State Of California
California

The Resources Agency of

Memorandum

Date: October 21, 2009
Telephone: (916) 653-1639

DOCKET
08-AFC-13
DATE OCT 21 2009
RECD DEC 09 2009

To: Felicia Bellows, SES Solar One, LLC
Bob Therkelsen

From: California Energy Commission – Christopher Meyer
1516 Ninth Street Project Manager
Sacramento, CA 95814-5512

Subject: **SES SOLAR ONE PROJECT (08-AFC-13) – Transmission Line Upgrades**

The following is in response to your request for an identification of the information needed for staff to analyze the reasonably foreseeable impacts of the Pisgah-Lugo transmission line upgrade for the proposed Stirling Energy Systems Solar One (SES Solar One) Project. In addition, please see the attached Appendix A from the Colusa Generating Station Project (06-AFC-9).

Biological Resources

- Complete special-status species surveys for both plants and animals done when the organisms are identifiable (meaning multiple trips out, especially for plants);
- Delineation of waters of the U.S. and state; and
- Breakdown of temporary vs. permanent impact acreage in the various habitat types, with acreage for each habitat type.

Cultural Resources

- Complete description of the upgrade and the construction methods involved
- Pedestrian cultural resources survey of no less than 25 percent of the transmission line ROW and regulatory buffer zone, sample structure to be developed in consultation with the BLM and the CEC
- Appropriate additions to background sections to cover regions not covered in the original technical report.

Soil and Water Resources

- Delineation of waters of the U.S. and state crossed by the alignment;
- Identify locations where the alignment crosses 100 year flood zones;
- Identify depth of foundations to assess impact to ground water;
- Provide slope gradients traversed by alignment/roads;
- Provide road construction methods (side cast, haul and store);
- Provide information on erodibility of soils in project area;
- Identify plans for erosion/sedimentation control (BMPs); and
- Identify any locations where the alignment crosses environmental hazard areas.

PROOF OF SERVICE (REVISED 12/2/09) FILED WITH
ORIGINAL MAILED FROM SACRAMENTO ON 12/9/09
TG

APPENDIX A
TRANSMISSION SYSTEM ENGINEERING
DOWNSTREAM IMPACTS
RECONDUCTORING ANALYSIS

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1.0 INTRODUCTION AND PURPOSE

Energy Commission staff has prepared this Transmission System Engineering Appendix to the Final Staff Assessment (FSA) for the Colusa Generating Station (CGS) project. This analysis discusses transmission system impacts beyond the first point of interconnection. The proposed CGS project is in response to a "Request for Offer" from Pacific Gas & Electric Company (PG&E). E&L Westcoast, LLC (E&LW) would develop the CGS project for PG&E and transfer ownership of the CGS project to PG&E after licensing and commissioning. This appendix examines the potential indirect impacts of future reconductoring of transmission lines and substation upgrades that may be required as a result of the CGS project.

Reconductoring would involve replacing the conductors on one or more transmission line segments with new conductors that, because of improvements in the metallurgy of the conductors, allow a large increase in the current-carrying capacity of the segment without increasing the weight or size of the cable. At this time, it is anticipated that reconductoring would not involve modifying any transmission line towers. Substation upgrades would involve installation or modification (resetting) of new protection and monitoring equipment within the substation properties. Additional upgrades at designated substations may be required as mitigation, prior to final approval of interconnection to California Independent System Operator (California ISO) and Non-California ISO controlled facilities.

Though E&LW contends that reconductoring would not be necessary to meet its business goals for developing the CGS, Staff and the Western Area Power Administration's (Western) analysis of the potential effects on the transmission system caused by operation of the proposed facility shows that reconductoring of at least one or more major lines in Western's non-California ISO controlled grid would be required. Reconductoring of the Shasta-Flanagan and Flanagan-Keswick (SHA-FLN/FLN-KE) 230-kV transmission lines, which are located approximately 90 miles north of the proposed CGS, would be a reasonably foreseeable event. Because of this, and the requirement under the California Environmental Quality Act (CEQA) to examine foreseeable subsequent projects that result from the project, Staff has analyzed the potential impacts of reconductoring as it may pertain to the CGS. Although it is the intent of Western to use the Commission's FSA in its National Environmental Policy Act (NEPA) compliance process, reconductoring would be a separate Western project in a separate process, and would be subject to a NEPA analysis through preparation of an Environmental Assessment (EA). A more general level of analysis is thus appropriate for this FSA to meet CEQA requirements.

The details of the reconductoring would be determined after Western has completed an EA document on the SHA-FLN/FLN-KE transmission line reconductoring. Western would recover the cost of the reconductoring from PG&E. In its EA, Western would discuss the design and construction procedures for the reconductoring project, examine

potential impacts to the environmental and public health that would be caused by the reconductoring, and propose mitigation that would either eliminate, avoid, reduce to a less-than-significant level, or compensate for any identified impact. Western would inform all adjacent property owners about the nature of the work that would occur.

Should the EA disclose any impacts that remained significant after mitigation, Western would suspend the EA process and initiate the preparation of an Environmental Impact Statement. Significant impacts are not anticipated since the action would: (a) occur in an existing cleared right-of-way; (b) use existing access roads; (c) not involve modifying the existing structures or insulators; and (d) essentially consist of replacing the existing conductors with new ones.

Western has performed comprehensive surveys of existing Western-owned rights-of-way (ROWs) from the Oregon border south to Tracy, CA, including the SHA-FLN/FLN-KE area (Redding/Trinity region), in order to analyze operations and maintenance (O&M) activities that occur in these ROWs. Western has developed Standard Operating Procedures (SOPs) and Project Conservation Measures (PCMs) to prevent adverse effects to sensitive resources in its ROWs during O&M activities. These include conductor upgrades and maintenance work, replacement of substation equipment, and vehicle and equipment staging. SOPs would be followed at all times during all O&M activities throughout the project area. Western would conduct an annual training class on SOPs for all maintenance crews. Western also developed PCMs to proactively protect the sensitive resources in the field. PCMs are specific to each resource and O&M activity and are detailed on a tower span-by-span basis for impact avoidance. The SOPs would apply to all construction work in the SHA-FLN/FLN-KE corridor. The PCMs would be implemented in span-by-span segments, where applicable, along both the Shasta-Flanagan and Flanagan-Keswick 230-kV ROWs. The SOPs and PCMs have been reviewed by all land managers in the area, including the Bureau of Land Management (BLM) and U.S. Forest Service (USFS), which have jurisdiction over lands crossed by the SHA-FLN/FLN-KE line.

The purpose of Staff's reconductoring analysis is to inform the Energy Commission Committee, interested parties and the general public of the potential direct and indirect environmental and public health effects caused by the approval of the CGS project. This analysis examines the process of reconductoring and the nature and scope of the probable impacts of reconductoring, should it occur as a result of approval of the CGS project. The reconductoring analysis focuses on impacts that would likely occur at locations, such as pulling and tensioning sites and staging yards. The analysis is based upon information supplied by E&LW, as well as information gathered from Western and other sources.

Finally, this analysis draws conclusions as to the likelihood that the reconductoring could be accomplished with no significant environmental impacts, and identifies mitigation measures that could be enacted to ensure the reconductoring project would not cause significant impacts. Because the potential for impacts in several technical areas are essentially non-existent, several of the areas normally studied in a Staff Assessment have been eliminated from this analysis. These are: Air Quality, Facility Design, Hazardous Materials Management, Power Plant Efficiency, Power Plant Reliability, Worker Safety, Socioeconomic Resources, and Waste Management.

Impacts to those areas, if any, would be similar, but likely much less in severity, to those related to construction of the CGS project and its associated linear projects. The construction-related analysis and proposed mitigation measures in those sections of the FSA for the Colusa Generating Station project provide a general understanding of the potential impacts in those areas that could possibly, but not likely, be caused by a reconductoring project.

2.0 DESCRIPTION OF THE PROPOSED PROJECT

This Chapter identifies the specific transmission line segments that will be reconductored, and provides an overview review of the reconductoring process on a general level. It describes the basic work involved in reconductoring a transmission line segment, as well as specific designs (when known) for the reconductoring project that is a reasonably foreseeable result of the approval of the project.

2.1 PROJECT LOCATION

This Project proposes to reconductor the SHA-FLN/FLN-KE transmission line. As shown in **Appendix A, Figure 1**, the line extends from the Shasta Dam to the Keswick Substation downstream of Keswick Dam. The total length of the transmission line segment to be reconductored is approximately 8.75 miles and ranges in elevation from 700 to 1,400 feet.

Western has proposed reconductoring two segments of the SHA-FLN/FLN-KE 230-kV transmission lines and modification of protection and monitoring equipment at the three substations, should the Commission issue the CGS project a license to construct. The two SHA-FLN/FLN-KE transmission line segments consist of single 230-kV circuit with three conductors mounted on the existing lattice towers in the existing right-of-way. The SHA-FLN/FLN-KE transmission line begins at the Shasta Lake Substation at the base of the Shasta Dam adjacent to the east bank of the Sacramento River, then travels south for 2.56 miles to the Flanagan Substation. It continues south west approximately 6.19 miles to the Keswick Substation, also located adjacent to the east bank of the Sacramento River **(Appendix A, Figure 1)**. The alignment of this segment roughly parallels the Sacramento River between Shasta Dam and Keswick Dam. The SHA-FLN/FLN-KE transmission line reconductoring includes a total of 48 existing towers. Tower modifications and excavation work near the towers are not anticipated at this time. The width of the Western ROW for the transmission line ranges from 118 to 817 feet along the entire 8.75-mile segment and averages 397 feet wide. For most of its length, the SHA-FLN/FLN-KE line shares ROW with two other transmissions lines, which accounts for the width of the ROW.

The area surrounding the transmission line corridor is primarily undeveloped, with a few residential structures located within 500 feet of the Western ROW. The nearest residences are located approximately 160 feet from the transmission line. The entire study area has been significantly disturbed by vegetation management practices beneath the existing transmission line, by the construction of access roads, and by the historic mining and copper smelting practices in the region during the late 19th and early 20th centuries. Historic mining and smelting activities in Shasta County killed or removed

most the vegetation in the project site and vicinity. Mining activities also degraded many of the rivers and streams in this region.

Approximately 152 acres along approximately 4.2 total miles of the ROW overlap land that is under the jurisdiction of the Bureau of Land Management (BLM) Redding Field office. In addition, approximately 0.4 miles (27 acres) of the northern portion of the project corridor are located within the Shasta-Trinity National Forest. The Shasta-Trinity National Forest is managed by the USFS.

2.2 CONSTRUCTION METHODS

In general, reconductoring is accomplished by disconnecting the old conductor and using it like a rope to pull the new conductor through the temporary pulleys, called "travelers" or "sheave blocks," that are mounted on each tower, until it reaches the other end. Workers would access each tower by truck, then climb the tower or use a truck-mounted aerial bucket to access the tower in order to place the temporary pulleys on each tower and route the conductor through the travelers. If the old conductor is not in good enough condition to be used to pull in the new line, it would be used to pull a carrier cable, or "sock line," through the pulleys to the end of the segment to be replaced; the sock line would then be used to pull in the new conductors **(Appendix A, Figure 2)**.

The work would involve setting up two work crews on each end of the segment that is being replaced. Each crew would generally consist of two large tractor/trailer units, which either feed out the new line or wind in the old line on spools mounted on the trailers, and two or three utility trucks carrying tools, other materials, and workers, for a total of six to eight trucks and about 20 workers. One crew would set up at a "pull site" near a tower at one end of the pull, and the other at a "tensioning site" near a tower at the other end of the pull. The tensioning crew would employ a special tensioner truck, which is essentially a large drum winch that is used to put back tension on the conductor being pulled. Each pull generally is limited to two to three miles, and the crews would pull all three conductors (one three-phase circuit) at once.

The tensioning site crew would either climb or use a truck-mounted aerial bucket (also called a "cherry-picker") to access the tower, disconnect the old conductors, and attach them through the tensioner truck to the new conductor on spools on the large trucks. The pull site crew would also climb their tower, disconnect the conductors, and attach them to the spools in the large trucks below the tower. During this time, other crews would set up temporary structures across roads and other potentially inhabited areas to protect those areas in the unlikely event that a conductor breaks and falls to the ground.

Once all protective structures are in place and the pull and tensioning sites are ready, the pull crew will begin to carefully wind the old conductors onto spools on the trucks, thus pulling the new conductors through the pulleys on the towers along the segment being replaced. The tensioning crew will keep the conductors taught, preventing them from sagging to the ground or other objects in the right-of-way. Once the new conductors are in place, the crews will once again access each tower, disconnect the new lines from the pulleys and install them permanently to the insulator strings.

The crews usually pull the new conductors through one or more miles of transmission towers at a time, depending on the length of conductor on the reels, and availability of suitable set-up locations. Because the potential for environmental impact is generally nonexistent between the pull and tensioning sites, this analysis focuses particularly on examining potential effects at the pulling and tensioning sites, as well as other locations that could be disturbed by truck movement. Activities between the pull and tensioning sites are generally restricted to (1) accessing the towers (either by climbing or using a truck-mounted aerial bucket) to place the pulleys and to remove the conductor from the pulleys and refasten it once stringing is completed; and (2) work on the tower structure to repair or replace spars that are damaged, or to replace insulators.

Though determining precisely where the pull and tensioning sites would be located is not possible, they would generally be sited at “angle” towers, which are located where the line makes a change in direction of more than 10 degrees. Pulling the old conductors and reeling out the new conductors is easier at these locations because the pulling and tensioning equipment can be arranged in line with the transmission line. Conversely, the crews try to avoid pulling the line through one or more angle towers because the conductors cannot be efficiently pulled through such an angle. Pulling and tensioning can also take place at “dead-end” sites, which are towers where the transmission line is physically connected to the tower rather than merely passing through the insulator clamps. In general, they are located where one spool of conductor is spliced to the next spool. Dead-end sites are generally located at angle towers, but also can be located at towers that are in-line with the route, rather than at an angle to the route. Dead-end towers have significant structural strength and resist the forces of pulling.

The work crews would likely have a great deal of flexibility in choosing the locations of the pull and tension sites, as it may be possible to pull through the angles on some of these towers (less than 30 degrees). Because of the flexibility in locating work sites, crews can generally select sites that either avoid creating impacts altogether, or create less-than-significant impacts with certain mitigation measures enacted.

In addition to the angle towers, pulling and tensioning is also very likely at or near the towers located within the Shasta, Flanagan, and Keswick Substations footprints. Depending on the terrain and the number of angles and dead-end sites, five to eight pull sites would be used. All likely pull or tensioning sites would be accessible from existing roads. Because the locations of angle towers, limitations on pull lengths and conductor reel capacity, and suitability of pull and tensioning sites affect site selection, it is likely most or all of the pulling and tensioning sites will be the same locations used when the SHA-FLN/FLN-KE transmission line was originally constructed.

Also during the reconductoring process, the work crews may replace some or all of the insulators on all 48 transmission towers on the line. This work would involve accessing the tower with a truck-mounted aerial bucket or by climbing, removing the old insulator strings, and installing new ones. The new insulators would be delivered and held in place by the aerial bucket and or rigging attached to the tower. The towers would also be inspected for corrosion prior to reconductoring and, if necessary, would be repaired. Repairs can include corrosion removal by mechanical means, re-galvanizing and repainting.

Throughout the reconductoring project, temporary staging areas would be required for equipment and materials storage. The reconductoring project would require two or three staging yards, each about one acre in size, located near each end of the transmission line segments. These staging or "marshalling yards" would likely be located at existing storage areas near or at the substations during the construction period.

3.0 ANALYSIS OF RECONDUCTORING

3.1 BIOLOGICAL RESOURCES

Environmental Setting

The 230-kV SHA-FLN/FLN-KE line is located in Shasta County, California and ranges in elevations from 700 to 1,400 feet. The line begins at the Shasta Substation downstream of Shasta Dam, above the east bank of the Sacramento River and ends at the Keswick substation downstream of Keswick Dam, which is also on the east bank of the Sacramento River. The alignment of this segment roughly parallels the Sacramento River between Shasta Dam and Keswick Dam. The width of the Western ROW for the transmission line ranges from 118 to 817 feet along the entire 8.75-mile segment and averages 397 feet wide. The "study area" includes the project corridor and a 500-foot buffer on each side of the Western ROW for the transmission line corridor.

Based on previously conducted surveys by Western, maps and GIS data depicting vegetation and wetland communities in the transmission corridor show that the dominant natural vegetation communities include oak woodland, chaparral, and California annual grassland. The oak woodlands are composed of an overstory of interior live oak (*Quercus wislizenii*), California black oak (*Quercus kelloggii*), and blue oak (*Quercus douglasii*) interspersed with an understory of annual grasses and white-leaf manzanita (*Arctostaphylos viscida*). Other vegetation communities in the ROW include foothill pine chaparral, Great Valley willow scrub, Great Valley cottonwood riparian forest, and montane white alder forest. Foothill pine chaparral is dominated by white-leaf manzanita, foothill pine (*Pinus sabiniana*) and buckbrush (*Ceanothus cuneatus*). Great Valley willow scrub occurs along numerous seasonal streams and typically includes willow (*Salix* spp.) and button bush (*Cephalanthus occidentalis var. californicus*). Great Valley cottonwood riparian forest is located in the project corridor along one small seasonal stream. Montane white alder consists of riparian stands of white alder (*Alnus rhombifolia*). These vegetation communities also occur outside of the ROW in the adjacent portions of the study area. The biological resources in the portions of the study area beyond the Western ROW (500-foot buffer on each side of the Western ROW) were mapped using aerial photograph interpretation (URS2007j).

Potential jurisdictional waters of the U.S. within the ROW include tributaries of the Sacramento River, seasonal wetlands and vernal pools. The streams that intersect the corridor include Little Churn Creek, Sulphur Creek, and Moccasin Creek. Numerous seasonal streams also cross over portions of the ROW and a few vernal pools and seasonal wetlands are scattered throughout the corridor as well.

The entire study area has been significantly disturbed by construction of the original SHA-FLN/FLN-KE transmission line and two adjacent lines, vegetation management practices beneath the existing transmission line, construction of access roads, and historic mining and copper smelting practices in the region during the late 19th and early 20th centuries. Historic mining and smelting activities in Shasta County killed or removed most the vegetation in the ROW and vicinity. Mining activities also degraded many of the rivers and streams in this region.

Special-Status Species

Special-status species evaluated in this section include all Federal and State-listed species and species proposed for listing under the Federal and California Endangered Species Acts (FESA and CESA), State Species of Special Concern, plant species included on the California Native Plant Society (CNPS) List 1B or List 2, and BLM sensitive animal and plant species. Special-status species with the potential to occur in the project vicinity were identified from the following sources (URS2007j):

- United States Fish and Wildlife Service (USFWS) species lists for the USGS 7.5-minute Redding and Shasta Dam quadrangles;
- Birds that are listed in the Migratory Bird Treaty Act;
- All species occurrences in the California Natural Diversity Database (CNDDB) for the Redding and Shasta Dam USGS 7.5 minute quadrangles as well as the adjacent quadrangles;
- All species occurrences in the CNPS online inventory for the Redding and Shasta Dam USGS 7.5 minute quadrangles;
- California Department of Fish and Game's Habitat Conservation Planning Branch online sensitive species lists;
- BLM Animal and Plant sensitive species lists within range of the project corridor; and
- California BLM Sensitive Plants List (see Appendix A of Applicant's Response to Data Requests).
- California BLM Animal Sensitive Species List (see Appendix B of Applicant's Response to Data Requests).

From the list of special-status species that have the potential to occur within the reconductoring vicinity, species with no suitable habitat in the vicinity of the project corridor are not discussed further in this document. Appendix C of the Applicant's Response to Data Requests provides a list of special-status species that have the potential to occur within the project corridor and vicinity, the legal status of the species, typical habitat associations, and the likelihood that the species may occur in the project corridor (URS2007j, Appendix C). Based on literature reviews, vegetation community data obtained from Western, aerial photographs, technical reports, and database searches, the following special-status species may occur in the project corridor (URS2007j):

Wildlife

- Western burrowing owl (*Athene cunicularia hypugea*)
- Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)
- Bald eagle (*Haliaeetus leucocephalus*)
- Foothill yellow-legged frog (*Rana boylei*)
- North American green sturgeon (*Acipenser medirostris*)
- Central Valley steelhead (*Oncorhynchus mykiss*)
- Central Valley fall/late fall-run chinook salmon (*Oncorhynchus tshawytscha*)
- Central Valley spring-run chinook salmon (*Oncorhynchus tshawytscha*)
- Winter-run chinook salmon (*Oncorhynchus tshawytscha*)
- Vernal pool fairy shrimp (*Branchinecta lynchi*)
- Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)
- Oregon shoulderband snail (*Helminthoglypta hertleini*)
- Vernal pool tadpole shrimp (*Lepidurus packardi*)
- Siskiyou sideband snail (*Monadenia chaceana*)
- Pacific fisher (*Martes pennanti pacifica*)
- Pallid bat (*Antrozous pallidus*)
- Townsend's western big-eared bat (*Corynorhinus townsendii*)
- Pale big-eared bat (*Corynorhinus townsendii pallescens*)
- Fringed myotis (*Myotis thysanodes*)
- Small-footed myotis (*Myotis ciliolabrum*)
- Long-eared myotis (*Myotis evotis*)
- Yuma myotis (*Myotis yumanensis*)

Plants

- Bent-flowered fiddleneck *(Amsinckia lunaris)*
- Northern clarkia *(Clarkia borealis ssp. borealis)*
- Red Bluff dwarf rush *(Juncus leiospermus var. leiospermus)*
- Dubious pea *(Lathyrus sulphureus var. argillaceus)*
- Legenere *(Legenere limosa)*
- Cantelow's lewisia *(Lewisia cantelovii)*
- Bellinger's meadowfoam *(Limnanthes floccosa ssp. bellingeriana)*
- Shasta snow-wreath *(Neviusia cliftonii)*
- Ahart's paronychia *(Paronychia ahartii)*
- Canyon Creek stonecrop *(Sedum paradisum)*
- Yellow-twist horsehair (Bryoria toruosa)
- Red-pored bolete *(Boletus haemantinus)*

Critical Habitat

The Sacramento River below Keswick Dam is designated as critical habitat for the Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*) and Central California Coast Coho salmon (*Oncorhynchus kisutch*) (URS2007j). However, the transmission ROW does not overlap the designated critical habitat for these species. No other designated critical habitat is present along the transmission line corridor.

Permits Required

Approximately 152 acres along approximately 4.2 total miles of the of the transmission line ROW are located on public land managed by the BLM Redding Field Office. In addition, approximately 0.4 miles (27 acres) of the northern portion of the Shasta-Flanagan transmission line is located within the Shasta-Trinity National Forest, which is managed by the USFS. Western conducts vegetation management and other maintenance activities along the line under existing agreements with these agencies. If deemed necessary, Western would consult with BLM and the USFS prior to initiating reconductoring activities. Table 1 below lists the permits related to biological resources that may be required for the SHA-FLN/FLN-KE transmission line reconductoring. The final project design would determine which permits would be necessary.

APPENDIX A Table 1
Responsible Agencies and Required Permits

Responsible Agency	Permit/Approval
U.S. Army Corps of Engineers	Nationwide Permit #12 (utility line activities) Nationwide Permit #14 (linear transportation crossings – To qualify for NWP, impacts to waters of the United States must be less than 0.5 acre; 0.10 acre for non-reporting) Nationwide Permit #33 (temporary construction access, and dewatering)
U.S. Fish and Wildlife Service	No impacts to listed species or critical habitats are anticipated. However, Western must informally consult with the USFWS under Section 7 of the federal Endangered Species Act with a “may effect, but not likely to adversely effect” determination. A concurrence letter from USFWS is required. If potential impacts to listed species are identified that would result in a “likely to adversely effect” determination, Western must enter into formal consultation and a biological opinion from the USFWS would be required.

APPENDIX A Table 1 Responsible Agencies and Required Permits	
Responsible Agency	Permit/Approval
NOAA Fisheries Service	No impacts to listed species or critical habitats are anticipated. However, Western must informally consult with the NOAA under Section 7 of the federal Endangered Species Act with a "may effect, but not likely to adversely effect" determination. A concurrence letter from NOAA is required. If potential impacts to listed species are identified that would result in a "likely to adversely effect" determination, Western must enter into formal consultation and a biological opinion from the NOAA would be required.
Regional Water Quality Control Board	401 Water Quality Certification or Waiver

Source: URS2007j

Impacts of Reconductoring

Section 2.0 of this Appendix provides a discussion of the reconductoring process and how it would be accomplished. Potential impacts to biological resources caused by the reconductoring of the SHA-FLN/FLN-KE line could occur as a result of construction disturbance at or near the construction work sites that would be established for the reconductoring. These sites would include the pull and tensioning sites used to pull the new conductors onto the towers and potential sites for staging or marshalling yards.Five to eight pull sites used to pull the new conductors onto the towers would be needed. The site locations and average area of each site has not yet been determined. However, in general, pull sites for a 230-kV line are approximately 0.5 acre. As discussed in Section 2.0, the sites would very likely be the same ones used to construct the original line. Two or three one-acre staging areas would also be used during construction. These staging or "marshalling yards" would likely be located at existing storage areas near or at the substations where the vegetation is already disturbed. The tensioning/pull sites and staging areas overall would result in 4.5 to 7 total acres of temporary disturbance.

In addition, the work crews would need to access each of the 48 towers along the 8.75-mile line to install and remove travelers and permanently attach the new conductors. Work crews may replace some or all of the insulators on all 48 transmission towers. Truck access to each tower would be required using existing access roads that connect to main paved roads, such as Keswick Dam Road and Quartz Hill Road. The equipment needed for a typical reconductoring project would include puller/tensioners, large 10 wheel trucks, and other rubber-tired vehicles. Other tower modifications and excavation work near the towers is not anticipated at this time. In the event that such work is deemed necessary, this work could result in additional temporary and permanent impacts to biological resources.

Impacts that could occur include disturbance of habitat caused by movement of the construction equipment, disturbance of nesting activities caused by construction noise

and movement of machinery, degradation of sensitive aquatic resources, and potential take of listed species caused by construction activities. Therefore, reconductoring could potentially impact special status species and sensitive habitats within the existing Western ROW. This analysis focuses on the potential impacts that could occur at all work sites to special-status wildlife and plant species, wetlands and other regulated waters of the U.S., and discusses Western SOPs and PCMs, which have been incorporated into the impact minimization measures, and would avoid, eliminate, or reduce impacts to a less-than-significant level or compensate for those impacts.

Waters of the United States

The proposed transmission line reconductoring project would not likely require placement of fill material in waters of the U.S. All construction work sites and associated equipment would be placed in upland areas that have been previously disturbed. However, some of the activities could require minor ground disturbance, especially if tower modifications would be deemed necessary. Erosion from these sites could temporarily increase the quantity of fine sediment in some wetlands or waters that would degrade water quality. However, the impact minimization measures, listed below, would reduce this to a less than significant impact. Therefore, no significant impacts to wetlands or other waters of the U.S. would be anticipated.

Special-Status Wildlife Species

Fish. Several special status anadromous fish species are present in the Sacramento River below Keswick Dam. These species include green sturgeon, Central Valley steelhead, Central Valley fall/late fall-run chinook salmon, Central Valley spring-run chinook salmon, and winter-run chinook salmon. Keswick Dam is a barrier that prevents anadromous fish from migrating upstream in the Sacramento River. Tributaries of the Sacramento River that connect to the river north of Keswick Dam are not accessible to anadromous fish. Moccasin Creek, which passes through the project corridor, is an example of such a tributary.

Little Churn Creek, Sulphur Creek, and a few unnamed streams located along the transmission corridor are tributaries of the Sacramento River that connect to the River below Keswick Dam. The hydrology of these streams in the project corridor and vicinity is seasonal. It is likely that most of these streams are dry from late April to late November. Therefore, they would not provide any habitat for anadromous fish during most years, if at all, due to high temperatures and the lack of connectivity with larger tributaries.

Impacts to anadromous fish would depend upon the location of work sites, the timing of construction, and the manner in which the work is carried out. Construction activities could degrade water quality and interfere with the reproductive success of adult salmonids that utilize aquatic habitats downstream of the reconductoring project corridor, or could decrease the survival of juveniles. No significant impacts to special-status fish species would be expected since the construction work would utilize existing access roads, ground disturbance near aquatic habitats would be minimized, and erosion control methods would be implemented. This is proposed by the reconductoring project and required by Western's SOPs and PCMs, which are incorporated into the impact minimization measures listed below with each resource.

Branchiopods. Aquatic habitats in the project corridor and vicinity could potentially support special status branchiopods, such as the federally-listed vernal pool tadpole shrimp or the vernal pool fairy shrimp. A few seasonal wetlands and vernal pools are scattered within the Western SHA-FLN/FLN-KE ROW. These wetland features could potentially support special-status branchiopods. A formal wetland delineation has not yet been conducted for the reconductoring project, so additional wetlands could be located within the project corridor that could potentially support special-status branchiopods.

Direct mortality to special-status branchiopods could occur if construction work would occur in or adjacent to seasonal wetlands or vernal pool habitats that potentially support special-status branchiopods. Indirect effects to listed branchiopods could result if construction would change the hydrology in areas where drainages eventually connect to wetlands that support branchiopods. Because branchiopod species are linked to hydrology, significant changes in hydrology could cause the elimination of branchiopod populations. Implementation of the impact minimization measures, listed below, would substantially avoid potential impacts to listed branchiopods and reduce the impacts to a less than significant level.

Western Burrowing Owl. No occurrences of western burrowing owl are documented from the project corridor or vicinity. Burrowing owls typically utilize open, dry grassland, agricultural and desert habitats. The shrub-dominated chaparral and oak woodland communities along the transmission corridor are not typically utilized by this species.

Burrowing owls could utilize grasslands or other open habitats in the project vicinity. Burrowing owls greatly rely on ground squirrel burrows for year round shelter and nest sites. This species may also use human-made structures in the project corridor such as culverts, debris piles, or openings beneath pavement as shelter and burrowing habitat (URS2007j). No surveys have been conducted to determine whether ground squirrel burrows or other features in the project corridor might be occupied by burrowing owls. However, the proposed reconductoring project could result in direct or indirect impacts to burrowing owls, if they are present.

Direct impacts would include mortality to individual owls from destruction of nesting and wintering burrows during construction. Destruction or degradation of burrows, or destruction or degradation of foraging habitat within 350 feet of occupied burrows are considered impacts to this species (URS2007j).

Indirect impacts to nesting and foraging burrowing owls would extend 250 feet out from the limits of construction during the breeding season (February 1 through August 15) and 160 feet during the wintering season, as outlined in CDFG (1995) guideline (URS2007j). The reconductoring project would not result in permanent fragmentation or removal of habitat for burrowing owls.

If burrows located within 350 feet of the project corridor are occupied by western burrowing owls at the time of construction, the proposed activities could result in potentially significant impacts to this species. Potential impacts to this species would be

reduced to a less-than-significant level through the implementation of impact minimization measures listed below.

Western Yellow-billed Cuckoo. Western yellow-billed cuckoos use large blocks of riparian habitats for nesting, particularly woodlands with cottonwoods and willows (URS2007j). The Great Valley willow scrub and Great Valley cottonwood riparian forest within the reconductoring project corridor are small and fragmented with sparse over story cover. Small trees and shrubs and are not likely to support the western yellow-billed cuckoo. Therefore, the reconductoring project would not likely significantly impact this species. In addition, impact minimization measures, listed below, would further reduce the potential that the project would affect on this species.

Bald Eagle. In California, bald eagles breed almost exclusively within Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity counties (URS2007j). Suitable nesting and foraging habitat is usually associated with large bodies of water, including reservoirs, natural lakes, or rivers. Shasta Lake is located directly north of the project corridor, north of the Shasta Substation. There are two documented occurrences of bald eagle nests approximately two miles northwest of the Shasta Substation and three miles northeast of Shasta Substation (URS2007j). Bald eagles use the lake as foraging habitat, and may also use large portions of the project corridor for foraging opportunities. Bald eagles feed primarily on fish, but they are opportunistic feeders and they can also consume birds, mammals, and carrion. Woodlands within the project corridor may be used as foraging and nesting habitat by this species. If trees containing bald eagle nests are removed or major vegetation is cleared, there could be significant impacts to this species. With the implementation of the impact minimization measures, listed below, impacts to this species would be less than significant.

Pacific Fisher. The Pacific fisher is currently on the USFWS candidate species list; thus, it is not protected under the Federal Endangered Species Act. The Pacific fisher may use deciduous trees and riparian areas with high canopy covers within the project transmission corridor for hunting and dispersal. There have been two documented occurrences of this species south and southeast of Shasta Lake, approximately 2 and 2.5 miles northeast of Shasta Substation (URS2007j).

Tree removal and ground disturbing activities in hardwood and riparian habitats could cause the direct mortality of the Pacific fisher and/or habitat fragmentation and degradation of this species habitat. Implementation of the impact minimization measures, listed below, would reduce these impacts to less than significant level.

Foothill Yellow-legged Frogs. Foothill yellow-legged frogs have been observed in Cornish Creek approximately 0.5 mile west of the project corridor approximately 1.2 miles south of Shasta Substation (URS2007j). Foothill yellow-legged frogs spend most of their time near streams. Construction activities near streams and riparian habitat have the potential to impact this species. Implementation of the impact minimization measures, listed below, would avoid or substantially minimize any impacts to streams and riparian habitat of the foothill yellow-legged frog. Therefore, the reconductoring project would not significantly impact this species.

Valley Elderberry Longhorn Beetle. The valley elderberry longhorn beetle is nearly always found on or close to its host plant the elderberry shrub (Sambucus species). Numerous elderberry bushes have been identified within the SHA-FLN/FLN-KE transmission ROW. This species could be impacted, if elderberry bushes are located within 100 feet of ground-disturbing activities. Implementation of the impact minimization measures, listed below, would reduce potential impacts to the valley elderberry longhorn beetle to a less-than significant level.

Bats. The pallid bat, Townsend's western big-eared bat, pale big-eared bat, fringed myotis, small-footed myotis, long-eared myotis, and Yuma myotis may roost in rock crevices and ledges, caves, tree hollows, and sheltered areas within the project corridor. With implementation of the impact minimization measures, listed below, (see Section 3.4 of this Appendix), the final project design would minimize noise and would avoid bat roosting habitat and aquatic foraging habitat. As a result, impacts to these species would be less-than significant.

Snails. The Oregon shoulderband snail and Siskiyou sideband snail may be found in rocky fissures and woody debris along the transmission route. Within the corridor, the Siskiyou sideband snail may also be found in the lower reaches of major drainages, in caves, and in shrubby areas in riparian corridors. If ground-disturbing activities occur in these habitats there may be direct mortality or injury to these species. Indirect adverse effects could result from the modification of their habitats in or adjacent to the construction work sites (URS2007j). Impacts to these species would be less than significant with implementation of the impact minimization measures, listed below.

Special-Status Plant Species

No vegetation clearing would take place along the alignment with the reconductoring activities. The existing transmission corridor is already maintained with adequate vegetation clearance from the lines and existing roadways would be used. Impacts to special-status plant species would be substantially avoided with implementation of the impact minimization measures listed below.

Oak Trees. Oak woodlands in the project corridor are composed of interior live oak, California black oak, and blue oak. Potentially significant impacts to oak trees might include (1) removal of trees during construction, or (2) construction within the drip line of oak trees. The drip line of the oak is assumed to correspond to the extent of the oak root zone. Construction within the drip line could cause soil compaction that would damage the roots of the tree and could result in tree mortality. Impacts to these species would be less than significant with implementation of the impact minimization measures listed below.

Vascular Plants. Habitat for special-status vascular plants is associated with cismontane woodland, valley and foothill grassland, chaparral, vernal pool, and seep habitats in the project corridor. The following special-status vascular plant species may be impacted by the proposed project, if they occur in the area of construction: bent-flowered fiddleneck, northern clarkia, Red Bluff dwarf rush, dubious pea, legenere, Cantelow's lewisia, Bellinger's meadowfoam, Shasta snow-wreath, Ahart's paronychia,

and Canyon Creek stonecrop. Impacts to these species would be less than significant with implementation of the impact minimization measures, listed below.

***Lichen*.** Habitat for yellow-twist horsehair in the project corridor is associated with oak trees. This species is found on trunks and branches of trees in well-lit, open stands, on oak and pine trees. There is potential for impacts to this species, if it occurs in the area of construction. However, impacts to these species would be less than significant with implementation of the impact minimization measures listed below.

Fungi. Habitat for red-pored bolete is associated with deciduous trees (e.g., oak trees) along the transmission corridor. There is potential for impacts to this species, if it occurs in the area of construction. However, impacts to these species would be less than significant with implementation of Western SOPs and PCMs and the mitigation measures described below.

Impact Minimization Measures

General Measures

With implementation of Western's SOPs and PCMs, wetlands would be avoided by placing pull-tensioning sites on upland, ruderal areas or paved surfaces. Breeding birds would be avoided by limiting construction periods or by installing noise attenuation on construction equipment. Vehicle use would be limited in areas where sensitive habitats are located. If the aforementioned means of impact avoidance were found to be infeasible at the time of construction, a helicopter could be used to minimize ground disturbances. Further, construction activities would be monitored by qualified personnel. However, no formal reconductoring plan would be developed until Western prepares its EA and conducts its own environmental review of the reconductoring project, which could require implementation of additional mitigation measures. With implementation of Western's SOPs and PCMs that would address potential impacts specific to this reconductoring project on a tower-by-tower basis, it is likely that the identified reconductoring project could be accomplished without creating a significant impact to biological resources. Before mitigation can be proposed, however, the project and its potential impacts must be clearly defined, including exact identification of work site locations.

Western's environmental SOPs and PCMs for reconductoring projects include identification of and avoidance of critical habitat and endangered species. Construction activities would be limited during the nesting season in compliance with the Migratory Bird Treaty Act. An additional biological survey would also be conducted prior to initiation of the project to ensure there are no nesting birds on towers or conductors. Although the construction activities and duration would be relatively minor and would occur in an existing transmission corridor, the following general measures, SOPs, and/or PCMs should be implemented during construction to minimize impacts to sensitive biological resources.

- ***Establish Environmentally Sensitive Areas.*** Additional direct and indirect impacts to sensitive biological resources (including wetlands, other waters of the United States, and sensitive habitats for listed species) throughout the project corridor would be avoided or minimized by designating these features outside of the construction impact area as environmentally sensitive areas (ESAs) on project plans and in project specifications. Information related to the locations of ESAs and their treatment would be shown on contract plans and discussed in the Environmental Awareness Training. ESA provisions would include, but are not limited to, the use of temporary high-visibility orange fencing to delineate the proposed limit of work in areas adjacent to sensitive resources, and to delineate and exclude sensitive resources from potential construction impacts. Contractor encroachment into ESAs would be restricted (including the staging/operation of heavy equipment or casting of excavation materials). ESA provisions would be implemented as a first order of work, and remain in place until all construction activities have been completed. All materials that are used to denote ESAs shall be removed at the completion of all construction activities.
- ***Biological Monitor*.** A qualified biologist would monitor all construction activities that occur near sensitive resources. Construction activities would not proceed without presence of a biological monitor. The biological monitor would have the authority to stop construction, if necessary, to avoid impacts to special status species or sensitive habitats.
- ***Environmental Awareness Training.*** All construction personnel working in the project corridor would be required to attend environmental awareness training. At a minimum, the training shall include: (1) an overview of the regulatory requirements for the transmission line reconductoring, (2) descriptions of the special-status species in the reconductoring project corridor and the importance of these species and their habitats, (3) the general measures that are being implemented to minimize environmental impacts, and (4) the boundaries within which equipment and personnel would be allowed to work during construction. Western would maintain a record of all workers who have completed the program.
- ***Limit Vegetation Removal*.** Vegetation removal would be limited to the absolute minimum amount required for construction.
- ***Erosion Control.*** Temporary erosion control devices would be installed on slopes where erosion or sedimentation could degrade sensitive resources.
- ***Construction Clean-up*.** All temporary fill and construction debris would be removed from the project site after completion of construction activities.
- ***Construction Scheduling.*** Construction would be timed to minimize potential impacts to sensitive biological resources.

Bureau of Land Management and Forest Service "Survey and Manage" Species

Prior to initiating construction, additional Western surveys would be conducted for "Survey and Manage" (S&M) species known or suspected to occur on lands that are managed by the Redding Field Office of the BLM and the Shasta-Trinity National

Forest.[1] S&M is a list of 296 species and four arthropod guilds. There are requirements to complete pre-disturbance surveys for 65 species, manage known sites for most, and conduct broad surveys for all.

In late July 2007, the BLM and Forest Service issued Records of Decision (ROD) on the "2007 Final Supplement to the 2004 Final Supplemental Environmental Impact Statement (FSEIS) To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines." The intent of the 2007 Final Supplement is to address the following two court cases that were filed by a coalition of environmental and conservation groups against the Departments of Agriculture and Interior challenging the decision in the 2004 FSEIS to eliminate the S&M program:

1. Three inadequacies found by the U.S. District Court for the Western District of Washington in *Northwest Ecosystem Alliance et al. v. Mark E. Rey, et al.,* No. 04-844P, W.D. Wash (August 1, 2005, January 9, 2006); and

2. Potential implications to Survey and Manage of the November 6, 2006, U.S. Court of Appeals for the Ninth Circuit ruling against the BLM on the Cow Catcher and Cottonsnake timber sales.

The Proposed Action (Alternative 2 in the 2007 FSEIS Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines) would remove the S&M Mitigation Measure Standards and Guidelines from the Land and Resource Management Plans in the Northwest Forest Plan area. Instead conservation of rare and little known species would rely on other elements of the Northwest Forest Plan if additional species-specific management is needed. However, until final rulings are made on the outstanding court cases in response to the 2007 ROD, the S&M Standards and Guidelines from January 2001 ROD would apply.

Therefore, surveys for the species listed below would be conducted in consultation with the BLM and Forest Service and in accordance with their protocols. Associated mitigation to species found would be required (BLM2007). BLM and Forest Service S&M species with potential suitable habitat within the SHA-FLN/FLN-KE project site include: bent-flowered fiddleneck, northern clarkia, Red Bluff dwarf rush, legenere, Cantelow's lewisia, Bellinger's meadowfoam, Shasta snow-wreath, Ahart's paronychia, Canyon Creek stonecrop, yellow-twist horsehair, red-pored bolete, western burrowing owl, Foothill yellow-legged frog, Oregon shoulderband snail, Siskiyou sideband snail, fringed myotis, small-footed myotis, long-eared myotis, and Yuma myotis (URS2007j).

[1] Survey and Manage (S&M) is a set of mitigation measures of the Northwest Forest Plan (NWFP) for little-known and rare species (amended in 2001). S&M has no direct link to the Endangered Species Act or special-status species programs for the Forest Service or BLM. There are three criteria for species to be listed as S&M: (1) The species must occur within the NWFP area. (2) The species must be closely associated with late-successional or old-growth forest. (3) The reserve system and other NWFP Standards and Guidelines do not appear to provide for a reasonable assurance of species persistence. The area covered by the NWFP extends, roughly, from California north of Mt. Shasta to the Canadian border, west of the Cascades, and includes approximately 55 million acres of public lands.

Management Indicator Species

Management Indicator Species (MIS) are identified in the Land and Resource Management Plan of Shasta-Trinity National Forest and are generally identified to represent habitat types that occur within the national forest boundary and/or because they are thought to be sensitive to National Forest System management activities. The reconductoring project would not likely adversely affect MIS due to the short construction duration, the small construction area relative to the entire National Forest property, the limited ground disturbance, and the fact that all activities would take place in a cleared, managed ROW. As such, MIS would not likely need to be considered.

Waters of the United States

All wetlands and other waters of the U.S. shall be designated as environmentally sensitive areas (ESAs) and shall be clearly marked and avoided. Therefore, no impacts to wetlands or other waters of the U.S. are anticipated. Disturbance to existing grades and vegetation shall be limited to the actual site of the project and necessary access routes. Placement of all staging areas and other facilities should avoid and limit disturbance to waters of the U.S. Existing ingress or egress points would be used. Parking of equipment, project access, supply logistics, equipment maintenance, and other project-related activities would occur at a designated staging area. Following completion of the work, the topography of the sites would be restored.

Once the locations of the construction work sites have been determined, a wetland delineation would be conducted to assess the status of the potentially jurisdictional wetland habitats mapped by Western and to delineate any other potentially jurisdictional waters of the U.S. near the work areas. If permanent and/or temporary fill to waters of the U.S. cannot be avoided, additional avoidance and minimization measures and compensatory mitigation would be required depending on the type of habitat impacted. These mitigation options would be developed in consultation with the Army Corps of Engineers and the Regional Water Quality Control Board.

The impact minimization measures listed in the Water and Soils Section (Section 3.8) shall be implemented for construction activities in and around water bodies associated with the new tower footings, if tower modifications are found necessary based on final engineering.

Wildlife

Fish. Because all construction work would be completed using existing access roads and no construction activities would occur in watercourses, special-status fish species would not be impacted by the transmission line reconductoring.

In the final project design, if it is determined that construction activities cannot avoid working in a channel, avoidance and minimization measures would be implemented to reduce impacts to special-status fish. In-stream construction activities would be limited to the period between June 1 and September 15, to minimize or avoid impacts to aquatic resources, including listed anadromous fish species. During construction, the available flows would be maintained across the work site at all times. If dewatering of some area is required during construction, a qualified biologist would be present during

the dewatering to ensure that fish are not injured. Fish that may be trapped would be netted and removed from the dewatering area. Additionally, a net or some other type of fish screen would be used on the end of the dewatering pump to prevent any fish from being sucked into the pumping mechanism, providing the biologist with adequate opportunity to remove the fish from the area.

Disruption of the streambed and adjacent riparian corridor would be minimized. All stream and riparian habitat areas outside of the construction limits would be designated as ESAs. All disturbed areas would be revegetated, including disturbed areas adjacent to the active channel. Implementation of these measures would reduce impacts to special-status fish to less-than-significant levels.

Branchiopods. The presence of vernal pool tadpole shrimp and vernal pool fairy shrimp is assumed in vernal pools and other seasonal wetlands that are potentially suitable habitats for the listed vernal pool fairy shrimp or the vernal pool tadpole shrimp. Therefore, the following measures would be implemented to avoid potential adverse effects to these species:

- No ground-disturbing construction activities would occur within 250 feet of suitable branchiopod habitat (vernal pools and/or seasonal wetlands).
- All construction activities within 250 feet of suitable branchiopod habitat would be limited to the dry season (May 1 to October 15) when listed vernal pool branchiopods are only present as durable resting eggs (cysts) and branchiopod habitat is less likely to be indirectly affected by erosion or sedimentation.
- Prior to construction, a buffer zone located 250 feet from the wetland margins of the branchiopod habitat with potential to be indirectly disturbed during construction, would be clearly marked as sensitive areas by a qualified biologist. All materials to mark these buffer zones would be removed at the end of construction.
- All ground-disturbing activities would be excluded from the buffer zone for the duration of construction. Only rubber-tired vehicles would be allowed within the buffer zone. No vehicles or personnel would be allowed within the wetland boundaries of the suitable branchiopod habitat to protect the cysts of listed vernal pool branchiopods.
- Straw wattles or silt fences would be used, as needed, to prevent sediment from disturbed areas reaching pools during rainy periods.
- All on-site construction personnel would receive a USFWS-approved worker environmental awareness training program to alert them of the established avoidance measures.
- A USFWS-approved biologist would monitor construction-related activities at the proposed SHA-FLN/FLN-KE corridor to ensure that no habitat destruction occurs.
- Upon completion of the project, all areas that have been temporarily affected by the project would be restored to approximate original site conditions (e.g., topography, hydrology, and vegetation).

Compensatory mitigation may be necessary for indirect and direct impacts to vernal pool fairy shrimp and vernal pool tadpole shrimp and would be subject to approval by

USFWS. Implementation of these measures would reduce impacts to special-status branchiopods to less-than-significant levels.

Western Burrowing Owl. Additional pre-construction surveys would be conducted within grasslands in the project footprint and within suitable habitat 500 feet from the project footprint. Burrowing owl and burrow surveys would be conducted at least once between April 15 and July 15 and at least once between December 1 and January 31. The locations of all observed burrowing owls and active burrows would be marked on a map of the project corridor at a scale sufficient to accurately show the distance of observed owls and active burrows to the limits of construction. If no owls or burrows are present, no minimization measures, as discussed below, would be necessary.

A mitigation and management plan should include the following CDFG Staff Report on Burrowing Owl Mitigation (1995) avoidance, minimization, and mitigation measures for impacts to burrowing owls, which have been incorporated into Western's PCMs as follows:

- From February 1 to August 31, herbicide application and other O&M activity should be prohibited within 250 feet of potential burrowing owl nesting dens (ground squirrel burrows, culverts, concrete slabs, debris piles that show signs (e.g. whitewash, feathers, pellets, etc.) they support nesting burrowing owls);
- From September 1 through January 31, disturbance should be prohibited within 160 feet of potential burrowing owl dens; OR
- A qualified biologist should conduct nesting and wintering surveys using methods described in California Burrowing Owl Consortium 1993. If nesting or wintering activity is detected, a qualified biologist would mark and monitor an appropriate non-disturbance buffer in the vicinity of burrows that have been active within the last three years. Within the buffer zone, all O&M activities and herbicide applications would be prohibited from February 1 to August 31.

No destruction of occupied burrows would be anticipated. However, if removal of occupied burrows would be required during reconductoring activities, passive relocation techniques, as described in California Burrowing Owl Consortium 1993, should be used. Compensation for removal of occupied burrows might include enhancement of unsuitable burrows adjacent to the project corridor (enlarged or cleared of debris) or construction of new burrows at a ratio of 2:1 on adjacent habitat. A complete report, including status of each burrow, would be provided to CDFG after construction is complete.

Artificial burrows should be monitored daily for one week to confirm owl use of burrows before active burrows are excavated. Western would hire a qualified biologist to conduct yearly monitoring of the artificial burrows for a minimum of three years or until the performance criteria of the mitigation has been met to the satisfaction of the CDFG. The biologist would assess the artificial burrows for occupancy, stability, and accessibility. If the burrows have degraded and can no longer be used by burrowing owls, they should be repaired/replaced during the non-breeding season (September 1st through January 31st) when the owls are not nesting and juveniles are not present.

When destruction of occupied burrows is unavoidable to offset the loss of foraging and burrow habitat, a minimum of 6.5 acres of foraging habitat per pair or unpaired resident bird should be set aside and permanently protected. Protected lands should be adjacent to occupied burrowing owl habitat or at a location acceptable to CDFG. Implementation of these measures and/or PCMs would reduce impacts to burrowing owls to less-than-significant levels.

Western Yellow-billed Cuckoo. A reconnaissance survey should be conducted to determine if habitat in the project corridor is suitable for nesting western yellow-billed cuckoo. If no suitable habitat is observed for this species, no mitigation measures would be necessary for this species. If suitable nesting habitat is observed for western yellow-billed cuckoo, the following avoidance and minimization measures will be implemented to avoid impacts to this species:

- Any vegetation clearing activities within 300 feet of any riparian habitat within the project corridor would be implemented outside of the western yellow-billed cuckoo breeding season.
- If construction cannot avoid the western yellow-billed cuckoo breeding season and would occur within 300 feet of riparian habitat, the following measures should be implemented:
    - A qualified biologist should conduct a pre-construction survey in riparian areas with suitable habitat (e.g. cottonwoods, willows) for this species 14 days prior to initiation of construction activities. The biologist would ensure there are no nesting birds on towers, substations, or trees that would be removed or cut.
    - If western-yellow billed cuckoo are identified in the SHA-FLN/FLN-KE project corridor, no clearing activities should take place in those identified areas and the adjacent riparian areas within 300 feet. Western would notify USFWS and CDFG regarding the findings and identify appropriate exclusion limits, monitoring requirements, and/or timing constraints to protect the western yellow-billed cuckoo.
    - If a lapse in project-related work of 30 days or longer occurs, another survey should be conducted before the work can be reinitiated. If new nest sites are identified, Western would coordinate with USFWS and/or CDFG as described above.

Bald Eagle and Other Raptors. The following avoidance and minimization measures will be implemented to avoid impacts to bald eagles and other raptors:

- If construction would occur during the period from January 1 to August 15, a qualified biologist should conduct a pre-construction survey 14 days prior to initiation of the construction activities to ensure there are no nesting birds on towers, substations, or trees that would be removed or cut. The surveys would be conducted within 0.25 mile of proposed construction activities.
- If nesting raptors are detected within 0.25 mile of the project area, Western would contact USFWS and/or CDFG to identify appropriate exclusion limits, monitoring requirements, and/or timing constraints.

- If a lapse in project-related work of 30 days or longer occurs, another survey should be conducted before the work can be reinitiated. If new nest sites are identified, Western would coordinate with USFWS and/or CDFG as described above.

The implementation of these avoidance and mitigation measures would reduce impacts to bald eagles and other raptors to less-than-significant levels.

Birds Listed in the Migratory Bird Treaty Act. A qualified biologist would survey for nests of birds that are listed in the MBTA. Surveys specific to species that only appear in the MBTA will take place not more than 14 days prior to construction at any given site. If active nests are found, Western would consult with USFWS regarding appropriate action to comply with the Migratory Bird Treaty Act. If a lapse in project-related work of 30 days or longer occurs, another survey and, if required, consultation with the USFWS should be conducted before the work is reinitiated. Implementation of these measures would reduce impacts to these species to less-than-significant levels.

Pacific Fisher. This species is not protected under the Federal Endangered Species Act because the West Coast distinct population segment of pacific fisher is listed as a Federal candidate species. Western's PCMs would require that off-road vehicle travel and activity would be prohibited in potential fisher habitat between February 1 and August 1. If off-road travel or ground disturbance are required in potential fisher habitat at any time of year, disturbance to downfall, snags, downed trees/logs, and stumps would be minimized. Snags, downfall, and stumps would never be moved or removed unless they are a specific safety concern. This would ensure that impacts would be less than significant. No such activity is anticipated given the nature of the reconductor project.

Foothill yellow-legged frogs. If ground-disturbing construction activities are required within streams or riparian habitats, a CDFG-approved biologist would conduct a pre-construction clearance survey of aquatic (riparian corridor) and adjacent upland habitat within 24 hours prior to the commencement of construction activities for any given site. Any foothill yellow-legged frogs found would be safely re-located out of the construction zone by a CDFG-approved biologist who possesses a valid CDFG Scientific Collecting Permit. A biological monitor would be available during construction, and if a frog is encountered, the monitoring biologist should have the authority to stop construction activities to relocate the frog or to determine that the frog would not be harmed. Implementation of these measures would reduce impacts to these species to less-than-significant levels.

Valley Elderberry Longhorn Beetle. Shrubs located within the project area should be clearly fenced and marked as sensitive areas. All materials to mark the buffer zone would be removed at the end of construction. All construction activities would be separated from elderberry shrubs by a minimum buffer width of 100 feet. In compliance with the USFWS "Conservation Guideline for the Valley Elderberry Longhorn Beetle (1999)," ('99 Guidelines) construction personnel would be briefed on the location of the shrubs and the avoidance requirements and signs will be erected with details on why the habitat must be avoided. If areas surrounding elderberry shrubs are disturbed, those areas will be restored and revegetated (URS2007j).

Elderberry shrubs that cannot be avoided would be transplanted to suitable locations within, or adjacent to the project area. Each elderberry stem measuring 2.5 centimeters (1 inch) or greater in diameter at ground level that would be adversely affected (including transplanted shrubs) must be replaced with cuttings at ratios specified in the ’99 Guidelines. The numbers of elderberry seedlings/cuttings and associated riparian native trees/shrubs to be planted as replacement habitat would be determined by the stem size class of the affected elderberry shrubs, the presence or absence of exit holes, and whether a proposed SHA-FLN/FLN-KE project would lie in a riparian or non-riparian area.

Cuttings would be obtained from the plants to be transplanted, and from other nearby plants, if necessary. The installation of these cuttings would be accompanied by the installation of other native plants that are associated with elderberries. These plants may include willows (Salix spp.), cottonwoods (Populus fremontii), alders (Alnus rhombifolia), Oregon ash (Fraxinus latifolia), and valley oaks (Quercus lobata). Plantings will be from seed or cuttings taken from local stock. The number of cuttings to be planted are determined by the ratios specified in the ’99 Guidelines. Implementation of these measures would reduce impacts to the valley elderberry longhorn beetle to less-than-significant levels.

***Bats*.** Potential bat roosting habitat may be present at the project corridor. A qualified biologist should survey construction sites for potential bat roosting habitat prior to the start of any ground-disturbing activities. This habitat might include abandoned mine shafts, caves, crevices in cliff faces, caves, tree hollows, and rock ledges where roosting bats may be present. Potential roosting sites for bats would be avoided. Implementation of these measures would reduce impacts to these species to less-than-significant levels.

Snails. Surveys for the Oregon shoulderband snail and the Siskiyou sideband snail should be conducted if ground-disturbing activities would occur in habitats that are potentially occupied by these species. Surveys would be conducted in accordance with the Survey Protocol for Survey and Manage Terrestrial Mollusk Species from the Northwest Forest Plan, Version 2.1 (2003) and in conjunction with consultation with the USFS and BLM. Federal lands adjacent to the project corridor should also be surveyed if construction activities may cause a significant negative effect on the species habitat or the persistence of the species on those lands (URS2007j). The determination of which adjacent areas may be affected depends on local site conditions and should be documented by a qualified biologist. Mitigation measures would be developed once surveys have been conducted and are subject to approval by the BLM and USFS. Implementation of these measures would reduce impacts to these species to less-than-significant levels.

Plants

***Oak Trees*.** Trees in the Western ROW are managed in accordance with the Sierra Nevada Region’s Integrated Vegetation Management Program and construction would be in conformance with Western’s Integrated Vegetation Management Environmental Guidance Manual. If oak tree removal is required, a qualified biologist would record the

species, location, and size of all oak trees removed by construction activities. Clearing of vegetation would be confined to the minimal area needed to conduct the construction activities.

Tree impacts are regulated under Section 1600 of the California Fish and Game code, and the following State and local ordinances:

- California Oak Woodlands Law states that if a county finds that a project within its jurisdiction has a significant effect to oak woodlands, four mitigation alternatives are available to proportionally mitigate significant impacts to oak woodlands habitat:
    3. Conserve trees within oak woodlands with a DBH (Diameter at Breast Height) of five inches or more through the use of conservation easements.
    4. Plant an appropriate number of trees, including maintaining plantings and replacing dead or diseased trees. Trees must be maintained for seven years.
    5. Contribute funds to the Oak Woodlands Conservation Fund, as established under subdivision (a) of Section 1363 of the Fish and Game Code, for the purpose of purchasing oak woodlands conservation easements.
    6. Other mitigation measures developed by the County.

Counties shall require one or more of these options for a project and the planting of oaks shall not fulfill more than 50 percent of the required mitigation. Therefore, the planting of oaks must always be accompanied by another mitigation alternative.

- Shasta County does not require oak tree protection or replacement. The County has voluntary guidelines that recommend avoiding impacts to oak trees and the replacement of trees removed during construction.

Vascular Plants. The following measures should be implemented to avoid impacts to special-status vascular plant species:

- A qualified botanist would conduct surveys for special-status vascular plant species throughout the SHA-FLN/FLN-KE project corridor. All surveys would be conducted during the period when these species are identifiable. In the event that any special-status vascular plant species are present or assumed present within and immediately adjacent to the limits of construction, these species would be avoided to the extent feasible.
- A 100-foot buffer zone around special-status vascular plant occurrences should be clearly marked by a qualified biologist prior to construction. Signs and fencing would be maintained for the duration of construction. All vehicles, construction personnel, and equipment would be required to avoid marked buffer zones.
- Avoidance measures could also include fencing areas for avoidance during construction, and use of straw wattles or silt fences to prevent sedimentation in areas that contain the plants.
- All natural areas temporarily disturbed by project activities would be revegetated using plant species that are locally native.

It is anticipated that these measures would be sufficient to avoid impacts to any special-status vascular plant species that may be present. If impacts to special-status species vascular plant species are avoided, no compensatory mitigation would be required. However, if impacts to special-status vascular plant species are unavoidable, additional compensatory mitigation measures would be required. Unavoidable impacts to special-status vascular plant species would be mitigated by implementing the following:

- Preservation, enhancement, and/or restoration of existing occurrences of special-status plant species at a ratio of 3:1 based upon the area of habitat affected.

If compensatory mitigation is required, the selected option would be subject to approval by CDFG and/or USFWS. The implementation of these avoidance and mitigation measures would reduce impacts to special-status vascular plant species to less-than-significant levels.

Lichen. Although unlikely, if the proposed project would require the cutting and/or removal of trees, surveys for yellow-twist horsehair would be conducted before any trees are disturbed. The surveys would be in accordance with Survey Protocols for Survey and Manage Category A&C Lichens in the Northwest Forest Plan, Version 2.1, and in conjunction with consultation with BLM and USFS. Mitigation measures would be developed once surveys have been conducted and would be subject to approval by the BLM and USFS. Implementation of these measures would reduce impacts to these species to less-than-significant levels.

Fungi. If the proposed project would require the cutting and/or removal of trees, surveys for red-pored bolete would be conducted before any trees are disturbed. BLM and USFS would be consulted to develop the appropriate survey methodology and any potential mitigation measures. Implementation of these measures would reduce impacts to these species to less-than-significant levels.

Conclusion

Because it appears some of the reconductoring work would occur in or near sensitive species, habitats, and/or waters of the U.S., Staff concludes that reconductoring the SHA-FLN/FLN-KE 230 kV transmission line could adversely impact sensitive biological resources in and/or adjacent to the transmission line corridor. Potential impacts include construction noise effects on nesting activities, and construction activity physical effects on wetlands.

It is Staff's opinion that impact avoidance measures included in Western's SOPs and PCMs would help reduce potentially significant biological impacts to levels less than significant. However, in the unlikely event that new tower foundations are required, habitat disturbances could be permanent in nature.

Without a complete description by Western of what would be required for the reconductoring process, and where that work will be conducted, it is not possible to provide a complete analysis of potential adverse impacts to biological resources. Staff recommends that after construction plans are finalized, a complete project description (including wetland delineations, results of all sensitive species surveys, and a revised assessment of potential impacts) be developed as part of Western's EA.

Activities associated with reconductoring the transmission line would require compliance with applicable Federal, State and local laws, ordinances and regulations, including: Federal and State Endangered Species Acts, Federal Migratory Bird Treaty Act, and Federal and State Clean Water Acts. Specific agency permits might be required before any reconductoring work could commence (see Table 1 above). To determine which permits may be applicable to reconductoring the transmission line, Staff recommends that Western should consult with the following agencies: U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Army Corps of Engineers, Central Valley Regional Water Quality Control Board, and the California Department of Fish and Game.

Therefore, if the reconductoring work complies with all applicable LORS, mitigation measures proposed by the Applicant are implemented, and standard Best Management Practices, SOPs and PCMs for construction activities are employed, the reconductoring of the SHA-FLN/FLN-KE line would not likely create significant impacts to Biological Resources.

3.2 CULTURAL RESOURCES

Environmental Setting

As an indirect result of the CGS project, reconductor of the Western's SHA-FLN/FLN-KE transmission line may be required. The SHA-FLN/FLN-KE line extends 2.56 miles south from Shasta Dam to the Flanagan Substation, and then south and west 6.19 miles to the Keswick Substation, which is located adjacent to the Sacramento River in northern California. The two SHA-FLN/FLN-KE transmission line segments consist of a single 230-kV circuit with three conductors mounted on existing lattice towers in an existing right-of-way. The length of the reconductoring effort would total 8.75 miles. Numerous streams are present along the existing route, and it is fairly close to the Sacramento River. Therefore, it appears that the route would likely be sensitive for cultural resources.

A records search was conducted by URS on September 19, 2006, and included a 0.5-mile wide corridor centered on the transmission line (URS2007j). In addition to resources filed at California Historic Resources Information System (CHRIS), a number of sites recently identified by Western were found within the SHA-FLN/FLN-KE transmission line area, but have not yet been filed at CHRIS. Synthesis of these sources indicates that 70 cultural resources have been identified in the 0.5-mile wide research area. The majority of the documented resources consist of historic sites related to mining activity, such as roads, trails, refuse dumps, mining sites, ditches, and prospect pits. Prehistoric resources, consisting of lithic scatters, seasonal campsites, and village sites, and sites containing both prehistoric and historic components, are also present. Site density is highest in the vicinity of Keswick Substation and reflects intensive historic mining activities that occurred in this area.

There are nine sites that fall within the SHA-FLN/FLN-KE transmission line corridor, and an additional seven sites that are located within 100 feet of the transmission line corridor. The nine sites falling within the SHA-FLN/FLN-KE ROW include (URS2007j):

- One prehistoric resource (WNA0405 09, a lithic scatter);
- One site with both prehistoric and historic-era components (CA-SHA 1968/H); and
- Seven historic-era resources (WNA1005 186, mining tailings; CA-SHA 3454H, a mining complex; NSR-WAP 001, an historic-era trash scatter; WNA0605 73, mining features; WNA0605 64, mining prospects; CA-SHA 3865H, the mining-related Jax Road System; and CA-SHA 3935H, a segment of the Old Diggings Railroad Grade).

Additional sites located more than 100 feet from the line have been identified along roads that may be used to access this line, however, no grading to access roads would be required with this project. The majority of the previously recorded sites have not been evaluated for eligibility for listing on the National Register of Historic Places. Site CA-SHA 1968/H has been determined as not eligible for listing on the National Register of Historic Places.

If cultural resources, including structures, are more than 45 years old, and might be affected by the project, the cultural resources need to be evaluated for eligibility for listing on the National Register of Historic Places (NRHP). The Office of Historic Preservation Directory of Properties in the Historic Property Data File for Shasta County lists four historic properties in or near the project area. The previously inventoried Keswick Substation is a component of the project and was built in 1942. It has been determined to be ineligible for listing on the National Register of Historic Places, but has not been evaluated for the California Register. Although the reconductoring work at the SHA-FLN/FLN-KE substations would consist of modifications inside control rooms or pulling and tensioning activities within the substation footprints, it is necessary to evaluate the substations as structures that might be eligible for listing on the NRHP. The other three recorded properties located within 0.5 mile of the transmission line include the Keswick Dam, the Shasta Dam, and the Shasta Dam-Beltway; which all have been determined to be eligible for the National Register of Historic Places. The Shasta and Flanagan Substations do not appear to have been inventoried or evaluated based on the results of the record search. Finally, reconductoring effort would affect the SHA-FLN/FLN-KE transmission line itself, built in 1949.

Federal agencies are required to comply with several Federal laws, including NEPA, Section 106 of the National Historic Preservation Act and implementing regulation 36 CFR Part 800, among others. Impacts to properties that meet the eligibility criteria for the National Register must be considered. Any adverse effects to historic properties must be mitigated in consultation with the State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation. Prior to initiating project activities, Western would fulfill obligations under Section 106 of the Nation Historic Preservation Act. Section 106 ensures that the lead federal agency consult with SHPO regarding historic properties that might be affected by the project. This consultation ensures that any impacts to historic properties are mitigated below a significant level (URS2007j).

The applicant contacted the Native American Heritage Commission (NAHC), and obtained a list of Native Americans who might have heritage concerns in the vicinity of the project. On August 9, 2006, the applicant sent letters to Native American individuals and groups describing the project. Two people responded to the applicant's letter. One person was not concerned because the line was already built and would be

reconductored. The other person responded with a list of locations that she believed would be sensitive for cultural resources. Although the consultations did not result in the identification of cultural resources, as part of its Section 106 responsibilities, Western would consult with both federally-recognized and non-federally recognized tribes in the vicinity of the project to determine whether there are any sensitive locations that might be affected.

Impacts of Reconductoring

Ground disturbance, the presence of vehicles driving over the top of sites and the installation of new towers could damage archaeological resources. After the work area is defined and after archaeological and historic surveys are complete in any areas that have not been protocol-level surveyed previously by Western, historic properties within the built environment may be identified. If the SHA-FLN/FLN-KE line or any of the substations are determined eligible for the NRHP, the reconductoring effort may result in an impact to historical resources. Whether the impact is significant would need to be determined after the line or substations are evaluated. The reason the line or substations are eligible, will determine the impact.

The Shasta-Flanagan-Keswick transmission line was constructed around 1949. The significance of this line has been evaluated and it does not appear to be eligible for inclusion in the NRHP based on a lack of distinction or association; it also does not appear to be a historical resource for the purposes of CEQA (URS2007j). The reconductoring consists of replacing the existing conductor on the existing towers with a higher capacity conductor and does not require construction of any new substations or expansion of the existing substations. The only work on the substations would consist of possible modification (resetting) of the protection and monitoring equipment that are within the existing substations and existing control rooms. The Keswick Substation was previously evaluated as not eligible for the National Register of Historic Places. The historic significance of the Shasta and Flanagan substations has not been evaluated and is not deemed necessary for this project given the scope of the proposed reconductoring.

Impact Minimization Measures

Western asserts that cultural resource sites would be identified and avoided by vehicles and construction activities (Western 2007, p. 3).

Staff recommends that after the construction area has been identified, and after work for Section 106 has been completed, that archaeological sites be evaluated for eligibility for listing in the NRHP or CRHR, if it appears that any would be affected by the project. Sites that have been evaluated as not eligible warrant no further consideration and avoidance is not required. Sites that have not been evaluated and sites that are considered potentially eligible will be treated as eligible resources pending formal evaluation.

Data recovery may be conducted as a mitigation measure for archaeological sites that are recommended as eligible to the CRHR or NRHP and would be impacted by the project. Monitoring of project-related excavation within an archaeological site is not appropriate mitigation and may destroy the site. Under Western's SOPs and PCMs, if

any cultural materials are encountered during construction or other ground-disturbing activities, all activities in the vicinity of the find (within 50 feet) would cease until the significance of the discovery is evaluated by a qualified archaeologist. If the discovery were to be determined significant, mitigation would be necessary. Western would comply with provisions of the National Historic Preservation Act and would consult with a California State Historic Preservation Officer regarding appropriate mitigation.

Conclusion

While Western would avoid effects to known cultural sites, it is possible that the reconductoring corridor has sensitive cultural resources that could be affected. Staff believes that it will be possible to mitigate all impacts to cultural resources to less than a significant level through the Section 106 process and implementation of Western's SOPs and PCMs that apply to cultural resources. Known sensitive areas would be avoided, construction activities would be monitored and other appropriate mitigation similar to the Conditions of Certification identified in the Cultural Resources FSA would be implemented.

3.3 LAND USE

Environmental Setting

The Land Use analysis for the SHA-FLN/FLN-KE transmission line focuses on the project's compatibility with the existing and planned land uses, and the project's consistency with local land use plans, ordinances, and policies. As provided in E&LW's Response to Data Requests (URS2007j), the reconductoring project utilizes existing transmission towers in an established utility corridor and conforms to all applicable regulations and general plan goals of Shasta County. Zoning along the established utility corridor consists of public property managed by the Bureau of Land Management, Shasta-Trinity National Forest managed by the U.S. Forest Service, to include the open space within Shasta County.

Land use along the transmission line ROW consists primarily of undeveloped land, with a few intermittent structures (potential residences) and roads. Highway SR-151 also transects portions of the transmission line route. Residences within 500 feet of the right-of-way are located at the southern portion of the transmission line route closer to the City of Redding. The nearest potential residences are located 160 feet east of the transmission line off of Quartz Hill Road. No schools, hospitals, daycare centers, or other sensitive receptors have been identified within 160 feet of the outside edges of the right-of-way. The north portion of the transmission line route is located within the Shasta Trinity National Forest. A commercial area is located at the north section of the transmission line route, just west of the Shasta Substation.

Impacts of Reconductoring

The reconductoring project would replace transmission conductors within an existing utility corridor. This transmission system upgrade would not involve changing existing or planned land uses in Shasta County. Construction laydown and staging areas would be within the existing transmission line right-of-way. The reconductoring of the electric transmission line would require the temporary stockpiling of materials and equipment in approved areas along the existing right-of-way. Any impacts to land use would be

isolated and short term while construction crews reconductor the existing transmission lines. Because the temporary stockpile areas would be temporary and would not displace any existing use, the impact would not be significant.

Reconductoring would also require access to the existing transmission line right-of- way by construction vehicles and equipment, which would use existing access roads. However, if new roads were necessary due to limited access, Western would need to acquire rights for the new roads. Any additional impacts to land use would be temporary and confined to the work areas. There would be no displacement of any existing land use. The temporary development of access roads to an existing ROW would not be considered a significant impact to land use in the area. Furthermore, since the utility corridor is an established land use, reconductoring of this line is not expected to conflict with applicable LORS, including the General Plans of Shasta County or Redding.

Impact Minimization Measures

Western's SOPs would require that any fences and gates damaged during maintenance and upgrade activities, such as reconductoring, would be repaired or replaced and fences and gates would be restored to their preconstruction condition. The SOPs also specify that if any land uses occurring within the ROW need to be temporary closed or have limited access, proper signage would be posted in these areas. Landowners adjacent to the ROW would also be notified of upcoming project activities. As there are no significant land use impacts along the electrical transmission line route related to the identified reconductoring project, additional mitigation measures (beyond Western SOPs) would not be warranted.

Conclusion

Reconductoring of the SHA-FLN/FLN-KE transmission line would not cause a change in land use. Staff concurs with the conclusion in the Applicant's Response to Data Requests that the existing ROW would be adequate for the reconductored line project and would not require widening. Since it would be entirely within an existing and established right-of-way, the reconductored transmission line would not disrupt or divide the physical arrangement of an established community. Also for these reasons, the reconductored transmission line would not restrict existing or future land uses along the route.

3.4 NOISE

Environmental Setting

Western's right-of-way for the SHA-FLN/FLN-KE transmission line corridor ranges from 118 feet to 817 feet in width along the 8.75-mile route. The entire area within the right-of-way is undeveloped, with the exception of a few roads that pass underneath the transmission line. There are a few residences within 500 feet of the transmission line right-of-way, including a residential community southeast of the Keswick Substation and south of the line. Short-term noise impacts to these residences may occur during the six to eight weeks of construction. Western would use existing ROW access roads to complete work.

Reconductoring the SHA-FLN/FLN-KE transmission line would require operation of heavy equipment at pull and tensioning sites. The potential for heavy equipment operation to disturb adjacent noise-sensitive land uses during the temporary period of line work was reviewed in the Applicant's Response to Data Requests (URS2007j). The applicant expects between five and eight pull sites will be necessary.

After the reconductoring work is complete and the line operational, the applicant expects no change in corona noise levels.

Impacts of Reconductoring

Reconductoring work would require operation of construction-type equipment at the pull and tensioning sites. The equipment involved includes line trucks, a puller-tensioner, man lifts, and possibly a Caterpillar truck. The applicant anticipates the project will take six to eight weeks, once the equipment and materials are in place. A few residences lie within 500 feet of the transmission line right-of-way, including a residential community southeast of the Keswick Substation and the closest residence is approximately 160 feet from the line. In general, construction work within 200 feet of any location would cause noise levels averaging around 65 dBA, with intermittent peaks up to about 88 dBA. This would be a noticeable (more than five dBA) temporary increase in the ambient noise levels near the work that would fade into quiet backgrounds at distances over one-quarter mile. Although construction noise would be required to comply with local ordinances, it may still be disruptive.

After reconductoring, no significant increase in corona noise levels would be expected. Corona noise is a function of the line voltage and the condition of the line. Because voltage would remain the same after reconductoring, and the condition of the line would be improved, corona noise may actually be reduced.

Impact Minimization Measures

Western's SOPs would require all vehicles and equipment to be equipped with exhaust noise abatement devices and would require landowner notification. To minimize disturbance, the applicant proposes to limit work to daytime hours, as specified in the applicable Shasta County and City of Shasta Lake LORS. Energy Commission Staff recommends implementation of mitigation measures similar to the proposed Conditions of Certification **NOISE-1**, **NOISE-2** and **NOISE-6** from the FSA to minimize potential impacts. These conditions would require notification of affected residents of impending construction, establishing a noise complaint resolution process, and limiting noisy construction to daytime hours.

Conclusion

Implementing mitigation measures similar to the Conditions of Certification that are proposed in the FSA for construction of the Colusa Generating Station and Western SOPs would avoid potential significant noise impacts from reconductoring work associated with the SHA-FLN/FLN-KE transmission lines.

3.5 TRAFFIC AND TRANSPORTATION

Environmental Setting

The existing transmission lines are situated within an established right-of-way ranging in width from 118 to 817 feet. The existing transportation network that would be affected by the SHA-FLN/FLN-KE reconductoring project would be located in Shasta County on primarily undeveloped land near the communities of Shasta Lake and Redding California. The applicant has estimated that the reconductoring project will require a maximum of 20 workers over a six to eight week period. Three to five pieces of equipment (i.e., line trucks, tensioners and cable pullers, possibly a Caterpillar truck) and support vehicles would be required along Keswick Dam Road, Quartz Hill Road, and State Highway Route 151 (SR151), all of which transect the transmission corridor. Eight (8) to 10 vehicle trips are estimated per day. Keswick Dam Road and Quartz Hill Road, both east-west trending local roads, connect to Old Diggins Road located west of the corridor. The applicant has not specified where these trucks would be stationed during the tensioning and cable pulling activity, however, it is likely that they would be within the existing ROW and at existing storage areas near or at the substations.

Impacts of Reconductoring

The proposed reconductoring project could affect the level of service (LOS) for transportation facilities under the jurisdiction of Caltrans and the local communities. Highway SR151 is approximately seven miles in length and provides access to Shasta Dam from Interstate 5. It is a four-lane divided highway for its first approximately 1.3 miles west of I-5 through Project City and then it becomes a two-lane divided roadway at Ashby Road until Shasta Dam. Table 2 presents the average daily traffic (ADT) volume for SR151 from Shasta Dam to I-5.

APPENDIX A Table 2
2006 Average Daily Traffic (ADT) on State Route 151

Description	Postmile Prefix[1]	Postmile[1]	Peak Hour[2]	Peak Month ADT[3]	Annual ADT[4]
Two-Way Travel					
Shasta Dam to Lake Boulevard	**-**	**0-3.781**	**180**	**660**	**490**
Lake Boulevard to Toyon	**-**	**3.781-4.450**	**190**	**1900**	**1750**
Toyon to Southern Pacific Railroad Underpass	**-**	**4.450-5.508**	**250**	**2700**	**2500**
Southern Pacific Railroad Underpass to Couplet	**-**	**5.508-5.620 (eastbound) or 5.930 (westbound)**	**610**	**5600**	**5500**
Couplet—Eastbound (One-Way Travel)		**-**	**-**	**-**	**-**

APPENDIX A Table 2 2006 Average Daily Traffic (ADT) on State Route 151					
Description	**Postmile Prefix[1]**	**Postmile[1]**	**Peak Hour[2]**	**Peak Month ADT[3]**	**Annual ADT[4]**
Begin Couplet at Ashby Road to Shasta Dam Boulevard at Hardenbrook Avenue	**R**	**5.620-5.931**	**590**	**5600**	**5500**
On Shasta Dam Boulevard at Hardenbrook Avenue to Shasta Dam Boulevard at Front Street	**R**	**5.931-5.994**	**590**	**5500**	**5500**
On Shasta Dam Boulevard at Front Street to Couplet End	**R**	**5.994**	**-**	**-**	**-**
Couplet—Westbound (One-Way Travel)		**-**	**-**	**-**	**-**
On Front Street at Hardenbrook Avenue to Front Street at Shasta Dam Boulevard	**R**	**5.930-5.993**	**570**	**5300**	**4900**
On Front Street at Shasta Dam Boulevard to Couplet End	**R**	**5.993**	**-**	**-**	**-**
Couplet End (Begin Two-Way Travel)		**-**	**-**	**-**	**-**
On Shasta Dam Boulevard; Divided Highway Facility to Cascade Boulevard	**-**	**5.993-6.790**	**1350**	**14400**	**13500**
Cascade Boulevard to Junction I-5, Project City	**-**	**6.790-6.924**	**1300**	**13800**	**13200**

Source: Caltrans2007.

[1]**Postmile:** Each profile breakpoint is identified by the milepost value corresponding to that point on the highway. The milepost values increase from the beginning of a route within a county to the next county line. The milepost values start over again at each county line. Milepost values usually increase from south to north or west to east depending upon the general direction the route follows within the state. The milepost at a given location will remain the same year after year. When a section of road is relocated, new milepost (usually noted by an alphabetical Postmile Prefix such as "R") are established for it. If relocation results in a change in length, "milepost equations" are introduced at the end of each relocated portion so that mileposts on the reminder of the route within the county will remain unchanged.

[2]**Peak Hour:** This value is useful to traffic engineers in estimating the amount of congestion experienced, and shows how near to capacity the highway is operating. Unless otherwise indicated, peak hour values indicate the volume in both directions. A few hours each year are higher than the "peak hour", but not many. In urban and

suburban areas, the peak hour normally occurs every weekday, and 200 or more hours will all be about the same. On roads with large seasonal fluctuations in traffic, the peak hour is the four near the maximum for the year but excluding a few (30 to 50 hours) that are exceedingly high and are not typical of the frequency of the high hours occurring during the season.

[3]**Peak Month ADT:** The peak month ADT is the average daily traffic for the month of heaviest traffic flow. This data is obtained because on many routes, high traffic volumes which occur during a certain season of the year are more representative of traffic conditions than the annual ADT.

[4]**Annual ADT:** Annual average daily traffic is the total volume for the year divided by 365 days. The traffic count year is from October 1st through September 30th. The counts are adjusted to an estimate of annual average daily traffic by compensating for seasonal influence, weekly variation and other variables which may be present.

The reconductoring project would require no more than 20 workers, which would result in a 1.5 percent increase (near I-5) to 10 percent increase (near Shasta Dam) in peak hour traffic volume. The area's roadways would also be used for transportation of equipment and access to the temporary staging areas. Finally, the movement of heavy machinery or the possible need to use rail lines to deliver equipment or materials to the project site could also affect the surrounding transportation system.

Although the project would be short-term (six to eight weeks) with only 15 to 20 workers traveling to the project site during peak hours, a 10 percent increase in peak hour traffic volume may impact traffic flow. In addition, large vehicles delivering materials and oversized vehicles used in the construction process may affect traffic flow on one or more of the roadways, resulting in a safety hazard. These potential impacts can be avoided through mitigation, which is discussed below.

Impact Minimization Measures

In order to mitigate potential impacts of the reconductoring project on the surrounding roadway system, at Western's discretion, it may avoid adding any vehicles to SR151 near Shasta Dam during peak travel times. This avoidance can be accomplished through using off-site (i.e., off SR151) facilities for reconductoring staging and laydown and non-peak hour scheduling. These measures would reduce the potential for project-related congestion in the general traffic areas of the reconductoring work.

Using off-peak period scheduling for delivery of equipment and materials via trucks can also avoid potential impacts during peak hour conditions. Scheduling worker arrival and departure patterns to occur outside of the morning (i.e., 6:00 to 9:00 AM) and evening (i.e., 3:30 to 6:30 PM) peak periods would also mitigate potential impacts of the reconductoring project. As described in Chapter 2.2 (Construction Methods) in this Appendix, temporary structures would be constructed across roads and other potentially inhabited areas to protect those areas in the unlikely event that a conductor breaks and the line falls to the ground. This safety precaution would reduce the potential for construction materials falling on any intersecting roadways during the tensioning/cable pulling process.

Conclusion

Since the majority of reconductoring activities would take place in undeveloped areas, it is projected that the activities would have minimal impact on the traffic level of service for the roadways in the vicinity of the activities, except during peak hours. Any activity that would need to occur outside of the transmission line ROW would require landowner notification and permission for access. Movement of heavy machinery on local roads would occur intermittently, but infrequently over the 6- to 8-week schedule. Based on the temporary nature of the reconductoring activities and the minimal staffing (approximately 15 to 20 personnel) and equipment expected to be required for this effort (8 to 10 vehicle trips per day), coupled with implementation of mitigation measures similar to Conditions of Certification concerning peak hour traffic in the FSA would ensure that any potential impacts of the reconductoring project to traffic and transportation would be less than significant.

3.6 TRANSMISSION LINE SAFETY AND NUISANCE

Environmental Setting

The electric and magnetic field impacts that were addressed in the FSA for the CGS would not be of potential concern for the area along the route of the SHA-FLN/FLN-KE reconductored line. As noted in the CGS FSA, the magnitude of such fields depends on line voltage and current levels. The potential for perceivable field impacts and significant field exposures would depend on the chosen design, the current levels, and distance from the line.

Impacts of Reconductoring

Since the reconductored line would be operated at the same voltage (230 kV) as the existing line, the magnitude of the electric field along the line route would not change from current levels, meaning that the electric field impacts that were addressed with respect to the CGS-related transmission line would not change from the levels associated with the line to be reconductored. The only field-related change from the reconductor (and its related increases in current flow) would be with respect to the magnetic field, because its intensity depends directly on current levels, as noted in the CGS assessment.

Since the reconductored line is within an existing transmission corridor, the reconductor-related increases in magnetic field intensity would lead to corresponding increases in human exposure to the line's magnetic fields. The nearest residences to the line are approximately 160 feet away. Line workers would also be exposed to EMF in close proximity to the lines; however, this type of short-term exposure is not significantly related to the present health concern. Western has not adopted any specific limits or regulation on EMF levels related to electric power facilities. Further, there are no Federal or State standards limiting human exposure to EMFs from transmission lines or substation facilities in California. For those reasons, EMF is not considered in this appendix as a CEQA/NEPA issue and no impact significance is presented.

Impact Minimization Measures

There remains a lack of consensus in the scientific community in regard to public health impacts due to EMF at the levels expected from electric power facilities. Until conclusive or more specific research results on the health effects of EMF are obtained, Western's EMF Position states that it will continue to take prudent actions regarding EMFs, including:

- Provide balanced and accurate information to employees, customers, and the public. EMF measurements will continue to be made upon request.
- Support and participate in scientific research on EMF and monitor results of research activities by utility, government, and private groups.
- Pursue and implement alternative design and siting approaches for new and upgraded transmission facilities to reduce public exposure to EMFs, particularly when the siting of facilities may occur in populated areas.

Therefore, specific field-reducing measures should be incorporated into the design for new or reconductored lines, such as the SHA-FLN/FLN-KE line.

Other public concerns related to electric power facility projects, are both safety and nuisance issues, and include: radio/television/electronic equipment interference; induced currents and shock hazards and potential effects on cardiac pacemakers. Western is not under jurisdiction of the CPUC, and so the SHA-FLN/FLN-KE reconductored line would be designed and operated according to standard Western practices, as noted in the submittal from the Applicant's Response to Data Requests (URS2007j). The applicable measures for the proposed Western reconductored line are those specified in Western's guidelines, which are similar to the CPUC's requirements that would apply to CGS. Staff's recommended Conditions of Certification in the CGS FSA are intended to ensure compliance with CPUC policy as related to field strengths, perceivable field effects, electric shocks, and human exposure. Staff would expect the line will be operated according to Western's guidelines, which would be in compliance with the applicable (non-EMF) health and safety laws, ordinances, regulations and standards (LORS).

Conclusion

The reconductored SHA-FLN/FLN-KE 230-kV transmission line would be designed, built and operated (within the existing route) according to Western's requirements, reflecting compliance with the health and safety (non-EMF) LORS of concern to Staff. Therefore, Staff would not expect its operation to pose a significant health and safety hazard to individuals in the area.

3.7 VISUAL RESOURCES

Environmental Setting

The SHA-FLN/FLN-KE transmission line is in an existing 230-kV corridor and crosses through primarily undeveloped land under jurisdiction of Shasta County, BLM, and U.S. Forest Service. In general, the line runs on hilly terrain between the Shasta and Keswick Dams near the ridgeline east of the Sacramento River. There are a few residences

within 500 feet of the transmission line ROW, including a residential community southeast of the Keswick Substation and south of the transmission line corridor. The line travels along Keswick Dam Road, Quartz Hill Road, and Highway SR151, all of which transect the transmission corridor, as well as from other local roadways. Highway SR151 provides access for recreation to Shasta Dam from Interstate 5. All work would take place within the existing ROW and substations and would utilize existing access roads.

Impacts of Reconductoring

The SHA-FLN/FLN-KE reconductoring project is expected to last approximately six to eight weeks. The reconductoring project would require two or three one-acre temporary staging areas for equipment and materials storage. The staging yards would likely be located at existing storage areas near or at the Shasta, Flanagan, and/or Keswick Substations during the construction period. Conductor pulling and tensioning equipment would be located at various sites along the 8.75-mile transmission line. Depending on the terrain and the number of angles and dead-end sites, five to eight pull sites would likely be needed.

Construction equipment and activities would be visible to motorists on SR151, Keswick Dam Road, Quartz Hill Road and other local roadways, as well as to residents living near the existing corridor. Due to short duration project construction, the adverse visual impacts that would occur during construction would not be significant. This conclusion assumes that construction areas and the ROW are restored to their pre-project conditions, as specified in Western's SOPs.

Reconductoring involves the replacement of existing electrical transmission wires (conductors) with new conductors. This change to the SHA-FLN/FLN-KE transmission line would be undetectable to most viewers of the line, including motorists and residents living near the line in the Redding and Shasta Lake areas. Tower modifications and excavation work near the towers are not anticipated at this time. However, if such activities are deemed warranted by Western during final engineering, it may be necessary to raise the height of some towers to allow for greater conductor sag. Because the existing transmission line and towers are an established part of the setting and tower modification (if necessary) would raise the existing towers most likely less than 10 percent of their present height, the adverse visual impacts that would occur due to installation of the new conductors, and any incremental changes in tower height or design, would likely not be significant. This conclusion assumes that the new conductors and towers would incorporate Western's SOPs and/or typical measures to mitigate potentially significant adverse visual impacts, such as those listed below.

Impact Minimization Measures

With the inclusion of the following Western SOPs or similar mitigation measures, visual impacts from construction activities related to reconductoring would likely not be significant:

- During project construction, the work site should be kept clean of debris and construction waste. Material and construction storage areas should be selected to minimize views from public roads, trails, and nearby residences.

- For areas where excavated materials would be visible from sensitive viewing locations, excavated materials should be disposed of in a manner that is not visually evident and does not create visual contrasts.
- All construction must be in conformance with Western's Erosion Control and Revegetation Plan.
- Maintenance operations work should be conducted in a manner that limits unnecessary scarring or defacing of the natural surroundings to preserve the natural landscape to the extent possible.

With the inclusion of the following Western SOPs or similar mitigation measures, operation of the reconductored line would likely not cause significant adverse visual impacts:

- Non-specular and non-reflective conductors should be used in order to reduce conductor visibility and visual contrast;
- Insulators should be non-reflective and non-refractive; and
- If tower modifications are deemed necessary, surface coatings should be applied to new or replacement structures that are visible from sensitive viewing locations with appropriate colors, finishes, and textures to most effectively blend the structures with the visible backdrop landscape. For structures that are visible from more than one sensitive viewing location, if backdrops are substantially different when viewed from different vantage points, the darker color shall be selected, because dark colors tend to blend into landscape backdrops more effectively than lighter colors, which may contrast and produce glare.

Conclusion

Construction of the reconductoring project would require only temporary disturbance necessary for replacement of existing transmission lines (i.e., heavy equipment, tensioning, and pull sites). After reconductoring and rehabilitation of temporary tensioning and pull sites, as required by the suggested mitigation, the transmission line would appear largely as it does now, and the project would not represent a reduction in scenic quality along the transmission corridor.

The reconductoring project would have the potential to cause adverse long-term visual impacts, such as through the use of reflective conductors and/or insulators that would make existing or new structures more dominant in the existing viewshed. However, Western's SOPs and/or feasible mitigation measures are available that would ensure that visual impacts of the reconductoring project would not be significant. With use of non-specular conductors and non-reflective and non-refractive insulators, potential long-term impacts associated with this activity would likely be indiscernible, and no significant visual impacts are expected.

3.8 SOIL AND WATER RESOURCES

Environmental Setting

In association with the proposed 660 MW CGS project, it may be necessary for Western to reconductor a 8.75-mile long section of 230-kV transmission line that travels between the Shasta, Flanagan, and Keswick Substations from the vicinity of Shasta Dam southerly to an existing substation near Keswick Dam.

The route would traverse steep, hilly topography ranging from approximately 800 feet above mean sea level (msl) at the northern terminus near Shasta Dam, to about 600 feet above msl near Keswick Dam. The high point is 1,400 feet above msl near Shasta Dam where the transmission line crosses a bend in Shasta Dam Boulevard as well as another location at 1,400 feet above msl about three miles south of Shasta Dam (URS2007j). In general, the line would run near the ridgeline east of the Sacramento River.

Several mines and/or mine workings are located in the vicinity of the alignment. The land is heavily vegetated and/or forested, not prime agricultural property. There are no agricultural resources within the transmission corridor.

The Soil Survey of the Shasta County Area (USDA, SCS, 1974) indicates that the transmission line would cross 12 soil types (mapping units) (URS2007j). Almost two thirds of the alignment would cross soils described as stony or rocky loam, formed over metavolcanic bedrock, primarily greenstone, with moderate to high susceptibility to erosion (URS2007j).

Impacts of Reconductoring

Towers and Footings

Based on preliminary evaluation, Western does not anticipate that tower modification or replacement would be required with the reconductoring project. However, based on final engineering, it may be necessary to raise the height of several towers to allow for greater conductor sag and some towers may require new foundations. These activities could involve earth disturbance that would increase the potential for erosion. The transmission lines cross several creeks that are tributaries to the Sacramento River. Construction activities for new towers and footings would not occur within the watercourses; therefore, impacts to water quality for construction and operation of the transmission lines would be less than significant. If tower replacement would be necessary, implementation of SOPs and PCMs typically employed by Western, such as temporary erosion control measures would ensure less than significant impacts to soils.

Reconductoring without New Towers and Footings

If existing towers can be used or reinforced without construction of new towers and footings, the potential for impacts to soils and water resources would be significantly reduced, because no ground disturbance would occur. Work sites using larger truck-mounted equipment would likely be limited to areas near angle and/or dead-end towers and five to eight of these pull sites would likely be needed. Temporary pull and tensioning sites would require an area of about 100 by 200 feet (0.5 acre) for equipment

setup. Activities between the pull and tensioning sites are generally restricted to (1) accessing the towers (either by climbing or using a truck-mounted aerial bucket) to place the pulleys and to remove the conductor from the pulleys and refasten it once stringing is completed; and (2) work on the tower structure itself to repair or replace spars that are damaged, or to replace insulators. These temporary sites would be susceptible to erosion from minor soil disturbance and compaction as a result of the vehicular traffic and hilly terrain; however, no grading would be anticipated and impacts would be less than significant with the implementation of Western SOPs and/or similar mitigation measures.

Impact Minimization Measures

Reconductoring

For temporary disturbance areas established on soil for pull and tensioning sites, and for work sites set up to modify existing towers, the following Western SOPs or similar mitigation should be included:

- On completing the work, all work areas except access trails should be scarified or left in a condition that would facilitate natural or appropriate vegetation, provide for proper drainage, and prevent erosion.
- All construction must be in conformance with Western's Integrated Vegetation Management Environmental Guidance Manual.
- All construction must be in conformance with Western's Erosion Control and Revegetation Plan.
- Disturbance and removal of soils and vegetation should be limited to the minimum area necessary for access and construction.
- Vehicles should be inspected daily for fluid leaks before leaving the staging area.
- All spills of fuel or hydraulic fluid should be cleaned up immediately according to Western's guidelines for hazardous waste handling.
- Non-biodegradable debris should be disposed of in the appropriate manner.
- Runoff from the maintenance site should be controlled and meet the Central Valley RWQCB storm water requirements in the Storm Water Pollution Prevention Plan (SWPPP).

Towers and Footings (if necessary)

In addition to the above soil and water resources measures, the following impact minimization measures should be implemented for earth disturbance activities associated with any work on tower footings:

- All soil excavated for structure foundations should be backfilled and tamped around the foundations, and used to provide positive drainage around the structure foundations.
- Use of ground-disturbing mechanical equipment to remove vegetation should be avoided on slopes over 40 percent, unless the threat of erosion would be minimal because of bedrock, or reseeding would be performed.

- All activity should be minimized during winter and other wet periods to prevent damage (excessive rutting, unacceptable erosion of fines from road surface, excessive soil compaction)
- Where soil has been severely disturbed and the establishment of vegetation is needed to minimize erosion, appropriate measures, as approved by the land manager, should be implemented to establish an adequate cover of grass or other vegetation as needed. Soil preparation, seeding, mulching, and fertilizing should be repeated as necessary to secure soil stabilization and revegetation acceptable to the land manager.
- Grading should be minimized to the extent possible. When required, grading should be conducted away from watercourses/washes to reduce the potential for material to enter the watercourse
- Should Western need to relocate a structure or access road, Western should consult with USACE to locate all new structures and access roads outside floodplains to the extent feasible.
- Sediment control devices, such as placement of native rock, should be used at all dry wash crossings.
- Run-off control structures, diversion ditches, and erosion-control structures should be cleaned, maintained, repaired, and replaced whenever necessary.
- All discharge water created by construction (e.g., concrete washout, pumping for work area isolation, vehicle wash water, drilling fluids) should be treated before discharge.

The following mitigation measures should be implemented for construction activities in and around water bodies associated with the new tower footings:

- Any discharge of material (displaced soils and, in certain circumstances, vegetation debris) within waters of the United States may be subject to US Army Corps of Engineers regulations under the Clean Water Act.
- If wet areas cannot be avoided, Western should use wide-track and/or balloon tire vehicles and equipment and or timber mats.
- All fill or rip-rap placed within a stream or river channel should be limited to the minimum area required for access or protection of existing Western facilities.

Conclusion

The reconductoring project would cause no displacement of agricultural land use, and neither construction nor operation of the transmission line would cause a significant impact to agricultural resources. Significant environmental impacts to soil and water resources will be avoided by implementing Western SOPs and best management practices or similar mitigation, as listed above.

3.9 TRANSMISSION SYSTEM ENGINEERING

Environmental Setting

Reconductoring the SHA-FLN/FLN-KE line, should it occur, would involve removing the existing conductors and replacing them with new conductors, in a manner that complies with applicable safety and reliability standards in order to increase transmission capacity. Insulators would also be removed and replaced with new strings, which would increase the line's capability to withstand voltage surges. Please see Chapter 2 of this Appendix for additional description of the likely construction areas and methods.

Impacts of Reconductoring

During construction, applicable safety and reliability Laws, Ordinances, Regulations and Standards (LORS) must be met following Western's Construction Standards. Western would schedule any outages in a manner such that maintains system reliability. Applicable LORS also include North American Electric Reliability Council (NERC) Planning Standards, Western Electric Coordinating Council (WECC) Reliability Criteria, which insure continuity of load service and protection of the interconnected grid, and the National Electric Safety Code 1999 (NESC).

Reconductoring of the SHA-FLN/FLN-KE 230-kV transmission line would result in local system benefits, in that it would provide considerably greater flexibility in routing power in the regional transmission network, even if the Colusa Generating Station is not built. The reconductoring project would ensure that the Colusa Generating Station project could generate at its rated capacity as it would mitigate overloads on the SHA-FLN/FLN-KE line.

Impact Minimization Measures

To mitigate potential safety and reliability impacts, the above-stated LORS and Western scheduling protocols would be used. Western assures conformance with the above safety and reliability requirements.

Conclusion

Conformance with applicable safety and reliability is required by several LORS, and would be successful in mitigating any safety or reliability implications of reconductoring.

3.10 GEOLOGY AND PALEONTOLOGY

Environmental Setting

The topography of the SHA-FLN/FLN-KE corridor region consists of a series of heavily vegetated hills and basins that flank the northernmost portion of the Sacramento Valley region. The existing SHA-FLN/FLN-KE transmission line generally traverses Pre-Devonian and Devonian metavolcanic units of the Copley greenstone. A short segment in the vicinity of the Walker Mine, about 4.5 miles south of Shasta Dam, crosses Devonian Balaklala rhyolite, an extrusive flow of granite composition. The Copley greenstone is described by Albers (1964) as keratophyre, spilite, and meta-andesite (including volcanic breccia and agglomerate facies), tuff, shaly tuff, and shale which intertongue with Balaklala rhyolite. Albers describes Balaklala rhyolite as porphyritic and

non-porphyritic quartz keratophyre, tuff, tuffaceous shale, and coarse volcanic breccia. Interbedded metasedimentary rocks of the Kennett Formation may also form a portion of the Paleozoic rock sequences encountered along the transmission line corridor. Just west of Summit City a short portion of the line crosses Little Churn Creek and what are thought to be Pleistocene non-marine semi-consolidated gravels of the Red Bluff Formation (URS2007j).

No active or potentially active faults are known to cross the transmission line corridor; however, two short and inactive fault structures cross the transmission line alignment (URS2007j):

- A northwest-southeast trending feature, northeast of Chamise Peak where the transmission line parallels Shasta Dam Boulevard; and
- An east-west trending structure in the vicinity of the Walker Mine about 4.5 miles south of Shasta Dam.

The hills and ridges to the west of the project area represent erosionally resistant landforms comprised of Paleozoic age metavolcanic rocks (Pz). In general metavolcanic and metasedimentary rocks are unlikely hosts for fossil deposits. The presence or absence of fossil deposits within the Pleistocene Little Churn Creek gravels is not known.

The California Division of Mines and Geology (CDMG) Map Sheet 48 (Petersen et. al., 1996), predicts a peak ground acceleration with a 10 percent probability of exceedance in 50 years of between 0.15 and 0.2g for the project corridor.

Impacts of Reconductoring

Since no new facilities are anticipated, the impacts to geologic and paleontologic resources would be limited to temporary construction sites. These sites would not require substantial grading or other disturbance of surface soils. As a result, the impacts to geologic and paleontologic resources would not be significant. Should new (or replacement) tower foundations be required as part of reconductoring, implementation of Western's SOPs and compliance with applicable LORS would reduce this potential impact to a less-than-significant level.

In addition, the identified reconductoring project would not change the impacts of seismic hazards, including but not limited to fault rupture and strong ground shaking, on the transmission line above current levels.

In general, the construction activity associated with transmission line reconductoring is assigned a low paleontological sensitivity rating, since Paleozoic age metavolcanic and metasedimentary rock units may be exposed. Furthermore, from a regional perspective, there is a low probability that fossil resources would be discovered within the Paleozoic rocks (Pz) exposed along the SHA-FLN/FLN-KE 230 kV line.

Impact Minimization Measures

Western's SOPs would apply to all reconductoring work. Although not anticipated, in the event that reconductoring of the SHA-FLN/FLN-KE transmission line would involve

construction of new tower footings or replacement of existing tower footings, the area affected by such construction would need to be evaluated with respect to potential landsliding by means of air photo interpretation and geologic reconnaissance mapping. If structure modification or relocation is needed, Western's SOPs require that a California-registered Professional Geotechnical Engineer evaluate the potential for geotechnical hazards and unstable slopes on slopes with over 15 percent gradient.

If interbedded metasediments exist within the Paleozoic age metavolcanic rocks along the right-of-way, a paleontologist would periodically examine excavation spoils during reconductoring operations. Any fossil materials found and recovered in these undifferentiated Paleozoic age rocks would be considered scientifically significant.

With implementation of Western's SOPs that would ensure proper re-vegetation, erosion control, and drainage, among other requirements, the minor reconductoring work would create a less than significant impact to geology and paleontology.

Conclusion

The Western Area Power Administration would comply with applicable LORS as related to the identified reconductoring project. No significant geologic or paleontologic resources have been identified in the project area. The existing transmission line was most likely designed and constructed in accordance with seismic requirements of Western's Construction Standards. The project would have no adverse impact with respect to geologic and paleontologic resources, if it implements Western's SOPs and complies with applicable LORS.

4.0 SUMMARY OF CONCLUSION

Chapters 2 and 3 of this Appendix describe the process and the potential impacts of reconductoring the SHA-FLN/FLN-KE 230-kV transmission line. This study was undertaken to inform the Energy Commission and the general public of the potential indirect environmental and public health effects caused by the approval of the CGS project.

The environmental and engineering disciplines can be divided into two groups: those with the potential for significant impacts, and those in which impacts are easily mitigable or clearly less than significant. This analysis determined that impacts in the following areas would be less than significant for this reconductoring project (some with implementation of standard mitigation measures, such as fugitive dust control to control emissions of particulate matter during construction):

- Air Quality
- Facility Design
- Hazardous Materials Management
- Power Plant Efficiency
- Power Plant Reliability
- Public Health
- Worker Safety
- Socioeconomic Resources
- Waste Management
- Worker Safety

The disciplines where potential impacts (to reconductoring) are of most concern are biological resources, cultural resources, and traffic & transportation. The conclusions of these analyses are summarized below.

Biological Resources: Because some of the reconductoring work would occur in or near sensitive species and/or habitats, staff concludes that reconductoring the SHA-FLN/FLN-KE Transmission Line could adversely impact sensitive biological resources in and/or adjacent to the transmission line corridor. Impact avoidance measures discussed in E&LW's Response to Data Requests (URS2007j) and Western's SOPs and PCMs would help reduce potentially significant biological impacts to less than significant levels. Staff recommends that after construction plans are finalized, a complete project description (including wetland delineations, results of all sensitive species surveys, and a revised assessment of potential impacts) be submitted to Western, which would ensure the reconductoring complies with applicable Federal, State and local laws, ordinances and regulations. Staff also recommends consultation with the California Department of Fish and Game, U.S. Fish and Wildlife Service, Army Corp of Engineers, National Marines Fisheries Service, and Regional Water Quality Control Board to identify potential impacts and develop additional mitigation measures that would avoid, eliminate, reduce to a less-than-significant level or compensate for those impacts. If the reconductoring work complies with all applicable LORS, the above-mentioned impact minimization measures are implemented, and standard Best Management Practices for construction activities are employed, the reconductoring of the SHA-FLN/FLN-KE Transmission Line would not create significant impacts to Biological Resources.

Cultural Resources: Approximately 70 cultural resources have been identified in the 0.5-mile wide research area of the SHA-FLN/FLN-KE line based on the applicant's data search and Western surveys. The majority of the documented resources consist of historic sites related to mining activity, such as roads, trails, refuse dumps, mining sites, ditches, and prospect pits. Prehistoric resources, consisting of lithic scatters, seasonal campsites, and village sites, and sites containing both prehistoric and historic components, are also present. Site density is highest in the vicinity of Keswick Substation and reflects intensive historic mining activities that occurred in this area. As a result, the proposed reconductoring route would be sensitive for cultural resources, and some of the resources may be impacted as a result of the reconductoring effort. Staff believes that it will be possible to mitigate all impacts to cultural resources to less than a significant level through the Section 106 process and implementation of Western's SOPs and PCMs that apply to cultural resources. Known sensitive areas would be avoided, construction activities would be monitored and other appropriate mitigation similar to the Conditions of Certification identified in the Cultural Resources FSA would be implemented.

Land Use: The reconductoring project utilizes existing transmission towers in an established utility corridor and conforms to all applicable regulations and general plan goals of Shasta County. Zoning along the established utility corridor consists of public property managed by the BLM, Shasta-Trinity National Forest managed by the U.S. Forest Service and the Bureau of Reclamation, and open space within Shasta County. Reconductoring of the SHA-FLN/FLN-KE transmission line would not cause a change in land use. Since the project would be entirely within an existing and established ROW,

the reconductored transmission line would not disrupt or divide the physical arrangement of an established community. Also for these reasons, the reconductored transmission line would not restrict existing or future land uses along the route.

Noise: The entire area within the right-of-way is undeveloped, with the exception of a few roads that pass underneath the transmission line. There are a few residences within 500 feet of the transmission line right-of-way, including a residential community southeast of the Keswick Substation and south of the line. Short-term noise impacts to these residences may occur during the six to eight weeks of construction from operation of heavy equipment at the five to eight pull and tensioning sites. Western would use existing ROW access roads to complete work. Implementing mitigation measures similar to the Conditions of Certification that are proposed in the FSA for construction of the CGS and Western SOPs would avoid potential significant noise impacts from reconductoring work associated with the SHA-FLN/FLN-KE transmission lines. After the reconductoring work is complete and the line operational, there would be no change in corona noise levels.

Traffic and Transportation: About 15 to 20 workers and intermittent delivery of equipment and eight to 10 vehicles on a daily basis would be involved in reconductoring the SHA-FLN/FLN-KE transmission line. The local roads most likely to be affected would be State Route 151, Keswick Dam Road, Quartz Hill Road and Old Diggins Road. Since the majority of reconductoring activities would take place in undeveloped areas, it is projected that the activities would have minimal impact on the traffic level of service for the roadways in the vicinity of the activities, except during peak hours where there could be as much as a 10 percent increase in peak hour traffic on SR151 near Shasta Dam. Movement of heavy machinery on local roads would occur intermittently, but infrequently over the 6- to 8-week schedule. Based on the temporary nature of the reconductoring activities and the minimal staffing and equipment expected to be required for this effort, coupled with implementation of mitigation measures similar to FSA Conditions of Certification, such as scheduling during non-peak hours, would ensure that any potential traffic and transportation impacts would be less than significant.

Transmission Line Safety and Nuisance: Since the reconductored line would be operated at the same voltage (230 kV) as the existing line, the magnitude of the electric field along the line route would not change from current levels. The only field-related change from the reconductor (and its related increases in current flow) would be with respect to the magnetic field, because its intensity depends directly on current levels. The reconductored SHA-FLN/FLN-KE 230-kV transmission line would be designed, built and operated (within the existing route) according to Western's requirements, reflecting compliance with the non-EMF related health and safety LORS of concern to staff. Therefore, its operation would not pose a significant health and safety hazard to individuals in the area.

Visual Resources: Construction of the reconductoring project would require only temporary disturbance necessary for replacement of existing transmission lines (i.e., heavy equipment, tensioning, and pull sites) and implementation of Western's SOPs or similar mitigation would ensure that this impact would be less than significant.

Western's SOPs and/or feasible mitigation measures are available that would ensure that long-term visual impacts of the reconductoring project would not be significant. With use of non-specular conductors and non-reflective and non-refractive insulators, potential long-term impacts associated with this activity would likely be indiscernible. After reconductoring and rehabilitation of temporary tensioning and pull sites, the transmission line would appear largely as it does now, and the project would not represent a reduction in scenic quality along the transmission corridor, and no significant visual impacts are expected.

Soil and Water Resources: The reconductoring project would cause no displacement of agricultural land use, and neither construction nor operation of the transmission line would cause a significant impact to agricultural resources. The transmission lines cross several creeks that are tributaries to the Sacramento River. Construction activities would not occur within the watercourses; therefore, impacts to water quality for construction and operation of the transmission lines would be less than significant. If tower replacement would be necessary, implementation of SOPs and PCMs typically employed by Western, such as temporary erosion control measures, best management practices or similar mitigation would ensure less than significant impacts to soils.

Transmission System Engineering: Reconductoring the SHA-FLN/FLN-KE line would involve removing the existing conductors and replacing them with new conductors, in a manner that complies with applicable safety and reliability standards in order to increase transmission capacity. Insulators would also be removed and replaced with new strings, which would increase the line's capability to withstand voltage surges. The reconductoring project would ensure that the Colusa Generating Station project could generate at its rated capacity as it would mitigate overloads on the SHA-FLN/FLN-KE line. Conformance with applicable safety and reliability is required by several LORS, and would be successful in mitigating any safety or reliability implications of reconductoring.

Geology and Paleontology: No significant geologic or paleontologic resources have been identified in the project area. The existing transmission line was most likely designed and constructed in accordance with seismic requirements of Western's Construction Standards. The project would have no adverse impact with respect to geologic and paleontologic resources, if it implements Western's SOPs and complies with applicable LORS.

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APPLICATION FOR CERTIFICATION
For the SES SOLAR ONE PROJECT

Docket No. 08-AFC-13

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(Revised 12/2/09)

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*indicates change

DECLARATION OF SERVICE

I Teraja` Golston, declare that on December 08, 2009, I served and filed copies of the attached Transmission Line Upgrads, dated, October 21, 2009. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: [www.energy.ca.gov/sitingcases/solarone].

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(*Check all that Apply*)

FOR SERVICE TO ALL OTHER PARTIES:

_x_ sent electronically to all email addresses on the Proof of Service list;

_x_ by personal delivery or by depositing in the United States mail at _____ with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses NOT marked "email preferred."

AND

FOR FILING WITH THE ENERGY COMMISSION:

_x_ sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (*preferred method*);

OR

_____ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 08-AFC-13
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.

Original Signature in Dockets
Teraja` Golston

*indicates change