

Section 3.10

VISUAL RESOURCES/LIGHT AND GLARE

Visual or aesthetic resources are generally defined as the natural and built features of the landscape that can be seen. The combination of landform, water, and vegetation patterns comprise the natural landscape features that define an area's visual character, while built features such as buildings, roads and other structures reflect human or cultural modifications to the landscape. Visual resource or aesthetic impacts are generally defined in terms of a project's physical characteristics and potential visibility and the extent to which the project's presence would change the perceived visual character and quality of the environment in which it would be located.

3.10.1 Methodology

This analysis of the visual effects of changes that might occur with implementation of the Wild Horse Wind Power Project (WHWPP) is based on field observations and review of the following information.

- Wind energy facility visual effects research, recorded public perceptions of wind energy facilities, and design measures for integrating wind energy facilities into landscape settings.
- Local planning documents.
- Project maps, drawings, and technical data.
- Computer-generated maps of the areas from which the project facilities are potentially visible.
- Aerial and ground-level photographs of the project area.
- Computer-generated visual simulations.

Site reconnaissance was conducted from March through June 2003 to examine the project area, to take representative photographs of existing visual conditions, and to identify key public views appropriate for simulation.

The visual study employs assessment methods based, in part, on the U.S. Department of Transportation (USDOT) Federal Highway Administration (FHWA) (U.S. Department of Transportation 1988) and other accepted visual analysis techniques as summarized by Smarden et al. (1988). The study is also designed to respond to the provisions of the Washington Administrative Code (WAC 463-42-362 Built Environment – Land and Shoreline Use) requiring analysis of aesthetic, light, and glare issues as part of the Washington Energy Facility Site Evaluation Council (EFSEC) process.

3.10.2 Affected Environment

3.10.2.1 Regional and Local Landscape Settings

The proposed project site encompasses a roughly 4-mile by 5-mile area located in the upland area on and immediately north of Whiskey Dick Mountain, a 3,873-foot-high ridge approximately 14 miles east of the city of Ellensburg and 9 miles east of the town of Kittitas. Whiskey Dick Mountain is part of a region of ridgetops that frame the eastern edge of the Kittitas Valley and separate it from the Columbia River to the east.

The project area has an open, windswept appearance. Most of the ridgetops on which the project facilities would be located consist of dry, rocky grasslands used for grazing, and areas covered with a mixture of sagebrush, bitterbrush, and bunchgrasses. Small clusters of ponderosa pines occur in draws and adjacent to springs.

Most of the project site, part of an approximately 25,000-acre ranch, is in private ownership. The remainder of the project site comprises five parcels of public lands: four parcels belonging to the Washington Department of Natural Resources (WDNR) and one to the Washington Department of Fish and Wildlife (WDFW). The property is not crossed or bordered by any public roads. The closest public roadways are Vantage Highway, which lies approximately 1.3 miles south of the project area's southern boundary, and Parke Creek Road, which lies approximately 4.0 miles from the project area's western perimeter. The only access into the project area is by private gravel roads. There are no residential or agricultural structures within the project area. The only structures on the site are a collection of antennae at the communication facility on Cribb Peak, a 3,558-foot peak in the eastern portion of the ridge formed by Whiskey Dick Mountain, and several meteorological test towers at various locations scattered across the project site. The safety lighting on these structures is the only source of artificial light in the area.

The WDFW manages large portions of the eastern slopes of Whiskey Dick Mountain, including parts of the Whiskey Dick and Quilomene units of the L.T. Murray Wildlife Area. These wildlife lands generally consist of steep, rocky slopes vegetated with sagebrush and bitterbrush mixed with various bunchgrasses, as well as narrow, riparian bottoms. The purpose of these wildlife lands is to provide habitat for the Colockum elk herd, as well as for mule deer and other wildlife. The Quilomene unit abuts the project site at its northeast corner.

Ginkgo Petrified Forest State Park is a 7,470-acre state park that lies immediately east of the Whiskey Dick unit of the L.T. Murray Wildlife area, and encompasses lands located on both the northern and southern sides of Interstate (I)-90. The park was established in the 1930s to protect the large area of both exposed and buried petrified wood within its boundaries. Most of the land in the park is undeveloped, and managed either as grazing land or as undisturbed shrub-steppe landscape. Developed park facilities are concentrated at the Wanapum Recreation Area, which lies along the Wanapum Reservoir on the Columbia River in the area south of I-90, where there is a boat ramp, picnic, and swim area, as well as 50 campsites. There is an interpretive center and picnic area at the Heritage Area just north of Vantage; a 2.5-mile trail system (including a 1.5-mile interpretive trail) is present at the Natural Area along the north side of the Vantage Highway, 2 miles west of Vantage. In 1997, the park attracted more than half a million visitors.

Under the Kittitas County Comprehensive Plan (Kittitas County 2001) and Zoning Ordinance, the lands on the project site have been zoned as Forest and Range and as Commercial Agriculture. The Comprehensive Plan does not acknowledge any special scenic or visual resource values in the project area, and does not include any policies that are specifically oriented to protection of scenic qualities of the project area. WDNR (Beach 2003) and WDFW (Clausing 2003) have not adopted plans that identify scenic resources in and around the project site, nor do they have policies protecting the scenic quality of these lands.

3.10.2.2 Assessment of Scenic Qualities

The analyses of the views toward the project site include an overall rating of the level of scenic quality prevailing in the views. These ratings were developed on the basis of field observations made from March through June 2003, review of photos of the affected area, review of methods for assessment of visual quality, and review of research on public perceptions of the environment and scenic beauty ratings of landscape scenes. The final assessment of scenic quality was based on professional judgment that considered a broad spectrum of factors, including the following.

- Natural features, including topography, watercourses, rock outcrops, and natural vegetation.
- The positive and negative effects of anthropogenic alterations and built structures on visual quality.
- Visual composition, including an assessment of the vividness, intactness, and unity of patterns in the landscape. Vividness is defined as the memorability of the visual impression received from contrasting landscape elements as they combine to form a striking and distinctive visual pattern. Intactness is defined as the integrity of visual order in the natural and built landscape, and the extent to which the landscape is free from visual encroachment. Unity is defined as the degree to which the visual resources of the landscape join together to form a coherent, harmonious visual pattern (Federal Highway Administration 1988).

The final ratings assigned to each view fit within the rating scale summarized in Table 3.10-1. This scale builds on one developed for use with an artificial intelligence system for evaluation of landscape visual quality (Buhyoff et al. 1994); the scale incorporates landscape assessment concepts applied by the U.S. Forest Service (USFS) and USDOT.

Table 3.10-1. Landscape Scenic Quality Scale

Rating	Explanation
Outstanding Visual Quality	A rating reserved for landscapes with exceptionally high visual quality. These landscapes are significant nationally or regionally. They usually contain exceptional natural or cultural features that contribute to this rating. They are what we think of as “picture post card” landscapes. People are attracted to these landscapes to view them.
High Visual Quality	Landscapes that have high quality scenic value. This may be due to cultural or natural features contained in the landscape or to the arrangement of spaces contained in the landscape that causes the landscape to be visually interesting or a particularly comfortable place for people. These landscapes have high levels of vividness, unity, and intactness.
Moderately High Visual Quality	Landscapes that have above average scenic value but are not of high scenic value. The scenic value of these landscapes may be due to human-made or natural features contained within the landscape, to the arrangement of spaces in the landscape, or to the two-dimensional attributes of the landscape. Levels of vividness, unity, and intactness are moderate to high.
Moderate Visual Quality	Landscapes that are common, or typical landscapes that have average scenic value. They usually lack significant human-made or natural features. Their scenic value is primarily a result of the arrangement of spaces contained in the landscape and the two-dimensional visual attributes of the landscape. Levels of vividness, unity, and intactness are average.
Moderately Low Visual Quality	Landscapes that have below average scenic value but not low scenic value. They may contain visually discordant human-made alterations, but these features do not dominate the landscape. They often lack spaces that people will perceive as inviting, and provide little interest in terms of two-dimensional visual attributes of the landscape.
Low Visual Quality	Landscapes that have below average scenic value. They may contain visually discordant human-made alterations, and often provide little interest in terms of two-dimensional visual attributes of the landscape. Levels of vividness, unity, and intactness are below average.

Note: Rating scale based on Buhyoff et al. 1994; USDA Forest Service 1995; and Federal Highway Administration 1988.

3.10.2.3 Assessment of Visual Sensitivity

The analysis of viewers, viewing conditions, and viewer sensitivity in each viewing area was structured to consider residential viewers, roadway viewers, and, to the extent to which they are present, recreational viewers. To summarize the insights developed through the analysis of viewer sensitivity, overall levels of visual sensitivity in each of the viewing areas were identified as *high*, *moderate*, or *low*. In general, high levels of sensitivity were assigned in situations where turbines would be potentially visible at distances of 0.5 mile or less from residential properties, heavily traveled roadways, or heavily used recreational facilities. Moderate levels of sensitivity were assigned to areas where turbines would be potentially visible at distances of 0.5–5 miles within the primary view cone of residences and roadways. A low level of sensitivity was assigned to areas 5 miles or more from the closest turbine, where a wind farm would constitute a distant and relatively minor element in the overall landscape. However, low levels of sensitivity could also be assigned to the 0.5- to 5-mile range, where such designation was indicated by contextual factors, including the viewing conditions in the immediate foreground of the view.

3.10.2.4 Project Site Visibility

Figure 3.10-1 depicts the areas from which the proposed wind turbines would potentially be visible. This visibility analysis was prepared using the *Zones of Visual Influence (ZVI)* feature of the WindPro software system, a program developed to assist in the planning, design, and environmental assessment of wind energy projects (EMD 2002). To identify the areas from which the turbines would potentially be visible, the ZVI module uses a digital height model generated from digital height contour lines. The module calculates lines of sight between each point on the land surface and the tops of each of the proposed turbines, and notes whether there is an unobstructed view toward the turbine. When the analysis is complete, the module produces maps showing the areas from which the turbines would potentially be visible, and can create the maps in a way that indicates the numbers of turbines that would be potentially visible from each point in the surrounding landscape on a clear day.

The visibility data presented in Figure 3.10-1 reflect the potential visibility of the turbine towers, which will extend up to 262 feet above the ground surface, and the rotor blades, which will extend up to 410 feet above the ground surface. The figure was prepared using the 20-foot contour lines from the most recent U.S. Geological Survey (USGS) topographic maps available. The figure depicts assessments of potential project visibility without considering the effect that other structures or trees close to viewers might have on views of the turbines. Views from the north of the project site, where there is some forest cover, may be partially screened.

Figure 3.10-1 encompasses all the project area's foreground and middleground viewing areas (i.e., the areas up to 5 miles), as well as portions of the background viewing area (up to 12 miles). These viewing areas derive from the landscape visual analysis systems developed by USFS and other agencies, which divide the landscape up into distance zones that are related to the degree to which landscape details are detectable by the viewer. The foreground distance zone is defined as the area within 0.25–0.5 mile from the viewer, where the maximum discernment of detail is possible. The middleground is defined as the area from 0.5 to 3–5 miles from the viewer, where there is visual simplification of vegetative surfaces into textures, overall shapes, and patterns, and where there is linkage between foreground and background parts of the landscape. The background is defined as the landscape zone 3–5 miles and further from the viewer, in which little color or texture is apparent, colors blur into values of blue or gray, and individual visual impacts become least apparent (USDA Forest Service 1973, pp. 56-57). The graphic display on this map indicates the relative numbers of turbines that can be seen from each location in the surrounding landscape. Figure 3.10-1 also encompasses the alignments of the transmission feeder lines that would connect the project to Bonneville Power Administration (BPA) and/or Puget Sound Energy (PSE) transmission corridors. The figure is annotated with numbers and arrows indicating the locations from which the photos were taken to develop the simulation views (Figures 3.10-2a, b, and c; Figures 3.10-3a, b, c, and d; Figures 3.10-4a and b; Figures 3.10-5a, b, c, and d; Figures 3.10-6a and b; and Figures 3.10-7a and b).

Review of Figure 3.10-1 suggests that four or more turbines will be visible from most of the valley and foothill areas to the west of the project site, from many of the ridgetops in the hill region between the Kittitas Valley and the Columbia River, and from lands lying to the east of the Columbia. The turbines will not be visible from areas in the Columbia River gorge or from the developed areas of Ginkgo Petrified Forest State Park. In areas more than about 5 miles from the project site, turbines may be visible, but they will be relatively small elements in the overall

view, and may tend to fade into the background, particularly at times when the atmosphere is less than completely clear. The turbines will have a limited effect on the overall character and visual quality of the landscape seen from those areas.

The greatest numbers of turbines will be visible from the project site itself and from the tops of ridges in the area to the north. In the valley areas west of the project site and in the hilly lands to the south, many of the project's turbines will not be visible because they will be located in areas screened by the ridgeline of Whiskey Dick Mountain.

3.10.2.5 Landscape Units

The project area was divided into six landscape units. These units are characterized by offering similar kinds of view of the project site, or by similar concerns about visual resources. The views from the landscape units are described below and are presented in the Visual Simulation Photos (Figure 3.10-2 through Figure 3.10-7). A Simulation Viewpoint (SV) was selected within each landscape unit on the basis of its accessibility and visibility to the public and a photo taken at that location. The photo was used to prepare a visual simulation of the future landscape with the proposed project in place.

Landscape Unit 1 – Vantage Highway Corridor South of the Project Site

Landscape Description and Scenic Quality

Landscape Area 1 encompasses the segment of the corridor along Vantage Highway closest to the project site. As mentioned above, no public roads pass through or immediately adjacent to the project site. The public road closest to the site is Vantage Highway, an east-west county road connecting Ellensburg to the community of Vantage; the Vantage Highway is a lightly traveled local road that provides access to the immediately surrounding area and serves as a back route between the Kittitas Valley and Vantage.

In the 15-mile-wide region of hills between the Kittitas Valley and the Columbia River at Vantage, the Vantage Highway's distance from the project site ranges from 1.8 to 9 miles. The point at which Vantage Highway passes closest to the project site is in Section 9 of Township 17 North, Range 21 East. At this point a private, gated, unimproved road diverges from Vantage Highway, providing access into the site. This road will serve as the proposed project's main access road.

Traveling eastward on Vantage Highway, Whiskey Dick Mountain and the project site are visible on the north side of the road. Further east along Vantage Highway, the lower slopes of the mountain close in on the road and screen views toward the project site on its upper slopes. The view toward Whiskey Dick Mountain's ridgeline and the project site opens up again as the road approaches Vantage Highway's high point in the area near the private road that provides access to the project site. East of this point the Vantage Highway descends Schnebly Coulee, where eastbound travelers' views toward the project site are completely screened by the steep slopes that define the north side of the coulee. Westbound motorists traveling up Schnebly Coulee cannot see the project site until reaching a point about 1.3 miles east of the project site access road, where a break in the slopes along the northern edge of the road corridor permits a

brief view toward Whiskey Dick Mountain's ridgeline and the project site. The view toward the ridgetop and the project site opens up more fully in the area along the highway from about 0.4 mile east of the project site access road to about 0.4 mile west of it. The ridgetop and the project site are not within the motorists' cone of vision west of this point.

Figures 3.10-2a through 3.10-2c depict existing and simulated views from SV 1, a point on Vantage Highway about 0.4 mile east of the project access road. This viewpoint lies slightly more than 1.5 miles south of the southern boundary of the project site. This wide-angle view toward the northwest extends from the cone-shaped 3,718-foot peak known as Chinaman Hat at the left side of the photo to the communication towers on Cribb Peak at the right side of the photo. The landscape in this area comprises open sagebrush and grazing lands, with little development except for roads and utility lines. The visual quality of this unit is moderate, because the visible landscape is relatively common in the region, and it has an average scenic value. However, there are several vantages offering higher levels of visual quality, as depicted in Figure 3.10-1; such vantages have a moderately high level of visual quality.

Viewers and Visual Sensitivity

The traffic volume on Vantage Highway in this area is 400 vehicles per day, according to Kittitas County Department of Public Works. Because of these relatively low traffic volumes, and because the highway approaches no nearer than 1.3 miles to the project site, the overall level of view sensitivity in this area is low to moderate.

Landscape Unit 2 – Valley Lands at Eastern Edge of Kittitas Valley

Landscape Description and Scenic Quality

Landscape Unit 2 encompasses the flat, open, valley lands at the eastern edge of the Kittitas Valley, and the area of gently rolling lands in the corridor along Parke Creek and Stevens Roads southwest of Whiskey Dick Mountain. From this area, the project turbines on the ridgeline and south slopes of Whiskey Dick Mountain will be visible at 3–6 miles in the distance. In general, this is a landscape of large ranch parcels devoted to grazing and field crops. However, in the corridors along Vantage Highway, Parke Creek Road, and Stevens Road, there are areas that have been subdivided into smaller, rural residential-sized parcels. Although many of these parcels remain undeveloped, there are clusters of developed rural residential lots at the northwest corner of the intersection of Vantage Highway and Parke Creek Road, along Park Creek and Stevens Road south of Vantage Highway, and along Sunset Road.

Figures 3.10-3a through 3.10-3d depict existing and simulated views from SV 2, taken at a point on Vantage Highway at Parke Creek Road. This viewpoint, approximately 4 miles west of the closest turbine location, is typical of views toward the project site from Vantage Highway and is generally representative of views toward the site from residences in this area. As review of these figures suggests, the foreground of views in this area consists of a humanized landscape, with roads, utility lines, fences, buildings, tree plantations, and cultivated fields, while the slopes of Whiskey Dick Mountain seen in the background exhibit a more natural character. In general, the level of visual quality is moderately high, reflecting the moderately high level of vividness provided by the ridgeline of Whiskey Dick Mountain, and the moderate to moderately high

levels of unity and intactness created by the generally orderly and attractive pattern of utility, agricultural, and rural residential uses.

Visual Sensitivity

In this area, the project site is clearly visible in the cone of vision of eastbound travelers on Vantage Highway; it is visible to a lesser degree in the cone of vision of eastbound and northbound travelers on Stevens Road. The Average Daily Traffic (ADT) on Vantage Highway in this area is 688 vehicles, while traffic volumes on Stevens Road are assumed to be considerably less. Because most portions of these roadways in this area are located in the outer half of the middleground distance zone, these roadway views have a moderate degree of sensitivity. In this area, there are approximately 50 residences from which the project site is potentially visible. Because residences in this area are located in the outer half of the middleground distance zone, and because views from some of them may be screened by structures and trees located in the immediate foreground, these residences have a moderate degree of sensitivity.

Landscape Unit 3 – Lands to the West, North, and East of the Project Site

Landscape Description and Scenic Quality

Landscape Unit 3 encompasses the ridge and canyon lands around the western, northern, eastern, and southeastern fringes of the project site. This is a region of high ridges dissected by narrow, steep-sided canyons. The vegetation consists of sagebrush and/or bitterbrush mixed with bunchgrasses. At the higher elevations, particularly in the area north of the project site, there are scattered groves of ponderosa pines, creating continuous forest cover in some places.

Much of the land in the area between the project site and the Columbia River is in state ownership. As indicated in Figure 3.10-8 and Figure 3.10-1, the Whiskey Dick unit of WDFW's L.T. Murray Wildlife Area, located north of Vantage Highway and east and southeast of the project site, occupies more than 28,500 acres. The Quilomene Unit of the L. T. Murray Wildlife Area, north and northeast of the project site, occupies nearly 18,000 acres. To the north of the Quilomene unit lies the Colockum Wildlife Area, an 88,000-acre wildlife refuge that extends north into Chelan County. These wildlife refuges have been established to provide habitat for the Colockum elk herd, as well as for mule deer and other wildlife. A number of the sections north, east, and west of the site are managed by WDNR. Further east, portions of the 7,470-acre Ginkgo Petrified Forest State Park are located between the Whiskey Dick unit of the wildlife area and the Columbia River. As Figure 3.10-1 indicates, the proposed project will not be visible from the park. Access into most portions of Landscape Area 3 is very limited, and there is little development. There is a small pocket of development along upper Parke Creek Road, an unpaved private road. Along this road corridor, approximately 1.5 miles north of the northern boundary of the project site, a large lot subdivision has been created. Based on flights over this area and review of air photos, it appears that 8–10 dwellings have been built on parcels in this subdivision, and that no more than four of these dwellings have unobstructed views toward the project site. Presently, this area is difficult to access under winter snow conditions; these dwellings are occupied only on a seasonal basis.

Figures 3.10-4a and b depict the existing and simulated views from SV 3, located near the project site access road on a ridgetop in Section 32 of Township 19 North, Range 21 East. This viewpoint is approximately 2.5 miles north of the northern edge of the project site on land that is managed by WDNR. Because this viewpoint is higher than the surrounding landscape, it provides an unobstructed view of most of the project site. From areas below the ridgetops, either the proposed project would not be visible, or visibility will be limited. The view from SV 3 is a broad panorama of ridgetops covered with grass, shrubs, and some groupings of trees; the only visible structures are the communications towers on Cribb Peak in the center of the view. The level of visual quality is high, reflecting a moderately high level of vividness and high levels of visual unity and intactness.

Visual Sensitivity

Viewers in this landscape area consist of users of the wildlife area lands and occupants of the seasonal residences. Review of use patterns on the wildlife refuge lands in consultation with the WDFW sergeant responsible for policing this area revealed that a total of approximately 1,000 hunters use the Whiskey Dick and Quilomene units of the Colockum Wildlife Area over the course of a year. The largest numbers of hunters come to the area during a period in late October and early November for the modern firearm elk season. Large numbers of hunters also come for the upland bird season, from October through January; much of this hunting takes place in the lower-elevation areas where there is less snow. Non-hunting use of the WDFW lands in this area is very limited, consisting primarily of birdwatching and hunting of shed antlers. Relatively little camping, hiking, or equestrian activity occurs on these lands. Approximately 80% of the people who use the wildlife refuge lands in this area gain access by the project site access road. With the relatively small numbers of users of the wildlife lands in this area, the overall visual sensitivity of these visitors is assumed to be low to moderate.

In the area along upper Parke Creek Road, there are approximately 8–10 dwellings that are used on a seasonal basis. These dwellings are located 1.5 miles and further north of the project site's northernmost edge; accordingly, the project site is in the middleground zone of the views from these structures. In many cases, the dwellings are sited in or close to groups of trees that would have the effect of providing partial to full screening of views toward the project site. The level of visual sensitivity of the views from these dwellings is considered to be low to moderately high, depending on the degree of screening of views toward the proposed project.

Landscape Unit 4 – Kittitas and Surrounding Valley Areas

Landscape Description and Scenic Quality

Landscape Unit 4 encompasses the region of valley lands in and around the community of Kittitas. As the viewshed map (Figure 3.10-1) indicates, the turbines on the ridgeline and southern slopes of Whiskey Dick Mountain would be visible at distances ranging from about 7 to more than 12 miles. Figures 3.10-5a, b, c, and d depict existing and simulated views from SV 4, located on the eastern edge of the community of Kittitas near the water tower at the intersection of Patrick Avenue and No. 81 and Clerf Roads. The photo shows the view looking east-northeast toward Whiskey Dick Mountain and the project site. This photo represents views from the open countryside around Kittitas and from the segments of the Iron Horse Trail and I-90 that

pass through this area. From within the community of Kittitas, the views toward the project site are obstructed to varying degrees by trees and structures in the immediate foreground. The foreground and middleground zones include roads, utility lines, fences, buildings, tree plantations, and cultivated fields. Whiskey Dick Mountain serves as the backdrop to this view. Because the mountain is located in the background, the details of its landscapes are not apparent; the mountain's overall form and the generalized patterns formed by areas of grass and shrubs on its slopes are its visible attributes from this viewpoint. In general, the level of visual quality in this area is moderate to moderately high, reflecting the moderately high level of vividness provided by the ridgeline of Whiskey Dick Mountain and the views across the valley, and the moderate to moderately high levels of unity and intactness created by the generally orderly and attractive pattern of utility, agricultural, and rural residential uses.

Visual Sensitivity

In this area, the project site is visible to varying degrees from residences in the community of Kittitas and from residences scattered across the surrounding rural area. In addition, it is clearly visible in the cone of vision of eastbound travelers on I-90, Vantage Highway, and various local roads. It is also clearly visible from the Iron Horse Trail.

Kittitas is an incorporated community with approximately 400 housing units and 900 residents. Because the project site is 9 miles and more from Kittitas, and because many views from the community toward the site are partially to fully screened by foreground structures and vegetation, the sensitivity of residential and other views from Kittitas is low.

I-90, the most important east-west cross-state route in Washington, crosses the flat valley lands in the area about 0.5 mile south of Kittitas. The Washington Department of Transportation (WDOT) reports that the ADT on I-90 in the area between Kittitas and Vantage is 11,000 vehicles. Views from the area along I-90 east of Kittitas and views toward Whiskey Dick Mountain and the project site are screened by a range of low hills north of the highway in this area. West of Kittitas, the views are more open, and the project site lies within the primary cone of vision of drivers. Although open views toward the project site are available from these portions of I-90, the level of visual sensitivity is low because the project site is more than 9 miles from the viewer.

The local roads in the Kittitas area carry less traffic than I-90. For example, at SV 4, the traffic count is 1,100 vehicles per day. From the eastbound and, to some extent, the northbound lanes of these roads, Whiskey Dick Mountain and the project site are visible within drivers' primary cone of vision. However, as in the case of views from I-90, the level of viewer sensitivity is low because the project site is located well within the background zone of the view.

The 109-mile John Wayne Trail in Iron Horse State Park is used by hikers, bicyclists, and equestrians. In the Kittitas area, the trail trends southeast and passes along the southern edge of Kittitas' original residential and commercial area. In this area, the trail has a wide gravel surface and is paralleled by the PSE Intermountain Power electric transmission line on wood poles. Washington State Parks reports that in 2001, the entire segment of the John Wayne Trail from Thorp to Vantage had 21,079 visitors, and that most visits took place during the summer season; this is contrasted with 163,532 visitors for the segment between North Bend and Thorp. In the Kittitas area, because of the trail's character as an engineered right-of-way with a wide gravel surface and proximity to high-voltage transmission lines, its visual sensitivity is assumed to be

lower than that of a more conventional park or wildland trail. In light of the trail's visual character, the moderate level of trail use this segment receives, and the background viewing distances toward the project site, the level of sensitivity of views from the trail is low.

Landscape Unit 5 – Lands East of the Columbia River

Landscape Description and Scenic Quality

Landscape Unit 5 encompasses the area east of the Columbia River. The turbines on the project site will not be visible from the Columbia River itself, but will be visible from the plateaus east of the river. In areas where the project site is potentially visible, the viewing distance is a minimum of 7 miles. Viewing areas of potential concern in the area east of the Columbia include the I-90 corridor and the Gorge Amphitheater. The project would not be visible from Sunland Estates, a river-oriented residential development located in the canyon, where the canyon's walls screen views toward the project site. A commercial and residential development known as Sun Canyon has been proposed for a site along I-90 at Silica Road; this site is within 12 miles of the project site. The project site would be visible from this development.

SV 5, on I-90 between the Silica Road Exit and the Columbia River, is representative of views from this landscape area. These figures show the view looking west/southwest toward Whiskey Dick Mountain and the project site. The foreground and middleground zones of the view consist of open landscapes covered with low sage-scrub vegetation. In other portions of this area, the landscape in the foreground and middleground is field crops and ranchlands. The one exception to these two predominant views is the Gorge Amphitheater, a major summer-season performance complex. From these areas, Whiskey Dick Mountain and associated ridges on the west side of the river provide a distant backdrop. Only overall form and the generalized patterns formed by the areas of grass and shrubs on the slopes of the ridges are visible due to its distance from the viewing area. The level of visual quality in this area is moderate to moderately high, reflecting the moderately high level of vividness provided by the line of distant ridges on the west side of the Columbia and the views across the valley, and the moderate to moderately high levels of unity and intactness of the lands visible in the foreground and middleground of views.

Visual Sensitivity

In this area, I-90 carries an average of 13,000 vehicles per day. East of the Columbia crossing at Vantage, a segment of the interstate follows a north-south direction along the plateau for 5 miles on the east side of the river. The project site is not within the cone of vision of drivers in this area. East of this area, the alignment shifts northeast-southwest for about 6 miles until reaching the community of George. There are many areas where the project site falls within the cone of vision of westbound travelers along this route. Figure 3.10-6a is typical of these views.

Although the site is within the line of sight of westbound travelers, the level of sensitivity to visual changes on the project site is low because the site lies 10 miles and more from those segments of I-90 from which it is potentially visible.

On the eastern side of the river, the residences closest to the project site are in Sunland Estates, alongside Wanapum Lake. The high, steep-sided slopes screen views from within the gorge toward the project site; accordingly, the proposed project would not be visible from Sunland

Estates. The project will be visible to individuals driving to Sunland Estates on the access road at the top of the bluff. The sensitivity of views from these areas to project-related visual changes is low, because views from the access road are more than 7 miles from the project site.

The Gorge Amphitheatre is an outdoor performance facility of regional importance at the edge of the bluffs overlooking the Columbia gorge in the area near Sunland Estates. With a seating capacity of 20,000, it is the site of large concerts from mid-May through the end of September. In addition to the performance area, concessions, and parking, the facility also contains a campground. The amphitheater's seating area is located on the slopes of the bluff, and the stage is sited so that the Columbia River and the distant ridges west of the Columbia serve as the backdrop. The project site falls within the line of sight of views from some portions of the amphitheater facility. The level of visual sensitivity from the Gorge Amphitheatre is low, because the project site is located in the view's background zone 9 miles or more from viewers within the amphitheater.

Landscape Unit 6 – I-90 in the Vicinity of the PSE Interconnect

Landscape Description and Scenic Quality

Landscape Unit 6 encompasses the short segment of I-90 between Kittitas and Vantage, from which there will be views of the transmission line and substation that will provide the electrical connection between the project and the PSE transmission system. Figures 3.10-7a and b depict the existing and simulated views from SV 6, a point at the edge of the westbound lanes of I-90, just east of the overcrossing of Stevens Road. This view looks west toward the proposed alignment of the project's 230 kV PSE feeder line and the location of the project's proposed PSE Interconnect Substation. The landscape view here is of I-90, a railroad trestle, the existing PSE transmission line, a canal that cuts across the side of the slope visible in the middleground, and a wireless communications tower. Given the moderately low levels of vividness, unity, and intactness of this landscape, the overall level of visual quality is low to moderately low.

Visual Sensitivity

In this area, I-90 carries an average of 11,000 vehicles per day. The transmission line alignment and substation are situated within the immediate foreground of the view to both westbound and eastbound travelers on I-90. The level of visual sensitivity is considered to be high.

3.10.2.6 Kittitas Valley Alternative

The project area has an open, windswept appearance. Project facilities would be located on dry, rocky grasslands used for grazing. U.S. Highway (US) 97 and the BPA and PSE electrical transmission lines that cross the project area in an east-west direction are the most visually prominent built features in the project area. There are several clusters of rural residences on large parcels throughout the project area.

Eleven viewpoints throughout the project area were analyzed and rated for scenic quality and visual sensitivity. These viewpoints were located along the US 97 corridor, along the ridges east of US 97, along Bettas Road, along the State Route (SR) 10 corridor, along the John Wayne

Trail, at Thorp Highway, along I-90, along Lower Green Canyon Road, and along Forest Service Road 35. Scenic views of the Stuart Range, a highly noticeable and memorable feature in the project area landscape, were also considered.

Existing sources of light and glare in the Kittitas Valley alternative site are primarily vehicle headlights on nearby roadways and light associated with residences, including glare from window glass.

3.10.2.7 Desert Claim Alternative

The Kittitas basin is bordered on the north and west by the Stuart Range of the Wenatchee Mountains, on the south by Manastash Ridge and the Saddle Mountains, and on the east by the Columbia River. It is steeply sloping at the edges and mostly flat in the valley, although a prominent ridge running north from Ellensburg provides some distinct topographic relief. The Yakima River flows from northwest to southeast through the eastern portion of the Kittitas basin and I-90 crosses the basin from east to west. The Desert Claim project area is located in the north central part of the Kittitas Basin on broad alluvial fan and foothill landforms. The project area is relatively flat and open, sloping gently from north to south. High-voltage power lines cross the project area from east to west.

The methods used to analyze visual impacts associated with the Desert Claim alternative differ from those used for either the WHWPP or the Kittitas Valley alternative, with visual assessment units containing varying numbers of viewpoints used in place of specific viewpoints. These units include the Northwest Valley Floor with 5 viewpoints, the Northeast Valley Floor with 3 viewpoints, the greater Ellensburg area with 3 viewpoints, and the Yakima River, Southwest Valley Floor, Hayward Hill, Dry Creek Slope and Table Mountain Slope areas with 1 viewpoint each.

As in the Kittitas Valley alternative, existing sources of light and glare in the Desert Claim alternative site are primarily vehicle headlights on nearby roadways and light associated with residences, including glare from window glass.

3.10.2.8 Springwood Ranch Alternative

The Springwood Ranch alternative site is located on the Thorp Prairie, a relatively broad and flat landscape within the Kittitas Valley and is adjacent to the Yakima River. Although information regarding specific viewpoints is not available for this alternative, the Springwood Ranch alternative site is located directly adjacent to I-90 in the southeastern section of the site, and the southwestern property line is generally within 0.5 mile of the Interstate for its entire length. Views of the property from I-90 are generally unobstructed. SR 10 parallels the property for about 5–6 miles, and Springwood Ranch can be viewed from the Thorp highway. Several home sites are also present on or near the ranch and the Springwood Ranch site can be viewed from the community of Thorp.

Outdoor lighting and vehicle traffic associated with the ranch result in a minor source of light and glare. The local road network surrounding the site accounts for the majority of existing light and glare in the vicinity of Springwood Ranch. Other sources of light adjacent to the project site include reflected sunlight during the daytime and illuminated vehicle lights at night from traffic

on I-90, Thorp Highway, SR 10, and Taneum Road. Outdoor lighting in Thorp and the residences in the surrounding area contribute to the local nighttime visual environment.

3.10.2.9 Swauk Valley Ranch Alternative

The Swauk Valley Ranch site has an open, expansive appearance similar to the Kittitas Valley site. Steep rocky slopes define the northern, western, and southern boundaries of the site. The northern panhandle portion of the site is heavily forested. The existing electrical transmission lines that cross the site in an east-west direction are the most visually prominent built features on the site. Several rural residences are scattered across the site.

The Swauk Valley Ranch is further from I-90 than the Springwood Ranch site but closer than Kittitas Valley and is adjacent to SR 10. It is expected that views of this alternative would be similar to those described for the Springwood Ranch site, although it may slightly less visible from I-90.

Existing sources of light and glare in the Swauk Valley alternative site are primarily vehicle headlights on nearby roadways and light associated with residences, including glare from window glass.

3.10.3 Impacts of Proposed Action

3.10.3.1 Analysis Procedure

The impact analysis is based primarily on the FHWA methodology for determining visual resource change and assessing viewer response to that change (U.S. Department of Transportation 1988). The analysis is focused on evaluating impacts and recommending measures to minimize adverse visual effects. Central to this assessment is an evaluation of representative public viewpoints from which the project would be most visible. To document the visual changes that would occur, visual simulations show the proposed project from six viewpoints selected to be representative of views toward the project from a range of locations. The visual simulations are presented as *before* and *after* images from each of these SVs. Presented as the *a* and *b* variants of Figure 3.10-2 through 3.10-7, the photos of existing conditions and the companion simulation images provide a clear image of the existing character and quality of the views from each of the SVs, as well as the scale and visual appearance of the changes that would result from the construction of the proposed project.

The simulations were developed using photographs taken with a 35 mm camera equipped with a 50 mm (i.e., “normal”) lens. The Photomontage module of the WindPro software program was used to perform the computer modeling and rendering required to produce the images of the project facilities; these images were superimposed on the photographs to create the simulations. Existing topographic and site data provided the basis for developing an initial digital model. The Applicant provided site plans and digital data for the proposed wind turbines. These datasets were used to create three-dimensional digital models of these facilities. The models were combined with the digital site model to produce a complete computer model of the wind farm. For each viewpoint, viewer location was digitized from topographic maps, using 5 feet as the

assumed eye level. The WindPro program overlaid computer “wire frame” perspective plots on the photographs of the views from the SVs to verify scale and viewpoint location. Digital visual simulation images were produced using computer renderings of the three-dimensional model combined with high-resolution digital base photographs. The final visual simulation images in this document were produced from the digital image files using a color printer.

The visual impact assessment was based on evaluation of the changes to the existing visual resources that would result from construction, operation, and decommissioning of the project. These changes were assessed by comparing the conditions under the simulated views with the conditions of the existing visual environment. Consideration was given to the following factors in determining the extent and implications of the visual changes.

- The specific changes in the affected visual environment’s composition, character, and any specially valued qualities.
- The affected visual environment’s context.
- The extent to which the affected environment contains places or features that have been designated in plans and policies for protection or special consideration.
- The relative numbers of viewers, their activities, and the extent to which these activities are related to the aesthetic qualities affected by the expected changes. Particular consideration was given to effects on views identified as having high or moderate levels of visual sensitivity.

Levels of impact were classified as *high*, *moderate*, and *low*. In general, high levels of aesthetic impacts were assigned in situations in which turbines would be highly visible from sensitive viewpoints and would alter levels of landscape vividness, unity, and intactness to the extent that there would be a substantial decrease in the existing level of visual quality. Moderate levels of aesthetic impact were assigned in situations in which turbines would be visible in areas with high levels of visual sensitivity and would alter levels of landscape vividness, unity, and intactness to the extent that there would be a moderate change in existing visual quality. Moderate levels of visual impact were also assigned in situations in which the presence of turbines in the view would lead to more substantial changes in visual quality, but where levels of visual sensitivity were moderate to low. Low levels of visual impact were assigned in situations where the project would have relatively small effects on overall levels of landscape vividness, unity, and intactness and/or where existing levels of landscape aesthetic quality are low or where there are low levels of visual sensitivity.

3.10.3.2 Construction Impacts

Construction Activities

The onsite activities that will be required to implement project construction are described in Section 2.2.4, “Construction Activities.” Project construction is expected to take place over a period of approximately 12 months. During that time, temporary laydown areas will be established near turbine E1 (see Figure 1-2) on the ridgeline of Whiskey Dick Mountain and at several locations in the plateau area to the north. The laydown areas will be used for temporary

storage of turbine components, equipment, and vehicles. Grading will be required to create access roads and 30- by 60-foot flat, gravel-covered areas at the base of each tower site that will accommodate the cranes required to erect the turbines.

Visual Effect of Construction Activities

During the expected 12-month construction period, large earthmoving equipment, trucks, cranes, and other heavy equipment will be highly evident features in views toward the project site from nearby areas. At some times, small, localized clouds of dust created by roadbuilding and other grading activities may be visible at the site. Active dust suppression should minimize the frequency of such dust events. Because of the construction-related grading activities, areas of exposed soil and fresh gravel that contrast with the colors of the surrounding undisturbed landscape will be visible. Construction activities will be moderately to highly visible from nearby segments of Vantage Highway and will have a moderate level of visual impact. However, these impacts will be temporary due to the short-term nature of construction. The landscape units with the greatest numbers of viewers with middleground views of the project site (i.e., the areas to the south and west) are areas in which construction activities will not be visible because they will be hidden behind the ridgeline formed by Whiskey Dick Mountain. From vantages with background views of the site, the visual effects will be relatively minor and will have little or no impact on the quality of views. After construction is complete, all construction-related debris will be removed from the site and areas disturbed during construction will be replanted to restore the appearance of their original vegetative cover.

3.10.3.3 Operations and Maintenance Impacts

The project's operational period is assumed to be 20 years. As the project approaches the end of its useful life, the project owner will either make plans to remove the project from the site, or will initiate the permitting process required to obtain permission to replace the turbines with new equipment (repowering). The project's aesthetic impacts during the operational period are presented in Table 3.10-2. The project has the potential to create moderate levels of visual impact in areas at the eastern edge of the Kittitas Valley and in the upland areas to the west, north, and east of the project site, where there are wildlife reserve lands and a small number of seasonal residences. In the other areas evaluated, the project's aesthetic effects would be low.

Table 3.10-2. Analysis of Impacts on Visual Resources During Project Operation

Landscape Areas/ Simulation Views	Existing Level of Visual Quality	Level of Visual Sensitivity	Assessment of Visual Change	Potential Level of Visual Impact
1 – Vantage Highway Corridor South of Project Site				
Simulation View 1 (Figure 3.10-2b) View looking west from Vantage Highway 0.4 mile east of project site access Road	Moderately high	Moderate	<p>Turbines will be visible along the ridgeline and southern slopes of Whiskey Dick Mountain at distances of 1.9–4.1 miles. All turbines will be either partially or fully silhouetted against the sky, with the degree of visual contrast and visual salience being moderate. The presence of the turbines will reduce the scene’s degree of intactness by introducing highly engineered vertical elements in an otherwise natural appearing landscape, and will have a minor effect on the visual unity of the scene’s composition. However, the presence of the string of turbines that accentuates the ridgeline may enhance the vividness for some viewers. The roadways that will be constructed to provide access to several of the strings on the south face of the mountain will be visible as thin lines of gravel that contrast with the surrounding vegetated slope. The O&M facility, located on a flat area at the top of the ridge near turbine E1, will be detectable. At 2.7 miles, the small O&M structure on the north side of the ridge’s crest will not be a major element in the view. The treatment of the structure’s surfaces with low-reflectivity colors blending with the surroundings will reduce the facility’s visibility. The new transmission line down the slope of the ridge will be visible, but will be a recessive element in the view because the wood-pole H-frame towers will be visually absorbed by the hillside backdrop. The visitor kiosk along the project access road in the vicinity of Vantage Highway will be small and painted with nonreflective, landscape-matching colors and will not be a highly visible element from this viewpoint. The WHWPP will result in a highly noticeable change in this view, adding a large number of tall turbines and several smaller project elements to a scene that is now generally rural in character.</p> <p>Although the appearance and character of this view will be changed, the overall level of visual impact will be less than significant in that the view’s level of visual sensitivity is low to moderate; although the view’s moderately high level of visual quality may be decreased, the decrease will not be substantial because the landscape’s topography and vegetative cover will remain mostly intact. The overall level of visual impact will be moderate.</p>	Moderate

Landscape Areas/ Simulation Views	Existing Level of Visual Quality	Level of Visual Sensitivity	Assessment of Visual Change	Potential Level of Visual Impact
2 – Valley Lands at Eastern Edge of Kittitas Valley				
Simulation View 2 (Figure 3.10-3a) View looking east from Vantage Highway at Parke Creek Road	Moderately high	Moderate	<p>From this viewpoint, turbines will be visible along the ridgeline and the upper slopes of Whiskey Dick Mountain. The turbines will be 4.5–7.6 miles distant; accordingly, all turbines will be in the far middleground and background zones of the landscape.</p> <p>Figure 3.10-3b is a simulation of the preferred alternative as it would appear with the 213-foot-high (to hub height) turbine towers. Figure 3.10-3c is a simulation of this view as it would appear under the 158-turbine/1.0-MW scenario; Figure 3.10-3d is a simulation of the project’s appearance under the 104-turbine/3-MW. As comparison of these three simulation images suggest, the turbines with the 262-foot towers appear somewhat taller and more noticeable than the turbines with the 213-foot towers, and the turbines with the 197-foot towers appear slightly smaller than the turbines with the 213-foot towers. Another difference among the three scenarios is that there are fewer of the taller turbines spread farther apart, while there are more of the shorter turbines spaced more closely together. At this viewing distance and in this context, the overall visual effects of the three scenarios are about the same.</p> <p>Although the turbines will be silhouetted against the sky, the distance from the viewer and the light color of the turbines will result in moderate visual contrast and sensitivity. The presence of the turbines will reduce the scene’s degree of intactness by introducing highly engineered vertical elements into a landscape that is now rural and open. The line of turbines along the ridgeline will have an orderly appearance, but its effect on the visual unity of the scene’s composition will be low. The presence of the string of turbines that accentuates the ridgeline may enhance the vividness of this view for some observers. The overall level of visual impact on this view will be moderate.</p>	Moderate

Landscape Areas/ Simulation Views	Existing Level of Visual Quality	Level of Visual Sensitivity	Assessment of Visual Change	Potential Level of Visual Impact
3 – Lands to the West, North, and East of the Project Site				
Simulation View 3 (Figure 3.10-4a) View looking south from rangeland north of the project site in Section 32, Township 19 North, Range 21 East	High	Moderate (views from wildlife lands) Low to Moderately high (views from seasonal residences)	<p>From this viewpoint, turbines will be visible on the high-elevation plateau that extends southward to the ridgeline of Whiskey Dick Mountain at distances of 2.8–7.8 miles. Most of the turbines will be seen entirely against the ground plane or distant ridgelines; the contrast between the lighter color of the turbines and the darker color of their backdrops will create a moderate level of visual contrast, increasing the visibility of these turbines. A small number of turbines visible in this view will be seen as fully or partially silhouetted against the sky; the neutral gray color of the turbines will reduce their contrast with the sky. Portions of the roads along the strings closest to this viewpoint may also be visible. The gravel of these roadways have the potential to create thin, linear bands that contrast with the color of the surrounding ground plane. The overhead collection line, O&M facility, step-up substation(s) and a portion of the project transmission line will be visible from this viewpoint; however, at a viewing distance of 4.5 miles or more, these project elements will not be highly detectable and will have a low impact on the view. The large number of visible turbines spread across the landscape in this view will have an adverse effect on the landscape’s degree of unity and intactness, decreasing its overall level of landscape quality. The overall visual impact will be moderate to small, as this viewpoint does not have many viewers.</p> <p>Turbines will be located in two areas encompassing ridgelines along upper Whiskey Dick Creek in the Whiskey Dick Wildlife Area. To the extent that hunters or other users of the wildlife area are on or near these areas, the landscape that they experience will be highly altered, with turbines and other project-related facilities visible in the immediate foreground. Although the character of the landscape in these areas will be transformed, and the existing visual quality reduced, the level of impact will be low because of the moderate visual sensitivity of these lands.</p>	Moderate

Landscape Areas/ Simulation Views	Existing Level of Visual Quality	Level of Visual Sensitivity	Assessment of Visual Change	Potential Level of Visual Impact
4 – Kittitas and Surrounding Valley Areas				
<p>Simulation View 4 (Figure 3.10-5a)</p> <p>View looking east from intersection of Patrick Avenue and No. 81 and Clerf Roads at the edge of the city of Kittitas</p>	Moderate to Moderately high	Low	<p>From this viewpoint at the edge of Kittitas, turbines will be visible running in a line along the distant ridgeline of Whiskey Dick Mountain. These turbines will be 8.3 to more than 11 miles distant; accordingly, all the turbines would be well into the background distance zone.</p> <p>Figure 3.10-5b is a simulation of the proposed project as it would appear with the 213-foot (to hub height) turbine towers. Figure 3.10-5c is a simulation of this view as it would appear under the 158-turbine/1.0-MW scenario; Figure 3.10-5d is a simulation of the project’s appearance under the 104-turbine/3-MW. As comparison of these three simulation images suggest, the turbines with the 262-foot towers appear somewhat taller and more noticeable than the turbines with the 213-foot towers, and the turbines with the 197-foot towers appear slightly smaller than the turbines with the 213-foot towers. Another difference among the three scenarios is that there are fewer of the taller turbines spread farther apart, while there are more of the shorter turbines spaced more closely together. At this viewing distance and in this context, the overall visual effects of the three scenarios are low.</p> <p>In all three alternatives, turbines would be silhouetted against the sky, but due to the far viewing distance and their light color, the visual contrast will be low. They would have a moderate degree of visual sensitivity in all three cases. The presence of the turbines would reduce the scene’s degree of intactness by introducing vertical elements along a distant ridgeline that currently has a natural profile, but the degree of change would be limited by the fact that the turbines are distant and would be secondary elements in the overall view. The effect on the scene’s degree of visual unity would be low because the line of turbines extending along the ridgeline would have an orderly appearance. The presence of the string of turbines that accentuates the ridgeline may enhance the vividness of this view for some viewers. The overall level of visual impact on this view would be low.</p>	Low

Landscape Areas/ Simulation Views	Existing Level of Visual Quality	Level of Visual Sensitivity	Assessment of Visual Change	Potential Level of Visual Impact
5 – Lands East of the Columbia River				
(Figure 3.10-6a) View looking west from I-90 west of Silica Road exit	Moderate to Moderately high	Low	From this viewpoint, more than ___ turbines will be seen spread across the upper slopes of the ridgeline in the far distance. All the turbines will be approximately 9–13 miles distant; accordingly, all would be well into the background distance zone. Some turbines will be seen entirely against the slopes of the ridge; the contrast between the lighter color of the turbines and the darker color of their backdrop will create a moderate level of visual contrast, increasing the visibility of these turbines. Many turbines will be seen as fully or partially silhouetted against the sky; their neutral gray color will help them to blend into the sky. The effect of the turbines on this view will be greatly attenuated by the fact that they are located so far in the distance. Under hazy atmospheric conditions, they will be less noticeable. The presence of the turbines will reduce the scene’s degree of intactness by introducing vertical elements along a distant ridgeline that now has a natural profile. The turbines will also have an effect on the view’s level of unity and intactness. The overall level of visual impact on this view would be low.	Low
6 – I-90 in the Vicinity of the PSE Interconnect				
(Figure 3.10-7a) View looking west from I-90 east of the freeway’s overcrossing of Stevens Road	Moderately Low	High	Figure 3.10-7b is a simulation of the view from the westbound lanes of I-90 looking toward the proposed PSE transmission feeder line and the substation that would connect this line with the PSE transmission system. In this view, the PSE interconnect substation would be visible at the base of the communications tower located at the top of the knoll in the center of the view. The substation’s takeoff structures and the H-frame transmission towers, which would be seen against the sky backdrop, would be the project’s most visible features. The impact of the proposed PSE interconnect substation and the PSE transmission feeder line on the visual character and quality of views in this area would be low.	Low

Project Appearance

The physical elements of the project are described in detail in Section 2.2.3, “Project Facilities.” Figure 1-2 shows a general site layout indicating the locations of proposed roads, overhead and underground transmission lines, substations, operations and maintenance (O&M) facility, and other project features.

The Applicant has proposed three different scenarios of rotor heights and number of turbines for the project site layout. Table 3.10-3 provides the rotor dimension and number of turbines for the three proposals. The turbines would be mounted on tubular steel towers approximately 18 feet in diameter at the base and with a hub height of up to 262 feet. Each tower would support a nacelle that houses a drive train, gearbox, generator, and other generating equipment. The nacelles would be approximately 30–37 feet long, 10–11 feet wide, and 10–12 feet high. The nacelles would be completely sheathed in an aerodynamically shaped fiberglass or metal shell. The rotors would be attached to the front of the nacelles, which are mounted on the tops of the towers. The rotors would have three blades with diameters of 197–295 feet. Each rotor would have an aerodynamic nose cone. The dimensions provided here represent the entire range of sizes of the various turbine models being considered for this project. Because the differences between the three scenarios are negligible and do not reflect changes in string layout or locations within the site, the impacts summarized in Table 3.10-2 apply to all three scenarios. Simulation views 2 and 4 were modeled using the 104-Turbine/3 MW, 136-Turbine/1.5 MW (most likely), and 158-Turbine/1 MW wind turbine scenarios. At most public viewing points, the overall visual effects of the three scenarios do not differ significantly. The visual impact would be quite low for all design scenarios under consideration.

Table 3.10-3. Project Site Layout Scenarios

Component	104 Turbines/3 MW	136 Turbines/1.5 MW (Most Likely Scenario)	158 Turbines/1 MW
Rotor diameter	295 feet	231 feet	197 feet
Number of turbines	104	136	158
Total height	410 feet	378 feet	361 feet

The Applicant is considering several turbine models from different vendors. The final decision regarding turbine and tower dimensions is driven largely by project economics (e.g., turbine pricing) and the performance of specific turbines under different wind conditions. The primary difference among the turbine models being considered is the rotor diameter, which could range from 197 to 295 feet. Most of the visual simulations presented here are based on a turbine with a hub height of 213 feet and a rotor diameter of 236 feet, the dimensions of the most likely scenario. For two of the simulation views, simulations are provided of the turbines with dimensions at the high and low ends of the dimension range (Figures 3.10-3a and b and Figures 3.10-5c and d) to allow visual comparison of the slightly larger and taller turbines with the turbines most likely to be used, which have been simulated in all views.

The surfaces of the turbine towers, rotors, and nacelles will be neutral gray and will be given a finish that has a low level of reflectivity. Information from the turbine manufacturers indicate

that the turbines and nacelles will be coated with a semi-gloss material; the two products available for this purpose have gloss ratings of 70% and 75%. The rotors will be made of materials similar to those used for rotors on turbines installed in other wind generation facilities developed recently in Washington; like those of existing turbines, the rotors of the planned turbines will not have highly reflective surfaces. Over time, the surfaces of the turbine equipment, like any coated surface exposed to the elements, will tend to weather; the effect of this weathering will be to dull the surfaces, producing a further decrease in levels of reflectivity.

The power generated by the turbines will be delivered to the project substation by means of a largely underground electric collection system. Small, pad-mounted transformers located at the base of each turbine tower will convert the electricity produced by the turbine to a transmission voltage of 34.5 kV and will connect to the underground collection lines. Each of the transformers will be housed in a metal-sided case approximately 8 feet wide, 8 feet long, and 8 feet high. The transformer housings will be painted in earth-tone colors using paint with a low-reflectivity finish. An approximately 2-mile-long segment of the collection system connecting the northern and southern portions of the project will be above ground due to the large amount of power flowing through this portion of the collection system (Figure 1-2). The first proposed collector line would extend from the north end of String E to the site of the proposed PSE step-up substation just west of String H. This portion of the collection system would be carried on single wood poles 40 to 60 feet tall with dual crossarms. Because this line would be located in an area north of the high ridgeline formed by Whiskey Dick Mountain, it would not be visible from areas to the south and west.

The network of roads that would provide access to each of the turbines would consist of both existing and new roads with a compacted gravel surface and a width of 20 feet where possible and 34 feet in other areas (approximately half the road miles will be 20 feet wide and the other half will be 34 feet wide). In areas with steeper slopes, cutting and filling will be required to keep grades below 15%.

The proposed O&M facility would be located on a flat area just north of the crest of Whiskey Dick Mountain near turbine E1. To construct this facility, the existing shrub-steppe vegetation on the site will be cleared and the site will be graded and fenced. The primary structure in the O&M facility will be a main building approximately 50 feet wide, 100 feet long, and 35 feet high. This building will house offices, spare parts storage, and a shop area. It will have siding painted with low-reflectivity paints in earth-tone colors to blend with the surrounding landscape. The outdoor areas devoted to parking and vehicle turning will be covered with gravel to minimize dust and runoff.

A small visitor kiosk is planned for a site located on a small, flat plateau approximately 0.1 mile north of Vantage Highway and along the west side of the road that will provide access from Vantage Highway into the project site.

Two sites have been proposed as locations for step-up substations. The site for the substation that would transform power for transmission to the BPA grid would be located in the plateau area north of the ridgeline formed by Whiskey Dick Mountain in the area near String J. The site for the substation that would step up power for transmission to the PSE system would be located further south in the plateau area, near String H. It is possible that either or both sites would be developed. In either case, the substation(s) would occupy an area of 2–3 acres that would need to be cleared and graded.

The primary elements of a substation on either site would include outdoor control cabinets, large transformers, structures housing switchgear, bus work, steel support structures, lightning suppression lines, outdoor lighting, and a perimeter chain link fence. The tallest structures would be the steel support structures, which would be approximately 60 feet tall. The bus work would be approximately 40–45 feet tall. The transformers, switchgear structures, and control building would be no more than 15–20 feet tall. Although the substation control cabinets would be painted an earth-tone color using low-reflectivity paints, the substation equipment would have a standard low-reflectivity neutral gray finish. Both proposed step-up substation sites are north of Whiskey Dick Mountain and would not be visible from main public roadways including Vantage Highway and I-90.

Light and Glare

Turbine Lighting

The project would be marked according to guidelines established by the Federal Aviation Administration's (FAA's) aircraft safety lighting requirements. FAA guidelines for lighting of wind turbines call for lights that flash white (at 20,000 candela) during the day and red (at 2,000 candela) at night. These lights are designed to concentrate the beam in the horizontal plane, thus minimizing light diffusion down toward the ground and up toward the sky. The exact number of turbines that will require lighting will be specified by the FAA after it has reviewed final project plans; however, FAA has typically required that warning lights be mounted on the first and last turbines of each string, and every 1,000–1,400 feet on the turbines in between. Aside from any required aircraft warning lights, the turbines will not be illuminated at night.

The FAA is now in the process of reviewing its safety lighting standards for wind energy facilities and is in the process of developing revised requirements. The research that the FAA has undertaken as part of this review suggests that the revised requirements are likely to go in the direction of requiring fewer lights that could be located further apart (Patterson 2003)

Based on experience at the operating Stateline and Nine Canyon wind power projects in Washington, it appears that the white flashing lights would be visible and likely to create a moderate or high level of visual impact.

At present, the project site and immediately surrounding area are dark at night except for the lighting present on the communications towers on Cribb Peak near the eastern end of Whiskey Dick Mountain's ridgeline. The flashing red lights associated with the project would be operated at night and would introduce a new element into the project area's nighttime environment. These lights would be limited in number, red, and directional with little potential to create skyglow¹ or backscatter.²

Figure 3.10-9 is a nighttime photo taken at the Nine Canyon Wind Power Project in Benton County, Washington, for the purpose of illustrating typical night lighting conditions. This photo was taken at a distance of about 1 mile from the closest turbine string at the location indicated on

¹ Skyglow is a brightening of the night skies caused by light that is projected upward and then reflected back toward the ground by the atmosphere.

² Backscatter is related to skyglow; the term refers to the reflection of light back toward the ground by moisture or dust in the atmosphere.

the map in Figure 3.10-10. The cluster of lights on top of the ridgeline at the right side of the photo is the night lighting at a radio tower complex that is not a part of the wind energy project. The remaining visible lights are the red aircraft safety lights associated with the Nine Canyon turbine strings. These lights are visible as small blinking points of light; they do not light up the sky or the surrounding landscape. The flashing red lights associated with the WHWPP would be most noticeable in areas within roughly 1 mile of the project. No residences or public residences are within this area.

Facility Lighting

At the O&M facility and substation(s), outdoor night lighting will be required for safety and security. This lighting will be restricted to the levels required to meet safety and security needs. Sensors and switches will be used to keep lights turned off when not required. All lights will be hooded and directed to minimize backscatter and illumination of areas outside the O&M and substation sites.

The project's O&M facility and substation(s) will create sources of light in areas where there are currently no nighttime sources of light. However, these lights will not be visible in views toward the project, because they will be situated behind the ridgeline of Whiskey Dick Mountain's ridgeline. The one exception is the view into the plateau area from the area north of the site along upper Parke Creek Road. However, because of the viewing distance from this area (4 miles or more) and the minimal amount of lighting involved, the impact will be low.

Mitigation measures will be implemented to restrict the substation and O&M facility lighting to the minimum required and to attenuate its effects. High-illumination areas not occupied on a regular basis will be equipped with switches or motion detectors to light these areas only when occupied. At times when lights are turned on, the lighting will not be highly visible off site and will not produce offsite glare effects because lighting will be restricted by specification of non-glare, hooded fixtures, and by placement of lights to direct illumination only into those areas where it is needed. Implementation of these measures will restrict the potential for lighting to create skyglow or backscatter.

Shadow Flicker

Shadow flicker, or strobe impacts, can occur only if the turbine is located close to a receptor and is in a position where the blades interfere with very low-angle sunlight. The project is not expected to result in any shadow flicker effects on any sensitive receptors, such as residences, because the distance of more than 9,000 feet to the nearest residence is well beyond the distance at which shadow flicker can cause impacts. A detailed discussion and analysis of the project's potential to create shadow flicker and any potential health effects is included in Appendix A.

3.10.3.4 Decommissioning Impacts

The project's operational period is assumed to be 20 years. As the project nears the end of its useful life, the project owner will either make plans to remove the project from the site (decommissioning), or will initiate the permitting process required to obtain permission to replace the turbines with new equipment (repowering). If the turbines are replaced, this would be carried out under a repowering program similar to those that have been implemented at several earlier wind power projects in Europe and California.

Decommissioning would consist of removing aboveground equipment (e.g., turbine and meteorological towers and their associated foundations to a depth of 3 feet below ground). Wind turbine foundations more than 3 feet below ground would remain. The ground surface would be restored to natural contours and revegetated to a natural condition.

For several years after decommissioning, site disturbance would be visible on close examination. The visual impacts of those aboveground elements that are not removed would remain. During the decommissioning process, impacts similar to those resulting from construction activities would occur, but to a lesser extent because less construction material would be removed than was delivered to the wind turbine sites.

3.10.4 Impacts of Alternatives

3.10.4.1 Impacts of Offsite Alternatives

Kittitas Valley Alternative

During construction, large earthmoving equipment, trucks, cranes, and other heavy equipment would be highly visible from nearby areas. The visual changes associated with construction activities would have a moderate to high visual impact. Areas disturbed during construction would be restored on project completion. Some construction activities may occur during evening or nighttime hours, and lighting may be needed.

The project has the potential to create high levels of visual impact at several locations. Of the 11 viewpoints analyzed and rated for scenic quality for this alternative, high or moderately high impacts are expected in the U.S. 97 corridor where turbines would be less than 0.5 mile from the highway or from residences; along Bettas Road due to proximity to residences; along SR 10 due to proximity to a Scenic and Recreational highway; and from FS Road 35 due to the high scenic quality of existing views from this area. Moderate impacts are expected to occur along US 97 where the highway and residences are greater than 0.5 mile from the project site; to drivers on Bettas Road due to a low number of users; to residences along SR10 due to distance and orientation of views from residences; and for the Thorp Highway, I-90, and along Lower Green Canyon Road due to distance. Low levels of impact are expected for ridges east of US 97, the John Wayne Trail, and the Thorpe Highway due to distance and low levels of use. Overall, visual impacts from this alternative would be greater than for the WHWPP due to proximity to a greater number of residences and views from a greater number of high use roads and scenic areas.

Turbines would be visible from US 97 and on the ridgetops throughout the project vicinity. The turbines would be seen against the sky or against the slopes of distant hills. Under some lighting conditions, the turbines would contrast with the backdrop, increasing the visual impact. Brown turbines have greater contrast with the sky than gray turbines and would have greater visual impact on views where they are seen against the sky. Accordingly, the turbines would have a neutral gray finish to minimize aesthetic impacts.

Impacts from light and glare would be similar under this alternative as described for the WHWPP, but would be expected to be greater due to the proximity of the Kittitas Valley alternative to high use roads and a larger number of residences than the WHWPP.

During project construction, double shifts may be necessary, which would in turn necessitate night lighting of the construction site, which would be visible from roads and residences. This would be temporary and short-term impacts.

Impacts from operations and maintenance would occur primarily in association with lighting required by the FAA. As per FAA regulations, specific turbines would be equipped with lights that flash white during daylight hours and red at night. The white lights would be visible during the day but not considered intrusive; however, the red flashing lights would be noticeable, particularly from nearby residences, and may adversely impact views.

Night lighting of project facilities would increase nighttime illumination in the vicinity, potentially impacting views from roads and residences.

The potential for impacts from glare would depend largely on materials used; however, glare would be minimized by using a low-reflectivity finish on all turbines.

Desert Claim Alternative

Visual changes associated with construction and operation of the Desert Claim Wind Power Project would have temporary but moderate visual impacts on nearby residences and roads. During construction (approximately 9 months), equipment, clouds of dust, and exposed soils would create temporary visual impacts.

Under this alternative, visual impacts would be greatest for the Northwest Valley Floor unit, with high level impacts from 2 viewpoints, moderate level impacts from 2 viewpoints, and low level impacts from the remaining viewpoint. Of the remaining units, this alternative would have moderate level impacts to one of three viewpoints in the greater Ellensburg unit and to the Hayward Hill and Table Mountain slope units. The remaining viewpoints would all experience low level impacts.

Visual impacts from this alternative are likely to be less than the WHWPP and the Kittitas Valley alternatives due to it not being visible from the Columbia River Gorge as compared to the WHWPP, and greater distance from major transportation routes such as I-90 and US-97 and fewer residences in close proximity than the Kittitas Valley alternative.

Impacts from light and glare under the Desert Claim alternative would be similar to those described for the WHWPP but greater due to closer proximity to residences. Wind turbines along the perimeter of this alternative would have dual lighting systems to meet FAA safety requirements. As described for Kittitas Valley, white lights flashing during the day are expected to be noticeable but have a low level impact while red lights flashing at night would be

noticeable from roads and residences and could have a high level impact on views in the project area. Residences in the Northwest Valley and Table Mountain slope assessment units would experience the greatest impact. Night lighting of project facilities would also contribute to increased night lighting in the project area.

Blade glare or glint may also occur occasionally, and this can be seen over distances of 6 to 9 miles.

Springwood Ranch Alternative

Visual impacts associated with construction would have a temporary but moderate visual impact on views from nearby residences and roads in the Thorp Prairie area. The construction-related visual impact from more distant viewpoints would be low.

The Springwood Ranch project would have significant visual impacts during operation. This alternative would be highly visible from I-90, with turbines located in middle-ground views and breaking the skyline, with similar impacts to views from SR 10 and the Thorp Highway. The visual quality of expected future views would be affected by the size, color, and arrangement of the turbines. The additional impact of experiencing the turbine's strong vertical forms across the wide-open, horizontal space would affect rural residences. From all views, the turbine arrangement would appear cluttered and overwhelming because it would be unrelated to a topographic or geometric order and would include too many turbines in a continuous cluster (Gipe 2002). Overall, development of a wind farm on Springwood Ranch would significantly change the aesthetic character of the local landscape, especially as viewed from I-90, and high level impacts would be expected.

The required aviation marking lights would result in significant additional impacts on nearby residents and passing motorists. Flashing white lights during the day would be noticeable, but not significant due to the lack of contrast with daylight. Flashing red lights at night would be visible from I-90, the Thorp Highway, and SR 10, as well as from residences in Thorp and the immediate vicinity. Security lighting at the O&M facility and the project substation would have minimal impact on the nighttime visual environment if it were tied to motion sensors. Blade glint or glare from sunlight reflecting off moving blades could possibly be an annoyance to eastbound drivers on I-90 late in the day.

Swauk Valley Ranch Alternative

Impacts to visual resources under this alternative would be similar to those described for the Springwood Ranch alternative, with both construction activity and operating turbines visible from I-90, SR10, and from nearby residences. Although information from individual viewpoints is not available for this alternative, it is expected that high level impacts would result from construction of this alternative due to its location.

Impacts from light and glare would also be similar to those described for the Springwood Ranch alternative.

3.10.4.2 Impacts of No Action Alternative

Under the No Action Alternative, the project would not be constructed or operated, and the visual and aesthetic impacts described would not occur. The No Action Alternative assumes that future development would comply with existing zoning requirements for the project area.

In the short-term, the visual character of foreground, midground, and distant views would remain similar to the existing conditions. The existing views are primarily of open, non-forested hillside rangelands. It is likely these conditions would persist into the long-term unless the present zoning is changed allowing for a different land use, or the land is purchased and converted to a different use (i.e., mining, or different agricultural use) permitted under the County's zoning code.

If the proposed project is not constructed, it is likely that the region's need for power would be addressed by user-end energy efficiency and conservation measures, by existing power generation sources, or by the development of new renewable and nonrenewable generation sources. Visual and esthetic impacts would depend on the type of facility being constructed.

3.10.5 Mitigation Measures

Mitigation measures proposed by the Applicant and incorporated into the project's design include the following:

- Active dust suppression will be implemented to minimize the creation of dust clouds during the construction period.
- Areas disturbed during the construction process will be reseeded to facilitate their return to natural-appearing conditions when construction is complete.
- The wind turbine towers, nacelles, and rotors used will be uniform and will conform to the highest standards of industrial design to present a trim, uncluttered, aesthetically attractive appearance.
- The turbines will have neutral gray finish to minimize contrast with the sky backdrop.
- A low-reflectivity finish will be used for all surfaces of the turbines to minimize the reflections that can call attention to structures in a landscape setting.
- The rotors will be turning approximately 80–85% of the time as a result of local wind conditions and the equipment used. This will minimize the appearance of the turbines being non-operational.
- The small cabinets containing pad-mounted equipment that will be located at the base of each turbine will have an earth-tone finish to help them blend into the surrounding ground plane.
- The only exterior lighting on the turbines will be the aviation warning lighting required by the FAA. This lighting will be kept to the minimum required intensity to meet FAA standards. It is anticipated that the FAA will soon be issuing new standards for marking of wind turbines that will entail lighting fewer turbines in a large wind farm than is now required, as well as synchronizing all the lights. These potential regulatory changes are being closely monitored and if, as is likely, they are made before project construction begins, the aviation safety marking lighting will be designed to meet these revised standards.

- Most of the project's electrical collection system will be located underground, eliminating potential visual impacts.
- Where feasible, existing road alignments will be used to provide access to the turbines, minimizing the amount of additional surface disturbance required. Where possible, access road widths will be restricted to 20 feet (approximately half of all access road miles.) The access roads will have a gravel surface and will have grades of no more than 15%, minimizing erosion and its visual effects.
- The O&M facility building will have a low-reflectivity earth-tone finish to maximize its visual integration into the surrounding landscape.
- The parking areas at the O&M facility will be covered with gravel, rather than asphalt, to minimize contrast with the site's soil colors.
- Outdoor night lighting at the O&M facility and the substation(s) will be kept to the minimum required for safety and security, sensors and switches will be used to keep lighting turned off when not required, and all lights will be hooded and directed to minimize backscatter and offsite light trespass.
- All equipment at the substation(s) will have a low-reflectivity neutral gray finish to minimize visual sensitivity.
- All insulators in the substations and takeoff towers will be non-reflective and non-refractive.
- The control buildings located at each substation will have a low-reflectivity earth-tone finish.
- The chain-link fences surrounding the substations will have a dulled, darkened finish to reduce their contrast with the surroundings.

3.10.6 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts will take place during the 12-month construction period.

The project would create substantial changes to the open space character of the area and, to a lesser extent, to the quality of a number of views toward the project site during the 20-year period of project operation. These changes would not constitute significant impacts because of the low to moderate levels of sensitivity of the affected views.