

1 including making long term wind speed and energy forecasts. I assisted in the preparation of the
2 Climate Section of the Application for Site Certification.

3
4 Q Would you please identify what has been marked for identification as Exhibit 24-1 (RN-1).

5
6 A Exhibit 24-1 (RN-1) is a résumé of my educational background and employment experience.

7
8 Q Would you summarize your experience with particular attention to the Pacific Northwest.

9
10 A I have been working as a meteorologist in wind energy since 1978. As far back as 1980, I
11 worked with a company that had wind farm development sites along the Oregon coast and in the
12 Columbia Gorge. I have worked on several hundred wind projects around the US, including
13 several in the Northwest, for over 20 years. Two years ago I acted as a consultant to NREL
14 (U.S. DOE, National Renewable Energy Lab) to review and validate the wind maps they were
15 developing for Washington, Oregon and numerous other western states. I have provided
16 meteorological consulting services to dozens of clients over the past 20 years including various
17 government agencies, utilities, independent developers, financial institutions, lenders and wind
18 power project owners.

19
20 Q Are you sponsoring any portion of the “Application for Site Certification”, for the Kittitas
21 Valley Wind Power Project?

22
23 A Yes. I am sponsoring the following section:

24 Section 3.2.1.1 Air Quality, Existing Conditions, Climate

1 Q What exhibits that are part of the Application that you are sponsoring?

2

3 A I am sponsoring the following exhibits to the Application:

4 Exhibit 27 Project Site Icing Conditions

5

6 Q Are you familiar with this section and Exhibit of the Application?

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8 A Yes

9

10 Q Did you provide the information for this section and exhibit and assist in its preparation?

11

12 A Yes, I was one of several people who provided information for this section and exhibit.

13

14 Q Is the information in this section within your area of authority and /or expertise?

15

16 A Yes.

17

18 Q Is the content of this section and exhibit of the Application and exhibit either based upon
19 your own knowledge, or upon evidence, such as studies and reports as reasonably prudent
20 persons in your field and expertise are accustomed to rely in the conduct of their affairs?

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22 A Yes.

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1 Q Are there any modifications or corrections to be made to those portions of the Application that
2 you are sponsoring?

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4 A No.

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6 Q To the best of your knowledge, are the contents of this section of the Application with this
7 modification true with the correct information provided above?

8
9 A Yes.

10
11 Q Do you incorporate the facts and content of this section and exhibit as part of your
12 testimony?

13
14 A Yes.

15
16 Q Are you able to answer questions under cross examination regarding this section and exhibit?

17
18 A Yes.

19
20 Q Do you sponsor the admission into evidence of this section and exhibit of the Application?

21
22 A Yes.

23
24 Q Would you please summarize the information provide in Section 3.2.1.1 of the
25 Application.

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A The Project site has a semi-arid or steppe climate type. The winds on the site are primarily thermally driven by the temperature difference between cooler air on the west side of the Cascade Mountains, and hotter air over the Kittitas Valley and over the Columbia Basin and Plateau on the east side of the Cascades. Winter winds are storm driven, but these are less persistent than the spring and summer thermal winds over the Project site. The expected 50-year extreme gust is 115 mph.

Q Would you please summarize the information provided Exhibit 27 of the Application regarding icing conditions on the site

A In order to estimate the frequency of icing events at the Wild Horse Wind Power Project site, I obtained meteorological records from the Ellensburg Airport. There are about six years of reliable records from the airport. During this 6-year period there was an average of three days per year of freezing rain. Freezing rain is the condition that could cause icing on the wind turbine blades, so it is the most relevant weather event. Because the elevation of the proposed site is about 800-ft higher than the airport, I would estimate that icing events would occur slightly more frequently than at the airport. Therefore, I would estimate that there could be approximately four to five days per year where ice might accumulate on the turbine blades.

Q Could you describe how the wind resource at the proposed site compares to other sites in Washington?

1 A Over the past 20 years, I have evaluated and examined wind data from more than 500
2 meteorological towers from various potential wind power project sites in the Northwest.
3 Based on my experience, there are truly very few sites that have what it takes to work for
4 large scale wind power projects in the state of Washington. In order to be economically
5 viable, a site must have a strong wind resource, available and adequate transmission, and
6 good accessibility. The Wild Horse site is one of the best wind power project sites
7 available in Washington. The wind resource is comparable to those at the large Stateline
8 Wind Project near Walla Walla and the Nine Canyon Project near Pasco. Subtle
9 differences in wind speed have a profound effect on the amount of wind energy that can
10 be generated. This is because wind power varies with the cube of the wind speed.
11 Therefore a wind speed that is twice as fast in the same area will carry 8 times the amount
12 of energy. For this reason, a difference of a few mph in the average long term wind
13 speed can mean a difference of 30% in wind energy and this is easily the difference
14 between a site that works versus a site that does not work for a wind power project.
15 Generally to be economically viable in today's energy market, a site must have an
16 average wind speed of at least 16 mph. A site with a wind speed of 15 mph probably is
17 not a viable site. The only other undeveloped economical wind farm sites that I am
18 aware of, with a comparable resource in Washington are the Kittitas Valley Wind Power
19 Project near Ellensburg, and the Columbia Hills, near Goldendale. Other sites may exist,
20 but have not been measured and assessed adequately. Based on my experience in
21 prospecting the state of Washington for other potential wind sites, I estimate that there
22 are fewer than 6 other economically viable and developable sites for a wind power
23 project larger than 50 MW. There are also some other sites that exist but are not
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1 developable, such as in the “Scenic Gorge Area” or at Cape Flattery, which I understand
2 is constrained by limited local transmission capacity.

3
4 Q. Based on your evaluation of the Project wind resource what percentage of the time do
5 you believe the rotors of the turbines at the Wild Horse Project will be turning?

6
7 A. I would estimate that the rotors of the Project wind turbine generators will be spinning
8 approximately 80 percent of the time on an annual basis.