Mitigation Measures Adopted for the McNary-John Day Transmission Line Project

Land Use and Recreation

- 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.
- Repair damages to access roads caused by or arising out of Bonneville use, leaving roads in good or better condition than prior to construction.

Geology, Soils, and Seismicity

- 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.
- In areas of potential wind erosion, apply gravel to access road surfaces.
- In area of landslide (corridor miles 39 and 41) do not construct any new roads within 100 feet of slide area; reshape existing access road with out-slope to provide drainage; and site tower east of area, if possible.
- 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 (prepare a Stormwater Pollution Prevention Plan).
- Regularly inspect and maintain project facilities, including the access roads, to ensure erosion levels remain the same or less than current conditions.
- Consider helicopter construction in areas of steep slopes to lessen the size of access roads and temporary tower site impacts (laydown areas of materials).

Streams, Rivers, and Fish

- 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, where possible. Where culverts are required, design and install to accommodate flows associated with a 100-year flood event.
- Where access roads cross a dry wash, the road gradient should be 0% to avoid diverting surface waters from the channel.
- 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.

Streams, Rivers, and Fish, continued

- Use erosion control methods during construction (see mitigation measures for Geology, Soils, and Seismicity), 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 within 200 feet of fish-bearing or potentially fish-bearing streams during periods when salmonid eggs or alevins are present in gravels.
- 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.
- Site staging areas away from streambeds.

For Columbia River water work:

- Site staging area 150 feet or more from water body.
- If working within 150 feet of water body, check vehicles daily for leaks and diaper stationary power equipment.
- Construct during recommended Corps in-water work windows for the Columbia River (December 1 thru March 31).
- Isolate in-water work area and capture and release fish from the work area under the supervision of a competent fisheries biologist experienced to capture ESA-list fish.
- Use appropriate fish screens on all intakes and pumps.

Vegetation

- 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.

Vegetation, continued

- Limit construction equipment to tower sites, access roads, and conductor tensioning sites.
- Avoid construction or construction activities at location of desert evening-primrose (Oenothera caespitosa ssp. marginata) near tower 47/1.
- Minimize disturbance to native shrub-dominated shrub-steppe communities and cryptogamic crusts, where possible, during construction. Where not possible, consider compensatory habitat through either restoration or acquisition and preservation of shrub-steppe communities.
- 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.

Wildlife

- 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 Habitat 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.
- Install line markers in avian flight paths or migration corridors, near crop circles in the vicinity of the town of Paterson (north of the Umatilla National Wildlife Refuge) and at the Columbia River crossings and the Rock Creek crossing.
- For the McNary Substation Alternatives, avoid placing towers and lines across wetlands to minimize risk of bird collision.
- Minimize the amount of shrub-steppe plant communities removed by clearing only the amount of vegetation necessary to prepare tower footings or build roads.

Wildlife, continued

- Minimize road construction in shrub-steppe areas with burrows (near corridor miles 19, 21, 63, and 76).
- Span riparian corridors to minimize removal of shrubs or trees within riparian areas.

Wetlands and Groundwater

- Locate structures, new roads, and staging areas so as to avoid waters of the U.S., including wetlands. Where avoidance is not possible, provide compensation for wetland impacts in accordance with Corps Section 404 permitting requirements.
- Avoid construction within designated Klickitat and Benton Counties, Washington 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 Soils, Geology, 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.
- Avoid refueling and/or mixing hazardous materials where accidental spills could enter surface or groundwater.
- Use 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.

Cultural Resources

- Locate structures, new roads, and staging areas so as to avoid known cultural resource sites.
- 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.
- On maps and in specifications provided to construction contractors, indicate cultural sites as generic avoidance areas to maintain site confidentiality.
- Have a monitor on site for construction activities in and around sites eligible for listing in the National Register of Historic Places.

Cultural Resources, continued

- Determine sites to be monitored based on Bonneville practices for avoiding adverse effects to historic properties, tribal concerns and the Oregon and Washington SHPO concurrence.
- Continue consultation with the Umatilla Tribes, Warm Spring Tribes, and the Yakama Nation to set up consultation protocols on site mitigation and management.
- Continue consultation with the Umatilla Tribes, the Warm Springs Tribes, and the Yakama Nation to ensure that the cultural and natural resources are protected.
- Conduct offsets and buffers around previously recorded and newly identified archaeological sites based on Bonneville practices for avoiding adverse effects to historic properties, tribal concerns and the Oregon and Washington SHPO concurrence.
- Stop all construction activities in the immediate area should any previously unknown artifacts be identified during construction until the resource can be evaluated by an archaeologist meeting the Secretary of the Interior's Qualifications Standards for Archaeology (48 FR 44738-39). Prehistoric site indicators include, but are not limited to, chipped stone, obsidian tools and tool manufacture debitage (waste flakes), grinding implements such as mortars and pestles, and darkened soil that contains organic remains of food production such as animal bone and shellfish remains. Historic site indicators include, but are not limited to, ceramic, glass, wood, bone, and metal remains.
- If previously unknown artifacts are identified during construction, immediately contact representatives of the affected tribes.
- For previously unknown artifacts, identify type and significance of discovered resource for determining if avoidance is necessary, depending on the type and significance of any discovered resource, procedures may include testing the site with shovel test probes to determine site boundaries and any possible subsurface components. If results of the shovel test probes determine the presence of an extensive subsurface component, move structure location to a suitable location that avoids the site. Alternatively, develop and implement a full data recovery program for the site or other mitigation in consultation with the affected tribes and the Oregon and Washington State historic preservation officers.
- Stop construction in the area immediately should human remains and/or burials be encountered. Secure the area, placing it off limits for anyone but authorized personnel and immediately notify proper law enforcement, Bonneville archeologist and appropriate tribes. .

Visual Resources

- 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.

Transportation

- 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.

Air Quality

- 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.

Noise

- All equipment to have sound-control devices no less effective than those provided on the original equipment.
- No equipment to have an unmuffled exhaust.
- Limit construction activities to daytime hours.
- Do not conduct noise-generating construction activity within 1,000 feet of a residential structure between the hours of 10:00 p.m. and 7:00 a.m.
- Notify landowners directly impacted along the corridor prior to construction activities.
- Restore TV or radio reception to a quality of reception as good or better than before line construction.

Public Health and Safety

- Prior to construction, contractor will prepare and maintain a safety plan in compliance with Washington and Oregon requirements. Keep plan on-site; include details on how to manage hazardous materials such as fuel, and how to respond to emergency situations.
- During construction, hold contractor crew safety meetings at the start of each workday to go over potential safety issues and concerns.
- Secure the site to protect equipment and the general public at the end of each workday.
- Ensure that employees are trained, as necessary, in tower climbing, cardiopulmonary resuscitation, first aid, rescue techniques, and safety equipment inspection.
- To minimize the risk of fire, fuel all highway-authorized vehicles off-site. Fuel of construction equipment, that is not highway authorized, in accordance with regulated construction practices and state and local laws. Fuel and house helicopters at local airfields or at staging areas.
- Consider public safety during helicopter flights (for example, flight paths could be established for transport of project components in order to avoid flying over populated areas or near schools; coordination could take place with local crop dusters and agricultural businesses to minimize interruption in agricultural activity during construction).
- Provide notice to public of construction activities, including blasting.
- Take appropriate safety measures for blasting consistent with state and local codes and regulations. Remove all explosives from the work site at the end of the workday.
- If implosion bolts are used to connect the conductors, install in such a way as to minimize potential health and safety risks.
- Inform construction and operation/maintenance workers that there is a Umatilla Army Depot emergency preparedness program in the event of a chemical release.

Public Health and Safety, continued

- Carry fire suppression equipment including (but not limited to) shovels and fire extinguishers, in vehicles.
- Adhere to local fire district regulations for fire-prevention measures.
- Stay on established access roads during routine operation and maintenance activities.
- Keep vegetation cleared according to Bonneville standards to avoid contact with transmission lines.
- Submit final tower locations and heights to the Federal Aviation Administration for review and potential marking and lighting requirements.
- Construct and operate the new transmission line to meet the National Electrical Safety Code.
- During construction, follow Bonneville specifications for grounding fences and other objects on and near the proposed right-of-way.
- Should contaminated media be unexpectedly encountered during construction, work will stop and an environmental specialist called to characterize the nature and extent of contamination and determine appropriate State-approved measures to prevent spread and protect health and safety.