STATE OF VERMONT

PUBLIC SERVICE BOARD

Petition of Green Mountain Power Corporation for a Certificate of Public Good pursuant to 30 V.S.A. § 248 authorizing the removal of an existing substation and the construction of a new substation in the Town of Rockingham	)))))	Docket No. _____

PREFILED TESTIMONY OF

PATRICK J. KEARNEY

ON BEHALF OF PETITIONER

Summary of Testimony

Mr. Kearney's testimony describes the need for replacement of the Bridge Street #67 Substation. He describes the proposed Substation and the reconfiguration of the associated distribution lines. He also explains how the proposed project is consistent with the Section 248 criteria relating to orderly development of the region, need for present and future demand for service, system stability and reliability, economic benefit to the state, outstanding resource waters, development affecting public investments, GMP's integrated resource plan, the Vermont 20-year plan, outstanding resource waters, and existing or planned transmission facilities.

TESTIMONY OF PATRICK J. KEARNEY

ON BEHALF OF

GREEN MOUNTAIN POWER CORPORATION

1Q. Please state your name, employer, and current position.

1A. My name is Patrick J. Kearney and I am employed by Green Mountain Power Corporation ("Green Mountain Power" or the "Company") as a Senior Transmission and Distribution Engineer.

2Q. Please state briefly your educational background and business experience.

2A. My education is as follows: I attended Lake Superior State University where I earned a Bachelor of Science Electrical Engineering Technology. I have been a Member of the Electric Council of New England, Standards and Specifications for 20 years and was Chairman for 3 years. I have attended various electric utility related seminars over the years. I have been employed by Green Mountain Power from 2002 to the present, and am responsible for all utility engineering, both T&D lines and substations in the Central and Southern districts. From 1988-2002, I was a transmission and distribution engineer for Bangor Hydro Electric, where I was responsible for the planning, design specification, construction inspection and maintenance criteria of the transmission and distribution line facilities for an area encompassing most of Bangor Hydro's service territory. I also was involved in ongoing reliability planning, power quality, capital and project budgeting, and inspection programs. Between 1967 and 1987 I worked for

several utilities and as an outside contractor in the distribution area.

3Q. Have you ever testified before the Public Service Board?

3A. Yes. I testified in Docket No. 7035 regarding the Company's Substation and related facilities in Richmond, Vermont and in Docket No. 7269 related to the expansion of Green Mountain Power's Substation in Waterbury, Vermont.

Project Description

4Q. Please describe the facilities in the area of the existing substation.

4A. Green Mountain Power and New England Power Company d/b/a National Grid ("National Grid") currently own and operate a substation on the southern edge of downtown Bellows Falls, Vermont. The substation, known as the Bridge Street #67 Station (the "Bridge Street Substation" or existing substation), is located on the corner of Bridge Street and Rockingham Street on land that is owned by TransCanada Northeast, Inc. ("TransCanada"). The current substation site contains equipment and structures separately owned and operated by National Grid and Green Mountain Power. The Bridge Street Substation is an open frame steel structure with exposed bus, five ground-mounted transformers, and five regulators. The station sits on a corner lot bounded by a canal (part of the water intake structure for the Bellows Falls No. 14 Hydroelectric Station referred to in this testimony as the "Bellows Falls Canal" or the "Canal") and Bridge Street. The Bridge Street Substation is the source of power for the greater Bellows Falls area. There are approximately 2,100 meters currently served by the Bridge Street

Substation. Green Mountain Power proposes to decommission and remove the Bridge Street Substation and replace it with a new substation at a new location (47 Bridge Street) (the "Project"), as described in Green Mountain Power's Petition, its prefiled testimony and exhibits. Distribution lines in the area will also be reconfigured – some will be placed underground, some will be reconductored and some will be removed – as described below. Green Mountain Power will be the sole owner of the proposed substation. The locations of the Bridge Street Substation and the proposed substation are identified on the orthophoto and the topographical map attached as Exhibits __[PJK-1] and [PJK-2]. Views of the substation site from the locations identified on the orthophoto are attached as Exhibit __[PJK-3]. The proposed substation is scheduled to be built in the Third Quarter of 2009 unless the Company encounters unforeseen delays. Green Mountain Power plans to keep both old and new substations operational until 2010 to allow for completion of the northern circuit of Bellows Falls.

The Bridge Street Substation is fed directly by two 6.6 kV National Grid underground cable feeders from TransCanada's nearby Bellows Falls No. 14 Hydroelectric station. The cable feeders leave TransCanada's 6.6 kV dam generator bus via underground ducts, proceed under Bridge Street and terminate inside the existing substation.

Within the existing substation, five National Grid transformers operate at separate positions off the bus. The first transformer is a 3750/5250 kVA with a 6.6 kV input and a 8320Y/4800V output. The second transformer is a three winding 3000 kVA with an

input of 6.6 kV and an output of 8320Y-2400V. The other three separate transformers are installed as a bank, each is a 1000kVA transformer with a 6.6 kV input and a 2400V output. There are five outgoing distribution circuits owned by Green Mountain Power that operate at 8.32kV and 2.4kV, each protected by individual reclosers. Three feeders operate at 8.32kV and two feeders operate at 2.4kV. One of the 2.4kV circuits is dedicated to the Island Corporation and feeds a primary meter owned by National Grid. This circuit delivers power under the provisions of an existing contract between National Grid, TransCanada and Island Corporation.

The steel box structures, foundations and other electrical equipment are jointly owned by National Grid and Green Mountain Power.

5Q. What are the disadvantages associated with the existing substation facilities?

5A. There are various concerns that make the relocation of the existing substation desirable. The existing substation has a relatively small footprint, and is located on the edge of Bridge Street in the downtown area. Green Mountain Power and National Grid access it by a short driveway directly across from the Post Office. While most of the Substation may be accessed from the driveway, pedestrian and vehicle traffic on Bridge Street make substation work difficult to work during the day in this busy downtown area.

Internally, the existing substation lacks working clearances necessary for safe and reliable operation, maintenance and repair. Tight clearances within the substation increase the

risk of an accident or substation failure and the potential for damage during a substation event. For instance, if one piece of equipment fails, damage can occur to adjacent equipment due to electrical flashover and flying debris.

In addition to concerns with human safety, there are environmental concerns. The Bridge Street Substation is currently located adjacent to and uphill from the Bellows Falls Canal. Although there is an oil containment system in place, it consists of a berm system. There are no oil containment pits within the Bridge Street Substation.

It is also not possible to connect Green Mountain Power's temporary mobile 46-12.5 kV substation transformer to the Bridge Street Substation, in the event of an accident or emergency, because the temporary transformer is not electrically compatible with the National Grid 6.6 kV supply voltage. In addition, Green Mountain Power cannot currently transfer electrical load to its substation in Westminister without causing a power outage. In the event of certain accidents or equipment failure, only part of the Bellows Falls service territory can be restored to power by using the Westminster Substation as a feeder back-up. As a result, a large portion of the northerly part of the service territory will be off-line until repairs can be made at the existing substation. This could result in a long outage.

The existing substation equipment is owned by two separate companies, Green Mountain Power and National Grid and taking one company's equipment off-line affects the other

company's equipment. This makes it difficult to schedule equipment repairs, replacements and maintenance.

In addition, TransCanada has requested Green Mountain Power to remove its facilities from TransCanada's Bellows Falls #14 Hydro generation bus. This is due to TransCanada's exposure to the possibility of an electrical fault associated with the direct connection of the existing substation, which could take TransCanada's generator off-line in a worst-case scenario.

Finally, the Town of Rockingham has long expressed an interest in relocating the existing substation away from the downtown area and the Bellows Falls Canal, because it is in a highly visible location.

The need for the Bridge Street Substation relocation project as a solution to safety and reliability concerns is further described in a report entitled "Relocation Options for the Bellows Falls Vermont Bridge Street Substation," prepared for Green Mountain Power by DuBois & King ("D-K") in 2001-2002 and recently updated (the "Relocation Study") and described in the prefiled testimony of Mr. John Benson.

6Q. Please describe the proposed project.

6A. Green Mountain Power proposes to remove its existing equipment and, together with National Grid, decommission the existing Bridge Street substation. Green Mountain

Power will then construct a new substation at a location on the other side of the Bellows Falls Canal. The proposed substation site is already owned by Green Mountain Power. TransCanada and National Grid own the property adjacent (to the east) to the proposed substation site. The National Grid Vilas Bridge Substation occupies a portion of this adjacent property. The proposed substation site is situated on an open, relatively flat piece of land and is located approximately one-quarter mile east of the existing substation.

The site is presently fenced, screened by vegetation and located away from both the downtown area and the Bellows Falls Canal. The view of the site is limited because Bridge Street, where it passes by the drive into the lot, is at a lower elevation than the balance of the lot. In addition, there are trees and other plantings along the north side that offer some visual screening. To the west, a private manufacturing building blocks all view of the site. To the south and east the property drops off steeply to the Connecticut River. The bank is covered with trees and the site is difficult to see from the river or even from across the river in New Hampshire. Views of the substation site from these locations are attached as Exhibit __[PJK-3].

The proposed substation site can be directly accessed from Bridge Street. Green Mountain Power is in the process of obtaining the necessary easements and agreements to build new circuits that will allow it to connect to the National Grid 46 kV transmission system and reconnect its distribution circuits. Green Mountain Power will own all of the

transformers and equipment at the proposed substation.

Green Mountain Power seeks the necessary regulatory approvals to:

- Construct a new substation at its new Bridge Street site. New equipment includes: one 14MVA transformer, three 668 kVA voltage regulators, three circuit reclosers and a SCADA communication system. The proposed substation will be controlled by motor operated, SCADA-controlled load break switches located inside the proposed substation. Central Vermont Public Service Corp. ("CVPS") and National Grid are currently drafting a system impact study, which will allow Green Mountain Power to move from the TransCanada generator bus to the National Grid 46kV transmission network. Green Mountain Power expects that switching and other electrical operations at the proposed substation will be set forth as part of that study. Green Mountain Power expects the study to be completed by January, 2008.
- Green Mountain Power has requested a preliminary bid (reflecting final design) showing the general structure arrangements for the proposed substation. Final design will not be established until the project is bid out, but the general design features and heights and sizes are a fair representation of the proposed Substation. Based on technical information supplied by Green Mountain Power's steel fabricator, the proposed substation structure will be approximately 25 feet high with three 10-foot lightning rods, for a maximum total height 35 feet from ground level. The proposed substation facility will include two open steel box frame structures having footprints of approximately 16x32 feet and 16x48 feet respectively and encompassed by an 8-

foot high chain link fence, set back approximately 100 feet from Bridge Street. General arrangement drawings showing details of a typical substation of this type are attached as Exhibit __[PJK-4]. The final design will not increase either the footprint or the height of the substation by more than 10%.

- An underground concrete storage pit at the proposed substation site, which will be constructed to contain the entire 1248 gallon volume of oil in the new transformers, as well as 5 inches of precipitation. The pit will conform to IEEE Standard 980-1994, IEEE "Guide for Oil Containment and Control of Spill in Substations."
- Build a modern engineered structural berm, 10 to 12 inches high and 2 feet wide, which will be constructed as an oil containment system in addition to the transformer oil storage pit. The berm will be located inside the substation security fence and will consist of a compacted crushed stone base that is covered with fabric and stone. The design of this system is in compliance with the U.S. Environmental Protection Agency requirements for the prevention of oil pollution.
- Reconfigure the National Grid 46 kV transmission tap to connect proposed substation to the National Grid transmission network. The proposed substation will be supplied from the National Grid 46kV network located directly adjacent to the proposed substation. This network is part of a 115/69/46kV interconnection system network co-owned by CVPS and National Grid. Preliminary designs of the transmission circuits may be found on exhibits to the prefiled testimony of Charles E. Wilson. Exhibit __[CEW-2].

- Remove the existing concrete transformer containment area at the proposed site, the pole storage area and a small portion of the existing driveway there. New steel framework, spill containment, concrete foundations, ground grid, conduits and chain link fence will be constructed. Pole and transformer storage will be relocated to the new Green Mountain Power Service Center.

Equipment and materials will be brought to the proposed substation site by truck and will be stored inside the existing fenced area, to the extent practicable. Access for the delivery of materials is straight-forward and should not cause any undue burden on the local transportation network. There is ample room for stocking and staging of materials, contractor parking and construction vehicles to set up within the fenced area of the proposed site. Large tractor-trailer type vehicles can easily back up into the proposed site to be positioned for off-loading or for temporary use.

A brief description of plantings proposed for the site as an aesthetic mitigation measure may be found in John K. Benson's prefiled testimony. Green Mountain Power will supervise all construction and plantings.

7Q. Please describe the distribution lines associated with the proposed project.

7A. Green Mountain Power plans to install new 12.5 kV distribution lines in the downtown Bellows Falls area and will also remove several lines. In general terms the configuration of the distribution circuits will change in the following ways.

The following new circuits will be constructed:

- Temporary distribution lines: Three new temporary overhead circuits will be built on a single pole line extending from the proposed substation across the Bellows Falls Canal and to a point behind the post office.
- Permanent distribution lines: Following the decommissioning of the existing Bridge Street Substation in 2010, Green Mountain Power will remove two overhead distribution lines across the Bellows Falls Canal to a point behind the post office. These circuits will be placed underground, and the portion across the canal will be embedded in the bridge. The Town of Rockingham agreed at their April 2007 council meeting to partially share with Green Mountain Power the cost of undergrounding these lines. This construction is estimated to be completed in 2011. See Exhibit__[PJK-5] -- Permanent Bridge Street Line Design. Second, there will be three new distribution lines between the proposed substation and the bridge. The distribution circuits will leave the proposed substation lot and extend to a 55-foot, rectangular laminate pole on the north side of Bridge Street at Island St. The three circuits then continue to a second laminated pole on the east side of the canal. Laminated, self-supporting poles are planned for these two locations due to inadequate guying space. Depending on the plans of other entities currently attached to the Island St. pole, two poles may remain at this intersection following the completion of the Project. Circuits will be constructed using very few cross-arms and wires will be bundled to create a narrow, aesthetically pleasing profile. The locations of the laminate poles may be found on Exhibit__[PJK-5]. Third, a new Green Mountain Power distribution line will be built along the east side of the Bellows Falls

Canal, along a corridor presently occupied by TransCanada to service its dam gates, and across the Connecticut River to connect with the existing Green Mountain Power circuit. The terms of an easement necessary for this line are currently being negotiated with TransCanada. See Exhibit__[PJK-6]: TransCanada Line Design. The location of temporary lines to be used during construction may be found on Exhibit__[PJK-7]. A schematic showing a laminate pole profile may be found on Exhibit__[PJK-8].

The following existing circuits will be removed:

- The main line Green Mountain Power circuits north of the existing Bridge Street Substation on the west side of the Bellows Falls Canal running to Canal St. will be permanently removed. Most of these poles on the west side of the Bellows Falls Canal will remain in place due to GMP and Verizon secondary attachments. See Exhibit__[PJK-5]: Permanent Bridge Street Line Design.
- Existing power lines and poles along Bridge Street will be replaced with new facilities.

8Q. In addition to the advantages of the proposed substation site listed in Mr. Benson's prefiled testimony on behalf of Green Mountain Power, what other advantages does the proposed site offer?

8A. Mr. Steele describes the advantages of the proposed site from an aesthetic perspective. There are also electrical engineering reasons why the proposed substation site is the best available alternative. Two distinct National Grid 46 kV sources are available to the proposed substation to form a "loop feed" arrangement, which will allow Green

Mountain Power to connect its proposed substation to the grid in a more reliable way. Maintenance will also be easier at the proposed site. If the preferred feeder is lost, power can be restored remotely with SCADA-controlled switches from Green Mountain Power's central office, conveniently allowing Green Mountain Power to use the alternate source. In contrast, the existing non-SCADA 6.6 kV operated underground feeders that presently connect the existing Bridge Street Substation must be reset manually in the event of an outage.

The proposed site will allow Green Mountain Power to connect its 46-12.5 kV mobile substation to a compatible electrical system allowing for an emergency power source, unlike its existing site where a mobile connection is not possible.

The proposed site will thus result in improved safety, reliability and aesthetics. Safety will be improved because the new site will be away from pedestrian travel and there will be no space constraints to make repairs or maintenance work more difficult. Reliability will be improved due to the new electrical equipment in the substation and the feeder ties that provide for greater flexibility during electrical outages. The project will result in improved aesthetics because the proposed substation will be located away from the center of Rockingham's downtown area and will replace a highly visible facility. A site plan for the proposed substation may be found on Exhibit__[PJK-9]. Likely views of the proposed substation site from highly frequented sites are shown in photographs in Exhibit__[PJK-3].

The proposed substation site will allow Green Mountain Power to construct a 12.5kV distribution system that currently conforms to Green Mountain Power's existing standards for most other Green Mountain Power equipment and locations. This will allow Green Mountain Power to operate more efficiently with fewer losses, less equipment and easier-to-manage equipment inventories.

9Q. Does Green Mountain Power anticipate any power outages as a part of the proposed project?

9A. Several short, early morning power outages are necessary during the construction period to complete the project. Green Mountain Power has planning and management practices in place to ensure safety during this kind of construction project. During construction, Green Mountain Power will require its employees, contractors, and subcontractors to strictly adhere to applicable labor standards and safety codes.

10Q. Why is a 14MVA transformer appropriate in the proposed substation?

10A. A 14MVA transformer was chosen because it will be capable of carrying the present combined 6.5 MVA Bellows Falls demand and the 4 MVA Westminster demand if an emergency load transfer is required.

Following the completion of the Bridge Street Substation relocation project, Green Mountain Power plans to upgrade the Westminster Substation transformer to a 14MVA unit and convert the area voltage to 12.5kV. It presently operates at 8.32kV. Following

the Westminster upgrade, the proposed 14mVA transformers at each location will have the capacity to fully transfer loads in either direction, improving feeder back-up in the area.

11Q. Describe the anticipated loss factors associated with the transformer and the future loading profile at the Bridge St. Substation?

11A. Factors used in calculating transformer losses are set forth on Exhibit___ [PJK-10] Loss Factors. This lifecycle data sheet will be used in the bidding process for the manufacture of the transformer. Bus Loading analysis is set forth on Exhibit__[PJK-11] and shows the calculation of loads that Green Mountain Power projects the proposed substation will carry during the next 10 years of operation based on available data.

12Q. Please discuss future plans for the existing substation site.

12A. Green Mountain Power will retain an environmental firm to prepare a reclamation report describing the proper procedure for decommissioning the existing substation site. Following the substation relocation, Green Mountain Power will remove and either salvage or discard all its equipment from its present location at the Bridge Street Substation. The concrete pads and fence will be left in place pending final disposition of the site, but will be removed as soon as practicable in accordance with the recommendation of the environmental firm retained by Green Mountain Power and in consultation with National Grid. Green Mountain Power and National Grid will each be responsible for the removal of its own equipment at the Substation site. The disposition

of National Grid's transformers and other equipment is discussed in the testimony of Charles E. Wilson. In the event that it is necessary to remove oil from any Green Mountain Power equipment, such removal will be performed by a recycler that is licensed in the state of Vermont to dispose of the oil. Disposal of all other material from the existing substation will be managed in accordance with applicable federal, state and local regulations. The power lines that connect the existing substation to the rest of the grid will be removed from the Bridge Street Substation and reconfigured to the new network. The Bridge St. Substation is currently scheduled to be fully removed no later than one year after the completion and proof of successful operation of the proposed substation. Green Mountain Power will make efforts to complete the removal as quickly as possible following the completion of the northern circuit. The Company currently assumes that this will include removal of the concrete pads and fence, but the timing of this will not be definitively determined until site testing is complete.

National Grid's plans with respect to its facilities at the Bridge Street Substation are set forth in the prefiled testimony of Charles E. Wilson.

13Q. How much will the proposed substation and related improvements cost?

13A. Exhibit __[PJK-12] sets forth the currently projected costs, based primarily on estimates by Green Mountain Power engineers. These costs will be refined once the contracts have been entered into with the various site contractors and substation fabricator.

SECTION 248 CRITERIA

14Q. Please indicate why the proposed project is required to meet the need for present and future demand more effectively than energy efficiency measures (30 V.S.A. § 248 (b)(2)).

14A. As noted above, the Project is proposed primarily to address reliability, safety, aesthetic, environmental, and municipal planning concerns that cannot be addressed through energy efficiency measures or demand response programs. Demand response and non-transmission alternatives were not equivalent resources to address the concerns associated with the Bridge Street Substation, when compared to the proposed solution for the Rockingham/Bellows Falls area.

In addition, because the Project is driven by safety and reliability concerns, additional electrical generation, conservation measures or demand-side management of Bellows Falls electrical load could not replace, delay or defer this project. As an example, reliability-related issues often occur over multiple days, yet these non-transmission alternatives are unlikely to be present for the entire duration of the reliability issue. Although the historical combined noncoincident peak loads of the five Green Mountain Power substation feeders are below the Bridge Street Substation's capacity of 8.25 MVA, Green Mountain Power's reliability, safety, aesthetic, environmental, and municipal planning concerns can only be addressed through a proposed substation in a different location, in a loop-feed configuration rather than by load reduction. Consequently the need for and benefits of the proposed substation cannot be addressed through energy efficiency measures.

In addition, the Project is not subject to the requirements of distributed utility planning ("DUP") under the Docket 6290 guidelines. Although the projected capital cost is more than the $2 million threshold, it will not be located in a constrained area and the Project is required to address reliability and safety concerns. A copy of Green Mountain Power's DUP Planning Worksheet is attached as Exhibit__[PJK-13]. Installation of the proposed substation with its greater clearances, ability to use the Green Mountain Power mobile substation and option for loop feed connection with Green Mountain Power's Westminister substation should result in a safer, more reliable distribution grid in the Bellows Falls area.

15Q. Will the proposed project adversely affect system stability or reliability, 30 V.S.A. § 248(b)(3)?

15A. System stability and reliability will be enhanced by the replacement of the Bridge Street Substation. Its replacement will enhance reliability because operating, maintenance and outage-related work will be performed more efficiently and safely, and because the mobile substation can be used at the new site. In addition, SCADA operation will shorten outage time. Safety will be improved because there will be significantly less nearby pedestrian and vehicular travel, and there will be no space constraints inhibiting repair and maintenance work. The Bellows Falls Canal that currently borders the substation will be less exposed to oil spills.

In terms of reliability, the dual 46 kV taps off of the National Grid system result in a "loop feed" SCADA-operated design for the Substation. This allows the source of power to be restored quickly and conveniently if there is a fault condition on either of the 46kV transmission lines, in contrast to the non-SCADA configuration serving the existing substation. Also, there will no longer be a 30 degree phase shift, thus allowing live ties with adjacent circuits.

The proposed substation will serve three outgoing 12.5kV distribution feeders, which will eliminate the need for three 8420 Volt feeders and two 2400 Volt feeders and associated substation equipment. The locations of existing and proposed incoming and outgoing circuits are shown on Exhibits __ [PJK-5].

16Q. Will the project provide a benefit to the state and its residents? (30 V.S.A. § 248 (b)(4))

16A. Yes, for the reasons discussed above. Currently certain outages at the Bellows Falls Bridge Street Substation would expose the communities of Rockingham and Bellows Falls to a complete loss of electrical service. An outage could last for an extended period because it is not possible to use Green Mountain Power's mobile transformer at the Bridge Street Substation, and because of the tight clearances in the existing Bridge Street substation site. Completion of the Project will benefit the State of Vermont and its residents by improving the reliability and safety of the distribution grid in the Rockingham/Bellows Falls area. The Project will thus reduce the potential economic and

safety risks to town and village residents associated with power disruptions and outages. The Project will also provide economic benefits to the Town of Rockingham by improving the aesthetics of its historic downtown area. Modern oil containment facilities will also benefit the State by moving a potential source of oil contamination further from the Bellows Falls Canal, which feeds into the Connecticut River. Finally, Rockingham has notified Green Mountain Power of its desire to relocate the substation away from the downtown area and out of the public view.

17Q. Will the project comply with any applicable waste disposal regulations, and will it involve any injection of harmful or toxic substances into the ground (30 V.S.A. § 248(b)(5))?

17A. All removed fill will be relocated from the proposed substation site and will be disposed of in an approved landfill or will be utilized as clean fill on the site. Construction debris will be disposed of at state-approved landfills. The Project does not involve any injection of harmful or toxic substances into the ground. Therefore the Project is consistent with these requirements.

18Q. Will the project be consistent with the Petitioner's last approved least-cost integrated plan and with the 20 Year Plan? (30 V.S.A. §§ 248(b)(6), 248(b)(7))

18A. Yes. The Project is consistent with the provisions of Green Mountain Power's Integrated Resource Plan ("IRP"), as approved by the Board's July 13, 2006 Order in Docket No. 6895. The 2006 IRP provides that:

> Green Mountain Power desires to provide consistent, reliable service throughout its distribution system. Adequate reliability requires additional contingency capacity,

> system interconnections and back-up circuits in areas where reliability problems have become significant. There may be situations where the existing facilities require replacement because of poor physical condition, even though capacity is still adequate. Alternatives involving enhanced system protection and distribution system automation will be evaluated to provide improved reliability where needed.

See Green Mountain Power 2006 IRP, Section III c, 2., b, at pp. 36-37 attached hereto as part of Exhibit__[PJK-14]. The Project is consistent with the above stated-goals in the IRP. It will reinforce the existing sub-transmission system by providing a loop feed arrangement for the proposed substation. There will be little environmental impact from the project as discussed above and below. Transmission and distribution operating voltages (34.5/12.5kV) are consistent with voltages described in Green Mountain Power's IRP. Use of these operating voltages for sub-transmission is beneficial from the perspective of cost, operating requirements, feeder configuration, and the impact of faults on adjacent circuits. Finally, as noted above, special Distributed Utility Planning is not required for the Project.

Green Mountain Power's 2007 IRP, which has been submitted to the Board for approval, states the following at Appendix F, p. 184:

Bellows Falls:

> In 2007, GMP will request Board Section 248 approval to construct a new 46 kilovolt/12.5 kilovolt, 14 MVA Bellows Falls Substation in a new location in downtown Bellows Falls. The current 8.3 kilovolt/4 kilovolt substation, located in an extremely undesirable location, operates at voltages that can't provide feeder backup or be served by GMP's mobile substation. The higher voltage and capacity of the new substation will allow the Bellows Falls service are to not only operate at 12.5 kilovolt, but also back up feeders from the Westminister Substation. . . . The issues addressed by the project could not be satisfied by [Distributed Utility Planning], so DUP analysis is not required.

A copy of Appendix F to the Company's 2007 IRP is attached as part of Exhibit __[PJK-14].

Construction of the proposed substation to replace an existing joint owned substation is also consistent with the 2005 Department of Public Service Twenty Year Plan ("2005 Plan"). The discussion concerning transmission in the 2005 Plan contains a very limited review of transmission/substation construction issues. Other than a brief review of distributed generation issues, there is no explicit discussion of transmission/substation construction issues. However, the 2005 Plan acknowledges the primacy of safety and reliability in planning the Vermont transmission and distribution system. 2005 Plan at 1-4. Because the primary benefit of this project is increased safety and reliability through its loop feed configuration, new SCADA hardware, ease of maintenance and access, the Bridge Street substation project is in compliance with the 2005 Plan's safety and reliability goals. The Project is also consistent with the Integrated Resource Planning Guidelines included in the 2005 Plan as Appendix A. In addition, Green Mountain Power has requested that the Department of Public Service render a determination that the Project is consistent with the Twenty-Year Plan, as required by 30 V.S.A. 202(f).

19Q. Does the proposed substation location offer any opportunity for loss savings due to circuit reconfiguration?

19A. Green Mountain Power plans to eliminate two existing circuits, two recloser positions and four power transformers. The reduction in losses to the Bellows Falls distribution

system as a result of building the Substation are calculated to be nominal due to the elimination of circuits and substation equipment.

Planning/Impact on Existing Systems

20Q. Will the proposed project unduly interfere with the orderly development of the region, with due consideration to the recommendations of the local and regional planning commissions and municipal legislative body? (30 V.S.A. § 248(b)(1))

20A. No. Chapter 4 of the 2006 Windham County Regional Plan provides for the following with respect to new or improved energy transmission or distribution facilities:

4. With regard to all energy generation, transmission and distribution projects:

a. Adhere to a high environmental standard that includes avoiding negative environmental impacts to the extent possible and adequately minimizing and mitigating those that cannot be avoided;
b. Conduct thorough and proper studies and analyses of all anticipated socioeconomic and environmental impacts, both positive and negative;
c. Adequately address all areas of concern regarding proposed developments; and
d. Effectively and adequately address all issues related to facility operation and reliability, recognizing that in some instances they are inextricably intertwined with public health and safety concerns.

5. With regard to new or improved energy transmission or distribution facilities:

a. Prefer and select existing transmission and distribution corridors over creation of new corridors;
b. Avoid extension of energy transmission or distribution facilities into or through Resource Lands; and
c. Avoid extension or alteration of energy transmission or distribution facilities in any manner that would significantly impact Resource Lands or significantly diminish important natural resource values.

2006 Windham County Regional Plan at 47. Relevant excerpts of the 2006 Windham County Regional Plan are attached as Exhibit__[PJK-15].

The Bridge Street Substation relocation project is consistent with the 2006 Windham County Regional Plan because potential environmental impacts from the proposed substation (e.g. from a possible oil spill) are less than those with the existing substation. Visual impacts are also reduced. The proposed substation will also be more efficiently integrated into the existing transmission system. The proposed site location has also been developed in consultation with Town of Rockingham officials both to take into account the best electrical solution for the reliability and maintenance problems relating to the existing Bridge Street Substation and to minimize aesthetic impact. The majority of new distribution lines will be in existing distribution corridors; in some cases, the lines will be placed underground or removed. See Exhibit __[PJK-5]. The Project will have no impact on Resource Lands[1] nor will it significantly diminish important natural resource values.

The proposed project is also consistent with the Rockingham 2001 Town Plan for Land Use Planning. Exhibit __ [PJK-16]. That plan notes at 37-38:

> One of the unique issues facing Rockingham and future development in the downtown area is the location of the electric substation on Bridge Street. In addition, major transmission lines run in both directions from the substation creating problems with

[1] Resource lands are defined in the 2006 Windham County Regional Plan as those dominated by lands requiring special protection or consideration due to their uniqueness, irreplaceable or fragile nature, or important ecological function. Resource lands include fish and wildlife habitats; areas hosting significant natural plants, animals and communities as designated by Vermont's Nongame and Natural Heritage Program, or federally identified endangered and threatened species; unique and fragile natural areas; riparian buffers; wetlands; shore lands; floodplains; aquifer recharge areas; steep slopes; lands over 2,500 foot elevation; ridgelines; essentially undeveloped forestlands having limited access to improved public roads; and regionally significant scenic corridors and areas. 2006 Windham Regional Plan at 26.

future development and improvements to existing structures. The relocation of the substation has been considered for many years. . . .the community has come to realize the very real limitations which may result from the current placement of the substation and its transmission lines.

The Town will seek the relocation of the electric substation on Bridge Street, across from the Post Office, and seek support from representatives to the legislature, state government, and the electric companies involved.

21Q. Have local and regional planning commissions and municipal legislative bodies made any recommendations?

21A. Yes. The Town of Rockingham responded to Green Mountain Power's pre-filing package in an October 31, 2007 letter attached as Exhibit__[PJK-17]. Rockingham's letter was generally supportive of the site selection, but expressed a concern about night lighting at the proposed substation, which I address below, and about the length of time that the concrete pad and fence will remain in place at the existing substation site.

22Q. Can the proposed project be served by existing/planned transmission facilities? (30 V.S.A. § 248(b)(10))

22A. Yes. The proposed project can be served by existing transmission facilities, with the changes described above, and will not adversely affect any public investments in governmental or public utility facilities.

Impact on Environment

23Q. Will the proposed project have an adverse effect on air and water purity, the natural environment, public health and safety, outstanding resource waters, or result in undue, air or water pollution? (30 V.S.A. § 248(b)(5), (8)).

23A. No. There are no incremental impacts on air quality from the proposed project, other than typical dust caused by activities during construction. The transformer installation will be in accordance with applicable federal oil spill prevention and counter-measure requirements. All equipment and construction will comply with applicable safety requirements, including the National Electric Safety Code. There should be a positive effect on ambient noise levels by replacing the existing substation located near traveled areas with a single substation in a more remote location. There will be no adverse impact on public health and safety as a result of the proposed substation construction. There are no outstanding resource waters located adjacent to the proposed substation site and the proposed project does not involve a facility affecting or located on any segment of any waters designated as an outstanding resource water. For a discussion of how the Project meets criteria specified in 10 V.S.A. §§ 1424a(d) and 6086(a)(1) through (8) please refer to the prefiled testimony of John Benson and John Steele of D-K.

24Q. Will the project have any impact on prime agricultural soils?

24A. No. Because the project will be constructed within the urban center of the Town of Rockingham/Village of Bellows Falls, the project will have no impact on primary agricultural soils.

25Q. Please describe any waste disposal or water conservation measures.

25A. All removed brush and fill will be relocated from the site and will be disposed of in an approved landfill or will be utilized as clean fill on the site. Construction debris will be disposed of at state-approved landfills. Because the proposed project will not involve water use, no water conservation measures are necessary.

26Q. Will the proposed project have an adverse impact on aesthetics or the scenic and natural beauty of the area?

26A. No. Please refer to Mr. Benson's and Mr. Steele's prefiled testimony for a discussion of the lack of adverse impact on aesthetics and the scenic and natural beauty of the area.

27Q. Will the proposed project have an adverse impact on Public Investments (10 V.S.A. § 6086(a)(9)(K))?

27A. The proposed project will not have any adverse effect on public investments, public utility facilities or public lands. To the contrary, the loop-feed configuration allowed by the proposed substation, as well as its SCADA-controlled hardware, should enhance electric reliability in the Town of Rockingham/Village of Bellows Falls and thus have a positive effect on infrastructure in the area generally, including the categories of public investments listed in 10 V.S.A. § 6086(a)(9)(K).

28Q. Are there any other permits that are required for this project?

28A. No.

29Q. Will this Project affect the power supply of Island Corporation?

29A. It is Green Mountain Power's understanding that National Grid intends to continue its current arrangements with Island Corporation. Representatives of Green Mountain Power have been working with representatives of National Grid and Island Corporation to identify an appropriate engineering solution that will allow this to take place.

30Q. How will the proposed substation be lit at night?

30A. The gates to the proposed substation equipment will be lit at night, only when needed, by two 250-watt high pressure sodium floodlights, but the lights will be directed away from Bridge Street.

31Q. Have Green Mountain Power's description of its distribution plans changed since the Company submitted its 45-day prefiling package pursuant to Public Service Board Rule 5.400?

31A. There are three aspects of the construction and removal of distribution lines associated with the Project that have either changed or which Green Mountain Power wishes to clarify since the Company submitted its 45-day prefiling package pursuant to Public Service Board Rule 5.400. First, the utility poles on the west side of the Bellows Falls Canal will probably remain in place after Green Mountain Power removes its distribution line. In Green Mountain Power's 45-day prefiling package, this line of poles was described as being removed. These poles are jointly owned with another utility. Second, a small Green Mountain Power service line will run across the canal north of Bridge street to serve buildings on Canal Street. This line was not shown on Attachment 2 to the

Company's 45-day prefiling package, but is shown on Exhibit__[PJK-5]. Third, there exists the possibility of a dual pole at the corner of Bridge and Island Streets of which the Company was unaware when it submitted its 45-day prefiling package.

32Q. Does this conclude your testimony?

32A. Yes.

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