

Appendix E

Visual Assessment

Visual Resource Report in Support of the I-5 Corridor Reinforcement Project Environmental Impact Statement

Prepared for:

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Table of Contents

1.0 Introduction	1
1.1 Data Sources	1
1.2 Analytical Methods	1
1.2.1 Visual Resource Inventory	4
1.2.2 Visual Simulations.....	6
1.2.3 Visual Contrast Rating	7
1.3 Definition of the Study Area	8
2.0 Affected Environment	9
2.1 Willapa Hills.....	9
2.2 Cowlitz/Chehalis Foothills	9
2.3 Western Cascades Lowlands and Valleys	10
2.4 Valley Foothills	10
2.5 Portland/Vancouver Basin.....	11
2.6 Substations.....	11
2.6.1 Sundial Substation	11
2.6.2 Casey Road Substation	11
2.6.3 Baxter Road Substation	12
2.6.4 Monahan Creek Substation.....	12
2.7 West Alternative	12
2.7.1 Scenic Quality Ratings	13
2.7.2 Sensitivity Ratings and Overall Landscape Ratings.....	14
2.8 Central Alternative	15
2.8.1 Scenic Quality Ratings	16
2.8.2 Sensitivity Ratings and Overall Landscape Ratings.....	17
2.9 East Alternative	18
2.9.1 Scenic Quality Ratings	19
2.9.2 Sensitivity Ratings and Overall Landscape Ratings.....	20
2.10 Crossover Alternative	21
2.10.1 Scenic Quality Ratings	22
2.10.2 Sensitivity Ratings and Overall Landscape Ratings.....	23
3.0 Environmental Consequences	24
3.1 Visual Impact	24
3.1.1 Impact Levels	24
3.2 Impacts Common to Action Alternatives	25
3.3 Substations.....	25
3.3.1 Sundial Substation	25

3.3.2 Casey Road Substation	25
3.3.3 Baxter Road Substation	25
3.3.4 Monahan Creek Substation.....	25
3.4 West Alternative.....	26
3.4.1 West Option 1	37
3.4.2 West Option 2.....	39
3.4.3 West Option 3.....	43
3.5 Central Alternative	44
3.5.1 Central Option 1	47
3.5.2 Central Option 2	47
3.5.3 Central Option 3	48
3.6 East Alternative	51
3.6.1 East Option 1	54
3.6.2 East Option 2.....	55
3.6.3 East Option 3.....	55
3.7 Crossover Alternative.....	55
3.7.1 Crossover Option 1	57
3.7.2 Crossover Option 2.....	58
3.7.3 Crossover Option 3.....	58
3.8 No Action Alternative	59
4.0 Mitigation Measures.....	60
5.0 Unavoidable Impacts	61
6.0 Cumulative Effects of the Project.....	62
7.0 Federal, State, Local, and Permit Requirements Review	63
8.0 List of Preparers	64
9.0 References	65
10.0 Acronyms and Glossary	66

List of Tables

Table 1-1	Viewpoints
Table 1-2	Scenic Quality Evaluation Criteria Ranking
Table 1-3	Visual Resource Landscape Rating
Table 1-4	Degree of Contrast Criteria
Table 2-1	West Alternative Scenic Quality Ratings
Table 2-2	West Alternative Sensitivity and Overall Landscape Ratings
Table 2-3	Central Alternative Scenic Quality Ratings
Table 2-4	Central Alternative Sensitivity and Overall Landscape Ratings
Table 2-5	East Alternative Scenic Quality Ratings
Table 2-6	East Alternative Sensitivity and Overall Landscape Ratings
Table 2-7	Crossover Alternative Scenic Quality Ratings
Table 2-8	Crossover Alternative Sensitivity and Overall Landscape Ratings
Table 3-1	Visual Impact Rating
Table 3-2	West Alternative Contrast Ratings and Visual Impact
Table 3-3	Central Alternative Contrast Ratings and Visual Impact
Table 3-4	East Alternative Contrast Ratings and Visual Impact
Table 3-5	Crossover Alternative Contrast Ratings and Visual Impact

List of Figures

Figure 1-1	Viewpoint Locations
Figure 3-1	Viewpoint 25-1
Figure 3-2	Viewpoint 25-2
Figure 3-3	Viewpoint 25-3
Figure 3-4	Viewpoint 41-1
Figure 3-5	Viewpoint 50-1
Figure 3-6	Viewpoint 52-1
Figure 3-7	Viewpoint 40-1
Figure 3-8	Viewpoint 48-1
Figure 3-9	Viewpoint 51-1
Figure 3-10	Viewpoint M-1
Figure 3-11	Viewpoint K-1

1.0 Introduction

This resource report describes the existing conditions and potential impacts on visual resources from construction and operation of a proposed electrical transmission line route for the I-5 Corridor Reinforcement Project (project). The Bonneville Power Administration (BPA) proposes to construct a new 500-kV transmission line in a north/south alignment between a new substation near Castle Rock, Washington and a new substation near BPA's existing Troutdale Substation in Multnomah County, Oregon. The transmission line towers would carry conductors for the electricity, overhead ground wires for lightning protection, and fiber for communication needs. BPA would construct new and improved existing access roads to accommodate construction and maintenance of the new transmission line. The route alternatives consist of segments, some of which are sited parallel to existing transmission lines, either within or adjacent to the existing right-of-way, and some would be located in new right-of-way. The information provided in this report may be used in part to select a preferred route and to support a National Environmental Policy Act (NEPA) Environmental Impact Statement (EIS) for the project.

Four alternatives (West, Central, East, and Crossover) are described and evaluated. Each alternative is comprised of segments. Each alternative also includes options which consider one or more other segments in lieu of one or more of the alternative segments. Three alternative sites for the new north substation are under consideration near Castle Rock. These substations are each assigned to specific alternatives. One substation site is proposed at the south end of the project in Oregon.

Section 1 of this report identifies data sources, analytical methods, and defines the study area used in the evaluation. Section 2 provides an overview of the affected environment, including descriptions of the alternatives, their options, and potential substation sites. Section 3 describes the potential impacts of implementing the project. Impact levels are defined and impacts common to all alternatives are included. Section 4 presents mitigation measures to minimize impacts on visual quality. Unavoidable impacts that may remain after all mitigation measures have been implemented are included in Section 5. Cumulative impacts are discussed in Section 6 and include an evaluation of the project in conjunction with other future development. Section 7 provides a description of the review and permit requirements of applicable laws, regulations, and plans.

1.1 Data Sources

No previous investigations or studies are relevant to or were used for this study. Tower designs were selected from tower design data provided by BPA on February 10, 2011. Photos used for this effort were taken by Golder Associates Inc. (Golder).

1.2 Analytical Methods

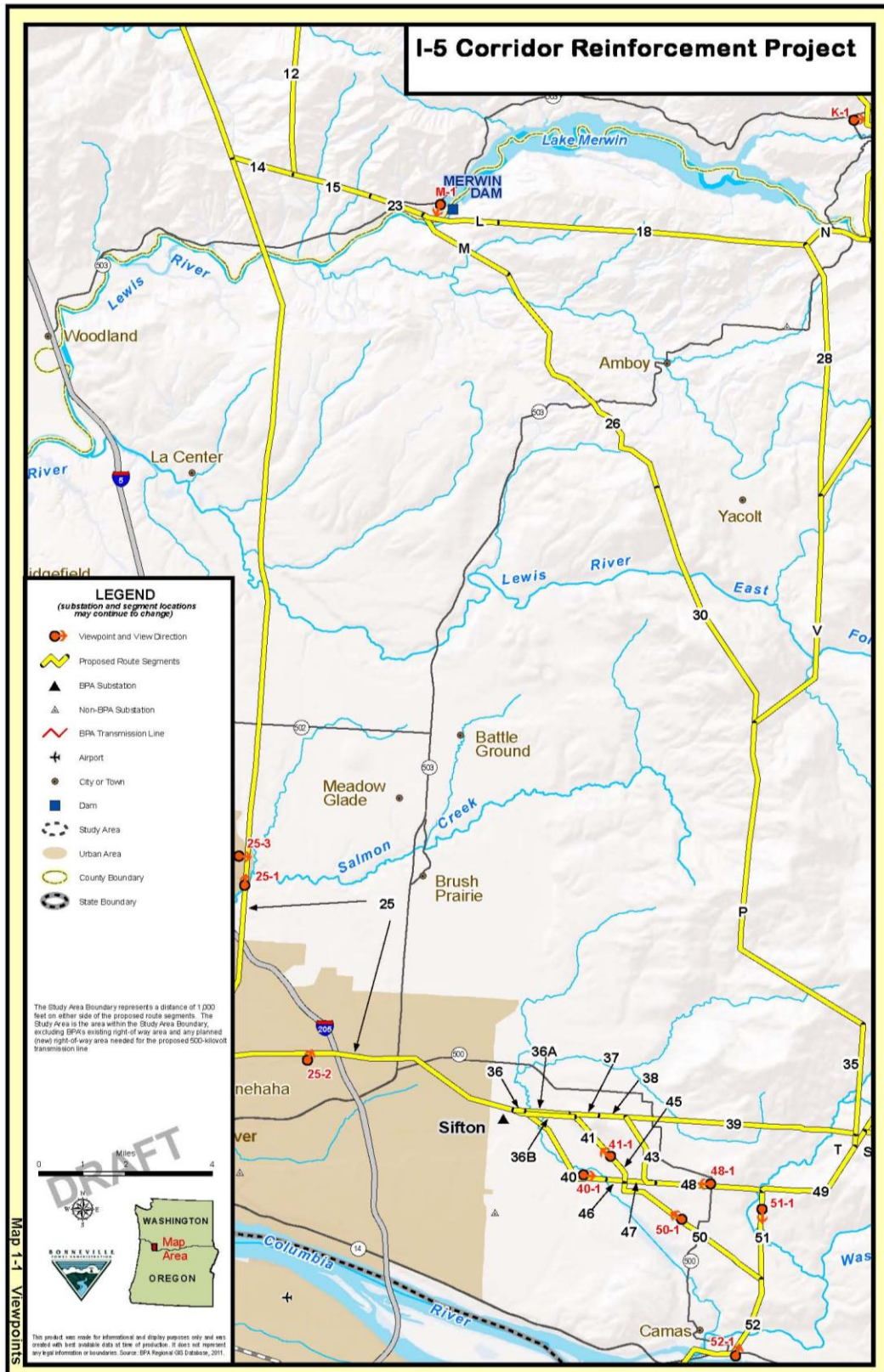
The method of assessment used for this analysis is based on the Bureau of Land Management's (BLM) Visual Resource Management (VRM) system. This method is effective for a variety of different development types, including transmission line projects. Other methods such as those designed specifically for forestry are effective for categorizing the landscape and rating the visual effects of forestry operations, clear cut logging cutblocks, or selective logging. These methods are less suitable for assessing transmission projects and the visual changes introduced by them, including construction of transmission towers, circuits/lines, roads, and substations.

Golder visited the route segments at locations where potentially important visual changes could occur. Due to the size of the project and remoteness of certain segments, only selected key areas were visited. Much of the Central and East alternatives is only accessible by logging roads and is not considered to contain key viewing areas. Golder took photos from 11 viewpoints to aid in the visual resource assessment. We identified areas of likely importance on maps of the area. In the field, specific locations were identified that offered a view of the project. The viewpoints are listed in Table 1-1 and their locations are depicted in Figure 1-1.

Table 1-1 Viewpoints

Viewpoint	Segment	New Towers Visible	Existing Line	Existing Towers Visible	Easting	Northing	Direction of View (Bearing)	Location
25-1	25	25/77 to 25/80	Ross-Lexington No 1	6/1 to 6/4	528696	5063610	N	NE Salmon Creek Avenue
25-2	25	25/124	McNary-Ross No 1 / Bonneville PH1-Alcoa No 1&2	6/3	531509	5057281	NNE	NE 76 th Avenue – Walnut Grove
25-3	25	25/78	Ross-Lexington No 1	6/3	528398	5064676	E	WSU Vancouver Campus
40-1	40	40/12 to 40/14	North Bonneville-Ross No 1 / North Bonneville-Ross No 2	26/3 to 26/5	542086	5053784	EES	NW Underwood Street
41-1	41	41/4 to 41/7	Bonneville PH1-Alcoa No 1&2	N/A	543041	5054564	NW	NE 28 th Street
48-1	48	48/1 to 48/7	North Bonneville-Ross No 1 / North Bonneville-Ross No 2	24/2 to 24/4	546833	5053813	WWS	NE 267 th Avenue
50-1	50	50/5 to 50/10	Bonneville PH1-Alcoa No 1&2	3/5, 3/6, 4/1 to 4/4	545856	5052407	NW	NE 3 rd Street
51-1	51	51/4 to 51/11	North Bonneville-Troutdale No 1 / North Bonneville-Troutdale No 2	N/A	548814	5053008	S	NE Zeek Road
52-1	52	52/3-52/10	North Bonneville-Troutdale No 1 / North Bonneville-Troutdale No 2 / North Camas-Oak Park No 1	1/1 to 1/12, 2/1 to 2/8	548234	5047480	NNE	Parking Lot Lewis and Clark Highway - Camas
M-1	M	M/2 to M/4	N/A	N/A	534066	5089450	S	Swimming Beach – Ariel – Lake Merwin
K-1	K	K/79	N/A	N/A	549193	5093744	EES	Yale Bridge Road

Figure 1-1 Viewpoint Locations



Golder collected photos with a Nikon D50 digital camera using a focal length of approximately 50mm (35mm film equivalent), considered consistent with the view perceived by the human eye (Horenstein et al. 2001). This is the standard focal length used in the development of photo simulations for visual resource assessment. Where potentially affected landforms were too large to fit into a single frame, multiple overlapping photos were taken.

The affected environment is discussed below in Section 2.0. This assessment is based on field observations, photos, maps, and visualization software (Google Earth). The project is divided into segments, comprising the alternatives, which traverse the landscape. Because the landscape often changes both in its scenic quality and its sensitivity across a particular segment area, a viewpoint that is representative of the most altered view does not reflect the overall visual impact for the entire segment. Other factors that are taken into account are the relative number of viewers, viewing conditions, length of view, and viewer sensitivity.

The general methods of the BLM VRM system are to inventory the visual resources of an area using the BLM Visual Resource Inventory methods and to perform analysis on a proposed alteration using the Visual Resource Contrast Rating (USDI 1986a, 1986b).

1.2.1 Visual Resource Inventory

The visual resource inventory process involves rating an area of land, in this case the area underlying and surrounding the proposed transmission line segments, measuring its visual appeal, determining the sensitivity or public concern for the scenic quality, and determining the visibility of the land to sensitive viewing locations (USDI 1986a). Ratings are performed with the understanding that all land has scenic value and that certain landscapes have more broadly appealing features than others. The value placed on the visual landscape is in the context of how and by whom it is viewed.

1.2.1.1 Scenic Quality

Scenic quality is a measure of the overall appeal of a view. The first step in the visual resource inventory process is to rate the scenic quality. The resulting ranking is High, Medium, or Low, which is determined based on several key factors (USDI 1986a). The key factors and the criteria used to rate them in this visual resource assessment are listed in Table 1-2.

With a maximum possible score of 32, values are totaled with results of 19 or more ranked High, 12 to 18 ranked Medium, and 11 or less ranked Low (these values are represented by A, B, and C respectively in the BLM VRM system).

1.2.1.2 Sensitivity

The second step in the visual resources inventory is ranking sensitivity levels. Sensitivity is a way of ranking public concern for visual resources. Factors considered in ranking sensitivity are the type of users, amount of use, public interest, adjacent land uses, special areas, and other factors that may be identified in other studies or research. Each of the sensitivity factors is assigned a ranking of High, Medium, or Low. Based on the ranking result, an overall sensitivity level is then assigned. The overall ranking is not necessarily an average of the individual factor rankings, since it is possible for certain factors to outweigh others. For example, public interest may be very high, despite other factors being low, indicating a generally high level of concern.

Table 1-2 Scenic Quality Evaluation Criteria Ranking

Key Factor	Rating Criteria and Score		
Landform	High vertical relief as expressed in prominent cliffs, spires, or massive rock outcrops, or severe surface variation or highly eroded formations including major badlands or dune systems; or detail features dominant and exceptionally striking and intriguing such as glaciers.	Steep canyons, mesas, buttes, cinder cones, and drumlins; or interesting erosional patterns or variety in size and shape of landforms; or detail features which are interesting though not dominant or exceptional.	Low rolling hills, foothills, or flat valley bottoms; or few or no interesting landscape features.
	5	3	1
Vegetation	A variety of vegetative types as expressed in interesting forms, textures, and patterns.	Some variety of vegetation, but only one or two major types.	Little or no variety or contrast in vegetation.
	5	3	1
Water	Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape.	Flowing, or still, but not dominant in the landscape.	Absent, or present, but not noticeable.
	5	3	0
Color	Rich color combinations, variety or vivid color; or pleasing contrasts in the soil, rock, vegetation, water or snow fields.	Some intensity or variety in colors and contrast of the soil, rock and vegetation, but not a dominant scenic element.	Subtle color variations, contrast, or interest; generally mute tones.
	5	3	1
Influence of Adjacent Scenery (Beyond the landform being evaluated)	Adjacent scenery greatly enhances visual quality.	Adjacent scenery moderately enhances overall visual quality.	Adjacent scenery has little or no influence on overall visual quality.
	5	3	0
Scarcity	One of a kind; or unusually memorable, or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc.	Distinctive, though somewhat similar to others within the region.	Interesting within its setting, but fairly common within the region.
	5	3	1
Cultural Modifications (changes to the visual landscape discernable as artificial, such as buildings or roads)	Modifications add favorably to visual variety while promoting visual harmony.	Modifications add little or no visual variety to the area, and introduce no discordant elements.	Modifications add variety but are very discordant and promote strong disharmony.
	2	0	-4
Source: Illustration 2 – Scenic Quality Inventory and Evaluation Chart. Manual 8410a. (USDI 1986a)			

The type of user has an influence on visual sensitivity, as perceptions of the landscape tend to vary based on the intended use of the land. Recreational sightseers tend to be highly sensitive to changes in scenic quality. Industrial workers travelling through the area regularly, such as forestry workers, tend to be less sensitive. Residents tend to have high sensitivity due to their attachment to the landscape and the duration of their views.

The amount of use influences sensitivity; as with a greater number of viewers, sensitivity generally increases. Public interest is generally expressed in public meetings, newspaper articles, websites, signs, and letters. A high public response and level of concern over a project indicate a higher sensitivity. The adjacent land use can influence sensitivity, as it can influence the type and expectations of the viewers. For example, adjacent commercial or industrial land use would be less sensitive than adjacent residential or recreational use. Special areas such as parks, natural areas, designated scenic areas, etc., can be indicative of a potentially higher level of sensitivity, but may depend on management objectives set out for the area.

1.2.1.3 Visual Landscape Rating

The scenic quality and sensitivity rankings are combined into a visual landscape rating based on the following table (see Table 1-3).

Table 1-3 Visual Resource Landscape Rating

Visual Resource		User Sensitivity		
		High	Medium	Low
Scenic Quality	High	High	High	High
	Medium	High	Medium	Low
	Low	Medium	Low	Low
Source: Illustration 11 – Determining Visual Resource Inventory Classes. Manual 8410a. (USDI 1986a)				

1.2.2 Visual Simulations

To assess the visual contrast of the project with the existing conditions, a 3-D computer landscape model of the study area was created using Visual Nature Studio (VNS) software (2010). VNS allows GIS and other spatial data to be incorporated into a 3-D landscape model. With a Digital Elevation Model used as the ground surface, vegetation is added to the model based on National Land Cover Data classified satellite imagery. Key existing views and project features are added to the model, including vegetation clearing, transmission towers, conductors, and substations. Transmission tower objects are the approximate size and design of the planned towers, based on descriptions provided by BPA.

At key viewpoints, visual simulations were created that simulate the appearance of the project facilities that correspond to the photographs taken in the field. The rendered images from the modeled views were then used for evaluating contrast.

1.2.3 Visual Contrast Rating

The project was rated at key viewpoints to determine the degree of visual contrast between the project and the existing landscape. Contrast is determined using the basic visual elements of form, line, color, texture. Factors such as scale (the proportional size of the object in relation to the field of view of the viewer) are also considered. The BLM Visual Contrast Rating Manual (USDI 1986b) describes the following elements:

- *form*, which includes the sub-elements of structures and movement, relates to the shape of disturbances in contrast to the existing landscape shapes
- *line*, which relates to the path the eye naturally follows when perceiving differences in landscape shape, color or texture
- *color*, which relates to the degree that the sub-elements of hue (e.g., red, blue, green), value (e.g., brightness), and chroma (e.g., saturation) contrast with existing landscape colors
- *texture*, which relates to the patterns that exist within the larger landscape elements
- *scale*, which relates to the proportional size of the object in relation to the field of view of the viewer

The elements are then combined into an overall contrast rating which, like the visual landscape inventory ratings, does not necessarily represent a mathematical average, since one element may dominate over the others. Each element and the overall contrast rating are then rated according to the descriptions provided in Table 1-4.

Section 3.0, Environmental Consequences discusses how the visual contrast rating is further combined with the visual landscape rating to determine the overall visual impact level for the segment.

Table 1-4 Degree of Contrast Criteria

Degree of Contrast	Criteria
None	The element is not visible or perceived.
Weak	The element contrast can be seen but does not attract attention.
Moderate	The element contrast begins to attract attention and begins to dominate the characteristic landscape.
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape.
Source: BLM Visual Resource Contrast Rating. Manual 8431. (USDI 1986b)	

1.3 Definition of the Study Area

The study area for a Visual Resources Assessment is defined as the area within 5 miles of the project. A distance of 5 miles was used because it represents locations with a potential foreground or middle-ground view (USDI 1986a) and the maximum distance at which a transmission line would create a dominant or intrusive presence to the viewer.

2.0 Affected Environment

The U.S. Environmental Protection Agency (EPA) Ecoregions provide a description of the physiography and general land use of the affected environment. The affected environment traverses several ecoregions as described by the United States Geological Survey (EPA 2007). Ecoregions are areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources; they are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components (see http://www.epa.gov/wed/pages/ecoregions/level_iii_iv.htm#Level III). This hierarchical system has subdivisions from Level I to Level IV, with Level I being the coarsest level (dividing North America into 15 ecological regions) and Level IV being the finest level. The Level III Ecoregions that dominate the study area's landscape include the Coast Range, Puget Lowland, Cascades, and Willamette Valley. These are further divided into Level IV Ecoregions. Level IV regions crossed by the study area include the Willapa Hills within the Coast Range; the Cowlitz/Chehalis Foothills within the Puget Lowland; the Western Cascades Lowlands and Valleys within the Cascades; and the Valley Foothills and Portland/Vancouver Basin within the Willamette Valley.

The affected environment consists of valley basins and foothills between the Coast Range on the west and the West Cascades to the east of the study area. The ecoregions traversed by the project are described in general in the following paragraphs. A more detailed rating of scenic quality and sensitivity is also provided in Sections 2.1 through 2.4.

2.1 Willapa Hills

At the north end of the project, all action alternatives originate in the Willapa Hills Level IV ecoregion. Segments A, B and E are contained in this region; segments C and D as well as the northern portions of segments 1, 2, 3 and F intersect it. This ecoregion consists of low, rolling hills and gently sloping mountains and fewer drainages than surrounding areas (EPA 2007). Visually, the region's landforms are uninteresting and the vegetation patterns do not form interesting or unique textures or patterns. Water features are not prominent. With fairly uniform vegetation, there are few interesting color differences, so it does not form a strong scenic element. The consistent vegetation and low rolling hills result in few long-range views. The hills and vegetation limit visual effects and result in adjacent scenery having little influence. The region is relatively sparsely populated, with the neighborhood of Longview Heights in the south and scattered residential acreages throughout other areas.

2.2 Cowlitz/Chehalis Foothills

All action alternatives also pass through a narrow section of the Cowlitz/Chehalis Foothills Level IV ecoregion. Segments 4, 5, 7 and 8 are contained in this region, the northern portions of segments 9, 11 and F as well as the southern portion of Segment 3 intersect it. This region in the study area consists of rolling to steeply sloping hills and the relatively flat Cowlitz River Valley. This region also forms the corridor for the Interstate (I-5) and contains the urban areas of Longview/Kelso and Castle Rock.

The landforms are non-dramatic and of little visual interest. The vegetation does not tend to vary to form interesting patterns or textures, but rather acts to visually contain the views so that long-range viewing opportunities are rare. There is water present, predominantly the Cowlitz River; however, it is not cascading or pristine, so only contributes to somewhat enhance scenic quality.

There are some color variations in the vegetation; however, they do not dominate or create a strong scenic element. The influence of adjacent scenery is limited due to the few long-range viewing opportunities. The visual characteristics of this region are common in much of south-western Washington and northwest Oregon.

2.3 Western Cascades Lowlands and Valleys

Covering a large part of the study area, the Western Cascades Lowlands and Valleys Level IV ecoregion includes the many valleys and ridges that stretch out west from the Cascade Range. Segments 10, 12, 14, 15, 18, 23, 26, 28, 30, 35, G to J, and L to W are contained in this region. The southern portions of segments 9, 11 and F, the northern portion of Segment 25, and the eastern portions of segments 39 and 49 intersect it. These segments include most of the East and Central alternatives.

The region has moderate to steeply sloping hills with western hemlock (*Tsuga heterophylla*) and Douglas-fir (*Pseudotsuga menziesii*) forests. The area has intensive forestry activity throughout. Although in general it is sparsely populated, it includes the communities of Ariel, Amboy, and Yacolt in the North; Venersborg and Hockinson in the Southwest; and the rural residential areas of Camas and Washougal in the South. The Kalama River, Lewis River, Lake Merwin, Yale Lake, portions of the Gifford Pinchot National Forest, Moulton Falls Park, and other small recreation sites are within this region of the study area.

The landforms of this region, while having more geographic relief than others in the study area, are not dominant or exceptional. The vegetation is fairly consistent and does not form interesting patterns or textures in most places. It tends to be most varied and interesting around the rivers and lakes mentioned above. Although not dominant through most of the area, water contributes to scenic quality around Merwin and Yale Lake and along the banks of watercourses. For the most part, water is not striking, cascading, or pristine. Color contributes to scenic quality, primarily in the fall. Otherwise, the landscape is dominated by similar shades of green throughout most of the area during the majority of the year.

2.4 Valley Foothills

West of the Western Cascades Lowlands and Valleys, the Valley Foothills Level IV ecoregion contains or is intersected by many of the smaller segments of the project in the Camas area. Segments 38, 41, 43, 45 and 47 fall completely within this region, segments 36B, 37, 39, 46, 48, 49, 50 and 51 intersect it. It is also intersected by a small northern portion of Segment 25.

This ecoregion is a transition zone between the Portland/Vancouver Basin to the west and the Western Cascades Lowlands and Valleys to the east. It is dryer than the neighboring mountainous ecosystems and has vegetation reflective of that, with Oregon oak (*Quercus garryana*) and Douglas-fir as the native vegetation. The non-native land use, which is more common than native vegetation, is made up of rural residential developments, woodlands, pastures, tree farms, vineyards, and orchards.

The landforms of this region consist of low rolling foothills with few dramatic features. There is some variety in the vegetation; however, it is rarely expressed in interesting forms, textures, or patterns. Visible water is rare throughout the ecoregion and for the most part does not contribute to scenic quality. There are some variations in color, which contribute slightly to the scenic quality; however, they are mostly shades of green and are not a dominant scenic element. Adjacent scenery has little effect on scenic quality, as most adjacent scenery is either blocked by

the topography and vegetation or is not a strong positive influence. The scarcity of the scenery is considered low, as the scenic elements found in the Valley Foothills are common throughout much of southwestern Washington and Oregon.

2.5 Portland/Vancouver Basin

The Portland/Vancouver Basin Level IV ecoregion is composed of floodplains and undulating terraces. Segments 36, 36A, 40 and 52 are contained in the region; segments 36B, 37, 46, 48, 50 and 51 as well as the southern portions of Segment 25 intersect it. All action alternatives move through this ecoregion before terminating at Sundial Substation.

The landforms of the region are dominated by low relief floodplains with small rolling hills on the eastern edge. These non-dramatic landforms do little to contribute to scenic quality. Vegetation is moderately varied in the ecoregion, as the change from rolling hills to floodplains results in more interesting forms, patterns, and textures. The vegetation patterns in the ecoregion moderately enhance scenic quality. Water moderately enhances the scenic quality from select locations surrounding the Columbia and Lewis Rivers, and other small creeks. As a scenic element, the water is limited in its influence because it is only visible in select locations and because it is not generally cascading or pristine. Color variations due to the diverse vegetation moderately enhance the scenic quality, but do not tend to be a dominant landscape element. Adjacent scenery is generally not highly visible or has little influence on scenic quality. This type of landscape is similar to other valley and basin ecoregions in southwestern Washington and northwestern Oregon.

2.6 Substations

2.6.1 Sundial Substation

The Sundial Substation is located in an area of Low scenic quality, owing to the flat relief floodplains; only somewhat varied vegetation consisting of smaller patches of forest, shrubs and open pastures; some influence of water, but that is not cascading or pristine; some color variations that are not a dominant scenic feature; no influence from adjacent scenery (due to limited visibility); somewhat distinctive scenery, but still common to floodplain landscape; and many negative cultural modifications due to proximity to an existing industrial park. The area has Medium sensitivity, given its location next to the Columbia River; high amount of use; low public interest; little influence of adjacent land use; no special areas; or other considerations. The combined Low scenic quality rating and Medium sensitivity rating result in a Low visual landscape rating.

2.6.2 Casey Road Substation

The proposed site of the Casey Road Substation is located in a remote area. . of Low scenic quality, in consideration of the low rolling foothills lacking dominant vertical relief or specific interesting landforms; a dense, uniform mixed-wood vegetation that is currently partly logged; very little visible water; few color variations; and no influence of adjacent scenery due to limited visibility. The site has a visual landscape common to the region, and includes negative cultural modifications such as the right-of-way of an existing transmission line and logging activity. The area has Low sensitivity, given the following factors: the type of use does not include residential use, parks, or other sensitive recreational uses; the amount of use is low; there is low public interest; the adjacent land uses do not increase the sensitivity; and there are not any special areas.

The Low scenic quality rating and Medium sensitivity rating result in a Low visual landscape rating.

2.6.3 Baxter Road Substation

The site is located approximately 2.5 miles from the Casey Road site, in an area of Low scenic quality, with low rolling foothills with few interesting features, little variety of vegetation, very little visible water, few color variations, and no influence of adjacent scenery. The site has a visual landscape common to the region, and there are no enhancing cultural modifications. The area has Low sensitivity, given the following factors: the type of use does not include residential use, parks, or other sensitive recreational uses; the amount of use is low; there is low public interest; the adjacent land uses do not increase the sensitivity; and there are not any special areas. The Low scenic quality rating and Medium sensitivity rating result in a Low visual landscape rating.

2.6.4 Monahan Creek Substation

The Monahan Creek Substation is located in an area of Low scenic quality, in consideration of the low foothills lacking dominant vertical relief or specific interesting landforms; largely uniform vegetation consisting primarily of mixed-wood forest and small open pastures; very little visible influence of water on the landscape; few color variations in the vegetation; no influence of adjacent scenery (due to limited visibility); a commonly occurring landscape throughout the region; and negatively influencing cultural modifications (buildings and other structures). The area is Medium sensitivity, given the rural residential usage, amount of use, and public interest. The combined Low scenic quality rating and Medium sensitivity rating result in a Low visual landscape rating.

2.7 West Alternative

The West Alternative originates in the Willapa Hills ecoregion, where it passes through rolling vegetated hills and rural residential areas before entering the West Side Highway and Kelso in the Puget Lowland ecoregion. Through the Puget Lowland ecoregion it passes through many residential and rural-residential areas. The hills become larger and the population less dense as it passes into the Western Cascades Lowlands and Valleys. After crossing the Lewis River, the alternative enters the Portland/Vancouver Basin ecoregion. The physiographic characteristics of the study area are consistent with the descriptions provided for the ecoregions through which the alternative passes.

The landscape along this alternative is consistent with the description of ecoregions, but the sensitivity varies locally with land use. Proximity to residential areas is the primary determinant for sensitivity along the alternative. The West Alternative portion of the study area is relatively close to residential areas for most of its length. At the north end it passes through rural residential areas northwest of West Side Highway. Rural residential areas have fewer users of the land, so the amount of use is lower than in more densely populated residential areas. However, public concern for the visual landscape in these areas may be higher due to the expectation of rural residents to have a more natural or open landscape. As the alternative crosses through West Side Highway and Kelso it runs through or close to residential areas.

The segment then crosses the Coweeman River and again crosses rural residential areas, which elevate the sensitivity. As the alternative continues south, across the Lewis River, it passes through agricultural land, which tends to be less sensitive than rural residential. The density of

residences increases south towards Hazel Dell. As the alternative shifts to a predominantly east-west direction it passes through urban residential, commercial, and industrial land. Crossing NE 4th Plain Road and heading SE towards Mill Plain and Camas, the alternative again passes through open space and rural residential areas. Public interest is high along the alternative, with signs on many yards expressing opposition to the project running through populated areas.

2.7.1 Scenic Quality Ratings

The scenic quality ratings for each segment of the West Alternative are provided in Table 2-1.

Table 2-1 West Alternative Scenic Quality Ratings

Route	Segment	Segment Length (miles)	Existing Conditions – Scenic Quality Ratings								
			Landform	Vegetation	Water	Color	Adjacent Scenery	Scarcity	Cultural Modifications	Scenic Quality Total	Scenic Quality Rating
West Alternative	2	6.04	2	2	1	2	0	1	-1	7	Low
	4	0.77	2	2	3	3	0	1	-2	9	Low
	9	18.72	2	2	3	3	0	1	-1	10	Low
	25	29.87	1	3	3	3	1	1	-2	10	Low
	36B	1.41	1	2	0	2	0	1	-1	5	Low
	41	1.27	1	3	1	3	0	1	-1	8	Low
	45	0.67	1	2	0	2	0	1	-1	5	Low
	50	4.09	1	3	1	3	0	1	-1	8	Low
	52	4.65	2	3	3	3	0	2	-2	11	Low
Totals	67.49										
West Option 1	36	0.22	1	2	0	2	0	1	-1	5	Low
	40	2.69	1	4	2	4	0	1	-1	11	Low
	46	0.46	1	2	2	2	0	1	-1	7	Low
	Totals	3.37									
West Option 2	36	0.22	1	2	0	2	0	1	-1	5	Low
	36A	1.03	1	2	0	2	0	1	-1	5	Low
	37	0.67	1	2	0	2	0	1	-1	5	Low
	38	0.66	1	2	0	2	0	1	-1	5	Low
	43	1.86	1	3	0	2	0	1	-1	6	Low
	48	2.49	1	2	0	2	0	1	-1	5	Low
	51	2.07	2	3	1	3	0	1	-1	9	Low
Totals	9.00										
West Option 3	36	0.22	1	2	0	2	0	1	-1	5	Low
	36A	1.03	1	2	0	2	0	1	-1	5	Low
	37	0.67	1	2	0	2	0	1	-1	5	Low
	38	0.66	1	2	0	2	0	1	-1	5	Low
	39	5.35	1	2	1	2	0	1	-1	6	Low
	T	0.31	1	2	0	2	0	1	-1	5	Low
	49	2.73	1	2	0	2	1	1	-1	6	Low
	51	2.07	2	3	1	3	0	1	-1	9	Low
Totals	13.04										

2.7.2 Sensitivity Ratings and Overall Landscape Ratings

The sensitivity rankings and overall landscape rating based on scenic quality and sensitivity for each West Alternative segment are listed in Table 2-2.

Table 2-2 West Alternative Sensitivity and Overall Landscape Rating

Route	Segment	Segment Length (miles)	Existing Conditions – Sensitivity and Overall Landscape Rating						
			Type of User	Amount of Use	Public Interest	Adjacent Use	Special Areas	Sensitivity Rating	Landscape Rating
West Alternative	2	6.04	H	M	M	L	L	Medium	Low
	4	0.77	H	H	M	L	L	High	Medium
	9	18.72	H	H	H	L	L	High	Medium
	25	29.87	H	H	H	L	L	High	Medium
	36B	1.41	H	H	H	L	L	High	Medium
	41	1.27	H	H	H	L	L	High	Medium
	45	0.67	H	H	H	L	L	High	Medium
	50	4.09	H	H	H	L	L	High	Medium
	52	4.65	H	H	H	L	L	High	Medium
Totals	67.49								
West Option 1	36	0.22	H	H	H	L	L	High	Medium
	40	2.69	H	H	H	M	L	High	Medium
	46	0.46	H	H	H	L	L	High	Medium
	Totals	3.37							
West Option 2	36	0.22	H	H	H	L	L	High	Medium
	36A	1.03	H	H	H	L	L	High	Medium
	37	0.67	H	H	H	L	L	High	Medium
	38	0.66	M	L	M	L	L	Medium	Low
	43	1.86	H	H	H	L	L	High	Medium
	48	2.49	H	H	H	L	L	High	Medium
	51	2.07	H	M	H	L	L	High	Medium
	Totals	9.00							
West Option 3	36	0.22	H	H	H	L	L	High	Medium
	36A	1.03	H	H	H	L	L	High	Medium
	37	0.67	H	H	H	L	L	High	Medium
	38	0.66	M	L	M	L	L	Medium	Low
	39	5.35	H	H	H	L	L	High	Medium
	T	0.31	M	L	M	M	L	Medium	Low
	49	2.73	H	M	M	H	L	Medium	Low
	51	2.07	H	M	H	L	L	High	Medium
	Totals	13.04							

Notes:

H = high rating for sensitivity conditions, M = medium rating, L = low rating

2.8 Central Alternative

The Central Alternative shares many characteristics with the West and Crossover alternatives. Northwest of the Cowlitz River the alternatives are very similar with only slight localized differences. East of the Cowlitz River, the Central Alternative crosses the Cowlitz/Chehalis Foothills ecoregion described in Section 2.0. The alternative then enters the Western Cascades Lowlands and Valleys ecoregion, which is also described in Section 2.0.

Through the portion of the Central Alternative located southeast of the Cowlitz River and north of the Lewis River, the alternative has generally Low sensitivity. This area is sparsely populated and has limited use. Sensitivity and scenic quality are higher near the Lewis River just west of Lake Merwin through Ariel. Near Amboy and Yacolt, and east of Lewisville and Battle Ground, the alternative is located amongst rural residential homes and has Medium sensitivity. Midway south along Segment P, the route turns east and away from rural residential areas until Segment 35, where the route passes near the rural residential homes of Camas.

2.8.1 Scenic Quality Ratings

The scenic quality ratings for each segment of the Central Alternative are provided in Table 2-3.

Table 2-3 Central Alternative Scenic Quality Ratings

Route	Segment	Segment Length (miles)	Existing Conditions - Scenic Quality Ratings								
			Landform	Vegetation	Water	Color	Adjacent Scenery	Scarcity	Cultural Modifications	Scenic Quality Total	Scenic Quality Ratings
Central Alternative	B	0.78	2	2	1	2	0	1	0	8	Low
	F	15.86	2	3	3	3	0	2	-2	11	Low
	G	1.39	2	2	1	2	0	1	-1	7	Low
	H	1.53	2	2	2	2	0	1	0	9	Low
	10	7.93	2	2	2	2	0	1	-1	8	Low
	12	4.96	2	2	2	2	0	1	0	9	Low
	15	1.86	2	2	2	3	0	1	-1	9	Low
	23	1.29	2	3	3	3	0	2	-1	12	Medium
	L	1.71	2	3	3	3	0	2	-1	12	Medium
	18	7.17	2	2	0	2	0	1	-1	6	Low
	28	5.94	2	2	1	2	2	1	-2	8	Low
	V	5.96	2	2	2	2	0	1	-2	7	Low
	P	8.62	1	2	0	2	0	1	-1	5	Low
	35	2.52	1	2	1	2	0	1	-1	6	Low
	T	0.31	1	2	0	2	0	1	-1	5	Low
	49	2.73	1	2	0	2	1	1	-1	6	Low
	51	2.07	2	3	1	3	0	1	-1	9	Low
52	4.70	2	3	3	3	0	2	-2	11	Low	
Totals	77.33										
Central Option 1	A	2.50	2	2	1	2	0	1	0	8	Low
	Totals	2.50									
Central Option 2	1	6.42	2	2	1	2	0	1	-1	7	Low
	4	0.77	2	2	3	3	0	1	-2	9	Low
	5	1.93	2	2	3	3	0	1	-1	10	Low
	8	1.61	2	2	1	2	1	1	-1	8	Low
	11	5	2	2	2	2	0	1	-1	8	Low
	Totals	15.73									
Central Option 3	M	2.39	2	3	3	3	0	2	-1	12	Medium
	26	6.54	2	2	1	2	1	1	-1	8	Low
	30	6.01	2	3	3	3	1	1	-1	12	Medium
	Totals	14.94									

2.8.2 Sensitivity Ratings and Overall Landscape Ratings

The sensitivity rankings and overall landscape rating based on scenic quality and sensitivity for each Central Alternative segment is presented in Table 2-4.

Table 2-4 Central Alternative Sensitivity and Overall Landscape Rating

Route	Segment	Segment Length (miles)	Existing Conditions -Sensitivity and Overall Landscape Rating						
			Type of User	Amount of Use	Public Interest	Adjacent Use	Special Areas	Sensitivity Rating	Landscape Rating
Central Alternative	B	0.78	L	M	M	L	L	Low	Low
	F	15.86	M	H	M	L	L	Medium	Low
	G	1.39	L	L	L	L	L	Low	Low
	H	1.53	L	L	L	L	L	Low	Low
	10	7.93	L	L	L	L	L	Low	Low
	12	4.96	L	L	M	L	L	Low	Low
	15	1.86	L	L	L	L	L	Low	Low
	23	1.29	M	H	H	L	L	Medium	Medium
	L	1.71	H	M	H	L	L	High	High
	18	7.17	M	L	M	H	L	Medium	Low
	28	5.94	M	M	M	L	L	Medium	Low
	V	5.96	L	L	M	L	L	Low	Low
	P	8.62	H	L	M	H	L	Medium	Low
	35	2.52	L	L	H	H	L	Medium	Low
	T	0.31	M	L	M	M	L	Medium	Low
	49	2.73	H	M	M	H	L	Medium	Low
	51	2.07	H	M	H	L	L	High	Medium
52	4.70	H	H	H	L	L	High	Medium	
	Totals	77.33							
Central Option 1	A	2.50	L	L	L	L	L	Low	Low
	Totals	2.50							
Central Option 2	1	6.42	M	M	M	L	L	Medium	Low
	4	0.77	H	H	M	L	L	High	Medium
	5	1.93	M	H	H	L	L	Medium	Low
	8	1.61	M	L	M	L	L	Low	Low
	11	5	L	L	L	L	L	Low	Low
	Totals	15.73							
Central Option 3	M	2.39	H	M	H	L	L	High	High
	26	6.54	H	M	H	L	L	High	Medium
	30	6.01	M	M	H	H	L	Medium	Medium
	Totals	14.94							
Notes: H = high rating for sensitivity conditions, M = medium rating, L = low rating									

2.9 East Alternative

The East Alternative originates west of Castle Rock in the Willapa Hills ecoregion, described in Section 2.0. The alternative crosses the Cowlitz River and extends across the Cowlitz/Chahalish Foothills ecoregion for approximately 8 miles before entering the Western Cascades Lowlands and Valleys ecoregion, described in Section 2.0. The East Alternative shares the portion of the route south of Lake Merwin and Yale Lake with the Crossover Alternative.

The sensitivity of the area surrounding the East Alternative is mostly based on land use. At the north end of the alternative, sensitivity is Low as there are not homes, roads or recreation areas. Near the north end of Castle Rock, sensitivity increases due to the increased amount of use and type of users. The number of potential viewers increases in the vicinity of Highway 504 and I-5. Highway 504 is a designated state scenic drive, where the sensitivity of Segment F is considered greater. East of Castle Rock viewer sensitivity is considered Low, as there are few residences, roads, or recreation areas. Segment K, covering most of the northern portion of the alternative, has Low sensitivity for most of its length because there are few homes, few roads, and low levels of use. Sensitivity is increased at the south end of Segment K, where it crosses Lewis River Road, and extends across the rural residential areas northwest of Ariel, and across the east end of Lake Merwin. South of Lake Merwin, the alternative shares segments with those described in Section 2.10 for the Crossover Alternative.

2.9.1 Scenic Quality Ratings

The scenic quality ratings for each segment of the East Alternative are provided in Table 2-5. General descriptions of the ratings are provided in Section 2.0.

Table 2-5 East Alternative Scenic Quality Ratings

Route	Segment	Segment Length (miles)	Existing Conditions - Scenic Quality Ratings								
			Landform	Vegetation	Water	Color	Adjacent Scenery	Scarcity	Cultural Modifications	Scenic Quality Total	Scenic Quality Ratings
East Alternative	B	0.78	2	2	1	2	0	1	0	8	Low
	F	15.86	2	3	3	3	0	2	-2	11	Low
	I	2.77	2	3	2	3	0	1	0	11	Low
	K	22.8	2	3	3	3	2	2	-1	14	Medium
	W	1.31	2	3	3	3	1	2	-1	13	Medium
	O	19.47	3	2	2	2	2	1	-1	11	Low
	Q	2.63	2	2	2	2	0	1	0	9	Low
	S	0.41	1	2	0	2	0	1	-1	5	Low
	49	2.73	1	2	0	2	1	1	-1	6	Low
	51	2.07	2	3	1	3	0	1	-1	9	Low
	52	4.70	2	3	3	3	0	2	-2	11	Low
Totals	75.53										
East Option 1	3	7.82	2	2	3	3	0	2	-1	11	Low
	7	2.05	2	2	1	2	1	1	-1	8	Low
	11	5	2	2	2	2	0	1	-1	8	Low
	J	2.72	2	2	1	2	0	1	0	8	Low
	Totals	17.59									
East Option 2	U	6.11	2	3	1	2	2	1	-1	10	Low
	V	5.96	2	2	2	2	0	1	-2	7	Low
	P	8.62	1	2	0	2	0	1	-1	5	Low
	35	2.52	1	2	1	2	0	1	-1	6	Low
	T	0.31	1	2	0	2	0	1	-1	5	Low
	Totals	23.52									
East Option 3	R	3.68	2	2	1	2	1	1	-1	8	Low
	Totals	3.68									

2.9.2 Sensitivity Ratings and Overall Landscape Ratings

The sensitivity rankings and overall landscape rating based on scenic quality and sensitivity for each segment of the East Alternative are provided in Table 2-6.

Table 2-6 East Alternative Sensitivity and Overall Landscape Rating

Route	Segment	Segment Length (miles)	Existing Conditions -Sensitivity and Overall Landscape Rating						
			Type of User	Amount of Use	Public Interest	Adjacent Use	Special Areas	Sensitivity Rating	Landscape Rating
East Alternative	B	0.78	L	M	M	L	L	Low	Low
	F	15.86	M	H	M	M	M	Medium	Low
	I	2.77	M	L	M	L	L	Medium	Low
	K	22.8	H	H	M	L	L	Medium	Medium
	W	1.31	H	M	M	L	L	Medium	Medium
	O	19.47	L	L	M	L	L	Low	Low
	Q	2.63	M	L	L	L	L	Low	Low
	S	0.41	M	L	M	M	L	Medium	Low
	49	2.73	H	M	M	H	L	Medium	Low
	51	2.07	H	M	H	L	L	High	Medium
	52	4.70	H	H	H	L	L	High	Medium
Totals	75.53								
East Option 1	3	7.82	M	H	M	L	L	Medium	Low
	7	2.05	H	M	M	L	L	Medium	Low
	11	5	L	L	L	L	L	Low	Low
	J	2.72	L	L	L	L	L	Low	Low
	Totals	17.59							
East Option 2	U	6.11	L	L	L	M	L	Low	Low
	V	5.96	L	L	M	L	L	Low	Low
	P	8.62	H	L	M	H	L	Medium	Low
	35	2.52	L	L	H	H	L	Medium	Low
	T	0.31	M	L	M	M	L	Medium	Low
	Totals	23.52							
East Option 3	R	3.68	L	L	L	L	L	Low	Low
	Totals	3.68							
Notes: H = high rating for sensitivity conditions, M = medium rating, L = low rating									

2.10 Crossover Alternative

The Crossover Alternative shares the northern half of the route with the West Alternative. The Crossover Alternative passes through the Western Cascades Lowlands and Valleys ecoregion and does not enter the Valley Foothills and Portland/Vancouver Basin until near its southern limit. The physiographic characteristics and scenic quality of the area surrounding the alternative are consistent with the ecoregion descriptions provided in Section 2.0.

The sensitivity varies along the alternative, with land use influencing the sensitivity. Near Amboy and Ariel, there are residential users, motorists, and recreational users of the landscape. South of Lake Merwin, sensitivity is lower, as there are fewer residences close to the alternative. Recreational land use becomes more influential on sensitivity; however, there is not a high amount of use, so sensitivity is Low to Medium. Entering the rural residential areas of Camas, the sensitivity becomes Medium to High, depending on the number and proximity of residences.

2.10.1 Scenic Quality Ratings

The scenic quality ratings for each segment of the Crossover Alternative are provided in Table 2-7.

Table 2-7 Crossover Alternative Scenic Quality Ratings

Route	Segment	Segment Length (miles)	Existing Conditions - Scenic Quality Ratings								
			Landform	Vegetation	Water	Color	Adjacent Scenery	Scarcity	Cultural Modifications	Scenic Quality Total	Scenic Quality Rating
Crossover Alternative	2	6.04	2	2	1	2	0	1	-1	7	Low
	4	0.77	2	2	3	3	0	1	-2	9	Low
	9	18.72	2	2	3	3	0	1	-1	10	Low
	14	1.50	2	2	2	3	0	1	-1	9	Low
	15	1.86	2	2	2	3	0	1	-1	9	Low
	23	1.29	2	3	3	3	0	2	-1	12	Medium
	L	1.72	2	3	3	3	0	2	-1	12	Medium
	18	7.17	2	2	0	2	0	1	-1	6	Low
	N	1.64	2	2	3	3	2	2	-1	13	Medium
	W	1.31	2	3	3	3	1	2	-1	13	Medium
	O	19.47	3	2	2	2	2	1	-1	11	Low
	Q	2.64	2	2	2	2	0	1	0	9	Low
	S	0.41	1	2	0	2	0	1	-1	5	Low
	49	2.73	1	2	0	2	1	1	-1	6	Low
	51	2.07	2	3	1	3	0	1	-1	9	Low
	52	4.70	2	3	3	3	0	2	-2	11	Low
	Totals	74.04									
Crossover Option 1	47	0.69	1	2	0	2	0	1	-1	5	Low
	48	2.50	1	2	0	2	0	1	-1	5	Low
	50	4.09	1	3	1	3	0	1	-1	8	Low
		Totals	7.28								
Crossover Option 2	C	3	2	2	1	2	0	1	0	8	Low
	E	1.34	2	2	1	2	0	1	0	8	Low
		Totals	4.34								
Crossover Option 3	D	2.86	2	2	1	2	0	1	0	8	Low
	E	1.34	2	2	1	2	0	1	0	8	Low
		Totals	4.2								

2.10.2 Sensitivity Ratings and Overall Landscape Ratings

The sensitivity rankings and overall landscape rating based on scenic quality and sensitivity for each segment of the Crossover Alternative are presented in Table 2-8.

Table 2-8 Crossover Alternative Sensitivity and Overall Landscape Rating

Route	Segment	Segment Length (miles)	Existing Conditions -Sensitivity and Overall Landscape Rating						
			Type of User	Amount of Use	Public Interest	Adjacent Use	Special Areas	Sensitivity Rating	Landscape Rating
Crossover Alternative	2	6.04	H	M	M	L	L	Medium	Low
	4	0.77	H	H	M	L	L	High	Medium
	9	18.72	H	H	H	L	L	High	Medium
	14	1.50	L	L	L	L	L	Low	Low
	15	1.86	L	L	L	L	L	Low	Low
	23	1.29	M	H	H	L	L	Medium	Medium
	L	1.72	H	M	H	L	L	High	High
	18	7.17	M	L	M	H	L	Medium	Low
	N	1.64	H	M	M	H	L	Medium	Medium
	W	1.31	H	M	M	L	L	Medium	Medium
	O	19.47	L	L	M	L	L	Low	Low
	Q	2.64	M	L	L	L	L	Low	Low
	S	0.41	M	L	M	M	L	Medium	Low
	49	2.73	H	M	M	H	L	Medium	Low
	51	2.07	H	M	H	L	L	High	Medium
	52	4.70	H	H	H	L	L	High	Medium
	Totals	74.04							
Crossover Option 1	47	0.69	H	H	H	L	L	High	Medium
	48	2.50	H	H	H	L	L	High	Medium
	50	4.09	H	H	H	L	L	High	Medium
		Totals	7.28						
Crossover Option 2	C	3	L	L	L	L	L	Low	Low
	E	1.34	H	M	M	L	L	Medium	Low
		Totals	4.34						
Crossover Option 3	D	2.86	L	L	L	L	L	Low	Low
	E	1.34	H	M	M	L	L	Medium	Low
		Totals	4.2						
Notes: H = high rating, M = medium rating, L = low rating									

3.0 Environmental Consequences

3.1 Visual Impact

The visual impact of the project is a function of the visual landscape rating (described in Section 1.2.1) and the visual contrast rating. Visual landscape ratings are provided for each segment in Tables 2-2, 2-4, 2-6, and 2-8; visual contrast ratings are provided for each segment in the segment descriptions below. These two ratings can be combined in Table 3-1 to determine the visual impact, which is rated as Negligible, Low, Moderate or High. This table rates the impact of the contrast of the project segments against the overall landscape in which it occurs. See Section 3.1.1 for more detail on how these impacts are determined.

Table 3-1 Visual Impact Rating

Visual Resource		Landscape Rating		
		Low	Medium	High
Overall Segment Contrast	None	Negligible	Negligible	Negligible
	Weak	Low	Low	Moderate
	Moderate	Low	Moderate	High
	Strong	Moderate	High	High
Source: Golder 2010				

3.1.1 Impact Levels

Impacts would be high where project activities would result in the following:

- A High or Medium landscape rating, and project features that dominate the landscape, or
- A High landscape rating, and project features that attract attention to the landscape.

Impacts would be moderate where project activities would result in the following:

- A High landscape rating, and project features that do not attract attention to the landscape, or
- A Medium landscape rating, and project features that attract attention to the landscape, or
- A Low landscape rating, and project features that dominate the landscape.

Impacts would be low where project activities would result in the following:

- A Medium or Low landscape rating, and project features that do not attract attention to the landscape, or
- A Low landscape rating, and project features that attract attention to the landscape.

No impact would occur where project features are visually negligible or not visible at all.

3.2 Impacts Common to Action Alternatives

Every action alternative would result in visual alterations to the landscape. Managing visual quality is a balancing act between placing disturbances in either more remote locations or adjacent to existing disturbances. Remote locations have fewer potential viewers, but are often less disturbed and therefore more sensitive to additional disturbances and viewers present may be more sensitive to potential changes. Sites close or adjacent to existing disturbances tend to be of a lower scenic quality, but often have higher populations and thus more potential viewers. As visual impact is a function of scenic quality, sensitivity, and contrast, the effects of alternatives are often balanced out.

The duration of the impacts is common to all action alternatives. The impacts discussed below are considered permanent for the life of the project. The landscape can be visually restored to existing conditions following the removal of transmission towers and re-growth of vegetation, so the alterations are not permanent, unless these facilities are never removed or are replaced with new facilities at the same location in the future.

3.3 Substations

3.3.1 Sundial Substation

There are no sensitive viewpoints that are expected to have a view of the Sundial Substation. The existing conditions of the area have many industrial operations, which would result in a lower contrast of the substation. The contrast is expected to be Weak, as it is unlikely to draw viewer's attention. With a contrast rating of Weak and a landscape rating of Low, the overall visual impact would likely be Low.

3.3.2 Casey Road Substation

The Casey Road Substation is not expected to be visible from any significant sensitive viewpoints. The visual impact of the Casey Road Substation would likely be Low.

3.3.3 Baxter Road Substation

The Baxter Road substation site sits in a small topographical depression and is surrounded by vegetation. The site is not expected to be visible from any significant sensitive viewpoints. The visual impact of the Baxter Road Substation would likely be Low.

3.3.4 Monahan Creek Substation

Monahan Creek Substation would likely be visible to surrounding residents and to motorists and commuters along Delameter Road and Monahan Road. The location of the substation would likely mean few long-range views; however, the substation would likely dominate the attention of viewers that have a foreground view, including users of Delameter Road. From beyond the immediately adjacent area, foreground vegetation would likely block views of most of the substation. No scenic viewpoints or designated areas are expected to be affected. The substation would likely be visible, attract attention, but not completely dominate the visual character of the landscape and therefore have a contrast rating of Moderate. With a contrast rating of Moderate and a landscape rating of Low, the expected visual impact of the substation is Low.

3.4 West Alternative

The impacts of the West Alternative and its options are summarized in Table 3-2. The contrast and impact of the segments within the options are discussed below.

Table 3-2 West Alternative Contrast Ratings and Visual Impact

Route	Segment	Segment Length (miles)	Contrast Ratings ¹ and Visual Impact						
			Form	Line	Color	Texture	Scale	Overall Contrast	Visual Impact
West Alternative	2	6.04	Strong	Strong	Moderate	Moderate	Strong	Moderate	Low
	4	0.77	n/a	n/a	n/a	n/a	n/a	Strong	High
	9	18.72	n/a	n/a	n/a	n/a	n/a	Moderate	Moderate
	25 ²	29.87	Moderate	Moderate	Weak	Weak	Strong	Moderate	Moderate
	36B	1.41	n/a	n/a	n/a	n/a	n/a	Moderate	Moderate
	41	1.27	Moderate	Weak	Weak	Weak	Moderate	Moderate	Moderate
	45	0.67	n/a	n/a	n/a	n/a	n/a	Moderate	Moderate
	50	4.09	Moderate	Moderate	Weak	Weak	Moderate	Moderate	Moderate
	52	4.65	Weak	Weak	Weak	Weak	Moderate	Weak	Low
	Totals	67.49							
West Option 1	36	0.22	n/a	n/a	n/a	n/a	n/a	Weak	Low
	40	2.69	Moderate	Moderate	Weak	Weak	Strong	Moderate	Moderate
	46	0.46	n/a	n/a	n/a	n/a	n/a	Moderate	Moderate
	Totals	3.37							
West Option 2	36	0.22	n/a	n/a	n/a	n/a	n/a	Weak	Low
	36A	1.03	n/a	n/a	n/a	n/a	n/a	Weak	Low
	37	0.67	n/a	n/a	n/a	n/a	n/a	Strong	High
	38	0.66	n/a	n/a	n/a	n/a	n/a	Weak	Low
	43	1.86	n/a	n/a	n/a	n/a	n/a	Weak	Low
	48	2.49	Moderate	Moderate	Weak	Weak	Strong	Moderate	Moderate
	51	2.07	Moderate	Moderate	Weak	Weak	Weak	Moderate	Moderate
	Totals	9.00							
West Option 3	36	0.22	n/a	n/a	n/a	n/a	n/a	Weak	Low
	36A	1.03	n/a	n/a	n/a	n/a	n/a	Weak	Low
	37	0.67	n/a	n/a	n/a	n/a	n/a	Strong	High
	38	0.66	n/a	n/a	n/a	n/a	n/a	Weak	Low
	39	5.35	n/a	n/a	n/a	n/a	n/a	Moderate	Moderate
	T	0.31	n/a	n/a	n/a	n/a	n/a	Weak	Low
	49	2.73	n/a	n/a	n/a	n/a	n/a	Moderate	Low
	51	2.07	Moderate	Moderate	Weak	Weak	Weak	Moderate	Moderate
	Totals	13.04							

Notes:

1. Only segments that had a visual simulation produced have individual contrast ratings for form, line, color, texture, and scale.
2. Contrast rating for form, line, color, texture and scale is for Viewpoint 25-1, overall contrast rating and visual impact is for Viewpoints 25-1, 25-2 and 25-3.

Segment 2: Typical views towards Segment 2 would be partially or fully obstructed by vegetation and some residences. The segment would be visible near Delameter road on the north end of the segment and then from a select few rural residences at a few locations along Hazel Dell Road and rural residences in the area of Trout Lake Road. It would also be visible at the southern end of the segment in Longview. With a landscape rating of Low and an overall contrast rating of Moderate, the impact of the segment would likely be Low.

Segment 4: This short segment runs adjacent to a residential area at the south end of the neighborhood of the West Side Highway and across I-5. For the residences along the right-of-way, the contrast would be Strong due to the scale of the towers created by their proximity. With an existing landscape rating of Medium and a contrast rating of Strong, the overall impact of Segment 4 would likely be High.

Segment 9: Segment 9 covers a long distance between Kelso/Longview and just north of the Lewis River, running adjacent to existing circuits. At the north end, the segment crosses over I-5 and through rural residential areas that decrease in density farther south along the segment. The expected contrast along Segment 9 would likely be Moderate or Strong, due to the large scale of the towers relative to their proximity to residences. The overall contrast of the segment is Moderate, as only certain residences would have the view dominated by the segment. The experience of most viewers would be slightly more distant and the line would be visible, but would not totally dominate the view. With a landscape rating of Medium and a contrast rating of Moderate, the overall impact of the segment would likely be Moderate.

Segment 25: Typical views of Segment 25 are from residences adjacent to the right-of-way or from nearby residential areas. The towers would dominate the view of anyone located adjacent to the right-of-way due to the towers' large scale and proximity to the viewer. From slightly farther away, the view of the segment would be partially obscured by trees and other houses. Most views would have many other existing visual alterations in the view, which would dilute the viewer's attention towards the segment. Three visual simulations along Segment 25 were created and are depicted in Figures 3-1 to 3-3.

Viewpoint 25-1 is specifically located on NE Salmon Creek Avenue; it is also representative of views from within or adjacent to the right-of-way through the low density rural residential areas north of Hazel Dell. The segment expands the cleared right-of-way, which disrupts the form of the vegetation. The patchy vegetation patterns of this area, however, mitigate the contrast of the vegetation clearing, resulting in a Moderate contrast rating for form. The line of the horizon is altered by both the vegetation clearing and the towers. Also the transmission lines themselves create a line that the eye naturally follows, which draws the viewer's attention. Since this line contrast element already exists, the contrast of the segment is lessened, resulting in a Moderate line contrast rating. The color of the cleared area is very similar to existing conditions. The towers are a contrasting color, but do not attract attention, resulting in a Weak color contrast rating. The texture of the vegetation clearing is very similar to the existing conditions and surrounding landscape and therefore was given a Weak texture contrast rating. The scale of the clearing has increased, as well as the size of the proposed transmission towers. The size of these towers relative to the existing structures and surrounding vegetation draw the attention of the viewer and were assigned a Strong contrast rating for scale. The overall contrast rating of Segment 25 from this viewpoint is Moderate.

Figure 3-1 Viewpoint 25-1

Looking North from NE Salmon Creek Avenue, Hazel Dell. West Alternative. Shows existing Ross-Lexington No. 1 line and towers 6/1 to 6/4. Simulation shows new towers 25/77 to 25/80.



Existing Conditions



Simulation

Figure 3-2 Viewpoint 25-2

Looking North-Northeast from NE 76th Avenue, Walnut Grove. West Alternative. Shows existing McNary-Ross No. 1 and Bonneville PH1-Alcoa No. 1&2 lines and Tower 6/34. Simulation shows new Tower 25/124.



Existing Conditions



Simulation

Figure 3-3 Viewpoint 25-3

Looking East from WSU Campus, Vancouver. West Alternative. Shows existing Ross-Lexington No. 1 line and Tower 6/3. Simulation shows new Tower 25/78.



Existing Conditions



Simulation

Viewpoint 25-2 is located in a residential neighborhood on the corner of NE 76th Avenue and NE 64th Street. It is representative of the view that would likely be experienced by many potential viewers in the neighborhoods surrounding Segment 25. The segment consists of existing right-of-way through suburban areas, so the main change is the visibility of the proposed towers above houses. The segment has Weak form contrast, as the main body of the view is largely unchanged. The line contrast is Moderate because the line of the horizon above the trees is more prominently disrupted by the taller towers. The color of the segment is very similar to existing conditions, so has Weak contrast. The texture element is also very similar to existing conditions and displays Weak contrast. The scale is a Moderate contrast, as the size of the proposed towers stands out more over the trees and houses and begins to dominate the landscape. The overall contrast of Segment 25 with the existing landscape at this viewpoint is Moderate.

Viewpoint 25-3 is located on the parking lot of Washington State University's Vancouver campus in Mt. Vista. It is representative of the view likely to be experienced by students and staff of the university as well as some residents of Mt. Vista. In this area, Segment 25 follows an existing right-of-way and the main change is the addition of new, taller towers to the right-of-way. The segment has Weak form contrast because the main body of the view is largely unchanged. The segment has Moderate line contrast, as the line of the horizon above the trees is more prominently disrupted by the taller towers. The color of the segment is very similar to existing conditions, so has Weak contrast. The texture element is also very similar to existing conditions and displays Weak contrast. The element of scale moderately contrasts, as the size of the towers now stands out more over the trees and begins to dominate the landscape. The overall contrast of Segment 25 with the existing landscape at this viewpoint is Moderate.

The overall contrast of Segment 25 across its considerable length is Moderate. The effect of vegetation clearing is moderated because it follows an existing right-of-way. The project's towers are larger and taller than existing structures, which would draw the attention of more viewers, but the towers are unlikely to be dominant in the landscape in contrast to existing conditions. With a landscape rating of Medium and an overall contrast of Moderate, the overall impact of Segment 25 on visual resources would likely be Moderate.

Segment 36B: This segment parallels segments 36 and 36A, and would run along the south side of the existing right-of-way. Typical views would have an unobstructed view of the segment. Some clearing of vegetation would be required where the segment crosses NE 199th Avenue and therefore has a Moderate contrast. The segment would be visible from the residences along NE Stoney Meadows Drive that back onto the open space as well as from NE 199th Avenue. With the segment on the south side of the existing right-of-way, the vegetation buffer between the residential area around NE 48th Circle and the towers would be maintained and visibility from 48th Circle is predicted to be limited. With a Moderate overall contrast and Medium landscape rating, the overall visual impact would likely be Moderate.

Segment 41: Typical views of Segment 41 would be from the Great Mountain Golf Course, NE 28th Street, and few residences along NE 28th Street. The typical view from the golf course would be unobstructed, whereas most residents would have a partially obstructed view.

A visual simulation viewpoint along Segment 41 is depicted in Figure 3-4. Viewpoint 41-1 simulates the view from NE 28th Street looking northwest. It is also representative of other unobstructed views that would be typical of those found on the golf course and to residents that are directly adjacent to the right-of-way. The triple-circuit tower replaces the previous double-circuit tower. The proposed tower for this segment is approximately twice the height than the tower it replaces, but requires little new right-of-way clearing. The segment has Moderate form contrast because the substantially larger tower draws more attention to its shape in contrast to its

surroundings. The line contrast is Weak, as the line of the horizon and the line of the circuits is similar to existing conditions. The color contrast is Weak, as the colors are very similar to existing conditions. The contrast in texture is also Weak. The scale is Moderate, as the larger towers stand out from their surroundings and begin to dominate the view. The overall contrast of the segment from this viewpoint is Moderate.

The overall contrast for the segment is Moderate. With a contrast rating of Moderate and a landscape rating of Medium, the overall visual impact of Segment 41 would likely be Moderate.

Segment 45: Typical views of Segment 45 would be direct, close views by residences along the right-of-way or partially obstructed views by nearby residents and motorists along NE 28th Street other smaller residential roads. Segment 45 shares characteristics with Segment 41 and the same contrast ratings apply as the ratings for Viewpoint 41-1 and the segment overall. The overall contrast for the segment is Moderate. With a contrast rating of Moderate and a landscape rating of Medium, the overall visual impact of Segment 45 would likely be Moderate.

Segment 50: Typical views of this segment are along rural roads or from residences adjacent to the segment. For much of its length, the segment passes through agricultural fields with open views but few viewers. At both ends of the segment, it passes through rural residential neighborhoods where the segment is highly visible from homes immediately adjacent to the right-of-way and would also be visible from more distant residences.

A visual simulation viewpoint along Segment 50 is depicted in Figure 3-5. Viewpoint 50-1 shows the view from NE 3rd Street looking northwest through an open rural section of Segment 50. This view is typical of the central section of the segment. The form of the segment has Moderate contrast with existing conditions, as the additional larger tower has a different shape than the existing towers, which promotes further disharmony in the landscape. The line contrast is Moderate, as the eye is drawn in similar ways as with existing conditions but the effect is increased to start to dominate the landscape. There is Weak contrast in the color element because there is little effect on vegetation and the towers and lines resemble existing conditions. There is Weak texture contrast, as the towers and lines are adjacent to existing lines and do not alter the vegetation in this view. The contrast in scale is Moderate, as the larger towers attract the attention of the viewer and begin to dominate their surroundings. Overall the contrast of the segment at this viewpoint is Moderate.

At the southeast end of the segment, the configuration is a triple circuit to minimize the right-of-way requirements. The larger triple-circuit tower would likely have a Moderate contrast with the existing conditions. The overall contrast for the segment is expected to be Moderate. With a landscape rating of Medium and an overall contrast rating of Moderate, the visual impact of Segment 50 would likely be Moderate.

Figure 3-4 Viewpoint 41-1

Looking Northwest from NE 28th Street, North of Camas, South of State Highway 500. West Alternative. Shows existing Bonneville PH1-Alcoa No. 1&2 line. Simulation shows new towers 41/4 to 41/7.



Existing Conditions



Simulation

Figure 3-5 Viewpoint 50-1

Looking Northwest from NE 3rd Street, North of Camas. West Alternative and Crossover Option 1. Shows Bonneville PH1-Alcoa No. 1&2 line and existing towers 3/5, 3/6, and 4/1 to 4/4. Simulation shows new towers 50/5 to 50/10.



Existing Conditions



Simulation

Segment 52: Views of Segment 52 range from unobstructed, distant views in open rural areas, close up views from roads and residences along the right-of-way in Camas, and views from Highway 14. North of the Columbia River Valley, the view and configuration would be similar to Viewpoint 51-1, as the landscape and line configuration are similar. The rebuilt 230-kV lines and proposed towers are larger than existing circuits and are no longer matching, so have more contrast than the existing towers. The contrast is Weak, however, because the size of the cleared right-of-way and number of towers remains relatively unchanged and is unlikely to dominate the characteristic landscape any more than existing conditions.

A visual simulation viewpoint along Segment 52 is depicted in Figure 3-6. Viewpoint 52-1 simulates the view of the segment from the Lewis and Clark Camp National Historic Site, located along Highway 14 (the Lewis and Clark Highway). It represents a middle-distance view of the segment as it descends into the Columbia River Valley. The contrast in form is Weak, as from this distance the greater size and shape of the towers do not begin to dominate the view. The line contrast is Weak because the line the eye follows changes very little from existing conditions. The color contrast is Weak, because colors are maintained from existing conditions. Texture contrast is also Weak, as there are not noticeable texture changes. The contrast in scale is Moderate, as the larger towers are noticeably larger than existing conditions and their surroundings. The overall contrast at this viewpoint is Weak, as the changes are noticeable, but are not dominant when compared to existing conditions.

The overall contrast of Segment 52 is Weak: the new towers, though noticeably larger and less harmonious, replace existing towers and therefore do not dominate the landscape in comparison to the existing landscape. With an overall Weak contrast and a landscape rating of Medium, the overall visual impact of the segment would likely be Low.

Overall Impact: The West Alternative has Moderate impact extending for most of the length of the alternative. There are “hot spots” of High impact localized to a fairly limited number of residences on segments 4 and 36. This alternative does not impact any recognized scenic areas or viewpoints, but has localized impacts on a large number of residents along the proposed route. The overall impact of the West Alternative would likely be Moderate to High.

Figure 3-6 Viewpoint 52-1

Looking North-Northeast from Lewis and Clark Highway, Camas. All action alternatives. Shows existing lines North Bonneville-Troutdale No. 1, North Bonneville-Troutdale No. 2, and North Camas-Oak Park No. 1, and existing towers 1/1 to 1/12, and 2/1 to 2/8. Simulation shows new towers 52/3 to 52/10.



Existing Conditions



Simulation

3.4.1 West Option 1

West Option 1 replaces segments 36b, 41 and 45 with segments 36, 40 and 46.

Segment 36: Through most of its short length, Segment 36 passes through rural fields where typical views would have a clear view of the segment, since it passes over flat ground with little vegetation. The contrast would be Weak because little vegetation clearing would be required and only the towers would be visible. The segment would be visible from the residences along NE Stoney Meadows Drive that back onto the open space. With a Weak overall contrast and Medium landscape rating, the overall impact would likely be Low.

Segment 40: For much of its length, views of Segment 40 are from several hundred feet away, across relatively open rural terrain. There are unobstructed or partially obstructed views from several residential roads and homes southwest of the segment. At the south end of the segment, it passes over NE Goodwin Road and through Camas Meadows Golf Course.

A visual simulation along Segment 40 is depicted in Figure 3-7. Viewpoint 40-1 depicts the view from the Lacamas Heritage Trail parking area off NE Goodwin Road. This portion of the segment includes the rebuilding of the existing 230-kV lines onto a new double-circuit 500-kV tower with the new line. This results in a tower height 2-3 times higher than the existing tower but minimizes the need for additional right-of-way or clearing. The form of the segment contrasts moderately with existing conditions as the shape of the new towers has changed and is more visible in the distance. The segment has Moderate line contrast with existing conditions as the towers now project much higher above the line of the horizon and above the ground, which draws the path of the eye to the alteration. The contrast in color is Weak, as the larger towers result in more metallic grey in the view; however, the color element alone does not attract attention. The texture contrast is also Weak, as it does not attract the viewer's attention. The contrast in scale is Strong, as the proposed towers dominate the view from close up and are visible from greater distances since they are taller than the surrounding trees. The overall contrast at Viewpoint 40-1 is Moderate.

The overall contrast of Segment 40 is Moderate, due to the taller towers that would be visible from a greater distance and would begin dominating the view from closer viewpoints. With an overall contrast of Moderate and a landscape rating of Medium, the overall visual impact of the segment would likely be Moderate.

Segment 46: This short segment passes through green space, the Lacamas Heritage Trail, and near residences. Views from the trail would be from directly in the right-of-way and would be similar to Viewpoint 40-1. It has the same contrast rating as Viewpoint 40-1 (Moderate). From residences set back from the right-of-way, the view would likely be partially obstructed by vegetation and other houses. The contrast from these locations would likely also be Moderate, as the towers would not be as prominent as closer up; however, the larger proposed double-circuit towers would be more visible above foreground obstructions such as houses or trees. With an overall contrast rating of Moderate and a landscape rating of Medium, the overall visual impact of Segment 46 would likely be Moderate.

Overall Impact: West Option 1 removes three segments with Moderate impacts and adds three segments with impacts similar to those they replace. West Option 1 is considered to have the same overall impact as the West Alternative.

Figure 3-7 Viewpoint 40-1

Looking East-Southeast from Lacamas Heritage Trail Parking Area. West Option 1. Shows existing lines North Bonneville-Ross No. 1 and North Bonneville-Ross No. 2, and towers 26/3 to 26/5. Simulation shows new towers 40/12 to 40/14.



Existing Conditions



Simulation

3.4.2 West Option 2

West Option 2 replaces segments 36B, 41, 45 and 50 with segments 36, 36A, 37, 38, 43, 48 and 51.

Segment 36: See West Option 1, Segment 36.

Segment 36A: This segment would be very similar to Segment 36. Typical views would have a clear view of the segment. As little vegetation clearing would be required and only the towers would be visible, the contrast would be Weak. The segment would be visible from the residences along NE Stoney Meadows Drive that back onto the open space as well as from NE 199th Avenue. With a Weak overall contrast and Medium landscape rating, the overall impact would likely be Low.

Segment 37: Segment 37 would be visible from the residences along the north edge of the right-of-way, specifically from the residential area around NE 48th Circle and from NE 199th Ave. The segment would remove much of the treed visual barrier between the residences and the right-of-way. This would cause the segment to be very prominent, as well as cause the previously obstructed existing segments to be visible. From these residences, the contrast would be Strong. From the road, the expected contrast is Weak: to motorists, the segment would only be visible momentarily where it runs perpendicular to the road and would not likely attract the attention of viewers.

The impact of Segment 37 is localized to specific residences and would have little impact beyond the residential area around NE 48th Circle. The overall contrast is Strong. With a Strong overall contrast and a Medium landscape rating, the overall visual impact of the segment would likely be High.

Segment 38: Views of Segment 38 would be largely obscured by vegetation. The top of the towers may be visible to some residents. The expected contrast of any potential views is Weak, as they are unlikely to attract the viewer's attention. With a Weak contrast and Low landscape rating, the overall visual impact of Segment 38 would likely be Low.

Segment 43: Views of Segment 43 would be mostly obstructed in the northern half of the segment. It would be visible to nearby residents and roadways. Because Segment 43 would be new right-of-way, it would attract the viewer's attention from the existing landscape; however, because the landscape consists of patches of trees, the discontinuous patterns would reduce the attention drawn to the segment. The overall anticipated contrast of Segment 43 is Weak. With a Weak contrast rating and Medium landscape rating, the overall visual impact of the segment would likely be Low.

Segment 48: Segment 48 would be seen by rural residences adjacent to the right-of-way and more distant residences with a partially obscured view. It would also be visible to motorists along NE 267th Avenue, which is crossed by the segment.

A visual simulation viewpoint along Segment 48 is depicted in Figure 3-8. Viewpoint 48-1 simulates the view from NE 267th Ave looking west-southwest. Right-of-way width is not changed by West Option 2, but larger double-circuit towers are added. These towers have Moderate form contrast, as they have a different, less harmonious shape, and are visible from much farther away. The proposed towers have Moderate line contrast, as they stand out above the line of the horizon well into the distance, whereas only the nearest existing towers are above the horizon. The color contrast color is Weak, as the larger towers result in more metallic grey in

the view; however, the color element alone does not attract attention. The texture contrast is also Weak, as it does not attract the viewer's attention. The contrast in scale is Strong, as the proposed towers dominate the view from close up and would be visible from greater distances than the existing towers since the proposed towers are taller than the surrounding trees. The overall contrast at Viewpoint 48-1 is Moderate.

The overall contrast of the segment is Moderate, as most potential views would be similar to Viewpoint 48-1. With an overall contrast rating of Moderate and a landscape rating of Medium, the overall visual impact of Segment 48 would likely be Moderate.

Segment 51: Views of Segment 51 are typically from rural residences and roads. Along this segment, the existing 230-kV towers would be replaced with one taller 230-kV double-circuit tower and a similarly sized single circuit 500-kV tower. The proposed towers are approximately twice the height of the existing towers and would no longer match, which is less harmonious than the existing matching towers. This is visually preferable, however, to a third set of towers and a wider right-of-way.

A visual simulation viewpoint along Segment 51 is depicted in Figure 3-9. Viewpoint 51-1 simulates the view from NE Zeek Road, looking south. The towers have Moderate form contrast, as they are larger than existing towers, have a different, less harmonious shape, and are visible farther into the distance. The taller towers also have Moderate line contrast, as they stand out above the line of the horizon well into the distance. The contrast of the project's color is Weak: the larger towers result in more metallic grey in the view, but the color element alone does not attract attention. The texture contrast is also Weak, because it does not attract the viewer's attention. The contrast in scale is Moderate, as the proposed towers are more prominent than the existing towers, but do not dominate the view and the characteristic landscape. The overall contrast at Viewpoint 51-1 is Moderate.

The overall contrast of Segment 51 is Moderate, as most viewing conditions would be similar to Viewpoint 51-1.

With an overall contrast rating of Moderate and a landscape rating of Medium, the overall visual impact of Segment 51 would likely be Moderate.

Overall Impact: West Option 2 removes three segments with Moderate impact and adds two segments with Low impact, four segments with Moderate and one segment with High impact. This option shares the impact of the West Alternative; however, the impact to residents along NE 48th Circle is increased from Moderate (Segment 36B) to High (Segment 37), the visual impact to the golf course is removed and the impact on residents along NE 28th Street is transferred to farther east to a new right-of-way. This option is less preferable to West Option 1 and the West Alternative, since it would result in High impacts to several residents, would require new right-of-way and would add more and longer segments with Low and Moderate impact.

The most preferable (lowest impact) options for the West Alternative are West Option 1 and the main alternative, followed by West Option 2 and West Option 3.

Figure 3-8 Viewpoint 48-1

Looking West-Southwest from NE 267th Avenue, North of Camas. West Option 2, Crossover Option 2. Shows existing lines North Bonneville-Ross No. 1 and North Bonneville-Ross No. 2, and towers 24/2 to 24/4. Simulation shows new towers 48/1 to 48/7.



Existing Conditions



Simulation

Figure 3-9 Viewpoint 51-1

Looking South from NE Zeek Road, Washougal. Central, East, and Crossover Alternatives, and West Options 2 and 3. Shows existing lines North Bonneville-Troutdale No. 1 and North Bonneville-Troutdale No. 2. Simulation shows new towers 51/4 to 51/11.



Existing Conditions



Simulation

3.4.3 West Option 3

West Option 3 replaces segments 36B, 41, 45 and 50 with segments 36, 36A, 37, 38, 39, T, 49 and 51.

Segment 36: See West Option 1, Segment 36.

Segment 36A: See West Option 2, Segment 36A.

Segment 37: See West Option 2, Segment 37.

Segment 38: See West Option 2, Segment 38.

Segment 39: Views of Segment 39 would typically be from rural residences and glimpse views along roadways. The widened right-of-way and addition of the single-circuit 500-kV tower would, from locations along the right-of-way, resemble Viewpoint 25-1 (see Figure 3-1). It would likely have Moderate contrast from existing conditions. The overall contrast of Segment 39 is expected to be Moderate, since there are residences scattered along the length of the segment that would be exposed to both the proposed segment and existing towers due to the right-of-way widening and removal of vegetation that is currently acting as a visual barrier. With a contrast of Moderate and a landscape rating of Medium, the overall visual impact of Segment 39 would likely be Moderate.

Segment T: There are no major public views of this segment as it is located amongst mature vegetation and is not on exposed terrain, and the views of the segment from the closest residences would likely be blocked by vegetation. The overall visual impact of Segment T would likely be Low.

Segment 49: Views of Segment 49 would likely be limited through the northern two thirds of the segment, as it is not exposed to roads, residences, or other viewpoints of consideration. Near the southern end of the segment, there are rural residences located immediately adjacent to the right-of-way. At the southern section, the existing right-of-way would be maintained and a double circuit installed. This would allow existing visual buffers to be maintained. The taller towers would likely be visible above the trees to a handful of residents. The anticipated overall contrast of the segment is Moderate, as the scale of the double-circuit towers attracts the viewer's attention. With an overall contrast of Moderate and a landscape rating of Low, the overall visual impact of the segment would likely be Low.

Segment 51: See West Option 2, Segment 51.

Overall Impact: West Option 3 removes four segments with a Moderate impact but adds two segments with Low impact, four segments with Moderate impact, and one segment (Segment 37) with High impact. This option is less preferable than West Option 1, West Option 2, and the West Alternative, since it would result in High impacts to several residents, and would add more and longer segments with Low impacts and similar or longer segments with Moderate impacts compared to all other options.

3.5 Central Alternative

The impacts of the Central Alternative and its options are summarized in Table 3-3. The contrast and impact of the segments within the options are discussed below.

Table 3-3 Central Alternative Contrast Ratings and Visual Impact

Route	Segment	Segment Length (miles)	Contrast Ratings ¹ and Visual Impact						
			Form	Line	Color	Texture	Scale	Overall Contrast	Visual Impact
Central Alternative	B	0.78	n/a	n/a	n/a	n/a	n/a	None	Negligible
	F	15.86	Weak	Moderate	Weak	Weak	Weak	Weak	Low
	G	1.39	n/a	n/a	n/a	n/a	n/a	None	Negligible
	H	1.53	n/a	n/a	n/a	n/a	n/a	Weak	Low
	10	7.93	n/a	n/a	n/a	n/a	n/a	Weak	Low
	12	4.96	n/a	n/a	n/a	n/a	n/a	Weak	Low
	15	1.86	n/a	n/a	n/a	n/a	n/a	Weak	Low
	23	1.29	n/a	n/a	n/a	n/a	n/a	Weak	Low
	L	1.71	Weak	Moderate	Weak	Weak	Weak	Weak	Moderate
	18	7.17	n/a	n/a	n/a	n/a	n/a	Weak	Low
	28	5.94	n/a	n/a	n/a	n/a	n/a	Weak	Low
	V	5.96	n/a	n/a	n/a	n/a	n/a	Weak	Low
	P	8.62	None	Weak	None	None	None	Weak	Low
	35	2.52	n/a	n/a	n/a	n/a	n/a	Weak	Low
	T	0.31	n/a	n/a	n/a	n/a	n/a	Weak	Low
	49	2.73	n/a	n/a	n/a	n/a	n/a	Moderate	Low
	51	2.07	Moderate	Moderate	Weak	Weak	Weak	Moderate	Moderate
52	4.70	Weak	Weak	Weak	Weak	Moderate	Weak	Low	
	Totals	77.33							
Central Option 1	A	2.50	n/a	n/a	n/a	n/a	n/a	None	Negligible
	Totals	2.50							
Central Option 2	1	6.42	0	0	0	0	0	Weak	Low
	4	0.77	n/a	n/a	n/a	n/a	n/a	Strong	High
	5	1.93	n/a	n/a	n/a	n/a	n/a	Weak	Low
	8	1.61	n/a	n/a	n/a	n/a	n/a	None	Negligible
	11	5	n/a	n/a	n/a	n/a	n/a	Weak	Low
	Totals	15.73							
Central Option 3	M	2.39	Moderate	Weak	Weak	Weak	Low	Weak	Moderate
	26	6.54	n/a	n/a	n/a	n/a	n/a	Moderate	Moderate
	30	6.01	Weak	Weak	Weak	Weak	Weak	Weak	Low
	Totals	14.94							
Notes:									
1. Only segments that had a visual simulation produced have individual contrast ratings for form, line, color, texture, and scale.									

Segment B: Segment B is not expected to be visible from any significant viewpoints. The overall impact of this segment would likely be Negligible.

Segment F: Views of Segment F are typically obstructed by surrounding vegetation. The segment is most visible as it crosses the Cowlitz River valley. As it crosses the valley and travels south along the slopes on the east side of the valley, locations with potential views of the segment include views from the Cowlitz River, I-5, Highway 504, and roads and residences surrounding Bond Road on the east side of I-5. In general, there are few viewing opportunities of the segment along this route. The view from the river, I-5 and highways would likely be a glimpse view of the lines overhead and would likely have Weak contrast, as the segment is not likely to attract the attention of the viewer. There is one residence that would be directly adjacent to the right-of-way. To this resident, the contrast is likely to be Moderate to Strong. The overall contrast of Segment F is Weak, as it is unlikely to significantly attract the attention of viewers. With a landscape rating of Low and an overall contrast rating of Weak, the overall impact of the segment would likely be Low.

Segment G: Segment G is not expected to be visible from any significant viewpoints. The overall impact of this segment would likely be Negligible.

Segment H: Segment H would not likely have any considerable viewing locations. It may be visible from a few rural residences located at the end of Mahaffey Road, although the views would be oblique and likely partially obstructed. As such, the expected contrast for the segment is Weak. With a landscape rating of Low and an overall contrast rating of Weak, the overall impact of the segment is Low.

Segment 10: Segment 10 would not likely have any considerable viewing locations, as it passes mainly through uninhabited forest without long range exposure to potential viewers. At the very south end of the segment, it passes over Kalama River Road and the Kalama River. At these locations the lines would be visible overhead; however, the towers would not likely be visible due to foreground vegetation. The contrast of just the lines passing over the river and road is likely to be Weak. With a landscape rating of Low and an overall contrast rating of Weak, the overall impact of the segment would likely be Low.

Segment 12: For most of its length Segment 12 would not likely have any considerable viewing locations, as it passes through mainly forest. At the very south end of the segment it would likely have slight exposure to the roads and residences in the Lewis River Valley. The small portion of the segment that could be visible passes through existing cutblocks, which would limit the contrast of the right-of-way clearing. The closest potential views would be approximately 1 mile away, so the towers are likely to have Weak contrast with the landscape. The overall contrast expected for the segment is Weak. With a landscape rating of Low and an overall contrast rating of Weak, the overall impact of the segment would likely be Low.

Segment 15: Views of Segment 15 would likely be limited to a few rural residences located on Tangen Road. Views to the Lewis River Valley and Ariel would likely be obstructed by topography and vegetation. Where views exist, the contrast would be mitigated by the existing transmission line right-of-way that runs parallel to the segment. For the few residences on the hill on Tangen Road, the contrast would likely be Moderate, as the segment would likely attract attention, but would not dominate the landscape. The overall contrast of the segment is expected to be Weak. With a landscape rating of Low and an overall contrast rating of Weak, the overall impact of the segment would likely be Low.

Segment 23: Segment 23 would be visible from the Lewis River Road and limited locations along the Lewis River, and select residences in Ariel and across the Lewis River would have partially obstructed views of the segment. The new right-of-way follows and widens the right-of-way of an existing transmission line, so the contrast with existing conditions is lessened. The expected contrast is Weak, as there are few unobstructed views and more distant views would be mitigated by the existing cleared vegetation. With a contrast of Weak and a landscape rating of Medium, the overall visual impact of Segment 23 would likely be Low.

Segment L: Segment L would likely be visible from Ariel, Lake Merwin, and occasional rural residences south of Lake Merwin. With a contrast rating of Weak and a landscape rating of High, the overall visual impact of the segment would likely be Moderate.

Segment 18: Views of Segment 18 are likely to be very limited, as it passes through forest that does not have any revealing landforms, such as exposed hillsides. At the east end of the segment there are rural residences adjacent to the right-of-way. Depending on the right-of-way vegetation clearing requirements, certain homes may not have vegetation obstructing the view to the right-of-way. Based on initial tower placement, however, there are not likely to be any direct unobstructed views of the towers. Since most of the segment would not be noticeable or would be heavily obstructed by vegetation, the contrast is likely Weak. With an overall contrast of Weak and a landscape rating of Low, the visual impact would likely be Low.

Segment 28: At the north end of the segment, it passes over NE Yale Bridge Road/Highway 503 and through Chelatchie Prairie. Here the segment would be visible to motorists and the few residences on the small prairie. The segment would likely have a Moderate contrast, as the towers would attract attention on the flat prairie and the right-of-way clearing would attract attention, particularly as it ascends the steep slope on the south side of the prairie. Neither would likely dominate the view. Farther south, the segment would also likely be visible to residents located off Healy Road. There would likely be a Moderate contrast to those few residents with an unobstructed view. The segment south of Healy Road would not likely be visible from any considerable viewpoints. The overall contrast of the segment is Weak, as it is only visible in limited locations and would largely go unnoticed. With a landscape rating of Low and an overall contrast rating of Weak, the overall impact of the segment would likely be Low.

Segment V: Views of the segment are mostly obstructed by foreground vegetation and topography. The subtle relief and topography make views of the landscape rare and usually partly obstructed. At the south end of Segment V, it passes over the East Fork of the Lewis River, over NE Sunset Falls Road, and near (approximately 600 feet from) a few rural residences. Views from the river are likely to be just of the lines passing overhead, as the foreground vegetation would likely block the views of the rest of the towers. The contrast at the river is likely to be Weak, as the lines are not likely to draw the attention of viewers. The segment would not likely draw the attention of motorists, as it would pass perpendicularly over the road and would only be visible as a brief glimpse; therefore, it would likely have a Weak contrast. From nearby rural residences, views are likely to be obstructed by vegetation and topography. The overall contrast of the segment is Weak. With a landscape rating of Low and an overall contrast rating of Weak, the overall impact of the segment is Low.

Segment P: Segment P passes along the western edge of the foothills and the eastern edge of the rural residences of Hockinson and Venersborg. There are no major public viewpoints close to this segment. Most views from nearby residences are likely to be obstructed by vegetation; however, there would likely be a few residences with a direct view of the segment. To these residents, the contrast would likely be Moderate to Strong, as the proximity of the towers would begin to dominate the view.

The overall contrast of the segment is Weak, as there are no public viewing areas that are affected and localized views are likely to be isolated and limited to only a few locations. With a landscape rating of Low and an overall contrast rating of Weak, the overall impact of the segment would likely be Low.

Segment 35: Views of Segment 35 are likely to be obstructed by foreground vegetation. The segment crosses NE Lessard Road and within a few hundred feet of a few residences, but is not likely to be visible through the vegetation. The contrast of the segment is likely to be Weak. With a landscape rating of Low and an overall contrast rating of Weak, the overall impact of the segment would likely be Low.

Segment T: Segment T is not expected to be visible from any significant viewpoints. The overall impact of this segment would likely be Negligible.

Segment 49: See West Option 3, Segment 49.

Segment 51: See West Option 2, Segment 51.

Segment 52: See West Alternative, Segment 52.

Overall Impact: Most of the Central Alternative runs through sparsely populated land with few sensitive viewers. Most impacts are Low, with a few Moderate impacts around Lake Merwin and Camas. The High impact reported for Segment 4 is localized and affects a relatively few number of residents. The overall impact of the Central Alternative is Low to Moderate.

3.5.1 Central Option 1

Central Option 1 adds Segment A to extend the transmission line from the site of the proposed Baxter Road Substation to the proposed Casey Road Substation.

Segment A: Segment A is not expected to be visible from any significant viewpoints. The overall impact of this segment would likely be Negligible.

Overall Impact: Central Option 1 adds one segment of Negligible impact. Central Option 1 is considered to have a visual impact similar to the Central Alternative.

3.5.2 Central Option 2

Central Option 2 replaces segments B, F and G and the proposed Baxter Road Substation with segments 1, 4, 5, 8 and 11 and the proposed Monahan Creek Substation.

Segment 1: Typical views of Segment 1 would be at least partially blocked by the surrounding vegetation. The segment would be visible from Delameter Road and select residences in that area, although it is unlikely to be dominant in the landscape, due to the subtle relief and trees that block the view. South along the segment there is little expected visibility of the segment, as there are few residences or roads nearby and the route does not follow highly exposed terrain. Near the south end of Segment 1, as it passes down the hillside into Longview, it would likely be visible from a few residences on the north edge of Beacon Hill.

The contrast from Segment 1 is expected to range from None to Weak, as it is not likely to be visible along much of its length. It would be visible from certain locations, but is unlikely to

draw the attention of the viewer. With a landscape rating of Low and a contrast rating of Weak, the overall impact of the segment would likely be Low.

Segment 4: This short segment runs adjacent to a residential area at the south end of the neighborhood of West Side Highway and across the Cowlitz River. For the residences along the right-of-way, the contrast would be Strong due to the scale of the towers created by their proximity. With an existing landscape rating of Medium and a contrast rating of Strong, the overall impact of Segment 4 would likely be High.

Segment 5: Segment 5 is largely obscured by the surrounding vegetation. The segment would be visible to motorists as it passes over I-5 and would have an expected contrast rating of Weak. The duration of the view would very brief as it crosses perpendicular to the road and the right-of-way clearing and towers are not likely to be noticeable farther away. The segment would also have partially obscured views from residences along Kitchen Drive and Holcomb Road. For most locations, the contrast would likely be Weak. For isolated residences adjacent to the segment, however, the contrast could be Moderate. The overall contrast for the segment is Weak, as it is unlikely to draw the attention of most viewers. With a landscape rating of Low and an overall contrast rating of Weak, the overall impact of the segment would likely be Low.

Segment 8: There are no potential viewpoints that are expected to have considerable views of Segment 8, as they are likely to be screened by terrain and vegetation. The overall visual impact of Segment 8 would likely be Negligible.

Segment 11: Segment 11 passes largely through forest with no considerable viewing opportunities. The segment does, however, pass through a rural area where it would likely be visible along parts of Rose Valley Road and to some residents of Clearwater Road. Views from the valley would likely be mostly obstructed by vegetation. The linear nature of the disturbance would draw more attention when visible than existing non-linear disturbances. The angle of viewing and the trees would likely mask the disturbance so the contrast would likely be Weak. With a landscape rating of Low and an overall contrast rating of Weak, the overall impact of the segment is Low.

Overall Impact: Central Option 2 replaces two segments with a Negligible impact and one segment with a Low impact. These are replaced with one segment with a Negligible impact, three segments with a Low impact, and one segment with a High impact. Central Option 2 also replaces the Baxter Road Substation, rated at a Low impact with the Monahan Creek Substation, rated at a Moderate impact. Central Option 2 has a higher overall visual impact than the Central Alternative and Central Option 1.

3.5.3 Central Option 3

Central Option 3 replaces segments L, 18, 28 and V with segments M, 26 and 30.

Segment M: The main view of interest for Segment M is at the north end where it crosses the Lewis River, south of Ariel. Both the river and nearby Merwin Lake attract recreational users who are likely to be more sensitive to potential changes to the visual landscape. From Ariel the view across the river to the south side of the valley would likely be partially obstructed by foreground vegetation. Where views are possible the tower would likely be visible on the far side, and the right-of-way clearing may be noticeable but not dominant up the hill on the south side. The level of contrast would largely depend on whether the vegetation can be maintained on the river valley slope. Assuming that the vegetation can be kept in the right-of-way through the

lower part of the valley on the steeper slopes, the contrast would likely be Weak. Farther south along the segment, the surrounding vegetation and topography would result in few or obstructed views of the segment and Weak contrast.

A visual simulation viewpoint along Segment M is depicted in Figure 3-10. Viewpoint M-1 simulates the view from the swimming beach on Lake Merwin in Ariel, looking south. The location has Moderate form contrast, as the larger towers have a different, less harmonious shape, and are visible into the distance. The location has Weak line contrast, as the towers do not stand out above the line of the horizon. The contrast of the segment's color is Weak, as the towers result in more metallic grey in the view; however, the color element alone does not attract attention. The texture contrast is also Weak, as it does not attract the viewer's attention. The contrast in scale is Weak, as the proposed towers are only somewhat prominent, and do not dominate the view and the characteristic landscape. The overall contrast at Viewpoint M-1 is Low.

The overall contrast of the Segment M would likely be Weak, since the segment would generally be less visible than at Viewpoint M-1. With an overall contrast of Weak and a landscape rating of High, the overall visual impact would likely be Moderate.

Segment 26: Potential viewing locations of Segment 26 include rural residential homes and Highway 503. There are no key public viewpoints that are likely to be affected. Rural residential homes immediately adjacent to the right-of-way would likely have a Moderate to Strong contrast. From Highway 503 and other public roads, the contrast of the segment is likely going to be Weak, as the segment would pass over the road and would only offer a glimpse view to motorists. Overall, the contrast of the segment would likely be Moderate. With an overall contrast of Moderate and a landscape rating of Medium, the overall visual impact of Segment 26 would likely be Moderate.

Segment 30: Typical views of Segment 30 are obstructed by vegetation and topography. Potential public viewing locations include Yacolt, 2 miles to the East, and where the segment crosses the East Fork of the Lewis River west of Lucia Falls and Moulton Falls Park. There are also a few rural residences close to the segment. From the Lewis River, the contrast of the segment is expected to be Weak, as foreground vegetation would block the view of the towers. The lines would be visible crossing the river, but are unlikely to draw the attention of the viewer. From residences, the contrast would likely be moderate, as the towers may be visible above the trees. With an overall contrast of Weak and a landscape rating of Medium, the overall visual impact of the segment would likely be Low.

Overall Impact: Central Option 3 adds one segment with a Low and two segments with a Moderate impact and removes three segments with a Low impact and one segment with a Moderate impact. The most noticeable visual impact resulting from Central Option 3 would occur where it crosses the Lewis River near Ariel. The difference between the two crossings does not affect the visual impact rating. However, the option does add Segment 26, which has a higher visual impact (Moderate) than the segments it replaces. Central Option 3 is considered to have a higher visual impact than the Central Alternative and Central Option 1 and a lower impact than Central Option 2.

The most preferable (lowest impact) options for the Central Alternative are Central Option 1 and the main alternative, followed by Central Option 3 and Central Option 2.

Figure 3-10 Viewpoint M-1

Looking South near Swimming Beach on Lake Merwin, Ariel. Central and Crossover Alternatives. Simulation shows new towers M/2 to M/4.



Existing Conditions



Simulation

3.6 East Alternative

The impacts of the East Alternative and its options are summarized in Table 3-4. The contrast and impact of the segments within the options are discussed below.

Table 3-4 East Alternative Contrast Ratings and Visual Impact

Route	Segment	Segment Length (miles)	Contrast Ratings ¹ and Visual Impact						
			Form	Line	Color	Texture	Scale	Overall Contrast	Visual Impact
East Alternative	B	0.78	n/a	n/a	n/a	n/a	n/a	None	Negligible
	F	15.86	Weak	Moderate	Weak	Weak	Weak	Weak	Low
	I	2.77	n/a	n/a	n/a	n/a	n/a	Weak	Low
	K	22.8	Moderate	Weak	Weak	Weak	Moderate	Weak	Low
	W	1.31	n/a	n/a	n/a	n/a	n/a	Weak	Low
	O	19.47	Weak	Weak	Weak	Weak	Weak	Weak	Low
	Q	2.63	n/a	n/a	n/a	n/a	n/a	Weak	Low
	S	0.41	n/a	n/a	n/a	n/a	n/a	None	Negligible
	49	2.73	n/a	n/a	n/a	n/a	n/a	Moderate	Low
	51	2.07	Moderate	Moderate	Weak	Weak	Weak	Moderate	Moderate
	52	4.70	Weak	Weak	Weak	Weak	Moderate	Weak	Low
	Totals	75.53							
East Option 1	3	7.82	0	0	0	0	0	Moderate	Low
	7	2.05	n/a	n/a	n/a	n/a	n/a	Weak	Low
	11	5	n/a	n/a	n/a	n/a	n/a	Weak	Low
	J	2.72	n/a	n/a	n/a	n/a	n/a	None	Negligible
	Totals	17.59							
East Option 2	U	6.11	n/a	n/a	n/a	n/a	n/a	None	Negligible
	V	5.96	n/a	n/a	n/a	n/a	n/a	Weak	Low
	P	8.62	None	Weak	None	None	None	Weak	Low
	35	2.52	n/a	n/a	n/a	n/a	n/a	Weak	Low
	T	0.31	n/a	n/a	n/a	n/a	n/a	Weak	Low
	Totals	23.52							
East Option 3	R	3.68	n/a	n/a	n/a	n/a	n/a	None	Negligible
	Totals	3.68							

Notes:
1. Only segments that had a visual simulation produced have individual contrast ratings for form, line, color, texture, and scale.

Segment B: See Central Alternative, Segment B.

Segment F: See Central Alternative, Segment F.

Segment I: Views of this segment are largely obstructed by vegetation and topography. No significant viewpoints are likely to have views of the segment. Some locations along Rose Valley

Road may have views toward the segment. These views are likely to be partially obstructed and portions of the segment that are visible are likely not to attract attention. The overall contrast of Segment I is likely Weak. With a contrast rating of Weak and a landscape rating of Medium, the overall visual impact of the segment would likely be Low.

Segment K: The majority of Segment K is obstructed by vegetation. At the south end of the segment, it descends between Lake Merwin and Yale Lake. The segment would be briefly visible as it crosses Lewis River Road and would be visible from Yale Road as it passes through an open area east of the road. At both these locations it is likely to have Weak contrast, as it would not likely attract the attention of viewers. Views to residences are likely to be at least partially obscured by vegetation, so the expected contrast is Weak. The segment crosses Lake Merwin, east of the Yale Bridge. From Lake Merwin the lines would be visible, and potentially the tops of the towers as well.

A visual simulation viewpoint along Segment K is depicted at Viewpoint K-1 (see Figure 3-11). Viewpoint K-1 simulates the view from Yale Bridge Road just south of the intersection with Lewis River Road, looking east. The segment has Moderate form contrast at this location, as the larger towers have a different, less harmonious shape, and are visible farther into the distance. The segment has Weak line contrast, as the taller towers now stand out above the vegetation but not above the line of the horizon. The contrast of the segment's color is Weak, as the larger towers result in more metallic grey in the view; however, the color element alone does not attract attention. The texture contrast is also Weak, as it does not attract the viewer's attention. The contrast of the scale is Moderate, as the proposed towers are more prominent, but do not dominate the view and the characteristic landscape.

The overall contrast at Viewpoint K-1, and Segment K, is Weak. . With an overall contrast of Weak and a landscape rating of Medium, the overall visual impact would likely be Low.

Segment W: Views to Segment W are expected to be largely obstructed by vegetation. The most significant view would be as the segment crosses over a small arm of Lake Merwin. The towers are likely going to be set back from the top of the escarpment with the underlying vegetation retained, so as not to be visible from the water. With only the lines visible, the anticipated contrast is Weak. With an overall contrast of Weak and a landscape rating of Medium, the visual impact would likely be Low.

Segment O: There are few potential views of Segment O, as there are no major roads in this area. Longer range views could be possible due to the greater relief; however, the landforms do not appear to expose the segment to longer range views. With an overall contrast of Weak and a landscape rating of Low, the visual impact would likely be Low.

Segment Q: Views to Segment Q would likely be restricted to motorists traveling along NE Boulder Creek Road. Rural residents nearby would likely not have a direct view of the segment due to vegetation. The overall contrast of the view would likely be Weak. With an overall contrast of Weak and a landscape rating of Low, the visual impact would likely be Low.

Segment S: There are no potential viewpoints that are expected to have meaningful views of Segment S, as they are likely to be screened by terrain and vegetation. The overall visual impact of Segment S would likely be Negligible.

Segment 49: See West Option 3, Segment 49.

Segment 51: See West Option 2, Segment 51.

Figure 3-11 Viewpoint K-1

Looking East-Southeast from Yale Bridge Road, Ariel. East Alternative. Simulation shows new Tower K/79.



Existing Conditions



Simulation

Segment 52: See West Alternative, Segment 52.

Overall Impact: Most of the impacts of the East Alternative are found in the south end, as it passes through Camas. Most of the segments have Negligible to Low Impact, as there are few potential sensitive viewpoints and the segments have little contrast with the landscape. The overall impact of the East Alternative is Low to Moderate.

3.6.1 East Option 1

East Option 1 replaces segments B, F and I and the proposed Baxter Substation with segments 3, 7, 11 and J and the proposed Monahan Substation.

Segment 3: Typical views of Segment 3 are partially or fully obstructed by foreground vegetation. There are, however, locations along Delameter Road, Hazel Dell Road, Highway 411, the rural residences located between Kelso and Castle Rock, I-5, and the residences near Ostrander Road that would have a view of the segment.

At Delameter Road, the segment would likely be visible as it leaves the substation, but would not likely be dominant on the landscape due to the subtle relief and vegetation. Where the segment crosses Hazel Dell Road, the towers and lines would likely be visible above the trees from the adjacent residences and briefly visible to motorists as they pass underneath the lines. There are also about five residences at the top of the hill along Pilgrim Road that would have a view of the segment, if their properties have a view to the south and beyond the trees. In these areas, the contrast would likely be Weak to Moderate. Along Hazel Dell Road, the segment would likely be visible to motorists and some residences along the road. The top of the transmission towers would likely just be visible at the top of the hill on the east side of the road. The contrast would likely be Weak, as it would not draw the viewer's attention due to its angle of viewing and being largely obscured. The view from Highway 411 would likely be a very brief view of the lines where they pass over the road. The contrast here would likely be Weak, as this type of view does not tend to draw the attention of motorists.

Along the flat floodplain, the segment would be visible from several residences, where the segment would likely have a Weak to Moderate contrast. Where Segment 3 crosses the Interstate, the contrast would likely be Weak, as the lines would pass over the highway and would only be momentarily visible since they cross perpendicularly. The neighborhood at the south end of Segment 3 would likely have view of the segment with a Moderate contrast.

The overall contrast rating for Segment 3 is Moderate, as some residences would have a view in which the segment could dominate the viewer's attention. With a landscape rating of Low and a contrast rating of Moderate, the overall impact of Segment 3 would likely be Moderate.

Segment 7: Most of Segment 7 would be obstructed by foreground vegetation and topography. Residents on the hill off Ostrander Road may have a view of the segment as it crosses the hillside at the west end of the segment. These views are likely to be partially obstructed and roughly half a mile from the segment. From these locations, the contrast of the segment with the existing landscape would likely be Weak. The overall contrast for the segment would likely be Weak. With a landscape rating of Low and an overall contrast rating of Weak, the overall impact of the segment would likely be Low.

Segment 11: See Central Option 2, Segment 11.

Segment J: Segment J is not expected to be visible from any significant viewpoints. The overall impact of this segment would likely be Negligible.

Overall Impact: East Option 1 replaces one segment with a Negligible impact and two segments with a Low impact with one segment with a Negligible impact and four segments with a Low impact. The option also replaces the Baxter Road Substation, rated at a Low impact, with the Monahan Creek Substation, rated at a Moderate impact. East Option 1 has a slightly higher impact than the East Alternative.

3.6.2 East Option 2

East Option 2 replaces segments O, Q and S with segments U, V, P, 35 and T.

Segment U: Segment U is not expected to be visible from any significant viewpoints. The overall impact of this segment would likely be Negligible.

Segment V: See Central Alternative, Segment V.

Segment P: See Central Alternative, Segment P.

Segment 35: See Central Alternative, Segment 35.

Segment T: See Central Alternative, Segment T.

Overall Impact: East Option 2 replaces one segment with a Negligible impact and two segments with a Low impact with one segment with a Negligible impact and four segments with a Low impact. The choice between East Option 2 and the East Alternative is mainly a balance between Low impacts to outdoor and recreational users of the landscape in East Option 2, and Low impacts to residences in the East Alternative. East Option 2 is considered to have visual impacts similar to the East Alternative.

3.6.3 East Option 3

East Option 3 replaces Segment Q with Segment R.

Segment R: Segment R is not expected to be visible from any significant viewpoints. The overall impact of this segment would likely be Negligible.

Overall Impact: East Option 3 replaces one segment with Low impact with a segment with Negligible impact. East Option 3 is considered to have visual impacts similar to the East Alternative.

The most preferable (lowest impact) options for the East Alternative are East Option 2, East Option 3, and the East Alternative.

3.7 Crossover Alternative

The impacts of the Crossover Alternative and its options are summarized in Table 3-5. The contrast and impact of the segments within the options are discussed below.

Segment 2: See West Alternative, Segment 2.

Segment 4: See West Alternative, Segment 4.

Segment 9: See West Alternative, Segment 9.

Segment 14: There are no potential viewpoints that are expected to have meaningful views of Segment 14, as they are likely to be screened by terrain and/or vegetation. The overall visual impact of Segment 14 would likely be Negligible.

Table 3-5 Crossover Alternative Contrast Ratings and Visual Impact

Route	Segment	Segment Length (miles)	Contrast Ratings ¹ and Visual Impact						
			Form	Line	Color	Texture	Scale	Overall Contrast	Visual Impact
Crossover Alternative	2	6.04	Strong	Strong	Moderate	Moderate	Strong	Moderate	Moderate
	4	0.77	n/a	n/a	n/a	n/a	n/a	Strong	High
	9	18.72	n/a	n/a	n/a	n/a	n/a	Moderate	Moderate
	14	1.50	n/a	n/a	n/a	n/a	n/a	None	Negligible
	15	1.86	n/a	n/a	n/a	n/a	n/a	Weak	Low
	23	1.29	n/a	n/a	n/a	n/a	n/a	Weak	Low
	L	1.72	Weak	Moderate	Weak	Weak	Weak	Weak	Moderate
	18	7.17	n/a	n/a	n/a	n/a	n/a	Weak	Low
	N	1.64	n/a	n/a	n/a	n/a	n/a	Weak	Low
	W	1.31	n/a	n/a	n/a	n/a	n/a	Weak	Low
	O	19.47	Weak	Weak	Weak	Weak	Weak	Weak	Low
	Q	2.64	n/a	n/a	n/a	n/a	n/a	Weak	Low
	S	0.41	n/a	n/a	n/a	n/a	n/a	None	Negligible
	49	2.73	n/a	n/a	n/a	n/a	n/a	Moderate	Low
	51	2.07	Moderate	Moderate	Weak	Weak	Weak	Moderate	Moderate
	52	4.65	Weak	Weak	Weak	Weak	Moderate	Weak	Low
	Totals	74.04							
Crossover Option 1	47	0.69	n/a	n/a	n/a	n/a	n/a	Moderate	Moderate
	48	2.50	Moderate	Moderate	Weak	Weak	Strong	Moderate	Moderate
	50	4.09	Moderate	Moderate	Weak	Weak	Moderate	Moderate	Moderate
		Totals	7.28						
Crossover Option 2	C	3	n/a	n/a	n/a	n/a	n/a	Weak	Low
	E	1.34	n/a	n/a	n/a	n/a	n/a	Weak	Low
		Totals	4.34						
Crossover Option 3	D	2.86	n/a	n/a	n/a	n/a	n/a	Weak	Low
	E	1.34	n/a	n/a	n/a	n/a	n/a	Weak	Low
		Totals	4.2						
Notes:									
1. Only segments that had a visual simulation produced have individual contrast ratings for form, line, color, texture, and scale.									

Segment 15: Typical views to Segment 15 would likely be obscured by vegetation and terrain. The sparse rural residences south of the segment could have obstructed partial views; however, it

is unlikely that the segment would contrast with the existing landscape and draw the attention of potential viewers. There is one rural residence that appears to have a line of sight to the segment. The overall contrast of the segment is Weak. With an overall contrast of Weak and a landscape rating of Low, the overall visual impact of Segment 15 would likely be Low.

Segment 23: See Central Alternative, Segment 23.

Segment L: See Central Alternative, Segment L.

Segment 18: See Central Alternative, Section 18.

Segment N: Views of Segment N are likely to be largely obstructed by vegetation. The segment would be visible as it crosses NE Yale Bridge Road. At the road crossing, the segment is unlikely to attract the attention of motorists, as it crosses perpendicular to the road and due to the vegetation, would only be visible briefly as motorists pass under the lines. The new right-of-way partly follows and widens the right-of-way of an existing transmission line, so the contrast with existing conditions is lessened. The expected contrast is Weak at the crossing. The overall expected contrast is Weak. With an overall contrast of Weak and a landscape rating of Medium, the visual impact would likely be Low.

Segment W: See East Alternative, Segment W.

Segment O: See East Alternative, Segment O.

Segment Q: See East Alternative, Segment Q.

Segment S: See East Alternative, Segment S.

Segment 49: See West Option 3, Segment 49.

Segment 51: See West Option 2, Segment 51.

Segment 52: See West Alternative, Segment 52.

Overall Impact: The Crossover Alternative is mostly Low to Moderate impact for most of its length. Segment 4 has localized High impact to a limited number of residences. The cross-over avoids the more populated western routes and results in fewer affected residents. This alternative does not impact any recognized scenic areas or viewpoints. The overall impact of this alternative is Low to Moderate.

3.7.1 Crossover Option 1

Crossover Option 1 replaces Segment 51 with segments 47, 48 and 50.

Segment 47 would be seen by rural residences adjacent to the right-of-way, and more distant residences with a partially obscured view. The overall contrast of the segment is Moderate. With an overall contrast rating of Moderate and a landscape rating of Medium, the overall visual impact of Segment 47 would likely be Moderate.

Segment 48: See West Option 2, Segment 48.

Segment 50: See West Alternative, Segment 50.

Overall Impact: Crossover Option 1 adds three segments with a Moderate impact through a rural residential area and eliminates one with a similar impact. Crossover Option 1 offers few visual benefits to offset the added length and exposure to a greater number of sensitive viewers, since it only eliminates one segment of Moderate impact. This option has a higher impact than the Crossover Alternative and is therefore less preferable.

3.7.2 Crossover Option 2

Crossover Option 2 adds segments C and E to extend the transmission line from the site of the proposed Monahan Creek Substation to the proposed Baxter Road Substation.

Segment C: Views of Segment C are expected to be screened by vegetation and topography. The segment would likely be visible at the south end to the rural residents near Melton Road. The segment would run on existing right-of-way with reconfigured towers. As such, the expected contrast of the segment is Weak. With an overall contrast of Weak and a landscape rating of Low, the visual impact would likely be Low.

Segment E: Segment E would likely be visible from Monahan Road, Delameter Road, and the rural residents located along the right-of-way. The segment would run on existing right-of-way with reconfigured towers. As such, the expected contrast of the segment is Weak. The segment would run on existing right-of-way with reconfigured towers. As such, the expected contrast of the segment is Weak. With an overall contrast of Weak and a landscape rating of Low, the visual impact would likely be Low.

Overall Impact: Crossover Option 2 adds two segments of Low impact to the Crossover Alternative. It does not change the overall rating of the alternative, but it does have a higher overall impact because it adds segments to the main alternative without replace any segments. However, the option includes the replacement of the Monahan Creek Substation with the Baxter Road Substation, which has lower visual impacts. Crossover Option 2 is therefore preferred over the Crossover Alternative and Crossover Option 1.

3.7.3 Crossover Option 3

Crossover Option 2 adds segments D and E to extend the transmission line from the site of the proposed Monahan Creek Substation to the proposed Baxter Road Substation.

Segment D: Views of Segment D are expected to be screened by vegetation and topography. The segment would likely be visible at the south end to the rural residents near Melton Road. The segment would require new right-of-way, which would add to the contrast compared to existing conditions; however, it is unlikely that the contrast would attract attention. The expected contrast of the segment is Weak. With an overall contrast of Weak and a landscape rating of Low, the visual impact would likely be Low.

Segment E: See Crossover Option 2, Segment E.

Overall Impact: Crossover Option 3 is similar to Crossover Option 2, except that Segment D requires new right-of-way. Although the segment remains a Low impact, it would be slightly higher impact than Crossover Option 2. However, it would be preferred over Crossover Option 1 and the Crossover Alternative due to the relocation of the substation.

The most preferable (lowest impact) option for the Crossover Alternative is Crossover Option 2, followed by Crossover Option 3, the Crossover Alternative, and Crossover Option 1.

3.8 No Action Alternative

Under the No Action Alternative, visual conditions would continue as described in Section 2, Affected Environment. Transmission lines in existing right-of-way would continue to be visible by surrounding viewers. In areas without existing transmission lines, other visual alterations would continue to occur, such as forestry, urban development, and transportation.

4.0 Mitigation Measures

Standard mitigation measures to minimize impacts to visual quality include the following:

- Use dulled towers to reduce light reflectivity and overall tower visibility.
- Use non-reflective conductors and non-luminous, non-reflective insulators.
- Place towers so that they would not be visible from nearby communities when possible.
- Site new towers near existing towers and use a similar tower type, where possible. This would lessen visual clutter that can result when different types of towers are visible in a vast open landscape.
- Where feasible, site new towers to take advantage of existing screening offered by topography and/or vegetation.
- Set towers back from road crossings to minimize intrusion on views along road corridors. Preserve existing vegetation along the roadway if possible to screen the transmission lines and towers. Allow the growth of dense masses of medium shrubs parallel to the roadway where the transmission line right-of-way crosses.
- Minimize ground-disturbing activities and dispose of all waste soil off-site.
- If wetlands would be disturbed, preserve the existing topsoil in wetland areas near disturbed tower sites by stockpiling it during construction and spreading it after construction so native plant communities would regenerate and blend with the surroundings. Phase and integrate these activities with the project construction schedule to ensure the quickest rehabilitation of sites.
- Leave low-growing vegetation where possible.
- Use techniques to re-vegetate cut and fill slopes on access roads and near tower locations.
- Minimize access road placement in highly sensitive areas.

5.0 Unavoidable Impacts

If all mitigation measures are employed, the transmission towers, vegetation clearing, access roads and substations would still be visible from some locations. Towers of this size are unavoidably visible from some locations, exposing certain viewers to changes in the visual landscape. The visual impact of the West Alternative is considered Moderate to High, while the impacts of the remaining alternatives are considered Low to Moderate. The higher impact rating for the West Alternative is primarily due to the higher number of potential viewers.

Depending on the option selected, potential High visual impacts for the West, Crossover, and Central alternatives could occur where the transmission lines run in close proximity to residential neighborhoods, specifically in the area of the West Side Highway (Segment 4) and around NE 48th Circle (Segment 37).

6.0 Cumulative Effects of the Project

Cumulative effects refer to environmental impacts that are additive or interactive (synergistic) in nature and result from multiple activities over time, including the action alternatives. The U.S. Council on Environmental Quality defines cumulative effects as "the impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions."

The potential for cumulative effects on the visual resources that may result from this project would be largely dependent on the extent of current and future urban and rural residential development consistent with county development plans, and on current and proposed forest harvesting operations.

Ongoing residential development will likely further encroach into what are now open spaces that are generally considered to have intrinsic scenic value. Developments also introduce more sensitive viewers to an area, which then can have the effect of increasing the perceived sensitivity to changes in the landscape resulting in changes to the landscape rating. This may cause existing and new developments to be received more negatively.

Forestry operations in the study area will continue into the future and are expected to continue to have a similar effect on the visual resources as they do under the current conditions. Forest management practices have generally improved in recent years in the area of visual impact and aesthetics, and as such, this trend would likely result in a reduction of visual impacts from future forest harvesting activities. The cumulative impact of the project with other existing and approved developments would likely be low, as the character of the affected ecoregions is not likely to change. The area encompassing the West Alternative would likely be subject to the most potential impacts in terms of viewers, as residential developments increase in the Portland/Vancouver Basin and open space is replaced by housing developments. With no major reasonably foreseeable developments known for the ecoregions of the East, Central, and Crossover alternatives, the cumulative impact for these alternatives would likely be low.

7.0 Federal, State, Local, and Permit Requirements Review

Federal Regulations

The National Environmental Policy Act (NEPA) requires in 42 USC Section 4321 that all actions sponsored, funded, permitted, or approved by federal agencies undergo planning to ensure that environmental considerations such as those related to visual resources are given due weight in decision-making. NEPA Section 101(b)(2) states that it is the “continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations” to “assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings”.

State Regulations

There are no state visual resources regulations in Oregon or Washington that apply to this project. The Washington State Environmental Policy Act (SEPA) considers visual resources as an element of the environment in its EIS requirements. Agencies with review authority under SEPA can prepare their own EIS or adopt a NEPA EIS for those projects that they feel require an EIS under SEPA.

Local Regulations

There are no specific local regulations specific to visual resources that apply to this project. See discussion on SEPA under State Regulations above.

Permit Requirements

There are no permits required with respect to visual resources.

8.0 List of Preparers

Kevin Graham. GIS and Visualization Specialist. Visual Resources Task Lead and Author.

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9.0 References

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10.0 Acronyms and Glossary

Acronyms

BLM	Bureau of Land Management
BPA	Bonneville Power Administration
GIS	Geographic Information System
I	Interstate
kV	kilovolt
NEPA	National Environmental Policy Act
SEPA	State Environmental Policy Act
USDI	U.S. Department of the Interior
VNS	Visual Nature Studio
VRM	Visual Resource Management
WSU	Washington State University

Glossary

cultural modifications – Any human-caused changes in the land form, water form, vegetation, or the addition of a structure that create a visual contrast in the basic elements (form, line, color, texture) of the naturalistic character of a landscape.

cumulative impacts – Impacts created by the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions.

double-circuit – Two separate electrical circuits (for alternating current, each circuit consists of three separate conductors or bundles of conductors) on the same transmission towers.

foreground and middle-ground view – The area visible from a travel route, use area, or other observation point to a distance of 3 to 5 miles. The outer boundary of this zone is defined as the point where the texture and form of individual plants are no longer apparent in the landscape.

long-range view – The area visible from a travel route, use area, or other observation point to a distance of greater than 5 miles. Also called the background distance zone.

right-of-way – An easement for a certain purpose over the land of another, such as a strip of land used for a road, electric transmission line, pipeline, etc.

scenic quality – A rating of the overall appeal of a view that is categorized as High, Medium, or Low, which is determined based on several key factors (BLM 1986). The key factors include landform, vegetation, water, color, influence of adjacent scenery, scarcity, and cultural

modifications. With a maximum possible score of 32, values are totaled with results of 19 or more ranked “High”, 12 to 18 ranked “Medium”, and 11 or less ranked “Low”.

sensitivity levels – In reference to visual resources, sensitivity is an evaluation of the viewer and as a way of ranking public concern.

single-circuit – One electrical circuit that consists of three separate conductors or bundles of conductors on one tower.

single-circuit tower – A tower that can support only one transmission line.

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