FIGURE 2-1
PROJECT SITE LAYOUT, MIDDLE SCENARIO

- proposed wind turbine generator location
- string name and turbine number
- existing access road
- new access road
- road turnaround area
- underground electrical
- overhead electrical
- underground and/or overhead electrical
- existing transmission line
- meteorological tower - temporary
- meteorological tower - permanent

Source: Sagebrush Power Partners LLC 2003a
EXISTING BONNEVILLE TRANSMISSION TOWERS

150 units/1.3 MW
upper end project scenario

121 units/1.5 MW
middle project scenario

82 units/3 MW
lower end project scenario

Source: Sagebrush Power Partners LLC 2003a

HH  hub height
RD  rotor diameter
TC  tip clearance
TH  tip height

TYPICAL WIND TURBINE DIMENSIONS

FIGURE 2-2

KITTITAS VALLEY WIND POWER PROJECT EIS
FIGURE 2-3

TYPICAL MODERN THREE-BLADED UPWIND TURBINE GENERATOR

Source: Sagebrush Power Partners LLC 2003a
FIGURE 2-4

TYPICAL NACELLE

Source: Sagebrush Power Partners LLC 2003a
FIGURE 2-5

ELECTRICAL AND COMMUNICATIONS SYSTEM

Source: Sagebrush Power Partners LLC 2003a

- Communication lines
- Wind turbine
- Pad-mounted transformer
- Meteorological data system
- Supervisory control & data acquisition
- Current transducers
- Voltage transducers

KITTITAS VALLEY WIND POWER PROJECT EIS

SHAPIRO & ASSOCIATES, INC.
### FIGURE 2-6
COMPARISON OF VARIOUS WIND TURBINE TECHNOLOGIES

<table>
<thead>
<tr>
<th></th>
<th>generator size</th>
<th>typical size</th>
<th>approx. units required for 182 MW</th>
<th>typical rotational speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Darrieus rotor</td>
<td>50-100 kW</td>
<td>100-150 ft</td>
<td>2,400</td>
</tr>
<tr>
<td>B</td>
<td>two-bladed (downwind)</td>
<td>50-200 kW</td>
<td>150-200 ft</td>
<td>2,400</td>
</tr>
<tr>
<td>C</td>
<td>three-bladed (upwind)</td>
<td>500-750 kW</td>
<td>240-300 ft</td>
<td>290</td>
</tr>
<tr>
<td>D</td>
<td>three-bladed (upwind)</td>
<td>1,300-2,500 kW</td>
<td>300-400 ft</td>
<td>121</td>
</tr>
</tbody>
</table>

Source: Sagebrush Power Partners LLC 2003c
ALTERNATIVE A SITE LAYOUT

- proposed wind turbine generator location
- facilities studied and removed from the project
- C1 string name and turbine number
- I.D.
- meteorological tower - temporary
- N2 meteorological tower - permanent
- existing access road
- new access road
- underground electrical
- overhead electrical

Source: Sagebrush Power Partners LLC 2003a
FIGURE 2-8

AREAS INVESTIGATED FOR WIND ENERGY DEVELOPMENT

KITTITAS VALLEY WIND POWER PROJECT EIS

1017002.2T
**ALTERNATIVE 1 WILD HORSE**

**FIGURE 2-9**

Source: Hockel/Westman Associates, Inc. 2003

- Proposed wind turbine generator location
- Meteorological tower - temporary
- Meteorological tower - permanent
- O&M facility
- Substation
- Underground electrical
- Overhead electrical
- Overhead electrical - 230kV with 34.5kV underbuild
- Pad switch/junction panel
- Quarry site
- Laydown area
- Existing road - minor improvement required
- Existing road - major improvement required
- New road
- Overhead electrical feeder line
- DNH panels included in project layout

Approximate Scale in Miles

KITITAS VALLEY WIND POWER PROJECT EIS
Source: Huckell/Weinman Associates, Inc. 2003

FIGURE 2-10

ALTERNATIVE 2
SPRINGWOOD RANCH

KITTITAS VALLEY WIND POWER PROJECT EIS

Source: Huckell/Weinman Associates, Inc. 2003

0 8
Approximate Scale in Miles

▲ proposed meteorological tower
〇 proposed wind turbine
FIGURE 3.1-1

GEOTECHNICAL TEST PIT AND FAULT LOCATIONS

- **GCP-15**: test pit location
- **GCP-19**: proposed wind turbine generator location (middle scenario)
- **GCP-18**: local high-angle fault

Source: Sagebrush Power Partners LLC 2003a
3 argixerolls complex
4 argixerolls-durixerolls complex
15 Reelow-LaBlue-Sketter complex
28 Reelow very cobbly loam
29 Reelow-LaBlue complex
31 Reelow-Reeser-Sketter complex
33 Reelow-Sketter-LaBlue complex
34 Reeser clay loam
36 Reeser-LaBlue-Sketter complex
37 Reeser-Reeser-Sketter complex
41 Sketter-Reelow complex
42 Sketter-Reelow-LaBlue complex
43 Sketter-Reeser-Reeser complex
52 Weirman complex

Source: Sagebrush Power Partners LLC 2003c
FIGURE 3.2-1

VEGETATION TYPES

- wetland
- riparian
- riparian trees
- dense conifers
- sparse conifers
- deciduous shrub - steppe
- dense shrub - steppe
- moderate shrub - steppe
- sparse shrub - steppe
- low sagebrush
- grassland
- lithosol plant community
- surface water
- talus
- developed
- 50-meter lithosol survey corridor
- 300-meter buffer corridor
- turbine locations and string name (middle scenario)
FIGURE 3.2-3

APPROXIMATE PERCHES AND FLIGHT PATHS OF BALD EAGLES

Source: Sagebrush Power Partners LLC 2003a
FIGURE 3.2-4
APPROXIMATE RAPTOR NEST LOCATIONS

Source: Sagebrush Power Partners LLC 2003a

- search area
- active red-tailed hawk nest
- inactive nest
- search paths
- permanent meteorological tower
- turbine (middle scenario)
- approximate project boundary

KITITAS VALLEY WIND POWER PROJECT EIS
FIGURE 3.2-5

MULE DEER AND ELK WINTER RANGES

Source: Sagebrush Power Partners LLC 2003c

- project boundary
- mule deer winter range
- elk calving areas
- elk migration corridors
- elk winter range
Source: Sagebrush Power Partners LLC 2003c

FIGURE 3.4-1

LIGHTNING FLASH DENSITY

1996-2000

Flash Density
flashes per square km per year

16+
9 - 16
4 - 9
2 - 4
1 - 2
0.5 - 1
0.25 - 0.5
0 - 0.25

Approximate Scale in Miles
0 600
### FIGURE 3.4-2

**TYPICAL ELECTROMAGNETIC LEVELS FOR TRANSMISSION LINES**

<table>
<thead>
<tr>
<th>Voltage (kV)</th>
<th>Electric Field (kV/m)</th>
<th>Mean Mag. Field (mG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>115 kV</td>
<td>1.0 0.5 0.07 0.01 0.003</td>
<td>29.7 6.5 1.7 0.4 0.2</td>
</tr>
<tr>
<td>230 kV</td>
<td>2.0 1.5 0.3 0.05 0.01</td>
<td>57.5 19.5 7.1 1.8 0.8</td>
</tr>
<tr>
<td>500 kV</td>
<td>7.0 3.0 1.0 0.3 0.1</td>
<td>86.7 29.4 12.6 3.2 1.4</td>
</tr>
</tbody>
</table>

Source: Bonneville 1995
FIGURE 3.6-1
EXISTING LAND USE

Approximate Scale in Feet

Source: CH2M HILL 2003

1-mile buffer from project site
existing structures
nature conservancy easement
irrigated agriculture
Washington DNR lands
commercial timber lands
high voltage transmission lines
proposed turbine locations (middle scenario)
proposed electric cables
roads
proposed substation locations
Ironhorse Recreational Trail

BPA 230kV
Rocky Reach - White River

PSE 230kV

220 kV Columbia-Covington
220 kV Grays Harbor-Columbia

Kittitas Valley Wind Power Project EIS
Shapiro Associates Inc.
FIGURE 3.6-2
EXISTING ZONING

- zoning boundary
- proposed wind turbine generator location (middle scenario)
- AG-20 agricultural - 20 acre
- AG-3 agricultural - 3 acre
- C-F commercial forest
- F-R forest and range
- G-C general commercial
- HWY-C highway - commercial

Source: Sagebrush Power Partners LLC 2003a
**Figure 3.6-3**

Approximate Scale in Miles

Source: Sagebrush Power Partners LLC 2003a

- U.S. Forest Service land
- Urbanized areas
- Kittitas County boundary

**Recreational Areas**

- Ehrburg
- Thorp
- Teanaway
- Cle Elum/Roslyn
- Easton
- Upper Cle Elum Valley
- Wenatchee
- Swauk-Table Mountain
- Squilchuck
- Wanapum/Ginkgo Park
FIGURE 3.7-1

CONSTRUCTION EMPLOYMENT SCHEDULE

KITTITAS VALLEY WIND POWER PROJECT EIS

Source: Sagebrush Power Partners LLC 2003a
FIGURE 3.9-1

PHOTOGRAPH LOCATIONS OUTSIDE PROJECT AREA

Source: Sagebrush Power Partners LLC 2003a

Graphics Server/Graphics/Billable/Kittitas Valley Windfarm/Fig 3.13-1   11.18.03

Approximate Scale in Miles

- major roadways in the project area
- proposed wind turbine generator string location
- viewpoint
- John Wayne Trail
FIGURE 3.9.2
PHOTOGRAPH LOCATIONS
WITHIN PROJECT AREA

Source: Sagebrush Power Partners LLC 2003a

proposed wind turbine generator location (middle scenario)
viewpoint

Approximate Scale in Feet

KITTITAS VALLEY WIND POWER PROJECT
FIGURE 3.10-1
EXISTING AVERAGE DAILY TRAFFIC VOLUMES FOR 2001

Source: Sagebrush Power Partners LLC 2003a

- Transportation route
- Existing roads
- Proposed wind turbine generator string location

Approximate Scale in Feet

0 10,000'
ELLENSBURG, WASHINGTON
05-01-92 to 10-31-1994

<table>
<thead>
<tr>
<th>Compass Direction</th>
<th>Mean Speed (mph)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>10.3</td>
</tr>
<tr>
<td>NNE</td>
<td>4.4</td>
</tr>
<tr>
<td>NE</td>
<td>3.3</td>
</tr>
<tr>
<td>ENE</td>
<td>3.5</td>
</tr>
<tr>
<td>E</td>
<td>5.1</td>
</tr>
<tr>
<td>ESE</td>
<td>7.5</td>
</tr>
<tr>
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<td>7.1</td>
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<td>6.6</td>
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<tr>
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<td>23.5</td>
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<tr>
<td>NW</td>
<td>17.4</td>
</tr>
<tr>
<td>NNW</td>
<td>14.3</td>
</tr>
</tbody>
</table>

% turbine energy inner circle = 0%
% time outer circle = 60%

Source: Sagebrush Power Partners LLC 2003c

FIGURE 3.11-1

KITITAS VALLEY AREA WIND ROSE

KITITAS VALLEY
WIND POWER PROJECT EIS
Source: Sagebrush Power Partners LLC 2003c

**FIGURE 3.12-1**

**NOISE MONITORING LOCATIONS**

- Site A: noise monitoring location
- Site B: proposed wind turbine generator location (middle scenario)
- Site C: proposed wind turbine generator location (middle scenario)

*Approximate Scale in Feet*
FIGURE 3.14-2

PHOTOGRAPH LOCATIONS FOR CUMULATIVE ANALYSIS

Source: Sagebrush Power Partners LLC 2003f

Approximate Scale in Miles

KITTITAS VALLEY WIND POWER PROJECT AREA

WENATCHEE NATIONAL FOREST

RECEER CREEK ROAD

DESSERT CLAIM (ENXCO) PROJECT AREA

Source: Sagebrush Power Partners LLC 2003f