

**STATE OF VERMONT
PUBLIC SERVICE BOARD**

Docket No. _____

Petition of Deerfield Wind, LLC for a Certificate)
of Public Good pursuant to 30 V.S.A. section 248,)
authorizing it to construct up to a 45 MW wind electric)
generation facility, and associated transmission and)
interconnection facilities, in Searsburg and Readsboro,)
Vermont, and operate the same.)

**PREFILED DIRECT TESTIMONY OF
JOHN ZIMMERMAN**

ON BEHALF OF DEERFIELD WIND, LLC

January 8, 2007

Summary:

Mr. Zimmerman provides a detailed description of the wind generating project that Deerfield Wind, LLC is proposing to build and operate in Searsburg and Readsboro, Vermont. He discusses the wind resources and siting of the Project, project economics, project components, construction and operation and maintenance, and the Project's compliance with the criteria of 30 V.S.A. § 248.

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1

2 **General Background**

3 **Q. Please state your name and position, relative to this project.**

4 Response. My name is John Zimmerman. I am the owner of Vermont
5 Environmental Research Associates, Inc., (VERA), a consulting firm that specializes
6 in developing commercial scale wind power facilities. VERA's office is located in
7 Waterbury Center, Vermont. VERA managed the northeast wind development
8 efforts of enXco Development (the former owner of Deerfield Wind, LLC). In this
9 role, I had the overall project management responsibilities for the development of
10 the Deerfield Wind Project. Since February 2006, VERA has been retained by PPM
11 Energy, Inc to provide on-going consulting services with respect to the Deerfield
12 Wind Project. PPM Energy, Inc. purchased Deerfield Wind, LLC from enXco in
13 February 2006.

14

15 **Q. What is the purpose of your testimony?**

16 Response. The purpose of my testimony is to provide a detailed description of the
17 wind generation project that Deerfield Wind is proposing to build and operate in
18 Searsburg and Readsboro, Vermont. My testimony discusses the wind resources and
19 siting of the Project, project economics, project components, construction and
20 operation and maintenance, and the Project's compliance with the criteria of 30
21 V.S.A. § 248.

22

23

1 **Q. What is Deerfield Wind, LLC?**

2 Response. Deerfield Wind, LLC is a project company that was established in 2004
3 for the sole purpose of owning the assets associated with the development of the
4 Deerfield Wind Project. It is a Delaware Limited Liability Company registered in
5 Vermont with its principal address in Portland, Oregon. Deerfield Wind's managing
6 member is PPM Energy, Inc.

7
8 **Q. Please describe your qualifications and experience in the development of**
9 **electric generation projects.**

10 Response. My educational background in the early 1980s includes an undergraduate
11 degree in Environmental Administration (BA) from Johnson State College and a
12 graduate degree in Business Administration (MBA) from the University of Vermont.
13 My professional career since that time has been strongly related to several aspects of
14 the electric generation industry. I have extensive experience in performing financial
15 analyses of electric generation projects in the regulated and unregulated electric utility
16 environment. In 1989, I co-founded Mountain Energy, Inc., Green Mountain
17 Power's (GMP's) unregulated investment subsidiary that was charged with investing
18 capital in independent power projects outside of Vermont. Mountain Energy's
19 investments focused on energy efficiency and renewable energy projects which
20 included several wind power projects.

21 I was instrumental in the design and implementation of GMP's wind turbine
22 siting program in the early 1980s, which screened over 400 potential sites in
23 Vermont for their suitability for commercial wind power generation. We developed

1 a short-list of site groups, with each site receiving a comprehensive evaluation and a
2 ranking of their appropriateness for development, taking into account estimated
3 wind resources, potential environmental issues, proximity to existing infrastructure
4 and other factors.

5 In the late 1980s, through VERA, I oversaw the site selection, equipment
6 procurement, permitting, installation and operation and maintenance of two 100
7 kilowatt wind turbines installed by GMP atop Little Equinox Mountain in
8 Manchester Vermont. After Equinox, VERA continued to work with GMP as the
9 co-project manager for their Searsburg Wind Power Facility, including specifically,
10 the wind resource assessment, development, equipment procurement, permitting,
11 and financial analyses required to build the 6 megawatt wind power facility in 1996.
12 VERA continues to monitor the performance of this plant for GMP and assists with
13 the associated public relations work. Today, nearly nine years after this plant began
14 service, Searsburg remains one of the two large commercial wind plant in New
15 England and continues to achieve very high levels of performance, with monthly
16 availability often over 90%.

17 In the late 1990s and early 2000s, I oversaw VERA's development and
18 implementation of a comprehensive wind site prospecting and evaluation program
19 for two wind development clients. The program was expansive in its geographic
20 scope – from Virginia to Maine – and comprehensive in its use of computer-based
21 geographic information systems (GIS) to store, process, and analyze the large
22 amount of information needed to assess and rank potential wind sites. My complete
23 resume is found in ***Exhibit DFLD-JZ-1***.

1

2 **Q. Please describe the organizational, financial, and technical capacity of**
3 **Deerfield Wind, LLC to build and operate this wind generation project.**

4 Response. Deerfield Wind is owned by PPM Energy, Inc., a wholly owned
5 subsidiary of Scottish Power – a Scottish company that provides electricity
6 generation, transmission and distribution services to customers in the U.S. and U.K.
7 PPM Energy, Inc. (www.PPMEnergy.com) develops, constructs, and operates wind
8 energy projects throughout the United States. Headquartered in Portland, Oregon,
9 PPM Energy is the second largest marketer of wind generated electricity and related
10 renewable attributes in the United States with more than 2,000 megawatts of wind
11 energy in operation or under construction as of December 2006. PPM Energy has a
12 further pipeline of more than 9,000 MW of projects under development across the
13 United States. As developer, power marketer and owner of wind projects, PPM
14 Energy is unique in combining the following attributes:

- 15 1. The ability to get involved with development opportunities at the earliest
16 stage (securing land rights) and nurture those opportunities into viable
17 projects;
- 18 2. The ability to develop projects at all phases relying primarily on in-house
19 resources, including experts in meteorology, environmental permitting,
20 engineering and construction, finance, legal, and power sales and trading;
- 21 3. The ability to own and operate projects;
- 22 4. The ability to balance sheet finance the construction of its projects;

- 1 5. The ability to own projects which do not have associated power purchase
2 contracts, in whole or in part; and
- 3 6. The ability to act as a long term power purchaser in connection with projects
4 owned by third parties.

5 While PPM began its development activities in the Northwestern U.S., over
6 the last few years, PPM has evolved into one of the few developers/owners with a
7 truly national scope. At present, PPM has operating assets in the West, Southwest,
8 Midwest and Eastern regions of the U.S. In January 2005, PPM acquired Atlantic
9 Renewable Corporation (“AREC”), the leading developer of wind projects in the
10 region. The AREC team has been responsible for the initiation and development of
11 over 75% of the operational wind projects in the Northeast including the 322 MW
12 Maple Ridge Project in Lowville, NY.

13 At this time, PPM Energy’s development efforts in the northeast region are
14 focused on projects in New York, Pennsylvania, Massachusetts and Vermont. In
15 addition, PPM expects to construct the 60 MW Casselman Wind Project and 30 MW
16 Keystone Wind Project in Somerset County PA in 2007 and 2008, respectively. In
17 New England, PPM Energy is developing the Hoosac Wind Project, a 30 MW
18 project in northwestern Massachusetts that has substantially all of its primary permits
19 and is slated for construction in 2007/2008. The combined capacity of PPM’s New
20 England projects under development is over 70 megawatts.

21 PPM has a proven track record of successfully developing, financing,
22 constructing, owning and operating wind power projects. PPM is unique among its
23 development peers in that it has the ability to finance and own projects that do not

1 have long term power purchase contracts associated with them, as well as provide
2 long term PPA's to projects owned by third parties. In these situations, PPM takes
3 the power marketing risk, backstopped by our power trading capability and A- credit
4 rating. This ability removes a major bottleneck in the project financing process.

5

6 **Q. Have you previously testified before the Public Service Board?**

7 Response. Yes. I testified before the Board in GMP's Petition for the Construction
8 of its Searsburg Wind Facility (Docket 5823).

9

10 **Project Description**

11 **Q. Please describe the region in which the Project is to be located, including**
12 **land ownership and current use.**

13 Response. The Deerfield Wind Project is located in a sparsely populated, heavily
14 forested section of the Green Mountains in south-central Vermont, in the towns of
15 Searsburg and Readsboro, in Bennington County. The wind turbines will be situated
16 on ridges that generally trend in a north-south orientation and which lie to the east
17 and west of State Rte. 8. The highest portions of the ridges, where the wind turbines
18 are to be installed, are entirely within the Green Mountain National Forest (GMNF)
19 and range in elevation between 823 – 951 meters (2,700 - 3,120 feet) above sea level.

20 ***Exhibit DFLD-JZ-3*** illustrates the location of the Project along with its proximity
21 to federally-owned land within the GMNF managed by the USFS.

22 The existing Searsburg Wind Power Facility, owned by Green Mountain
23 Power Corporation (GMP), adjoins the proposed Eastern Project Area to its north,

1 on private land. Existing access roads and other infrastructure associated with
2 GMP's plant extend to the base of the hill. The proposed project will upgrade and
3 share the use of some of GMP's privately owned facilities. To the north of the
4 Western Project Area, access roads will be built through public and private lands to
5 join with a short section of existing town road (Putnam Road), before joining with
6 State Rte. 8. Putnam Road, located off the west side of State Route 8, is the current
7 preferred western access route because it follows an existing logging access corridor
8 and avoids wetland resource intersections. Private lands that will be needed for this
9 project are currently used for wind power generation in the Eastern Project Area,
10 and for timber harvesting in the Western Project Area. Neither of these uses will be
11 diminished by the proposed project. **Exhibit DFLD-JZ-2** provides a number of
12 photographs of the proposed project site from several vantage points.

13 Activities on the federal land are subject to a Green Mountain National
14 Forest Land and Resource Management Plan ("LRMP"). In February 2006, the U.S.
15 Forest Service approved a new LRMP for the Green Mountain National Forest.¹
16 The LRMP divides the Green Mountain National Forest into several different
17 Management Areas (MAs), each with a unique management "prescription". All
18 components of the Deerfield Wind Project are located within a MA designated as
19 Diverse Forest Use, which "emphasizes a variety of forest uses." The Deerfield
20 Wind Project is consistent with the development, level of disturbance, and actions

¹ Deerfield Wind filed its Special Use Authorization application with the U.S. Forest Service when the prior 1987 Land and Resource Management Plan was still in place.

1 expected in the Diverse Forest Use MA. The LRMP also specifically discusses siting
2 visually prominent facilities, including wind turbines, on National Forest Lands.

3 The LRMP's Final Environmental Impact Statement emphasizes the
4 potential for "wind power development", and states that several sites have good
5 potential for wind energy development, in the areas in which the Deerfield Wind
6 Project is proposed. The Project is compatible with these current and planned uses
7 of federal land. This issue is discussed in greater detail later in my testimony.

8

9 **Q. Why did Deerfield Wind select this site for the development of a wind electric**
10 **generation facility?**

11 Response. Deerfield Wind believes this site is highly favorable for the development
12 of a wind electric generation facility within the region based on a number of factors:

- 13
- 14 ▪ the site's superior and well-documented wind resources;
 - 15 ▪ the amount of land area available;
 - 16 ▪ the compatibility of wind development with existing uses of this land;
 - 17 ▪ the site's low potential for significant environmental impacts;
 - 18 ▪ the presence of existing access roads, transmission lines, and the existing
19 wind energy facility nearby; and
 - 20 ▪ adequate electrical capacity on existing transmission lines.

21 As mentioned previously, the process of selecting Searsburg as a wind power
22 site began over twenty years ago when GMP screened and examined potential sites
23 in Vermont for their suitability for commercial wind power facilities. Screening for
such factors as wind resource, proximity to existing infrastructure, as well as

1 acceptable and environmental impacts, resulted in the Searsburg site being identified
2 as the most attractive in Vermont. Subsequent assessments of these factors confirm
3 this ranking. Since the initial selection process, the exceptional wind resource has
4 been further documented and understood. In addition, actual performance data
5 from GMP's existing wind facility over the past nine years provides empirical
6 evidence that the power production capability of this site over the long-term is quite
7 good and well documented.

8 Scientific surveys, done in connection with the permitting of the GMP wind
9 plant, determined that the level of public acceptance for wind power in this region of
10 the state is quite good. Deerfield Wind's first-hand experience with the local
11 citizens and town officials agrees with these findings.

12

13 **Q. Were other sites considered before selecting this location for the Project?**

14 Response: Yes, this site was selected as the optimum location for the Project through
15 a hierarchal screening process that was applied to many sites. This screening process
16 involved two overarching project objectives:

17 1. To build a commercially viable expansion of the existing Searsburg wind power
18 facility to help meet the region's current and future need for renewable wind
19 power energy. Several siting factors were considered under this objective:

20 • The site must be located on a high-elevation mountain ridge (generally over
21 2,500 feet above sea level);

- 1 • The site should be oriented in a general north-south direction to provide
2 maximum perpendicular exposure to the persistent prevailing wind direction
3 in Vermont;
 - 4 • The land area should be exposed to strong and persistent winds from all
5 directions throughout the year;
 - 6 • The site should be located in close proximity to existing transmission
7 facilities and access roads; and
 - 8 • The site should have available ridgeline for a project that could support
9 approximately 25 MW or more of installed wind capacity.
- 10 2. To develop a commercially viable wind power facility in a manner that avoids or
11 minimizes conflicts with surrounding land uses and minimizes the overall
12 environmental impacts of the project. The factors considered under this
13 objective include:
- 14 • Site development should not adversely affect highly sensitive environmental
15 resources in a manner that cannot be avoided, minimized, and/or mitigated
16 during construction, operation and reclamation of the facility.
 - 17 • The site should be located geographically to take advantage of existing
18 infrastructure to help minimize environmental impacts associated with
19 constructing necessary facility components, such as access roads, substations,
20 and transmission facilities.
 - 21 • The limited site development that is to occur must be permissible with
22 relevant local, state, and/or federal regulatory requirements, and should be
23 consistent with surrounding land uses.

1 • National Forest Service lands should only be used if other reasonable
2 alternatives for siting a commercial wind facility near the existing Searsburg
3 facility are not identified.

4 Deerfield Wind examined numerous locations immediately surrounding the
5 existing Searsburg facility in addition to other potential locations. Deerfield Wind
6 could not identify a way to meet its objectives without the need to use National
7 Forest System Lands. Other locations considered, but rejected, included:

- 8 • Mount Snow/Haystack: Potential land use conflict.
- 9 • Glastenbury-Western Foothill: Less attractive wind resource, limited site
10 capacity, and increased visual impact from Appalachian and Long Trails.
- 11 • Upland areas in Eastern Stamford/Southern Woodford: Undocumented
12 wind resources and longer distance from existing infrastructure.

13

14 **Q. Please describe the major components of the Project and its layout.**

15 Response. The major components of the Deerfield Wind Project are:

- 16 • Wind turbines,
- 17 • Access and service roads,
- 18 • Electric system, and
- 19 • Operating and maintenance facilities.

20 The wind turbines will be installed along the service roads in the Eastern and
21 Western Project Areas. New access roads will be built to connect both of these
22 Project Areas to the existing State Rte. 8. The electric system includes the electric
23 collection lines that will connect all the turbines with a central substation. Operating

1 and maintenance facilities will be needed to house computer controls and provide
2 other workshop and storage space. The layout of all of these components is
3 illustrated in three exhibits. The first, ***Exhibit DFLD-JZ-3***, shows the Project's
4 overall site plan on an aerial photograph. ***Exhibit DFLD-JZ-4a*** shows the Project
5 layout using the option of 24, 1.5 MW turbines, while ***Exhibit DFLD-JZ-4b***
6 illustrates the configuration with 15, 2 MW turbines.

7
8 **Q. Please describe in more detail the quantity, size, and dimensions of the**
9 **Project's major components.**

10 Response.

11 **Wind Turbines**

12 The Project will use between 15 and 24 state-of-the-art turbines with a rated
13 electrical capacity of 1.5 to 3.0 megawatts (1,500 to 3,000 kilowatts) each, depending
14 on the specific turbines ultimately selected for this project.² About half would be
15 placed in the Eastern Project Area on the same ridgeline as GMP's existing Searsburg
16 Wind Facility. The remaining 10 to 14 turbines would be placed along the ridgeline
17 west of Route 8 in the Western Project Area. Together, the wind turbines would be
18 capable of producing up to a maximum of 45 megawatts of electricity.

² The specifications for the wind turbines to be used in this project will be known 6 – 10 months prior to construction. For this reason, a range of wind turbines is used in the description of the Project, using turbines in the size range that will likely be available at the time of construction for this Project. For the general descriptions, and economic and electrical modeling, a working assumption is represented by 24, 1.5 - 2.0 megawatt class turbines.

1 The type of wind turbine proposed for the Project is a horizontal axis turbine
2 with a three-bladed upwind rotor. Each wind turbine consists of three major
3 components:

- 4 • Tower,
- 5 • Nacelle, and
- 6 • Rotor assembly.

7 Features typical of the turbines to be used in this project are illustrated along
8 with their general specifications in the General Electric product brochure included in
9 this application as ***Exhibit DFLD-JZ-5***. The turbines' "hub height" (height at the
10 hub) will be up to 80 meters (263 feet), with rotor diameters in the range of 70 to 90
11 meters (230 to 295 feet). This range of options results in possible "tip heights"
12 (height at the highest blade tip position) of up to 125 meters (410 feet). The wind
13 turbines are to be installed in the higher elevation portion of the Eastern and
14 Western Project Areas and spaced at a rough minimum of 2.5 rotor diameters apart
15 for optimum extraction of power from the wind.

16 Towers: The tubular tower is a conical steel structure manufactured in
17 multiple sections and delivered by tractor-trailer truck to a staging area and then to
18 each wind turbine location. The diameter of the base tower section at its widest
19 point is approximately 4.9 meters (16 feet). The tower will house an internal safety
20 ladder and will be externally painted a neutral color to be visually less obtrusive.
21 Each tower will be erected in several sections using a large construction crane
22 mounted on an exposed concrete foundation approximately 5.5 x 5.5 meters (18 x 18
23 feet).

1 Nacelles: The nacelle houses the main mechanical components of the wind
2 turbine generator including the drive train, gearbox, and generator. The nacelle is
3 equipped externally with an anemometer and a wind vane that signals wind speed
4 and direction information to an electronic controller. The Yaw System uses electric
5 or hydraulic motors to rotate (yaw) the nacelle and rotor into the wind to maximize
6 energy capture. Approximate dimensions for the nacelles of the larger turbines
7 described above are: 9.6 meters (31.5 feet) long, 3.6 meters (11.8 feet) wide, and 4
8 meters (13.1 feet) in height.³ A nose cone hub protrudes from the upwind end of
9 the nacelle. Aircraft safety lighting, when required by the Federal Aviation
10 Administration (FAA), is attached to the top of the nacelle in accordance with
11 directions from the regulations.

12 Rotor Assembly: The wind turbines will use a rotor assembly mounted to
13 the nacelle to operate upwind of the tower. Each rotor consists of three fiberglass
14 blades approximately 35 to 45 meters (115 to 148 feet) long to the center of the hub.
15 The rotor blades are "pitched" (rotated along their axis) to enable them to operate
16 efficiently in varying wind conditions. The wind turbines are typically designed to
17 begin generating energy at wind speeds as low as 4 meters per second (9 mph) and
18 produce full power at wind speeds above 13.5 meters per second (30 mph). In
19 addition, the rotor can spin at different (variable) speeds to operate more efficiently
20 at lower wind speeds. The rotor speed can vary between 0 and 20 rpm depending

³ These are the dimensions of a Vestas V-90 nacelle specified in their online product brochure as of January 2006. See also www.vestas.com.

1 on wind conditions. The blades may be coated in a dark color to allow them to
2 absorb solar radiation and reduce icing in the winter.

3 ***Electrical System***

4 The electrical system's purpose is to connect the wind turbines electrically to
5 the existing 69 kilovolt (kV) regional transmission system. It is comprised of two
6 primary parts:

- 7 • a 34.5 kV collector system, and
- 8 • a 34.5 kV to 69 kV substation.

9 Collector System: Electricity produced by the generator in the nacelle travels
10 through cables to an intermediate transformer to step up the generators' voltage to
11 that of the collector circuit. The intermediate transformer may be located inside or
12 outside the wind turbine, depending on the turbines used. Collector circuit and
13 turbine communication cables generally run underground (under the service road)
14 along the ridgeline, and above ground on pole lines (beside the access road). The
15 collector circuit and SCADA⁴ communication cables in the vicinity of the wind
16 turbines, along the ridge, will be buried in a trench approximately 1 meter (3 to 4
17 feet) deep. It will be installed beside or underneath the newly constructed access
18 and service roads when they are being constructed. When above ground between
19 the ridge and the substation, the collector circuit will be installed on poles
20 approximately 10 to 13.7 meters (35 to 45 feet) high, running immediately along the
21 side of the access roads. The electrical collector system also includes junction

⁴ Supervisory Control and Data Acquisition System, described later in this testimony.

1 boxes, pad-mounted transformers and switchgear that connect cables coming from
2 different directions and that allow for the isolation of particular turbine strings.

3 The new collector system will be on federal land, except where it crosses
4 State Rte. 8 in the vicinity of the existing substation and as it follows the existing
5 access road on GMP's property. Between turbines, it generally follows the new
6 access and service roads. The exception to this would be if the southern access road
7 is not constructed, then a new transmission corridor for the collector line will need
8 to be established between the vicinity of the existing Sleepy Hollow substation and
9 turbines in the Western Project Area. Approximately 6.25 km (3.75 miles) of
10 collection circuit will run underground between the turbines and under the service
11 roads; an additional 3.2 km (2.0 miles) will be overhead, generally in lower elevations,
12 following the access roads, and including the length of the existing GMP line that
13 will be upgraded (strengthened and raised) to support both GMP's existing 12 kV
14 circuit and the new 34.5 kV circuit needed by the turbines in the Eastern Project
15 Area. The detailed specifications for the collection circuit will be defined during the
16 final design of the electrical system, and are further described in the testimony and
17 exhibits of Dave Estey, from E/PRO Engineering, Deerfield's electrical engineers
18 for the Project.

19 Substation: Two possible sites for installing the substation equipment have
20 been identified. Subsequent studies to determine their suitability for this Project
21 based on electrical requirements and other factors indicate that modifying the
22 existing Sleepy Hollow substation yard owned by GMP is the less desirable option in
23 terms of environmental impact and cost. The preferred option is to build a new

1 substation in the extreme northern end of the Western Project Area, adjacent to the
2 existing 69 kV transmission line, in a cleared area in the forest. It will require a
3 fenced-in yard approximately 0.5 to 0.75 acres in size. With this option, the existing
4 GMP substation will not be used, but the lengths and configuration of collection
5 lines needed for both proposals are nearly the same.

6 The new substation will use similar structural components internally, which
7 could reach to a height of approximately 13.7 meters (45 feet), including lightening
8 protection components. The substation will be screened from public viewing places
9 using existing vegetation supplemented with planted vegetation as necessary for
10 screening. A typical vertical elevation diagram of the equipment needed in the
11 substation is included in the elevation drawing, ***Exhibit DFLD-JZ-6*** Elevation
12 Diagram of Typical Equipment in 34.5 kV to 69 kV substation. The detailed
13 specifications for the substation will be defined during the final design and
14 engineering phase of the project development. A more thorough discussion of the
15 electrical features of this Project is provided in the testimony of David Estey.

16 **Access and Service Roads**

17 The service roads are the newly constructed roads that run between wind
18 turbines. Access roads are those that connect the service roads to the existing public
19 roads. The new road system has not yet been fully engineered, so only a description
20 of general features, approximate locations and typical construction standards and
21 dimensions are included in this section. The approximate location of these access
22 and service roads is shown on the site map in ***Exhibit DFLD-JZ-4a***.

1 A more complete, technical description of the planned road system and
2 erosion control measures is provided in the testimony of Jason Krzanowski, of Hill
3 Engineers, Architects and Planners, Deerfield Wind, LLC's civil engineers on this
4 project.

5 Roads in the Eastern Project Area. The Searsburg Wind Facility access road,
6 built 10 years ago by GMP, will be used to gain access to the ridgeline and the
7 beginning of a new service road constructed in the Eastern Project Area. It will
8 require some modification to allow the transport of larger equipment, such as the
9 widening of the riding surface of the road to approximately 4.9 meters (16 feet) from
10 the present riding width of 3.9 meters (13 feet), and possible modification to the
11 right angle turn at the base of the mountain, in the vicinity of the Sleepy Hollow
12 substation on private land. The intersection of the present GMP access road with
13 the Sleepy Hollow road may also need slight modifications to allow for the passage
14 of the large equipment components and transport vehicles. Beginning at the
15 southerly end of the present GMP road, at the top of the hill, a new service road will
16 be constructed from the southern end of the Searsburg Wind Facility service road in
17 the vicinity of the town line [federal and private land boundary] and then south
18 through the Eastern Project Area for approximately 2,400 meters (7,900 feet).
19 Though this road is designed to have a cleared riding surface during construction of
20 up to 11.6 meters (38 feet), the riding surface will be maintained at 4.9 meters (16
21 feet) after construction and until the time that it is necessary to use it for equipment
22 replacement or other purposes.

1 Roads in the Western Project Area. A new access and service road will be
2 constructed in the Western Project Area of approximately 4,350 meters (14,270 feet)
3 in combined length. The service road's specifications for riding width will be the
4 same as that for the service road in the Eastern Project Area. This road will be
5 connected to State Rte. 8 by a northern and/or possibly a southern access road.
6 The northern access road option will be shorter, by approximately 150 meters (500
7 feet), and will roughly follow the route of an existing logging trail and Forest Service
8 easement, to connect the northern end of the Western Project Area service road to
9 the existing town road, Putnam Road (Searsburg Town Road #2). The junction of
10 the present Putnam Road and Route 8 will need to be widened and re-graded should
11 the transportation of large construction traffic be required along this route.

12 If the southern access road is constructed, it will be approximately 1,110
13 meters (3,610 feet) in length and will connect the southern end of the ridgeline
14 service road to Route 8 approximately opposite the present junction of Sleepy
15 Hollow Road and Route 8. The intersection of the southern access road with Route
16 8 will require substantial re-grading. Deerfield will apply for permits needed for the
17 above modifications, to the extent any are required.

18 Access and service roads will be all-weather roads and will be designed in
19 accordance with U. S. Forest Service standards, applicable Vermont standards, and
20 relevant engineering principles including standards for slope, materials, erosion
21 control and safety pullouts relative to the weight and size of equipment that must be
22 transported over them. Where possible, the graveled riding surface after
23 construction will be reduced to approximately 4.9 m (16 feet) wide for routine

1 maintenance over the long-term. Please see an example of a typical road cross
2 section in ***Exhibit DFLD-JK-3*** Characteristics of the roads needed for the Project
3 are more fully discussed in the testimony and exhibits of Jason Krzanowski.

4 **Operating and Maintenance Facilities**

5 Deerfield Wind will construct operating and maintenance (O&M) facilities,
6 including a building, storage area, and ancillary facilities, on a parcel of private land at
7 the western end of Putnam Road which Deerfield Wind, LLC has rights to acquire.
8 The O&M facilities will function during the construction phase as a location for the
9 construction office and as a staging area. After construction and during operation,
10 the facilities will serve as a centralized location to receive and store parts and
11 equipment used by the plant, to perform repairs on equipment as needed, to house
12 the control and administrative functions of the plant and to contain the plant's
13 SCADA system. It will also be the location technicians report to work and perform
14 maintenance and administrative functions when they are not servicing the turbines in
15 the field.

16 The O&M building will be approximately 100 square meters (1076 square
17 feet) in size, and will have metal frame construction with neutral/non-reflective
18 coloration. A storage yard of approximately three acres in size will be maintained
19 adjacent to the building. The storage yard will be used during construction to
20 temporarily store large components as they arrive at the site and await installation.
21 During the operating phase, this yard will be used less intensively and will only store
22 large components that may be needed for replacement from time to time.

1 The O&M facilities will include a well and waste disposal system to provide
2 water and sanitary facilities to the building. Electric distribution and telephone
3 service will be extended from the existing distribution line at the end of Putnam
4 Road. The northern access road to the Western Project Area will connect Putnam
5 Road to the Western Project Area and will also provide access to the O&M facilities.
6 The detailed plans for this building and related infrastructure will be prepared in the
7 future design and engineering work by Deerfield Wind, LLC's consulting civil
8 engineers.

9

10 **Q. Please describe what components of the Project will be on private land and**
11 **federal land.**

12 Response. The Project consists of wind turbines, electrical systems, access and
13 service roads and a storage and maintenance facility, situated mostly on federal land.
14 These features are illustrated in the site plans and potential configurations for the
15 Project included as **Exhibits DFLD-JZ-3, 4a, and 4b**. The Project will also use
16 privately owned access roads and transmission lines, some of which are now part of
17 GMP's existing Searsburg Wind Facility. **Table 1** presents the allocation of the
18 Project's major components between public and private ownership for all potential
19 component configurations.

20

Table 1: Project components on federal and private land

<u>Component</u>	<u>USFS Land (Site Area)</u>	<u>Private Land</u>
Electric Capacity	Up to 45 megawatts	none
Wind turbines	15-24 turbines	none

<u>Component</u>	<u>USFS Land (Site Area)</u>	<u>Private Land</u>
Substations If GMP substation not used If GMP substation used	< 1acre none	none < 1acre
Transmission Lines New overhead/underground Upgrade existing line	4.85 miles (7.8 km) none	none 0.9 mi (1.4 km)
Access Roads New service roads w/ Northern Access only w/ Southern & Northern Access Upgrade existing roads	3.6 mi (5.8 km) 4.2 mi (6.75 km) none	0.6 mi (.75 km) 0.6 mi (.75 km) 1.0 mi (1.6 km)
Storage and Maintenance Facility	none	1

1

2

3

4

5

6 **Approvals**

7

8

Q. What federal approvals are required to construct and operate the Project in the GMNF, and what is the status of those approval processes?

9

10

11

12

Response. The Project is being reviewed under both state and federal regulatory standards and is subject to a National Environmental Policy Act (NEPA) environmental impact study as part of the federal permitting process. The relevant authorizations, approvals, permits and recommendations are presented in **Table 2:**

1

Table 2: Relevant Federal Authorizations, Permits and Recommendations

Relevant Authorization, Approval, Permit, or Recommendation	Agency	Relevant Statutory/Regulatory Provisions	Action Requiring Review
Special Use Authorization	U.S. Forest Service	16 U.S.C. § 497; 36 C.F.R. § 251 et seq.	Use of National Forest Service System Lands requires Special Use Authorization. Review includes the preparation of a NEPA Environmental Impact Statement (EIS).
Facility Lighting and Marking Recommendation	Federal Aviation Administration	49 U.S.C. § 44718; 14 C.F.R. § 77.13	FAA provides recommendations on lighting for structures over 200 feet tall.
National Pollution Discharge Elimination System (NPDES) Permit (Construction Phase)	Environmental Protection Agency (delegated to the Vermont Agency of Natural Resources)	33 U.S.C. 1342(p); 40 C.F.R. §§ 122.26 & 122.28; VT General Permit 3-9020 for Stormwater Runoff From Large Construction Sites	Construction activities that disturb more than one (1) acre

2

3 **Q. Are there any unique considerations regarding the Board's review of this**
 4 **Petition given its location in the GMNF?**

5 Response. Yes, there are several unique considerations.

6 First, the Project is undergoing a federal review at this time which requires
 7 the preparation of an Environmental Impact Statement (EIS) pursuant to the
 8 National Environmental Policy Act (NEPA), and ultimately a decision by the Forest
 9 Supervisor. Deerfield Wind requests that the Board's review be completed on a
 10 schedule that runs in parallel and with minimal conflict to the federal NEPA review.
 11 This will include using the same study results in the federal and state permitting
 12 processes to the extent possible. Deerfield Wind is further requesting that the
 13 Board's decision precedes the decision of the Forest Supervisor, given that under
 14 federal regulations, the USFS is required to take the Board's decision into account in
 15 rendering its final determination.

1 Second, this Project is unique because the GMNF's Land and Resource
2 Management Plan controls land uses on the project site. The LRMP was enacted
3 pursuant to numerous federal laws including the Multiple-Use Sustained-Yield Act,
4 16 U.S.C. § 528 et seq., the Forest and Rangeland Renewable Resources Planning
5 Act, 16 U.S.C. § 1600 et seq., and the National Forest Management Act, 16 U.S.C. §
6 1600 et seq. Furthermore, Congress specifically delegated to the U.S. Forest Service
7 the ability to authorize special use of National Forest System lands, like the one
8 sought by PPM for this project. See 16 U.S.C. § 497(c).

9 Third, the federal application for this project has been accepted by the Forest
10 Service after going through initial and secondary screening pursuant to 36 C.F.R. §
11 251, and Chapter 10 of the Forest Service's Special Use Application Handbook
12 (Forest Service Handbook 2709.11, sec. 12.2 & 12.3). Specifically, the Forest Service
13 found that the proposed use:

- 14 ▪ is consistent with the laws, regulations, orders, and policies establishing or
15 governing National Forest System (NFS) lands, with other applicable Federal
16 laws, and with applicable State and local health and sanitation laws;
- 17 ▪ is consistent or can be made consistent with standards and guidelines in the
18 applicable forest land and resource management plan prepared under the
19 NFMA and 36 CFR part 219;
- 20 ▪ will not pose any serious or substantial risk to public health or safety;
- 21 ▪ will not create an exclusive or perpetual right of use or occupancy;

- 1 ▪ will not unreasonably conflict or interfere with administrative uses by the
2 Forest Service, other scheduled or authorized existing uses of the National
3 Forest System, or use of adjacent to non-National Forest System lands;
4 ▪ does not have an outstanding debt to the Forest Service;
5 ▪ does not involve gambling or providing of sexually-oriented commercial
6 services, even if permitted under State law;
7 ▪ does not involve military or paramilitary training or exercises; and
8 ▪ does not involve the disposal of solid waste or disposal of radioactive or
9 other hazardous substances.

10 See **Exhibit DFLD-JZ-7**, GMNF Forest Supervisor letter dated April 15, 2004 to
11 John Zimmerman, Deerfield Wind, LLC.

12 The Forest Service further found that the proposal satisfied all five second-
13 level screening criteria, and specifically concluded that:

- 14 ▪ The proposed use is consistent and compatible both with the purposes for
15 which the lands are managed and with surrounding uses;
16 ▪ The proposed use is in the public interest;
17 ▪ The proposed use is qualified;
18 ▪ The proponent has demonstrated the technical and economic feasibility of
19 the proposed use and the financial and technical capability to undertake the
20 use and to fully comply with the terms and conditions of the authorizations;
21 and

1 Response. Because the wind turbines will be greater than 200 feet in height, federal
2 law requires Deerfield Wind to file a notice with the Federal Aviation Administration
3 (FAA) under 14 CFR Part 77 at least thirty days prior to constructing the proposed
4 project so that the FAA may review the project and offer recommendations on
5 aircraft warning lights. Because this filing must include the specific turbines and
6 their precise location, Deerfield Wind intends to file with the FAA when the turbines
7 are selected. Current FAA guidelines would call for flashing white lights in the
8 daytime and dual flashing red lights at night atop each turbine.

9 The FAA's Technical Center has researched and provided new
10 recommendations on reduced wind turbine lighting scenarios. The new
11 recommendations include: (i) eliminating daytime lighting; (ii) reducing night-time
12 lighting to a single, red (L-864) flashing light mounted atop a turbine nacelle; (iii)
13 lighting only turbines at each end of the turbine string and those every ½ mile within
14 the string; and (iv) synchronizing the lights. See **Exhibit DFLD-JZ-9**, FAA
15 Technical Report "Development of Obstruction Lighting Standards for Wind
16 Turbine Farms", dated November 2005. I understand that the FAA has been
17 applying the revised recommendations on a case by case basis, pending reissuance of
18 its lighting guidelines.

19 Deerfield Wind has developed a proposed lighting plan consistent with the
20 draft guidelines. Should the FAA ultimately apply these recommendations to the
21 Project, the result would be a reduction of night-time lighting from all turbines to 8
22 to 10 turbines, and the elimination of daytime lighting. Deerfield Wind will work

1 with the FAA to develop a final lighting plan that minimizes lighting while at the
2 same time maintains aircraft safety.

3

4 **Energy Production and Sales**

5 **Q. Please describe the wind resource assessment program.**

6 Response. The site for the Deerfield Project has been extensively investigated over
7 the past 20+ years to measure and document the wind resource. The first
8 measurement tower was installed in the fall of 1981, located on the top of a hill to
9 the east of State Rte. 8 and is still in operation and serves as the long-term reference
10 station for the GMP facility. In addition, there are presently wind measurement
11 towers in operation on Forest Service land at the proposed project areas. Altogether,
12 data from eight different measurement stations within the Eastern and Western
13 Project Areas was collected and analyzed. The locations of these are illustrated on
14 the map included as ***Exhibit DFLD-JZ-10***, Deerfield Wind Project Map – Wind
15 Measurement Tower Locations. To my knowledge, the measurement program at the
16 Deerfield Wind Project site represents the most comprehensive set of wind data
17 collected for wind power purposes in the Eastern United States.

18 Long-term records indicate that in the range of commercially-available
19 turbine hub heights, annual average wind speeds in the Project Area are in the Class
20 5 (16.8 -17.9mph) to Class 6 (18.0 – 19.7 mph) range. This range is considered
21 “excellent” by the American Wind Energy Association for wind power generation.

22

23 **Q. Will the wind monitoring program be continued after the Project is built?**

1 Response. The existing monitoring towers in the Eastern and Western Project
2 Areas will need to be removed during construction. After the new turbines are
3 installed, it is anticipated that one permanent measurement tower will be reinstalled
4 at the hub-height of the wind turbines, near the middle of the turbines in the
5 Western Project Area. The exact location for this tower will depend on the final
6 configuration for the turbines, but it will be sited upwind of the turbines as
7 determined by Deerfield's meteorologist. The new tower will be of open lattice
8 design and will be self supporting, eliminating the use of guy wires and
9 corresponding clearing, thereby reducing its impact on birds and minimizing wildlife
10 habitat alteration. It may include lighting if recommended by the FAA.

11

12 **Q. What is the expected capacity factor and energy output of the Project?**

13 Response. Based upon the wind resources across the site, and assuming efficiencies
14 of today's wind turbines, long-term annual net energy production from the Deerfield
15 facility is expected to be approximately 120,000 megawatt-hours (+/- 10%
16 depending on the number and type of turbines ultimately selected for this Project).
17 Existing wind data indicates that the Project will generate near full output
18 approximately 6% of the time over the course of a year, partial power approximately
19 87% of the time, and no power approximately 7% of the time. The expected
20 capacity factor is 0.35 (+/- 10%, again depending upon the turbines selected).

21

22 **Q. How will the power output of the Project be sold?**

1 Response. Deerfield Wind has entered into a Letter of Intent (LOI) to sell up to
2 50% of the energy and environmental attributes generated by the Project to Green
3 Mountain Power. The LOI initially established December 2006 as the deadline for
4 execution of the associated power purchase agreement, although this date has been
5 extended by PPM and GMP to August 2007. Other Vermont utilities have also
6 expressed an interest in acquiring a portion of the output from Deerfield Wind, and
7 discussions with these prospective purchasers continue.

8 The market for the output from wind plants in New England is strong, and
9 Deerfield Wind expects to sell the remaining electrical output and corresponding
10 environmental attributes to wholesale customers on the New England power grid,
11 both on a long and short term basis. These customers will include utility companies,
12 power marketers or other service providers looking for a source of electricity
13 produced by new renewable sources. Specific solicitations or arrangements for the
14 sale of this power have not yet been undertaken, as it is difficult to do so this far in
15 advance of construction. Deerfield Wind believes market conditions for the sale of
16 the plant's output will continue to be strong and improve over time. We anticipate
17 that prior to the construction of this facility, arrangements will be made to sell the
18 remaining output under long-term bilateral contractual arrangements.

19

20 **Q. Has Deerfield Wind obtained Qualified Facility (QF) status for the proposed**
21 **project?**

22 Response. Yes. Deerfield Wind has submitted a self-certification for the Project
23 seeking QF status under federal law (PURPA) from the Federal Energy Regulatory

1 Commission. ***Exhibit DFLD-JZ-11*** provides Deerfield Wind's QF application
2 materials.

3

4 **Q. What is Green Mountain Power's role in the Project?**

5 Response. In addition to its expected role as an offtaker of power, GMP is leasing
6 certain land to Deerfield Wind which will enable access to the project site for
7 construction, operation and maintenance as well as allow for the locating of
8 transmission and interconnection facilities. GMP has also executed a Data Sharing
9 Agreement, whereby it provides certain fee-based services to the Project, including
10 the sharing of wind data and environmental study information from the existing
11 Searsburg project.

12

13 **Construction, Operation and Maintenance**

14 **Q. How will the site be accessed and cleared for construction and operation, and**
15 **what changes or improvements, if any, are needed to any public or private roads?**

16 Response. A general description of the project components is provided in the
17 project description above, and is shown on the accompanying exhibits. Deerfield
18 Wind has prepared preliminary plans of access roads and has evaluated several
19 alternatives for accessing the Western Project Area in particular. Deerfield's civil
20 engineers, Hill Engineers, Architects, and Planners, are working in concert with
21 ecological and archaeological consulting firms to refine preliminary road designs to
22 avoid environmentally sensitive areas. Jason Krzanowski, from Hill Engineers,

1 presents comprehensive testimony on this issue. Please see his testimony for that
2 description.

3

4 **Q. What is the sequence of construction activities and the construction schedule?**

5 Response. Construction work will be done in a phased manner that reduces erosion
6 potential and assures work productivity. A phased construction plan will be
7 prepared that reflects Forest Service and ANR input and advice, during the final
8 engineering phase of the project design work. Ideally the construction of the
9 Project will occur over a nine-month period during the 2008 construction seasons.
10 The specific components of this plan, as they are now contemplated, are discussed in
11 the testimony of Jason Krzanowski of Hill Engineers, Deerfield's civil engineers.

12

13 **Q. How will the wind turbines and other equipment be maintained?**

14 Response. The proper operation and performance of the wind power plant and its
15 sub-systems will be monitored by a combination of a computer-controlled SCADA
16 system and the manual observations and inspections done by the technicians
17 responsible for operating this facility. Operation and maintenance (O&M) activities
18 include scheduled and unscheduled maintenance. Both activities will be managed by
19 maintenance technicians assigned to this Project who will have an office in the O&M
20 facilities. The lead O&M technician will conduct these activities in accordance with
21 an Operating and Maintenance Plan for the facility, which will be prepared in
22 collaboration with the equipment suppliers and the O&M service providers selected
23 for this project.

1 Supervisory Control and Data Acquisition (SCADA) System. The Project
2 will be monitored and controlled using a Supervisory Control and Data Acquisition
3 (SCADA) system. The wind turbines, as well as certain circuit breakers, metering and
4 meteorological equipment are monitored by a centralized SCADA system. The
5 SCADA system is designed to monitor the condition of the wind plant equipment,
6 alert service technicians to any fault or alarm conditions, record and sort data, and
7 allow remote control of the turbines.

8 Scheduled and Routine Maintenance. Major components of the wind power
9 facility, such as large bearings in the wind turbines, electrical transformers, other
10 large equipment and roads, are routinely inspected and serviced on a scheduled basis.
11 For example, typically wind turbines need to have fluid levels checked routinely and
12 filled during each of two annually scheduled preventative maintenance inspections,
13 each roughly six months apart. Similarly, parts showing wear during these scheduled
14 maintenance events will need to be adjusted or replaced during these inspections.
15 Routine maintenance also includes inspections that are either direct visual or physical
16 observations or those that can be done in conjunction with the plant's SCADA
17 system that is monitoring, reporting and recording many vital functions of the
18 facility. Occasionally, the SCADA system will alarm the technician to any operating
19 parameters it detects that are outside of preset 'normal' conditions. Some of these
20 abnormal conditions may be resolved using the SCADA system and some may
21 require the technicians to physically go to the malfunctioning component to reset,
22 repair, or replace it.

1 Unscheduled maintenance. Components that fail unexpectedly need to be
2 repaired or replaced as the failures occur. These may be related to a defective
3 component or an unusual weather event. The replacement of large or heavy
4 components could require bringing additional equipment and personnel on to the
5 site to make the repair.

6 Deerfield Wind will coordinate the timing cycle for service of high voltage
7 interconnection and low voltage collection system equipment with GMP. If
8 coordination of these service activities in conjunction with these entities is deemed
9 impractical, Deerfield Wind will attempt to schedule these service outages during low
10 wind periods.

11

12 **Q. Will the public have access to the site?**

13 Response. The Project will be operated in accordance with the recommended safety
14 protocol of the equipment manufacturers and in accordance with all electrical system
15 safety requirements. Controlled (gated) year-round access to the project facilities will
16 be maintained so operators can monitor the facilities and equipment and quickly
17 respond to any unforeseen condition that might impact the safety of the operations
18 staff or the public. Public access to the turbine sites shall be limited in accordance
19 with the conditions established in the Special Use Authorization issued by the Forest
20 Service and any state requirements. There are no known hiking trails, motorized
21 trails, or recreational sites in the near vicinity, nor is there any high amount of public
22 use of the area for the proposed facility. Back country hikers are known to use parts
23 of the Eastern Project Area in the summer but apparently no trail system is used.

1 Deerfield Wind expects to work with the U.S. Forest Service, with input
2 from the public, and the appropriate state agency(s) to identify and refine measures
3 to ensure that the facility is operated in a manner that is both safe and consistent
4 with the management objectives of the surrounding national forest land. Such
5 measures may include, if appropriate and consistent with Forest Service management
6 objectives: posting the property with signs warning the public of potential safety
7 issues, such as high voltage warning signs on turbines; gating the access roads to
8 discourage unintended use; and the use of plantings to further prevent unintended
9 use of the access road. Deerfield Wind anticipates implementing a public access
10 control plan similar to the management plan in place for the existing Searsburg
11 facility. To the extent that the public may have a right of access over portions of the
12 premises on which the wind turbines are located, Deerfield Wind would limit public
13 access by signage when safety concerns warrant such limitation. Permissions for
14 project site access by the general public will be addressed on a case by case basis by
15 Deerfield Wind, following, where practical, the procedures presented in the public
16 access control plan. We do envision that a public information station or visitor
17 station will be prescribed in this plan that addresses the public's anticipated desire for
18 information about the Project.

19

20 **Q. What is the expected useful life of the Project? Will the Project require**
21 **decommissioning, and if so, how?**

22 Response. Deerfield Wind intends to operate the Project efficiently over its useful
23 life, with proper maintenance and refurbishment of certain components as required.

1 The major equipment components (e.g., rotor blades, generators etc.) are usually
2 designed to have useful lives of twenty to thirty years before a major overhaul or
3 rebuild is considered. In the event these overhauls can no longer be performed cost
4 effectively or permission to use the federal land on which the Project is constructed
5 is withdrawn, the facility would be dismantled and removed, and the site would be
6 restored to pre-construction conditions as much as is practical. This is expected to
7 include removing all buildings, structures, and other above ground equipment on
8 federal and private land. The exceptions will be related to non-wind turbine
9 components that landowners request remain in place (e.g., access roads, buildings,
10 underground electrical service, etc.)

11 The wind turbines will be disassembled in the reverse order in which they
12 were assembled. Some of the equipment, such the gearbox and generators and
13 certain electrical equipment will be saved for reconditioning for resale. The parts of
14 the wind turbines that cannot be refurbished such as the bedplates and towers, will
15 be removed from the site and sold as scrap or otherwise disposed of off-site.
16 Turbine foundations, poles and insulators will be removed to a minimum depth of
17 three feet and the site surface will be graded using native fill. Drainage areas
18 disturbed during decommissioning will be repaired as required by the current state
19 and federal standards in effect at that time.

20 As the attached cost estimate (**Exhibit DFLD-JZ-12**) indicates, the net cost
21 of decommissioning is expected to be relatively low -- \$256,000 -- assuming no resale
22 of turbine components. When resale is factored in, decommissioning will produce
23 net revenues of \$1.4 million.

1 Decommissioning will be paid for by a fund established by Deerfield Wind as
2 follows: Beginning at year 15 of operations and every 5 years thereafter, a
3 decommissioning cost and salvage value estimate will be prepared by Deerfield and
4 reviewed by an independent third-party. To the extent that expected
5 decommissioning costs exceed the salvage value estimates, Deerfield will provide
6 for a Decommissioning Fund, funded to this net value. The balance in this account
7 will be brought current at every five year update. Deerfield Wind will, at its
8 discretion, capitalize the Fund using cash, a letter of credit, bond, corporate
9 guarantee from an investment grade company, or an equivalent security.

10 The Project will also meet all obligations of the Forest Service regarding
11 decommissioning. At an appropriate interval prior to closure of the facility, a
12 Removal and Reclamation Plan (Plan) will be developed and approved by the Forest
13 Service to ensure that (1) all applicable future restoration goals, policies, guidelines,
14 and requirements of the Green Mountain National Forest are factored into the Plan;
15 (2) proposed implementation procedures and performance criteria meet Forest
16 Service approval; and, (3) all applicable terms and conditions of the Project's Special-
17 Use Authorization, the Environmental Impact Statement, and other applicable
18 regulatory approvals are fully addressed.

19

20 **Q. Is Deerfield Wind seeking conceptual approval of the Project, followed by**
21 **post-certification review of final design plans?**

22 Response. Yes that is how Deerfield Wind is proceeding, pursuant to PSB Rule
23 5.402(C)(3). As explained below, submitting design-level plans at the application

1 stage for a wind generation project is infeasible and impractical. It is also
2 unnecessary in this case, as Deerfield Wind has provided adequate site-specific
3 evidence for the Board to make affirmative findings under section 248.

4 First, there is a multi-year lead time between the start of numerous pre-
5 application studies (environmental, electrical, aesthetic and others) and the actual
6 start of construction. At the same time, there is a tight supply of wind turbines in
7 the market, and wind turbine technology is evolving at a rapid pace. Given these
8 factors, Deerfield Wind is not in a position to know the precise wind turbine make
9 and model that will be available (and that will be optimal) at the time a CPG is
10 approved. Final road layouts, grading plans, stormwater designs, erosion control
11 plans, and the like are all dependant on the final turbine model, number of turbines,
12 and turbine layout, and, those various plans are likely to change somewhat due to
13 input from other state and federal resource agencies. In addition, final substation
14 and interconnect plans are dependant on the final ISO system impact study, a study
15 which is based on a specific turbine type and configuration.

16 Second, large scale section 248 projects often go through a somewhat
17 iterative process whereby changes are made in response to issues and concerns raised
18 by other parties, and in past cases the Board has actively encouraged petitioners to
19 remain flexible and open to considering such changes. Preparing final plans may
20 provide a disincentive for petitioners to consider modifications, given the
21 commitments already made to a particular design and the time and resources
22 involved in making changes.

1 Third, the costs to produce final studies and engineering plans (civil,
2 electrical, ISO, stormwater, etc.) will likely run in the hundreds of thousands of
3 dollars, and redoing some or all of those plans 2-3 times could result in having to
4 incur much of this expense repeatedly.

5 Fourth, Deerfield Wind has conducted its various field studies and analyses
6 (visual, noise, wildlife, wetlands, water resources, economic, electrical) assuming
7 “worst-case” conditions. In other words, field studies have covered all potential
8 areas where the Project would be located, noise and visual studies have assumed
9 turbine noise levels and turbine heights that would not exceed a specified amount,
10 the ongoing ISO study assumes a full buildout to 45 MW, etc. As a result, all of the
11 potential site-specific impacts have been assessed to a degree that allows a positive
12 conclusion on each 248 criteria, irrespective of the exact final layout, and Deerfield
13 Wind has demonstrated how it can meet all applicable requirements.

14 For all these reasons, it is infeasible, impractical and unnecessary to submit
15 final plans at this time. The benefit of requiring final construction plans at this time
16 does not outweigh the cost of doing so, and to the extent that final plans are
17 different from the project outlined and described in the petition, post-certification
18 review is the appropriate mechanism for reviewing and ultimately authorizing any
19 material changes. As an additional layer of protection, the final layout of the Project
20 will also be subject to the review and approval of other state, federal, and quasi-
21 public entities. For example, ANR will review and approve final stormwater plans as
22 a part of the stormwater permitting for the Project. Similarly, the United States
23 Forest Service will review and approve final project plans as a part of the Special Use

1 Permitting procedure. In addition, the ISO will review the final turbine specifications
2 and layout, and the transmission line owners ultimately will not allow the Project to
3 interconnect until such time as Deerfield Wind agrees to perform any necessary
4 system modifications. The Board is thus in a position to make all the required
5 evidentiary findings under section 248, and it is unnecessary for the Board to require
6 more detailed plans at this time.

7

8

SECTION 248(b) CRITERIA

9 **Q. Have you assessed the Project's compliance with the criteria of 30 V.S.A. §**
10 **248(b)?**

11 Response. Yes, in conjunction with other witnesses, I have assessed the Project's
12 compliance with 30 V.S.A. § 248(b)(1)-(10). The Project complies with all applicable
13 criteria. My specific responses are noted below.

14

15

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

16 **Q. Will the Project unduly interfere with the orderly development of the region?**

17 Response. The Project will not unduly interfere with the orderly development of
18 the region, and will not cause any direct impacts on the capacity of the region to
19 develop. The Project will not cause an undue burden on public roadways, or other
20 types of municipal or state services or infrastructure. It will not utilize land or
21 resources that are otherwise needed or planned for other forms of development
22 within the region. The Project will result in the use (clearing and/or occupancy) of

1 no more than 80 acres of federal land, principally for roads, out of the tens of
2 thousands of acres of surrounding GMNF lands.

3

4 **Q. Given that the Project is located in the Green Mountain National Forest,**
5 **administered by the United States Forest Service, are there special management**
6 **plans that apply?**

7 Response. Yes, as I previously discussed, the Forest Service has a
8 comprehensive management plan in place for lands under its jurisdiction. To
9 manage these lands, the Forest Service has developed a Land and Resource
10 Management Plan for the Green Mountain National Forest. The current LRMP was
11 finalized in February 2006. A goal of the forest-wide management direction for the
12 GMNF is to “provide opportunities for renewable energy use and development.”
13 2006 LRMP at 15. The Plan divides the Green Mountain National Forest into
14 several Management Areas (MA). Each MA is subject to the Forest Plan’s Standards
15 and Guidelines (S&Gs), which establish the rules that govern how and where
16 management activities can take place within an MA. The proposed project is located
17 within an area designated as MA Diverse Forest Use which “emphasizes a variety of
18 forest uses.” 2006 LRMP at 47. The proposal is consistent with the development,
19 level of disturbance, and actions expected in MA Diverse Forest Use. The
20 management prescription for this designation allows for non-recreational special
21 uses, including wind power development. Green Mountain National Forest, LRMP,
22 Final Environmental Impact Statement at 3-298.

1 As discussed earlier in my testimony, the Project went through initial and
2 secondary screening pursuant to 36 C.F.R. § 251, and Chapter 10 of the Forest
3 Service's Special Use Application Handbook (Forest Service Handbook 2709.11, sec.
4 12.2 & 12.3). The Forest Service determined that the Project satisfies all of the
5 screening criteria. See **Exhibit DFLD-JZ-7**, GMNF Forest Supervisor letter dated
6 April 15, 2004 to John Zimmerman, Deerfield Wind, LLC and **Exhibit DFLD-JZ-**
7 **8**, GMNF Forest Supervisor letter dated November 17, 2004 to John Zimmerman,
8 Deerfield Wind, LLC.

9

10 **Q. Did Deerfield Wind provide advance notice of the Petition to the Windham**
11 **Regional Planning Commission, the Searsburg Planning Commission, and the**
12 **Readsboro Planning Commission, and if so, did they provide any recommendations**
13 **to the Public Service Board?**

14 Response. Yes, Deerfield Wind sent a 45-day notice to the Windham and
15 Bennington County Regional Commissions as well as to the Readsboro Planning
16 Commission and the Searsburg Selectboard as Searsburg does not have a planning
17 commission. The Windham Regional Planning Commission held a public meeting
18 in September of 2005 and compiled a list of comments from those expressed by
19 various members of the public at that meeting. The towns did not submit any
20 comments to the Board as a result of these notices.

21

1 **Q. Did Deerfield Wind provide advance notice of the Petition to any other**
2 **municipal or regional entities, and if so, did they provide any recommendations to**
3 **the Public Service Board?**

4 Response. Yes, in August 2005, Deerfield Wind sent a notice of its plans to file a
5 248 petition for this Project to all town select boards and planning commissions
6 within a ten-mile radius of the Project (including the host communities, Readsboro
7 and Searsburg), and to the Windham and Bennington County Regional
8 Commissions. The notice complied with, and went beyond, the statutory 45-day
9 notice requirements. See **Exhibit DFLD-JV/MB-4, Map 1** for a context map
10 showing all of the ten-mile towns.

11 The Bennington County Regional Commission held a public meeting in
12 September 2005, for informational purposes, as neither Searsburg nor Readsboro is
13 under the planning jurisdiction of this commission. The Bennington Commission
14 has not submitted any comments to the Board, nor have any of the other towns.

15

16 **Q. Does Deerfield Wind have any response to the recommendations of the**
17 **Windham Commission?**

18 Response. Yes, Deerfield Wind did not agree with several of the Windham Regional
19 Commission's (WRC) recommendations and has responded to them in writing as
20 included here as **Exhibit DFLD-JZ-13**, Deerfield Wind, LLC's letter to the
21 Windham Regional Commission dated October 3, 2005. The WRC, for example,
22 recommended a process change whereby the Project would be reviewed first under
23 the federal NEPA process and then, after a decision is made by the Forest Service,

1 the state should review it. This would result in a very long and duplicative process
2 and one that the Collaborative Team addressed head-on when it was established in
3 2003 and the WRC took part. During several years of participating in the
4 Collaborative process, the WRC never mentioned that it saw this as a desirable
5 review alternative. Furthermore, the suggestion is not consistent with PSB
6 precedent in this area. The WRC also suggested that Deerfield endeavor to have
7 sincere and effective negotiations with the host communities. Deerfield has met
8 with both Searsburg and Readsboro about this Project and both towns have sent
9 representatives to participate in Collaborative Team meetings. Furthermore,
10 Deerfield has provided information to the towns to assist in determining how they
11 may receive tax revenue from this Project – a somewhat complex issue since most
12 of the asset will be on federal land. Both towns have identified this as a very
13 important issue to them. Finally, the WRC recommended to the Board that a
14 decommissioning fund be established. This is an issue we have addressed as
15 described above, and that we are prepared to address with the Forest Service as
16 discussed above.

17

18 **Q. Is the Project consistent with any specific land conservation provisions of the**
19 **Readsboro Town Plan that directly relate to a project of this type?**

20 Response. Yes. The Project is consistent with all applicable and specific land
21 conservation provisions of the Readsboro Town Plan. The Readsboro Plan notes
22 several areas of aesthetic value to the Town. The Plan also recognizes the potential
23 for a wind energy project within the GMNF, but provides no specific determinations

1 or guidance with respect to the aesthetic impacts of the proposed project, except that
2 the impacts must be carefully considered. Consistency with the Readsboro Town
3 Plan is further explained in the pre-filed direct testimony and report of Jean
4 Vissering.

5

6 **Q. Is the Project consistent with the Regional Plan, and if so, how?**

7 Response. Section 248 requires the Board to give “due consideration” to any
8 recommendations of the Regional Planning Commission, but makes no specific
9 mention of the Regional Plan itself. Deerfield Wind has addressed the Commission’s
10 recommendations, as noted above.

11 Should the Board determine that the Regional Plan must be separately
12 considered under section (b)(1), the Deerfield Wind Project does not conflict with
13 any of its general or specific provisions. The Regional Plan provides little discussion
14 on siting electric generation facilities and less on siting wind power facilities.
15 However, the Project does directly address the Plan’s stated goal of “reducing the
16 Region’s dependence on outside energy sources” by providing a local source of
17 renewable energy. The Project is also consistent with the Plan’s individual land use
18 policies. The Public Service Board previously considered the provisions of a
19 substantially similar version of the Windham Regional Plan during its review of the
20 Searsburg Wind Farm in 1996. Recognizing that “any economically viable
21 commercial scale wind development must be sited at high elevation and
22 topographically prominent locations to intercept useful quantities of wind energy,”
23 the Board concluded that the Searsburg project complied with the Regional Plan

1 because it had been sited to minimize the impacts of the facility to the extent
2 possible. The Project proposed here, has similarly been limited in size, and carefully
3 sited to minimize impacts of the facility to the extent possible. Specific provisions of
4 the Regional Plan are further addressed in the prefiled direct testimony and report of
5 Jean Vissering.

6

7 **Q. Have you considered the impact of the Project on other towns within a ten-**
8 **mile radius?**

9 Response. Yes. We have assessed the potential impact of the Project on towns
10 within a ten-mile radius of the Project. The Project is physically located in the towns
11 of Readsboro and Searsburg. Other towns within the ten-mile radius include
12 Bennington, Dover, Halifax, Marlboro, Pownal, Shaftsbury, Stamford, Stratton,
13 Whittenham, Wilmington, and Woodford.

14 As discussed throughout the petition and supporting evidence, Deerfield
15 Wind has assessed the potential impacts on the host communities, including visual,
16 noise, economic and environmental considerations. None of these factors will cause
17 the Project to unduly interfere with the orderly development of the region.

18 The only potential impacts that could extend beyond the host towns are
19 visual and economic impacts. With respect to aesthetics (and as discussed further in
20 the direct testimony of Jean Vissering), the Project will not have an undue adverse
21 visual effect on the natural and scenic qualities of the area, including views from
22 other towns within the ten-mile radius. With respect to potential economic impacts
23 (and as discussed below), there are likely to be a number of positive impacts on the

1 development of the region, which may provide benefits to both the host towns and
2 other surrounding towns. Thus, the Project will not unduly interfere with the orderly
3 development within the ten-mile towns.

4

5 **Q. Are there aspects of the Project that will have a positive impact on the**
6 **development of the region?**

7 Response. Yes. The Project will enhance power reliability in the region by adding a
8 local generation source, which will assist, rather than interfere, with orderly
9 development in the region. The Project will be a substantial tax base in the region
10 and will pay substantial local property taxes (or payments in lieu of taxes). During
11 construction, the Project will, to the extent possible, use local services and goods for
12 clearing and site preparation, constructing roads and foundations. Local goods and
13 services will be consumed during construction and operation. During the operating
14 period, the Project will provide site technician jobs. Deerfield Wind also expects
15 that, like the existing Searsburg facility, there will be a continuing demand to visit the
16 facility by tourists, area residents and regional educational institutions. There is
17 considerable evidence that wind farms in a number of U.S. and international sites,
18 including the existing facility in Searsburg, have become tourism draws.

19

20 **Q. Do you have any other information relative to whether the Project would**
21 **negatively impact development in the region?**

22 Response. Yes. Although the question of the impact of wind projects on property
23 values and tourism is often mentioned in the general debate concerning the

1 suitability of wind farms in Vermont, there is no indication that the Project will have
2 any negative effects on local property values or tourism. In fact, a systematic study
3 of the effect of wind farms on property values demonstrates that, if anything, the
4 value of property in the viewshed may increase.⁵ See **Exhibit DFLD-JZ-14** (REPP
5 Study). The REPP report at pages 3 and 4 states, “The statistical analysis of all
6 property sales in the view shed and the comparable community done for this Report
7 provides no evidence that wind development has harmed property values within the
8 view shed . . . For the great majority of projects in all three of the Cases studied, the
9 property values in the view shed actually go up faster than values in the comparable
10 region.” An even more recent study of the impacts of a wind farm in Fenner, NY
11 found no effect on property values. Please see **Exhibit DFLD-JZ-25**.

12 With respect to tourism, the experience from the existing Searsburg facility is
13 encouraging. Even though the access is gated, there is a steady stream of visitors to
14 the pull off area constructed at the intersection of Sleepy Hollow Road and State
15 Route 8. The number of visitors that use this site increases substantially during the
16 Fall foliage season, including tour busses. Though no specific counts have been
17 made, it is reasonable to estimate that hundreds of people visit this site daily during
18 peak periods based on the observations of site technicians and the need to replenish
19 brochures that are available in the pull off area. The level of interest in this facility
20 remains very high, with no discernable reduction in visitors over time. Some

⁵ Another study that looks at the economic impacts of wind power development and finds no undue impacts is: Grover, Stephen. “Economic Impacts of Wind Power in Kittitas County.” Phoenix Economic Development Group/ECO Northwest. 2002. Available at: www.catenergy.com/pdf%20files/Kittitas%20Wind%20final.pdf.

1 Internet tourist sites have included GMP's facility as a designated stop on southern
2 Vermont recommended drives. See **Exhibit DFLD-JZ-15**. GMP also offers to
3 take groups up for pre-arranged tours, on-site, several times per year, primarily
4 during the late summer when potential wildlife impacts are minimized. These tours
5 are planned by local schools and colleges, environmental and planning groups, and
6 clubs and members of the general public from the three neighboring states and
7 Vermont. Pre-arranged tour attendance in 2005 was at an all time high, with over
8 1000 people visiting the site.

9 Deerfield Wind's view that the Project is unlikely to have negative effects on
10 the region is further bolstered by the increasing public acceptance of wind projects
11 once they are built, as evidenced by the pre- and post-construction public acceptance
12 surveys performed for GMP's Searsburg facility. The results of the surveys mailed to
13 electric users in surrounding towns, as well as in the host town of Searsburg, showed
14 that respondents viewed the plant favorably and most would support an expansion
15 of the facility. Pre-construction, support for the facility was more mixed, with about
16 30% of survey respondents being big supporters, 35% moderate supporters, and
17 35% of respondents not supporting the proposal. Post-construction, acceptance
18 rose significantly, with over half of respondents being big supporters, 30% being
19 moderate supporters, and less than 20% remaining non-supporters. See **Exhibit**
20 **DFLD-JZ-16**, Searsburg Post-Construction Survey.

21

1 the Project, it is not expected to adversely affect system stability and reliability. This
2 has been confirmed by Deerfield's electrical engineer, David Estey of E/PRO
3 Engineering and Environmental Consulting, LLC and as found in the Feasibility
4 Study conducted for the Project by National Grid (NGrid) and the New England
5 Independent System Operator (ISO-NE), in a manner consistent with the rules and
6 procedures approved by the Federal Energy Regulatory Commission (FERC) and
7 implemented by ISO-NE. For details, see the prefiled direct testimony of Dave
8 Estey, E/PRO.

9 Mr. Estey's testimony explains the scope and results of the studies that have
10 been done thus far. A further examination of potential thermal and reliability
11 effects of the Project on the electric grid is being done in the System Impact Study
12 presently being conducted for the Project by NGrid and ISO-NE. The study is
13 expected to be completed early in 2007, and will be made available to the parties and
14 the Board at that time.

15 In general, the wind turbines, transformers, and power lines will utilize a
16 number of systems to isolate the Project from the power grid in the event of
17 equipment failure. The wind turbines will be disconnected from the transmission
18 line in the event of ground faults, phase faults, over-current, under and over voltage,
19 under and over frequency, and system imbalance. In addition, the turbines have
20 power electronics which provide soft-start capability to reduce starting surges, to ride
21 through short-term voltage dips, and to provide or consume reactive power to
22 improve voltage regulation on the 69 kV transmission system.

23

1 **30 V.S.A. §248(b)(4) – Economic Benefit to the State**

2 **Q. Will the Project result in an economic benefit to the state and its residents?**

3 Response. Yes. During the development and construction period, the Project will
4 create an economic benefit to the local and state economies through the creation of
5 professional and trade jobs, the purchase of local goods and services, and the
6 resulting generation of state tax revenues. Roughly one quarter of the capital cost of
7 a wind project is related to site preparation and infrastructure construction, both of
8 which require the procurement of local goods and services. With a project in the
9 size range of Deerfield, this would result in the creation of dozens of construction-
10 related jobs and the infusion of millions of dollars into the local economies, over the
11 construction period. The projected installed capital cost of the Project is expected
12 to be approximately \$2 million dollars per installed megawatt in 2006 dollars.

13 Over the long-term, the Project will support three to five technical jobs to
14 operate and maintain the plant. In addition, it will pay substantial funds into the
15 local and state economy through the payment of property and income taxes. In
16 addition, the Project will make payments to the Forest Service for the use of their
17 property over the life of the Project. The payments to the federal government will
18 be distributed to all other towns in Vermont in which there is National Forest.

19 In addition, the Project will create competitively-priced renewable power,
20 and other direct and indirect health economic benefits (including the value of
21 avoided air emissions). The Project will have an estimated annual benefit of between
22 \$0.6 million and \$1.1 million/year in avoided external costs due to displaced
23 conventional generation (depending on the project size and other variables), as

1 described in the prefiled direct testimony of Ezra Hausman, Ph.D., of Synapse
2 Energy Economics.

3 As part of the EIS process, further socioeconomic information may be
4 generated. Deerfield Wind will supplement its filings should new information
5 become available.

6

7 **30 V.S.A. § 248(b)(5) and (8) – Environmental Considerations**

8 **Q. Will the Project have an undue adverse effect on aesthetics, historic sites, air**
9 **and water purity, the natural environment, and the public health and safety, with due**
10 **consideration begin given to the criteria specified in 10 V.S.A. § 1424a(d) and §**
11 **6086(a)(1) through (8) and (9)(K)?**

12 Response: No. The Project will not have an undue adverse effect under these
13 criteria, for the reasons discussed below and as provided in the prefiled direct
14 testimony of Michael Lew-Smith, Jeffrey Parsons, Jason Krzanowski, Hope Luhman,
15 Jeffery Wallin, Robert Roy/Wallace Erickson, Paul Kerlinger, Kenneth Kaliski, and
16 Jean Vissering/Michael Buscher.

17

18 **Public Health and Safety.**

19 The Project's wind turbines and associated electrical facilities will be situated
20 so as to be approximately 0.8 km (0.5 mi) from the nearest public roads or private
21 homes, and will be fenced and gated so they will not present any risk to the passive
22 general public. Access to the Project will be controlled with gates so those members
23 of the public that want to see the facility up close will need to make arrangements

1 with the Project owner or O&M provider to do so. Back country recreational users,
2 whether on foot or using off-road motorized vehicles, will be deterred when
3 encountered by O&M personnel in accordance with procedures developed in
4 collaboration with the Forest Service. As mentioned earlier in my testimony,
5 Deerfield Wind expects to work with the Forest Service, with input from the public
6 and the appropriate state agency(s), to identify and refine measures to ensure that the
7 facility is operated in a manner that is both safe and consistent with the management
8 objectives of the surrounding national forest land. Such measures may include, if
9 appropriate and consistent with Forest Service Management Objectives: posting the
10 property with signs warning the public of potential safety issues, such as high voltage
11 warning signs on turbines; gating the access road(s) to discourage unintended use;
12 and the use of plantings to further prevent unintended use of the access road.
13 Deerfield Wind anticipates implementing a public access control plan similar to the
14 management plan in place for the existing Searsburg facility. This plan has been very
15 effective over the last nine years, as there have been no public health or safety issues
16 encountered.⁶

17 The plant will be in operation or ready for operation depending on the wind
18 conditions, and its performance will be constantly monitored. Any abnormal events
19 that may pose a risk to the public will be detected and the O&M personnel or proper
20 authorities will be notified to take corrective action.

⁶ Personal communication with GMP service technician, Aaron Taylor January 20, 2006.

1 Through normal winter operation, the wind turbine and other structures will
2 accumulate ice. Ice falling from overhead structures or wind turbine rotor blades
3 presents a potential hazard to persons in close proximity to the overhead structures.
4 Studies of safety distances for wind turbines⁷ indicate that an appropriate (and
5 conservative) safety distance, beyond which the probability of being injured by falling
6 ice is very low, is approximated by one and one half times the sum of a turbine's
7 hub-height plus its rotor diameter. For the highest turbines being considered for
8 this Project, this corresponds to a distance of $1.5 \times (80\text{m} + 90\text{m}) = 255$ meters (836
9 feet). There are no public areas or private residences within this radius of the
10 operating turbines. Site technicians will follow proper safety procedures, developed
11 by the O&M services provider based on experience and to reflect any applicable
12 federal or state safety codes when working in this environment. It is also instructive
13 to note that there have been no instances of injury as a result of icing conditions
14 reported at the Searsburg facility since it has been in operation.

15 With regard to the issue of shadow flicker, given the topography, vegetation,
16 and distances from surrounding residences, the potential for adverse impacts due to
17 shadow flicker is remote. This has been confirmed by the analysis of AWS
18 Truwind. See ***Exhibit DFLD-JZ-18***.

19

⁷ Tammelin, B. and H. Seifert (2000), The EU WECO-project Wind Energy Production in Cold Climate, Proceedings of an International conference BOREAS V, Levi, Finland. CDROM.Finnish Meteorological Institute.

1 **Outstanding Resource Waters**

2 There are no Outstanding Resource Waters on the Project site or in any
3 adjacent areas, based upon the list published by the Water Resources Board. The
4 factors listed in 10 V.S.A. § 1424a(d) have been considered through the
5 environmental review conducted by Deerfield Wind's environmental consultants. See
6 prefiled direct testimony of Michael Lew-Smith, of Arrowwood Environmental.

7
8 **No Undue Air Pollution**

9 The Project will not result in undue air pollution. The wind turbines will not
10 generate any air pollutants, and the Project will not require an air pollution control
11 permit. Moreover, the Project will generate emissions-free power that will displace
12 power generated by fossil fuel-fired plants, and thereby reduce air pollutants
13 including NO_x, SO_x, and CO₂. See the prefiled direct testimony of Ezra Hausman,
14 PhD., of Synapse Energy Economics, Inc.

15 The wind turbines will generate noise levels that will not exceed any health-
16 based standards. Please see ***Exhibit DFLD-JZ-19***, a map modeling the proposed
17 project's sound levels. The potential sound impacts from the proposed project are
18 described and discussed in detail in the report and the prefiled direct testimony of
19 Kenneth Kaliski, of RSG Systems.

20
21 **No Undue Water Pollution**

22 The Project will not result in undue water pollution. Michael Lew-Smith's
23 prefiled direct testimony assesses the Project's potential impacts on wetlands and

1 surface water bodies and concludes that it will not have an undue adverse impact.
2 The prefiled direct testimony of Jason Krzanowski further substantiates the finding
3 that the Project will meet all applicable stormwater and waste disposal regulations.
4

5 **Waste Disposal**

6 Waste disposal will be handled through private haulers, and will create no
7 burden on local government. Stormwater management is discussed in the prefiled
8 direct testimony of Jason Krzanowski. A septic disposal system will be designed and
9 constructed to service the sanitary facilities at the O&M building generally described
10 previously in this testimony.

11 Any hazardous materials needed at this facility will be stored and disposed of
12 in accordance with local and state hazardous waste laws. Any wastes generated at the
13 Project will be hauled off-site for disposal under a U.S. EPA Small Quantity
14 Hazardous Waste License.

15

16 **Water Conservation**

17 Design of the Project “has considered water conservation, incorporates
18 multiple use or recycling where technical and economically practical, utilizes the best
19 available technology for such applications, and provides for continued efficient
20 operation of these systems.” Construction and operation of the Project will use a
21 minimal amount of water. Water for construction and dust control will be brought
22 on site by the contractor. No running water is needed to maintain the wind turbines
23 and other equipment, and maintenance staff will bring water to the site if necessary.

1 A water supply well will be installed at the O&M building, or will be provided by an
2 existing supply secured by Deerfield Wind. This well will only be used for domestic
3 consumption and sanitary facilities at the O&M building.

4

5 **Floodways**

6 The Project is on two ridgelines that are 2700 feet and 3120 feet in elevation.
7 It is not within a floodway or floodway fringe based upon the National Flood
8 Insurance Inventory Maps. See the prefiled direct testimony of Michael Lew-Smith.

9

10 **Streams, Shorelines, Wetlands**

11 The Project will have no undue adverse impacts to streams, shorelines or
12 wetlands. Streams will be protected through the appropriate engineering and
13 construction of roads, stormwater systems, and other infrastructure, and compliance
14 with erosion plans and other provisions in state stormwater permits. There are no
15 shorelines at or near the project site. No Class 2 wetlands are impacted by the
16 Project, and Class 3 wetlands have largely been avoided through the iterative project
17 design process. See the prefiled direct testimony of Michael Lew-Smith and Jason
18 Krzanowski.

19

20 **Sufficiency of Water and Burden on Existing Water Supply**

21 There is “sufficient water available for the reasonably foreseeable needs” of
22 the Project. The Project will not “cause an unreasonable burden on an existing water

1 supply, if one is to be utilized.” See the prefiled direct testimony of Jason
2 Krzanowski.

3

4 **Soil Erosion**

5 Soil erosion issues have been considered since early in the design process.
6 The Project will not cause unreasonable soil erosion. This finding is discussed in
7 detail in the prefiled direct testimonies of Jason Krzanowski and Michael Lew-Smith.

8

9 **Highway and Airways**

10 The Project will not cause unreasonable congestion or unsafe conditions with
11 respect to the use of highways, waterways, railways, airports, and airways.

12 All public roads can handle the expected volume of construction and post-
13 construction traffic without creating congestion or unsafe conditions. See ***Exhibit***
14 ***DFLD-JZ-17***, VTrans letter dated November 28, 2005. See the pre-filed direct
15 testimony of Jason Krzanowski for further information and details on this subject.

16 Adequate space for worker parking and construction vehicles will be
17 available in the area adjacent to the O&M building at the end of Putnam Road.

18 Because the turbines are over 200 feet in height, FAA guidelines call for
19 lighting the structures. See the discussion above.

20

21 **Educational Services**

22 The Project will not cause an unreasonable burden on the ability of a
23 municipality to provide educational services.

1 The construction phase of the Project will occur over a nine-month period
2 during the 2008 construction seasons. It is unlikely that temporary construction
3 workers and their families would move to the area due to the Project. Once the
4 Project is operational, it is anticipated that three to five workers will be devoted to
5 operation and maintenance. These workers may be hired from the existing local
6 workforce.

7 Deerfield has notified the towns of Readsboro and Searsburg and the
8 Windham Southwest Supervisory Union school district of the Project. While all
9 Searsburg students attend schools outside of Searsburg in the SWSU district,
10 Readsboro middle and high school students attend the SWSU schools and students
11 in grades K-6 attend the Readsboro Central School. The response from the
12 Superintendent of Schools, Dr. M. Peter Wright, (letter dated December 2, 2005)
13 indicates that the Project should not create any unreasonable burdens. See ***Exhibit***
14 ***DFLD-JZ-20***, Windham Southwest Supervisory Union letter dated December 2,
15 2005.

16

17 **Municipal Services**

18 The Project will not cause an unreasonable burden on the ability of the local
19 governments to provide municipal or governmental services. The private roads
20 accessing the site will not require municipal expenditures for maintenance. Town
21 roads – including Putnam Rd and Sleepy Hollow Rd, in Searsburg may require minor
22 alteration during the construction phase, which would be accomplished at Deerfield
23 Wind's expense.

1 The traffic on the public roads associated with project operations,
2 approximately 5 trips per work day, will be minimal; thus additional maintenance of
3 the town highways should not be necessary. Waste disposal will be handled through
4 private haulers, and will create no burden on local government.

5 All Project roads will be of sufficient size and capacity to handle any
6 emergency vehicles. The appropriate fire and rescue departments have been
7 notified. Responses to date have been received from the rescue departments of
8 Wilmington and Whitingham and the Shaftsbury Barracks of the Vermont State
9 Police. See ***Exhibit DFLD-JZ-21***, Deerfield Valley Rescue, Inc. letter dated
10 November 14, 2005; ***Exhibit DFLD-JZ-22***, Whitingham Ambulance Service Inc.
11 letter postmarked December 5, 2005; and ***Exhibit DFLD-JZ-23***, Vermont State
12 Police, Shaftsbury Barracks letter dated January 11, 2006. Notice of the Project has
13 also been provided to the Readsboro and Wilmington Fire Departments and to the
14 Bennington County Sheriff with verbal indication that the Project will not result in
15 an undue burden.⁸

16 The Project will provide a net benefit to the towns, in that it will generate
17 local property taxes but require very little in the way of municipal services.

18

19 **Aesthetics**

20 Visual. The Project will not cause an undue adverse effect on the scenic or
21 natural beauty of the area. Witnesses, Jean Vissering and Michael Buscher provide

⁸ Personal communication between Martha Staskus (VERA) and Raymond Eilers, Readsboro Fire Department; Fire Chief Troy Johnson, Wilmington Fire Department; and Sheriff Gary Forrest, Bennington County Sheriff's office, in December 2005, indicated that this proposed facility will not create a burden on services provided by these three organizations.

1 extensive pre-filed direct testimony on visual simulations and on the visual impact of
2 this wind project and wind projects generally.

3 Sound. The Project will not cause an undue adverse effect on air pollution,
4 and meets recognized standards for sound emissions in rural settings. See the report
5 and prefiled direct testimony of Kenneth Kaliski, Resource Systems Group, Inc., for
6 further discussion of the Project's potential sound impacts.

7

8 **Historic and Archaeological Sites**

9 *A Phase IA Archaeological Survey and Historic Resource Screening Study* was
10 performed for the proposed project and, as discussed in the prefiled direct testimony
11 of Hope Luhman, Ph.D., of The Louis Berger Group, Inc., the Project is not
12 expected to have an undue adverse impact on historic and pre-historic resources.

13

14 **Rare and Irreplaceable Natural Areas, Necessary Wildlife Habitat, and**
15 **Endangered Species**

16 The Project will not have a significant impact on Natural Areas, Necessary
17 Wildlife Habitat, or Endangered Species. This finding is substantiated in the reports
18 and prefiled direct testimony of Michael Lew-Smith; Jeffrey Parsons, from
19 Arrowwood Environmental; Paul Kerlinger of Curry and Kerlinger LLC.; Robert
20 Roy of Woodlot Alternatives and Wallace Erickson, of WEST Inc.; and Jeffrey
21 Wallin of Multiple Resource Management. Specifically, Mr. Lew-Smith concludes
22 that the Project will not have an undue adverse impact on rare and irreplaceable
23 natural communities, or on rare, threatened and endangered plant species. Mr.

1 Wallin and Mr. Parsons do not believe the Project will have an undue adverse impact
2 on bears.⁹ Mr. Parsons found no state or federally listed species during wildlife
3 inventories, nor did he find any species occurring on the GMNF Regional Forester's
4 Sensitive Species list. Mr. Roy and Mr. Erickson have found that the Project should
5 not have any undue adverse effect on migrating or resident birds or bats. Mr.
6 Kerlinger also concludes that the Project should not have an undue adverse impact
7 to any breeding or migratory birds, including rare, threatened, or endangered species.
8

9 **Development Affecting Public Investments**

10 The Project will not unnecessarily or unreasonably endanger the public or
11 quasi-public investment in public facilities, services, or lands, or materially jeopardize
12 or interfere with the function, efficiency, or safety of, or the public's use or
13 enjoyment of or access to, the public facility, service, or lands. As mentioned in
14 earlier testimony above, the Forest Service has determined that the proposed project:

- 15 ■ is consistent and compatible both with the purposes for which the lands are
16 managed and with surrounding uses; and
- 17 ■ is in the public interest;

18 See ***Exhibit DFLD-JZ-7***, GMNF Forest Supervisor letter dated April 15,
19 2004 to John Zimmerman, Deerfield Wind, LLC.

20 Public lands or facilities from which the Project may be visible were also
21 evaluated as part of the visual analysis conducted for this Project. The prefiled

⁹ At the same time, Deerfield Wind continues to investigate the need and potential for bear habitat mitigation and is in discussions with the USFS, private landowners, and state agencies.

1 direct testimony of Jean Vissering, Deerfield's Landscape Architect, provides further
2 discussion of this impact.

3 As discussed above under Traffic, the Project will not unreasonably impact
4 any public roads, and Deerfield Wind will bear the cost of any necessary
5 improvements.

6

7 **30 V.S.A. § 248(b)(6) – Integrated Resource Planning**

8 **Q. Is the Project consistent with the principles for resource selection expressed**
9 **in that company's approved least cost integrated plan?**

10 Response. This criterion is not strictly applicable to this Project or other merchant
11 plants, because Deerfield Wind is not required under state law to prepare an IRP.
12 Even if it does apply, the Project meets the principles of least cost planning given the
13 need for this renewable energy project and its economic and environmental benefits,
14 as described in the answers above.

15

16 **30 V.S.A. § 248(b)(7) – Comprehensive Energy Plan**

17 **Q. Is the Project in compliance with the Department of Public Service's**
18 **approved Electric Energy Plan?**

19 Response. Deerfield Wind has sent a letter to the Department requesting a
20 determination of compliance under the Vermont Comprehensive Energy Plan that is
21 currently in effect.

22 The Project complies with the recommendations and goals contained in the
23 Vermont Electric Plan 2005, as can be illustrated by reviewing the priorities that the

1 Plan outlines. The Plan’s overarching policy, derived from a larger State Energy
2 Policy, is “to meet Vermont’s electric energy needs in a manner that is efficient,
3 adequate, reliable, secure, sustainable, affordable, safe, and environmentally sound,
4 while encouraging the State’s economic vitality and maintaining consistency with
5 other state policies.” (2005 VT Electric Plan at 1-4). The Deerfield Wind Project
6 will comply with this effort by providing a new source of energy in a manner that
7 meets all the desired criteria and especially excels in being efficient, sustainable, safe,
8 and environmentally sound. The 2005 Plan also outlines several more specific goals
9 for the future, including resource diversification, lower cost electric service, and the
10 promotion of clean and stable energy sources. Increased wind power plays an
11 important role in each of these priorities. Vermont faces the issue that in 2012, the
12 state’s contract with Vermont Yankee expires and its contracts with Hydro Quebec
13 decline through 2016. Together, these sources currently supply about two-thirds of
14 Vermont’s energy. The upcoming contract expirations increase the importance of
15 finding new and diverse supply sources. Operation of the proposed Deerfield Wind
16 Project would result in greater diversification of Vermont’s energy portfolio and
17 would add another energy source that does not rely on inputs from outside of the
18 state or on cost-sensitive fossil fuel sources. This increased diversification can help
19 buffer increasing energy costs. A more detailed discussion of efficiency,
20 affordability, and other economic factors that relate to the 2005 Electric Plan can be
21 found in the report and direct testimony of Ezra Hausman.

22 The Vermont Electric Plan 2005 is supportive of renewable energy, and its
23 action plan includes the point that, “Electric utilities should explore potential for

1 appropriate new renewable resource acquisitions as existing energy sources and
2 contracts expire (2005 VT Electric Plan at 10-22). The Plan also discusses policies to
3 encourage renewable technologies (2005 VT Electric Plan at 5-15). The Plan
4 specifically acknowledges that, “[w]ind should be viewed as a component in a
5 balanced portfolio of resources that can importantly act as a hedge against
6 fluctuating fossil fuel prices.” (2005 VT Electric Plan at 5-6). Furthermore, wind is
7 addressed when the short-term action plan (2004-2007) states that, “Vermont
8 regulators should establish proceedings for adopting appropriate recommendations
9 of the Advisory Commission on Commercial Wind Energy,” (VT Electric Plan at 10-
10 21). Wind plays a critical role in offering an environmentally sound supply of energy,
11 advancing an important point in the Plan, which states that the “[e]nhancement and
12 conservation of our natural resources and mitigation of the impact of necessary
13 energy production and use on air, water and land are basic governmental
14 responsibilities. Planning for future electric energy needs must also address air and
15 water quality objectives.” (2005 VT Electric Plan at 1-6). As noted, wind turbines will
16 not generate air pollution. Furthermore, energy produced by the turbines will
17 decrease the overall emissions from fossil fuel plants, which would otherwise be
18 needed to supply energy. A more detailed quantification of emissions reduction
19 estimated for the proposed project can be found in the report and direct testimony
20 of Ezra Hausman. In addition, the Project will not result in undue water pollution,
21 as explained in more detail through the direct testimony of Michael Lew-Smith.

1 The Deerfield Project is in line with the goals outlined by Vermont's Electric
2 Plan, embodying the commitment to clean, reliable, affordable, and sustainable
3 energy that the Plan envisions.

4

5 **30 V.S.A. § 248(b)(10) – Transmission Facilities**

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

8 Response. Yes it can, by interconnecting to the existing National Grid and VELCO
9 69 kV transmission lines located within the Project Area. Deerfield Wind will bear
10 all the costs of the interconnection, with no impacts to Vermont utilities or
11 ratepayers. See also the prefiled direct testimony of Dave Estey for further
12 description of the electrical interconnection scheme and facilities.

13

14 **Q. Now that you have described the Project's compliance with the section 248**
15 **criteria, can you summarize the steps Deerfield Wind has taken to avoid, minimize**
16 **and/or mitigate potential impacts from the Project?**

17 Response. Yes. A number of steps have been taken throughout project design and
18 planning. Mitigation steps are summarized in ***Exhibit DFLD-JZ-24***, and are
19 discussed in further detail in the direct testimonies and reports of our expert
20 witnesses. One item I would highlight is that a number of the potential post-
21 construction wildlife studies would need to be designed in a coordinated fashion, to
22 ensure that they do not involve conflicting techniques which could either jeopardize
23 the effectiveness of the studies, or create inadvertent impacts to wildlife habitat.

1 Deerfield Wind has and will continue to engage in discussions with the federal
2 agencies and ANR regarding such studies.

3

4 **Q. Does this conclude your testimony at this time?**

5 Response. Yes it does.