Appendix add appropriate reference

Utility Operations and Maintenance Activities

**Instructions: This appendix is meant to be a detailed description of the following:**

* **O&M activity classes**
* **O&M activity descriptions**
* **Electric facility patrol and inspection**
* **Pole and tower equipment repairs and maintenance**
* **Communication equipment repairs and replacement**
* **Facility replacements, installations, and removals**
* **Roads and road maintenance**
* **Substation maintenance**
* **Vegetation management**

**Please review the sample text to guide in development of an Activities Plan specific to your Utilities infrastructure and maintenance needs.**

# Overview

Electric utility facilities are designed, constructed, operated, and maintained in accordance with strict utility industry and regulatory specifications. Utility Name (herein referred to as the *Utility*) is required to comply with regulations and standards for operating and maintaining facilities and facility rights-of-way (ROWs). These requirements are summarized in the *Operations and Maintenance Plan for Electric Facilities on Bureau of Land Management Lands within BLM office/State* (Plan) (see Chapter add reference*, Overview*, in the O&M Plan). The electric facility-related operations and maintenance (O&M) activities described in this appendix are critical to ensuring that these standards are met.

In general, Utility O&M activities (O&M activities) occur on a regularly scheduled basis in accordance with operational or regulatory guidelines. O&M activities consist of patrols and physical inspections; maintenance, repair, or replacement of facilities and associated equipment; maintenance or repair of roads with an authorized ROW grant; and facility-related vegetation maintenance. The methods, processes, and procedures identified in this appendix are based on the current maintenance standards and required activities and are meant to represent the type of work that will be carried out in accordance with the O&M Plan; they are not considered to be a processes, procedures, and technologies. The Utility’s adherence to current standards is key to ensuring complete or exhaustive list. Over time, the legal and regulatory standards may evolve, prompting new applications or the use of new methods, electric facility safety and reliability. If O&M activities not included in this appendix are needed, the Utility would provide details of the work to the Bureau of Land Management (BLM) for review and approval prior to work commencement. New O&M activities are considered modifications to the Plan and would be reviewed by both the BLM and the Utility before they are included in the Plan. All new O&M activity additions would be included as modifications to the Plan.

Utility emergency response activities are not detailed in this appendix but can consist of many of the same O&M activities described below.

# Classification of Activities

The Utility organizes O&M activities included under the Plan into three activity classes (Class I, Class II, and Class III) that reflect the environmental review, notification, and approval processes to be carried out.

## Utility O&M Activity Descriptions

The specific activities conducted by the Utility and the general classification of activities are described below. Classes in parentheses, adjacent to activity types, indicate the lowest classification of work associated with activities. Work can shift between classes based on several factors, including but not limited to, site access, ground disturbance, and the presence of resources. These activities by also listed below in Table 1.

Review O&M activities below and coordinate with BLM to identify the appropriate classification

**Table 1. Utility O&M Activities by Classa**

**Activity Description**

**Section Activity**

**Initial Activity Classification**

**I II III**

 **Electric Facility Patrol and Inspection**

Patrols and Inspections Aerial X

Patrols and Inspections Ground X

Pole and Tower Test and Treat X

 **Electric Pole and Tower Equipment Repairs and Maintenance**

Anchor/Guy Wire Replacement X

Electric Equipment Maintenance Overhead X

Electric Equipment Maintenance Insulator Washing X

Pole Reinforcement and Protection X

Tower Maintenance Cathodic Protection X

Tower Maintenance - Grounding / Arc Fault Protection X

Tower Repairs Minor X

Sand Removal Excess Accumulation Removal X

Staging Area Outside ROW X

 **Internal Communications Equipment Repairs and Replacement**

Communications Equipment Maintenance Overhead X

Communications Equipment Maintenance Ground X

* + 1. Weather Station Maintenance X

**Electric Facility Replacements, Installations, and Removals**

Electric Line Reconductoring X

nter-Set Installations X

Overhead Line Removals X

Pole Replacements X

Temporary Line Installations (Shoo-Fly) X

Tower Replacements X

 **Underground Electric Equipment Repairs and Replacement**

 Underground Facility Repairs and Replacement X

 **Roads and Road Maintenance**

Overland Travel X

Bridge Maintenance X

Cleaning Drainage Structures X

 **Substation Maintenance**

Equipment Maintenance X

Vegetation Management X

 **Vegetation Management**

Tree Felling X

Vegetation Clearing Facilities X

Vegetation Clearing Roads X

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Section** | **Activity** |  | **I** | **II** | **III** |
|  | Vegetation Management | Application of Herbicides |  |  | X |
|  | Vegetation Mowing |  | X |  |  |
|  | Vegetation Pruning |  | X |  |  |
|  | Vegetation Restoration |  |  |  | X |
|  | Woody Debris Management |  |  | X |  |

a Activity classification represents the initial and general starting classification of the activity. Final classification will vary based on work location and potential to affect resources. Please see full activity description to understand how the work is conducted.

## Electric Facility Patrol and Inspection

Physical inspections of facilities, associated equipment, and vegetation conditions occur on the ground or via aerial equipment (e.g., drones and helicopters) by qualified Utility staff and contractors. The frequency of patrols and inspections depends on the facility-specific regulations and requirements, but they generally are conducted annually or on an as-needed basis. Where physical inspections identify the need for facility-related maintenance, repairs, or equipment replacements, these activities are then scheduled and performed by field crews using a variety of hand tools, mechanical tools, and other specialized equipment and vehicles.

### Patrols and Inspections  Aerial (Class I)

Utility staff conduct aerial patrols and inspections for electric facility-related assets (e.g., distribution, transmission, and telecommunication infrastructure; substations; and helicopter pads) to collect visual documentation of the condition of these assets, ROWs, access roads, and surrounding areas. Aerial patrols or inspections generally are performed in place of ground patrols and inspections when there are access road constraints or when large-scale rapid assessment is needed after a weather or fire-related event.

Aerial patrols and inspections are conducted from helicopters, fixed-wing aircraft, and unmanned aerial vehicles (UAVs) such as drones. Typically, helicopter and aircraft patrols are flown 200 feet above the tree line, depending on land use, topography, and infrastructure requirements. Hovering during helicopter patrols and inspections typically lasts only a few minutes. All helicopter use occurs in accordance with Federal Aviation Administration regulations and requirements. UAV image capture may be completed by a multi-person ground crew that hikes, drives, or uses off-road vehicles to operate within the facility ROW within a visual line-of-sight to the asset. All UAV use is carried out by certified operators in accordance with Federal Aviation Administration regulations and requirements.

### Patrols and Inspections  Ground (Class I)

Utility staff conduct ground patrols and inspections of all electric facility-related assets (e.g., distribution, transmission, and telecommunication infrastructure; substations; and helicopter pads) to assess the condition of these assets, ROWs, access roads, and surrounding areas. Areas are checked for vegetation and tree clearances, brush and other potential fire hazards, erosion, and slides or soil covering tower footings and poles. Ground patrols generally are conducted using light- duty vehicles (e.g., trucks) traveling on roads described in the Plan (e.g., navigation and access roads), on all-terrain vehicles if overland travel is needed (see appropriate reference Overland Travel), or by foot. These activities typically involve patrol or inspection personnel performing a general visual review of facilities (patrols) or more detailed examination (inspections) of poles for visual defects like splitting, woodpecker cavities, breaks, and rot. Inspectors may measure height, note attachments and anchors, and run calculations on wind or ice loading.

### Pole and Tower Test and Treat (Class I)

Wood pole and steel tower inspection includes intrusive testing to comply with regulatory requirements. Wood pole testing may involve excavating soil around the base of the pole and poking or drilling into the pole to confirm that it is not deteriorated. Steel tower inspections include investigation of tower footings, foundations, and structural members for rust and deterioration. Pole and tower testing may require temporary soil removal and the use of jackhammers and hand tools for digging. Preservative may be injected into the pole to preserve it. Electric components found not to meet minimum requirements may be repaired or replaced by field crews at the time of testing, using hand tools and specialized equipment and vehicles as required.

## Electric Pole and Tower Equipment Repairs and Maintenance

The routine repair and maintenance activities described below typically are identified as needed based on the facility patrols and inspections. These activities usually require at least a standard light-duty truck and bucket truck and may be performed while the line is energized (i.e., while the power lines are operating) or de-energized, depending on access, loading, and safety. These activities are typically of short duration (less than 1 day), require minimal staging space, and typically occur within the analysis area. Minor vegetation management (pole/tower clearing or pruning vegetation) may be needed to ensure safe access and facility clearance.

### Anchor/Guy Wire Replacement

Anchor/guy wire replacements or additions are necessary when a structure or hardware modification requires additional support to accommodate increased loading or higher voltages, to repair damages, or to maintain structure safety. Anchors/guy wires are metal cables typically installed from an attachment point on the pole or tower requiring support and attached to the ground using a guy anchor. Light-duty trucks typically are used although heavy-duty line trucks with rotary screw attachments are needed for certain anchor replacements. Anchor/guy wire replacements are completed on an as-needed basis.

 **Screw Anchor (Class I):** Installation of anchor/guy wire replacements typically involves manual installation of a rotary screw guy anchor and a guy line and requires minimal ground disturbance.

 **Plate Anchor (Class II):** Depending on the pole or tower loading requirements or the proximity of bedrock, installation of a new plate anchor may be needed.

 **Rock Anchor (Class II):** Installation of anchors into solid rock may be necessary when screw and plate anchors are not viable options. Rock anchors are installed into core holes bored into rock. The anchor is tightened along the anchor shaft to expand resistance wedges into the rock.

### Electric Equipment Maintenance  Overhead (Class I)

Overhead electric poles and towers include a wide range of equipment components (e.g., cross - arms, transformers, switches, fuses, relays, and insulators) that require regular maintenance.

Overhead electric work is conducted using light-duty trucks, bucket trucks, and other specialty vehicles, depending on the work to be performed. If access is limited, a helicopter may be used to transport crew members and tools.

Other minor repairs include painting; replacing fuses, breakers, relays, cutouts, switches, and transformers; and adding cathodic protection. When a line outage is required, the Utility temporarily reroutes power by installing a shoo-fly (see *Temporary Line Installations [Shoo-Fly]* description for additional details) consisting of a temporary pole or tower to reroute the electricity and make the facility safe to complete the repair. Tower repairs require ground disturbance adjacent to the base of the tower and may require a staging area for vehicles, parts, and equipment.

### Electric Equipment Maintenance  Insulator Washing (Class I)

Electric insulators, which are found on all overhead electric poles/towers, need to be washed periodically to prevent faults. Insulators are washed using a truck- or trailer-mounted spray system or by helicopter. Washing typically is carried out during energized conditions. Distilled water, typically from local sources, is used to wash the insulators; dry washing using ground corn hulls is also used. All activities involving water use and disposal are conducted in compliance with current regulatory requirements.

### Pole Reinforcement and Protection (Class I)

Wood poles occasionally require reinforcement, including stubbing or trussing. Utility engineers determine the technique after reviewing the testing results of an inspected line segment.

Stubbing and trussing entail driving or setting a short steel truss or wood pole into the ground adjacent to the existing pole and attaching it to the existing pole to provide support. Fiber - wrapping is performed on poles that are not candidates for trussing or replacement. This entails preservative-wrapping the pole at or below ground level with a material that has been impregnated with preservatives to prevent and slow external deterioration of the pole. Pole reinforcement and protection work involves the use of light-duty trucks, jackhammers, and hand tools for digging.

### Tower Maintenance  Cathodic Protection (Class II)

To help prevent corrosion of metal tower foundations, a corrosion protection system is installed using zinc rod(s) and a wire(s) underground near the tower that allows the zinc rods to corrode instead of the tower footing. This process involves installing a corrosion protection array in narrow-diameter holes and trenches under or adjacent to the base of the tower. Vegetation removal may be needed within 10 feet of each tower, using handheld equipment. To view the underground steel, the contractor hand digs  foundation to expose the steel for visual inspection and then backfills the hole with the same native material. A trench may be dug from anodes to tower leg, using handheld equipment or a compact chain-type trencher.

### Tower Maintenance - Grounding / Arc Fault Protection (Class II)

Arc fault protection involves reducing the potential for electricity to travel from overhead power lines to other nearby facilities that may result from inclement weather or mechanical failure. This process includes driving a rod at a depth of 8 to 12 feet into the ground and connecting the rods to the structure with an insulated copper cable. Deep ground electrodes are augered or drilled, and a mini-excavator or similar equipment is used to excavate holes and trenches adjacent to the base of the structure.

### Tower Repairs  Minor (Class I)

Tower repairs typically involve installing replacement tower parts or extensions. The repairs typically are installed using a tower lifter or crane but may also be installed using a helicopter. Other tower repairs include replacement of the concrete footings and other foundation repairs; these are done by removing existing concrete and installing new concrete.

### Sand Removal  Excess Accumulation Removal (Class II)

Facilities in desert and coastal areas may be subject to sand accumulation. Maintenance of facilities in these areas may require removing excess sand to restore the original grade of the facility and may also include the repair, replacement, or removal of fences.

This work is conducted using a vacuum truck, small equipment (e.g., skid steer loader, backhoe, small excavator), or hand tools (where feasible) to ensure facility access and to prevent public safety issues. Vacuum trucks with hose attachments covered by mesh (approximately ¼ inch in diameter) are used to remove excess sand within facilities and an approximately 5-foot clearance around them. Sand usually is hauled offsite or redistributed nearby using a truck-mounted belt conveyor.

### Staging Area Outside ROW (Class II)

A staging area outside the ROW is sometimes needed in support of activity elements. A staging area outside the ROW footprint requires the activity to be considered a Class II activity.

## Internal Communications Equipment Repairs and Replacement

Internal communications technologies and systems (e.g., fiber optics, microwave, radio, telecommunication cables, high-definition cameras, weather stations, and other technology) are critical for the safe and reliable operation of electric systems. These systems can be found throughout the service territory, housed within operating Utility facilities such as substations, on overhead poles/towers, in underground conduits, or on dedicated poles/towers. The repairs and maintenance activities are typically of short duration (less than 1 day), require minimal to no ground disturbance, and are limited to the existing ROWs.

### Communications Equipment Maintenance  Overhead (Class I)

Maintenance of internal communications equipment may involve repairing or replacing pole- mounted fiber optics, telecommunications cables, and related communications equipment (e.g., remote fault indicators, packet routers). Helicopters, cranes, rigging, and boom trucks may be used to complete maintenance work. If the maintenance activities require sky wrap cable, special equipmentincluding a helicopter, a tugger, and a spinner may be used.

### Communications Equipment Maintenance  Ground (Class II)

Maintenance of internal communications equipment may also involve replacing and repairing optical ground wires, ground-based fiber optics, ground-based communications cables, and related internal communications equipment. Cranes, rigging, and boom trucks may be used to complete microwave maintenance work. Vehicles used for communication lines and site maintenance may include bucket/reel trucks (without outriggers), various-sized pickup trucks or boom trucks, cable dollies, a single drum puller, a two-axle trailer, and a splice lab truck. Vehicles used to receive and load out materials include various-sized pickup trucks.

### Weather Station Maintenance (Class I)

Weather stations associated with electric facilities collect weather-related data and information. Maintenance of weather stations includes annual calibration and other minor non-ground- disturbing work.

## Electric Facility Replacements, Installations, and Removals

The need for pole, tower, or line replacements, installations, or removals typically are identified based on the facility patrols and inspections. Activities described below may be performed with the pole energized or de-energized, depending on system requirements or site conditions. When an outage is required, the Utility may temporarily reroute power by installing a shoo-fly (*see Temporary Line Installations [Shoo-Fly]* description for additional details) consisting of a temporary pole and additional conductor to reroute the electricity and make the facility safe to repair or replace.

These activities may require minor vegetation maintenance (pruning vegetation) to ensure safe access and facility clearance. The work duration for these activities varies depending on the number of work locations, although a single pole or tower replacement may be completed in as little as 2 days. These activities require work staging or laydown areas typically located adjacent to the facility work structure within the ROW. Some projects within this category of activities may require large staging or laydown areas located outside of the ROW.

### Electric Line Reconductoring (Class I)

Reconductoring overhead electric lines involves replacing the existing conductors with new conductors and may require installation of new inter-set or replacement poles supporting the conductors (see *Pole Replacements* and *Inter-Set Installations* descriptions for details).

Reconductoring typically is done in 2- to 3-mile sections with the use of pull and tension sites (“pull sites”)

Pull sites are temporary construction areas (comparable to staging areas) that are used during removal of existing conductors and placement of new conductors along the electric line. Pull sites may be used to stage materials and provide work areas for tower or pole work. Several pieces of equipment are used at the pull sites, including tensioners (rope trucks) to feed out the new conductor and adjust tension, conductor reels to receive the existing conductor as it is removed, and reels of new conductors. Trailers pulled by semi-trucks and cranes are also needed for these activities.

### Inter-Set Installations (Class II)

The Utility may install a new inter-set pole between existing poles to support new infrastructure and equipment or to increase the height of the energized conductor. Inter-set poles are installed in-line between existing overhead poles in existing ROWs. Inter-set poles are installed in the same manner as a new pole (see *Pole Replacements* description for details). The work is performed using a backhoe, track machine, crane, bucket truck, heavy line truck (with auger), and/or helicopter, depending on the location and local conditions. If access is limited, use of a helicopter set may be required. Vegetation adjacent to the new pole also may be affected and may require pruning or removal to ensure safe and compliant distances to conductors.

### Overhead Line Removals (Class II)

Electric lines may be removed due to line retirement or plans for replacement with underground lines. Additional coordination is needed with the BLM for grant disposal and decommissioning. Existing overhead facilities may be removed in their entirety; with shared or joint pole facilities, some structures may remain in place for continued use. Electrical facility removal involves de- energizing the line, then removing the power line conductor and overhead equipment, and then the pole or tower. The facility removal may require a crane, bucket truck, line truck, and helicopter (in remote areas). Existing structures such as poles, towers (and footings) would be removed by excavating around the structure base and then using specialized equipment to remove the structure. Old holes would be backfilled with dirt and crushed rock for compaction. Where joint pole facilities exist, poles may be topped (cut) below the transmission or distribution cross-arms and left in place. All debris associated with facility removal (e.g., lines, wires, poles, cross-arms, and insulators) is disposed of offsite at a landfill or other appropriate location.

Permanent removal of electric lines and poles where original installation was via a BLM ROW grant will be submitted under Class III requirements. Where original installation was via a private or perpetual easement, removal will be submitted under Class II requirements. The replacement of overhead lines with underground lines is not covered in this Plan.

### Pole Replacements (Class II)

Pole replacement involves replacement or upgrade of wooden, composite, concrete, light- duty steel, or tubular steel poles. Pole replacements may involve removing a power line conductor and equipment from a tree (known as a *tree attachment* or *tree connect*) and installing it on a new pole. The pole replacement is accomplished using a backhoe, track machine, crane, bucket truck, heavy line truck with auger, and/or helicopter, depending on the location and local conditions. If access is limited, use of a helicopter set may be required. Once the new pole is set and framed with cross- arms and insulators, the conductor and equipment from the old pole are transferred to the new pole, and the old pole is removed. On rare occasions, the new pole is placed within the boring of the existing pole (same hole set), but this is not the preferred method due to safety concerns.

### Temporary Line Installations (Shoo-Fly) (Class II)

Shoo-fly installations add temporary poles or structures around existing permanent facilities to limit service interruptions until work crews can complete installations or repairs. Shoo-flies involve temporary installation of poles and anchors supporting conductors to bypass facilities needing repairs or upgrades and therefore are installed in conjunction with other planned overhead electric

facilities replacement or repair projects. The method of installation for shoo-fly poles is the same as described above for *Pole Replacements*. In some cases, existing conductors are removed from the existing poles or structures and reattached to the shoo-fly structures. Typically, this is accomplished with one or two poles for every circuit attached to the structure being shoo-flied. Shoo-fly supports are removed when the repair or construction work is complete.

### Tower Replacements (Class II)

Tower replacements typically involve replacement of the concrete footings, as well as assembling and erecting the new tower. The replacement tower and footings may be installed at a different location. The replacement towers typically are installed using a tower lifter or crane but also may use a helicopter. Localized grading may be needed to level the tower lifter or crane. If a helicopter is used, a temporary landing zone may be needed, although the staging area often serves this function. Other equipment will also be replaced, including fuses, breakers, relays, cutouts, switches, transformers, and cathodic protection. Tower replacements require ground disturbance at and adjacent to the base of the tower and a nearby lay-down area for vehicles, parts, and equipment.

## Underground Electric Equipment Repairs and Replacement

Underground electric lines exist in areas where overhead electric lines were not feasible or unsafe based on site conditions. These activities may require minor vegetation management (clearing or pruning ground vegetation) to ensure access to the facility. The work duration for these activities varies depending on the size of the work area. These activities require excavation to access the underground lines, and work staging areas typically are located adjacent to the work area within the ROW.

### Underground Facility Repairs and Replacement (Class II)

Underground electrical line repairs and replacements may be needed for both transmission and distribution lines. Underground cable repair is accomplished by excavating a small portion of the line. Underground lines typically are encased in polyvinyl chloride (PVC) plastic conduit, and high- voltage transmission lines may also be encased in a thermal concrete-encased duct bank (a small underground box where transmission lines are connected) to protect the lines and disperse heat. Splice vaults or duct banks may also need to be accessed for the repair. The line segment to be repaired or replaced will need to be excavated using standard excavation equipment (concrete saw cutting equipment, excavators, trenchers, vacuum excavation equipment, or directional drilling machines are used to excavate the trench). The project length varies based on the length of the line. Excavated materials are removed during trench excavation and stockpiled to backfill the trench in addition with other backfill materials (e.g., sand, aggregate).

## Roads and Road Maintenance

Safe and dependable access to facilities is essential for all O&M work. To access their facilities, the Utility has identified the public roads and BLM routes within BLM-administered lands. Further, the BLM and the Utility agreed upon terminology to categorize these BLM routes as either navigation or access. Access roads used by field crews and vehicles to reach facilities must be able to provide safe

passage for a variety of Utility vehicles (e.g., light-duty/heavy-duty trucks, bucket trucks, trailers, excavators, backhoes, off-highway vehicles/utility terrain vehicles, tracked vehicles, and specialized equipment) regardless of weather or field conditions. Driving on public roads or BLM routes within BLM-administered lands is considered a Class I activity.

Navigation roads may be maintained by the Utility on an as-needed basis with a short-term ROW grant. Access roads are included in the consolidated ROW grants and will be maintained by the Utility on an as-needed basis. Road maintenance activities may apply to both categories of roads. Roads and their associated features (e.g., drainage systems, culverts, guardrails, cattle guards, fences, and gates) must be maintained and kept clear of obstructions such as downed trees, snow and ice, overgrowth of vegetation, rocks, and other debris. Road maintenance may include the use of simple hand tools or heavy construction equipment, depending on the maintenance need. The work duration for road maintenance is highly dependent on the size of the area to be maintained.

Road maintenance activities can include roadbed restoration, vegetation management, erosion control, cleaning obstructed culverts and drainage structures, and any other requirements to keep the road safe and passable to provide access to Utility infrastructure for inspection and maintenance activities. Road maintenance typically occurs within the road prism (existing footprint of the road) and approximately 2 to 5 feet beyond the berm or road edge when necessary. The managed road height for vegetation trimming is 14 feet for overhanging tree limbs/branches. All road maintenance activities designated as Class I will be elevated to a Class II activity if work is needed outside of the road prism.

### Overland Travel (Class II)

In some locations, overland travel may be required for the Utility to access their facilities and/or work within their ROW boundaries. Overland travel occurs when there is vehicular travel off BLM routes or public roads within BLM-administered lands. Overland travel must be submitted as a Class II work package.

### Bridge Maintenance (Class II)

Bridge maintenance may involve clearing debris lodged on or under the bridge structure, repairing scour or erosion, stabilizing bridge footings, repairing bridge decking, or performing other bridge- related maintenance tasks required for safe bridge use.

### Cleaning Drainage Structures (Class I)

Drainage structures are constructed passages with single or multiple waterways that are designed to promote efficient water flow without damaging surrounding resources. Examples include drains, culverts, bridges, and other structures that permit water flow under the roadway. Maintenance of these structures includes cleaning inlets, outlets, related channels, existing riprap, trash racks, delineators, object markers, rails, and timber; bridge inspections; and other work necessary to maintain the structures. All materials used to maintain drainage structures will conform by type and specification to the material in the structure being maintained.

 **Ditch Cleaning:** Ditch cleaning involves removing and disposing of all slide or slump material from roadside ditches to provide an unobstructed waterway conforming reasonably to the previous line, grade, and cross section. If these activities require heavy equipment and recontouring the ditch, they would be submitted as a Class II activity.

 **Culvert Cleaning:** Culvert cleaning involves cleaning and reconditioning of culverts, catch basins, and other small drainage structures. If these activities require heavy equipment, as well as recontouring drainage to restore flow patterns, they would be submitted as a Clas s II activity.

### Clearing Obstructions (Class I)

Clearing obstructions involves removing downed trees, rocks, and other debris present on the road prism.

### Culvert and Rock Ford Crossing Repair and Maintenance (Class I)

Repair and maintenance of culvert and rock ford crossing includes adding rock or aggregate at a road crossing to improve drainage control.

### Physical Structure Maintenance (Class I)

Physical structures include retaining walls, guardrails, cattle guards, fences, gates, and other similar existing structures. Maintenance of these existing structures involves cleaning and other repair work necessary to ensure that all structures remain fully functional. This work may be done as Class I if within the existing footprint of the physical structure.

### Road Surface Blading (Class I)

Road surface blading involves keeping the native material or aggregate surface of the road in a condition to facilitate traffic, minimize additional future maintenance, reduce erosion, and provide proper drainage. Road surface blading also includes maintaining the crown, in-slope, or out-slope of the traveled way and shoulders, roadside ditch, drainage dips, leadoff ditches, berms, and turnouts; and removing minor slides and slumps and other irregularities that prevent normal runoff from the road surface. Road surface blading is considered a Class II activity if there is not prior adequate cultural resource survey of the work area or if Utility internal screening identifies the presence of BLM special status species within the work area. Road surface blading is considered a Class III activity if Utility internal screening identifies the presence of cultural resources within the work area.

### Road Surface Repair (Class I)

Road surface repair consists of using surface aggregate or other materials to patch potholes and depressions. It includes all surface preparation activities, furnishing and placing all surfacing materials, and other work necessary to patch the road surface.

### Signage and Traffic Services Maintenance and Installation (Class I)

Maintenance of signage and traffic services includes maintaining traffic-related regulatory, warning, and directional signs, as well as roadside delineators, markers, and other such devices. New signage will be submitted as Class II.

### Slide Removal and Slump Repair (Class II)

Slide removal and slump repair includes all work necessary to restore the road to its original cross section, as may be necessary following a slide or slump event. This work typically cannot be accomplished by a grader during surface blading and ditch cleaning operations due to the size of the slide or slump. Slide removal and slump repair may include excavation; loading, hauling, placing, and compacting replacement material; and removing and disposing of waste material at approved locations.

### Snow Removal (Class I)

Snow removal includes blading, shoveling, or otherwise removing snow, ice, and associated debris from roads. Road salting will not be utilized as a snow removal method. Snow removal is conducted in a manner that protects the road; ensures safe and efficient transportation of materials; and prevents erosion damage to roads, streams, and adjacent lands.

### Surface Rock Replacement or Spot Surfacing (Class I)

Surface rock replacement or spot surfacing consists of adding rocks, gravel, or other surfacing materials to the road to re-establish or improve existing conditions and allow for a drivable surface and appropriate drainage control.

### Vegetation Management (Class I)

The Utility conducts vegetation management within and along roads to ensure safe and reliable access to facilities. These activities are detailed in the Vegetation Management section below.

### Water Drainage Feature Installation and Maintenance (Class II)

This activity includes all work necessary to install or restore the rolling dip and waterbar to its original shape and form. Upon completion of the work, the roadway is shaped to provide for removal of surface water and passage by high-clearance vehicles. Berms existing prior to maintenance operations are repaired or reinstalled. Installation and maintenance include excavation and placing and compacting surface material.

## Substation Maintenance

Electric substations are a part of an electrical generation, transmission, and distribution system. Substations perform the critical function of transforming the voltage (i.e., high to low, low to high) during transmission of electricity or distributing electricity to Utility customers. Utility substations can be found throughout the service territory and often are located near load centers such as residential, commercial, and industrial areas. Substation maintenance includes activities within the substation as well as just outside the substation fencing. Substation expansions within the ROW may be related to O&M activities but outside the ROW are not considered to be O&M activities and require BLM project review.

### Equipment Maintenance (Class I)

Typical equipment maintenance tasks at substations include inspection, testing, and repair of transformers, circuit breakers, voltage regulators, switches, fuses, meters, fencing, and insulators

within the existing substation footprint. Load demands may require modifications of station equipment or installation of new equipment. Such maintenance activities may involve moving substation fence lines to accommodate installed or relocated equipment; this work may be done as Class I if within the existing footprint of the physical structure. If expansion goes beyond the substation footprint, it would be submitted as a Class II activity. Substation maintenance crews access substations using light-duty trucks and generally perform maintenance work with hand- operated tools. These covered activities could require use of the substation footprint or adjacent ROW area for construction staging, materials storage, permanent facilities, and land management.

Substation equipment maintenance activities are performed as needed or in conjunction with broader electrical projects. Maintenance of substation systems is periodic and scheduled throughout the year.

### Vegetation Management (Class I)

The Utility conducts vegetation management inside and outside of substation facilities. These activities are detailed in the *Vegetation Management* section below.

## Vegetation Management

Vegetation management is a critical component to maintaining safe and reliable Utility facilities. Vegetation growth around, above, and under electric facilities can pose a hazard to operation of the equipment. Additionally, overgrowth of vegetation along roads can impede access to facilities. Unmanaged vegetation growth can result in accidental contact with energized equipment, increase the risk of fires due to fuel loading, deteriorate underground lines, and create an impediment to field crews attempting to access the facilities for inspection or maintenance. Vegetation management work includes pruning and removal of vegetation that presents a risk of growing into the required clearance distances; full or partial removal of hazard trees that present a fall-in risk to electric facilities, including danger and hazard trees; trimming and removal of incompatible vegetation at the base of poles, towers, and guy wires that inhibit inspection or access; and use of herbicides. Tools and equipment may include hand tools, mowers, chippers, lift trucks, specialized logging equipment, hydro-axes, masticator equipment, large tractors, and other specialized vegetation removal equipment. Vegetation management takes place on incompatible vegetation that is undesirable, unsafe, or interferes with the intended use of the ROW. “Incompatible vegetation” is any vegetations that can grow to a height that encroaches into minimum vegetation clearance distances, presents a potential fire hazard, impedes access, or obscures inspection of facilities.

Through vegetation management, the Utility specifically targets hazard trees that are dead or show signs of disease, decay, or defect; trees that lean; trees that are defective because of any cause, such as heart or root rot, shallow roots, excavation, bad crotch, dead or with dead top, deformity, cracks or splits; or trees with ground or root disturbance that might fall into or otherwise affect conductors, towers, or guy wires.

Per the Federal Land Policy and Management Act (FLPMA): The term "hazard tree" means any tree or part thereof (whether located inside or outside a right-of-way) that has been designated, prior to tree failure, by a certified or licensed arborist or forester under the supervision of the Secretary concerned or the owner or operator of a transmission or distribution facility to be- (A)

dead, likely to die within the routine vegetation management cycle, or likely to fail within the routine vegetation management cycle; and (B) if the tree or part of the tree failed, likely to - (i) cause substantial damage or disruption to a transmission or distribution facility; or (ii) come within 10 feet of an electric power line.

Vegetation management can include proactive work along distribution and transmission line sections that have experienced tree-related outages by targeting vegetation that will grow into lines in the future.

Vegetation clearance distances are derived from regulatory requirements and vary depending on factors such as voltage of the line, type of construction, and field conditions. The Utility standard approach is to remove sufficient vegetation beyond the minimum clearance distances required by law to allow for line sag during hot temperatures, sway due to wind movement, and annual plant growth. Pruning or topping of hazard trees is discouraged due to the danger of the activity involved; felling of hazard trees is preferred for the safety of crews. Vegetation management is conducted based on findings of site conditions from routine ground or aerial patrols and inspections, and as needed to ensure safe and reliable access to facilities.

### Tree Felling (Class II)

Trees to be removed are cut by removing limbs and wood from the top down or by felling trees whole. Other equipment that may be used during these activities includes lift trucks, specialized logging equipment, hydro-axes, masticator equipment, and large tractors. All material generated during vegetation management activities is managed in a manner consistent with BLM requirements (see Section add appropriate reference) and Best Management Practices (BMPs), and compliant with environmental regulations.

### Vegetation Clearing  Facilities (Class I)

The Utility performs vegetation clearing around the base of poles and towers, along electric transmission and distribution lines and corridors, and at substations and other facilities. Pole and tower vegetation clearing is conducted in two phases (initial clearing and regular maintenance clearing) in accordance with regulatory requirements.

Line clearing is performed along distribution and transmission line sections between the poles and tower structures to ensure that adequate clearances are maintained between electric conductors and vegetation growing within the power line ROWs. Vegetation management typically is conducted using hand-tools, string trimmers, or chainsaws. Once the vegetation has been cleared, when appropriate, vegetation may be treated with herbicides to prevent regrowth. Herbicide use always requires BLM input and must be classified as Class III.

### Vegetation Clearing  Roads (Class I)

Clearing vegetation consists of cutting and managing vegetative growth. Vegetation removal is required if unmanaged growth causes an unacceptable reduction of sight distance or operational capability, impedes the flow of water, or diverts water from drainage structures. Clearing vegetation from roads generally does not involve new ground disturbance outside the existing road prism and is performed using hand tools (e.g., weedwhackers, string trimmers, or chainsaws). In some cases, mechanical equipment (e.g., a masticator or mower) is used to remove weeds or vegetation growing

in the road or from the side of the road. Tree felling may also be needed, but it would be processed as a Class II activity.

### Vegetation Management  Application of Herbicides (Class III)

Herbicide application is used as needed in conjunction with physical vegetation maintenance techniques to inhibit growth/re-sprouting of non-compatible species and invasive plants. The Utility may rely on spot treatments or larger-scale applications for eradication of incompatible vegetation using only BLM-, federally, registered herbicides. Trained and qualified staff typically use the following methods in the field. A Pesticide Use Permit (PUP) is required and must be on file with the appropriate BLM Field Office.

 **Backpack Application** (foliar, basal stem). Herbicide is sprayed on a specific target area using a backpack sprayer.

 **Vehicle-Mounted Application** (foliar, pre-emergent). Herbicide is sprayed on a large target area using vehicle-mounted sprayers. This method often is used for bare-ground, pre-emergent herbicide applications, and/or when selective herbicides are used to target incompatible vegetation.

 **Cut-Stump Application**. This application is used for woody tree and brush species that are prone to re-sprouting after mechanical cutting. Herbicides are applied to the cut stump using a backpack, hand-held spray bottle, or hand-held wick device.

 **Frill-and-Squirt Application**. This application is also used for woody species. The method involves direct injection of herbicides with handheld spray bottle into a frill or “hack” made into the target plant using a hatchet.

### Vegetation Mowing (Class I)

The Utility performs vegetation mowing on and along roads. Vegetation mowing is conducted in two phases (initial clearing and regular maintenance clearing). Vegetation management typically is conducted using hand-tools, string trimmers, or chainsaws. Once the vegetation has been cleared, when appropriate, vegetation may be treated with herbicides to prevent regrowth. (Note: Herbicide use always requires BLM input and must be classified as Class III.)

### Vegetation Pruning (Class I)

Trees and brush that are near roads and may cause a fall-in or other unsafe conditions are pruned or cleared. Similarly, trees and brush that are near energized powerlines are pruned or cleared to reduce the risk of fire by contact due to arcing or sparking and to prevent unnecessary power outages. Tree pruning uses power and hand tools, including chippers, chainsaws, pole pruners, and hand saws.

### Vegetation Restoration (Class III)

Vegetation restoration consists of applying seed, fertilizer, mulch, and plantingssingularly or in specified combinationsto cut-or-fill slopes, slides, slumps, disposal areas, or other areas disturbed during road maintenance activities. The work area may be limited to designated portions of the roadway and roadside or may include treatment of the entire area bounded by the outer limits of the ROW. The Utility will comply with weed-free and native plant initiatives for the local area.

### Woody Debris Management

#### Woody Debris Management (Class II)

Woody debris management is needed to address the cleanup related to Utility vegetation management activities. The management prescription for woody debris is based on several factors. Management prescriptions may include lop and scatter, chip and broadcast or haul, hand pile in BLM-designated areas (for BLM use), mastication, and burning (using air curtain burner).

Prescription details and criteria for woody debris management are included below.

#### Criteria for Wood and Debris Cleanup Related to Utility Vegetation Management Activities on BLM Lands

The purpose of this section is to provide criteria for wood and debris cleanup related to Utility vegetation management activities on BLM-administered land conducted under this Plan.

Management of wood and debris resulting from Utility vegetation management work will be classified consistent with the Plan. The following are key considerations for this work.

 The commitments outlined in this attachment apply only to wood and vegetative debris that the Utility has generated (i.e., the Utility is not obligated to clean up wood and debris left by others).

 The Utility will ensure that all compliance and notification protocols are followed.

 All work will be done according to all applicable state and federal regulations and laws.

 The Utility will evaluate and select the wood and debris management options from this list according to what is safe, operable, and compatible with the BMPs, Resource Protection Measures (RPMs), and other requirements of the Plan.

 The Utility will provide the BLM a confirmation of what debris management occurred in the Work Complete Notice. This description will list the equipment and methods used, any overland travel, any pile locations, and any information not previously provided in the work package.

 The vegetation management tree work and the wood and debris management work may or may not occur concurrently (i.e., there may be a lag in time between tree felling and pruning and wood and debris cleanup). If a substantial lag (greater than 45 calendar days) is anticipated between the hazard mitigation and the cleanup, the Utility will inform the BLM of the delay and the anticipated timeline for completion. If the wood and debris cleanup activity itself would result in a different class activity, the Utility will submit the cleanup activity as separate notification package.

 The Utility will implement appropriate BMPs and RPMs described in the Plan to avoid impacts on biological and cultural resources.

 The Utility will identify any trees with attached signs (e.g., seed trees, marked wildlife trees, bearing trees, witness trees, or trees with informational signs) prior to any vegetation management work and will identify them as part of the work package. If the Utility feels that ensure the safety of the crew or the Utility’s facilities, this will be flagged in the work package for removal is necessary to BLM concurrence.

 Overland equipment will not be operated on slopes greater than 30 percent.

As appropriate, any remaining cut vegetative material will be either lopped and scattered, chipped onsite, and/or removed offsite until safe hazardous fuel depths are achieved on public lands.

#### Debris Management (Material Less than 4 Inches Diameter)

Debris management will be prescribed by the Utility in accordance with site constraints, using one or more of the following options.

* + - * 1. Within 100 feet of roads, work-generated woody debris up to 4 inches diameter will be:

Lopped and scattered.

Chipped and hauled offsite. If offsite hauling is determined to be difficult or unsafe, the Utility will notify the BLM before, or chips will be broadcast onsite with chips not to exceed a depth of 6 inches.

* + - * 1. Where work-generated woody debris is located greater than 100 feet from a road or within 100 feet of a road but unable to be chipped due to safety or feasibility concerns, the Utility will implement one or more of the following options:

Lop and scatter.

Lop and scatter woody debris to a depth not to exceed 18 inches from the ground surface.

All limbs, branches, and unused material will be cut into small (4 feet or less) sections and scattered through the surrounding area to avoid accumulation.

No slash or debris will be left in roads, ditches, or culvert basins.

Hand-pile in pre-designated areas per BLM request.

Hand-pile debris for later burning by BLM personnel, if prescribed.

Hand-pile all limbs, branches, and unused material in small compact piles in an open area away from live trees.

Pile size shall be a minimum of 4 feet x 4 feet, but not to exceed 8 feet x 8 feet. Stack vegetation pyramid style, where piles are taller than they are wide and kept compact.

Piles will not be placed under the conductors. Piles will be placed in an area where, when piles are burned, resources (cultural and natural) will not be harmed, and the burning will not scorch existing tree canopies. Piles will be located at least twice the distance of the height of the pile from the canopy of any standing trees.

The location of each pile will be provided as a kmz or shapefile attachment as part of the Work Complete Notice. BLM-preferred pile locations will also be discussed as needed at annual meetings.

Mastication

On slopes less than 30 percent with dense brush or extensive small debris, a mastication machine may be used to grind up debris in place to a depth not to exceed 4 inches. The Utility will identity staging areas for all equipment.

Track chipper.

On slopes less than 30 percent, a track chipper may be used to chip and broadcast project-generated debris to a depth not to exceed 12 inches. The Utility will identify staging areas for all equipment.

Air curtain burner.

An air curtain burner will be used as an alternative to other debris management when an air curtain burner is already being used for wood disposal. The Utility will identity staging areas for all equipment.

#### Wood Management (Material Greater Than 4 Inches Diameter)

Wood management will be prescribed by the Utility in accord with site constraints using one or more of the following options.

1. Large woody debris will be limbed and cut so that the full length of the bole is in contact with the ground and left on site. Limbs and tops will be lopped and scattered to a depth not to exceed 18 inches from the ground surface and left onsite.
2. Utility Name may retrieve the wood, using equipment such as a grapple truck or other similar vehicle operated from the road without causing ground disturbance.
3. Utility Name or the BLM may identify special projects or special areas where wood will be retrieved using equipment such as a skidder or other similar vehicles. The work package will describe disturbance areas and if impacts need to be repaired or restored the Utility will work with the BLM to remedy the disturbance.
4. Utility Name may deck or haul off wood to an appropriate disposal site or use air curtain burners or tub grinders to dispose of wood.
5. No slash or large woody debris will be left in roads, ditches, or culvert basins.

If any damage occurs to roads, ROWs. Or nearby areas during operations, the Utility will report out this damage in the Work Complete Notice and work with the BLM to remedy.

#### Prioritization of Wood Management

The Utility considers the following factors when prioritizing wood management.

1. **Safety ** If wood is perched above a road or has potential to fall or cause damage to Utility facilities or property. Work must be able to be conducted in a safe manner.
2. **Environmental ** If leaving wood could adversely affect a biological or cultural resource, it will be addressed.
3. **Roads and Access ** If wood is impeding ingress or egress, or otherwise blocking access or encroaching into a roadway. it will be addressed.
4. **Facilities and Buildings ** If wood is encroaching on structures or recreational public use areas, it will be addressed.

#### Wood Permitting

Some vegetation management work packages will trigger the need for the BLM to issue a wood permit to the Utility for compensation of merchantable timber. The Utility will identify work that requires a BLM wood permit as part of the Work Complete Notice packages and process outlined in the Plan.

The Utility will provide the BLM point of contact with an accounting of the final trees felled within 30 business days from completion of work. The BLM Field Office will bundle permits if possible. Each permit will have the work activities and associated vegetation broken out by Utility tracking and project number.

The Utility will coordinate with each Field Office, District, or BLM State or Field office name forester, as appropriate, to determine wood permit thresholds and permit triggers.