

# **Description and Comparison of Impacts Along Segment A Reroute**

## **Bonneville Power Administration Schultz-Hanford Area Transmission Line Project**

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## **1.0 RATIONALE FOR SEGMENT A REROUTE**

As can happen with transmission projects such as the Schultz-Hanford Area Transmission Line Project, an original proposal can change to accommodate new information. BPA proposed the Segment A Reroute in October 2001 as a response to new information. Specifically, the reroute was developed in response to anticipated delays or the inability to acquiring a new right-of-way easement and in renewing the right-of-way easement for the existing Schultz-Vantage line across a tribal allotment.

Negotiations between BPA and the allottees include discussions with the Bureau of Indian Affairs (BIA). These government-to-government agreements have been known to take a great deal of time and result in short-term agreements (10 years for example). BPA's right-of-way easements are typically perpetual or at least for 50 years; therefore, an easement in the range of 10 years for a transmission line that is expected to last at least 75 years is not practical for BPA. The Segment A Reroute was included in the DEIS in order to obtain environmental clearance for that potential reroute if the negotiations with the allottees fail.

## **2.0 DESCRIPTION OF SEGMENT A REROUTE**

The Segment A Reroute is an optional alignment for a small portion of Segment A, referred to as Segment A1 in this report. (Map 1, *Segment A Reroute*) It is not part of the Preferred Alternative identified in the Schultz-Hanford Area Transmission Line Project FEIS.

The Segment A Reroute was developed to avoid parcels owned by tribal allottees and was designed to minimize the reroute distance. Shortly after crossing into the NW quarter of section 6, township 18N range 20E, the existing Schultz-Vantage line and the proposed new line would be rerouted to the south of the existing Schultz-Vantage alignment. This Segment A Reroute would start about ½ mile southeast of the point where the existing Schultz-Vantage line crosses the north-south alignment of Coleman Road (SE quarter of section 36, T19N R19E). The lines would run south/southeast until roughly Cooke Canyon Road, at which point the lines would head east until re-joining the existing Schultz-Vantage alignment just west of Colockum Road (SE quarter of section 6, T18N R20E). The proposed location of the re-aligned Schultz-Vantage line and the proposed new line are shown on Map 1, *Segment A Reroute*. Segment A1, the portion of Segment A being rerouted, is also identified on Map 1, *Segment A Reroute*.

The Segment A Reroute would be 1.27 miles in length, as opposed to 1.04 miles along the Segment A alignment between the beginning and end of the reroute points. The right-of-way width needed for the Segment A Reroute would total 350 feet. Both the Schultz-Vantage line and the new line would be located in this 350 feet; 75 feet of edge distance from the centerline of each alignment to the outer edge of the right-of-way and 200 feet between the two centerlines. If the Segment A Reroute were chosen, the new line and the relocated existing line would be constructed within this 350 feet and the existing Schultz-Vantage line would be removed from its current location across the tribal allotment. BPA has estimated that it would cost approximately \$1,000,000 more to construct the new line along Segment A Reroute than to construct it along Segment A1. To dismantle and relocate the existing Schultz-Vantage line would cost an additional \$1,000,000.

## **2.1 Structures**

The Segment A Reroute would use Delta 500-kV single-circuit steel lattice structures. See Figure 1, *Proposed Structures*. The height of each structure would vary by location and surrounding landforms, with an average height of 135 feet. It is estimated that a total of 12 transmission line towers would be required for the Segment A Reroute, six for the re-routed existing Schultz-Vantage line and six for the proposed new line. Three of the six structures on each line would be angle point structures (or deadends), one at each end and one roughly mid-way along the alignments.

## **2.2 Conductors**

The single-circuit transmission lines would be made up of three sets of wires called conductors. Conductors are not covered with insulating material, but rather use the air for insulation. Conductors are attached to the structure using porcelain or fiberglass insulators. Insulators prevent the electricity in the conductors from moving to other conductors, the structure, and the ground.

Two smaller wires, called overhead ground wires, are attached to the top of transmission structures. Overhead ground wires protect the transmission line from lightning damage. To disseminate the electrical power from lightning, the power is routed to the ground at each tower through wires called counterpoise.

## **2.3 Clearing**

Vegetation within the right-of-way is restricted by height. This is required for the safe and uninterrupted operation of the line. It is not anticipated that a large number of trees will need to be cleared for this alignment; however, because of safety considerations, there may be some trees at water crossings that would need to be cut.

At the structure sites, all trees and brush would be cut and removed within roughly a 1/3 acre area (100-by-150-foot area or 0.34 acres), with root systems being removed from a 50-by-50-foot area for the tower footings. A portion of the site would be graded, if necessary, to provide a relatively level work area. The Segment A Reroute would require roughly 4.1 acres to be cleared for the anticipated structure sites (12) along the 1.27-mile route.

Woody debris and other vegetation would either be left lopped and scattered, piled, or chipped, or would be taken off-site. Burning would not be used.

## **2.4 Access Roads**

No permanent access roads are proposed to serve the Segment A Reroute.

## **2.5 Pulling and Reeling Areas**

Pulling and reeling areas would be needed for the installation of the conductor. Pulling and reeling sites are also needed at angle points, because the tension is too great to be able to pull conductor at large angles. Each pulling and reeling area would be roughly ¼ acre in size and located every 2.5 miles. Due to the need for an angle point at roughly the mid-point of the

Segment A Reroute alignment, two temporary pulling and reeling areas would be needed on either side of this angle point.

## **2.6 Staging Areas**

No staging areas are proposed along the Segment A Reroute.

## **2.7 Substations**

The Segment A Reroute would be located between two existing substations, Schultz and Vantage.

## **2.8 Communication Equipment**

Fiber optic cable is not attached to the Schultz-Vantage line and would not be installed as part of this project. No communication equipment would be installed along the proposed new line in the vicinity of the Segment A Reroute.

## **2.9 Maintenance**

BPA would perform routine, periodic maintenance and emergency repairs on structures, substations, and accessory equipment. These activities typically include replacing insulators, inspecting structures, and vegetation control.

A large part of maintenance activities is vegetation control. In central Washington, this primarily focuses on the spread of noxious weeds. Tall growing vegetation would also need to be managed in and adjacent to the right-of-way, primarily where the line crosses water bodies. Vegetation maintenance activities would follow the guidelines set in the BPA Transmission System Vegetation Management Program EIS. When vegetation control is needed, a vegetation management checklist would be developed for the right-of-way. It would identify sensitive resources and the methods to be used to manage vegetation.

## **3.0 AFFECTED ENVIRONMENT**

This section describes the existing environment that may be affected by the Segment A Reroute. Each section describes a specific resource, with the natural environment first and then the human environment.

### **3.1 Water Resources**

#### 3.1.1 Precipitation

The average annual precipitation of nearby Ellensburg is 8.86 inches (2001 Washington State Yearbook).

#### 3.1.2 Watersheds

The Segment A Reroute is within the Upper Yakima watershed. Water from Cooke Creek and drainages along the Segment A Reroute eventually flows into the Yakima River. Thirteen

springs are believed to be located near the Segment A Reroute: North Cooke, House Pond, Front Pond, Vancil, Wagon Wheel, Aspen, Teepee, Meadow, Calf, N. Coyote, S. Coyote, E. Flasch, and W. Flasch. The nearest spring to the proposed reroute is North Cooke, approximately 1,000 feet south.

### 3.1.3 Water Quality

Cooke Creek is a part of the Upper Yakima watershed. The Upper Yakima watershed as a whole is below state or tribal water quality standards; however, within the Segment A Reroute, Cooke Creek is not listed as Water Quality Limited under section 303(d) of the federal Clean Water Act.

### 3.1.4 Shorelines

The Segment A Reroute would not cross a designated shoreline.

### 3.1.5 Aquifers

In the Ellensburg Basin unconsolidated deposits that are as much as 1,000 feet thick and Miocene basaltic rocks that underlie the unconsolidated deposits provide thousands of gallons of water through wells for public supply, domestic and commercial use, and agriculture. Typical well depths in Kittitas County are less than 100 to 1,300 feet below land surface. Well yields in Kittitas County can range from less than 500 to 4,800 million gallons per minute. Large yields from wells are common in the Ellensburg area (Whitehead, 1994).

## **3.2 Floodplains and Wetlands**

### 3.2.1 Floodplains

The Segment A Reroute crosses the Cooke Creek floodplain through an area consisting of five to six narrow, rocky creek channels in a relatively flat area.

### 3.2.2 Wetlands

Cooke Creek runs through a relatively flat area and consists of five to six narrow, rocky creek channels. The dominant woody species along Cooke Creek are black cottonwood, black hawthorn, and willows. National Wetland Inventory maps indicate that Cooke Creek has a wetland classification of palustrine, forested wetland, seasonally flooded.

## **3.3 Soils and Geology**

The Segment A Reroute would cross a portion of the broad plateau that extends from the BPA Schultz substation area north of Ellensburg, Washington to the Saddle Mountains in the northern portion of the Yakima Training Center. Soils from the Schultz substation area to the Vantage substation vary from shallow to deep, are well drained, and formed in a variety of parent materials including *loess*<sup>1</sup>, *residuum*<sup>2</sup>, *alluvium*<sup>3</sup>, and basaltic *colluviums*<sup>4</sup> (Washington State University 1998). The Segment A Reroute would cross five soil map units: Camaspatch, Brysill, Weirman, Ackna-brysill, and Maxhill. The Weirman units are hydric soils.

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<sup>1</sup> **Loess** is a windblown deposit of fine-grained silt or clay.

<sup>2</sup> **Residuum** is unconsolidated weathered mineral material that accumulated as consolidated rock and disintegrated in place.

<sup>3</sup> **Alluvium** is sedimentary material deposited by flowing water as in a delta or riverbed.

<sup>4</sup> **Colluvium** is soil and/or rock fragments moved by creep, slide, and/or local wash and deposited at the base of steep slopes.

The Brysill, Ackna, and Maxhill soil map units would be considered prime and unique farmland if irrigated. See Section 5 for a further discussion of prime and unique soils. Brysill and Weirman soil map units are potentially highly erodible by wind erosion and Ackna-Brysill is potentially highly erodible by both wind and water erosion.

### **3.4 Vegetation**

#### 3.4.1 Washington Natural Heritage Program (WNHP) High Quality Plant Communities

There are no WNHP High Quality Plant Communities located along the Segment A Reroute.

#### 3.4.2 Vegetation Cover Types

The area around the Segment A Reroute consists mostly of shrub-steppe vegetation dominated by sagebrush. Riparian areas along Cooke Creek exist as thin strips of small black cottonwoods, black hawthorn, willows and other shrubs following five or six individual stream channels.

#### 3.4.3 Weed Species

Detailed weed surveys have not been done along the Segment A Reroute because permission to enter and conduct environmental surveys on nearly 80 percent of the private property along the reroute alignment has not been granted.

#### 3.4.4 Rare Plants

Detailed rare plant surveys have not been done along the Segment A Reroute because permission to enter and conduct environmental surveys on nearly 80 percent of the private property along the reroute alignment has not been granted.

### **3.5 Wildlife**

The wildlife habitat present along the Segment A Reroute is primarily shrub-steppe. Wildlife populations along the Segment A Reroute are generally typical of shrub-steppe habitats. The area is used as wintering grounds by large herds of mule deer. Cooke Canyon is a migration corridor for the Quilomene elk herd. East of Cooke Canyon, a sharp-tailed grouse sighting within 1 mile of the proposed line was recorded in 1981. The area east of Cooke Canyon is also known to harbor nesting long-billed curlews (WDFW, 2001a).

The Segment A Reroute crosses Cooke Creek in an area of five to six small channels lined with narrow low-growing riparian species. Wildlife species such as bald eagles, osprey, hawks, cavity-nesting birds and bats typically found in well established riparian areas nearby would occur infrequently near the Segment A Reroute due to the limited and low-growing riparian habitat of the area.

#### 3.5.1 Threatened and Endangered Species

Bald eagles, listed as a Threatened species, are known to winter along some of the streams in this area and may use larger trees along Cooke Creek for roosting and perching. They may use the area of the Segment A Reroute that crosses Cooke Creek. However, because no areas of large riparian trees are present along the Segment A Reroute, eagle use would most likely be temporary and transitory.

### 3.5.2 Federal and State Listed Species

Federal and State Listed species present along the Segment A Reroute are listed on Table 1 in section 4.4 of this document.

## **3.6 Fish Resources**

Segment A Reroute crosses Cooke Creek approximately 0.3 mile south of Coleman Road. The stream is divided into five or six small channels in this area. The stream flows through an open shrub-steppe area with riparian vegetation consisting of narrow strips of small trees and shrubs. Stream flow is good in this area, although the split channels may limit available fish habitat. It is possible that rainbow, cutthroat, or brook trout may be encountered near where the project crosses (Renfrow, 2001). No anadromous fish are present this high in Cooke Creek (WDFW, unpub.).

### 3.6.1 Threatened and Endangered Species

No Threatened or Endangered fish species are currently present in the area of the Segment A Reroute. Middle Columbia River Steelhead may rear in the lowest reaches of Cherry Creek, which Cooke Creek is a tributary to, approximately 13 miles downstream of the project area, however stream blockages and diversions prevent them from reaching the project area.

## **3.7 Land Use**

The Segment A Reroute is located entirely within Kittitas County. The roughly 1.3-mile reroute would cross public lands (less than 0.1 mile of BLM land) and private lands (approximately 1.2 miles). Open space rangeland is the only identified land use along the 1.3 miles and within the proposed 350-foot right-of-way. Rural residences and some agricultural uses are located on some of the same properties that would be crossed by the reroute; however, these uses are located south of the proposed alignments, outside the proposed right-of-way.

## **3.8 Socioeconomics**

Socioeconomic data were compiled at the county and state levels of analysis. The Segment A Reroute is located entirely within Kittitas County and has similar socioeconomic conditions as other portions of the project that are located in Kittitas County. The Kittitas County affected environment is summarized below.

### 3.8.1 Population

Population is located in sparsely populated rural areas, with Ellensburg being the nearest population center. Caucasians are the dominant race of people living in Kittitas County. Population growth over the past has been unsteady, but is recently experiencing large increases.

### 3.8.2 Economy

Government provides almost one-third of the jobs in Kittitas County and almost half of the wage and salary earnings. Kittitas County has the lowest median household income (\$32,546) compared to Grant, Yakima, and Benton Counties. Household incomes in Kittitas County comprise approximately 59 percent earnings, 22 percent interest and dividends, and 17 percent transfer payments. The average unemployment rate in Kittitas County for 2001 was 6.5 percent.

### 3.8.3 Taxes

The amount of the retail sales and use tax varies by locality. The state tax base is 6.5 percent, above which each locality can assess 0.5 to 2.1 percent additional tax. Combined state and local tax rates for the study area range from 7.6 to 8.0 percent.

The average state property tax rate is \$3.16 per \$1,000 of assessed property value (Washington State DOR, 2002). Local tax rates vary depending on regular and special levies. The state average for local property tax rates is \$12.96 per \$1,000 assessed value (Washington State DOR, 2002).

Other taxes such as the business and occupation (B&O) tax, local excise taxes (on fuels, tobacco products, liquor, timber, and rental cars), hotel/motel taxes, municipal business taxes and licenses also generate revenue for the state and local municipalities.

## 3.9 Visual Resources

The Segment A Reroute crosses the edge of rural, agricultural lands near the base of the Wenatchee Mountains and is a relatively flat to rolling area of sagebrush and rabbit brush. Typical views in this area are **foreground<sup>5</sup>** and **middleground<sup>6</sup>** views of the agricultural and sagebrush/rabbitbrush lands. Background views are of the Wenatchee, Boylston and Saddle Mountains and sky. Viewers are residents of the low-density, scattered rural homes, dispersed recreationalists and motorists on Coleman Creek, Cooke Canyon and Gage Roads. The Segment A Reroute would be in the foreground or middleground for most viewers.

## 3.10 Recreation Resources

No **dedicated recreation<sup>7</sup>** sites have been identified within 1 mile of the proposed Segment A Reroute.

**Dispersed recreation<sup>8</sup>** activities that have been identified as occurring on the properties that would be crossed by the proposed Segment A Reroute include such activities as hunting, fishing, hiking, horseback riding, snowshoeing, snowmobiling, camping, broom hockey, and off-road and all-terrain vehicle use. These activities take advantage of the creeks, ponds, and open spaces of the area. Persons participating in these recreation activities are predominately full-time residents of the properties and their guests or approved visitors.

## 3.11 Cultural Resources

Literature search has indicated that the area, which includes the Segment A Reroute, has the potential to contain sites that may have cultural value. No cultural resource surveys were done on the Segment A Reroute since permission to enter and conduct environmental and cultural resource surveys on nearly 80 percent of the private property along the reroute alignment has not been granted.

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<sup>5</sup> **Foreground** is within 0.25 to 0.5 mile of the viewer.

<sup>6</sup> **Middleground** is from the foreground to about 5.0 miles from the viewer.

<sup>7</sup> **Dedicated Recreation** refers to activities that are limited to a finite geographic location and are supported by improvements that commit the resource to a specific recreational activity.

<sup>8</sup> **Dispersed Recreation** refers to recreation activities that are not limited to a finite location. These types of activities do not require improvements that commit resources to a particular type of recreation.

## 3.12 Public Health and Safety

### 3.12.1 Electric and Magnetic Fields

Transmission lines, like all electrical devices and equipment, produce **electric and magnetic fields**<sup>9</sup> (EMF). The voltage, or force that drives the **current**<sup>10</sup>, is the source of the electric field. The strength of magnetic field depends on the current, design of the line, and the distance from the line. Field strength decreases rapidly with distance. Electric fields can be reduced significantly by the presence of conducting objects. Thus, inside houses and automobiles, electric fields are lower than outside because of shielding. Unlike electric fields, magnetic fields from outside power lines are not reduced in strength by trees and building material. Because of this, transmission lines can be a major source of magnetic field exposure throughout a home located close to the line. Along Segment A Reroute there are no residences within 1,000 feet of the proposed transmission lines.

There are currently no national standards in the United States for electric and magnetic fields from transmission lines. The state of Washington does not have limits for either electric or magnetic fields from transmission lines. The BPA has maximum allowable electric fields of 9-kV/m on the ROW and 5-kV/m at the edge of the ROW. The BPA also has maximum allowable electric field strengths of 5-kV/m, 3.5-kV/m, and 2.5-kV/m for road crossings, shopping center parking lots, and commercial/industrial parking lots, respectively.

Both electric and magnetic fields induce currents in conducting objects, including people and animals. The magnitude of the induced current in objects under lines depends on the electric- or magnetic-field strength and the size and shape of the object. The currents induced in people, even from the largest transmission lines, are generally too weak to be felt. However, under certain circumstances, contact to a grounded object by a well-insulated person in a high electric field can result in a perceived nuisance shock or spark discharge. Transmission lines are designed and built so that such shocks occur infrequently and, if they do, are no higher than the nuisance level.

The possibility of health effects from long-term exposure to 60-Hz electric or magnetic fields has been researched for several decades. The consensus of scientific panels reviewing this research is that the evidence does not support a causal relationship between electric or magnetic fields and any adverse health outcomes, including childhood cancer, adult cancer, reproductive outcome, or other diseases. However, investigation of a statistical association between magnetic field exposure and childhood leukemia continues.

### 3.12.2 Transmission Line Noise

Audible noise can be produced by transmission line **corona**<sup>11</sup>. In a small area near the surface of the conductors, energy and heat are dissipated. Part of this energy is in the form of small local pressure changes that result in audible noise. Corona-generated audible noise can be characterized as a hissing, crackling sound that under certain conditions is accompanied by a 120-Hz hum.

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<sup>9</sup> **Electric and magnetic fields** (EMF) are the two kinds of fields produced around the electric wire or conductor when an electric transmission line or any electric wiring is in operation.

<sup>10</sup> **Current** is the amount of electrical charge flowing through a conductor.

<sup>11</sup> **Corona** is an electrical discharge, at the surface of a conductor. Corona-generated noise can be characterized as a hissing, crackling sound.

### 3.12.3 Radio and TV Interference

Corona on transmission line conductors can generate electromagnetic noise in the frequency bands used for radio and television signals. In rare circumstances, corona-generated **electromagnetic interference (EMI)**<sup>12</sup> can also affect communication systems and sensitive receivers. Interference with electromagnetic signals by corona-generated noise is generally associated with lines operating at voltages of 345-kV or higher.

Radio reception in the AM broadcast band (535 to 1,604 kilohertz (kHz)) is most often affected by corona-generated EMI. FM radio reception is rarely affected. Generally, only residences very near transmission lines can be affected by radio interference. Corona-caused television interference occurs during foul weather and is generally of concern only for conventional receivers within about 600 feet of a line. Cable and satellite television receivers are not affected.

### 3.12.4 Toxic and Hazardous Materials

Areas along the Segment A Reroute where human activities are concentrated are the most likely to have hazardous materials issues. However, hazardous materials could be encountered anywhere along the proposed route and could include such things as illegally dumped waste, spilled petroleum products, pesticides, and other wastes. No hazardous materials sites have been identified along the Segment A Reroute.

### 3.12.5 Fire

Numerous wildfires have occurred on private and public land in central Washington over the past several years. They may have been caused by human actions such as vehicle ignitions from roads, unattended campfires, burning of adjacent agricultural lands and arson, or by natural causes such as lightning.

Farmers throughout the state, including those in central Washington near the line segments, burn agricultural fields to remove the remaining plant material after harvest and prepare for planting the next crop. In order to meet the requirements of the Washington State Clean Air Act of 1991, a statewide agricultural burning permit program has been implemented.

## 3.13 Air Quality

The Washington State Department of Ecology, Central Regional Office works to control, monitor and prevent air pollution in Kittitas County, the location of the proposed Segment A Reroute. Data from air quality monitoring sites has shown that air quality is improving across the State of Washington. Still, there are a few **nonattainment areas**<sup>13</sup> in the state. The Segment A Reroute would not be located in one of the nonattainment areas. In addition, there are no designated **Class 1**<sup>14</sup> areas within the vicinity of the proposed right-of-way.

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<sup>12</sup> **Electromagnetic interference (EMI)** is high-frequency electrical noise that can cause radio and television interference.

<sup>13</sup> A **nonattainment area** is a geographic region designated by EPA in which federal air quality standards are not or were not met by a certain date. There are six air pollutants that are monitored; particulate matter (PM), carbon monoxide (CO), ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), and lead (Pb).

<sup>14</sup> Section 160 of the federal Clean Air Act requires the preservation, protection, and enhancement of the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic or historic value. The 1977 Clean Air Act amendments called for a list of existing areas to be protected under section 160. These are called **Class 1 areas**.

## **4.0 ENVIRONMENTAL CONSEQUENCES**

Parsons Brinckerhoff's environmental team used a variety of methods to study the Segment A Reroute, including aerial photography review, literature research and review, state and federal database queries, and contact with local, state, and federal agency representatives.

The entire Segment A Reroute was not subjected to field visits because BPA and its consultants were denied permission by private property owners to enter private property along roughly 80 percent of the reroute, thereby limiting the effectiveness of the field visits. Without access to a portion of the proposed reroute alignment conclusions on potential environmental impacts along this area were based on aerial photography, details contained in available databases and in the literature, and knowledge of the private property from local, state, and federal agency representatives.

To analyze potential impacts from construction, operation and maintenance activities, resource specialists have analyzed actions using a scale with four impact levels: high, moderate, low, and no impact. The level of detail for the impact discussions of each resource depends on that resource's character, and the significance of the issue.

Construction of the alternatives would be typical of other BPA transmission line projects. Typical transmission line construction activities include:

- Clearing right-of-way;
- Preparing structure sites;
- Excavating and installing structure footings;
- Delivering structures to the sites (steel, insulators, conductors, and other miscellaneous equipment);
- Assembling and erecting structures;
- Stringing and tensioning conductor, ground wire, and fiber optic cable; and
- Installing counterpoise.

At the site of the structures all vegetation would be removed and sites would be graded, if needed, to provide a level work area. An average area of about 100 feet by 150 feet would be disturbed at each structure site. The footprint of the structures would be considered permanent disturbance. The average footprint would be 27 by 27 feet. Each leg of a tower has a footing. Footings for suspension towers generally occupy an area of about 6 feet by 6 feet, to a depth of 12 feet. Footings at angle points would be larger and deeper, about 15 feet by 15 feet and 16 feet deep.

If the Segment A Reroute were to be chosen, a little more than 1 mile of the existing Schultz-Vantage line would be removed. In order to remove and reroute the existing Schultz-Vantage line, deadend structures would be built on either end of the section to be removed. These heavy steel structures would be able to support the stresses of the conductor at angles introduced by the reroute. The conductor would then be cut and taken off of the structures to be removed. The structures would be dismantled and trucked offsite. The area around the structure legs would be excavated in order to cut the steel off below ground, approximately 2 feet below the surface. The existing footings for the structures would remain. The holes would be backfilled and the ground smoothed and graded.

Impacts associated with the Segment A Reroute, which would add 0.23 mile to Segment A, would not substantially change the overall impacts associated with the 58- to 70-mile alternatives. Further details concerning impacts to specific resources are provided below.

#### **4.1 Water Resources, Soils, and Geology**

The construction of the Segment A Reroute would disturb 4.3 acres of soil surface, impair soil productivity, remove 0.3 acres of land from production and could have the potential for additional erosion, sedimentation, and runoff near Cooke Creek. Erosion and sediment releases from the construction area are unlikely to directly enter Cooke Creek, because towers would be placed on either side of the creek, no access roads would cross the creek, revegetation would occur after construction and the topography of the land surrounding Cooke Creek generally slopes parallel to the creek (the creek is on an alluvial fan).

It is anticipated that the construction of the Segment A Reroute would have a low to no impact to groundwater. Groundwater, if shallow, should remain at its current level. The Segment A Reroute would have moderate erosion, loss of productive soils, and potential for some increased runoff and sedimentation.

#### **4.2 Floodplains and Wetlands**

The Segment A Reroute would have minimal impacts on the floodplain associated with Cooke Creek because the project would span the floodplain (towers would be located on either side of the floodplain). Some small riparian trees may need to be removed from the reroute right-of-way and the relocation of the existing Schultz-Vantage line right-of-way, but these would have only a minimal impact on stream stability and floodplain function.

#### **4.3 Vegetation**

The small riparian vegetation along the reroute would require removal of only a few small trees, if any, for line clearances. The relocation of the existing Schultz-Vantage transmission line may also require removal of a few small trees for line clearance. Approximately 4.3 acres of shrub-steppe would be cleared for tower locations. Some disturbance from temporary vehicle travel would occur, however no permanent access roads would be constructed. Removal of the existing Schultz-Vantage line would cause additional impacts to shrub-steppe vegetation along 1.01 miles from equipment passage and tower removal, although no shrub-steppe or riparian trees would be cleared. Overall impacts to shrub-steppe and riparian vegetation from the Segment A Reroute would be low.

#### **4.4 Wildlife**

A search of the Washington Natural Heritage Program database and discussions with Washington Department of Fish and Wildlife (WDFW), Washington State Department of Natural Resources (WDNR), United States Fish and Wildlife Service (USFWS), and independent botanists and biologists, did not indicate that the area of the Segment A Reroute harbored fish and wildlife species or plant assemblages unique to the region or substantially different than the surrounding areas. (BPA was denied permission to enter roughly 80 percent of the private property along the Segment A Reroute to conduct detailed biological surveys.) Table 1

identifies the potential impacts to federal and state listed species that might result from the Segment A Reroute.

**Table 1  
Potential Impact to Federal and State Listed Species on Segment A Reroute**

Species Name	Federal Status	State Status	Documented Occurrence Type	Potential Impact
<b>Riparian, Open Water and Wetland Species</b>				
Perching and Cavity-Nesting Birds				
Bald eagle	FT	ST	W	N
Osprey		SM	B	N
Great blue heron		SM	B	N
Black-crowned night heron		SM	B	N
Lewis' woodpecker		SC	B	N
Olive-sided flycatcher	FSC		P	N
Little willow flycatcher	FSC		P	N
Bats				
Pacific western big-eared bat	FSC	SC	P	N
Long-eared myotis	FSC	SM	P	N
Long-legged myotis	FSC	SM	P	N
Fringed myotis	FSC	SM	P	N
Western small-footed myotis	FSC	SM	P	N
Yuma myotis	FSC		P	N
Pallid bat		SM	P	N
Herpetofauna				
Spotted frog	FC	SE	P	Mn
<b>Shrub-Steppe Species</b>				
Raptors and Migratory Birds				
Northern goshawk	FSC	SC	M	Mn
Golden eagle		SC	B	Mn
Ferruginous hawk	FSC	ST	B	Mn
Swainson's hawk		SM	B	Mn
Prairie falcon		SM	B	Mn
Peregrine falcon	FSC	SE	B	Mn
Turkey vulture		SM	B	Mn
Western bluebird	FSC	SM	B	Mn
Sagebrush-Dependent Birds				
Sage sparrow		SC	B	M
Sage thrasher		SC	B	M
Long-billed curlew	FSC	SM	B	M
Western sage grouse	FSC	ST	B	M
Loggerhead shrike	FSC	SC	B	M
Sharp tailed grouse	FSC	ST	H	M
Mammals				
White-tailed jackrabbit		SC	B	M
Small Burrowing Species				
Northern grasshopper mouse		SM	P	M
Sagebrush vole		SM	P	M
Merriam's shrew		SC	B	M
Herpetofauna				
Sagebrush lizard	FSC		B	M
Striped whipsnake		SC	B	M
<b>Federal Status</b>	<b>State Status</b>	<b>Documented Occurrence Type</b>		<b>Potential Impact</b>
FE = Endangered	SE = Endangered	P = Present (general presence)		H = High
FT = Threatened	ST = Threatened	B = Breeding		M = Moderate
FC = Candidate	SS = Sensitive	M = Migrant		L = Low
D = Delisted	SC = Candidate	W = Winter Resident		Mn = Minimal
FSC = Species of Concern	SM = Monitor	N = Not Present		N = None
				H = Historically Present, Not Currently Present

#### 4.4.1 Threatened & Endangered Species

The proposed Segment A Reroute would have no impact on bald eagles because no large cottonwoods and willows, preferred by eagles for roosting, would need to be removed.

## **4.5 Fish Resources**

The Segment A Reroute would cross Cooke Creek approximately 0.3 mile south of Segment A. Fish species present in Cooke Creek include rainbow trout, cutthroat trout, and brook trout. No anadromous salmonids are present due to downstream obstructions (WDFW, unpub.). No Threatened or Endangered fish species are currently present in the area of the Segment A Reroute. Steelhead may rear in the lowest reaches of Cherry Creek, which Cooke Creek is a tributary to, but no impacts to water resources and fish would occur that far downstream as a result of this project. The creek in this area has five or six channels lined with low-growing riparian vegetation. Tower sites would be located well back from any channels of Cooke Creek on the Segment A Reroute and no access roads would cross the creek. The topography of the area slopes parallel to Cooke Creek, ensuring that no sediments or pollution resulting from construction in upland areas would flow directly into the creek. Best management practices proposed for construction near streams would prevent sediments and pollutants from leaving construction sites. Overall impacts to fish resources from the Segment A Reroute would be minimal to none.

## **4.6 Land Use**

During construction heavy machinery would temporarily disrupt any land use activities occurring near the construction area and within the proposed right-of-way. Because this disturbance would be temporary and pre-construction conditions would be re-established, the impact to land uses from construction would be low.

Open space rangeland is the only identified land use along the 1.3-mile Segment A Reroute. It is estimated that 12 transmission line towers would be required along the reroute. The towers would impact roughly 4.3 acres of rangeland, 0.3 of which would be permanently under the tower footprint. Unlike agricultural lands that may have limitations on the types of crops located under the transmission lines, the land uses associated with open space rangeland could continue within the proposed right-of-way, around the proposed structures, and under the conductors. As a result, the impact to the open space rangeland would be low.

## **4.7 Socioeconomics**

Impacts on socioeconomics were evaluated for the study area as a whole, which included four counties: Benton, Grant, Kittitas, and Yakima.

### 4.7.1. Population

Constructing a new transmission line would not encourage population growth in the area, but rather would be a response to growth that is already occurring in central Washington and the Pacific Northwest. No impact to the population would occur as a result of the proposed project.

### 4.7.2 Economy and Industry

Because transmission line construction requires specialized labor, construction crews would likely be brought in from outside the local area. Construction would likely occur over 1 year, with one or two primary contractors. About 100 people would be needed to construct a project of this scale on this timeline. This would be a positive impact on employment in general, but not necessarily a local impact if workers do not come from the study area.

Constructing a new transmission line would not impact the distribution of jobs within industry sectors, personal and household incomes, or industry earnings.

#### 4.7.3 Housing and Public Services

Socioeconomic impacts to temporary housing facilities are relatively minor for transmission line construction projects in most areas. Because of the relatively small number of construction crews who would build the project, there should be few negative impacts to the temporary housing supply in the area.

Impacts to public services such as police, fire, and medical response, would be of short duration during the construction phase.

#### 4.7.4 Retail Sales and Use Tax

The major cost of any transmission line project is labor and materials. A combined state and local sales and use tax would be levied on materials purchased for the project by the contractor. This would be a positive impact to local and state revenues.

#### 4.7.5 Business and Occupation Tax and Public Utility Tax

For Business and Occupation (B&O) tax purposes, contractors performing work for BPA are classified as government contractors and are subject to the B&O tax. The gross contract price is subject to this tax. This would be a positive impact to state revenues.

#### 4.7.6 Property Tax

BPA, as a federal agency, is exempt from paying local property taxes, except in the case of acquiring real property to build a new substation. No real property acquisition is expected to occur in Kittitas County.

#### 4.7.7 Property Value

Any new transmission line or access road easements would be appraised, and landowners would be offered the fair market value for these land rights. The new line is not expected to cause overall long-term adverse effects on property values. See Appendix E, *Property Impacts*, of the FEIS for more information on impacts to property values.

#### 4.7.8 Land Taken Out of Production

Activities such as farming, which do not interfere with the transmission line or endanger people, are usually not restricted. In cases where productive lands cannot be avoided, some land may be taken out of production. Landowners would be compensated for any lands taken out of production. No actively cultivated land would be affected by the Segment A Reroute.

#### 4.7.9 Other Taxes

Other state taxes that would be assessed include **excise**<sup>15</sup> taxes on fuel, cigarettes, tobacco products, liquor, timber, and rental cars. Revenues generated from these miscellaneous taxes would have a positive impact on state and local revenues, but are expected to be small due to the limited crew size involved in this type of construction.

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<sup>15</sup> **Excise** taxes are internal taxes imposed on the production, sale, or consumption of a commodity or the use of a service.

#### **4.8 Visual Resources**

The visual importance of the area around the Segment A Reroute is identified as “Visually Sensitive” due to the number of residences, and thus sensitive viewers, with foreground views of the proposed transmission line project(s). Views from residences south of the proposed lines would be dominated by, or at least clearly include, the new transmission towers.

Visual impacts of the Segment A Reroute would be high at viewpoint locations within 0.5 mile and moderate for residential properties between 0.5 mile and 5.0 miles of the Segment A Reroute due to the introduction of the new delta towers (average 135-foot height) into this area, which does not currently contain transmission structures.

#### **4.9 Recreational Resources**

During construction dispersed activities occurring within the Segment A Reroute right-of-way would be temporarily impacted. For safety reasons, these activities would not be allowed within the construction area. The overall impact to these activities during construction, however, would be low because the nature of these activities does not limit them to a specific area. Once construction was complete the activities could resume adjacent to and within the transmission line right-of-way.

Permanent impacts to recreation activities would be low. The two proposed transmission lines would not prevent the identified dispersed recreation activities, such as camping, broom hockey, and all-terrain vehicle riding, from occurring elsewhere on the properties along the alignment, including within the transmission line right-of-way.

#### **4.10 Cultural Resources**

The Phase 1 cultural survey, which was a literature and database search of known sites, indicated that the Segment A Reroute has a potential to contain culturally significant sites. A ground survey was only completed on the preferred alternative (which did not include Segment A Reroute); therefore, no further details on the existence of cultural resources along the Segment A Reroute are known.

#### **4.11 Public Health and Safety**

There are no residences within 1,000 feet of the new right-of-way. Impacts from electric and magnetic fields would be low. Activities presently occurring within what would become the right-of-way would not change, as they are activities associated with open fields. Calculated levels for electric and magnetic fields are shown below.

**Table 2  
Calculated Electric Fields  
New 500-kV and Rerouted Vantage–Schultz 500-kV Lines Operated at Maximum Voltage**

ROW width, ft.	350			
Line	New 500-kV		Rerouted Vantage – Schultz 500 kV	
Clearance	Min.	Avg.	Min.	Avg.
Peak field, kV/m	8.6	5.8	8.6	5.0
Edge of ROW, kV/m	2.5	2.4	2.5	2.4

**Table 3  
Calculated Magnetic Fields  
New 500-kV and Rerouted Vantage–Schultz 500-kV Lines Operated at Maximum Current**

ROW width, ft.	350			
Line	New 500-kV		Rerouted Vantage – Schultz 500 kV	
Clearance	Min.	Avg.	Min.	Avg.
Peak field, mG	234	159	114	76
Edge of ROW, mG	68	59	38	33

Impacts from the noise of the new and rerouted lines would be low/moderate. The predicted median foul-weather audible noise levels at the edge of the right-of-way would be 50 dBA. This is roughly the same level of noise expected from moderate rainfall on foliage. Since there is presently no transmission line along this right-of-way the introduction of a noise producing line creates an impact. The lack of residence immediately surrounding the new right-of-way lowers the impact rating.

More information is available in Appendix I, Electrical Effects, Addendum 2 of the Schultz-Hanford Area FEIS.

Noise impacts would result from construction activities. However, this noise would be short term, occurring mostly during daylight hours. It would typically occur for only a few days at any one location.

Corona on transmission line conductors can also generate electromagnetic noise in the frequency bands used for radio and television signals. This noise can cause radio and television interference (RI and TVI). Interference with electromagnetic signals by corona-generated noise is generally associated with lines operating at voltages of 345-kV or higher. This is especially true of interference with television signals. The three-conductor bundle design of the proposed 500-kV line is intended to mitigate corona generation and thus keep radio and television interference levels at acceptable levels. If interference should occur, there are various methods for correcting it, and BPA has an active program to identify, investigate, and

mitigate legitimate RI and TVI complaints. Therefore, the anticipated impacts of corona-generated interference on radio, television, or other reception would be minimal.

Several common construction materials (e.g., concrete, paint, etc.) and petroleum products (e.g., fuels, lubricants, and hydraulic fluids) would be used during construction. BPA would follow strict procedures for disposal of these or any hazardous materials. No impacts would occur.

Contaminated media (soil, surface water or groundwater), if unexpectedly encountered during construction of the project, may present potential risk/liability to BPA. Potential risk and liability includes workers health and safety, management of contaminated materials and/or exacerbation of contaminated media (soil, surface water, or groundwater).

Should contaminated media be unexpectedly encountered during construction of the project, work will be stopped and an environmental specialist will be called in to characterize the nature and extent of the contamination and to determine how the work may safely be completed. Work will proceed only after measures approved by the WDOE are put in place to prevent the spread of contaminated materials and protect the health and safety of workers.

It can be expected that some construction activities will occur during summer when the weather is hot and dry. During the summer months, the potential for wildfires is high due to dry vegetation, such as sagebrush and grasses, along the right-of-way. The fire risk increases even more with the increased use of vehicles and other motorized equipment used during construction. The addition of construction workers in the area also elevates the potential for fire. Vehicles would carry fire suppression equipment. After construction, to prevent fires and other hazards, BPA maintains a safe clearance between the tops of trees and power lines.

#### **4.12 Air Quality**

Construction vehicles and heavy equipment would emit pollutants. However, emissions would be short-term and would have a low or no impact on air quality in the region. Windblown dust from the construction sites and clearing activities would also create a short-term low impact on air quality.

Long-term impacts to air quality would come from the new lines themselves. The limited air emissions can result from a breakdown of the air at the surface of the conductors, called corona. The proposed Segment A Reroute is designed to have lower corona levels than the existing older 500-kV lines in the area and would not result in an impact to air quality.

### **5.0 PRIME FARMLAND**

The Farmland Protection Policy Act directs federal agencies to identify and quantify adverse impacts of federal programs on farmlands. The Act's purpose is to minimize the number of federal programs that contribute to the unnecessary and irreversible conversion of agricultural land to non-agricultural uses.

The location and extent of prime farmlands designated by the Natural Resources Conservation Service (NRCS) were obtained from NRCS soil survey information. Lists of unique, statewide,

and locally important farmlands in Washington are in the process of being updated and were unavailable for consideration.

In Kittitas County farmland soils are classified in one of three ways: always prime farmland, prime farmland if irrigated, or not prime farmland. As shown in Table 4, roughly 0.8 mile or 4,190 linear feet of land with the designation of “prime soils if irrigated” would be crossed by the proposed alignment.

**Table 4**  
**Distance of Farmland Soil Classifications Crossed by Segment A Reroute**

<b>Classification</b>	<b>Approximate Linear Distance Crossed</b>
Always prime farmland	0 mile (0.0 feet)
Prime farmland if irrigated	0.8 mile (4,190 feet)
Not prime farmland	0.5 mile (2,491 feet)
<b>TOTAL</b>	<b>1.3 miles (6,681 feet)</b>

Prime farmland would be permanently affected if any structures were located on designated soils that are being irrigated. Prime farmland would not be affected if the transmission facility could span the designated soils that are being irrigated. Estimated tower locations for the proposed new transmission line and rerouted existing transmission line place seven towers (four along the new line and three along the re-routed existing Schultz-Vantage line) on soils classified as prime farmland if irrigated.

Any prime farmland that would be converted to nonagricultural uses requires approval by the NRCS.

## **6.0 DIRECT COMPARISON OF SEGMENT A REROUTE AND SEGMENT A1**

In order to achieve a better understanding of the differences in impacts between using Segment A as proposed in the FEIS, and Segment A using the Segment A Reroute, a direct comparison of the impacts between the reroute and the portion of Segment A that it would replace, Segment A1, is provided below.

**Table 5**  
**Segment A Reroute vs. Segment A1**

	<b>Segment A Reroute</b>	<b>Segment A1</b>
<b>Length</b>	1.27 miles	1.04 miles
<b>Width of ROW</b>	350 feet	200 feet
<b>Number of New Transmission Lines</b>	2; Realigned Existing Schultz-Vantage and new line	1; New line 200 feet north of existing Schultz-Vantage
<b>Est. Number of Structures</b>	12; 6 on existing Schultz-Vantage and 6 on new line	4
<b>Est. Number of Angle Point Structures Required</b>	6; 2 at each end and 2 near the midpoint of the alignment	0
<b>Est. Acres of Disturbance from New Structures</b>	4.3 acres	1.4 acres
<b>Est. Acres of Disturbance from Removed Structures</b>	1.4 acres	0
<b>Acres within new ROW</b>	53.9 acres	25.2 acres

While the Segment A Reroute is roughly 0.23 mile longer than Segment A1, and would disturb approximately 4.3 more acres of land area due to the need for eight additional towers, Parsons Brinckerhoff has concluded that in many cases the impacts to resources along the Segment A Reroute would be similar to those reported for Segment A1.

**Table 6**  
**Segment A Reroute and Segment A1 Impact Comparison**

<b>Resource</b>	<b>Summary of Impacts</b>	
	<b>Segment A Reroute</b>	<b>Segment A1</b>
Water Resources, Soils, and Geology	Moderate erosion, loss of productive soils, and potential for some increased runoff and sedimentation.	Low to moderate erosion and loss of productive soil. Some increased runoff and sedimentation.
Floodplains and Wetlands	Minimal to no impacts to floodplains and wetlands because towers would be located on either side.	Impacts would be similar to the Segment A Reroute.
Vegetation	Low impacts to shrub-steppe, grasslands and riparian vegetation.	Low impacts to shrub-steppe and grasslands and moderate impacts to riparian vegetation.
Wildlife	Low impacts to shrub-steppe species, minimal impacts to bald eagles, other raptors, cavity-nesting birds and bats.	Low impacts to shrub-steppe species, bald eagles, other raptors, cavity-nesting birds and bats.
Fish	Minimal impacts from construction and removal of small riparian vegetation along Cooke Creek.	Low impacts from removal of large riparian trees.
Land Use	The impact to open space rangeland, the only identified land use within the proposed right-of-way, would be low.	Impacts would be similar to the Segment A Reroute.

**Table 6  
Segment A Reroute and Segment A1 Impact Comparison**

Resource	Summary of Impacts	
	Segment A Reroute	Segment A1
Socioeconomics	No impacts to local population compositions or distributions are expected to occur. A positive impact to local and state tax revenues and local economies would result from construction-related jobs and expenditures.	Impacts would be similar to the Segment A Reroute.
Visual	Visual impacts would be high to moderate due to no existing line along proposed right-of-way and because the new lines would be in the foreground or middleground for most viewers.	Visual impacts would be moderate because of existing lines already in the area.
Recreation	Impacts to recreational resources would be low.  Dispersed recreation activities would be temporarily impacted during construction. Activities could resume within the right-of-way and around the structures after construction is complete.	Impacts would be similar to the Segment A Reroute.
Cultural	The Phase 1 cultural survey, which was a literature and database search of known sites, indicated that the Segment A Reroute has a potential to contain culturally significant sites.	Impacts would be similar to the Segment A Reroute.
Public Health and Safety	Impacts from electric and magnetic fields would be low. Fields from the relocated existing line would be lower than the current fields from that line.  Impacts from the noise of the new and rerouted lines would be low/moderate. Predicted median foul-weather audible noise at edge of ROW would be 50 dBA. Low/moderate impact due to new lines in an area currently without lines.	Impacts from electric and magnetic fields would be low.  Impacts from the noise of the new line would be low. Predicted median foul-weather audible noise at edge of ROW would be 65 dBA. Has a lower impact level due to existing line already creating noise in the area.
Air Quality	Impacts from construction equipment and wind blown dust during construction would be low and temporary.  No long-term impacts to air quality would occur.	Impacts would be similar to the Segment A Reroute.
Prime Farmland	Roughly 0.8 mile or 63 percent of the Segment A Reroute would cross soils designated as "prime farmland if irrigated," with an estimated seven structures on these soils	Roughly 0.6 mile or 58 percent of the Segment A1 would cross soils designated as "prime farmland if irrigated," with an estimated three structures on these soils.

As shown in Table 6, the impact to the following resources would experience similar impacts on the Segment A Reroute as compared to those on Segment A1:

- Floodplains and Wetlands

- Land use
- Socioeconomics
- Recreation
- Cultural
- Air quality

For those resources where the anticipated impacts are expected to be different between the Segment A Reroute and Segment A1, a brief discussion comparing the two segments and explaining the cause of the variation in impact has been provided below.

### **6.1 Water Resources, Soils, and Geology**

Although the Segment A Reroute would cross the same soil units as Segment A1, the construction of the Segment A Reroute would disturb additional soil surface, with the relocation of the existing line and the addition of the new line, and have the potential for additional erosion, sedimentation, and runoff at or near Cooke Creek; impair soil productivity; and remove 0.3 acre of land from production. Although, the Segment A Reroute impacts would be within the Segment A1 assigned impact of low to moderate, impacts would potentially be on the more moderate side than low for the reroute.

### **6.2 Vegetation**

The Segment A Reroute would reduce impacts to forested lands and grasslands and increase the impacts to shrublands compared to Segment A1. The reduction of impacts to forested land is due to fewer large cottonwoods and willows that would need to be removed on the Segment A Reroute as opposed to the original route. The original route crosses an area of large cottonwoods and willows, a number of which would need to be removed for line clearance purposes.

### **6.3 Wildlife**

Bald eagles, other raptor species, cavity-nesting birds, and bats all use large riparian trees such as cottonwoods and willows. Segment A1 would cause minimal impacts due to some of these trees being removed for line clearance purposes. No large trees would need to be removed along the Segment A Reroute, so no habitat for the species mentioned above would be removed. Table 7 compares the potential impacts to federal and state listed species between the Segment A Reroute and Segment A1.

**Table 7**  
**Comparison of Impacts to Federal & State Listed Species on Segment A Reroute and Segment A1**

Species Name	Federal Status	State Status	Documented Occurrence Type	Potential Impact Segment A Reroute	Potential Impact Segment A1
<b>Riparian, Open Water and Wetland Species</b>					
Perching and Cavity Nesting Birds					
Bald eagle	FT	ST	W	N	Mn
Osprey		SM	B	N	Mn
Great blue heron		SM	B	N	Mn
Black-crowned night heron		SM	B	N	Mn
Lewis' woodpecker		SC	B	N	Mn
Olive sided flycatcher	FSC		P	N	Mn
Little willow flycatcher	FSC		P	N	Mn
Bats					
Pacific western big-eared bat	FSC	SC	P	N	Mn
Long-eared myotis	FSC	SM	P	N	Mn
Long-legged myotis	FSC	SM	P	N	Mn
Fringed myotis	FSC	SM	P	N	Mn
Western small-footed myotis	FSC	SM	P	N	Mn
Yuma myotis	FSC		P	N	Mn
Pallid bat		SM	P	N	Mn
Herpetofauna					
Spotted frog	FC	SE	P	Mn	Mn
<b>Shrub-Steppe Species</b>					
Raptors and Migratory Birds					
Northern goshawk	FSC	SC	M	Mn	Mn
Golden eagle		SC	B	Mn	Mn
Ferruginous hawk	FSC	ST	B	Mn	Mn
Swainson's hawk		SM	B	Mn	Mn
Prairie falcon		SM	B	Mn	Mn
Peregrine falcon	FSC	SE	B	Mn	Mn
Turkey vulture		SM	B	Mn	Mn
Western bluebird	FSC	SM	B	Mn	Mn
Sagebrush-Dependent Birds					
Sage sparrow		SC	B	M	M
Sage thrasher		SC	B	M	M
Long-billed curlew	FSC	SM	B	M	M
Western sage grouse	FSC	ST	B	M	M
Loggerhead shrike	FSC	SC	B	M	M
Sharp-tailed grouse	FSC	ST	H	M	M
Mammals					
White-tailed jackrabbit		SC	B	M	M
Small Burrowing Species					
Northern grasshopper mouse		SM	P	M	M
Sagebrush vole		SM	P	M	M
Merriam's shrew		SC	B	M	M
Herpetofauna					
Sagebrush lizard	FSC		B	M	M
Striped whipsnake		SC	B	M	M
<b>Federal Status</b>		<b>State Status</b>		<b>Documented Occurrence Type</b>	
FE = Endangered		SE = Endangered		P = Present (general presence)	
FT = Threatened		ST = Threatened		B = Breeding	
FC = Candidate		SS = Sensitive		M = Migrant	
D = Delisted		SC = Candidate		W = Winter Resident	
FSC = Species of Concern		SM = Monitor		N = Not Present	
				<b>Potential Impact</b>	
				H = High	
				M = Moderate	
				L = Low	
				Mn = Minimal	
				N = None	
				H = Historically Present, Not Currently Present	

**6.3.1 Threatened & Endangered Species**

The proposed Segment A Reroute would have less of a potential effect on Bald eagles than Segment A1 because fewer large cottonwoods and willows, preferred by eagles for roosting, would need to be removed.

## 6.4 Fish

Overall, impacts to fish species present in Cooke Creek would be slightly less on the Segment A Reroute than along the Segment A1 alignment, but not enough to change overall impacts to fish species along Segment A. Because no large trees would need to be removed on the Segment A Reroute, impacts to water quality and large woody debris sources would be slightly lower than the Segment A1 alignment, where several large riparian trees would need to be removed.

## 6.4 Visual Resources

The Segment A Reroute would have a slightly higher impact on visual resources than Segment A1 because it would be located in a right-of-way that currently has no existing transmission lines and it would be in the foreground or middleground for most viewers. Impacts from Segment A1 would be moderate, but impacts from the Segment A Reroute would be high for viewpoint locations within 0.5 mile and moderate for the viewpoints between 0.5 mile and 5.0 miles.

## 6.5 Public Health and Safety

### 6.5.1 Segment A1

There are no residences within 1,000 feet of the right-of-way. Impacts from electric and magnetic fields would be low. Activities presently occurring within what would become the right-of-way would not change, as they are activities associated with open fields. Calculated levels for electric and magnetic fields are shown below.

**Table 8**  
**Calculated Electric Fields**  
**New 500-kV and Existing Vantage–Schultz 500-kV Lines Operated at Maximum Voltage**

ROW width, ft.	350			
Line	New 500-kV		Vantage – Schultz 500-kV	
Clearance	Min.	Avg.	Min.	Avg.
Peak field, kV/m	8.7	5.8	8.5	5.1
Edge of ROW, kV/m	2.5	2.5	5.3	4.1

**Table 9**  
**Calculated Magnetic Fields**  
**New 500-kV and Existing Vantage–Schultz 500-kV Lines Operated at Maximum Current**

ROW width, ft.	350			
Line	New 500-kV		Vantage – Schultz 500-kV	
Clearance	Min.	Avg.	Min.	Avg.
Peak field, mG	229	155	151	95
Edge of ROW, mG	71	62	88	66

Impacts from the noise of the new and existing lines would be low. The predicted median four-weather audible noise levels at the edge of right-of-way would be 65 dBA. The noise level would be more than that of normal conversation indoors (60 dBA) and less than that of a gas lawnmower at 100 feet (70 dBA). Because the closest residents are more than 1,000 feet from the existing right-of-way, it is not expected that they would perceive any increased noise levels from the new line.

6.5.2 Segment A Reroute vs. Segment A1

As shown in Tables 10 and 11, the calculated electric fields for the proposed new line would be practically the same along the Segment A Reroute vs. Segment A1. However, the magnetic fields would have a slightly higher peak field and a slightly lower edge of right-of-way field. The calculated electric and magnetic fields for the existing Vantage-Schultz line would decrease along the Segment A Reroute.

**Table 10**  
**Calculated Electric Fields**  
**Difference Between Segment A Reroute and Segment A1 at Maximum Voltage**

ROW width, ft.	350			
Line	New 500-kV		Vantage – Schultz 500-kV	
Clearance	Min.	Avg.	Min.	Avg.
Peak field, mG	-0.1	0.0	+0.1	-0.1
Edge of ROW, mG	0.0	-0.1	-2.8	-1.7

**Table 11**  
**Calculated Magnetic Fields**  
**Difference Between Segment A Reroute and Segment A1 at Maximum Current**

ROW width, ft.	350			
Line	New 500-kV		Vantage – Schultz 500-kV	
Clearance	Min.	Avg.	Min.	Avg.
Peak field, mG	5	4	-37	-19
Edge of ROW, mG	-3	-3	-50	-33

Impacts from the noise of the new and relocated existing lines would be slightly higher for the Segment A Reroute (low/moderate vs. low) due to the fact that the Segment A Reroute would be locating lines in an area that currently has no transmission lines. Along either alignment, the Segment A Reroute or Segment A1, the closest residents would be more than 1,000 feet from the right-of-way and it is not expected that they would perceive any increased noise levels from either alignment.

## **6.6 Prime Farmlands**

Both the Segment A Reroute and Segment A1 would cross lands designated as “prime farmland if irrigated.” However, the Segment A Reroute would have the potential to affect a greater amount of prime farmland because it would cross roughly 0.2 mile of additional designated soils and would require an estimated seven new transmission line structures to be located on these designated soils; Segment A1 would require an estimated three new structures on these designated soils. As a result, the maximum estimated area of impact (0.34 acre per structure) to lands designated as “prime farmland if irrigated” from the Segment A Reroute would be 2.38 acres versus 1.03 acres for Segment A1 - a potential difference of roughly 1.35 acres.

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