STATE OF VERMONT
PUBLIC UTILITY COMMISSION

Petition of Vermont Transco LLC and Vermont Electric Power Company, Inc. (collectively, "VELCO"), for a certificate of public good, pursuant to 30 V.S.A. § 248, authorizing the construction of the New Haven Operations Facility in New Haven, Vermont	)	Case No. 19-____-PET

PREFILED TESTIMONY OF PETER W. LIND ON BEHALF OF VELCO

November 15, 2019

Mr. Lind's testimony provides a general overview of the Project, describes the scope, alternatives, cost and schedule for the proposed Project, and addresses a subset of the Section 248 criteria.

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1. Introduction

Q1. Please state your name, occupation, and address.

A1. My name is Peter W. Lind. I am employed by Vermont Electric Power Company, Inc. ("VELCO") as a Senior Project Manager. My business address is 366 Pinnacle Ridge Road, Rutland, Vermont 05701, which I refer to here as the Pinnacle Ridge Campus.

Q2. Please describe your education, job description, and professional experience.

A2. My resume is attached as **Exhibit Petitioner PWL-1**. I have worked in the electric utility industry for over 39 years predominately in the areas of Engineering and Project Management. At VELCO, I am responsible for multiple functions to primarily manage and support capital transmission and communication projects involving design, engineering, permitting, land acquisition and construction activities, including oversight of final Project commissioning activities. I also coordinate federal and local compliance requirements for new projects including public outreach, coordination with regulatory agencies, and oversight of contractors, among other functions.

Q3. Have you previously testified before the Public Utility Commission ("PUC") or in other judicial or administrative proceedings?

A3. Yes. I have testified in a number of PUC proceedings, including regulatory proceedings such as Docket 5270 (Demand Side Management); transmission proceedings that include Docket 6860 (Northwest Reliability Project), Docket 7099 (Kemp & Linton Condemnations), Docket 7121 (Grice Condemnation), and Docket 7970 (Vermont Gas Addison Project); and Section 248a telecommunications proceedings that include Dockets 7711 & 7752 (Northeast Mountain in Wells), Docket 7750 (Garfield Corners in Hyde Park) and Docket 7767 (Okemo Mountain).

Q4. What is the purpose of your testimony?

A4. My testimony supports the Petition for a Certificate of Public Good ("CPG") pursuant to 30 V.S.A. § 248 with respect to the proposed New Haven Operations Facility, as described further below. I also introduce the other witnesses offering testimony in support of the Project; provide an overview of the Project's scope, alternatives, cost, and schedule; and address a subset of the Section 248 criteria.

Q5. Please identify each of the other witnesses on behalf of the Petitioner and the scope of their testimony.

A5. In further support of the Petition, VELCO submits prefiled testimony and exhibits sponsored by the following witnesses:

Witness	Subject Matter
David P. Haas, VELCO	Explains the role of the Main Control Center in VELCO's transmission operations, and describes the need for the Backup Control Center and its effect on system stability and reliability under 30 V.S.A. §248(b)(3).
Daniel L. Nelson, VELCO	Explains the role of a data center in VELCO's business operations, and describes the need for the Secondary Data Center and its effect on system stability and reliability under 30 V.S.A. §248(b)(3).
Jacob T. Reed, VELCO	Addresses the Project's potential impacts on natural resources and historic sites under 30 V.S.A. §248(b)(5).
Michael J. Buscher, T.J. Boyle & Assoc.	Evaluates the Project's potential effects on aesthetics under 30 V.S.A. §248(b)(5).
Ken H. Kaliski, Resource Systems Group	Assesses the sound levels associated with the Project under 30 V.S.A. §248(b)(5).

2. Project Overview

Q6. Please describe the Project in general terms.

A6. The New Haven Operations Facility involves the construction of a new, two-story building situated on the south side of Route 17 (Main Street) in New Haven, Vermont between Forest Drive and Town Hill Road, proximate to VELCO's existing New Haven substation. The Project is intended to serve as VELCO's backup control and data center to be used during a catastrophic event affecting the company's ability to manage its transmission assets from VELCO's Main Control Center facility ("MCC") at the Pinnacle

Ridge Campus. The building also includes an emergency response and training facility for VELCO's transmission operations, while also housing a Secondary Data Center designed to collect, safeguard, and use transmission-related data critical to VELCO's business operations.

This Project will support VELCO's responsibility to reliably transmit electric power within Vermont and between neighboring transmission systems, for use within the state, a duty that was assigned to VELCO through its founding CPG (Docket 2735). As explained more fully in the prefiled testimony of Mr. Haas, transmission utilities such as VELCO are required to design, operate, and maintain a transmission network according to national and regional reliability standards developed and enforced by the North American Electric Reliability Corporation ("NERC"). Under these standards—and specifically NERC EOP-008-1 (**Exhibit Petitioner DPH-2**)—VELCO is required to have primary and backup operational functionality, with facilities that can be operated independently. The backup facility must be capable of coming online within two (2) hours after a loss of the primary operations center. The Project's Backup Control Center will replace VELCO's current backup facility at its West Rutland substation. The existing backup facility is inadequate both in its location and functionality for the reasons set forth in Mr. Haas's testimony.

Q7. Please generally describe the Project location.

A7. The proposed Project site is located on five acres of VELCO's 110-acre property, setback on the south side of Main Street/Route 17 in New Haven, Vermont. The Project is

located in a predominantly rural setting between US Route 7 and the New Haven town center to the east. The area immediately surrounding the Project to the north, east, and west includes open fields interspersed with a small number of agricultural buildings and an occasional residence. Further to the south of the Project, there are more densely-situated single family homes along Town Hill Road.

Existing vegetation and topography largely screen most of the Project site from the surrounding area. Much of the existing vegetation on the Property will be retained, and some additional landscaping will be installed to supplement the natural screening.

A proposed landscape plan and photographs of the existing area are provided with the Aesthetic Analysis Report (**Exhibit Petitioner MJB-2**) prepared by Michael Buscher, Principal Landscape Architect with T.J. Boyle Associates in Burlington, Vermont.

Q8. Please describe the overall level of design of the Project.

A8. VELCO retained B.A.W. Architecture, a consultant experienced in designing primary and secondary control and data centers around the world. Based on the combination of efforts on the part of VELCO, B.A.W., Stantec, T.J. Boyle & Associates, and Resource Systems Group, the Project is at an approximately 60% level of architectural and engineering design as of the date this Petition is being filed, but with the locations, elements, and key features at a design level of detail for purposes of PUC Rule 5.400.

Q9. Please describe the exterior components of the Project.

A9. The Project's exterior features include the "Main Building" (i.e., the two-story,

approximately 18,000 sq. ft. operations building designed to blend into the agricultural setting), and a back-up generator building to the immediate east of the Main Building, along with mechanical equipment surrounded by a retaining wall located on the western side of the Main Building.

The Main Building, associated generators and mechanical equipment will be protected by an eight-foot tall, chain link security fence. Access to the site will be provided from Route 17 by the existing driveway extending to a new parking area containing space for two temporary work trailers, if additional office spaces are required. Please refer to the site plan (**Exhibit Petitioner PWL-2**) and the architectural renderings (**Exhibit Petitioner PWL-3**) for a visual depiction of the Project features and design.

New redundant and independent, three-phase electric distribution services with power transformers (the "Distribution Improvements") will be supplied by Green Mountain Power Corporation ("GMP"). In addition, the site will be interconnected to the fiber optic communication system via two redundant connections: both extended from the existing VELCO New Haven substation across the Property.

Q10. Please describe the main design features selected to ensure that the facility would be available for use in a man-made or natural event disaster.

A10. The engineering design and construction features incorporated into this Project were specifically selected to make sure that the Facility is fully capable and operational when it is most needed, i.e., a critical event that impacts the region or the state. These resiliency-

focused features—ranging from physical security systems to concrete reinforcements to redundant energy sources—are described further below as well as in the confidential affidavit being separately submitted to describe the interior and security features of the Facility. VELCO and its consultants selected equipment, materials and technologies that ensured the Facility would be as robust and resilient as feasible, and equipped with redundant services to withstand potential disasters such that it could effectively respond to and support emergency efforts, especially maintaining safe and reliable electric service throughout Vermont and the region.

Q11. Please explain the decision to employ an agricultural design for the Main Building.

A11. Once the determination was made to locate the Project in New Haven, VELCO committed to ensuring that the new facility would blend into the rural environment as much as possible, without compromising the critical functions the Project is intended to serve. The design also helps with building security by not drawing attention to the Facility for passersby. The Project team also learned that the Town had been receptive to the agricultural building design of an earlier proposed (but never built) non-VELCO electric facility in New Haven, and decided that it would conceive of a similar design for this Project. For these reasons, VELCO retained an architecture firm to combine the necessary components of the facility with a design appropriate for a rural setting. The aesthetic review and design elements are further described in Mr. Buscher's testimony and Aesthetic Analysis Report (**Exhibit Petitioner MJB-2**), and the positive reaction from the Town of New Haven to the proposed design is described in the section of my

testimony on public outreach, below.

Q12. Please provide additional detail regarding the Distribution Improvements.

A12. Several upgrades are required to the existing single-phase electric distribution lines along Route 17 to provide two independent three-phase line extensions to the Project, without affecting GMP and the wireline telecommunications providers presently collocated on GMP's utility poles. Additionally, three power regulators and one capacitor bank will be installed on the 9G4 Vergennes circuit to support this Project. These upgrades are being undertaken by GMP contemporaneously with the CPG application. A site location map depicting the preliminary distribution alignments was prepared by T.J. Boyle and is included in **Exhibit Petitioner PWL-4**.

The design of the Distribution Improvements are not yet final, however it is expected that it will involve in-kind pole replacements, guy wire installations, and re-spanning of some sections of distribution lines to support the single-phase to three-phase upgrades. Additionally, it is expected that each pole will require the addition of a crossarm to support the additional phase wires. The lines to be upgraded are generally within or adjacent to the VTrans rights-of-way for Route 7 and Route 17, and as such, the majority of the work is expected to be completed from the road surface. Once the three-phase power reaches the Property, the electric services will be undergrounded from Route 17 and extended across the VELCO Property to the Project. GMP will obtain any necessary permits and authorizations prior to performing the Distribution Improvements.

Q13. Please describe the Project's electrical and thermal energy needs.

A13. The New Haven Operations Facility will be connected to electric system via two independent and redundant distribution line extensions. Additionally, emergency power will be provided by two independent back-up generators and two uninterruptable power systems ("UPS"). VELCO will also install solar panels on the Main Building's rooftop to offset electric usage: all of the electric generation will be consumed onsite as opposed to through a net-metering arrangement.

Building heating, ventilation, and air conditioning ("HVAC") will be provided by an innovative GeoXchange system that will utilize three deep ground-source wells for heating and cooling of the entire facility. The heat reclaimed from the operation of the electronic equipment in the Secondary Data Center on the lower level of the Main Building will be the primary heat source for the building. Additionally, a redundant air-cooled chiller system will also be installed to provide backup HVAC coverage, if needed. No fossil fuel systems will be installed at this facility to meet the heating requirements.

Q14. Regarding the emergency generators, please discuss their general characteristics and fuel source.

A14. The Generator Building will house two diesel-powered 1 MW emergency generators to be used in the event that both of the GMP electric distribution services are unavailable. Per NERC Reliability Standards BAL-005-1 (R3 and R5), the generators must be sized to power the Secondary Data Center, the Backup Control Center, and all other critical functions in the Main Building to ensure they have functionality for 99.5% of each year,

with no exceptions. To meet this functionality standard, the generators must be routinely maintained and tested. The generators are redundant and fully independent, such that only one would be used at any one time. The generators will be housed within a separate building, located predominantly underground, to allow for ease of maintenance and future replacement, to help limit noise from the units and to keep flammable fuels separated from the Main Building.

Q15. In general terms, please describe the interior components of the Main Building.

A15. The purpose of the Main Building is to serve a number of VELCO's critical functions and will include a Backup Control Center, a system operator training facility, a Secondary Data Center, an emergency response center, and general conference and office space intended to be used primarily during emergency situations for core business functions, or as a convenience for those travelling to the Facility for operator training. The space may also be used for utility-related meetings when not needed for emergency purposes.

The emergency response center will provide an emergency work location in the event of a partial or total evacuation of VELCO's Pinnacle Ridge Campus. This aspect of the Facility is needed to ensure that key components of two VELCO operational plans are met in such an event. The first plan is the Emergency Response Plan ("ERP"), which is intended to be used when potential or actual events jeopardize VELCO's bulk transmission or communication systems. The second plan is the Business Continuity Plan ("BCP"), which identifies resource needs to perform key business processes in the

event of a qualifying business continuity event. The general conference space is intended to serve multiple business functions for the organization as they may arise from time to time.

The BCP and ERP, as well as the interior features of the floor plan and security elements of the Facility, are addressed in my accompanying affidavit and confidential exhibits, being submitted under seal to avoid compromise of the Main Building's security features. *See* **CONFIDENTIAL Exhibits Petitioner PWL-14** (Security Affidavit), **PWL-15** (Interior Floor Plan), **PWL-16** (BCP), and **PWL-17** (ERP).

Q16. Please explain any energy efficiency considerations being included in the Project's design.

A16. The building design will incorporate energy efficiency and environmental sustainability principles to the greatest extent economically feasible, consistent with VELCO's overall commitment to sustainability. Examples include using a GeoXchange heating/cooling system that will use ground source wells and heat exchangers to simultaneously heat and cool the entire facility, variable frequency drives, energy efficient indoor lighting, exterior lighting that reduces light pollution, monitoring systems to track energy performance, use of low-emitting construction materials, designing the HVAC system to comply with enhanced indoor air quality standards and use of low-flow faucets and toilets. As noted above, the southern roof of the Main Building has been designed with solar panels to allow for on-site power generation to be used entirely within the facility. These design features, and others, have been included as a result of consultations with

personnel from Efficiency Vermont and GMP. Consistent with VELCO's vision of a sustainable Vermont, these features of the building result in increased potential to achieve U.S. Green Building Council Leadership in Energy and Environmental Design ("LEED") certification. As I explain further below, VELCO expects to apply for LEED certification from the U.S. Green Building Council if the Project is ultimately approved.

Q17. What is the intended occupancy of the Main Building and how was this determined?

A17. The Main Building is currently designed to provide temporary office space for approximately 60 individuals. The occupancy was determined as part of the development of VELCO's BCP to ensure continuity of all critical business operations if and when required.

Q18. What arrangements have been made for security at the Project?

A18. Security measures at the site will be in general alignment with the equipment and practices used at VELCO substation facilities, including fence detection, interior and exterior cameras, and remote sensing and alarming equipment. The Main Building will also be designed to accommodate the relocation of the security officers, currently housed at the Pinnacle Ridge Campus in the event the BCP is activated. As stated previously, other security features are described in my stand alone affidavit, which is being submitted under seal to avoid a compromise of those features.

Q19. Has a fire suppression system been incorporated into the building design?

A19. Yes, waterless fire suppression systems have been included for the generators and the

Secondary Data Center. Final fire protection system design will be completed as part of the final design effort, and will include consultation with state and local fire and code officials.

3. Construction Schedule and Impacts

Q20. Please describe the Project schedule as well as the various phases of construction that will be required to construct the Project.

A20. An overview of the current Project Milestone Schedule is provided as **Exhibit Petitioner PWL-7**. We anticipate that construction of the Project will begin as soon as possible after receiving the required approvals, presently assumed to be sometime by mid-July 2020. Currently, the estimated Project construction schedule extends from late summer 2020 through the second quarter of 2022.

VELCO seeks exemption from the standard CPG condition that requires acquisition of all state and federal permits prior to the start of construction, and respectfully requests permission to begin Project site work immediately after receiving the required USACE Section 404 Approval and Construction Stormwater Discharge Permit described in the prefiled testimony of Mr. Reed. These permits govern soil and resource impacts associated with initial site preparations anticipated to commence during the first three months of construction. Other Project permits, such as the Division of Fire Safety Construction Permit, pertain to work performed during later stages of construction, and are not applicable to initial site work for the Project. We ask that the Commission condition later stages of construction upon the receipt of the other necessary permits.

Once the permits governing initial site work are received, land surveys and resource flagging will move forward, along with installation of erosion prevention and sedimentation controls, followed by limited clearing of vegetation. Once the site is cleared, earthwork for the installation of the building foundation will occur and the building shell will be erected, with the objective of constructing an enclosed building before the winter of 2020/2021. Building "dress-out" will then begin over the winter and continue into the summer of 2021, starting with the installation of interior walls, plumbing, HVAC, and electrical components. After the major equipment and building systems are installed, the detailed interior construction will continue with the installation of the electrical and fiber optic systems. Lastly, the data servers and associated operational equipment will be installed and the facility will be connected to the VELCO fiber system, which will in turn allow for the equipment and systems testing and, lastly, the final commissioning activities. Final site work and grading is expected to be completed in the spring/summer of 2022, with the objective of achieving a completed, fully-commissioned Main Building, Generator Building, and site before the winter of 2022/2023. After commissioning the Facility, obsolete equipment from the existing backup center and secondary data center in West Rutland will be removed, reused, and/or disposed of, consistent with requirements for electronic waste.

Q21. What are the implications if you do not meet this milestone schedule?

A21. Failure to achieve this construction schedule will likely have adverse impacts on the Project commissioning dates and significant increases to the overall Project cost.

Consistent with Commission precedent, VELCO proposes that outdoor construction will take place between 7:00 A.M. and 7:00 P.M. Monday through Friday, and between 8:00 A.M. and 5:00 P.M. on Saturdays. No outdoor construction activities will take place on Sundays or state or federal holidays, though VELCO seeks to conduct activities on Bennington Battle Day given (i) the short summer construction season, (ii) the anticipated construction start, and (iii) that the holiday is not widely granted as a paid day off for the workers on this Project. VELCO requests that interior work (e.g., electrical, painting, and flooring, etc.) not be subject to these time constraints because these interior activities will not impact neighboring landowners or the broader community.

Q22. Will the Project require blasting?

A22. Geotechnical surveys were performed in the summer of 2019 for the general Project area around the Main Building and Generator Building to supplement existing geotechnical information collected as part of the construction of the nearby New Haven substation. Based on these survey results, blasting is not expected to be required for the Project. As the actual need to remove rock is not completely known until the below-grade construction occurs, the possibility of blasting cannot be ruled out entirely. If the Project requires blasting, VELCO will adhere to its Rock Removal Specification, a copy of which is provided as **Exhibit Petitioner PWL-5**. These Rock Removal Specifications incorporate the Vermont Department of Environmental Conservation Best Management Practices for Blasting ("BMPs").

Q23. What vegetation removal is required to complete construction?

A23. VELCO will need to remove approximately 1.25 acres of vegetation to construct the Project. Cut trees and other vegetation will either be chipped and or cut and left to decompose on site or removed for off-site disposal. A landscaping plan for aesthetic mitigation through plantings and selected vegetation removal are detailed in the testimony and exhibits provided by Mr. Buscher.

Q24. Will the Petitioner be using laydown areas outside of the Project area for material staging and storage?

A24. No: all areas to be used for storage of material and equipment, as well as space for temporary construction trailers and sanitary facilities, will be within the Project area, save for other existing developed areas nearby (e.g., the New Haven substation yard). Laydown areas will be situated on land that has been pre-assessed for environmental and historic sites, as addressed in Mr. Reed's prefiled testimony and exhibits.

As part of an unrelated effort to achieve efficiencies, a separate material storage area will be constructed on the site located southwest of the building, completely within the New Haven Operations "Study Area". It is anticipated that this area will be completed prior to commencement of the Project's construction, and this effort will include obtaining necessary Act 250 and local permits. Depending on timing, this additional area may be used for material storage or staging for this Project.

Q25. Are there any offsite areas being proposed for use for staging?

A25. No, no offsite properties are proposed to be used.

4. <u>Need for the Project: (30 V.S.A. § 248(b)(2))</u>

Q26. In general terms, please describe the need for the New Haven Operations Facility.

A26. As explained more fully in the accompanying prefiled testimonies of Mr. Haas and Mr. Nelson, electric transmission utilities such as VELCO are required to design, operate, and maintain a transmission network according to national and regional reliability standards. Under these standards—and specifically NERC EOP-008-1—VELCO is required to have primary and backup operational functionality that can be operated independently. The backup facility must be capable of coming online within two (2) hours after a loss of the primary operations center. VELCO's current backup facility at the West Rutland substation is located too close to the existing MCC, such that a significant weather event or other unforeseen circumstance affecting the Rutland area (e.g., an attack, explosion, earthquake, or major accident) poses a high risk of impacting operations at both facilities.

The Project will address critical needs set forth in VELCO's BCP, which is designed to support business processes following a disruption resulting in security risks, supplier-related complications, or other undefined events preventing the execution of normal business processes at the MCC. The Project was designed with critical input on transmission operations control center planning obtained through the North American Transmission Forum ("NATF"), all to factor in experiences of other electric utilities addressing NERC reliability requirements.

Q27. Please explain what factors led to selection of this specific site in New Haven.

A27. In 2014, VELCO identified the need to evaluate the company's emergency preparedness and overall ability to continue ongoing operations. As part of this effort, improvements were made at the Pinnacle Ridge Campus to improve data storage and management as well as to address gaps in preparedness resources, such as a BCP. Concurrently, a plan was initiated to develop a solution to provide an adequate facility to be used in the event of a business continuity event, and to serve as a backup operations and secondary data center. Through this effort, VELCO recognized that the existing backup control and secondary data center facility, while operationally compliant, was not an ideal solution for VELCO's operations if the MCC and data center at the Pinnacle Ridge Campus were to become inoperable.

Thus, VELCO began the process to identify options and to develop criteria for a backup control and secondary data center that would meet the company's increasing operational requirements. VELCO determined that a co-located facility would address the company needs in an effective manner, and several alternative sites were evaluated using a decision matrix. A summary of the alternatives analysis is provided as **Exhibit Petitioner PWL-6**.

Ultimately, VELCO's existing 110-acre New Haven property was determined to best meet the requirements for the facility due to several factors, including its convenient location near Route 7; distance from Rutland; nearby electric transmission and communications facilities to allow for the interconnection of high-speed fiber optics; and

the overall suitability of the parcel including slope, constructability, and lack of hazards such as floodplains.

5. Project Cost (30 V.S.A. § 248(b)(2))

Q28. Please describe the approach for developing the Project cost estimate.

A28. The Project cost estimate was developed using the standard methodology that VELCO has used in previous projects, which is based on ISO-NE Planning Procedure #4, a regional document that serves as a guide on the development of estimates for utility projects in New England. Our standard methodology starts with identifying the resources required to plan, design and construct the previously described Project elements by utilizing seven (7) resource categories to establish the total direct and indirect cost for each Project element. The resource categories are material, labor, equipment, indirect, applicable escalation, capital interest and contingency. In conformance with 6A and B of the MOU for Docket 8385, VELCO is consulting with the PSD to review the project costs estimate.

Q29. Please describe any special analysis to determine suitable options for meeting the energy needs for the facility.

A29. A cost analysis was completed to determine the suitability of using geothermal and solar systems as well as the fuel source for the backup generators. Ultimately, the determination was made that these alternative elements could be effectively incorporated into the Project design without compromising any of the key functions of the facility.

Q30. Please summarize the process used to develop the Project's direct and indirect costs.

A30. The direct costs were developed utilizing company cost data as well as cost information provided by project consultants and design engineers. Where actual cost data was not available, estimated cost data from vendors was utilized. Labor, material and equipment costs were estimated using the preliminary design. The detailed line items for each Project element were estimated into sub-categories following the Federal Energy Regulatory Commission ("FERC") code chart of accounts. Developing the cost estimates by FERC code enhances VELCO's ability to track costs over the life of the Project in a manner consistent with the reporting format of actual costs as required by FERC. Also, escalation costs can be more accurately calculated by applying forecasted values from the Handy-Whitman cost index to the estimated costs by FERC code.

The indirect costs are the costs of the resources required to support the completion of the Project and include: Engineering and Design, Operations, Planning, Communications, Environmental Engineering, Archeological Studies, Noise Studies, Field Surveys, Impact Mitigation, Aesthetic Impact, Legal Expenses, Regulatory Permitting and Filings, Administrative Overheads, Mobilization and Demobilization, Project Management, Construction Supervision, and Project Administration.

The estimated indirect costs of project support services are based on the number of people and hours (level of effort) required to support the particular function as well as outsourced consulting services for each resource category (e.g., archeology studies, engineering and surveying, etc.).

Escalation costs were developed utilizing the scheduled spending plan and projected Handy-Whitman Index and the Consumer Price Index ("CPI").

Capital interest (indirect cost during construction) at an annual rate of approximately 3.25% was also included. The capital interest rate is typically based on VELCO's credit rating and is subject to change based on the financial market conditions.

Finally, the Project cost estimate also includes a contingency of 15 percent due to the remaining design features to be finalized, and the uncertainty and risk associated with the current level of Project definition.

Q31. What is the total cost estimate for the Project based on the various cost elements and resource categories described?

A31. The total cost of the Project is estimated to be $50.7M including contingency. The total estimate is comprised of $25.6M direct costs, $15.1M indirect costs, $2.6M in escalation, $1.2M in capital interest, and $6.2M contingency. Please refer to **Exhibit Petitioner PWL-8** for a cost summary by resource category and Project element.

Q32. How were risk elements and contingency funds addressed in the cost estimate?

A32. Consistent with standard project management practices that are recognized by organizations such as the Project Management Institute ("PMI"), the contingency allowance was included in the estimate to account for Project risks. These risk elements include the Project duration; level of certainty regarding ground condition for below-grade work; design unknowns; required aesthetic, environmental, and archeology

mitigation measures; volatility regarding escalation rate; and potential resource constraints at the anticipated time of construction. As part of the execution of the Project, cost risks will be routinely reviewed and tracked in a Project risk register. As indicated above, a contingency of 15% was applied to the total estimated cost, based on the current level of Project definition.

Q33. Please describe how the costs would be allocated among ratepayers in Vermont and New England.

A33. Due to the nature of the facility, it would be classified as a "General Plant" by FERC, as opposed to being eligible for Pool Transmission Facilities ("PTF") treatment. Therefore, it is expected that approximately 80% or about $40.6M of the costs would be supported on a New England-wide basis. Vermont will be responsible for approximately 20% or about $10.1M of the costs.

Due to the facility's "General Plant" classification, the Project would not be presented at the ISO-NE Reliability Committee ("RC") because RC approval or a Transmission Cost Allocation ("TCA") submittal for regional cost treatment is not required; however, VELCO did present the Project before the Vermont System Planning Committee ("VSPC") meeting on October 16, 2019 for informational purposes and to solicit feedback. The VSPC expressed no concerns regarding the Project.

Q34. Please describe the review process used to ensure the accuracy of the Project's cost estimate.

A34. As described earlier, the Project estimate was developed using VELCO's estimating process, which aligns with the ISO-NE cost estimating procedure. The process relies on the use of information of incurred or "actual" costs as a basis for estimating expected project costs. Given the lack of cost information pertaining to building construction at VELCO, B.A.W. Architecture was retained to generate an initial estimate. This effort included consultation with regional service and material providers for relevant cost information.

Once drafted by B.A.W., the estimate was provided to several companies with experience as well as cost information associated with buildings similar to the proposed Facility. This information was then reviewed by the VELCO estimator and incorporated into the VELCO estimate included in **Exhibit Petitioner PWL-8**.

Q35. Please describe how costs will be managed on this project.

A35. As with other VELCO projects, engagements will be performed in accordance with the company's established procurement process, which included competitive bids through request for proposals ("RFPs"). In fact, the RFPs for the remaining architectural and engineering design effort as well as construction management services were recently completed and issued for bids. The design effort will include a review of the completed 60% design and completing the Project design for Issued-for-Construction drawings, all with a focus to incorporate opportunities to reduce costs. The second RFP will develop

construction management strategies to seek efficiencies and incorporate value-added engineering.

The Project financials will also be closely monitored by the VELCO Project Controls Team, which reviews vendor invoices and overall vendor engagements, compiles and analyses cost reports, and provides support for the Project Manager in the execution of the Project estimate.

6. Orderly Development and Public Outreach (30 V.S.A. § 248(b)(1))

Q36. Will the Project 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?

A36. No. The Project is consistent with the New Haven Town Plan ("Town Plan") and the Addison County Regional Plan ("Regional Plan"). Excerpts from the Town and Regional Plans are provided as **Exhibit Petitioner PWL-9** and **Exhibit Petitioner PWL-10**, respectively. The Project will not violate any land conservation measures contained in the Town Plan or the Regional Plan, and will further the goals of the Regional Plan to ensure that the region continues to benefit from reliable and safe electric service. Regional Plan at 7-51.

As further summarized below, the Project team sought input from the Town of New Haven while designing the Project. The proposed design is consistent with a number of the Siting, Screening, and Performance Standards identified at page 74 of the Town Plan,

including:

- Satisfying the Town Plan's aesthetic mitigation standards through use of an agricultural design for the Main Building that harmonizes the Project with the surrounding landscape and neighborhood (**Exhibit Petitioner MJB-2** (Aesthetic Assessment Report));
- Designing the Project to meet the minimum setback requirements for the applicable zoning district (**Exhibit Petitioner MJB-2** (Aesthetic Assessment Report));
- Substantially adhering to the Town Plan's noise standards (**Exhibit Petitioner KHK-2** (Noise Impact Study));
- Engaging with municipal fire and public safety personal to discuss unique aspects of the Project, in furtherance of the Town Plan's health and safety standards; and
- Consulting with GMP regarding aesthetic impacts associated with the Distribution Improvements in furtherance of the Town Plan's electrical line standards (**Exhibit Petitioner MJB-2** (Aesthetic Assessment Report)).

See Town Plan at 71-73, 79. While the Town Plan discourages energy projects on primary agricultural soils, Mr. Reed's testimony and accompanying Natural Resources Assessment (**Exhibit Petitioner JTR-2**) explains how the proposed design has minimized such impacts, as well as VELCO's discussions with the Agency of Agriculture as a means of addressing the Project's impacts on primary agricultural soils. The proposed roof-mounted solar panels are also consistent with the Town's general

support for building-mounted systems "in all land use districts." Town Plan at 77. The subject parcel is not designated as a scenic resource in the Town Plan, nor does it contribute to any noteworthy open-space views.

That being said, the Project site is located along a portion of Main Street/Route 17 that the Town has designated as a scenic corridor. Town Plan at 91. Vistas from this scenic corridor are considered scenic viewsheds. While the Town seeks to maintain and preserve these scenic viewsheds, the Town Plan explains that "does not mean that development within these viewsheds is prohibited; it means that development within these viewsheds must be appropriately sited and scaled, and if necessary augmented with visual mitigation such as landscaping in a naturalized style that harmonizes with the hedgerows, forest blocks or other landscape features in which it is to be located." Town Plan at 93-94. The Project site is located within the Rural Planning Area. In relevant part, the Town Plan states that development in this area "shall not be sited in prominently visible locations on hillsides or ridgelines, and shall, at a minimum, utilize earth tone colors and non- reflective materials on exterior surfaces of all structures, and must minimize clearing of natural vegetation." Town Plan at 108.

The Project as proposed meets the intent of the guidelines for development along the scenic corridor and in the Rural Planning Area. As further explained in the Aesthetic Analysis Report sponsored by Mr. Buscher (**Exhibit Petitioner MJB-2**), the Project is appropriately sited and not proposed in a prominently visual location. Portions of the Main Building and the Generator Building would be dug into the existing topography,

and the Project retains and utilizes surrounding hedgerows to screen Project components. The agricultural design of the Main Building and proposed colors would help the Project to harmonize with the character of the surrounding area.

As stated above, the Regional Plan supports capital investments in the electrical grid and related infrastructure "to ensure the Region continues to enjoy reliable electric service and opportunity for economic growth." Regional Plan at 7-51. The most relevant Standards contained in the Regional Plan are those that apply to substations given the Project's footprint and layout, as opposed to the transmission standards that apply to linear projects. Regional Plan at 7-97. The Project parcel has several features that make it a "good site" according to the Regional Plan that include its proximity to existing commercial and industrial facilities (i.e., the VELCO substation, a VTrans facility, and the Phoenix Feeds facility west of the Project). *See* Regional Plan at 7-97. The Regional Plan also observes that "[r]ural structures like barns fit into the landscape because their scale and mass generally do not impact large tracts of otherwise open land." Regional Plan at 7-97 to 7-98. Under this reasoning, the Project will fit into the landscape insofar as it has been designed to resemble a traditional Vermont barn. The Project's landscape mitigation plan (see **Exhibit Petitioner MJB-2**) is also consistent with the "mitigation methods" set forth in the Regional Plan at page 7-94.

Q37. Please describe VELCO's public outreach efforts related to this Project.

A37. VELCO reached out to the local community in New Haven at the initial stages of the Project to receive preliminary feedback. Once the Project's need and site details were

further refined, VELCO distributed a 45-day Advance Notice describing the Project to the abutting landowners, landowners within the broader community, the Town of New Haven Select Board, the Town of New Haven Planning Commission, the Addison County Regional Planning Commission, the Department of Public Service, the Agency of Natural Resources, the Agency of Agriculture, Food and Markets, and Vermont Division of Historic Preservation.

VELCO Project staff met with members of the Town of New Haven Select Board regarding the Project, with several concerns expressed about the aesthetics of the building, which have been addressed. All stakeholders were invited to a public meeting to provide face-to-face interaction for questions and feedback. The public meeting was scheduled for the convenience of interested persons; nearly twenty members of the public attended. The public has been offered other means of communicating with VELCO including phone and email transmittals. The VELCO website also provides Project information and provides a means of submitting requests for information via an on-line contact form. Please see **Exhibit Petitioner PWL-11** for copies of documents shared with the public during these outreach efforts, including the advance notice letter. VELCO's public outreach efforts are summarized below:

- October 29, 2018: Met with representatives from Town of New Haven.
- August 19, 2019: Met with representatives from Town of New Haven.
- September 10, 2019: Met with representatives from Town of New Haven.
- September 18, 2019: Held a public informational meeting for the community.

- September 30, 2019: Met with Division of Fire Safety.
- October 7, 2019: Met with New Haven Development Review Board.

Additional public comment periods will take place concurrently with the Section 248 process as part of the collateral permitting efforts.

Q38. How did VELCO address the comments and input that were received from the public outreach efforts?

A38. As noted above, VELCO met with members of the Town of New Haven Select Board on three separate occasions starting in October of 2018, prior to VELCO's start of the professional architectural and engineering design phase of this Project. Concerns raised by Select Board members included the general appearance of the Main Building, landscaping, potential noise that would be generated by the equipment supporting the Project, and the preliminary schedule for construction activities.

To address these comments, VELCO purposefully located the Project away from Route 17 and Town Hill Road such that the Main Building will be located behind a natural buffer. VELCO hired the landscape architecture firm T.J. Boyle to make specific siting recommendations for the Project and supplemental landscaping. In order for this new facility to fit into the local rural environment, the actual design of the building was purposefully designed to look like a traditional, dark red matte finish barn typical of Vermont as shown in the Project renderings, **Exhibit Petitioner PWL-3**. Additionally, the Main Building was designed as a two-story facility to take advantage of the natural topography and lay-of-the-land. In particular, the lower level of the facility was designed

to fit into the existing topography, thereby keeping the appearance of the building, as viewed from Route 17, as a one-story barn.

VELCO also retained Resource Systems Group, Inc., an engineering firm from White River Junction, to perform a noise assessment of the Project, including establishing existing background sound levels and then modeling the planned equipment for determining specific recommendations to limit noise impacts and meet the Town sound requirements specified in the Town Plan. To address noise issues, VELCO also designed the backup emergency generators to be entirely housed in a separate Generator Building located primarily underground in the existing topography, with special equipment installed to further lessen the noise impact. Additionally, VELCO has situated the exterior mechanical equipment in a way that lessens the potential noise impact. Please see the prefiled testimony and sound assessment (**Exhibit Petitioner KHK-2**) sponsored by Mr. Kaliski for further description of the Project's sound mitigation elements.

Q39. You mentioned that VELCO met with the Town on two other occasions. What, if any, other issues did the Town raise during those subsequent discussions?

A39. In subsequent meetings with members of the Selectboard, the issue of upgrading the existing GMP electric distribution lines along Route 17 from single-phase to three-phase was discussed, and a suggestion was made to VELCO to consider undergrounding the new three phase distribution lines. VELCO met with GMP representatives and requested that, in addition to the overhead configurations that GMP was designing, GMP also design, determine the cost, and identify issues for burying both of the GMP distribution

lines (one GMP line originating from the west on Route 7, and the second GMP line originating from the east at the Route 17 intersection with Town Hill Road).

GMP determined that the proposed upgrade of the two overhead three-phase distribution lines from Route 7 and the Town Hill Road area would cost approximately $200,000. For the same GMP distribution lines to be redesigned underground for three-phase service, the preliminary and partial cost for the GMP lines from those locations would be approximately $750,000, not including the additional costs to survey and acquire new underground easements from each landowner, ledge and rock removal, environmental services, concrete encasements, access-road improvements, etc. Additionally, the equipment, materials and installation costs to have all overhead communications and cable services buried to each residential and commercial property has not been estimated, and is therefore not included in GMP's underground cost estimates.

Consequently, VELCO is proposing to bury only the distribution line extension serving the Project from Route 17 across the Property to the Facility, based on the estimated costs of undergrounding.

Q40. Did VELCO also evaluate connecting a distribution line from the New Haven substation to the Main Building as a partial alternative to upgrading lines along Route 17?

A40. Yes, VELCO did consider the possibility of providing a line extension from the existing VELCO substation, and determined that it is not a viable option, as the New Haven substation is only a transmission-voltage facility that lacks distribution-voltage

equipment to service the proposed Project. Adding distribution equipment at the substation would require a significant effort including new transformers, regulators, and other equipment. Thus, VELCO determined that this option was not feasible.

Q41. Please discuss any other public comments received on the Project.

A41. Additional public comments were provided to VELCO from two public meetings that were held in the Town of New Haven: one in September at a VELCO informational meeting to introduce the Project and solicit public comments, and another at a meeting in October with the Town of New Haven Development Review Board ("DRB"). The comments addressed the potential to install photovoltaics ("PV") on the southern exposed roof of the Main Building, the level of coordination with the New Haven Fire Department on the fire suppression design and access to the site, and incorporating energy efficiency measures into the Main Building. A concern was also expressed regarding protection of a shared septic system located on the Property. These comments are captured in the draft DRB minutes included as **Exhibit Petitioner PWL-12**.

VELCO advised that PV was being considered and that the roof of the Main Building was been designed to accept a PV system. VELCO has since decided to proceed with the PV panels, and will consume all of the renewable generation on-site. VELCO has incorporated energy efficiency measures throughout the building systems and equipment that meet and/or exceed energy efficiency building codes and may support LEED certification in recognition of the level of efficiency and sustainability incorporated into the building design, construction, and operation.

VELCO also spoke with the New Haven Fire Department and met with the Vermont Department of Fire Safety to address the design of various fire suppression systems within the Main Building and the Generator Building, and for general access to the facility.

VELCO will continue to seek and accept additional public comments received via its website, phone calls, letters, and emails.

7. System Stability and Reliability (30 V.S.A. § 248(b)(3)

Q42. Will the Project adversely affect system stability and reliability?

A42. No. The Project will have no adverse impact on the stability and reliability of GMP's distribution system or VELCO's bulk electric transmission system. As discussed above, VELCO is coordinating with GMP to ensure that the Distribution Improvements allow the safe and efficient operation of the Project. Moreover, the Project will enhance system stability and reliability by virtue of its secondary data and operations facilities, which are discussed further in the prefiled testimony of Mr. Haas and Mr. Nelson, respectively.

8. Economic Benefits (30 V.S.A. § 248(b)(4))

Q43. Please describe in general terms the economic benefits of the Project for the State.

A43. The most obvious benefits of the Project stem from VELCO's continued ability to operate and restore the grid during major weather events such as ice storms, severe wind events and floods, as well as other serious incidents affecting transmission service. The transmission system is critical for preventing potential economic loss to businesses around Vermont caused by power outages. Vermonters depend on reliable electrical

service for continued profitability and employment and a major loss of transmission service in any portion of the State can have profound consequences, particularly to the industrial and commercial sectors.

Additionally, the Project will benefit the Addison County economy during the construction period, insofar as supporting local restaurants, service stations, and retailers while work is completed. Some of this benefit will continue post-construction during periods when the Project is in use for training, conferences, and during activation consistent with the BCP.

Q44. What will be the tax benefit to the Town of New Haven and the State of Vermont as a result of the facility?

A44. Based on property taxation, the Project is expected to generate hundreds of thousands of dollars in annual tax revenue to the municipality and the State.

9. <u>Transportation Systems and Traffic (30 V.S.A. §248(b)(5))</u>

Q45. Will the Project cause unreasonable congestion or unsafe conditions with respect to the use of highways or other means of vehicular transportation existing or proposed?

A45. The Project poses no long-term traffic impacts in the Town of New Haven. VELCO anticipates only minor, short duration traffic impacts, if any, due to deliveries of equipment and material to the Project site during the construction period. Such deliveries will use existing roads with vehicles that are commonly used on public roads. During delivery of any large equipment, VELCO will employ the services of traffic control personnel to manage traffic flow. VELCO will obtain all required highway permits

associated with the work and deliveries.

Q46. Have municipal and/or state transportation authorities reviewed the plans for the Facility?

A46. Yes, both the Road Commissioner of New Haven and the staff at VTrans have reviewed the Project plans. The Town Road Commissioner expressed that the only issue was raised by the Fire Department regarding access to the facility and this has been addressed and will be further coordinated directly with the Fire Department as the Project progresses. VELCO also discussed the proposed project with staff at VTrans, who determined that the traffic associated with the Project would not justify a traffic impact study and that the Project will not require an access permit. A copy of the VTrans determination is provided as **Exhibit Petitioner PWL-13**.

Q47. Describe any measures being taken to ensure public safety on the affected roadways and railways during construction.

A47. As previously stated, most of the construction equipment activity will occur entirely on the property, thereby minimizing impacts on Route 17 and nearby roadways. For those times where there is activity occurring on Route 17 (e.g., during delivery of any large equipment to the site), VELCO will employ the services of traffic control personnel to manage traffic flow and enable emergency response vehicles to get to and from where they need to go. While not expected, VELCO will also provide advance notice to the Town of any potentially long interruptions to traffic. There will be extensive (24/7/365) monitoring, alerting, and reporting systems installed at the Project site.

Q48. Are any airports, airways, or waterways affected by the Project?

A48. No, none of these transportation systems is located in this area of New Haven.

10. Educational and Municipal Services (30 V.S.A. §248(b)(5))

Q49. Will the Project have any impact on educational and/or municipal services?

A49. No. With respect to educational services, the Project will not add any new students to the affected municipality. Thus, the Project will not place an unreasonable burden on the ability of a municipality to provide educational services because the Project will not require or affect educational services. Municipal water supply and wastewater systems will not be affected as the Project will rely on its own well and its own septic. Nor will the Project place additional demands on municipal fire protection, police protection, rescue service, road maintenance, or solid waste disposal. Upon the completion of the Project, VELCO will review the building layout with municipal fire safety personnel. The Project will also result in a positive impact on these services through the additional tax revenue VELCO will pay to the Town of New Haven.

11. Development Affecting Public Investments (30 V.S.A. §248(b)(5))

Q50. What impact, if any, will the Project have on public investments in any public resources?

A50. Generally speaking, the Project will not unnecessarily or unreasonably endanger any public or quasi-public investment in any facility, service, or lands, or materially jeopardize or interfere with the function, efficiency or safety of, or the public's use or enjoyment of, or access to any facility, service or lands. More broadly, the Project protects the Vermont ratepayers' investments in VELCO's transmission and data assets,

by ensuring the safe, effective operation of the electric transmission system.

12. Public Health and Safety (30 V.S.A. §248(b)(5))

Q51. Will the Project have any adverse effects on the health, safety, or welfare of the public or adjoining landowners?

A51. No, the Project will not endanger the public or adjoining landowners. VELCO has and will continue to design and will ultimately construct the Project in accordance with state and federal codes. VELCO will adhere to prudent utility and building construction practices throughout the construction phase. Access to the site will be controlled during and after construction to protect against unauthorized entry. As set forth in my affidavit being filed under seal, the Project has been designed with multiple security elements to reduce risks associated with unauthorized entry or attacks.

Once completed, VELCO will operate and maintain all components of the Project in the same, safe manner that the company operates and maintains all of its facilities.

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

Q52. Is the Project consistent with the principles for resource selection generally expressed least-cost integrated planning?

A52. Yes. VELCO does not have an integrated resource plan, but produces a long-range transmission plan every three years, the most recent of which is the *2018 Vermont Long-Range Transmission Plan*. Notably, this Plan only covers projects that address

transmission system reliability deficiencies. *See* Long-Range Plan at 9.[1] For instance, the Plan is not intended to include projects aimed at maintaining existing infrastructure and those needed to maintain and operate the existing system. Consequently, the proposed Project—which does not directly address transmission system reliability deficiencies—is not the sort of improvement that falls within the scope of the Long-Range Plan, and it is nowhere identified in the plan. Nevertheless, VELCO still brought the Project before the VSPC to share for informational purposes. And as detailed above and on **Exhibit Petitioner PWL-6**, VELCO evaluated various alternatives to the proposed Project, and the Project represents the most prudent and least-cost option to address the critical functions that it will serve.

14. Twenty Year Electrical Plan (30 V.S.A. §248(b)(7))

Q53. Is the Project consistent with Vermont's Comprehensive Energy Plan?

A53. Yes. Vermont's 2016 Comprehensive Energy Plan ("CEP") stresses that the state must plan and prepare for electric power supply emergencies, noting the recent significant weather events such as Tropical Storm Irene and recent ice storms serve as sobering reminders. To that end, the CEP recommends, among other items, designing resiliency into critical infrastructure, training key personnel to implement energy emergency response plans, and developing plans for coordinated restoration efforts and enhanced

[1] An electronic copy of VELCO's *Long-Range Plan* can be accessed here: https://www.velco.com/our-work/planning/long-range-plan.

situational awareness. See CEP at 271-74.[2] More broadly, the CEP strives for the protection of public safety, preservation of the environment, and least cost planning. The Project strikes the proper balance between these objectives, and directly advances the emergency planning themes in the CEP. VELCO is asking the Department of Public Service for a determination under 30 V.S.A. § 202(f) that the Project is consistent with the 20-Year Plan.

15. Waste to Energy Facility (30 V.S.A. §248(b)(9))

Q54. Is there any component of the Project that could constitute a waste-to-energy facility?

A54. No, this criterion does not apply to the Project.

16. Existing or Planned Transmission Facilities (30 V.S.A. §248(b)(10))

Q55. Can the Project be served economically by existing or planned transmission facilities without undue adverse effect on Vermont utilities or customers?

A55. Yes. The proposed Project consists of a facility that will enhance operational efficiency, ensure continued operation of the grid during an emergency event, and allow for emergency response and business continuity efforts. The distribution line extension upgrades GMP is providing to the Project, together with the fiber optic line extensions from the New Haven substation, can be served by existing transmission facilities with no impact on utilities or customers.

[2] An electronic copy of the CEP can be accessed here: https://publicservice.vermont.gov/publications-resources/publications/energy_plan

17. Conclusion

Q56. In your professional opinion, is the New Haven Operations Facility consistent with the general good of the State?

A56. Yes. As stated above, this Project will support VELCO's responsibility to reliably and safely transmit and maintain electric power within Vermont and between neighboring transmission systems, for use within the state, a duty that was assigned to VELCO through its founding CPG (Docket 2735). Moreover, the Project represents the culmination of years of planning, third-party consultation, and research to address vulnerabilities for continued safe operation of the bulk electric transmission system and the corresponding data and communications systems needed for operations. The Project takes into account both the expanding needs of the company and increased federal compliance requirements, as well as the diversity of potential natural- and man-made threats posed to the Pinnacle Ridge Campus. The Project accomplishes this with a building situated in a largely undisturbed rural setting, one which for all intents and purposes will appear to most passersby as a one-story red barn off of a quiet country road.

Q57. Does this conclude your testimony at this time?

A57. Yes, it does.