon their fellow citizens. There are reasons why the Legislature might choose to prohibit hydraulic fracturing in Vermont — such a prohibition may serve to protect

65. Tr. 9/16/13 at 58–59 (Gilbert).

66. *Id*. at 59, 73–74 (Gilbert).

67. 29 V.S.A. § 571(a). This section appears in Sub-Chapter 08 of Title 29, which is entitled "Hydraulic Fracturing For Oil Or Gas Recovery." Thus, despite the broad language, it appears that the ban on hydraulic fracturing is limited to using this extraction method for oil or gas recovery only, as opposed, for instance, to well water extraction for a residence.

Vermonters and their environment. There are also reasons why the Legislature might simultaneously have chosen not to prohibit the importation or use of gas derived from hydraulic fracturing in Vermont, notwithstanding any environmental degradation outside of Vermont that may attend the production of such hydraulically-fractured gas. The use of this fuel is known to be safe, clean and economic, it is being lawfully brought to market in other jurisdictions where it would appear that different public policy interests have prevailed, and, as noted above, the practice of hydraulic fracturing to recover oil and gas is not new. Our system of governance presumes that the Legislature struck a balance in prohibiting the practice of hydraulic fracturing in Vermont, while not prohibiting the use of gas which may have been produced through hydraulic fracturing within our borders. By law, it is the Board's duty to respect the balance of reasons as reflected in the language of the laws adopted by the Vermont Legislature; it is not for the Board to strike its own balance, or to otherwise speculate that the Legislature must have intended to include the use of hydraulically-fractured gas in its ban against the practice of hydraulic fracturing in Vermont.[68]

In addition to the comments from the public, there are parties to this proceeding who have voiced concerns about hydraulic fracturing. For instance, Mr. Palmer has pointed out that many individuals are "attempting to get the uninformed public to listen to the arguments against hydraulic fracturing and building out of more fossil fuel infrastructure."[69] Alternatively, VFDA has proposed that the Project at least be delayed until studies can be completed to better understand the impacts of hydraulic fracturing.[70]

CLF has argued in specific legal terms that the Project should not be approved because VGS has failed to address the environmental externalities of the hydraulic fracturing undertaken by the Company's suppliers to extract natural gas for exportation to Vermont and other markets elsewhere.[71] CLF contends that Vermont law explicitly prohibits hydraulic fracturing in

68. See *In re Petition of Twenty-Four Vermont Utilities*, 159 Vt. 339, 361, 618 A.2d 1295, 1308 (1992).

69. Palmer Direct Brief at 4.

70. VFDA Direct Brief at 2-5.

71. CLF Direct Brief at 10-12.

Vermont, and that the Legislature imposed this ban to ensure that Vermont's underground sources of drinking water remain free of contamination. Based on these facts, CLF argues that the Project does not meet the standard for approval under Section 248(a) of promoting the general good of the state because the Project will "use and deliver gas from [hydraulically-fractured] sources" and VGS has failed to "propose any reasonable limits on gas from sources that use hydraulic fracturing or any means to address the externalities of its proposed project."[72]

VGS counters that the Board's authority in this proceeding to consider the impacts of the hydraulic fracturing activities of VGS's out-of-state suppliers is limited to the incremental additional hydraulic fracturing that, but for the construction and operation of the Project, would not be undertaken. According to VGS, given the Project's modest size, any incremental impact of additional hydraulically-fractured gas production would be offset by a reduction in other fossil fuel production, since natural gas will displace these other fuels.[73]

The dispute about the scope of review for environmental externalities in Section 248 proceedings is reminiscent of a similar issue the Board confronted over two decades ago in Docket 5330, a case involving a Section 248 review of a proposed long-term hydroelectric power supply contract between a group of Vermont electric utilities and Hydro-Quebec, a Canadian wholesale power company.[74] In that case, we were urged to consider the environmental impacts of the contract and certain hydroelectric facility construction upon James Bay, the site of a hydroelectric dam in Canada and a place that is home to many Cree, a Native American people.

We have made clear in our Orders in the Hydro-Quebec proceeding and subsequent Orders that, in assessing whether issuance of a CPG pursuant to Section 248 will promote the general good of the state, we will consider the extra-jurisdictional environmental impacts of the proposed project only to the extent that those impacts materially affect the general good of

72. CLF Direct Brief at 11-12.

73. VGS Reply Brief at 16-17.

74. Docket 5330, *Application of twenty-four electric utilities for a certificate of public good authorizing execution and performance of a firm power and energy contract with Hydro-Quebec and a Hydro-Quebec Participation Agreement*, Order of 9/21/89.

Vermont.[75] Thus, for the Board to consider extra-jurisdiction environmental externalities, parties must show that the extraterritorial activity in some way has material effects upon the general good of Vermont. When we have previously considered this question, the projects at issue have been long-term power purchase contracts. Thus, this pipeline extension case presents us with a new factual context within which to apply our established standard, as the project at issue involves the construction of in-state facilities that will transmit and distribute natural gas originating from out of state that has been extracted via hydraulic fracturing — a practice which some people contend has adverse environmental impacts in the locale where this extraction method is used.

As we discussed earlier in this Order, we are persuaded that the Project is likely to result in a net reduction in greenhouse gases. Furthermore, having reviewed the evidentiary record in this proceeding, we find no persuasive basis to conclude that there are any adverse environmental impacts that materially affect the general good of the State, notwithstanding whatever environmental impacts hydraulic fracturing may have outside of Vermont. Nor is there any evidence in the record to support the conclusion that our approval of the Project will result in additional hydraulic fracturing outside of Vermont — with attendant environmental impacts — that would not have occurred but for the construction and operation of this Project. Therefore, we find no merit to CLF's argument that the Project will not promote the general good of the state because it proposes to use and deliver gas from hydraulically-fractured sources.

In reaching this conclusion, it is not our purpose to disregard that there may be broad environmental impacts from the extra-territorial supply decisions made by Vermont utilities simply because these impacts arise from energy production activities outside of Vermont. Rather, our conclusion is rooted in the deference that we owe to the Legislature's intent that this Board consider only those environmental effects in Section 248 proceedings that would materially affect the general good of Vermont. As we have previously determined in construing

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75. *See*, Docket 7670, *Petition of twenty Vermont utilities and Vermont Public Power Supply Authority requesting authorization, pursuant to 30 V.S.A. Section 248, for the purchase of shares of 218 MW to 225 MW of electricity of H.Q. Energy Services (U.S.) Inc.*, Order of 4/15/11 at 48 n. 32; Docket 5330, Order of 9/21/89 at 4. The Board's interpretation of the appropriate scope of review in Section 248 cases for extra-jurisdictional environmental impacts has been sustained by the Vermont Supreme Court. *In re Petition of Twenty-Four Vermont Utilities*, 159 Vt. at 361, 618 A.2d at 1308.

Section 248 in regard to this issue, in the absence of material effects upon the general good of Vermont, we do not construe Section 248 to authorize this Board to review actions in Canada — or elsewhere — that have only local environmental effects, though these effects may be of concern to Vermonters as a matter of justice, morality or responsibility.[76] Such issues "may be very real, but they are more appropriate for legislative judgments than for quasi-judicial review."[77]

The Palmers also argue that the Project cannot be deemed to promote the general good because it will result in an impermissible economic cross-subsidy. The Palmers assert that long-standing Vermont regulatory policy mandates that rates charged to a utility's customers must reflect the costs attributable to those same customers and that, unless specifically authorized by statute, cross-subsidization between groups is not permitted. In this case, the Palmers maintain that the customers in Addison County will not bear the full costs of extending the line to serve them because the Project will implicitly be cross-subsidized by customers in Franklin and Chittenden County, who derive no benefit from the Project.

The Palmers are correct that this Board's ratemaking policy generally has been based upon assigning costs to the customers who cause those costs. In applied terms, this policy has meant that cross-subsidies — in which a class of customers pays above their costs in order to provide a discount to other customers — have generally been proscribed unless (1) authorized by legislation, or (2) unless there are other benefits to the subsidizing class. And, as the Palmers' filing highlights, the Board had concerns that the expansion of VGS's system could result in an unfair cross-subsidy from ratepayers in Chittenden and Franklin counties. Nonetheless, after review of the evidence in this proceeding, we are not persuaded that the Project will result in such cross-subsidies.

Turning to the merits of the Palmers' argument, we do not find that there would be an

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76. Docket 5330, Order of 9/21/89 at 8-10 ("One might well question whether the General Assembly was correct in directing us not to consider the local environmental consequences of projects that will not directly affect the general good of Vermont. ... However, there are also reasons beyond mere chauvinism that might have led the legislature to limit the scope of our review. These include such pragmatic problems as our difficulty in requiring entry onto land, in executing subpoenas, or, more generally, in enforcing orders of this Board beyond Vermont.")

77. Docket 5330, Order of 9/21/89 at 13 n. 10.

impermissible geographic cross-subsidization. The Palmers' argument rests upon the assumption that any cost shift between geographic areas is proscribed. That is not the case. Board policy disfavors cross-subsidization, but to make ratemaking feasible, some cross-subsidy nonetheless exists. For example, we allocate the cost of electric and natural gas distribution service generally, not based upon the actual costs of lines to serve customers that are farther out in the distribution system. This occurs even though it is known that some customers are farther out on the distribution system and therefore are more expensive to serve. Similarly, the costs associated with the electric and natural gas transmission systems are allocated to all customers.

In the case of service extensions by Vermont Gas, invariably, the revenues in the early years of a Project (such as the expansion to Jericho) will not cover the incremental carrying costs of the Project. Rather, VGS has typically examined such projects to determine whether the incremental revenues will exceed carrying costs after ten years.[78] This reflects the fact that the natural gas pipeline is a long-lasting investment and, over time, the newly served customers will provide contributions to fixed costs of the overall system and thereby benefit all customers. Certainly, in these cases, in the short term, the existing customers effectively contribute to the new customers. Nonetheless, we have not considered this to be an impermissible cross-subsidy.

In this case, the evidence demonstrates that it will be twenty years before the annual revenues from the Project are expected to exceed the annual carrying costs.[79] While this is greater than the typical analysis that VGS has employed (and to which the Board has not objected), there are valid reasons to conclude that the expansion is reasonable and does not unjustly cross-subsidize. The twenty-year estimate is based upon conservative assumptions of customer growth. For example, VGS estimated a 40% saturation rate in the first year; recent experience in Richmond produced a 58% rate. Similarly, the analysis did not assume market growth.[80]

Moreover, the pipeline is expected to be in service well over twenty years. This means that from year twenty to the end of the life, the new customers will cover the costs of the Project

78. Tr. 9/16/13 at 213-214 (Simollardes).

79. Tr. 9/16/13 at 211-212 (Simollardes); exh. Board-1.

80. Tr. 9/16/13 at 217 (Simollardes).

and provide a contribution to other costs. Although in the near term there may be cross-subsidization from existing customers, over the long term that is not correct. For a project that has such an extended life, we find this outcome acceptable.[81]

Finally, contrary to the Palmers' assertions, existing customers also derive benefits from the Project. Part of the Project includes additional facilities in Chittenden County, including a gate station in Williston, that will enhance the reliability of the existing system.[82] And all Vermont customers, including those in Chittenden and Franklin County, benefit from the reduction in greenhouse gas emissions.[83] Finally, existing customers benefit from the increasing economies of scale that result from the expansion.[84]

In sum, we do not find that the Project will result in impermissible cross-subsidization.

Some parties have also questioned whether the introduction of natural gas to Addison County promotes the general good of the state because it may slow the timely achievement of the state's renewable energy and energy efficiency goals. They characterize the Project as unwarranted costly customer investment associated with introducing natural gas to Addison County. We discuss this issue in some depth in our application of the Section 248(b)(2) need criterion, above. In that section, we concluded that no party had demonstrated that construction of the transmission line would affect achievement of the state's renewable goals. However, to redress any possible concerns, we have conditioned our approval of this Project on VGS proposing programs to promote both bio-methane development and energy efficiency for its new customers in Addison county. This Project thus provides a double greenhouse gas benefit by: (1) switching to the lower emitting natural gas from propane and fuel oil; and (2) increasing the availability of energy efficiency programs to a new customer base.

The Department and Vermont Gas have highlighted the finding that the Project will foster

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81. Using the longer time horizon that VGS has employed in this case may also make expansion into other areas more cost-effective. In the past, we have questioned VGS's use of the shorter 10-year horizon since it frustrated potential expansion we would like to have seen.

82. *Id*. at 218-219 (Simollardes).

83. *Id*. at 220 (Simollardes).

84. *Id*. at 220-221 (Simollardes).

the development of bio-methane and make it available through the Project's distribution system. Our approval of the Project is conditioned upon Vermont Gas further creating and proposing for Board review a program similar to Green Mountain Power Corporation's Cow Power program subject to the conditions discussed above as well as an aggressive energy efficiency program in Docket No. 7670 for new Addison County customers.

VIII. CONCLUSION

After examining the evidentiary record and analyzing the legal arguments put forth by the parties in this Docket, we find that construction of the Project will promote the general good of the state subject to all of the conditions that we have included in this Order. The evidence presented in this Docket has convinced us that the proposed Project can be constructed, with the alterations required by this Order, without undue adverse impacts on Vermont's natural and built environment and without presenting a risk to Vermonters' health and safety. This decision required us to weigh numerous competing concerns raised during evidentiary hearings, a process which was informed by the many comments of the public. The Order that results from that process will not please everyone, but it reflects our best judgment which is firmly grounded in the evidence and will serve to realize the greater good of all Vermonters. We very much appreciate the hard work of all who participated in this decision-making process, from the citizens who shared their views with us through public comments, to the many parties who expended much time and effort to provide the information needed for a robust evidentiary record, and who produced thoughtful MOUs on important issues in this case.

To the extent the findings in this Order are inconsistent with any proposed findings, such proposed findings are denied.

IX. ORDER

IT IS HEREBY ORDERED, ADJUDGED AND DECREED by the Public Service Board ("Board") of the State of Vermont that:

1. The proposed construction of the "Addison Natural Gas Pipeline" consisting of approximately 43 miles of new natural gas transmission pipeline in Chittenden and Addison

Counties, approximately 5 new distribution mainlines in Addison County, together with three new gate stations in Williston, New Haven, and Middlebury, Vermont (the "Project"), by Vermont Gas Systems, Inc. ("VGS"), will promote the general 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.

2. `Construction of the proposed Project shall be in accordance with plans and evidence as submitted in this proceeding. Any material deviation from these plans or a substantial change to the Project must be approved by the Board. Failure to obtain advance approval from the Board for a material deviation from the approved plans or a substantial change to the Project may result in the assessment of a penalty pursuant to 30 V.S.A. §§ 30 and 247.

3. The Petitioner shall obtain all necessary permits from the Agency of Natural Resources, the U.S. Army Corps of Engineers, and the Vermont Agency of Transportation before commencement of construction or site preparation. This includes the Vermont Stream Alteration Permit, Vermont Wetland Permit, Section 401 Water Quality Certification, NPDES Stormwater Permit, and Army Corps of Engineers Section 404 Permit. Prior to proceeding with construction in any given area, the Petitioner shall also obtain all other necessary permits and approvals 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.

4. VGS separately entered into eight Memoranda of Agreement (MOUs) with different parties to this proceeding. VGS shall comply with the provisions of these MOUs.

5. VGS shall use horizontal directional drilling ("HDD") as reflected in its 6/28/13 Alignment plan (as amended to reflect the use of HDD for all of the Palmer property) and the MOUs.

6. VGS shall conduct any blasting in accordance with the Blasting Plan. Additionally, along with complying with the Monkton notification agreement in finding 81 above, VGS shall notify all the municipalities and their school principals or the principals' designee using the same procedures stated in finding 81, above.

7. VGS shall present a final diagram reflecting the final Rotax Road re-route plan for

inclusion in the record.

8. VGS shall construct pipeline re-routes at Rotax Road and Old Stage Road in Monkton consistent with the provisions of this Order.

9. VGS shall conduct post-construction noise level monitoring at the gate stations. Testing at the sites shall ensure that the noise levels do not exceed 55 dBA in the daytime or 45 dBA at night, as measured at the gate station fenceline. If test results should exceed these levels, follow-on testing shall occur at the nearest residence. Test results shall be reported to the Vermont Department of Public Service ("Department") which shall develop any mitigation steps in consultation with VGS, and, if necessary, with the Board.

10. VGS shall train appropriate emergency response personnel in Addison County in the use of non-sparking tools and methane gas detection meters. Upon completion of relevant training, VGS shall equip these emergency personnel, free of charge, with this equipment and shall provide for the regular calibration of the meters and appropriate refresher training following the same regulatory and industry standards followed by VGS personnel. VGS shall further ensure that ongoing communication and coordination with ACRPC occurs for purposes of emergency response planning, in particular with regard to the timing and deployment of trained personnel from both VGS and local response organizations as warranted in distribution and transmission pipeline emergencies.

11. In consultation with the Department, VGS shall file a petition with the Board proposing a program to promote bio-methane project development.

12. VGS shall develop an aggressive new energy efficiency program for its new customers in Addison County and present it to the Board for review and approval. One goal of this program shall be to invest the projected $200 million dollar savings into energy efficiency transitions that will facilitate, rather than frustrate, achieving the 90% renewable energy goal by 2050. At a minimum, VGS needs to ensure that its proposal addresses three issues: (1) its new industrial (and residential) customers in Addison County and the shaping of their energy efficiency future; (2) the opportunity for savings by industrial customers in energy efficiency technology as they invest in conversion to natural gas (e.g., replacing old technology with more efficient technology rather than simply converting it to natural gas); and (3) ensuring that the investment of VGS

ratepayers in the Project results in not only reliability and greater availability of natural gas to new customers but also greater energy efficiency (and reduced GhG emissions) for new and existing customers.

13. Construction shall take place between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday, and 8:00 a.m. to 5:00 p.m. on Saturday. No construction will take place on Sundays or state or federal holidays. Blasting operations will be limited to 9:00 a.m. to 4:30 p.m., Monday through Friday. Where VGS is conducting HDD, VGS may continue the drill 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, and VGS shall provide residents of reasonable advance notice of 24-hour HDD operations.

14. VGS shall address landscaping, site offset, and site appearance concerns to mitigate the visual impact of the New Haven gate station within its agricultural setting in consultation with the Department of Public Service.

15. VGS shall engage in a post-construction aesthetic review of the Project with the Department within 120 days of the completion of the Project.

16. VGS shall comply with all the conditions of the VGS-AIG MOU, in particular the conditions mitigating the impacts conservation easement as well as those mitigating the adverse impacts on both conventional and organic farming.

17. VGS shall take measures to ensure that disruptions to traffic flows are minimized and shalll implement appropriate safety measures, as described in this Order.

18. VGS shall follow through on its commitment to avoid undue adverse impacts on archaeological resources by either drilling or undertaking archaeological mitigation. In either instance, VGS shall perform these activities to the satisfaction of the DHP.

Dated at Montpelier, Vermont, this 23rd day of December, 2013.

s/ James Volz	)	
	)	PUBLIC SERVICE
	)	
s/ David C. Coen	)	BOARD
	)	
	)	OF VERMONT
s/ John D. Burke	)	

OFFICE OF THE CLERK

FILED: December 23, 2013

ATTEST: s/ Susan M. Hudson
Clerk of the Board

NOTICE TO READERS: This decision is subject to revision of technical errors. Readers are requested to notify the Clerk of the Board (by e-mail, telephone, or in writing) of any apparent errors, in order that any necessary corrections may be made. (E-mail address: psb.clerk@state.vt.us)

Appeal of this decision to the Supreme Court of Vermont must be filed with the Clerk of the Board within thirty days. Appeal will not stay the effect of this Order, absent further order by this Board or appropriate action by the Supreme Court of Vermont. Motions for reconsideration or stay, if any, must be filed with the Clerk of the Board within ten days of the date of this decision and Order.

Appendix A: Appearances

Kimberly K. Hayden, Esq.
John D. Marshall, Esq.
Heidi H. Trimarco, Esq.
Alison Stone, Esq.
Christopher Roy, Esq.
Downs Rachlin Martin PLLC
for Vermont Gas Systems, Inc.

Louise C. Porter, Esq.
Timothy M. Duggan, Esq.
for Vermont Department of Public Service

Judith L. Dillon, Esq.
Donald J. Einhorn, Esq.
for Vermont Agency of Natural Resources

John W. Kessler, Esq.
for Vermont Division of Historic Preservation

Adam G. Lougee, Executive Director
for Addison County Regional Planning Commission

Sandra Levine, Esq.
for Conservation Law Foundation

Richard H. Saudek, Esq.
Christopher J. Smart, Esq.
Cheney Saudek & Grayck PC
for Vermont Fuel Dealers Association

Leonard H. Singer, Esq.
Adam T. Conway, Esq.
Couch, White, LLP
for International Business Machines Corporation

David Cain, Esq.
Eric Berliner
Candice Callahan
Janet Doyle
Nathan Fiske
Dan Tukey
for International Business Machines Corporation

Diane E. Zamos, Esq.
for Vermont Agency of Agriculture, Food and Markets

Elizabeth M. Egan, Esq.
for Vermont Housing and Conservation Board

Richard F. Peterson, Jr., Esq.
for Vermont Land Trust, Inc.

Toni H. Clithero, Esq.
for Vermont Agency of Transportation

S. Mark Sciarrotta, Esq.
for Vermont Electric Power Company, Inc. and Vermont Transco LLC

Thomas R. Melloni, Esq.
Julia S. Flores, Esq.
Burak Anderson & Melloni, PLC
for Chittenden Solid Waste District

Paul Gillies, Esq.
Tarrant, Gillies, Merriman & Richardson, LLP
for Town of Williston

E.M. Allen, Esq.
Stetler, Allen & Kampmann
for Town of Hinesburg

Joshua R. Diamond, Esq.
Diamond & Robinson, P.C.
for Town of Monkton

Joseph S. McLean, Esq.
Stitzel, Page & Fletcher, P.C.
for Monkton Central School

Cindy Ellen Hill, Esq.
for Town of New Haven

Benjamin W. Putnam, Esq.
Karl W. Neuse, Esq.
Neuse, Duprey & Putnam, P.C.
for Town of Middlebury

James H. Ouimette, Esq.
James W. Runcie, Esq.
Ouimette & Runcie
for City of Vergennes

Charles A. Romeo, Esq.
for City of Rutland

William Bryant, Town Administrator
for the Town of Bristol

W. Scott Fewell, Esq.
Wm. Andrew MacIlwaine, Esq.
Dinse, Knapp & McAndrew, P.C.
for Middlebury College

Lowell E. Blackham, Chief Counsel
for International Paper Company

Geoffrey H. Hand, Esq.
Andrew N. Raubvogel, Esq.
Dunkiel Saunders Elliott Raubvogel & Hand, PLLC
for Agri-Mark Inc./Cabot Creamery

Robin P. Scheu, Executive Director
for Addison County Economic Development Corporation

Thomas L. Donahue, Executive Vice President/CEO
for Rutland Region Chamber of Commerce, Inc.

James B. Stewart, Executive Director
for Rutland Economic Development Corporation

Jeffrey M. Messina, Esq.
Daniel P. O'Rourke, Esq.
Bergeron, Paradis & Fitzpatrick, LLP
for Dr. Robert Johnson and Shirley Johnson

Nathan B. Palmer, *pro se*
Jane Palmer

James A. Dumont Esq.
Law Office of James A. Dumont, PC
for Nathan & Jane Palmer

Michael Hurlburt, *pro se*
for Herrick Hurlburt, Sr., David Hurlburt, Herrick Hurlburt, Jr. and Joshua Hurlburt

Matthew T. Baldwin, *pro se*

Robert F. O'Neill, Esq.
Matthew S. Stern, Esq.
Gravel & Shea PC
for David Carse and Elizabeth Hazen

Fritz Langrock, Esq.
Langrock Sperry & Wool, LLP
for Peter and Margaret Carothers

Aldo E. Speroni, *pro se*
Mary L. Speroni

David Ambrose, *pro se*
Claudia Ambrose

Appendix B: Table of Acronyms

AAFM	Vermont Agency of Agriculture, Food and Markets
ACEDC	Addison County Economic Development Corporation
ACRP	Addison County Regional Plan
ACRPC	Addison County Regional Planning Commission
AIG	Agricultural Interests Group
ANR	Vermont Agency of Natural Resources
APE	Area of Potential Effect
API	American Petroleum Institute
ASA	Archaeological Sensitivity Assessment
ASTM	American Society for Testing and Materials
BMP	Best Management Practice
CCRP	Chittenden County Regional Plan
CEP	Comprehensive Energy Plan
CIRC	Circumferential Highway (VT 289)
CLF	Conservation Law Foundation
CNG	Compressed Natural Gas
CO2e	Carbon Dioxide Equivalent
CPG	Certificate of Public Good
CSWD	Chittenden Solid Waste District
DEC	Vermont Department of Environmental Conservation
DHP	Vermont Division for Historic Preservation
DIMP	Distribution Integrity Management Plan
DFW	Vermont Department of Fish and Wildlife
DPS	Vermont Department of Public Service
DWA	Deer Wintering Area
EIA	United States Energy Information Agency
EPSCP	Erosion Prevention and Sediment Control Plan
FDA	Facilities Development Agreement

FEH	Fluvial Erosion Hazards
FEMA	Federal Emergency Management Agency
GhG	Greenhouse Gas
HCA	High Consequence Area
HDD	Horizontal Directional Drilling
IBM	International Business Machines, Inc.
IP	International Paper
Mcf	A thousand cubic feet of natural gas
MCS	Monkton Central School
MOU	Memorandum of Understanding
MP	Mile-Post
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
NWH	Necessary Wildlife Habitat
PAS	Primary Agricultural Soils
PSB	Public Service Board
PHMSA	Pipeline and Hazardous Materials Safety Administration
PIG	Pipeline Inspection/Intervention Gauge
Psi	Pounds per square inch
REDC	Rutland Economic Development Corporation
RINA	Rare and Irreplaceable Natural Area
RRCC	Rutland Region Chamber of Commerce
ROW	Right-of-way
SCADA	Supervisory Control And Data Acquisition
SOW	Statement of Work
SPA	Source Protection Areas
TIMP	Transmission Integrity Management Plan
UVM CAP	University of Vermont Consulting Archeology Program
VELCO	Vermont Electric Power Company, Inc.

VFDA	Vermont Fuel Dealers Association
VGS	Vermont Gas Systems, Inc.
VHB	Vanasse Hangen Brustlin, Inc.
VHCB	Vermont Housing and Conservation Board
VIS	Vermont Intergenerational Stewards
VLT	Vermont Land Trust
VMP	Vegetation Management Plan
VMT	Vegetation Management Types
VTrans	Vermont Agency of Transportation
VWR	Vermont Wetland Rules
WDP	Vermont Wildlife Diversity Program