Summary

Introduction

This summary includes information regarding the following elements of the National Environmental Policy Act (NEPA) environmental impact statement (EIS) for the McNary-John Day Transmission Line Project:

- the purpose and need for action;
- short-line routing alternatives; and
- affected environment, impacts, and mitigation measures.

The project would involve construction of a new 500-kilovolt (kV) transmission line parallel to existing Bonneville Power Administration (Bonneville) transmission lines from the McNary Substation to the John Day Substation, a distance of approximately 79 miles.

Purpose and Need for Action

Bonneville is a federal agency responsible for purchasing, developing, marketing, and transmitting electrical power to utility, industrial, and other customers in the Pacific Northwest. Bonneville is required to ensure its transmission system can reliably serve customer power needs under all operating conditions, including times of peak use (maximum demand).

The Federal Columbia River Transmission Act directs Bonneville to construct additions to the transmission system that are required to provide interregional transmission facilities [16 U.S.C. § 838b(c)], integrate and transmit electric power from new generating sources [§ 838b(a)], and for maintaining the electrical stability and reliability of the transmission system [§ 838b(d)]. The proposed action is needed to comply with these Congressional mandates.

Bonneville is facing two problems regarding power flow on the system: there is not enough electricity being generated to meet demand, and many of Bonneville's transmission lines are now at capacity and cannot carry more power. To solve the

problem of lack of power, private investors have proposed and are developing gas-fired and wind-powered generation facilities. Many of these facilities are in southeast Washington and northeast Oregon (Figure S-1). This is a prime area for power generation because of sufficiency of wind or access to gas pipelines, as well as access to high voltage transmission lines. The newly generated power from these facilities will need to be transmitted to the west side of the Cascades because there is a high demand for electricity from the west side's urban areas. However, the existing transmission lines connecting southeast Washington and northeast Oregon to the west side of the Cascades are at or near capacity. In order to help ensure that existing and newly generated power can move east to west through the system, Bonneville needs to increase the capacity of its transmission system between the McNary and John Day Substations.

Two of the generation facilities proposed in this area are the Starbuck Power Project (near Starbuck, Washington) and the Wallula Power Project (near Wallula, Washington). These gas-turbine facilities would generate a total of 2,500-megawatts (MW) of power. The new transmission line would be necessary to allow the power from these facilities to integrate into the transmission system and would allow Bonneville to grant firm transmission service to these facilities.

Purposes

While meeting the need to increase the capacity of the transmission system in this area, the proposed action has other purposes (or objectives). Bonneville intends to base its decisions on the following objectives:

- maintenance of transmission system reliability;
- consistency with Bonneville's environmental and social responsibilities; and
- cost and administrative efficiency.

Cooperating Agencies

The U.S. Army Corps of Engineers, the U.S. Bureau of Land Management, the U.S. Fish and Wildlife Service, and the Bureau of Indian Affairs are cooperating agencies in the development of this EIS because of their roles as managers of lands crossed or need to make findings on the project.

Proposed Action and Alternatives

Bonneville proposes to construct a 500-kV transmission power line from its McNary Substation to its John Day Substation, a distance of about 79 miles. The new line would begin at the existing McNary Substation in Umatilla City (Umatilla County, Oregon) near the Columbia River and cross the Columbia River into Washington between the McNary Dam and the Umatilla Bridge. The proposed line would then generally follow the Columbia River and State Route (SR) 14 west through Benton and Klickitat Counties. At

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Stacy Mason - KEC-4
Bonneville Power Administration
P.O. Box 3621
Portland, OR 97208

the John Day Dam, the proposed line would cross back into Oregon and connect into the John Day Substation near Rufus (Sherman County, Oregon). The proposed line would parallel existing transmission lines in an existing corridor that runs between the McNary and John Day Substations.

For most of the route in Washington, Bonneville already has existing right-of-way or easement available next to the lines.

Along the majority of the existing corridor between the McNary Substation and the crossing at John Day Dam, there are two existing transmission lines; in two areas along the corridor there are three existing lines.

Some new right-of-way easements would need to be purchased adjacent to the existing corridor along approximately 14 miles of the route.

Towers

The towers for the proposed new 500-kV line would be 145 to 165 feet tall lattice steel towers with spans of 1,150 to 1,500 feet between towers. The towers would be similar to the towers of the existing lines. The towers would be made of galvanized steel and may appear shiny for two to four years before they dull with the weather. About 360 transmission towers would be needed to carry the wires (conductors) for the proposed transmission line.

Tower Footings

Three types of footings would be used depending on the terrain and tower type (ranging from 4 feet by 4 feet to 12.5 feet by 12.5 feet in area).

A trackhoe would be used to excavate an area for the footings. The excavated area would be at least 2 feet larger than the footings to be installed (if the soil is loose or sandy, then a wider hole may be necessary). Each tower would use an area about 0.06 acre, with a temporary disturbance during construction of about 0.25 acre (equipment, soils, etc.).

Conductors

Conductors, wires that carry electrical current on a transmission line, are suspended from towers with insulators. Insulators are made of nonconductive materials (porcelain or fiberglass) that prevent electric current from passing through towers to the ground.

Two smaller wires (0.5-inch diameter), called overhead ground wires, would also be attached to the top of the transmission towers. Ground wires are used for lightning protection.

Tree Clearing

Most of the vegetation along the corridor is low-growing sagebrush or fields that are compatible with transmission lines. Tall trees cannot be allowed to grow under or near the lines because electricity can arc, which can start a fire or injure or kill someone nearby.

Access Roads

Much of the existing transmission line corridor lies within 2 miles of public highways. Because the proposed transmission line would be next to existing lines, the proposed new line would utilize up to 90% of the existing 90 miles of access roads.

The new transmission line would require some upgrades to existing access roads (approximately 40 miles would need to be reconditioned and widened); construction of new access roads (about 3 miles of new road would need to be built); construction of new access road spurs (about 270 short spur roads, each about 250 feet long from an existing access road to a new tower); and purchase of new easement (for up to 30 new access roads in areas off of the right-of-way).

Staging Areas

Temporary staging areas would be needed along or near the proposed transmission line for construction crews to store materials and trucks.

Substation Facilities

At the McNary Substation, the east side of the substation would require an expansion measuring 80 feet by 700 feet, about 1.3 acres. The substation expansion would be on Bonneville property.

At the John Day Substation, the line would terminate into a new 500-kV bay located within the existing substation fence. No expansion would be necessary.

Maintenance

During the life of the project, Bonneville would perform routine, periodic maintenance and emergency repairs to the transmission line. For lattice steel structures, maintenance usually involves replacing insulators. Every 2 months, a helicopter would fly over the line to look for hot spots (areas where electricity may not be flowing correctly) or other problems indicating that a repair may be needed.

Vegetation is also maintained along the line for safe operation and to allow access to the line. The area along the McNary-John Day transmission line needs little vegetation maintenance because of the low-growing nature of a majority of the vegetation along the right-of-way.

Alternatives

This EIS addresses short-line routing alternatives at four locations along the project corridor, as described in Table S-1.

Table S-1. Short-Line Routing Alternatives at Four Locations Along the Project Corridor

Alternatives	Description
McNary Substation Alternatives	
A – Relocate Building	Under this alternative, a 2,000-square-foot Bonneville office building would need to be relocated because the new 500-kV line would cross directly over the top of it, causing potential safety hazards. The building would be relocated somewhere adjacent to the substation within the Bonneville property line.
B – Cross Wildlife Natural Area	With this alternative, the new transmission line would exit the northeast side of the substation, cross Third Street, and run behind the office building and across the U.S. Army Corps of Engineers (Corps) Wildlife Natural Area. This alternative may require removal of some cottonwood trees.
C – Bus Work in Wildlife Area	For this alternative, the transmission line would exit the northeast side of the substation, cross Third Street, then descend into bus work across the Wildlife Natural Area behind the office building. The bus work would be about 2,000 feet long by 75 feet wide.
Hanford-John Day Junction Alternatives	
A – North Side	With this alternative, the proposed transmission line would stay in the same alignment paralleling the existing lines. This would require moving the existing Hanford-John Day line 200 feet to the north. At corridor mile 70, the proposed line would cross to the south side of the corridor and the Hanford-John Day line would ease back into its alignment in the corridor.
B – South Side	With this alternative, the proposed transmission line would cross to the south side of the corridor just before the Hanford-John Day line enters the right-of-way. The proposed line would stay on the south side through the rest of the route. For the first mile on the south side, the line would also be on the south side of the highway. Just before corridor mile 70, there is a house with a barn and a shed on the south side of the highway. This alternative would require the removal of the barn and shed, and may require the removal of the house.

Alternatives	Description
C – South Side, Highway	This alternative is very similar to Alternative B; the proposed line would cross to the south side of the corridor and highway just before the Hanford-John Day line enters the right-of-way. This alternative differs from Alternative B in that the proposed line would stay on the south side of the highway until the exiting lines crosses the highway, eliminating two highway crossings of the proposed line. As with Alternative B, the barn and shed (and possibly the house) would need to be removed. With this Alternative C, the line would be about 35 feet closer to the house than with Alternative B.
Corridor Mile 32 Alternatives	
A – Parallel Existing Line	With this alternative, Bonneville would construct the proposed line across the tribal-owned property at corridor mile 32, paralleling the existing lines within the existing right-of-way. About 1,100 feet of conductor and perhaps one tower would be located on the property.
B – Move Entire Corridor	With this alternative, the proposed line would be moved to skirt around the tribal-owned property. The other two existing lines would also be moved to avoid the property. This alternative would require one additional tower for the proposed line. For the existing lines, eight towers (four for each line) would be removed and ten new towers (five for each line) constructed for the reroute. New right-of-way would be purchased from the landowners.
Corridor Mile 35 Alternatives	
A – Parallel Existing Line	With this alternative, Bonneville would construct the proposed line across the tribal-owned property at corridor mile 35, paralleling the existing lines within the existing right-of-way. About 500 feet of conductor would be located across the property.
B – Move Entire Corridor	With this alternative, the proposed line would be moved to skirt around the tribal-owned property at corridor mile 35. The other two existing lines would also be moved to avoid the property. No additional towers would be required for this alternative (compared to Alternative A). For the existing lines, eight towers (four for each line) would be removed and eight new towers (four for each line) constructed for the reroute. New right-of-way would be purchased from the landowners.

No Action Alternative

The No Action Alternative would be to not build the proposed transmission line. If Bonneville did not build this line, new generation facilities in the area could not connect and send power over the transmission system.

Alternatives Considered but Eliminated from Detailed Study

During the scoping process, Bonneville considered a range of alternatives for the proposed action. Alternatives that did not meet the need and purposes, including whether they were practical or feasible, or would obviously have greater adverse environmental impacts than the proposed action, were eliminated from detailed study. The following alternatives did not meet the need and purposes.

- **Oregon Route Alternative.** Bonneville examined various ways to transmit power from east to west, including a new transmission line from the McNary Substation to the John Day Substation through Oregon. This Oregon routing alternative would have required the purchase of all new right-of-way as there is no existing vacant right-of-way available for a 500-kV line in this area of Oregon. The social and environmental impacts of an Oregon route would also be much greater with the relocation of residents, disruption of existing land uses, construction of new access roads (erosion, water quality), and potential vegetation clearing.

- **McNary Substation Southeast Alternative.** In examining ways for the line to exit the McNary Substation and reach the river crossing, Bonneville considered exiting the southeast side of the substation. This alternative was eliminated from consideration for reliability reasons.

- **Increased Capacity Line Alternative.** The proposed line would have a capacity of 1,400 to 2,300 MW. During scoping, commenters requested a line capable of carrying 5,000 MW or more. Transmission lines need back-up line(s) in case any component of the transmission system were to fail. There is sufficient back-up in the area for the proposed line. In order to maintain the reliability of a new line carrying 5,000 MW, a new second high voltage line would have to be built as a back-up. Rather than building two high voltage lines now, Bonneville's system planners will continue to evaluate the need for increased capacity as new generation facilities request interconnection.

- **Underground Transmission Line Alternative.** Underground transmission lines (cables), are highly complex in comparison to overhead lines. For 500-kV lines, underground cable may be ten times as costly as overhead designs. Because of the cost, Bonneville uses underground cable in limited, special reliability, or routing situations, such as near nuclear power stations, at locations where high capacity lines must cross, at long bay crossings, or in urban areas.

- **Double Circuit Alternative.** Double circuiting would involve taking out one of the existing lines and putting in a double circuit line (one set of towers to hold both the existing line and the proposed line). This alternative was eliminated due to costs because the transmission towers for a double circuit line are twice as much as for a single circuit line. The overall cost of removing one of the existing lines and constructing a double circuit line would be much greater than constructing the proposed single circuit line.

Affected Environment, Environmental Impacts, and Mitigation

The affected environment, potential impacts, and mitigation for the resource elements evaluated in this EIS are briefly described below.

Land Use and Recreation

Affected Environment

The existing Bonneville corridor (the site for the proposed transmission line) crosses mostly private land (94% of lands crossed) as well as tribal, federal, and state lands in eastern Washington and Oregon bordering the Columbia River.

Land use within the corridor is primarily agriculture (irrigated cropland, dryland wheat farming, and grazing). Irrigated agricultural uses in the project corridor include poplar tree farms, orchards, and a variety of crops such as potatoes, corn, onions, carrots, and asparagus. Some crops change annually. There are no lands designated as prime farmland in the project corridor.

Thirteen formal recreational sites lie within one mile of the proposed transmission line in Benton and Klickitat Counties, Washington, and Sherman and Umatilla Counties, Oregon. A majority of the facilities are located on, or are associated with the Columbia River. Informal recreational opportunities in the vicinity of the project corridor include upland bird hunting in certain areas of the corridor in Benton County, and various water sports on the Columbia River along most of the project corridor. SR 14 is designated as a Scenic and Recreation Highway by the state of Washington.

Environmental Consequences—Proposed Action

Construction

Development of the proposed project would add an additional transmission line to the current land uses within the existing Bonneville transmission line corridor.

The project would be consistent with the purpose and intent of the zoning and comprehensive plans of the local jurisdictions.

Temporary impacts on land use would be due to construction activities such as heavy equipment causing soil and crop disturbance, noise, and dust. The construction activities that could cause impacts would include placement of towers, access roads upgrades and construction, and conductor tensioning sites.

Approximately 47 acres (12 acres in cropland and 35 acres in grazing land) would be impacted during the construction of the new access roads and spur roads. Approximately 93 acres (29 acres of upland and 64 acres of grazing land) would be impacted during the construction of the towers.

Approximately 25 acres of trees would need to be removed from the poplar tree farm in the vicinity of Glade Creek, and a total of 50 acres would be removed from cottonwood production.

None of the formal recreation facilities would be disturbed during construction. Upland bird hunting may be temporarily disturbed in the project corridor in Benton County, depending on the time of year when construction occurs.

Operation and Maintenance

The permanent footprints of the towers would occupy approximately 19 acres total (6 acres of irrigated and nonirrigated cropland and 13 acres of grazing land). New access roads would occupy approximately 47 acres of additional area. The cropland no longer available for farm use would represent a small portion of the agricultural land in the project corridor and a negligible portion of agricultural land in each of the four affected counties. This would not appreciably disrupt the current and planned agricultural uses of the land in the four affected counties.

Environmental Consequences—Short-Line Routing Alternatives

The potential land use and recreation impacts of the short-line routing alternatives are presented in Table S-2.

Mitigation

The following mitigation measures would help minimize land use impacts.

- Locate towers and roads so as not to disrupt irrigation circles, where possible.
- Locate structures and roads outside of agricultural fields, orchards, and vineyards, where possible.
- Coordinate with landowners for farm operations, including plowing, crop dusting, and harvesting.
- Redesign irrigation equipment and compensate landowner for additional reasonable costs where new right-of-way needs to be acquired.
- Compensate farmers for crop damage and restore compacted soils.
- Control weeds around the base of the towers.
- Keep gates and fences closed and in good repair to contain livestock.

No mitigation measures are warranted for recreation since no impacts are anticipated.

Environmental Consequences—No Action Alternative

If the No Action Alternative was implemented, existing land uses in the project corridor would continue without influence from the proposed project.

Geology, Soils, and Seismicity

Affected Environment

The project corridor and vicinity consist mainly of river terraces, ridges, bluffs, and volcanic tableland adjacent to the north bank of the Columbia River running parallel to SR 14. The corridor crosses numerous incised stream channels draining into the Columbia River.

Soils along the project corridor primarily consist of wind-blown loess deposits or glacial outburst flood sands and gravels underlain by basaltic bedrock. Most soils along the corridor are designated as suitable for rangeland, woodland, or wildlife, and some steeper areas may require complex conservation methods when used for cultivation.

The project corridor and vicinity lie in a low earthquake hazard area (seismic zone 2B) recognized by the 1994 Uniform Building Code. Published geologic maps and field observation indicated five faults (probably inactive) along the corridor (Phillips and Walsh 1987).

Environmental Consequences—Proposed Action

Construction

Construction of the proposed project would potentially remove vegetation and disturb the underlying soils in up to 222 acres. This temporary impact is projected to last up to one year and has the potential to increase the rate of erosion along the corridor. In areas along the corridor where quaternary period loess soils have developed as a result of wind deposition, removal of vegetation would likely increase the rate of wind erosion.

Operation and Maintenance

Anticipated erosion rates during operation and maintenance are expected to remain at or near current levels, once revegetation has occurred.

Environmental Consequences—Short-Line Routing Alternatives

The potential impacts of the short-line routing alternatives are presented in Table S-2.

Mitigation

The following mitigation measures would help minimize impacts to soil and seismicity impacts.

- Minimize vegetation removal.
- Avoid construction on steep slopes where possible.
- Properly engineer cut-and-fill slopes.
- Install appropriate roadway drainage to control and disperse runoff.
- Ensure graveled surfaces on access roads in areas of sustained wind.
- Develop additional mitigation measures (using a certified engineer) between corridor miles 39 and 41 due to the presence of an active landslide in the vicinity of tower 40/3.
- Apply erosion control measures such as silt fence, straw mulch, straw wattles, straw bale check dams, other soil stabilizers, and reseeding disturbed areas as required.
- Regularly inspect and maintain project facilities, including the access roads, to ensure erosion levels remain the same or less than current conditions.

Environmental Consequences—No Action Alternative

Under the No Action Alternative, the potential impacts to geology and soils from the proposed project would not change from the current site conditions. No impact to geology and soils is predicted.

Streams, Rivers, and Fish

Affected Environment

A total of 15 streams, the Columbia River, and 146 dry washes cross the project corridor. Of the streams and river, 11 are considered fish bearing or potentially fish bearing and five are non-fish-bearing.

Five of the 11 fish-bearing streams (Glade Creek, the unnamed tributary to Glade Creek, Dead Canyon, Alder Creek, and Rock Creek) along the project corridor were found to have water temperatures in excess of 64.4°F during the June 2001 field surveys. These conditions identify water quality in these streams as impaired under Section 303(d) of the Clean Water Act and may indicate problems for fish species.

All streams identified as either fish bearing or potentially fish bearing in the project area are included in designated Essential Fish Habitat (EFH) for chinook and coho salmon. Chinook salmon that utilize the streams intersected by the project corridor are not

currently federally listed, while coho salmon are a candidate for federal protection. Steelhead trout is another anadromous salmonid known to occur in the fish-bearing streams crossed by the project corridor.

The 146 non-fish-bearing dry washes that cross the project corridor (channels lacking any semblance of a riparian zone) are intermittent, primarily providing seasonal drainage off of hills (WDFW 2000).

Environmental Consequences—Proposed Action

Construction

The construction of the proposed project could potentially impact fish habitat through the transport of sediment (and hazardous materials) from construction sites to streams.

Riparian vegetation would not be removed, but instead would be spanned by the transmission line. Some short-term sediment transport would occur until stream channels are stabilized following installation of culverts on ephemeral streams.

There is a risk of sediment transport into streams from construction of towers, access roads, spur roads, and staging areas; and impacts to fish from blasting, if such blasting is within 200 feet of fish-bearing streams. No fish-bearing streams would be crossed by the construction of new access roads and no existing access road currently crosses a fish-bearing or potentially fish-bearing stream that Bonneville owns and/or manages.

Several common construction materials (e.g., concrete and paint) and petroleum products (e.g., fuels, lubricants, and hydraulic fluids) could be toxic to fish and other aquatic organisms if spilled into or near streams.

The work associated with the McNary Substation and the towers spanning the Columbia River adjacent to the Umatilla Bridge would occur within the FEMA-designated 100-year floodplain of the Columbia River. However, the McNary Substation and the new towers are above the elevation of the 100-year flood event as designated by the U.S. Army Corps of Engineers. This is based on water level control through the dam system along the Columbia River.

All other new access roads and towers would be installed outside the 100-year floodplains of other streams crossed and would create no impacts to the floodplains.

Operation and Maintenance

Routine inspections, monitoring, and vegetation management would not impact fish or fish habitat.

Environmental Consequences—Short-Line Routing Alternatives

The potential impacts of the short-line routing alternatives are presented in Table S-2.

Mitigation

The following mitigation measures would minimize potential impacts to streams and fisheries habitat from possible erosion and clearing of vegetation.

- Place towers outside of stream riparian areas and utilize natural landscape features to span the conductor over existing shrub and tree riparian zones and avoid cutting.
- Place new access roads outside of stream riparian areas, where possible.
- Construct fords instead of culverts at access road crossings of dry washes or seasonal streams if possible. If culverts are required, design and install to accommodate flows associated with a 100-year flood event.
- Preserve existing vegetation where practical, especially next to intermittent and perennial streams.
- Avoid construction within the 200-foot designated stream buffers in Klickitat and Benton Counties, Washington.
- Maximize the use of existing roads, minimizing the need for new road construction.
- Avoid tower or access road construction on potentially unstable slopes where feasible.
- Use erosion control methods during construction (see mitigation measures for Geology, Soils, and Seismicity, Chapter 3), to minimize transport of sediments to streams via runoff.
- Install appropriate water and sediment control devices at all dry wash crossings, if necessary.
- Reseed disturbed areas following construction where appropriate.
- Construct any required culverts using Washington Department of Fish and Wildlife culvert installation guidelines. Methods may include avoiding installation during periods of flow, armoring streambanks near the culvert entrance and exit, installing culverts on straight sections of stream to ensure unimpeded flow, and following the contour of the stream channel.
- Repair existing road failures and drainage devices between corridor mile 33 to 47 to reduce potential impacts to dry washes.
- Avoid blasting during periods when salmonid eggs or alevins are present in gravels.

- Avoid blasting within 200 feet of fish-bearing or potentially fish-bearing streams.
- Develop and implement a Spill Prevention and Contingency Plan to minimize the potential for spills of hazardous material including provisions for storage of hazardous materials and refueling of construction equipment outside of riparian zones, spill containment and recovery plan, and notification and activation protocols.
- Keep vehicles and equipment in good working order to prevent oil and fuel leaks.
- Return staging areas to pre-construction condition.

Environmental Consequences—No Action Alternative

The No Action Alternative would result in no changes to the existing corridor, and aquatic habitats would not be affected in the project vicinity. Therefore, no impacts to fish or fish habitat would occur as a result of the No Action Alternative.

Wetlands and Groundwater

Affected Environment

Wetlands in the area are mostly seasonal because of low annual precipitation and common drought during the summer. Typically, the area receives approximately 8 inches of precipitation annually. Most precipitation falls as light showers or snowfall in the winter (SCS 1972).

A total of 25 wetlands totaling 45 acres were identified within the project corridor. These wetlands are generally supported by water sources associated with riparian areas, seasonal spring seeps, shallow depressions fed by precipitation, and surface runoff. Wetland sizes range from narrow riparian fringes 5 to 10 feet wide, to large wetland complexes covering 5 to 10 acres.

Near the McNary Substation, there is a large wetland complex associated with the floodplain of the Columbia River. Near corridor miles 48 to 50, there is a large depressional wetland complex associated with alkali saltgrass communities on saline-alkali soils. Between corridor miles 71 and 75, there are several palustrine emergent wetlands located in depressions among rock outcroppings.

Groundwater is generally available in large quantities in the Columbia Plateau province from the basalt bedrock. Aquifer recharge occurs primarily by precipitation through direct infiltration and seepage from the numerous intermittent streams along the corridor. Some recharge may occur from the spray irrigation of orchards and other agricultural crops using well water, but this is negligible relative to recharge from irrigation canals elsewhere in eastern Washington and eastern Oregon.

Environmental Consequences—Proposed Action

Construction

Of the 43 acres of wetlands located within the project corridor, no wetland areas would be filled to construct the proposed project. Vegetation would be cut within wetlands for McNary Substation Alternative B where the line would cross the wildlife refuge.

Construction of access roads or towers located adjacent to some wetlands may require removal of wetland buffer vegetation. The quality of vegetation of the wetland buffers in these areas is marginal; the areas are mostly used for grazing and are dominated by invasive weeds such as cheatgrass. However, the reduction of some of the vegetated buffers adjacent to these wetlands would reduce overland flow and slightly increase the likelihood of silts and sediments entering wetland surface waters, thus decreasing water quality. These anticipated impacts are minor.

Oils and pollutants from machinery could also enter surface water, potentially effecting fish or wildlife species. The construction of roads and tower pads could also alter overland flow patterns, thereby either increasing or decreasing wetland hydroperiod (the duration of soil saturation or inundation within a wetland).

The potential for impacts on groundwater is minor due to the use of construction techniques that avoid trenching and drilling. Potential groundwater impacts that could occur during construction include the potential for localized groundwater contamination from refueling and equipment maintenance. Erosion in areas of soil disturbance and vegetation removal could result in increased groundwater turbidity, and interception of groundwater seeps in road cutbanks could alter the hydrology or water quality of adjacent wetlands and streams.

Operation and Maintenance

Impacts during operation and maintenance of the proposed line could result from the use of access roads for tower maintenance, and from vegetation clearing. These activities could potentially introduce sediment into local wetlands through surface runoff, potentially affecting water quality. These operational impacts on groundwater are considered minimal.

Environmental Consequences—Short-Line Routing Alternatives

The potential impacts of the short-line routing alternatives are presented in Table S-2.

Mitigation

The following mitigation measures would minimize wetland and groundwater impacts.

- Locate structures, new roads, and staging areas so as to avoid waters of the United States, including wetlands.
- Avoid construction within designated Klickitat and Benton Counties wetland and stream buffers to protect potential groundwater recharge areas (Klickitat County Critical Areas Ordinance; Benton County Code Title 15).
- Avoid mechanized land clearing within wetlands and riparian areas to avoid soil compaction from heavy machinery, destruction of live plants, and potential alteration of surface water patterns to reduce groundwater turbidity risk.
- Anticipate and avoid, as required, contaminated soil and underground tanks during construction activities near pipelines and agricultural and other historic projects. Anticipate and avoid orphaned wells, as required, particularly near the communities of Plymouth, Paterson, Roosevelt, Sundale, and Towal.
- Use erosion control measures (see mitigations listed in the Geology, Soils, and Seismicity section) when conducting any earth disturbance within 100 feet of wetlands, or within the resource buffer as established by Benton and Klickitat Counties.
- Avoiding refueling and/or mixing hazardous materials where accidental spills could enter surface or groundwater.
- Using existing road systems, where possible, to access tower locations and for the clearing of the transmission line alignment.
- Avoid construction on steep, unstable slopes if possible.
- Place tower footings on upland basalt outcroppings and limit access road construction in wetlands complex and buffers between corridor miles 70 and 74, if possible.
- Place tower footings and access roads within uplands within the wetland complex between corridor miles 48 and 50.
- Avoid placing towers and roads that would necessitate the cutting of the palustrine-forested wetland near the McNary Substation (Alternative B).

Environmental Consequences—No Action Alternative

Under the No Action Alternative, the existing transmission corridor would remain as at present. Potential impacts to wetlands and groundwater resources along the corridor associated with the proposed project would not occur.

Vegetation

Affected Environment

The area is characterized by flat buttes, rolling hills, basalt cliffs, terraces, and scablands including rock outcroppings interspersed with wet areas. Portions of the project corridor cross irrigated agricultural cropland, particularly in the eastern half of the corridor. Shrub-steppe communities dominated by bunchgrasses and sagebrushes dominate the dry, rocky areas. Within the corridor, shrub-steppe and mixed grasslands are the most common plant communities, comprising approximately 61% of the corridor.

Other vegetation communities present include agricultural areas, scabland/lithosol (shallow soils) communities, riparian corridors, and ruderal communities in developed areas. Past disturbance of the corridor has influenced the types of plant communities present. Along the project corridor, the invasive species cheatgrass is prevalent in most of the plant communities.

The U.S. Fish and Wildlife Service has identified one federally listed threatened species (Utes ladies' tresses) and one candidate plant species (northern wormwood) as having potential habitat present within the project corridor. Neither species was found during field surveys conducted in July 2001.

The Washington Natural Heritage Program (WNHP) has identified potential habitat in or near the project corridor for three state sensitive plant species. None of these plant species were found during field surveys conducted in July 2001. However, the field surveys verified that favorable habitat for all three species is present in portions of the corridor.

Environmental Consequences—Proposed Action

Construction

The proposed transmission line expansion would result in both permanent and temporary impacts to vegetation within the project corridor from vegetation removal or trampling and soil compaction. Permanent impacts would total approximately 54 acres. Temporary impacts would total 121 to 134 acres, depending upon the number and location of conductor tensioning sites.

The project is not likely to adversely affect any federal or state-listed sensitive plant species, since none are likely to occur within the project area. Construction would temporarily disturb soils, creating opportunities for colonization by noxious weeds or other undesirable plants.

The proposed project would result in temporary impacts to 24 to 27 acres of native plants and approximately 4 acres of cryptogamic crusts. Permanent project impacts would require the removal of approximately 12 acres of native plant species, and 2 acres of

cryptogamic crusts. Loss of the cryptogamic crusts could result in an increase in soil erosion and decreased soil nutrient and water retention.

Of the transmission towers to be placed, approximately 144 would be placed in grazed shrub-steppe vegetative cover, 118 would be placed in agricultural cover, 75 would be in grasslands, 26 would be in scabland/lithosol communities, and 11 would be in shrub-dominated shrub-steppe cover. No towers would be placed in riparian communities.

The proposed expansion of the McNary Substation would result in the loss of approximately 2 acres of mixed native/nonnative grassland communities. The construction of a new 3-mile-long access road, and 270 (250-foot-long) spur roads would result in 95 acres of temporary impacts to vegetation communities on the proposed route.

Operation and Maintenance

Operations and maintenance of new access roads would result in the permanent alteration of 31 acres of existing vegetation communities in the proposed roadbeds. Impacts to local vegetative cover types during operation and maintenance of the access roads include continued disturbance and compaction of soils and the potential for spreading noxious weed species. An additional potential impact to local vegetation would be the risk of fire from vehicles driving along the access roads, particularly during dry periods.

Environmental Consequences—Short-Line Routing Alternatives

The potential impacts of the short-line routing alternatives are presented in Table S-2.

Mitigation

The following measures would help minimize potential impacts to vegetation along the proposed transmission line corridor.

- Locate the proposed transmission line adjacent to the existing corridor to minimize additional clearing.
- Utilize the existing access road system to the extent possible to reduce the need for new access roads.
- Keep vegetation clearing to the minimum required to maintain safety and operational standards.
- Avoid construction activities or permanent tower or access road siting in native shrub-dominated shrub-steppe communities if possible.
- Reseed areas temporarily disturbed in higher quality shrub-steppe with native grasses and forbs (if recommended by local county) and salvage topsoil and bunchgrass plant material. Reseeding should occur at the appropriate planting season. Reseed all disturbed areas with seeds recommended by the local county.

- Equip all vehicles with basic fire-fighting equipment including extinguishers, shovels, and other equipment deemed appropriate for fighting grass fires.
- Avoid tree removal to the extent possible.
- Limit construction equipment to tower sites, access roads, and conductor tensioning sites.
- Minimize disturbance to native species to the extent possible during construction to prevent invasion by nonnative species.
- Conduct a pre-construction and a post-construction noxious weed survey to determine if construction contributed to the spread of noxious weed populations.
- Enter into active noxious weed control programs with land owners/mangers or county weed control districts where activities may have caused or aggravated an infestation.
- Wash vehicles that have been in weed-infested areas (removing as much weed seed as possible) before entering areas of no known infestations.
- Use certified weed-free mulching.

Environmental Consequences—No Action Alternative

Under the No Action Alternative, vegetation in the project area would not be disturbed by the proposed transmission line construction. The existing transmission line corridor would remain at its present width, with no additional area that would likely become dominated by invasive species.

Wildlife

Affected Environment

Five habitats are present within or near the project corridor, including ruderal areas (made up of grazed shrub-steppe, agricultural lands, and grasslands), cliffs, shrub-dominated shrub-steppe, stream riparian zones, and tree stands.

The U.S. Fish and Wildlife Service has identified the bald eagle as the only listed wildlife species known to occur in the project vicinity. A winter foraging and roosting area is located approximately 2,300 feet south of the corridor on an island in the Columbia River near the town of Paterson. The U.S. Fish and Wildlife Service has also identified the spotted frog and the Mardon skipper butterfly as candidate wildlife species potentially occurring in the project vicinity. Habitat for 29 different Washington and/or Oregon state-listed species occurs within or near the corridor.

The Columbia River basin is a wintering and breeding area for waterfowl. Waterfowl rest during migration and forage in wetlands, agricultural fields, and other open water

bodies. Shallow wetlands are located near streams crossed by the project corridor. Waterfowl also feed in agricultural fields near Paterson. Open water habitat occurs within the project corridor at the major stream crossings and in the vicinity of the existing transmission lines at Rock Creek and the Columbia River crossings at McNary and John Day Dams.

Raptors (such as hawks, eagles, falcons, and owls) use grasslands, cliffs, and agricultural lands, habitats that are relatively common in the project vicinity. Such habitats are relatively common in the project vicinity.

Mule deer are known to occur in the Rock Creek watershed and in the Umatilla National Wildlife Refuge. The primary mule deer concentration area is more than 2 miles north of the crossing location at Rock Creek (PHS 2001).

Environmental Consequences—Proposed Action

Construction

During construction, wildlife may be impacted by noise and human presence that cause disturbance to foraging and breeding behavior. Additionally, construction would cause disturbance to and the modification of vegetation and soils that would result in loss of habitat. Temporary construction impacts would be associated with noise and human presence such as tower installation activities involving the use of heavy equipment, helicopters, and blasting, explosive couplers, and high levels of human activity around the construction site; construction of the substation addition and roads; clearing rights-of-way; and pulling conductors.

The project is not likely to adversely affect the bald eagle. The primary potential impact of construction activities would be to eagles foraging on the Columbia River in the area of construction. Few trees in the project corridor representing potential eagle perching habitat would be removed by the proposed project.

Construction of the proposed project could impact raptor nesting activities particularly near cliffs or rocky outcrops. Temporary disturbance would be caused by activities such as road and tower building construction near known burrowing owl burrows. Owls could be flushed from their nests, and road construction or tower erection in burrow areas could cause burrow abandonment and loss of recruitment for the year. An incremental amount of burrowing owl habitat could be lost from access roads and towers.

Noise and human disturbance from construction activity would be temporary and result in no permanent displacement of waterfowl from feeding or breeding areas.

Operation and Maintenance

Potential operation and maintenance impacts include bird collisions with power lines, and avoidance of areas by wildlife due to such activities as road or vegetation maintenance and repair of towers, helicopter flights for line surveys, and replacement of insulators.

Operations and maintenance activities are not likely to adversely affect nesting or wintering bald eagles.

Impacts during operation and maintenance would be limited to bird collisions with power lines and potential disturbance of roosting or foraging due to maintenance activities.

The proposed line would cross few areas of open water or wetlands and would run primarily through upland grazed shrub-steppe and croplands. One area of high seasonal bird use is the Umatilla National Wildlife Refuge. This area would represent the highest risk areas for avian collisions because of the high seasonal use and the species involved.

Because of the temporary nature of maintenance activities, the noise, and human disturbance, impacts from those activities would be minor and of short duration.

Environmental Consequences—Short-Line Routing Alternatives

The potential impacts of the short-line routing alternatives are presented in Table S-2.

Mitigation

The following mitigation measures would be employed to minimize potential impacts to wildlife along the proposed transmission corridor.

Threatened, Endangered or Other Sensitive Species

- Prior to construction, conduct raptor nest surveys (for existing and new nests) of cliffs located within 0.25 mile of the right-of-way (corridor miles 3, 54, 56, 57, 72, 73). See potential mitigation measures below for specific species.
- Between January 1 and July 30, avoid using helicopters within 0.25 mile of cliffs identified as priority habitat by the Washington Department of Fish and Wildlife (use ground-based equipment near cliffs.
- Avoid blasting cliffs identified as priority habitats by Washington Department of Fish and Wildlife and consult with the Washington Department of Fish and Wildlife or Oregon Department of Wildlife regarding measures to minimize nest disturbance on a site-by-site basis if nests are found.
- If bald eagle nests are found on the cliffs, restrict construction during nesting season (January 1 through July 15).

- **Mitigation for burrowing owls.** If possible, avoid disturbance within 160 feet of occupied burrows during the non-breeding season of September 1 through January 31 or within 250 feet during the breeding season of February 1 through August 31.
- **Mitigation for peregrine falcon.** If possible, avoid disturbance within 0.25 mile of any active nests during the breeding season (March through June).
- **Mitigation for prairie falcon.** If possible, avoid construction activities between February 15 and July 15 within 0.25 mile of active nests.
- **Mitigation for red-tail hawk.** If possible, avoid construction activities within 320 feet between February 15 and July 15
- **Mitigation for other raptors.** Consult with Oregon Department of Fish and Wildlife and Washington Department of Fish and Wildlife.

Avian Collisions

- If deemed appropriate, install line markers in avian flight paths or migration corridors, such as near crop irrigation circles in the vicinity of the town of Paterson (north of the Umatilla National Wildlife Refuge) if appropriate and for the Columbia River crossing.
- For the McNary Substation Alternatives, avoid placing towers and lines across wetlands to minimize risk of bird collision.

Shrub-Steppe Dependent Wildlife

- Minimize the amount of shrub-steppe plant communities removed by clearing only the amount of vegetation necessary to prepare tower footings or build roads.
- Minimize road construction in shrub-steppe areas with burrows. Burrows were found in the field near corridor miles 19, 21, 63, and 76.

Riparian Dependent Wildlife

- Span riparian corridors to minimize removal of shrubs or trees within riparian areas.

Environmental Consequences—No Action Alternative

Under the No Action Alternative, wildlife and wildlife habitats would not be altered. Agricultural lands would continue to be managed for crop production. The shrub-steppe lands to the east would continue to be used as grazing lands.

Cultural Resources

Affected Environment

The 73-mile portion of project corridor that lies within Washington State is within the Mid-Columbia Study Unit as defined by the Resource Protection Planning Process (RP3). Archival records indicate ten known archaeological sites along the corridor. Near the corridor, there are at least 70 additional archaeological sites recorded within a 1-mile radius of the proposed transmission line. Of these 70 sites, 26 (37%) are underwater behind the John Day Dam.

Historical data demonstrate continuous use of the Mid-Columbia Study Unit from the time of the first Euro-American exploration through the arrival of a trans-continental railroad, a state highway system, and construction of two federal dams.

A total of 12 cultural resource sites were identified during the field surveys. An additional 14 isolate finds were also documented. Of the 10 previously recorded sites situated within or adjacent to the corridor, eight were re-identified in the field.

Jones & Stokes, on behalf of Bonneville, contracted with the Confederated Tribes of the Umatilla Indian Reservation (Umatilla Tribes), Confederated Tribes of the Warm Springs Reservation Oregon (Warm Springs Tribes), and the Yakama Nation to provide the oral history of the project vicinity. Detailed oral accounts were prepared and are summarized in Chapter 3 of this EIS.

Environmental Consequences—Proposed Action

Construction

No impacts to cultural resources are anticipated during construction of the proposed project. Tower construction would be limited to a relatively small area adjacent to existing transmission line towers. Road construction and improvements are the most likely activities to disturb unknown cultural resources.

Of the 14 cultural resource sites found along the corridor, 12 require avoidance and two sites should have cultural resource monitors during construction excavation. Of the 10 previously documented cultural resource sites along the corridor, nine require avoidance and one site requires a cultural resource monitor during construction excavation.

Operation and Maintenance

No impacts to cultural resources are anticipated during the continuing operation and maintenance of the proposed McNary-John Day Transmission Line.

Environmental Consequences—Short-Line Routing Alternatives

The potential impacts of the short-line routing alternatives are presented in Table S-2.

Mitigation

The following mitigation measures would minimize impacts to significant cultural resources.

- Locate structures, new roads, and staging areas so as to avoid known cultural resource sites.
- If archaeological or historic materials are discovered during construction, further surface-disturbing activities at the site would cease and Bonneville, state historic preservation offices, and tribal personnel would be notified to ensure proper handling of the discovery.
- Utilize existing access road system to the extent possible to reduce the need for new access roads.
- Limit construction equipment to tower sites, access roads and conductor tensioning sites.
- Limit the number of contractors to cultural resource site sensitive information on a need-to-know basis.
- The Umatilla Tribes CRPP identified ten TCP areas. Based on file and literature searches and oral history interviews with tribal elders, the CRPP recommends that a tribal monitor be present during all ground disturbing activities throughout the construction process. The CRPP further requests that the Tribe be consulted with through the entire construction process, including the planning phase and until the completion of the transmission line project. Furthermore, the CRPP recommends that Jones & Stokes and Bonneville meet with the Cultural Resources Commission and the Board of Trustees to set up consultation protocols on site mitigation and management because the law requires consultation.
- The Umatilla Tribes would like Bonneville to ensure that the cultural and natural resources are protected. The Umatilla Tribes would like Bonneville to guarantee that traditional use of this area, in accordance with treaty reserved rights, be able to be utilized.

Environmental Consequences—No Action Alternative

Under the No Action Alternative, cultural resources in the project area would not be disturbed by the proposed transmission line construction. The existing transmission line corridor would remain at its present width, with no additional disturbance to known or

previously undocumented cultural resources. Continued impacts associated with operation and maintenance of the two existing lines would remain.

Visual Resources

Affected Environment

The affected environment and visual impacts of the proposed project was evaluated by assessing the visual quality of the project corridor, viewer sensitivity, and the visibility of the towers and transmission line as seen from sensitive viewpoints.

The visual quality of the project corridor is predominantly rural, with a few low-density settlement areas, including Umatilla City, Plymouth, Paterson, Roosevelt, and Rufus. In addition, there are single houses, small groupings of houses, and small farm complexes scattered along the corridor outside of these settlements.

Sensitive viewpoints include residences in Umatilla City and Rufus, Oregon (at the east and west ends of the corridor, respectively) and in Plymouth, Paterson, and Roosevelt, Washington. There are also small groupings of houses and small farm complexes scattered along the corridor outside of these settlements.

Other sensitive viewpoints include segments of SR 14 where the project corridor is in close proximity to the highway and from various recreational sites in relatively close proximity to the project corridor.

Environmental Consequences—Proposed Action

Potential visual impacts include temporary visual changes during construction and the overall permanent visual changes caused by the presence of the towers and the transmission lines.

Construction, Operations and Maintenance

Impacts during construction and operations and maintenance would be relatively the same, except during construction when equipment would also be part of the viewscape. Construction sites would be visible from a distance in Benton County, Washington from I-82 through corridor mile 13. As the line moves further away from SR 14 and as the topography changes to hills and canyons, views would be intermittent and sites would not likely be seen from a distance due to the topography. Installation of the towers by sky-crane helicopters would likely be visible from a distance regardless of the location in the corridor.

The proposed towers and transmission lines, which would be located in an existing Bonneville transmission line corridor and would be spaced to match the existing spans and towers in the corridor where possible, would be visible for some distance.

Residences in Umatilla City would probably not notice the McNary Substation expansion or the new line leaving the substation because their views would be partially obstructed by the existing substation and several transmission lines that originate at or leave the substation.

The flat terrain in Plymouth would provide residents relatively unobstructed views of the proposed transmission line, especially for residences located close to the existing transmission line corridor (closest resident is about 500 feet).

In Paterson at corridor mile 16, orchards, farm buildings, and other transmission lines could partially obstruct some residents' views of the new transmission line, depending on their location. In North Roosevelt and West Roosevelt, the hilly terrain would partially obstruct some residents' views, again depending on location. In West Roosevelt, the hills would provide a backdrop for the towers, causing them to blend into the landscape. In these communities, the new line would add more humanmade elements to the landscape.

Scattered residences located along the corridor would see the new line.

Environmental Consequences—Short-Line Routing Alternatives

The potential impacts of the short-line routing alternatives are presented in Table S-2.

Mitigation

The mitigation measures that would help minimize visual impacts are as follows.

- Site all construction staging and storage areas away from locations that would be clearly visible from SR 14 as much as practical.
- Provide a clean-looking facility following construction by cleaning-up after construction activities.
- Keep the areas around the towers clean and free of debris.
- Provide regular maintenance of the access roads and fences within and leading to the corridor.

Environmental Consequences—No Action Alternative

Under the No Action Alternative, the visual quality and sensitivity of the viewers along the existing Bonneville corridor would not be influenced by the proposed project. Viewers would continue to see the existing transmission lines and towers in the existing Bonneville transmission line corridor.

Socioeconomics, Public Services, and Utilities

Affected Environment

The area of potential effect for this section covers six counties, four of which are where the proposed project would be located. The other two counties, Franklin County in Washington and Wasco County in Oregon, are less likely to be affected, but were also included in the population, employment, and housing analyses. In 2000, the six-county study area had a population of 307,256 people. Benton County, Washington, was the most populated with 142,475 people and Sherman County, Oregon, was the least populated with 1,934 people.

In 2000, Oregon's three-county study area employment was 42,135 people, of that the average annual agricultural employment was 4,350. In 1999, Washington's three-county study area total employment (including agriculture) was 87,627.

Environmental Consequences—Proposed Action

Construction

The project would be constructed by one or more construction crews. A typical transmission line construction crew for the 500-kV line would likely consist of up to 60 construction workers.

The typical crew would likely construct about 10 miles of line in 3 months. To meet the proposed construction schedule for this project (1 year), two or more crews would work simultaneously on separate sections of the 79-mile-long transmission line. During the 1-year construction period, approximately 180 workers would be required to complete the project, assuming three crews are mobilized at the start of the construction period. Of these crews, one would likely be stationed out of the Umatilla and Hermiston area (Umatilla County) and the other two would likely be stationed either in Goldendale (Klickitat County) or in the Biggs, Wasco, or Rufus area (Sherman County). Franklin and Wasco counties—which have relatively large metropolitan areas including Pasco (Tri-Cities Area) and The Dalles—could also provide workers and attract workers to stay there during construction.

A potential temporary increase in spending on goods and services in the study area would also occur. The potential influx of workers from outside the project area would create a temporary increase in population.

No adverse impacts to housing in the project area are expected, and the influx of workers would create modest economic benefits to the area. Schools are not expected to be impacted.

The impact of introducing a new right-of-way easement for transmission towers and lines along the corridor would vary depending on the placement of the right-of-way in relation

to the property's size, shape, and location of existing improvements. The transmission line could diminish the utility of a portion of the property if the line effectively severed this area from the remaining property.

If the new transmission line crossed a portion of a property in agricultural use such as pasture or cropland, little utility would be lost between the towers, but 100% of the utility would be lost within the base of the tower. Towers may also present an obstacle for operating farm equipment and controlling weeds at tower locations. To the extent possible, the new transmission lines and towers would be designed to minimize the impact to existing and proposed (if known) irrigation systems.

Minority and low-income populations would not be disproportionately affected by the proposed project because the project would occur entirely within or adjacent to an existing Bonneville transmission line corridor. The population that would be crossed by the line are a mix of income levels and there are no minority groupings.

Operation and Maintenance

During operation of the project, no impacts are expected to housing, schools, or water and sanitary sewer systems, and only minor adverse impacts could occur to emergency services, due mainly to the risk of fire. Positive benefits include increased service capacity for the Bonneville transmission grid.

The proposed transmission line is not expected to have long-term impacts on property values in the area. The proposed action would have no direct beneficial effect on the local taxing districts because Bonneville, as a federal agency, is exempt from local taxes. Conversely, the proposed action could have a minor but negative impact on local taxing authorities if any properties are devalued as a result of limits the proposed easement might impose on the highest and best use of a parcel.

Environmental Consequences—Short-Line Routing Alternatives

The potential impacts of the short-line routing alternatives are presented in Table S-2.

Mitigation

See the Land Use and Recreation section for mitigation measures for agricultural uses. No additional mitigation measures are needed.

Environmental Consequences—No Action Alternative

Under the No Action Alternative, there would not be opportunity to hire people from the area to work on the project, nor would there be an increase in goods and services and lodging revenues from workers staying in the area during construction.

Transportation

Affected Environment

Structural parts for the transmission line would likely travel by truck to the project via I-5. I-5 provides access across the Columbia River and connects with SR 14 in Vancouver, Washington, and with I-84/US 30 in Portland, Oregon. East-west access on the south (Oregon) side of the Columbia for the project is provided by I-84/US 30. The Bonneville right-of-way and SR 14 follow the north (Washington) side of the Columbia River for more than 80% of the project length. If parts are trucked from the east, they would likely be transported via I-90, connecting to I-82/SR 97 near Ellensburg, and connecting to the project site via SR 97 near Goldendale or I-82/SR 12 on east past the Tri Cities via I-82/US 295 into Hermiston.

Bonneville could choose to utilize the Burlington Northern Santa Fe Railway that follows SR 14 and the project corridor to transport materials.

The Columbia River could also be utilized to transport equipment and components via barge. Ports in the project vicinity are located at Umatilla, Morrow, and Arlington.

The Port of Morrow and Port of Umatilla would be able to assist in the import or export of materials for Bonneville; the Port of Arlington is a grain barging facility.

There are seven airports and landing strips of various sizes in the project vicinity.

Environmental Consequences—Proposed Action

Construction

Transportation impacts during the 12-month construction period are anticipated to be minimal. During project construction, heavy and light vehicles would access the corridor, and equipment and components would be transported to the project site via trucks, along the routes previously described in the Affected Environment section above.

There are numerous transportation options for getting equipment to the project sites. Highway SR 14, in combination with local roads and the access road system, provide adequate pathways for getting materials and workers to the project with minor impacts to existing traffic flows.

There may be short interruptions of SR 14 traffic when trucks cross the road or there is blasting (to protect cars from flying debris). If the railroad needs to be crossed, the contractors would appropriately time the crossing to avoid interrupting train service.

Operation and Maintenance

Transportation impacts during operation and maintenance of the transmission line would be negligible. Operation and maintenance traffic would normally consist of personnel vehicles and project pickup trucks. On infrequent occasions, larger equipment, such as flatbed trucks or a crane, may be required to replace or repair the transmission line and towers.

Environmental Consequences—Short-Line Routing Alternatives

The potential impacts of the short-line routing alternatives are presented in Table S-2.

Mitigation

The following mitigation measures would help minimize transportation impacts.

- Coordinate routing and scheduling of construction traffic with state and county road staff and Burlington Northern Santa Fe Railway.
- Employ traffic control flaggers and post signs warning of construction activity and merging traffic, when necessary for short interruptions of traffic.
- Repair any damage to local farm roads caused by the project.
- Install gates on access roads when requested by property owners to reduce unauthorized use.

Environmental Consequences—No Action Alternative

No impacts on existing transportation facilities would occur if the proposed project is not constructed.

Air Quality

Affected Environment

There are no major industrial facilities along the corridor and no significant existing air quality problems. Local air pollutant emissions are limited mainly to windblown dust from agricultural operations and tailpipe emissions from traffic along state highways and local roads.

The nearest air quality monitoring stations are in Washington at Wallula, Kennewick, and Goldendale. The project area has been designated by the Washington State Department of Ecology (Central Region and Eastern Region), the Benton Clean Air Authority, and the Oregon Department of Environmental Quality, as having attainment status.

Environmental Consequences—Proposed Action

Construction

Air quality impacts associated with the construction of the proposed transmission line and associated facilities would be minimal. The primary type of air pollution during construction would be combustion pollutants from equipment exhaust and fugitive dust particles from disturbed soils becoming airborne.

The amount of pollutants emitted from construction vehicles would be relatively small and similar to current conditions with the operation of agricultural equipment in the project site and vicinity. Such short-term emissions from construction sites are exempt from air quality permitting requirements.

Operation and Maintenance

Air quality impacts during operation and maintenance of the project would be negligible. Operation and maintenance vehicles would mainly use access roads with native surfaces, causing dust particles to be stirred up. Quantities of potential emissions would be very small, temporary, and localized.

Environmental Consequences—Short-Line Routing Alternatives

The potential impacts of the short-line routing alternatives are presented in Table S-2.

Mitigation

The following mitigation measures would help to control dust and reduce emissions.

- Water exposed soil surfaces if necessary to control blowing dust.
- Cover construction materials if they are a source of blowing dust.
- Limit vehicle speeds along dirt roads to 25 miles per hour.
- Shut down idling construction equipment, if feasible.

Environmental Consequences—No Action Alternative

Under the No Action Alternative, potential impacts to air quality associated with the proposed project would not occur.

Noise

Affected Environment

Most of the proposed corridor is near highways or freeways, so existing noise levels are mainly characterized by traffic noise. Background noise in the more remote areas of the corridor far from highways would mainly consist of corona noise from existing transmission lines.

Sources of noise associated with electrical transmission systems include construction and maintenance equipment, transmission line corona, and electrical transformer hum. Corona is the partial electrical breakdown of the insulating properties of air around the transmission line wires. Corona-generated noise can be characterized as a hissing, crackling sound that is accompanied by a 120 Hertz (Hz) hum under certain conditions.

Noise from transmission lines generally occurs during wet weather. Conductors can be wet during periods of rain, fog, snow, or icing. Such conditions are expected to occur infrequently in the project area.

Environmental Consequences—Proposed Action

Construction

Sources of noise associated with construction of the proposed project include construction of access roads and foundations at each tower site, erection of steel towers at each tower site, helicopter assistance during tower erection and stringing of conductors, potential blasting, and potential use of implosive couplers for conductor splicing.

The Washington state limit for noise levels at residential areas caused by permanent daytime industrial operations is 65 dBA. Construction noise levels would exceed these limits, but construction noise is exempt from state limits.

An estimated 19 homes in the cities of Plymouth, Paterson, and North and West Roosevelt in Washington, and the cities of Umatilla and Rufus in Oregon; and single residences, small groupings of houses, or small farm complexes located along the line would be within approximately 600 feet of construction activity and may experience noise levels at or above 65 dBA. If helicopters are used to install the towers a wider range of residences could be affected.

Operation and Maintenance

Noise impacts during operation and maintenance of the proposed project would be negligible. Every 2 months a helicopter would fly the line to look for any problems or repair needs. When and if these needs arise, field vehicles would be used to access the trouble spots.

If the proposed transmission line is found to be the source of radio or television interference in areas with reasonably good reception, measures would be taken to restore the reception to a quality as good or better than before the interference.

Environmental Consequences—Short-Line Routing Alternatives

The potential impacts of the short-line routing alternatives are presented in Table S-2.

Mitigation

To reduce the potential for temporary, adverse noise impacts during construction, the following measures would be incorporated into contract specifications.

- All equipment will have sound-control devices no less effective than those provided on the original equipment.
- All equipment will have muffled exhaust.
- No noise-generating construction activity will be conducted within 1,000 feet of a residential structure between the hours of 10:00 p.m. and 7:00 a.m.
- Landowners directly impacted along the corridor will be notified prior to construction activities.
- Bonneville will take measures to restore reception to a quality of reception as good or better than before the radio or television interference.

Environmental Consequences—No Action Alternative

Under the No Action Alternative, existing background noise levels in the project vicinity would continue without influence of the proposed project.

Public Health and Safety

Affected Environment

Potential hazards along the corridor include fire (both natural and human-caused), existing overhead transmission line crossings, and natural gas pipeline crossings.

Environmental Consequences—Proposed Action

Construction

During construction and installation of the towers and conductor/ground wires, there is a risk of fire and injury associated with the use of heavy equipment, hazardous materials such as fuels, cranes, helicopters, potential bedrock blasting for towers or access roads,

and other risks associated with working near high-voltage lines. There is also a potential for fire during refueling of hot equipment such as trackhoes and bulldozers that cannot be taken off-site for refueling. Connection of conductors may be accomplished using implosion bolts, which could be a source of injury to construction personnel. In addition, there are potential safety issues with more traffic on the highways and roads in the project area during construction.

Operation and Maintenance

With the addition of the proposed transmission line, there will be slight additional risks for fire and injuries as maintenance workers and vehicles travel along the corridor to perform required maintenance.

An increase in public exposure to magnetic fields could occur if field levels increase and if residences or other structures draw people to these areas. The predicted field levels are only indicators of how the proposed project may affect the magnetic-field environment. They are not measures of risk or impacts on health. The 79-mile-long corridor in which the proposed line would be built is sparsely populated. There are about 40 structures within 400 feet of either side of the right-of-way edge.

Environmental Consequences—Short-Line Routing Alternatives

The potential impacts of the short-line routing alternatives are presented in Table S-2.

Mitigation

The following mitigation measures would help minimize potential health and safety risks during construction.

- Prior to starting construction, the contractor would prepare and maintain a safety plan in compliance with Washington and Oregon requirements. This plan would be kept on-site and would detail how to manage hazardous materials such as fuel, and how to respond to emergency situations.
- During construction, the contractors would also hold crew safety meetings at the start of each workday to go over potential safety issues and concerns.
- At the end of each workday, the contractor and subcontractors will secure the site to protect equipment and the general public.
- As necessary, employees would be trained in tower climbing, cardiopulmonary resuscitation, first aid, rescue techniques, and safety equipment inspection.
- To minimize the risk of fire, all highway-authorized vehicles would be fueled off-site. Fueling of construction equipment that was transported to the site via truck and is not highway authorized would be done in accordance with regulated construction

practices and state and local laws. Helicopters would be fueled and housed at local airfields.

- Helicopter pilots and the contractor would work with communities along the corridor to ensure public safety. For example, flight paths could be established for transport of project components in order to avoid flying over populated areas or near schools (Helicopter Association 1993). Contractors would also work with local crop dusters and agricultural businesses to minimize interruption in agricultural activity during construction (for instance, to schedule work or tower placement so it does not conflict with crop dusting and harvesting).
- If blasting is required, a notice would be sent to residents in the affected area. A public meeting would be held prior to blasting to inform residents and other interested parties of the date and time of the blasting and to answer questions. During blasting, appropriate safety measures would be taken as required by state and local codes and regulations. All explosives would be removed from the work site at the end of the work day.
- If implosion bolts are used to connect the conductors, they would be installed in such a way as to minimize potential health and safety risks.
- Construction and operation/maintenance workers would need to be trained in what to do in the event of a chemical release from the Umatilla Army Depot.
- Operation and maintenance vehicles would be required to carry fire suppression equipment including (but not limited to) shovels and fire extinguishers.
- Drivers would be required to stay on established access roads and smoking would be prohibited.
- The corridor would be maintained to control tall grass that could potentially start fires via contact with hot vehicle parts. Trees and other tall vegetation would be trimmed to Bonneville standards to avoid contact with transmission lines.
- The towers are not expected to exceed 200 feet in height. However, Federal Aviation Administration laws would be followed regarding the placement of line markers to warn approaching aircraft. Bonneville would submit final locations and tower heights to the Federal Aviation Administration for review and requirements for markings and lighting would be addressed at that time.
- Because of the proximately of the proposed transmission line to agricultural fields, crop dusting pilots planning to enter the area would take suitable precautions to avoid collision with the proposed transmission lines.

Environmental Consequences—No Action Alternative

Under the No Action Alternative, the proposed transmission line would not be built and the potential increased health and safety risks associated with the proposed transmission line project would not occur.

Table S-2: Summary of Impacts of Short-Line Alternatives, McNary-John Day Transmission Project

McNary Substation Alternatives			Hanford-John Day Junction Alternatives			Corridor Mile 32 Alternatives		Corridor Mile 35 Alternatives	
Alternative A	**Alternative B**	**Alternative C**	**Alternative A**	**Alternative B**	**Alternative C**	**Alternative A**	**Alternative B**	**Alternative A**	**Alternative B**
Wildlife viewing temporarily obstructed; no impact to soils; some sedimentation to Columbia River and pond habitat; about 0.1 acre of trees in wetland; about 2 acres grassland removed for building relocation; about 2 acres marginal grassland habitat removed; no cultural resource impacts with mitigation; recreationists and travelers would have views of construction; no impact to socioeconomics; negligible transportation impacts during construction; minimal air quality impacts during construction/operation; construction noise; no specific health and safety impacts	Wildlife viewing temporarily obstructed; no impact to soils; some sedimentation to Columbia River and pond habitat, though less ground disturbance than Alternative A, but closer to river; about 0.2 acre of willows in wetland removed; cottonwood trees and vegetation removed; bird nesting and ground dwelling animal habitat removed, increased risk of avian collisions; no cultural resource impacts with mitigation; recreationists and travelers would views of construction; no impact to socioeconomics; negligible transportation impacts during construction; minimal air quality impacts during construction/operation; construction noise; no specific health and safety impacts	No recreation impacts anticipated; no impact to soils; slight increased (than Alternative A or Alternative B) sedimentation to Columbia River and pond habitat though ground disturbance and permanent surface of bus work; minor sediments to wetland; about 0.7 acre of grassland removed for bus work; negligible wildlife impacts; no cultural resource impacts with mitigation; recreationists, travelers, and residence would have views of bus work; no impact to socioeconomics; negligible transportation impacts during construction; minimal air quality impacts during construction/operation; construction noise; no specific health and safety impacts	About 1.5 acres of grazing land disturbed; no impact to soils; no impact to fish/water; invasive *Ailanthus* sp. trees in wetland may be removed; sedimentation to small wetland; about 1.6 acres of vegetation impacted; negligible wildlife impacts; no cultural resource impacts with mitigation; views of line from highway and residence (less than Alternative B or C); no impact to socioeconomics; negligible transportation impacts during construction; minimal air quality impacts during construction/operation; construction noise; no specific health and safety impacts	About 1.5 acres of grazing land disturbed, residence may need to be removed; no impact to soils; no impact to fish/water; trees in wetland may be removed, sedimentation to small wetland; about 1acre of vegetation impacted, 10 invasive *Ailanthus* sp. trees removed; loss of trees reduce bird nesting habitat; no cultural resource impacts with mitigation; views of line from highway and residence (more than Alternative A); no impact to socioeconomics; negligible transportation impacts during construction; minimal air quality impacts during construction/operation; construction noise and corona noise; no specific health and safety impacts	About 1.5 acres of grazing land disturbed, residence may need to be removed; no impact to soils; no impact to fish/water; invasive ailanthus sp. trees in wetland may be removed; sedimentation and potential fill in small wetland; about 1acre of vegetation impacted, 10 invasive ailanthus sp. trees removed; loss of trees reduce bird nesting habitat; no cultural resource impacts with mitigation; views of line from highway and residence (more than Alternative A); no impact to socioeconomics; negligible transportation impacts during construction; minimal air quality impacts during construction/operation; construction noise and corona noise; no specific health and safety impacts	About 0.8 acre of cropland removed from production; no impact to soils; no impact to fish/water; no wetland impacts; about .4 acres grazed shrub-steppe impacted; minor impacts to grazed shrub-steppe designated Priority Habitat by WDFW; no cultural resource impacts with mitigation; travelers on highway and agricultural workers would view line (less than Alternative B); agreement between tribes and Bonneville needed to cross tribal; negligible transportation impacts during construction; minimal air quality impacts during construction/operation; construction noise; no specific health and safety impacts	About 0.6 acre of cropland; no impact to soils; no impact to fish/water; no wetland impacts; about 5.5 acres grazed shrub-steppe impacted; about 1 acre of marginal agricultural habitat removed; no cultural resource impacts with mitigation; travelers on highway and agricultural workers would view line (more than Alternative A); no impact to socioeconomics; negligible transportation impacts during construction; minimal air quality impacts during construction/operation; construction noise; no specific health and safety impacts	About 0.8 acre of cropland removed from production; no impact to soils; slight sedimentation to Columbia River (less than Alternative B); no wetland impacts; no vegetation impacts; minor impact to heavily grazed shrub-steppe habitat; no cultural resource impacts with mitigation; travelers on highway and agricultural workers would view line (less than Alternative B); agreement between tribes and Bonneville needed to cross tribal; negligible transportation impacts during construction; minimal air quality impacts during construction/operation; construction noise; no specific health and safety impacts	About 0.6 acre of cropland; no impact to soils; slight sedimentation to Columbia River (more than Alternative A); no wetland impacts; about 5.5 acres grazed shrub-steppe impacted; minor impact to heavily grazed shrub-steppe habitat (more than Alternative A); no cultural resource impacts with mitigation; travelers on highway and agricultural workers would view line (more than Alternative A); no impact to socioeconomics; negligible transportation impacts during construction; minimal air quality impacts during construction/operation; construction noise; no specific health and safety impacts