STATE OF VERMONT
PUBLIC SERVICE BOARD

Petition of Georgia Mountain Community Wind, LLC for a Certificate of Public Good, pursuant to 30 V.S.A. § 248, authorizing the construction and operation of a 5 wind turbine electric generation facility with associated electric collection and interconnection facilities on Georgia Mountain, in the Towns of Milton and Georgia, Vermont, to be known as the "Georgia Mountain Community Wind Project"	))))))))	Docket No. ____

PREFILED TESTIMONY OF JOHN L. ZIMMERMAN

ON BEHALF OF GEORGIA MOUNTAIN COMMUNITY WIND, LLC

March 26, 2009

The purpose of Mr. Zimmerman's testimony is to describe Vermont Environmental Research Associate's involvement with the Project as the Project Lead, to describe the Project as well as the wind research assessment and plans for production output. In addition, Mr. Zimmerman's testimony addresses the following Section 248(b) criteria: Section 248(b)(1)(orderly development); Section 248(b)(2)(need), Section 248(b)(3)(system stability and reliability), Section 248(b)(7)(compliance with DPS Electric Energy Plan), and Section 248(b)(10)(existing or planned transmission facilities).

TABLE OF CONTENTS

EXHIBITS

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1. Introduction

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

A1. My name is John L. Zimmerman. I am the owner and President of a small consulting firm, Vermont Environmental Research Associates ("VERA"). My business address is 1209 Harvey Farm Road, in Waterbury Center, Vermont 05677.

Q2. Please describe your educational background.

A2. I received my bachelor's degree in Environmental Administration from Johnson State College, and a Master in Business Administration from the University of Vermont.

Q3. Have you ever testified before the Public Service Board before?

A3. I have testified before the Public Service Board in Dockets 5823 (Searsburg); 7250 (Deerfield); and NM-297 (Teal Farm) along with several "248j" filings for wind measurement tower installations. A copy of my resume is attached as Exhibit Petitioner JLZ-1.

Q4. Please describe VERA and your role in the firm.

A4. VERA is the successor to a firm founded in the late 1970s (NEWECS) to provide project management and analytical work associated with renewable energy generation projects in the regulated and non-regulated arms of the electric utility industry. As the owner of the firm, I am responsible for all of its business endeavors including guiding its strategic direction. On a day to day basis, my primary areas of responsibility for our clients include project management work, business strategy development, performing financial and feasibility analyses, technical report preparation and overseeing the work of VERA's several technical staff members and consultants. Since the late 1980s much of VERA's work has been associated with the project development, financing, and permitting of commercial wind power facilities. For example, under my direction, VERA was responsible for the early wind resource and siting work for Green Mountain Power Corporation's ("GMP's") establishment of the first utility-sponsored wind program in the country, which led to the development of both GMP's pioneering

wind power facilities on Little Equinox Mountain (1989) and the Searsburg Wind Power Facility (1997).

Since Searsburg, VERA has worked closely with several national wind development firms establishing and managing their northeast regional offices. In addition to being responsible for setting their strategic direction, VERA also provided specialized skills and technical capabilities that are needed in wind project development. VERA conducts wind site assessments, wind resource assessments, financial analyses, along with providing Geographic Information Systems (GIS) mapping services; wind turbine micrositing and wind facility design optimization; visual simulations of wind facilities; shadow flicker analyses and mapping; and estimations of the long-term energy production and economic performance of wind facilities. To support the analytical work we use specialized software including ARC GIS 9.3, Windpro 2.5, WaSP, Windfarmer and other data processing and analysis programs. We routinely work closely with civil and electrical engineers, environmental scientists, and legal professionals.

Under my guidance, VERA also performed a number of assignments for the Vermont Department of Public Service ("DPS"), including a hypothetical estimation of wind power potential on Vermont's public lands (2003), the production of state-wide county wind resource maps (2004), the wind siting consensus-building workshops (2002), and initiation and management of the

Vermont small wind turbine network program (2005-present) which monitors performance, maintains a program data website and assists with maintenance.

Q5. What is your relationship to the applicant?

A5. In early 2006, VERA was asked by the Harrison family to examine the feasibility of installing a wind power facility on Georgia Mountain (the so-called "Georgia Mountain Community Wind Project", "GMCW Project" or "Project"). Early work involved permitting (Docket No. 7212), installing (Dec. 2006) and monitoring a wind measurement station and organizing the Project team. In 2007, after a full year of wind data was acquired and analyzed, VERA performed a feasibility assessment for the Project. Our assessment indicated an attractive wind resource exists for an economically viable project to be developed in the present economic environment. On this basis, the Harrisons decided to move the GMCW Project forward, formed Georgia Mountain Community Wind, LLC ("GMCW") to build and operate the Project, and asked VERA to serve as the Project Lead for the planning and implementation of Project development work. In addition to project management assistance, we have lead roles in the Project wind resource and energy production assessments, economic analyses, community outreach work, photographic simulations preparations, and planning and oversight of the work of the environmental consultants.

Q6. What is the purpose of your testimony?

A6. My testimony will provide a general overview description of the Project site, the major physical components of GMCW Project, and the wind resource assessment as production output. I will also describe how the Project fits with certain Section 248 evaluation criteria, including the following substantive criteria of Section 248(b) of Title 30, Vermont Statutes Annotated: Section 248(b)(1)(orderly development); Section 248(b)(2)(need); Section 248(b)(3)(system stability and reliability); Section 248(b)(4)(economic benefit); Section 248(b)(7)(compliance with DPS Electric Energy Plan); and Section 248(b)(10)(existing or planned transmission facilities).

2. Project Description

Q7. Please describe the Project site.

A7. Georgia Mountain is one of several rolling hill landforms in the northern Champlain Valley that rise several hundred feet above the valley floor with summits between approximately 1000 feet and 1500 feet above mean sea level. It lies about 6 miles east of the shores of Lake Champlain, with a ridgeline of approximately 3/4 miles in length, at elevations above sea level ranging between 1,320 and 1,440 feet. The ridge straddles the border between the Town of Milton in Chittenden County, and the Town of Georgia in Franklin County, in a northwest – southeast orientation. The ridgeline is approximately perpendicular to the prevailing wind flows from the southwest. Near its western base is Lake

Arrowhead, the site of an existing dam and hydroelectric generation station; the Lamoille River valley lies to the north; rolling hills and eventually agricultural land extend through the eastern quadrant; and Westford Road runs east-west at the southern base of the hill. Presently Georgia Mountain is used primarily for forestry purposes. It is also the site of a 120 ft. telecommunication tower serviced by an existing 4-wheel drive road and an electric distribution line extending from Westford Road. All-terrain vehicle and snowmobile trails are present throughout the property and are heavily utilized. Log truck and skidder tracks can also be found throughout much of the area.

Wind studies indicate that up to 5 wind turbines could be sited along the ridgeline on two private parcels of land. At the northeastern end of the ridgeline, in Georgia, potentially 2 wind turbines could be sited on a small portion of the larger 445+/- acre parcel owned by Green Crow LLC, a forest products company. GMCW has an agreement with Green Crow, allowing them to lease this portion of land for the Project. The southeastern end of the ridgeline, in Milton, can support 2 – 3 wind turbines, depending on their rotor diameter, on a portion of the Harrison Family's 700+/- acre parcel. An access road and an electric collection line from the wind turbines to the point of interconnection along North Road will traverse over Harrison land. The geographic features as well as the location of proposed Project elements, are shown in the Overall Project Site Plan prepared for the Project by Cross Consulting Engineers, Exhibit Petitioner PC-2.

Q8. Please describe the wind turbines anticipated for use in the GMCW Project.

A8. GMCW anticipates installing up to 5 wind turbines on the ¾ mile ridgeline. The specific quantity and model of the wind turbines will be determined closer to the anticipated construction period. Based upon wind turbines GMCW has considered up to this point, and anticipated market conditions over the next year, we expect wind turbines available in the 2010 market will be megawatt-scale, three-bladed rotor, horizontal axis type, with an electrical rating between 1.5 and 3.0 megawatts each. Generally speaking, the lower the rated turbine capacity (MWs), the more that could be installed in the available space, while the higher the rated turbine capacity, the fewer that would be used. Given this range of turbine sizes and electrical ratings, and the physical space available along the ridge, GMCW expects the Project will have an installed name plate capacity of between 7.5 and 12.0 megawatts. A wind turbine schematic, showing typical dimensions and labeled components is included as Exhibit Petitioner JLZ-2.

A typical wind turbine of the type and electrical rating proposed for GMCW have rotor diameters between approximately 75 to 90 meters (246 to 295 ft.). The three-bladed rotors are arranged in an upwind configuration, attached at the hub to a generator and gearbox housed in an enclosure called a “nacelle.” The nacelle sits on a columnar tower through which service access is gained and electrical and communication cables are run to its base. Tower heights or “hub-height” range

from 70 to 90 meters (230 to 328 ft.). Thus, the physical dimensions for the GMCW Project wind turbines could be as large as 90 meter rotors on 90 meter towers, for a total height at the tip of the rotor blades in their highest position of 135 meters (443 ft.). Three or four wind turbines of this largest type could be used, sited 2.5 – 3.5 rotor diameters apart from one another. A schematic showing the major components and dimensions of a wind turbine typical of the scale proposed for this project is included with my testimony as Exhibit Petitioner JLZ-2.

The wind turbines chosen for this Project will be painted a neutral off-white color. Five wind turbines, representing the largest possible "footprint"[1] are being assumed for assessing Project impacts. Exhibit Petitioner PC-2 depicts the expected turbine layout for a 5 turbine design.

The type of transformers used in this Project will depend on what wind turbines are used in the Project. Dry and mineral oil transformers are routinely used in the wind industry. If the mineral oil transformers are used, GMCW will install oil containment and the site maintenance plan will include routine inspections.

[1] Wind turbine sizing for the 5 turbines assumes an 80 meter rotor sited with similar 2.5 to 3.5 rotor diameter spacing.

Q9. Please provide an overview of the electrical system and interconnection to be used for this Project.

A9. Each wind turbine will have a transformer either within the nacelle or at the base of the turbine, depending on model selected, that will increase the generator voltage to 34.5 kilovolts. A new 34.5 kV electric collection line will carry power from the transformers at the wind turbines to a Point of Interconnection at the Husky Injection Molding facility entrance along the Milton town highway (TH-5), North Road. The location is shown in Exhibit Petitioner PC-2. Central Vermont Public Service Corporation ("CVPS") is the owner of the nearby existing 34.5 kV sub-transmission line and is the interconnecting utility. The electric collection line from the wind turbines to North Road will be entirely on Harrison lands. It will be installed underground between the wind turbines along the ridge, and overhead on 34- 38' tall, single poles, spanning approximately 250' – 300', from the ridge to North Road, and approximately 1450 ft. along North Road to the Point of Interconnection with the CVPS pole at the entrance to Husky Injection Molding plant, as shown on Exhibit Petitioner PC-2.

GMCW has submitted a Generation Resource Application to CVPS in accordance with PSB Rule 5.500, and in February 2009 authorized CVPS to prepare the Feasibility Study for this interconnection. We will provide the results to the Board in the form of a supplemental filing once the study is complete.

Q10. Please provide an overview of the new access road and other facilities needed for this Project.

A10. Access to the wind turbines will be approximately 2.2 mi. (3.7 km.) of new and upgraded service road entirely within the Harrison property and connect the wind turbine area with the Westford Road to the south. The details are described in the prefiled testimony and accompanying engineering plans submitted by Peter Cross.

3. Project Need - Section 248(b)(2)

Q11. Please describe your assessment of the Project need under Section 248(b)(2).

A11. The demand for new sources of renewable energy in Vermont, as well as all of New England, is robust at this time. Expectations among renewable energy developers are for the market to remain strong for the electricity and the environmental attributes produced by new renewable generation sources into the foreseeable future.

In Vermont, the demand for new renewable sources of electric generation is fostered by several legislative initiatives in recent years. A new Vermont law, effective July 1, 2008, as a result of the enactment of S. 209, states the following: "It is a goal of the state by the year 2025 to produce 25% of the energy consumed within the state through the use of renewable energy resources particularly from Vermont farms and forests." This law will also require Vermont utilities to support the Sustainably Priced Energy Enterprise Development ("SPEED")

program by securing stable pricing of long term renewable energy resources and increasing the amount of renewable energy resources that Vermont utilities must acquire for their customers. GMCW represents an attractive resource for utilities needed to meet the state's and the regions renewable energy goals. GMCW's discussions with Vermont electric utilities have been consistent with this increased need of Vermont utilities to acquire or build new instate sources of renewable energy.

Q12. What is the expected energy production estimated for this facility?

A12. At the low end of possible project sizes, at 7.5 MW, Georgia Mountain Community Wind's annual wind energy production is expected to be about 2,100 megawatt-hours. At this level GMCW will contribute to the reduction in global climate change, and thus is perfectly consistent with Vermont's Act 61 renewable energy goals[2], Act 74 promotion of this growth and federal policy initiatives supporting this kind of new development activity.

Moreover, based on energy production estimates and the forecasted marginal emission rates produced by ISO New England, Inc. ("ISO-NE"), Georgia Mountain Community Wind, with an annual generation of 21,000 megawatt-hours, can potentially offset emissions as shown in the table to follow.

[2] See 30 V.S.A. 8001(a)(1)(6)

Emission	Annual Average (lbs/MWH)[3]	Annual Potential Offset (lbs) [4]
SO_2	0.53	11140
NO_x	0.29	6090
CO_2	993	20853000

Table 1: Emissions offset by GMCW, assuming a 7.5 MW project with a net annual generation of 21,000 megawatt-hours.

4. Wind Resource Assessment and Production Output

Q13. Please describe the Wind Resource Assessment performed for this Project by VERA.

A13. In November of 2006, the Harrison's installed a 132 ft. (40 m) tall NRG Systems Inc. (Hinesburg VT) wind measurement tower atop Georgia Mountain. Wind speed and direction sensors are installed at 66, 98 and 131 ft. (20, 30 and 40 m.) heights (redundant anemometers at the top level) and temperature data is collected at approximately 10 ft above ground level. Conditions are measured at all sensors at 3-second intervals and summary statistics are stored every 10-minutes. Data is collected daily via cell phone transmission to an Internet Service Provider to VERA's office where accumulated data is subjected to a quality assurance process. The first 13 months of operation recorded a data recovery rate of 100% at this station. The short-term measured data has been adjusted to long-term estimates using wind data measured during coincident periods at the NOAA's

[3] From ISO NE 2006 New England Marginal Emissions Rates (Sept. 2008)
[4] Calculated assuming 21,000 MWH/year net energy production for 7.5 MW facility using 5 GE 1.5 sle wind turbines.

Weather Service station at the Burlington International Airport. Wind measurement stations with over 5 years or more of data available are considered to be "long-term" stations. The Burlington Airport meets this criterion as its wind measurement equipment has been installed at the same location on airport grounds since 1996. Based on the correlation with the Burlington Airport data for the coincident measurement periods, a climatologic adjustment was applied to the measured wind speed values to derive the predicted long-term average wind speed of 14.4 mph (6.4 m/s) at 131 ft. (40 m) above ground. Then, applying the wind shear power law to the predicted values at differing heights on the tower, the wind speed was extrapolated to the wind speed at 230 ft (70 m.), closer to hub-height of turbine types being considered for GMCW.

Data collection rates are very high through 2008, yielding over two years of high quality data from this site as of January 1, 2009. For the most recent analysis, the hub-height level has been increased to 263 ft (80 m.). The long-term adjusted mean wind speed extrapolated to 80 meters is projected to be 17.6 mph (7.9 m/s), using measured wind shear values with the wind speed power law. With 2 years of adjusted wind data, uncertainty associated with estimates of the long-term values is relatively low, approximately 3.5%. This leaves the procedure to extrapolate sensor height values to the hub-height of the turbines as the largest source of uncertainty. To further reduce this uncertainly, GMCW plans to extend the height of data collection levels from 131 ft. (40 m.) to 197 ft. (60 m.) in the

spring of 2009[5]. Measurements at the higher levels are expected to reduce uncertainty associated with extrapolating wind speeds to the 263 ft (80 m.) hub-height level, and will permit more accurate energy production estimates to be calculated.

Q14. Can you describe the wind resource on a qualitative basis, and put it in perspective with other sites?

A14. Yes. A wind power classification scheme that was developed by the U. S. Department of Energy in the 1980s has become standardized and is often used world-wide to describe the general quality of the wind resource by variations in wind speeds found a given heights above ground cover. Wind speeds (expressed as long-term annual mean wind speeds) are classified in 1 of 7 wind speed classes, with low wind speeds falling into lower numbered wind classes. The GMCW estimated long-term values at 131 ft. (40 m.) and 263 ft. (80 m.) above-ground height are illustrated in the table below by the non-shaded Class 4 winds, representing "Good" wind resources respectively.

[5] This increase in tower height was approved by the Public Service Board in the Memorandum, dated March 11, 2009.

Wind Speed Class	Wind Speeds at 30 m. (98.4 ft.) above effective ground cover		Wind Speeds at 70 m. (229.6 ft.) above effective ground cover		Resource Potential
	MPH	M/S	MPH	M/S	
1	0 - 11.4	0 – 5.1	0 - 12.8	0 - 5.8	Poor
2	11.4 - 13.2	5.1 - 5.9	12.8 - 14.9	5.8 - 6.7	Marginal
3	13.2 - 14.5	5.9 - 6.5	14.9 - 16.3	6.7 - 7.3	Fair
4	14.5 - 15.7	6.5 - 7.0	16.3 - 17.7	7.3 - 7.9	Good
5	15.7 - 16.6	7.0 - 7.4	17.7 - 18.7	7.9 - 8.4	Excellent
6	16.6 - 18.3	7.4 - 8.2	18.7 - 20.6	8.4 – 9.2	Outstanding
7	> 18.3	> 8.2	> 20.6	> 9.2	Superb

Table 2: Wind resource classification table developed by the US Department of Energy (DOE/NREL). GMCW's 131 ft (40m) measured adjusted mean wind speeds and 263 ft,(80 m.) extrapolated hub-height values fall within the non-shaded values. Note that the height values in the table correspond to height above effective ground cover (3/4 tree canopy height of approximately 10 meters in GMCW case), which in turn correspond to hub-height values which are referenced as height above ground.

In practice, wind power developers, when searching for attractive wind sites in the New England region, use a threshold hub-height wind speed of 15.6 mph (7.0 m/s) as a threshold value for pursuing development. A typical horizontal axis, three-bladed wind turbine with an 80 meter hub-height, for example the popular GE SLE 77 meter rotor turbine, rated at 1.5 megawatts, can be expected to produce between 4,000 and 4,750 megawatt hours annually[6], after deducting 16% for various losses, in a Class 4 wind regime.

VERA has also performed a detailed analysis using the computer program WAsP to model the wind flow over the summit area, based on measured data, and then has optimized the siting of different quantities of megawatt-scale wind turbines at

[6] Assumes a Rayleigh wind speed distribution, at sea level, and 16% losses.

the site. These results indicate 4 – 5 wind turbines with generator ratings between 1.5 and 3.0 megawatts and rotor diameters of 70 - 90 meters may be sited in the windy portions of the ridge line. A particular wind turbine's rotor diameter and tolerance for turbulence will be factors in the micrositing and turbine solicitation process. Ultimately, GMCW will work with the selected wind turbine supplier to finalize the micrositing of turbines.

Q15. What steps, if any, has GMCW undertaken to make its generating facility a competitive alternative?

A15. First, because it is a relatively small scale renewable project, its impacts are much more limited than most, and this conclusion is repeated in the various resource assessments provided by the other witnesses in this filing. As noted in these project assessments, this feature of this Project makes it very viable in terms of meeting the various resource criteria evaluated for permitting in the Section 248 process as well as other state permits. In addition: 1) After initial analysis and preliminary design focused on the Milton portion of the Project ridgeline, it acquired the rights to installed turbines on a neighboring property (the Green Crow parcel in Georgia), which provided two additional potential turbine sites, representing a 67% improvement over the 3 sites available on Harrison controlled property. We estimate that expanding from 3 to 5 turbines has the effect of reducing the average unit cost of energy produced by approximately 9 percent; 2) GMCW is keeping development cost low through a well planned and efficiently

operated development team; 3) GMCW has been successful in obtaining state funds through the Clean Energy Development Fund in 2007-2008 and has a new application pending for 2009. We estimate that the development cost for the Project will be a small fraction of the several million dollars expended in other larger wind turbine projects in the region; and 4) Because of its relatively small size, relatively small amounts of capital are needed.

Q16. Please elaborate on your last point.

A16. GMCW anticipates financing the Project locally to the extent possible. Local banks have expressed interest in providing debt, and Vermont electric utilities have as well. GMCW is better sized for local financing than are larger competitors. Internationally, the markets for wind turbines and capital financing markets have changed rapidly and dramatically since GMCW planning began in 2006. This can be expected to continue to evolve as the development and permitting processes continue. The current economic downturn and credit tightening is having a significant adverse impact on the ability of larger wind projects to obtain financing. Smaller, well developed projects closer to fruition, like GMCW, are becoming an attractive market for wind financiers and wind turbine manufacturers in the current (March 2009) economy. The national and international downturn in wind turbine orders is also having the positive effect of increasing turbine availability to GMCW and more attractive wind turbine prices.

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Q17. What are the plans for the output from GMCW?

A17. Although GMCW has not finalized a contractual arrangement(s) for the sale of the Project's output, GMCW has contacted Vermont electric utilities and found most are very interested to discuss power sales arrangements. Early discussions have been encouraging and several utilities are actively negotiating with GMCW at this time. Long-term contracts, with stable prices that are adequate enough to attract financing is the ultimate goal. GMCW is also positioning itself to obtain such contracts as provided in the SPEED program created under 30 V.S.A. § 8005 as a second alternative to obtaining long-term contracts for GMCW's output from Vermont utilities.

5. <u>System Stability and Reliability - Section 248(b)(3)</u>

Q18. Criteria 24(b)(3) & (4) require the Board to find that a project, if approved, will not adversely affect electric system stability and reliability. What information can you provide that would demonstrate that the Project will meet this requirement?

A18. As I noted earlier, CVPS is the owner of the nearby existing 34.5 kV sub-transmission line to which GMCW plans to interconnect. GMCW has submitted a Generation Resource Application to CVPS in accordance with PSB Rule 5.500, and CVPS is preparing a Feasibility Study for this interconnection, at several possible generation levels. The interconnection requested in-service date is December 2009, though this has since been updated to December 2010 in the Feasibility Study Agreement. We will supplement this filing with the results from

the CVPS study during the course of this proceeding, when the results are available. We expect the results to be available by June 2009.

6. Orderly Development - Section 248(b)(1)

Q19. 30 V.S.A. § 248(b)(1) requires the Public Service Board to find that a project will not unduly interfere with the orderly development of the region, with due consideration having been given to the recommendations of the municipal and regional planning commissions, the recommendations of municipal legislative bodies, and the land conservation measures contained in the plan of any affected municipality. Have you evaluated the Project under this criterion?

A19. Yes. In accordance with Board Rule 5.403, we assessed the Project's potential impacts upon the orderly development of the towns and regions within a ten mile radius of the wind turbine sites. Our assessment is included in this section of my testimony, and more fully discussed in LandWorks report as part of Mr. Raphael's testimony at Exhibit Petitioner DR-2.

As shown on the Overall Project Site Plan, Exhibit Petitioner PC-2, most Project components (up to three turbines, access road and electric connection line) will be located within the Town of Milton, which is part of the Chittenden County Regional Planning Commission ("CCRPC"). Up to two wind turbines are being evaluated for the Green Crow, LLC property in the Town of Georgia and which is part of the Northwest Regional Planning Commission ("NRPC"). Other towns

within a ten-mile radius are identified on the Viewshed Map prepared by LandWorks, Appendix 1 to LandWorks Visual Report (Exhibit Petitioner DR-2), and include portions of Westford, Underhill, Essex, Colchester, Fairfax, Fairfield, Fletcher, St. Albans Town, St. Alban's City, South Hero and Grand Isle. A description of the Project site and its fit within the regional cultural landscape is provided in LandWork's visual report, Exhibit Petitioner DR-2, as well as in earlier sections of my testimony. Land use on Georgia Mountain is commercial forestry along with recreational use by ATVs and snowmobiles. A telecommunications tower and access road were installed several years ago. The property was purchased with an existing forest management plan prepared by Upland Forestry of Bristol, VT in effect. The Green Crow property also maintains a current forest management plan for its property to the north in Georgia. On the Harrison property, selective cutting has occurred over a 6-year period and limited logging over the last 4 years. The open fields along Ted Road are large 20-acre tracts that were clear cut and chipped prior to acquiring the property.

Development of wind energy on Georgia Mountain is both compatible with these existing uses and reflects many of the expressed community goals to develop more sustainable, clean, renewable energy resources in the region to serve the electrical needs of this area.

Q20. Have you provided these towns and regional commissions with any information concerning the Project prior to filing a petition with this Board?

A20. Yes. As noted in Mr. Harrison's testimony, GMCW has engaged in an extensive outreach process with local communities, community members, businesses and interested parties by providing information about the Project. GMCW has developed a project brochure and a Project website, with key information about the Project and contact information. Members of the GMCW development team have met with the selectboards of the neighboring communities, and with the Chittenden and Franklin county regional planning commissions. VERA has assisted with this effort, including development of photo simulations of the proposed Project.

Q21. Have you had an opportunity to review the local and regional plan provisions of the affected towns and regional commissions?

A21. We have reviewed and assessed each of the local and regional plans. Many of the plans express community goals and policies to develop more sustainable, clean, renewable energy resources in the area. The pertinent provisions are discussed below:

Milton

The Town of Milton 2008 Comprehensive Plan states that renewable energy sources should be a part of the Town's energy policy, and facilitating such

sources is a stated energy goal of the Plan. (Milton Town Plan at 33 and 34.) The Plan further acknowledges that renewable energy resources, including wind generation, may help to reduce the Town's dependence on petroleum and other non-renewable resources. (Milton Town Plan at 34.) The Plan also notes that the Town has received wind generation proposals, including a proposal for the GMCW Project. (Milton Town Plan at 34.)

As noted in Mr. Raphael's visual Report, Exhibit Petitioner DR-2, the Plan contains a section on conservation areas "at the highest elevations and other environmentally sensitive areas … which have been delineated in and around … Georgia Mountain." (Milton Town Plan at 34.) However, there is no mention of their value for conservation purposes, nor are there any stated goals or policies outlined in this section. In addition, The Plan notes that the boundaries of this district are not accurately delineated. (Milton Town Plan at 77.)

The Plan also contains "goals" relating to the Arrowhead Lake Area, including a general goal to "maintain scenic vistas and viewsheds." (Milton Town Plan at 96.) Georgia Mountain is not mentioned in this section, and as noted earlier, where Georgia Mountain is specifically mentioned in the energy section of the Plan, a stated goal is to promote development of renewable resources.

Georgia

The Town of Georgia 2006 Municipal Plan devotes a significant section to the discussion of the need to utilize more renewable resources. The Plan recommends that the Town should look more seriously at alternative energy sources for its future needs, with an emphasis on renewable energy sources, including wind generation. (Georgia Town Plan at 52.) The Plan states that, "anything Vermonters can do to reduce their dependency on imported energy resources will also show significant benefit to the states economy." (Georgia Town Plan at 52.) The Plan further discusses the need to become more energy conscious and the environmental consequences of its present patterns of energy use. (Georgia Town Plan at 52.) According to the Plan, the Town should be able to reduce its dependency on dwindling fossil fuel resources and improve the environment at the same time as renewable energy resources become more viable. (Georgia Town Plan at 52.) The Plan's energy policy concludes, "it is important to reduce [its] use of polluting expensive energy sources through conservation, technological advances and increase its use of renewable and non-polluting energy sources." (Georgia Town Plan at 53.)

The Town considers Georgia Mountain and Arrowhead Lake noteworthy scenic features and its policy is to encourage the preservation of such features. (Georgia Town Plan at 25 and 26.) The Plan notes that Georgia Mountain and other forested slopes are "prominent features whose scenic quality are subject to

degradation by development or cover change." (Georgia Town Plan at 25.) The Plan also notes that steep wooded hillsides are a valuable scenic resource for the town and that it should pay more attention to the value of Arrowhead Mountain Lake as a resource for the town. (Georgia Town Plan at 45.) As I have noted earlier, Georgia Mountain is already the site of an existing cell tower with associated access road and a trail network, and Arrowhead Lake hosts another important renewable energy resource – hydroelectric power facilities.

The Plan does not identify any specific land conservation measures for Georgia Mountain. It includes stated policies for energy infrastructure development, which policies are more in the nature of suggested mitigation to reduce aesthetic and ecological impacts. For example, at page 42, the Plan's stated policies are to promote co-location where possible, to require new structures, transmission lines and access roads to be installed so as to minimize aesthetics and ecological impacts, to minimize lighting on towers, including shielding lights so that they may be cast where needed, and use of non-reflective and neutral colors on towers. (Georgia Town Plan at 42.) Our proposal is consistent with these policies.

Fairfax

The Town of Fairfax 2008 Plan states that power generated from local renewable sources, including wind generation, can provide cost-saving and environmental benefits, noting that locally produced power makes communities, and the state as

a whole, less dependent on non-renewable and non-locally produced power. (Fairfax Town Plan at 39.) The Plan also discusses the concept of "net-metering," and acknowledges that this is an "opportunity to offset some costs and potentially generate revenue from investing in local, renewable energy generation." (Fairfax Town Plan at 40.) A stated policy of the Plan is "to encourage and enable public and private installation and application of appropriately sited, small scale renewable energy production systems, such as wind energy conversion and photo voltaic systems." (Fairfax Town Plan at 44.)

With respect to Fairfax's natural and scenic resources, the Plan urges that such resources, including ridgelines, should be considered as part of planning and development. (Fairfax Town Plan at 35.) The Plan discourages development that compromises the archaeological or visual integrity of significant scenic views or cultural features. (Fairfax Town Plan at 36.) It also seeks to "protect and preserve natural, cultural, and scenic resources, which help define the Town's rural character, natural environment, and traditional working landscape." (Fairfax Town Plan at 36.)

The Plan does not speak to Georgia Mountain or the Project, and the Project infrastructure will not be sited within Fairfax. The Project is consistent with the Plan policy "to encourage and enable public and private installation and

application of appropriately sited, small scale renewable energy production systems, such as wind energy … systems." (Fairfax Town Plan at 44.)

Westford

The 2004 Westford Town Plan does not make any clear statements regarding the development of local renewable energy resources. The Plan notes the Town's visual resources and states that "whenever possible, development should be sited in such a way as to preserve those views which are important to Westford residents." (Westford Town Plan at 17.) The Plan does not speak to Georgia Mountain or the Project, and the Project infrastructure will not be sited within Westford.

Chittenden County Regional Plan

The Chittenden County Regional Plan ("CCRP") states that certain areas in Chittenden County are generally suitable for wind energy applications. (CCRP at 10.12.) Although the Plan recognizes the scenic and aesthetic concerns regarding the siting of potential wind energy projects, it notes that wind power can enhance Vermont's energy self-reliance, is relatively quiet, and has minimal impacts on air and water quality. (CCRP at 10.12.) The Plan also states that energy production, transmission, and distribution infrastructure in Chittenden County should be efficient, reliable, cost-effective, and environmentally responsible, and emphasizes that a larger share of the county's energy needs should be supplied by

a combination of responsible new generation in the county, including renewable power sources. (CCRP at 10.14). The Plan does not speak directly to Georgia Mountain or the Project.

Northwest Vermont Regional Plan

The 2007 Northwest Vermont Regional Plan ("NRP") contains a section devoted alternative energy resources and potential. The Plan states that wind energy offers the prospect of increased electrical production with greatly reduced effects on air pollution, noting that "new technologies are now available to harness wind to produce power that is highly efficient and a viable alternative to other more traditional sources of power." (NRP at 118.)

While the Plan recognizes the potential benefits of wind power, it understands that the siting of wind turbines may interfere with scenic, natural and historical resources. (NRP at 119.) The Plan further notes that ridgelines, a likely location for wind generation sites, are the more visible portions of the Region's landscape and aesthetically valued by many. (NRP at 119.)

In general, the Plan states that energy projects, with the least adverse environmental, aesthetic, economic, and social impacts are preferred. (NRP at 123.) It also states that generation, transmission and distribution lines or corridors should avoid adverse impacts on significant wetlands, plant and animal habitat,

and recognized historic, natural, or cultural resources. (NRP at 123.) Other Plan policies which appear to be applicable to the Project are as follows:

- Encourage the private sector to develop energy conservation and renewable energy technologies.
- Encourage locally produced renewable energy sources which create local jobs, stimulate investment in the Region, and have minimal environmental impact.
- Support and encourage communities to enable appropriately sited and scaled wind energy systems.
- Develop a system of infrastructure that promotes energy conservation, substitution of low-impact renewable energy sources for non-renewable sources, and which provides sustainable, reliable, and affordable energy for the region. (NRP at 123, 124 and 125.)

The Plan does not speak directly to Georgia Mountain or the Project.

Underhill

The Underhill 2004 Town Plan notes that its objectives are in line with the Chittenden County Regional Plan. (Underhill Town Plan at 6.) Although the Plan does not mention wind generation, it advocates for the use of solar energy, suggesting that the Town is open to the prospect of renewable energy resources. (Underhill Town Plan at 14.) The Plan also notes that the Town should support the advocacy efforts of the State and County regarding policies on the efficient

use of energy. (Underhill Town Plan at 14.) The Plan does not speak to Georgia Mountain or the Project, and the Project infrastructure will not be sited within Underhill.

Cambridge

The Cambridge 2008 Municipal Development Plan encourages the Town and its residents to "reduce dependence on outside sources of energy through energy efficiency and use of locally available renewable sources." (Cambridge Plan at 22.) Further, the development and use of wind, wood, solar and other renewable energy sources is a stated energy policy in the Plan. (Cambridge Plan at 27.) The Plan does not speak to Georgia Mountain or the Project, and the Project infrastructure will not be sited within Cambridge.

Essex

The Town of Essex 2006 Town Plan indicates that the Town of Essex is open to opportunities for the utilization of alternative energy resources. (Essex Plan at 53.) Indeed, the Plan encourages the development of new renewable energy sources, including wind energy where appropriate. (Essex Plan at 70.) The Plan suggests that the Town will revise its zoning bylaws to minimize development on ridgelines and the visual impact of communications towers and/or wind power towers on areas designated as scenic resources. (Essex Plan at 122.) The Plan

does not speak to Georgia Mountain or the Project, and the Project infrastructure will not be sited within Essex.

Colchester

The Colchester 2007 Comprehensive Town Plan does not make any clear statements regarding the development of local renewable energy resources. The Plan does not speak to Georgia Mountain or the Project, and the Project infrastructure will not be sited within Colchester.

South Hero

The South Hero 2004 Town Plan does not make any clear statements regarding the development of local renewable energy resources. The Plan does not speak to Georgia Mountain or the Project, and the Project infrastructure will not be sited within South Hero.

Grand Isle

The Grand Isle 2007 Town Plan encourages the development of alternative and renewable energy resources, noting that such development can reduce the "impact of volatile electric and heating fuel costs on the community and the state as a whole." (Grand Isle Plan at 28.) Further, the Plan states that "with careful and appropriate review, the development of alternative power generation facilities will help diversify and strengthen Grand Isle's energy portfolio." (Grand Isle Plan at

29.) The Plan does not speak to Georgia Mountain or the Project, and the Project infrastructure will not be sited within Grand Isle.

St. Albans Town

The Town of St. Albans 2005 Town Plan makes no clear statements regarding the development of local renewable energy resources, but promotes the awareness and use of alternative energy sources (St. Albans Town Plan at 6 and 33.) The The Plan does not speak to Georgia Mountain or the Project, and the Project infrastructure will not be sited within St. Albans Town.

St. Albans City

The City of St. Albans 2005 Town Plan makes no clear statements regarding the development of local renewable energy resources. The Plan does not speak to Georgia Mountain or the Project, and the Project infrastructure will not be sited within St. Albans City.

Fletcher

The Town of Fletcher 2005-2010 Town Plan promotes the development and sustainable management of locally available renewable energy resources, including wind power. (Fletcher Plan at 7-4 and 7-7.) The Plan opposes development on any ridgelines and hilltops within the town, but does not speak to distant ridgelines. (Fletcher Plan at 3-18.) The Plan does not speak to Georgia

Mountain or the Project, and the Project infrastructure will not be sited within Fletcher.

Fairfield

The Town of Fairfield 2002 Town Plan encourages the development of local renewable energy systems. (Fairfield Plan at 64.) The Plan does not speak to Georgia Mountain or the Project, and the Project infrastructure will not be sited within Fletcher.

Lamoille County Regional Plan

The 2006 Lamoille County Regional Plan ("LCRP") notes that "generating electricity from wind is a likely area to increase regional electricity production." (LCRP at 63.) The Plan remarks that although large commercial wind farms may not be viable options for many towns in Lamoille County, there may be towns where small private wind generation may be possible. (Lamoille County Regional Plan at 63.) The Plan states that such small private wind generation "should be encouraged provided safety and aesthetic considerations are met. (Lamoille County Regional Plan at 63.) The Plan does not speak to Georgia Mountain or the Project, and the Project infrastructure will not be sited within Fletcher.

7. Section 248(b)(7) – Compliance with DPS Electric Energy Plan

Q22. Have you reviewed whether the Project is consistent with the goals and objectives of the Vermont Department of Public Service ("DPS") Twenty Year Vermont Electric Plan?

A22. Yes, and I believe that the Project is consistent with the Twenty Year Electric Plan. For example, the Plan speaks to the concern over the potential loss of existing power resources, and the need to diversify the Vermont power portfolio with a more sustainable, and stable long term supply mix, one that is diversified away from large fossil fuel sources. (Plan at v, 1-5). Chapter 5 of the Plan speaks to the importance of a sustainable resource portfolio in Vermont, and includes a section devoted to wind resources.

The Project is entirely consistent with these objectives in the Plan as well as more recently enacted legislation promoting the development of renewables in Vermont.

8. Section 248(b)(10) – Existing or Planned Transmission Facilities

Q23. Please address plans for use of existing or planned transmission facilities.

A23. As I noted earlier, CVPS is the owner of the nearby existing 34.5 kV sub-transmission line to which GMCW plans to interconnect at a location off of North Road, just north of the Husky Injection Modeling entrance drive (see the Project Site Plan, Exhibit Petitioner JLZ-2). The interconnection will include switch gear

and other protection equipment installed on poles near the interconnection point. My earlier testimony describes the plans for the collection lines to the summit.

9. <u>Educational and Municipal Services, 10 V.S.A. § 6086(a)(6)&(7)</u>

Q24. Is the Project expected to impact educational and municipal services in the affected municipalities?

A24. There will be no impacts upon educational services, as the Project will not result in an increase in the student population in the affected communities. Moreover, the Project will not impact the ability of local municipalities to provide educational services.

The Project also will not place an unreasonable burden on the ability of the affected municipalities to provide municipal services. Once completed, the Project will require minimal support services from local fire departments or law enforcement officers. As discussed in Mr. Cross' testimony regarding transportation plans, some coordination with traffic control services will be necessary in order to deliver equipment to the Project site. This will be a temporary impact and limited to equipment delivery. Mr. Cross' testimony also addresses construction impacts.

Regarding waste disposal, the disposal of construction debris will have little to no impact on the ability of regional solid waste facilities to provide disposal services.

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

Q25. Will the Project negatively impact public investments?

A25. The Project will not materially jeopardize or interfere with the function, efficiency, safety, or public use, access to or enjoyment of public services, facilities or lands. The Project is not situated on any publicly owned lands. The Georgia Mountain site and access are privately owned.

As far as potential indirect impacts, Mr. Raphael has completed a thorough assessment of the Project's potential visual impacts for a 10 mile radius, in accordance with board Rule 5.403, and has determined that the Project will not have an undue adverse impact upon aesthetics of public lands or facilities from which the Project would be visible. Although not directly situated on Arrowhead Lake, the lake sits at the foot of Georgia Mountain and is already the site of another renewable energy resource, the existing hydropower generating facility and dam.

11. Icing and Shadow Flicker

Q26. Have you looked at whether icing or shadow flicker may pose a safety or health risk to the public?

A26. Neither icing or shadow flicker would present a risk to the public. There are no residences, public roads, or other receptors that are with ½ mile of the facility

where these conditions could potentially exist. There are no public trails that lead to the summit. The access road will be gated and locked when the site is unattended. Snowmobile trails will be signed to warn of potential danger during winter icing conditions, and routed a so as to maintain a safe distance from the turbines.

12. Decommissioning

Q27. What are the plans for decommissioning the Project, once operations cease?

A27. A plan for decommissioning the facility will be prepared in collaboration with the wind turbine supplier for Board approval prior to beginning construction on this facility.

13. Conclusion

Q28. Does this conclude your testimony at this time?

A28. Yes, it does.