

3.11 VISUAL RESOURCES/LIGHT AND GLARE

3.11.1 Introduction

3.11.1.1 Purpose and Scope

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 represent 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. These natural and built landscape features or visual resources contribute to the public's experience and appreciation of the environment. 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.

In response to EFSEC's requirements for assessment of a proposed project's aesthetic and light and glare impacts, this chapter documents the visual conditions that now exist in the area in which the Wild Horse Wind Power Project (Project) is located and evaluates the implications that the Project would have for the public's experience of the area's aesthetic qualities, and day and night light conditions.

3.11.1.2 Overview of Wind Energy Aesthetics Issues

Wind energy has a long history in that it has been used for centuries for grinding grain and pumping water. As a consequence in many places, including ranches in the American west, windmills have been a long-established and well-accepted part of the landscape. In the United States, large-scale use of wind power to generate electricity first took place in California in the 1980's with establishment of wind farms such as those in the Altamont, Tehachapi, and San Geronio Passes involving large numbers (thousands) of small turbines that were closely spaced. Many of these early turbines were supported on lattice steel towers that were similar in appearance to the towers frequently used for transmission lines. These wind farms were located on highly visible sites, in many cases, within close range view of major freeway corridors, and generated considerable discussion about their appearance. Reaction to the wind farms was split. In the view of some, the turbines were visually dominant technological structures that adversely affected the natural or rural character of the landscapes in which they were located. In the view of others, though, the wind turbines were visually interesting technological objects, and the strings of turbines along the ridgelines were seen as delineating and emphasizing the topography's variations. In addition, the movement of the turbines in the wind was seen as introducing an unusual kinesthetic dimension to the visual experience. To some extent, the turbines became a point of visual interest, and were featured in films and advertisements, and were depicted on post cards sold in the regions around the facilities. Although many appreciated the early California wind farms as positive visual features,

they created a number of specific aesthetic problems. These problems included creation of dense, disorderly, cluttered-appearing arrays of turbines on hillsides; use of rickety appearing lattice steel towers with awkward designs; use of a variety of highly divergent turbine designs of varying heights in a single installation, creating a sense of visual disunity; the presence of non-operating turbines; visual impacts related to poorly engineered road cuts; and visible erosion of hillsides related to improper drainage of access roads. This experience in California provided valuable lessons that have been drawn on in planning and designing subsequent wind energy installations in a way that avoids the aesthetic issues associated with these early projects.

Perception research validates that even though these early California wind farms created specific aesthetic problems, the public perceptions of them, although mixed, were generally favorable. For example, research on public perceptions of the Altamont Wind Energy Area by Thayer and Freeman (1987) found that those surveyed perceived the wind farms in the Altamont Pass area to be highly visible, constructed environments, but that more respondents tended to like wind energy developments than dislike them. However, when asked to rate photos of the wind installations on a scale from beautiful to ugly, respondents rated the views as neutral to slightly ugly. Thayer and Freeman discovered that reactions to the Altamont wind energy installations were complex, and factors other than beauty played a major role in determining them. The symbolic or connotative aspects of the wind energy facilities were found to be particularly important in influencing reactions. Those who indicated strongly positive attitudes toward the wind energy facilities were likely to find them to be appropriate, efficient, safe, natural (in the production of energy) progressive, and a sign of the future. Those who indicated strongly negative attitudes tended to cite the visual conspicuousness, clutter, and unattractiveness of the facilities. This finding led Thayer and Freeman to conclude that the two groups focused on different aspects of the facilities "...with the 'like' group responding strongly to the symbolic, referential attributes not automatically associated with the visual stimuli. This group was willing to forgive the visual intrusion of the turbines on the existing landscape for the presumably higher goals of the project where dislikers were not." (Thayer and Freeman 1987, p. 394)

One of Thayer and Freeman's key findings related to the importance of symbolic aspects in influencing evaluations of wind energy developments is that viewers have negative responses when they see turbines that are not operating. They discovered that viewers expect the turbines to turn when the wind is blowing, and when these expectations are not met, they have negative reactions. Based on their research, Thayer and Freeman reached a number of conclusions related to design measures that could improve the public's perceptions of wind farm attractiveness. Design measures supported by their research include (Thayer and Freeman 1987, pp. 395-396):

- Use of neutral colors for turbines;
- Evenly spaced arrays;
- Consistency in turbine type and size within arrays;
- Use of fewer, larger turbines versus use of more smaller ones;
- Minimization of conspicuously malfunctioning turbines

The proposed Wild Horse Wind Power Project builds on and applies the lessons learned from the California experience. Development of the Project's proposed layout and operational plans were informed by the design principles identified by Thayer and Freeman, and other observers of recent wind energy experience in California and in Europe as well, where the level of concern with landscape values is particularly high. In addition, the Project will make use of the latest generation of turbines, which are larger, more widely spaced and rotate at lower RPM (revolutions per minute) than those used in earlier projects. The equipment being used reflects design refinements made by industrial designers intended to make the turbine towers, nacelles, and rotors, sleek and attractive elements in the landscape.

3.11.1.3 Methodology

This analysis of the visual effects of changes that might occur with implementation of the proposed wind energy facility is based on field observations and review of the following information: research about wind energy facility visual effects, public perceptions of wind energy facilities, and design measures for integrating wind energy facilities into their 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; and computer-generated visual simulations. Site reconnaissance was conducted from March 2003 through June 2003 to observe 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 the Transportation Federal Highway Administration (FHWA) (US DOT 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) that specify the analysis of aesthetic and light and glare issues as part of the EFSEC process. Included are systematic documentation of the visual setting, an evaluation of visual changes associated with the Project and measures designed to mitigate the Project's visual effects, including lessening of any light and glare impacts and restoration or enhancement of any portions of the landscape that may have been disturbed during construction.

3.11.2 Existing Conditions

3.11.2.1 Regional and Local Landscape Settings

The lands on which the Wild Horse Wind Power Project is sited extend across a roughly 4 mile by 5 mile area located in the upland areas on and to the immediate north of Whiskey Dick Mountain, a 3,873 foot high ridge located approximately 14 miles to the east of the City of Ellensburg, and 9 miles east of the town of Kittitas. Whiskey Dick Mountain is a small part of a large region of ridgeland that frames the eastern edge of the Kittitas Valley, and separates 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. In scattered locations in draws and adjacent to springs, there are small clusters of ponderosa pines.

Most of the Project site is a portion of a much larger (~25,000 acres) private ranch property, and it also includes four sections of land that belong to the Washington Department of Natural Resources and one section that belongs to the Washington Department of Fish and Wildlife. The property is not crossed or bordered by any public roads. The closest public roadways are Vantage Highway, which lies a minimum of 1.3 miles south of the Project area's southern boundary, and Parke Creek Road, which lies a minimum of 4.0 miles from the Project area's western perimeter. The only access into the Project area is by way private gravel roads, and over which the public does not have the right to pass. On the Project site and on the larger ranch parcel of which it is a part, there are no residential or agricultural structures. The only structures on the site consist of the collection of antennae at the communication facility on Cribb Peak, a 3,558 foot elevation peak in the eastern portion of the ridge formed by Whiskey Dick Mountain, and several meteorological test towers at locations scattered across the Project site. The safety lighting on these structures is also the only lighting in the area.

Large portions of the eastern slopes of the ridge area of which Whiskey Dick Mountain is a part are wildlife lands administered by the Washington Department of Fish and Wildlife as the Whiskey Dick and Quilomene units of the L. T. Murray Wildlife Area. These wildlife lands generally consist of steep, rocky slopes and narrow, riparian bottoms vegetated with sagebrush and bitterbrush, mixed with various bunchgrasses. The purpose of these wildlife lands is to provide habitat for the Colockum elk herd, as well as for mule deer and other wildlife. There are no developed uses on these lands, and the only access is by a system of rough, unpaved roads.

Ginkgo Petrified Forest State Park is a 7,470 acre state park that lies to the immediate 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 I-90. The park was established in the 1930's to protect the large area of both exposed and buried petrified wood located 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 are a boat ramp, picnic, and swim area, and 50 camp sites; at the Heritage Area just north of Vantage, where there is an interpretive center and picnic area; and at the Natural Area located along the north side of the Vantage Highway, two miles west of Vantage, where there is a 2.5 mile trail system that includes a 1.5 mile interpretive trail. In 1997, the park attracted over 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 Project area scenic qualities. Inquiries with the Washington Department of Natural Resources (Beach 2003) and the Washington Department of Fish and Wildlife (Clausing 2003) revealed that these two agencies do not have adopted plans for their lands in and around the project site that identify scenic resources on these lands or that include policies to protect these lands' scenic qualities.

3.11.2.2 Project Site Visibility

Exhibit 18-C, 'Potential Project Visual Impact', provides a generalized indication of the areas from which the proposed wind turbines will be potentially visible. This visibility analysis was prepared using the "Zones of Visual Influence" (ZVI) feature of the WindPro software system, a sophisticated 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 are potentially visible, the ZVI module makes use of 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 will be potentially visible, and can create the maps in a way that indicates the numbers of turbines that are potentially visible from each point in the surrounding landscape on a clear day.

The visibility data presented in Exhibit 18-C represents the potential visibility of the turbine towers, which will extend up to 262 feet above the surface of the ground, and the rotor blades, which will extend up to 410 feet above the ground surface. Both figures were prepared using the 20 foot contour lines from the USGS topographic maps available for the region. Both figures represent "worst case" assessments of potential Project visibility because they do not take into account the effect that other structures or trees close to viewers might have on obstructing views toward the turbines and thus overstate the potential visibility of the turbines to some degree. The overstatement of the potential visibility is particularly pronounced in areas to the north of the Project site, where the presence of forest cover will, in places, provide substantial screening of views.

Exhibit 18-C encompasses all of the Project area's foreground and middleground viewing areas (the areas up to 5 miles) and portions of the background viewing area extending out to up to 12 miles. These viewing areas derive from the landscape visual analysis systems developed by the US Forest Service and other agencies, which divide the landscape up into distance zones that are related to the degree to which landscape details are detectable to the viewer. The foreground distance zone is defined as the area within $\frac{1}{4}$ to $\frac{1}{2}$ mile from the viewer, where the maximum discernment of detail is possible. The middleground is defined as the area from $\frac{1}{4}$ to 3 to 5 miles from the viewer, where there is visual simplification of vegetative surfaces into textures, overall shapes and patterns, and there is linkage between foreground and background parts of the landscape. The background is defined as the landscape zone 3 to 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 provides an indication of the relative numbers of turbines that can be seen from each location in the surrounding landscape. Exhibit 18-C also encompasses the alignments of the transmission feeder lines that would connect the Project to BPA and/or PSE transmission corridors. The figure is annotated with numbers and arrows that indicate the locations from which the photos taken as the simulation views, presented as Exhibit 18-B, ‘Visual Simulation Photos’, Views 1-6, were taken.

Review of Exhibit 18-C suggests that four or more turbines will be visible to one degree or another from most of the valley and foothill areas to the west of the project, from many of the ridgetops in portions of the hill region lying between the Kittitas Valley and the Columbia River, and from lands lying to the east of the Columbia. As this map indicates, for the most part, the turbines will not be visible from the area in the Columbia River gorge or from the portions of the Ginkgo Petrified Forest State Park in which there are developed facilities. Based on field work conducted in the area, it is fair to say that the seen area analysis presented on Exhibit 18-C substantially overstates the Project’s potential visibility in that there are many areas, particularly in the City of Kittitas and other developed areas where structures and trees in the foreground of the view create substantial or complete blockage of views toward the distant ridge area where the Project will be located. An additional factor to be kept in mind in reviewing this figure is the effect of distance. In areas beyond about five miles from the Project site, even though turbines may be visible, they will be relatively small elements in the overall view, will tend to fade into the backdrop, particularly at times when the atmosphere is less than completely clear, and will have a limited effect on the overall character and visual quality of the landscape seen from those areas.

Review of Exhibit 18-C indicates that 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 (although as noted earlier, the actual visibility of the Project from the area to the north is likely to be less than suggested by this figure because of the screening provided by the intermittent forest cover in this area). In the valley areas to the west of the Project and in the hilly lands to the south, many of the Project’s turbines will not be visible because they are located in areas that are screened by the ridgeline of Whiskey Dick Mountain.

3.11.2.3 Viewing Areas

To structure the analysis of the Project’s effects on visual resources, the Project area was divided up into a number of viewing areas – areas which offer similar kinds of views toward the Project site and/or within which there would likely be similar concerns about landscape issues. The existing visual conditions of views from these areas toward the Project site are described below and are presented in Exhibit 18-B, ‘Visual Simulation Photos’. Within each of these viewing areas, a Simulation Viewpoint (SV) was selected as a location for taking a photo that could be used for the development of a simulated view of the Project that could form the basis for visualizing the Project’s potential visual effects on that viewing area. Thus, the simulation viewpoints were established to capture

views that are typical of the conditions that exist in each of the viewing areas, and the emphasis was placed on views from publicly accessible locations that would be likely to be seen by the largest numbers of people. Simulated photos and existing photos are presented in Exhibit 18-B, ‘Visual Simulation Photos’.

3.11.2.4 Assessment of Scenic Qualities

To assess the scenic quality of the landscapes potentially affected by the proposed Project scenarios, the analyses of the views toward the Project site from each of the viewing areas includes an overall rating of the level of scenic quality prevailing in the views. These ratings were developed based on 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 made based on professional judgment that took a broad spectrum of factors into consideration, including:

- Natural features, including topography, water courses, rock outcrops, and natural vegetation;
- The positive and negative effects of man-made alterations and built structures on visual quality; and 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 man-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. Unity refers to the compositional harmony of intercompatibility between landscape elements. (US DOT Federal Highway Administration 1988).

The final ratings assigned to each view fit within the rating scale summarized in Table 3.11.2-1. Development of this scale builds on a scale developed for use with an artificial intelligence system for evaluation of landscape visual quality (Buhyoff et al., 1994), and incorporates landscape assessment concepts applied by the U.S. Forest Service and the U.S. Department of Transportation.

Table 3.11.2-1 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	Landscapes that have high quality scenic value. This may be due to

Table 3.11.2-1 Landscape Scenic Quality Scale

Rating	Explanation
Quality	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 man-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 man-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 man-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 man-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; U.S. DOT Federal Highway Administration, 1988, and United States Department of Agriculture Forest Service, 1995.

3.11.2.5 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 being High, Moderate, or Low. In general, High levels of sensitivity were assigned in situations where turbines would be potentially visible within 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 within 0.5 to 5 miles within the primary view cone of residences and roadways. In distinguishing between moderate and low levels of sensitivity in the 0.5 to 5 mile zone, account was also taken of contextual factors, including the viewing conditions in the immediate foreground of the view. In areas lying 5 miles or more from the closest turbine, where a wind farm would be distant and relatively minor element in the overall landscape, a low level of sensitivity was assigned.

3.11.2.6 Existing Visual Conditions in the Landscape Viewing Areas

Landscape Area 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 in closest proximity to the Project site. As indicated in the review of the regional and local landscape setting in Section 3.11.2.1 above, there are no public roads that pass through or immediately adjacent to the Project site. The public road that is closest to the site is Vantage Highway, an east-west county road that extends from Ellensburg to the community of Vantage. This road was once a portion of Highway 10, a major east-west route across the state, but with the completion of I-90 several miles to the south, Vantage Highway now plays the role of 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 that lies 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. It is at this point that a private, gated, unimproved road takes off from Vantage Highway, providing access into the site. This road will serve as the Project's main access road.

For motorists traveling eastward on Vantage Highway, as they enter the hill area to the east of Parke Creek Road, Whiskey Dick Mountain and the Project site are visible on the north side of the road. As motorists proceed 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 into the Project site. East of the private road providing access into the Project site, the Vantage Highway travels down Schnebly Coulee, and in this area, for eastbound travelers, views toward the Project site are completely screened by the steep slopes that define the north side of the coulee. For westbound motorists traveling up Schnebly Coulee, there are no views toward the Project site until reaching a point about 1.3 mile east of the Project site access road, where a break in the slopes defining 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 mountain's ridge top and the Project site opens up more fully in the area along the highway that extends from a point about 0.4 mile east of the Project site access road to a point about 0.4 mile west of it. Westward of this point, the ridgetop and the Project site lie outside of the motorists' cone of vision.

Views from this Landscape Area are represented by Exhibit 18-B, view from Simulation Viewpoint 1, a point on Vantage Highway about 0.4 mile east of the private road that provides access into the Project site. This viewpoint lies a little over 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 elevation peak known as Chinaman Hat at the left side of the photo to the peak with the communication towers on it known as Cribb Peak on the photo's right side. As review of Exhibit 18-B suggests, the landscape in this area consists of open sage brush and grazing lands, with little apparent development except for roads and utility lines. In much of the area along Vantage Highway, the level of visual quality is moderate, reflecting the fact that the landscape visible is relatively common in the region and has average scenic value. In views like the one seen in Exhibit 18-B, Figure 1, in which the ridgeline of Whiskey Dick Mountain provides a degree of topographic interest, the level of landscape visual quality is moderately high.

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 the relatively low traffic volumes and the fact that the highway at its very closest is 1.3 miles from the Project site, the overall level of view sensitivity in this area is moderate at most.

Landscape Area 2- Valley Lands at Eastern Edge of Kittitas Valley

Landscape Description and Scenic Quality:

Landscape Area 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 to the southwest of Whiskey Dick Mountain. From this area, the Project turbines on the ridgeline and south slopes of Whiskey Dick Mountain will be visible from 3 to 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.

Views from this Landscape Area are represented by Exhibit 18-B, Figure 2, the view from Simulation Viewpoint 2, a point on Vantage Highway at Parke Creek Road. This viewpoint, which is located 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 this figure 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 have a more natural appearing 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 within the cone of vision of eastbound travelers on Vantage Highway, and is also visible to some degree in the cone of vision of eastbound and northbound travelers on Stevens Road. The Average Daily Traffic on Vantage Highway in this area 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 0.5 to 5 mile middleground distance zone, these roadway views have at most a moderate degree of sensitivity. In this area, there are on the order of 50 residences from which the Project site is potentially visible. From some of the residential properties, views toward the site may be screened to some degree by structures and trees located in the immediate foreground. Because, like the roadway segments from which the site is visible, these residences are located in the outer half of the 0.5 to 5 mile middleground distance zone, these residential views have a moderate degree of sensitivity.

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

Landscape Description and Scenic Quality:

Landscape Area 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. For the most part, the vegetation consists of sagebrush and/or bitterbrush, mixed with bunchgrasses. At the higher elevations, particularly in the area to the north of the Project site, there are scattered groves of ponderosa pines, which in some places create continuous forest cover. Much of the land in the area lying between the Project site and the Columbia River is in state ownership. As indicated on Exhibit 18-A and 18-C, the Whiskey Dick unit of the Washington Department of Fish and Wildlife's L. T. Murray Wildlife Area, is located in the area north of Vantage Highway and to the east and southeast of the Project site and occupies over 28,500 acres. The Quilomene Unit of the L. T. Murray Wildlife Area is located to the north and northeast of the Project site and contains 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 set up to provide habitat for the Colockum elk herd as well as for mule deer and other wildlife. A number of the sections to the north and east of the site and to the west to some extent as well, belong to the Washington Department of Natural Resources. Further to the 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 Exhibit 18-C indicates, the Project will not be visible from the park. Access into most portions of Landscape Area 3 is very limited, and there is little development, so overall, the landscape has a generally natural looking appearance. There is one area where there is a small pocket of development, along upper Parke Creek Road, an unpaved private road. In the area along this road corridor approximately a mile and a half north of the northern boundary of the Project site, a large lot subdivision has been created. Based on air flights over this area and review of air photos, it appears that 8 to 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. Because this area is difficult to access, particularly under winter snow conditions, the dwellings in this area are occupied on a seasonal basis only.

Views from this Landscape Area are represented by Exhibit 18-B, Figure 3, the view from Simulation Viewpoint 3, a location near Project site access Road on a ridgetop in Section 32 of Township 19 North, Range 21 East. This viewpoint is located approximately 2.5 miles north of the northern edge of the Project site on land that is owned by the Washington Department of Natural Resources. Although this view is intended to be representative of views toward the Project from the wildlife areas and from the area of scattered seasonal dwellings along upper Parke Creek Road, it can be considered to be a worst case view in that it is taken from a high elevation that provides an unobstructed view of most of the Project. As review of the viewshed map (Exhibit 18-C) indicates, in the areas off of the ridgetops, either the Project won't be visible at all, or the visibility will be limited. The view from Simulation Viewpoint 3 is a broad panorama of ridgetops covered with grass, shrubs, and some groupings of trees. Except for the barely detectable cluster of communications towers on Cribb Peak in the center of the view, no structures are visible, and the scene has a natural-appearing character. 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 with the WDFW sergeant responsible for policing of this area revealed that for the Whiskey Dick and Quilomene units and in the Colockum Wildlife Area, there are a total of approximately 1,000 hunters who use these lands over the course of a year. The largest numbers of hunters come to the area during a several week period in late October and early November for the modern firearm elk season. Large numbers of hunters also come for the upland bird season, which takes place 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 bird watching and hunting of shed antlers. Relatively little camping, hiking, and equestrian activity takes place, perhaps because of the high summer temperatures, limited timber and limited water sources. Approximately 80% of the people who use the wildlife refuge lands in this area gain access by way of Project site access Road, the private road that crosses through the Project site. Because of the relatively small numbers of users of the wildlife lands in this area, and because the use is oriented primarily toward wildlife hunting and viewing as opposed to sightseeing and landscape appreciation, the overall visual sensitivity of these visitors is assumed to be moderately sensitive at most.

In the area along upper Parke Creek Road, there are approximately 8 to 10 dwellings that are used on a seasonal basis. These dwellings are located 1.5 mile and further to the north of the Project site's northernmost edge, which means that the Project site is in the middleground zone of the views from these structures. In most cases, the views from these dwellings would not be as wide or as open as the view represented in Exhibit 18-B, Figure 3 because these dwellings tend to be located in sheltered locations in the canyons and on the slopes of the ridges rather than on the ridgetops, and in many cases, they are sited in or in proximity 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 Project.

Landscape Area 4 – Kittitas and Surrounding Valley Areas

Landscape Description and Scenic Quality:

Landscape Area 4 encompasses the region of valley lands in and around the community of Kittitas. As the viewshed map (Exhibit 18-C) indicates, from this area, the turbines on the ridgeline and southern slopes of Whiskey Dick Mountain will be visible at distances ranging from about 7 to over 12 miles. Views from this Landscape Area are represented by Exhibit 18-B, Figure 4, the view from Simulation Viewpoint 4, which is 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 captures the view looking east-northeast toward Whiskey Dick Mountain and the Project site. This view is fairly typical of views toward the Project site 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 more limited because they tend to be obstructed to one degree or another by trees and structures in the immediate foreground. As study of Exhibit 18-B, Figure 4 suggests, in this area, what is seen in the foreground and middleground zones is a humanized landscape, with roads, utility lines, fences, buildings, tree plantations, and cultivated fields. Whiskey Dick Mountain serves as the backdrop to the scene. Because of the mountain's distance in the view, the details of its landscapes are not apparent, and what is seen are the mountain's overall form, and the generalized patterns formed by the areas of grass and shrubs on its slopes. 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 within 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 nine miles and further 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 to the visual changes the Project might create is low.

Interstate 90, the most important east/west cross-state route in Washington, travels in an east/west alignment across the flat valley lands in the area about a half a mile south of

Kittitas. WDOT figures indicate that the average daily traffic on I-90 in the area between Kittitas and Vantage is 11,000 vehicles per day. As Exhibit 18-C indicates, from much of the area along I-90 east of Kittitas, views toward Whiskey Dick Mountain and the Project site are screened by the range of low hills that lies north of the Interstate 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 so far distant (nine miles and greater) in the view.

The local roads in the Kittitas area carry considerably less traffic than I-90. For example, at the point where the photo in Exhibit 18-B, Figure 4, was taken (at the intersection of Patrick Avenue and No. 81 and Clerf Roads), the traffic count is 1,100 vehicles per day. From the eastbound lanes of these roads, and to some extent the northbound lanes, Whiskey Dick Mountain and the Project site are visible within the drivers' primary cone of vision. However, as is the case with the 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 John Wayne trail is a hiking, biking, and equestrian trail that has been developed in the Iron Horse State Park, a state park created on the former right of way of the Milwaukee Road railroad, which was acquired by Washington State Parks in the 1980s. The John Wayne Trail extends 109 miles from a trailhead near North Bend on the west to the Columbia River on the east. In the Kittitas area, the trail has a southeastward trending alignment and passes along the southern edge of the City 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 carried on wood poles. Washington State Parks reports that in 2001, the entire segment of the John Wayne Trail extending from Thorp eastward to Vantage had 21,079 visitors, and that most visits took place during the summer season. This is considerably lower than the 163,532 visitor figure for the segment to the west between North Bend and Thorp, where the trail passes through Snoqualmie Pass and the trail is closer to the population centers of the Puget Sound area, the scenery is more outstanding and where the trail ties in with other recreational facilities. In the Kittitas area, because of the trail's character as an engineered right-of-way that has a wide gravel surface and is paralleled with 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 area, the level of sensitivity of views from the trail to potential Project-related visual changes is low.

Landscape Area 5 – Lands East of the Columbia River

Landscape Description and Scenic Quality:

Landscape Area 5 encompasses the area to the east of the Columbia River. As indicated by the view shed map (Exhibit 18-C) the turbines on the Project site will not be visible from the Columbia River itself, but will be visible from the tops and sides of some of the plateaus on to the river's east. From the areas where the Project site is potentially visible,

the viewing distance is a minimum of 7 miles. For the most part, the landscape on the east side of the river consists of open lands covered with shrub-steppe vegetation or devoted to grazing or agricultural use. Viewing areas of potential concern in the area east of the Columbia include the corridor along I-90, and the Gorge Amphitheater. The project would not be visible from Sunland Estates, a river-oriented residential development located in the canyon, where views toward the project site are screened by the canyon's walls. The only place where there is planned future development in areas on the east side of the river that lie within 12 miles of the Project site and where the Project site is visible is a site along I-90 at Silica Road where an amendment to the Grant County Comprehensive Plan has been approved that would permit a project known as Sun Canyon that would include a mix of commercial and residential uses.

Exhibit 18-B, Figure 5, the view from Simulation Viewpoint 5, which is located on along I-90 in the area between the Silica Road Exit and the Columbia River is representative of view from this landscape area. This photo captures the view looking west/southwest toward Whiskey Dick Mountain and the Project site. This view is typical of views toward the Project site from the plateau areas east of the Columbia River. In many areas, such as the one depicted in Exhibit 18-B, Figure 5, the foreground and middleground zones consist of open landscapes covered with low sage-scrub vegetation, and have a natural appearance. In other portions of this area, the landscape in the foreground and middleground has been altered through its use for field crops and grazing, and in the case of the Gorge amphitheater, for a major performance complex. From all of these areas, Whiskey Dick Mountain and associated ridges on the west side of the river provide a distant backdrop. Because of the distance of these ridges in the view, what is apparent is their overall form and the generalized patterns formed by the areas of grass and shrubs on their slopes, rather than the details of their landscapes. 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 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. Just to the east of the crossing of the Columbia at Vantage, there is a segment of the interstate that runs for about five miles in a north/south direction along the plateau lands on the east side of the river. From this area, the Project site is not within the cone of vision of drivers. To the east of this area, the alignment shifts to a northeast/southwest oriented alignment for about six miles until reaching the community of George. Along this portion of the route, there are many areas where the Project site falls within the cone of vision of westbound travelers. Exhibit 18-B, Figure 5 is typical of these views. Although the site is within the line of sight for westbound travelers, the level of sensitivity to visual changes on the Project site is low because the site lies 10 miles and further from the segments of the Interstate from which it is potentially visible.

On the eastern side of the river, the residences that are closest to the Project site are those in Sunland Estates, a recreation-oriented development located in the Columbia Gorge

alongside the portion of the river that has been dammed by the Wanapum Dam to create Wanapum Lake. As indicated on Exhibit 18-C, because the high, steep sided slopes screen views from within the gorge toward the Project site, the Project will not be visible from Sunland Estates. The Project will, however, be visible to those driving to Sunland Estates on the access road at the top of the bluff. Because the areas of the access road with potential views toward the Project site are 7 miles and more from the Project site, the sensitivity of views from these areas to Project-related visual changes is low.

The Gorge Amphitheatre is an outdoor performance facility of regional importance that is located at the edge of the bluffs overlooking the Columbia gorge in the area near Sunland Estates. It has a seating capacity of 20,000 and is the site of large concerts that take place during a season that runs from mid-May through the end of September. In addition to the performance area, concessions, and parking, the facility also includes 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 to the west of the Columbia serve as the backdrop. Although the Project site falls within the line of sight of views from some portions of the amphitheater facility, the level of visual sensitivity is low because the Project site is located in the view's background zone, nine miles and further from viewers at the amphitheater.

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

Landscape Description and Scenic Quality:

Landscape Area 6 encompasses the short segment along 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. Views in this area are represented by Exhibit 18-B, Figure 6, the view from Simulation Viewpoint 6, a point at the edge of the westbound lanes of I-90, located just east of the freeway's overcrossing of Stevens Road. This view looks westward 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 visible in this view is one that has been highly modified to accommodate the Interstate highway, 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. Because for westbound travelers, and to a much smaller degree for eastbound travelers the transmission line alignment and substation site fall within the immediate foreground of the view, the level of viewer visual sensitivity is considered to be high.

3.11.3 Impacts of the Proposed Action

3.11.3.1 Analysis Procedure

The impact analysis is based primarily on the Federal Highway Administration (FHWA) methodology for determining visual resource change and assessing viewer response to that change (US DOT, 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 views from which the Project would be most visible. To document the visual changes that would occur, visual simulations show the proposed Project from a set of 6 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 simulation viewpoints. Presented as the “a” and “b” variants of Exhibits 18-B, Figures 1 through 6, 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 simulation viewpoints and of the scale, and visual appearance of the changes that would be brought about by the proposed Project. The computer-generated simulations are the result of an objective analytical and computer modeling process and are accurate within the constraints of the available site and Project data.

The simulations were developed using photographs taken with a 35 mm camera, using a 50 mm focal length. The Photomontage module of the WindPro software program (a widely accepted and applied program used for planning and assessing wind generation projects) was used to carry out the computer modeling and rendering required to produce the images of the Project facilities that 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 were used to create three-dimensional (3-D) digital models of these facilities. These 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 Simulation Viewpoints to verify scale and viewpoint location. Digital visual simulation images were produced as a next step based on computer renderings of the 3-D model combined with high-resolution digital base photographs. The final “hardcopy” visual simulation images that appear 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 and operation of the Project. These changes were assessed, in part, by evaluating the “after” views provided by the computer-generated visual simulations and comparing them to 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; and
- 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 in areas with sensitive viewers, 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 in which the presence of the turbines 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 found 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 found 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.

3.11.3.2 Construction

Construction activities

The on-site activities that will be required as a part of Project construction are described in Section 2.2.5 'Construction Methodology'. Project construction is expected to take place over a period of approximately 12 months. During that time, temporary laydown areas will be set up near turbine E1 on the ridge line 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 earth moving 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 road-building 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 contrasts with the colors of the surrounding undisturbed landscape will be visible. In close-at-hand views, which for this Project would be limited to those from nearby segments of Vantage Highway, the visual changes associated with the construction activities will be moderately to highly visible and will have a moderate level of visual

impact. From more distant viewing locations, the visual effects will be relatively minor and will have little or no impact on the quality of views. From the middleground areas with the greatest numbers of viewers, i.e. the areas to the south and west, much of the area in which construction activities will be taking place will not be visible because it will be hidden behind the ridgeline formed by Whiskey Dick Mountain. It is important to note that because construction activities take place over a period of only 12 months, the construction impacts will be relatively short in duration. After construction, is complete, all construction-related debris will be removed from the site and areas disturbed during construction will be replanted to recreate the appearance of their original vegetative cover.

3.11.3.3 Operations

The Project's operational period is assumed to be 20 years. At the time the Project begins to reach 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 3.11.3-1. As these tables indicate, 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.

Project Appearance

The physical elements of the Project are described in detail in Section 2.2.2 Project Facilities. Exhibit 1-B, 'Project Site Layout', is a general site layout that indicates the locations of the proposed roads, overhead and underground transmission lines, substations, operations and maintenance facility, and other features that comprise the Project.

The Project will include up to 158 turbines. The turbines will be mounted on tubular steel towers that will be approximately 18 feet in diameter at the base and will rise to a hub height of up to 262 feet. Each tower will support a nacelle that houses a drive train, gearbox, generator, and other generating equipment. The nacelles will be approximately 30 to 37 feet long, 10 to 11 feet wide and 10 to 12 feet high. The nacelles will be completely sheathed in an aerodynamically shaped fiberglass or metal shell. The rotors will be attached to the front of the nacelles, which are mounted on the tops of the towers. The rotors will have three blades, and will have a diameter of 197 feet to 295 feet. Although not required for functionality, each rotor will have an aerodynamic appearing nose cone to improve its appearance. The dimensions provided here represent the entire range of sizes of the various turbine models being considered for this Project.

The Applicant is considering several turbine models from different vendors. The final decision regarding turbine and tower dimensions is driven largely by Project economics such as 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 feet 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, which are representative of the dimensions of the turbines that are being considered for the Project. For two of the simulation views, simulations are provided of the turbines with dimensions at the high and low ends of the dimension range (Exhibits 18-B, Figures 2c and 2d and Figures 4c and 4d) to permit the appearance of the slightly larger and slightly taller turbines being considered to be compared with that of the turbines most likely to be used, which have been simulated in all the views.

The surfaces of the turbine towers, rotors, and nacelles will be neutral gray in color and will be given a finish that has a low level of reflectivity. Data from the turbine manufacturers indicates that the turbines and nacelles will be coated with a semi-gloss material and that 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, and as is that case with the existing turbines, the rotors on the planned turbines will not have surfaces that are highly reflective. Over time, the surfaces of the turbine equipment, like any coated surface exposed to the elements, will tend to weather, and the effect of this weathering will be to dull the surfaces, producing a further decreases in the 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 that is 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, as indicated in Exhibit 1, Project Site Layout. The first proposed collector line begins at a point at the north end of String E, and would extend to the site of the proposed PSE step-up substation located just west of String H. This portion of the collection system would be carried on single wood poles with dual cross arms that are 40 to 60 feet tall. Because this line would be located in an area that lies to the north of the high ridgeline formed by Whiskey Dick Mountain, it would not be visible from areas lying to the south and west.

The network of roads that will provide access to each of the turbines will consist of both existing and new roads which will have 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 operations and maintenance (O&M) facility will 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 that is approximately 50 feet wide, 100 feet long, and 35 feet high. This building will house offices, spare parts storage, and a shop area. This building will have siding that will be painted with low reflectivity paints in earth-tone colors that blend well 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 located 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 Bonneville Power Authority 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 also be located in the plateau area, but at a location further south, near String H. It is possible that either or both of these sites would be developed. In either case, the substation(s) would occupy an area of 2 to 3 acres that would need to be cleared and graded. The primary elements of a substation on either site would include a 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 on the order of 60 feet high. The bus work would be in the range of 40 to 45 feet high. The transformers, switchgear structures, and control building would be no more than 15 to 20 feet in height. 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 step-up substations are located north of Whiskey Dick Mountain which shields them from visibility from main public roadways including Vantage Highway and I-90.

Light and Glare

Turbine Lighting:

To respond to the Federal Aviation Administration's (FAA) aircraft safety lighting requirements, the Project will be marked according to guidelines established by the FAA. At present, FAA guidelines for lighting of wind turbines call for lights that flash white during the day (at 20,000 candela) 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, typically, FAA has required that warning lights be mounted on the first and last turbines of each string, and every 1000 to 1400 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 a 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 that will be mounted on the turbines and flash during daylight hours as required by the FAA for daytime aircraft safety will be visible, but not particularly intrusive to viewers in the areas surrounding the Project and are thus unlikely to create a moderate or high level of visual impact. The flashing red lights (2,000 candela) that the FAA requires be operated at nighttime will introduce a new element into the Project area's nighttime environment. At present, the Project site and immediately surrounding area are dark at night except for the lighting present at the set of communications towers on Cribb Peak near the eastern end of Whiskey Dick Mountain's ridgeline. Because the nighttime aircraft safety lights will be limited in number, red, and highly directional, their potential to create skyglow or backscatter will be minimal.

Exhibit 18-D is a nighttime photo taken at the Nine Canyon Wind Power Project in Benton County, Washington to illustrate the night lighting conditions that are typical at existing large wind power projects in the region. This photo was taken at a distance of about one mile from the closest turbine string at the location indicated on the map in Exhibit 18-D. 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 lights visible are the red aircraft safety lights associated with the project's turbine strings. These lights are visible as small blinking points of light. As this photo suggests, these lights do not light up the sky or the surrounding landscape. The flashing red lights associated with the Wild Horse Project will be most noticeable in the areas within a mile or so of the Project, but because there are no residences or public roads in these areas, the impacts on potential viewers will be negligible

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, the impacts of the lighting associated with these facilities will not be substantial. Because of their location to the north of Whiskey Dick Mountain's ridgeline, where they will be screened in most views toward the Project site, the minimal night lighting associated with them will have no effect on most views. The one exception is the view into the plateau area from the area to the north of the site along upper Parke Creek Road. However, because of the viewing

distance toward these facilities from this area (four miles or more) and the minimal amount of lighting involved, the degree of impact will be minor.

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 provided 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 offsite and will not produce offsite glare effects because lighting will be restricted by specification of non-glare, hooded fixtures, and placement of lights to direct illumination into only those areas where it is needed. With these measures to restrict lighting at the O&M facility and substation(s) to the minimal required, and to assure that it is appropriately hooded and directed downward into the areas where it is needed, the potential for it to create skyglow¹ or backscatter² will be limited.

Shadow Flicker

Shadow flicker, or strobe impacts, can occur only if the turbine is located in close proximity 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 to any sensitive receptors, such as residences, due to the distance of more than 9,000 feet to the nearest residence which 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 Exhibit 9, 'Shadow Flicker Briefing'

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.

Table 3.11.3-1: Analysis of Impacts to 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 (Exhibits 18-B, Figure 1b) View looking west from Vantage Highway 0.4 mile east of Project site access Road	Moderately High	Moderate	A total of 43 turbines will be visible along the ridgeline and southern slopes of Whiskey Dick Mountain, at distances ranging from 1.9 to 4.1 miles. All of the turbines will be either partially or fully silhouetted against the sky; however because of their distance from the viewer and because of their light color, the degree of visual contrast and visual salience will be 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 could be thought of as enhancing the vividness of this view. The roadways that will be constructed to provide access to several of the strings located 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, which will be located on a flat area at the top of the ridge near turbine E1 will be detectable. However, because of the 2.7 mile viewing distance and the fact that the O & M structure will be relatively small and will be located on the north side of the ridge’s crest, it will not be a major element in the view. The treatment of the structure’s surfaces with low-reflectivity colors that blend with the surroundings will further reduce the facility’s noticeability. Although the new transmission line that will travel down the slope of the ridge will be visible, it will, in general, be a recessive element in the view because the wood-pole H-	Moderate

Table 3.11.3-1: Analysis of Impacts to 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
			frame towers will to a large degree be visually absorbed by the hillside backdrop. The visitor kiosk, which will consist of a parking area and kiosk in the area along the Project access road in the vicinity of Vantage Highway. Because this structure will be very small and will be painted with colors that are non-reflective and compatible with the surrounding landscape, it will not be a highly visible element in the scene. The Project will result in a highly noticeable change in this view, adding a large number of tall turbines and several smaller project elements as well to a scene that is now generally rural in character. 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 moderate at most, and although the view's moderately high level of visual quality may be decreased to some extent, the decrease will not be substantial because the landscape's topography and vegetative cover will remain essentially intact, and because the vividness of the view will be increased. The overall level of visual impact will be moderate.	
2 – Valley Lands at Eastern Edge of Kittitas Valley				
Simulation View 2 (Exhibits 18-B, Figure 2) View looking east from Vantage Highway at Parke Creek Road	Moderately High	Moderate	From this viewpoint, a total of up to 43 turbines will be visible running along the top of and on the upper slopes of the ridgeline of Whiskey Dick Mountain. The closest of these turbines will be 4.5 miles away, and the furthest will be 7.6 miles, placing all of the turbines in the far middleground and background zones of the landscape. Exhibit 18-B, Figure 2b is a simulation of the Project as it would	Moderate

Table 3.11.3-1: Analysis of Impacts to 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
			<p>appear with the 213 foot high (to hub height) turbine towers that are most likely to be used for this project. Exhibit 18-B, Figure 2c is a simulation of this view as it would appear under a scenario in which 262 foot high towers would be used, and Exhibit 18-B, Figure 2d is a simulation of the project’s appearance assuming towers 197 feet in height. As comparison of these three simulation images suggest, the turbines with the 262 foot high towers appear to be somewhat taller and a little bit more noticeable than the turbines with the 213 foot towers, and the turbines with the 197 foot high towers appear to be slightly smaller than the turbines with the 213 foot high towers. Another difference among the three scenarios is that there are fewer of the taller turbines and they are spread farther apart, while there are more of the shorter turbines, and they are spaced more closely together. At this viewing distance and in this context, the overall visual effects of the three scenarios are about the same. Because of their increased numbers and the density of their configuration, the smaller turbines have a level of visual impact that is about the same or maybe even slightly greater than that of the taller turbines that are smaller in number and more widely spaced.</p> <p>Although the turbines will be silhouetted against the sky because of their location along the ridgeline, because of their distance from the viewer and because of their light color, the degree of visual contrast and visual salience will be moderate. The presence of the turbines will reduce the scene’s degree of intactness extent by introducing highly engineered vertical elements into a landscape that now has a rural and natural appearance. Because the line of turbines extending</p>	

Table 3.11.3-1: Analysis of Impacts to 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
			along the ridgeline will have an orderly appearance, the overall effect on the visual unity of the scene's composition will not be substantial. In addition, the presence of the string of turbines that accentuates the ridgeline could be thought of enhancing the vividness of this view. The overall level of visual impact on this view will be moderate, and the level of impact will be less than significant.	
3 – Lands to the West, North and East of the Project Site				
Simulation View 3 (Exhibits 18-B, Figure 3) 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)	From this viewpoint, over 100 turbines will be visible on the high elevation plateau that extends southward to the ridgeline of Whiskey Dick Mountain at distances that range from 2.8 to 7.8 miles. Most of the turbines will be seen entirely against the ground plane or distant ridgelines, and 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 the turbines visible in this view will be seen as fully or partially silhouetted against the sky, and for these turbines, their neutral gray color will reduce their contrast with the sky backdrop. 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. Because of the viewing distance (4.5 miles or more) and because they will be backdropped, these Project elements will not be highly detectable, and will have relatively little effect on the view. The large number of	Moderate

Table 3.11.3-1: Analysis of Impacts to 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
			<p>turbines visible 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. However, because of the relatively small numbers of viewers, particularly of the most sensitive viewers, the users of the seasonal residences, the overall visual impact will be moderate.</p> <p>Nineteen of the turbines will be located on two sections that encompass ridgelines along upper Whiskey Dick Creek that are a part of the Whiskey Dick Wildlife Area. To the extent that hunters or other users of the wildlife area are on or near these sections, the landscape that they experience will be substantially 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 to some degree, the level of impact will be less than significant because of the moderate visual sensitivity of these lands, which are being managed primarily for their wildlife values rather than their scenic qualities.</p>	
4 – Kittitas and Surrounding Valley Areas				
Simulation View 4 (Exhibits 18-B, Figure 4) View looking east from intersection	Moderate to Moderately High	Low	From this viewpoint at the edge of Kittitas, approximately 30 turbines will be visible running in a line along the distant ridgeline of Whiskey Dick Mountain. The closest of these turbines will be 8.3 miles away, and the furthest will be over 11 miles away, placing all of the turbines well into the background landscape distance zone.	Low

Table 3.11.3-1: Analysis of Impacts to 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
of Patrick Avenue and No. 81 and Clerf Roads at the edge of the City of Kittitas			<p>Exhibit 18-B, Figure 4b is a simulation of the Project as it would appear with the 213 foot high (to hub height) turbine towers that are most likely to be used for this Project. Exhibit 18-B, Figure 4c is a simulation of this view as it would appear under a scenario in which 262 foot high towers would be used, and Exhibit 18-B, Figure 4d is a simulation of the Project’s appearance assuming towers 197 feet in height. As comparison of these three simulation images suggest, the turbines with the 262 foot high towers appear to be slightly taller and a little bit more noticeable than the turbines with the 213 foot towers, and the turbines with the 197 foot high towers appear to be slightly smaller and less noticeable than the turbines with the 213 foot high towers. Another difference among the three scenarios is that there are fewer of the taller turbines and they are spread farther apart, while there are more of the shorter turbines, and they are spaced more closely together. At this viewing distance and in this context, the overall visual effects of the three scenarios are not significantly different.</p> <p>In all three scenarios, the turbines that are visible will all be silhouetted against the sky, but, because of their great distance and because of their light color, the degree of visual contrast will be low. However because of their scale and form, they will have a moderate degree of visual salience in all three cases. The presence of the turbines will reduce the scene’s degree of intactness to some extent by introducing vertical elements along a distant ridgeline that now has a natural profile, but the degree of change will be limited by the</p>	

Table 3.11.3-1: Analysis of Impacts to 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
			fact that the turbines be so far away and will be secondary elements in the overall view. The effect on the scene's visual unity will also be attenuated by the fact that the turbines will be so far away; in addition, the effect on the scene's degree of visual unity will be minimized because the line of turbines extending along the ridgeline will have an orderly appearance. The presence of the string of turbines that accentuates the ridgeline could be thought of enhancing the vividness of this view. The overall level of visual impact on this view will be low.	
5 – Lands East of the Columbia River				
(Exhibits 18-B, Figure 5) View looking west from I-90 west of Silica Road exit	Moderate to Moderately High	Low	From this viewpoint, over 100 turbines will be seen spread across the upper slopes of the ridgeline in the far distance of the view. All of the turbines will be in the range of 9 to 13 miles in the distance, placing all of them well into the landscape's background zone. Some of the turbines will be seen entirely against the slopes of the ridge, and 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 of the turbines will be seen as fully or partially silhouetted against the sky, and for these turbines, their neutral gray color will help them to blend into the sky backdrop. 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, their degree of noticeability is likely to be particularly low. The presence of the turbines will reduce the scene's degree of intactness to small degree by introducing vertical elements along a distant ridgeline that now has a natural	Low

Table 3.11.3-1: Analysis of Impacts to 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
			profile. The turbines will also have a small effect on the view's level of unity and intactness. The overall level of visual impact on this view will be low.	
6- I-90 in the Vicinity of the PSE Interconnect				
(Exhibits 18-B, Figure 6) View looking west from I-90 east of the freeway's overcrossing of Stevens Road	Moderately Low	High	Exhibit 18-B, Figure 6b 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 will 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 will be seen against the sky backdrop will be the Project's most visible features. Although the Project facilities will be readily visible in this view, they will be relatively minor features in the overall landscape composition and will be consistent with the other infrastructure facilities that now dominate the landscape in this area. As a consequence, 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 will be low.	Low

3.11.3.4 Aesthetic and Scenic Resources

There are no recreational wilderness areas in close proximity to the Project area. Surrounding wildlife and recreation areas have been indicated on the Zone of Visual Influence Map included in Exhibit 18-C. This ZVI analysis indicates that the Project will not be visible from the Wanapum Recreation Area nor the recreational trails in the Ginkgo Petrified Forest State Park.

The simulation from Simulation Viewpoint 5 is generally representative of views from the east side of the Columbia, including views from the Gorge Amphitheater and the I-90 Wildhorse Viewpoint.

The only designated recreational trail in the project vicinity from which the Project might be visible is the Iron Horse Trail. Views from this trail are discussed in the existing conditions and project impact analyses for Landscape Area 4. The impacts on the quality and character of the landscape experienced by users of this trail will be minor.

3.11.4 Comparison of Impacts of Proposed Alternatives

Simulation views 2 and 4 were both modeled using the Most Likely (70.5 meter rotor diameter), Small WTG (60 meter rotor diameter) and Large WTG (90 meter rotor diameter) wind turbine scenarios. Results of those analyses are presented in table 3.11.3-1 above. At most public viewing points, the overall visual effects of the three scenarios are not significantly different. The visual impact will remain quite low for all design options under consideration.

3.11.5 Impacts of the No Action Alternative

Under the No Action Alternative, the Project would not be constructed or operated, and the environmental impacts described in this section would not occur. The No Action Alternative assumes that future development would comply with existing zoning requirements for the Project area, which is zoned Commercial Agriculture and Forest and Range. According to the County's zoning code, the Commercial Agriculture zone is dominated by farming, ranching, and rural lifestyles, and permitted uses include residential, green houses and agricultural practices. Permitted uses in the Forest and Range zone include logging, mining, quarrying, and agricultural practices, as well as residential uses (Kittitas County 1991). However, 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 non-renewable generation sources. Baseload demand would likely be filled through expansion of existing, or development of new, thermal generation such as gas-fired combustion turbine technology. Such development could occur at conducive locations throughout the state of Washington.

A baseload natural gas-fired combustion turbine would have to generate 67 average MW of energy to replace an equivalent amount of power generated by the project (204 MW at 33% net capacity). (An average MW or “aMW” is the average amount of energy supplied over a specified period of time, in contrast to “MW,” which indicates the maximum or peak output [capacity] that can be supplied for a short period.) See Section 2.3, ‘Alternatives’.

3.11.6 Mitigation Measures

Mitigation measures that have been made an integral part of the Project’s design include:

- During the construction period, active dust suppression will be implemented to minimize the creation of dust clouds;
- When construction is complete, areas disturbed during the construction process will be reseeded to facilitate their return to natural appearing conditions;
- 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;
- Because of the wind conditions at the site and the high level of reliability of the equipment being used, the rotors will be turning approximately 80-85% of the time, minimizing the amount of time that turbines will appear to be non-operational, a condition that the public often finds to be unattractive;
- 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. It 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 far fewer turbines in a large wind farm than is now required, and having all the lights be synchronized. 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 standards;
- Nearly all of the Project’s electrical collection system will be located underground, eliminating visual impacts;
- To the extent 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 off-site light trespass;
- At the substation(s), all equipment will have a low reflectivity neutral gray finish to minimize visual salience;
- All insulators in the substations and on takeoff towers will be non-reflective and non-refractive;
- The control buildings located at each substation would 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;

3.11.7 Significant Unavoidable Adverse Impacts

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

Although the Project would create substantial changes to the character, and to a lesser extent 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 their low to moderate levels of sensitivity.