Chapter 5 Detailed Discussion of Significant Impacts

In accordance with the Proponent's Environmental Assessment (PEA) Checklist issued by the California Public Utilities Commission (CPUC) and Section 15126.2 of the California Environmental Quality Act (CEQA) Guidelines, this section:

- Discusses the applicant proposed measures (APMs) that SCE is proposing in order to avoid, minimize, or mitigate potentially significant effects.
- Discusses the alternatives that were considered and the justification for the selection of the preferred alternative.
- Describes any growth-inducing impacts associated with the Full-Rebuild Concept.
- Identifies the measures that SCE incorporated into the Full-Rebuild Concept to address greenhouse gas (GHG) emissions.
- Discusses the irreversible and irretrievable commitment of resources associated with the Full-Rebuild Concept as applicable to CEQA.

5.1 Applicant Proposed Measures Proposed to Minimize Significant Effects

Based on the findings in *Chapter 4 – Environmental Impacts Assessment Summary*, the Full-Rebuild Concept is not likely to result in significant impacts to any resource area except Air Quality after implementation of the APMs. SCE plans to implement 31 APMs during construction of the Full-Rebuild Concept to reduce or avoid impacts to biological resources, cultural and paleontological resources, noise, traffic, and from the use and transport of hazardous materials. Table 5.1-1: Applicant Proposed Measures lists these APMs, as well as the justification for each.

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Table 5.1-1: Applicant Proposed Measures

APM Number	Description	Justification
WEAP	**Worker's Environmental Awareness Training Program.** All workers on the project site shall be required to attend a Worker's Environmental Awareness Training Program (WEAP). Training shall inform all construction personnel of the resource protection and avoidance measures as well as procedures to be followed upon the discovery of environmental resources. The WEAP training will include, at a minimum, the following topics so crews will understand their obligations: • ESA boundaries and other species specific restrictions • Housekeeping (Trash and equipment cleaning) • Safety • Work stoppage procedures • Communication Protocol • Consequences of Non-compliance	Reduce impacts to natural and cultural resources generally.
BIO-GEN-1	**Pre-construction Biological Clearance Surveys and Monitoring.** Pre-construction clearance surveys would be performed by a CPUC-approved biologist, which may be chosen from previously CPUC approved biologists, to avoid or minimize impacts, where feasible, on special status plants, breeding birds, and/or wildlife species in areas with the potential for resources to be present. Sensitive resources identified during the clearance survey would be either: • Flagged for avoidance • Moved to outside impact areas • Implement procedures to avoid impacts to individuals while impacting habitat (e.g., burrows, dens, etc.), or • Documented based on permit authorizations. Specific details on the pre-construction survey requirements may be found within measures for each individual species. Where special-status species (e.g., reptiles, birds, mammals, and bat roosts) or unique resources (defined by regulations and local conservation plans) are known to occur and there is a potential for impacts, biologists would monitor construction activities, unless otherwise mitigated for, as appropriate actions are described in species-specific APMs, or infeasible due to hazardous construction. SCE would be responsible for ensuring that impacts to special-status species, native vegetation, wildlife habitat, and unique resources are avoided to the extent feasible.	Reduce impacts to biological resources generally.
BIO-AVI-1	**Prepare Nesting Bird Management Plan.** SCE would prepare and implement a Nesting Bird Management Plan to address nesting birds undertaken in collaboration with California Department and Fish and Wildlife (CDFW) and U.S. Fish and Wildlife Service (USFWS). The Plan would be an adaptive management plan that may be updated as needed if improvements are identified or conditions in the field change. The Plan would include the following: • Nest management and avoidance • Field approach (survey methodology, reporting, and monitoring) • Communication protocols • Project's avian biologist qualifications. The avian biologist would be responsible for oversight of the avian protection activities including the biological monitors.	Reduce impacts to nesting birds.

Table 5.1-1: Applicant Proposed Measures

APM Number	Description	Justification
BIO-AVI-2	**Burrowing Owl** **Pre-construction Survey.** A pre-construction, focused burrowing owl survey would be conducted no more than 14 days prior to initial start of construction within habitat to determine if any occupied burrows are present. If occupied burrows are found, adequate buffers shall be established around burrows. Adequate buffers would be determined by a Project Avian Biologist based upon field conditions and resource agency guidelines for wintering burrows and breeding season burrows. **Prepare Burrowing Owl Management Plan.** SCE would develop a Burrowing Owl Management Plan for the Project. The Plan would include information related to: • Assessment of Burrow Suitability • Replacement Burrows • Methods for Relocation • Monitoring and Reporting • Implementation Locations.	Reduce impacts to burrowing owl individuals and habitat.
BIO-AVI-3	**Yellow-Billed Cuckoo** **Avoid and minimize impacts.** SCE would avoid ground-disturbing activities within habitat for yellow-billed cuckoo during the nesting season. In the event that activities within yellow-billed cuckoo nesting habitat are unavoidable, a U.S. Fish and Wildlife Service (USFWS) approved biologist would conduct pre-construction surveys for yellow-billed cuckoo no more than 7 days prior to initial start of construction, if work would occur between March 15 and September 30. Surveys for yellow-billed cuckoo would be conducted in nesting habitat within approximately 500 feet of the Proposed Project area. Responsible agencies and lead agencies will be notified before implementing pre-construction surveys, and that the methods and results (including the name of the surveyor and dates, time, and locations of all surveys) will be provided promptly to the responsible agencies and lead agencies, before project activities begin. If a breeding territory or nest is confirmed, the USFWS and CDFW would be notified, and an exclusion buffer would be established around the nest in coordination with the USFWS and CDFW. Unless otherwise authorized by the USFWS and CDFW, no Proposed Project activities would occur within the established buffer until it is determined by the biologist that the nest is no longer active. Construction activities in occupied yellow-billed cuckoo habitat would be monitored by a full-time USFWS- and CDFW-approved biologist.	Reduce impacts to yellow-billed cuckoo during nesting season.

Table 5.1-1: Applicant Proposed Measures

APM Number	Description	Justification
BIO-AVI-4	**Golden Eagle** **Avoid and minimize impacts.** All project activities located within areas identified as habitat shall implement the following avoidance and minimization measures. • Golden eagle nest surveys would be performed when construction activities are scheduled to occur in or near golden eagle nesting habitat from January 1-July 31 to determine if any eagle nests are active within a 1-mile radius. Ground-based or helicopter-based survey methods will be developed in coordination with USFWS and will be consistent with current USFWS survey guidelines. • For construction activity, should an active golden eagle nests be present, the nest shall receive a 1-mile buffer if in line of sight, 0.5 mile buffer if no line of sight—with USFWS concurrence. Buffers and buffer modifications for golden eagles would be addressed in the Project Nesting Bird Management Plan (BIO-AVI-1).	Avoid impacts to golden eagle.
BIO-HERP-1	**Desert Tortoise** **Pre-construction surveys/Construction monitoring.** Pre-construction surveys/Construction monitoring. No more than seven days prior to the onset of ground-disturbing activities, a biological monitor under the supervision of an agency-approved biologist—with experience monitoring and handling desert tortoise—would conduct a pre-activity survey in all work areas within potential desert tortoise habitat, plus an approximately 300-foot buffer. All desert tortoise burrows within the pre-activity survey area (including desert tortoise pallets) would be prominently flagged at that time so that they may be avoided during work activities. Proposed actions would avoid disturbing desert tortoise burrows to the extent possible. However, burrows would be excavated if they would be impacted by construction activities. If a potential tortoise burrow must be excavated, the biologist would proceed according to the most recent USFWS guidelines (currently the 2009 USFWS Desert Tortoise Field Manual). The approved biologist would be on site to ensure the proper monitoring for work areas for desert tortoise. The approved biologist would be responsible for performing surveys prior to Proposed Project activities in areas identified as desert tortoise habitat. The approved biologist would have the authority to halt all non- emergency actions (as soon as safely possible) that may result in harm to desert tortoise and would assist in the overall implementation of APMs for the tortoise. Only an agency-approved biologist may move or handle desert tortoises. If a desert tortoise is moved, the approved biologist would be responsible for following the appropriate protocols outlined by USFWS (currently the 2009 USFWS Desert Tortoise Field Manual). In the event a desert tortoise is encountered in the work area, all work would cease until the approved biologist is contacted and further guidance is provided. Work would not commence until the animal has either voluntarily moved away from the work area or is moved by an agency-approved biologist. No tortoise will be handled or harassed except under authorization from the US Fish and Wildlife Service and California Department of Fish and Wildlife. Encounters with desert tortoise would be documented and provided to the appropriate wildlife resource agencies. In the event a dead or injured desert tortoise is observed, the approved biologist would be responsible for notifying SCE's	Reduce impacts to desert tortoise individuals and habitat

Table 5.1-1: Applicant Proposed Measures

APM Number	Description	Justification
	Herpetologist and reporting the incident to the wildlife resource agencies. **Coordinate with agencies.** SCE either will obtain take authorization from USFWS and CDFW prior to initiating ground disturbing activities, or it will halt any activities in the vicinity of a desert tortoise until authorization is obtained. **Avoid and minimize impacts.** All project activities located within areas identified as habitat shall implement the following avoidance and minimization measures: • Under Vehicle Checks. Desert tortoises commonly seek shade during the hottest times of the day. Employees working within the geographic range of this species would be required to check under their equipment or vehicles before they are moved. If desert tortoises are encountered, the vehicle would not be moved until the tortoise has either voluntarily moved away from the equipment or vehicle or is moved by an agency-approved biologist. • Excavation of Desert Tortoise Burrows. Should it prove necessary to excavate a desert tortoise from its burrow to move it out of harm's way, the approved biologist would be responsible for following the appropriate protocols outlined in the 2009 USFWS Desert Tortoise Field Manual. • Disposal of Trash. Trash and food items would be contained in closed containers and removed daily to reduce attractiveness to opportunistic predators, such as common ravens (Corvus corax), coyotes (Canis latrans), and feral dogs (Canis lupus familiaris). • Pets Prohibited. Employees would not bring pets to the Proposed Project area. • Vehicle Travel. During construction-related activities, motor vehicles would be limited to maintained roads, designated routes, and areas identified as being permanently or temporarily affected by construction within the Project footprint. Motor vehicle speeds along Project routes and access roads within habitat for desert tortoise would not exceed 20 miles per hour. • Trapped Animal Prevention. All auger holes, trenches, pits, or other steep-sided excavations that may pose a hazard to desert tortoise would be either constructed with escape ramps (earthen or wooden) or securely covered when unattended to prevent entrapping animals. At the start and end of each workday, and just before backfilling, all excavations would be inspected for trapped animals. If found, trapped animals would be removed by the qualified biologist and relocated to outside the Project footprint, as required in all applicable permits or habitat conservation plans. **Wildlife attractants.** All trash, food waste, water sources will be strictly controlled and monitored to ensure that no food or water attractants for tortoise or common raven are available on the work sites during or following project activities.	

Table 5.1-1: Applicant Proposed Measures

APM Number	Description	Justification
BIO-HERP-9	**Northern Leopard Frog** **Pre-construction survey/Construction monitoring.** Prior to initial ground-disturbing activities, a qualified biologist would conduct surveys within areas identified as habitat for this species. Biological monitors shall monitor all construction activities in areas identified as northern leopard frog habitat. The responsible agencies and lead agencies will be notified before implementing pre-construction surveys, and that the methods and results (including the name of the surveyor and dates, time, and locations of all surveys) will be provided promptly to the responsible agencies and lead agencies, before project activities begin. **Avoid and minimize impacts.** All project activities located within areas identified as habitat shall implement the following avoidance and minimization measures: • Spill Prevention. Where feasible, all fueling and maintenance of vehicles and other equipment and staging areas would occur at least 100 feet from any riparian and aquatic habitat, unless full containment can be implemented. All workers would be informed of the importance of preventing spills and the appropriate measures to take should a spill occur. • Vehicle Travel. During construction-related activities, motor vehicles would be limited to maintained roads, designated routes, and areas identified as being permanently or temporarily affected by construction within the Project footprint. Motor vehicle speeds along Project routes and access roads within areas identified as habitat for northern leopard frog would not exceed 15 miles per hour.	Avoid and minimize impacts to northern leopard frog.
BIO-MAM-1	**Mohave Ground Squirrel** **Coordinate with agencies.** If MGS habitat is determined or presumed to be occupied within or adjacent to impact areas or if presence is assumed (no trapping due to poor conditions or time constraints), SCE shall consult with CDFW to determine whether the protective measures identified below are sufficient or if additional measures may be needed and obtain an incidental take authorization, if needed. **Avoid and minimize impacts**. All project activities located within areas identified as suitable MGS habitat shall implement the following avoidance and minimization measures: • Trash disposal. Trash and food items would be contained in closed containers and removed daily to reduce attracting predators. • Pets Prohibited. Employees would not bring pets to the Proposed Project area, unless needed to comply with the Americans with Disabilities Act of 1990 (42 U.S.C. §§ 12101, et seq., "ADA"). • Vehicle Travel. During construction-related activities, motor vehicles would be limited to maintained roads, designated routes, and areas identified as being permanently or temporarily affected by construction within the Project footprint. Motor vehicle speeds along Project routes and access roads within habitat for Mojave ground squirrel would not exceed 15 miles per hour.	Avoid and minimize impacts to Mohave ground squirrel individuals and habitat.

Table 5.1-1: Applicant Proposed Measures

APM Number	Description	Justification
	• Trapped animal prevention. All auger holes, trenches, pits, or other steep-sided excavations that may pose a hazard to MGS would be either constructed with escape ramps (earthen or wooden) or securely covered when unattended to prevent entrapping animals. At the start and end of each workday, and just before backfilling, all excavations would be inspected for trapped animals. Any MGS found would be allowed to escape unimpeded. If an MGS is trapped and does not leave on its own, a qualified biologist would move the animal according to agency authorizations, if there is no agency authorization, the MGS shall not be moved (unless in imminent danger) until the CDFW has been contacted and further guidance has been received. • Cover Materials. All pipes or other construction materials or supplies shall be covered or capped in storage or laydown areas at the end of each workday to prevent entrapping animals. No pipes or tubing of sizes or inside diameters ranging from 3 to 10 inches shall be left open either temporarily or permanently. All pipes or other construction materials shall be inspected for wildlife prior to moving or installing. MGS would be allowed to leave on their own accord or would be removed by a qualified biologist according to ITP or other authorization requirements.	
BIO-MAM-5	**Bighorn Sheep – Nelson's /Desert Bighorn Sheep** **Pre-construction survey/Construction monitoring.** Prior to initial ground-disturbing activities, a qualified biologist would conduct surveys within areas identified as habitat for bighorn sheep prior to construction activities. Monitoring by a qualified biologist would be implemented in areas with the potential for bighorn sheep. The biological monitors would halt construction activities if BHS are within 500 feet of work areas or display signs of disturbance. Prior to initial ground-disturbing activities, a qualified biologist would conduct surveys within 2 miles from construction work areas identified as habitat for bighorn sheep during the peak lambing period Feb-May (63 FR 13135 and USFWS BHS Recovery Plan in the Peninsular Ranges, California 2000). During construction, monitoring by a qualified biologist would be implemented in occupied areas within the range of BHS between Feb 1 – Sept 30. The biological monitors would halt construction activities if BHS are within 500 feet of work areas or display signs of disturbance. **Coordinate with agencies.** SCE shall provide survey results to USFWS, CDFW, and BLM prior to conducting construction activities if work is planned within bighorn sheep (BHS) habitat. **Avoid and minimize impacts**. All project activities located within areas identified as BHS habitat shall implement the following avoidance and minimization measures: • Limited Operating Period**.** SCE shall avoid construction activities within one-mile of bighorn sheep lambing areas during the lambing period February 1 – May 30, and from identified water sources during the dry summer months, between May 1 – September 30, in the Cady Mountains and Clark Mountains (63 FR 13135 and USFWS 2000). This measure does not apply to emergencies.	Avoid and minimize impacts to desert bighorn sheep.

Table 5.1-1: Applicant Proposed Measures

APM Number	Description	Justification
	• Pets Prohibited. Employees would not bring pets to the Proposed Project area, unless required for ADA compliance. • Helicopter Avoidance. Helicopter flight paths and activities would be seasonally adjusted by implementing a one-mile horizontal avoidance buffer and a minimum 1,500-foot altitude around bighorn sheep lambing areas during the lambing season and known water sources during the dry summer months. • Wildlife attractants. All trash, food waste, water sources will be strictly controlled and monitored to ensure that no food or water attractants for bighorn sheep are available on the work sites during or following project activities.	
BIO-MAM-6	**Bats, Common and Sensitive Species** **Pre-construction Surveys.** A qualified bat biologist would conduct surveys before the start of construction to identify active bat roosting or maternity colonies within or adjacent to project impact areas. Trees, rock outcrops, caves, and mines with bat roost potential would be assessed for the presence of bats during the maternity season (April 15 - August 15) or winter torpor season (October 31 - February 15). For the maternity season, a one-night visual emergence survey during acceptable weather conditions (e.g., no rain or high winds, night temperatures >45F) may be employed to determine presence. Alternatively, the roost can be physically examined if conditions permit (e.g., remote cameras or lift equipment). High-value habitat features (large tree cavities, crevices, bark fissures, basal hollows, loose or peeling bark, larger snags, mines, rock outcrops, buildings, etc.) would be identified and the area around these features searched for bats and bat sign (guano, culled insect parts, staining, etc.). Riparian woodland, orchards, and stands of mature broadleaf trees should be considered potential habitat for solitary foliage roosting bat species, such as the solitary western red bat and western yellow bat. **Construction Monitoring**. If a colonial or solitary maternity roost was located, tree/structure removal would be avoided between April 15 and August 15 (the maternity period) to avoid impacts to active maternity roosts (reproductively active females and dependent young). A qualified biologist would determine the appropriate buffer area around active nest(s) and provisions for buffer exclusion areas. Unless restricted by the qualified biologist, construction vehicles would be allowed to move through a buffer area with no stopping or idling. The qualified biologist would determine, evaluate, and modify buffers as appropriate based on species tolerance and behavior, the potential disruptiveness of construction activities, and existing conditions. Furthermore, the roost would be monitored to determine activity. Roost monitoring would be conducted by qualified biological monitors with knowledge of bat behavior under the direction of a CDFW qualified bat biologist. The qualified biological monitor would observe and document implementation of appropriate buffer areas around active roosts(s) during project activities.	Avoid and minimize impacts to special-status bats and habitat.

Table 5.1-1: Applicant Proposed Measures

APM Number	Description	Justification
BIO-RES-1	**Habitat Restoration Management Plan** Impacts to native habitats would be mitigated through restoration, compensatory mitigation, or a combination of both as set forth by the appropriate resource agencies. SCE shall develop a Habitat Restoration and Monitoring Plan (HRMP) to address impacts to native habitats. The HRMP shall detail compensatory mitigation and restoration strategies, which may include; topsoil salvage and reapplication, special-status plant species restoration, nonnative plant removal, revegetation methods (including seeding and planting), timeline and sequence of implementation, monitoring and reporting, revegetation success standards, and adaptive management strategies. SCE would consult with appropriate agencies during development of the HRMP and implement the HRMP in conjunction with applicable permit conditions and mitigation measures.	Restore native habitat.
BIO-RES-2	**Develop Integrated Weed Management Plan** SCE shall prepare and implement an Integrated Weed Management Plan (IWMP). This plan shall include measures designed to avoid the introduction and spread of new weed species and minimize the spread of existing weed species resulting from project activities. The IWMP would include: weed survey methods, implementation locations, removal methods (mechanical, chemical, and manual), target weed species and timing for optimal control, preventive measures and BMPs, weed management goals, and monitoring and reporting strategies. At a minimum, the IWMP would cover the following measures: • Pre-construction surveys and mapping of existing weed species, excluding ubiquitous weeds. • Guidance for vehicle and equipment inspections and/or washing, including wash station (mobile or built in place) locations, to help prevent the spread of weeds into new areas of the project. • Condition the use of construction or erosion control materials (straw, hay, gravel, soil, etc.) to be free of weeds. • Federal land agency requirements (e.g., Herbicide use).	Avoid and minimize introduction of noxious and invasive weeds.
BIO-BOT-1	**Special-status Herbaceous Plants** **Pre-construction surveys/Construction Monitoring**. Focused surveys would be conducted by a qualified botanist during the appropriate blooming period to identify special-status plants species observed during surveys (Table 4.4-4) in the proposed project areas where suitable habitat is present. Surveys would be current and consistent with the protocol outlined by CDFW Protocols for Surveying and Evaluating Impacts to Species Status Native Plant Populations and Sensitive Nature Communities (May 2018). The boundaries of the populations would be delineated for avoidance. A qualified botanist would be present whenever work is occurring within or adjacent to mapped populations. In the event of an unexpected discovery of a new species or previously unmapped population, the same steps will be used as discussed above. In addition, when there is discovery of a new species, the CPUC, CDFW, and/or BLM will be notified. **Coordinate with Agencies.** If populations or individuals of special-status plants cannot be avoided, a Habitat Restoration Management Plan (HRMP) shall address impacts, topsoil salvage, and restoration and/or mitigation.	Avoid and minimize impacts to special-status plants.

Table 5.1-1: Applicant Proposed Measures

APM Number	Description	Justification
	Approval of the HRMP by agencies is required before impacts to the given species population is allowed. Agencies would also approve the plan to impacts special status plants and determine if more 10% impact is acceptable or if more restrictive requirements are in order. Temporary impacts would be mitigated through on-site restoration and revegetation. Permanent impacts would be mitigation for the loss of and/or impacts through on- or off-site restoration and/or compensatory mitigation as set forth by the appropriate resource agency.	
BIO-BOT-2	**Special-status Tree/Shrubs/Cactus** **Pre-construction surveys/Construction Monitoring.** Pre-construction surveys would be conducted by a qualified botanist to identify any smoke trees (Psorothamnus spinosus), mesquites (Prosopis spp.), all species of the family Agavaceae (including Mojave yucca and Joshua tree), palo verdes (Parkinsonia spp.), desert pincushion (Coryphantha chlorantha), matted cholla (Grusonia parishii) curved-spine beavertail (Opuntia curvispina), or Mojave fishhook cactus (Sclerocactus polyancistrus) in the project area. Surveys would be consistent with the protocol outlined by CDFW Protocols for Surveying and Evaluating Impacts to Species Status Native Plant Populations and Sensitive Nature Communities (May 2018). Pre-construction surveys would focus on identifying individuals not captured during focused surveys. Identified individuals would be delineated for avoidance. If avoidance is not possible, mitigation would be implemented. The project shall be designed to minimize impacts to special-status plants during construction. Where special-status plants are known to occur, all work shall occur outside a 50-foot buffer. Buffer reductions may occur with the implementation of appropriate minimization measures. If avoidance is not possible, mitigation would be implemented. A qualified botanist monitor with the authority to halt work shall be present whenever work occurs within reduced buffers. If avoidance of listed species is not feasible, SCE will consult with USFWS/CDFW and implement any additional measures pursuant to the ESA/CESA. In the event of an unexpected discovery of a new species or previously undocumented population, the same steps will be used as discussed above. In addition, when there is an unexpected discovery of a new species, the CPUC, CDFW, and/or BLM will be notified. **Coordinate with Agencies.** If populations or individuals of special-status plants cannot be avoided, a Habitat Restoration Management Plan (HRMP) shall address removal methods, number of individuals to be removed, and restoration and/or mitigation (see APM BIO-RES-1). Approval of the HRMP by agencies is required before impacts to the given species is allowed. In the event trees, cactus, or Joshua tree cannot be avoided, the project would follow the measures (below) for removal. **Tree Removal.** Tree removal and trimming would be designed to minimize the total number of individual trees removed or significantly trimmed. During tree removal, a qualified arborist would be onsite to make recommendations on trimming and removal. Protection and replacement of trees impacted by project activities would be mitigated consistent with applicable jurisdiction and agency requirements. **Cactus/Joshua Tree Removal.** Removal and trimming would be designed to minimize the total number of individual	Avoid and minimize impacts to special-status plants.

Table 5.1-1: Applicant Proposed Measures

APM Number	Description	Justification
	trees removed. The qualified botanist would make recommendations on trimming and removal. Protection and replacement of trees impacted by project activities would be mitigated consistent with applicable jurisdiction and agency requirements. Where appropriate, mitigation for the loss of and/or impacts would be through on- or off-site restoration and/or compensatory mitigation as set forth by the appropriate resource agency.	
CUL-1	**Develop Cultural Resource Management Plan.** SCE shall prepare and submit for approval a Cultural Resource Management Plan (CRMP) to guide all cultural resource management activities during project construction. Management of cultural resources shall follow all applicable federal and state standards and guidelines for the management of historic properties/historical resources. The CRMP shall be submitted to the BLM, CPUC and tribes for review and approval at least 90 days prior to the start of construction. The CRMP shall include, but not be limited to, the following sections: • Cultural Resources Management Plan: The CRMP shall define and map all known cultural resources, including all NRHP- and CRHR-eligible properties in or within 100 feet of the Proposed Project APE/API. • The CRMP will also contain details about how all NRHP- and CRHR-eligible properties will be avoided and protected during construction. Protective measures shall include, at a minimum designation and marking of Environmentally Sensitive Areas (ESAs), archaeological monitoring, personnel training, and reporting. The plan shall also detail what avoidance measures will be used, where and when they will be implemented, lines of authority and communication, and how avoidance measures and enforcement of ESAs will be coordinated with construction personnel. • Cultural Resource Monitoring and Field Reporting: Detail procedures for archaeological and Native American monitoring, for reporting protocols, and for determining when monitoring is no longer necessary. Include guidelines for monitoring in Areas of High Sensitivity for the discovery of buried NRHP and/or CRHR eligible cultural resources, including burials, cremations, or sacred sites. • Unanticipated Discovery Protocol: Detail procedures for halting construction, defining work stoppage zones, notifying stakeholders (e.g. agencies, Native Americans, utilities), and assessing NRHP and/or CRHR eligibility in the event unanticipated discoveries are encountered during construction. Include methods, timelines for assessing NRHP and/or CRHR eligibility, formulating mitigation plans, and implementing treatment. Mitigation and treatment plans for unanticipated discoveries shall be reviewed by appropriate Native American tribes and approved by the BLM and CPUC, prior to implementation. • Data Analysis and Reporting: Detail methods for data analysis in a regional context, reporting of results within one year of completion of field studies, curation of artifacts and data (maps, field notes, archival materials, recordings, reports, photographs, GIS shapefiles, and analytical data) at a facility that is approved by the BLM and CPUC, and dissemination of reports to appropriate repositories.	Reduce impacts to cultural resources.

Table 5.1-1: Applicant Proposed Measures

APM Number	Description	Justification
CUL-2	**Avoid Environmentally Sensitive Areas (ESAs).** SCE shall perform surveys for any project areas not yet surveyed (e.g. new or modified staging areas, pull sites, or other work areas) and areas covered by expired surveys (older than 10 years). Resources discovered during the surveys would be subject to Mitigation Measures CUL-1 (Develop CRMP). Where operationally feasible, all NRHP- and CRHR-eligible resources shall be protected from direct project impacts by project redesign (i.e., relocation of the line, ancillary facilities, or temporary facilities or work areas). In addition, all historic properties/historical resources shall be avoided by all project construction, operation and maintenance, and restoration activities, where feasible. Avoidance mechanisms shall include fencing off Environmentally Sensitive Areas (ESAs) for the duration of the Proposed Project or as outlined in the CRMP.	Reduce impacts to cultural resources.
CUL-3	**Conduct Construction Monitoring.** Archaeological monitoring shall occur as outlined in the CRMP, including but not limited to the archaeological monitor's authority, duties and reporting requirements. Archaeological monitoring shall be conducted by a qualified archaeologist familiar with the types of historic and prehistoric resources that could occur within the Proposed Project area. A Native American monitor may be required at culturally sensitive locations specified during government-to-government consultation with Native American tribes. SCE shall retain and schedule any required Native American monitors. The qualifications of the principal archaeologist and monitors shall be approved by the BLM and CPUC. Brief monitoring reports shall be submitted to the BLM and CPUC on a weekly basis. A monitoring report presenting the results of the monitoring effort shall be prepared and submitted to BLM and the CPUC for review and approval within one year of the completion of monitoring.	Reduce impacts to cultural resources.
CUL-4	**Property Treat Human Remains.** SCE shall follow all federal and state laws, statutes, and regulations that govern the treatment of human remains. Minimally, all work in the vicinity of such as find will cease within a 200-foot radius of the remains and, the area will be protected to ensure that no additional disturbance occurs. Should inadvertent effects to or unanticipated discoveries of human remains be made on federal lands, the BLM, and County Coroner (California Health and Safety Code 7050.5(b)) shall be notified immediately. If the remains are determined to be Native American or if Native American cultural items pursuant to the Native American Graves Protection and Repatriation Act (NAGPRA) are uncovered, the remains shall be treated in accordance with the provisions of NAGPRA (43 CFR 10) and the Archaeological Resources Protection Act (43 CFR 7). If the remains are not on federal land, the CPUC and County Coroner shall be notified immediately and the remains shall be treated in accordance with Health and Safety Code Section 7050.5, CEQA Section 15064.5€, and Public Resources Code Section 5097.98. SCE shall assist and support the BLM and/or state agencies, as appropriate, in all required NAGPRA and Section 106 actions, government to-government and consultations with Native Americans, agencies, and consulting parties as requested by the BLM and/or state agencies. SCE shall comply with and implement all required actions and studies that result from such consultations.	Reduce impacts to human remains.

Table 5.1-1: Applicant Proposed Measures

APM Number	Description	Justification
HAZ-1	**Prepare a Hazardous Materials Management Plan.** SCE will prepare and implement a project specific Hazardous Materials Management Plan (HMMP), during project construction. The plan will outline proper hazardous materials handling, use, storage and disposal requirements, as well as hazardous waste management procedures. This plan will be developed to ensure that all hazardous materials and wastes will be handled and disposed of according to applicable rules and regulations. The HMMP will address hazardous materials storage, employee training requirements, hazard recognition, fire safety, first aid/emergency medical procedures, hazardous materials release containment/control procedures, hazard communication training, PPE training, and release reporting requirements. If on site refueling is necessary, BMPs shall be implemented in accordance with the project SWPPP. All construction personnel, including environmental monitors, will be made aware of state and federal emergency response reporting guidelines for accidental spills.	Reduce hazardous materials-related impacts.
HAZ-2	**Prepare a Soil Management Plan**. A Soil Management Plan will be developed and implemented for the proposed project. The Soil Management Plan will provide guidance for the proper handling, on-site management, and disposal of impacted soil that may be encountered during construction activities. The Soil Management Plan will direct that during grading or excavation work, the construction contractor shall observe the exposed soil for visual evidence of contamination. If visual contamination indicators are observed during construction, potentially contaminated soil will be segregated, sampled, and tested to determine appropriate treatment and disposal options. Work in the area of the potentially contaminated soil will be stopped until appropriate measures are determined based on the testing results and are taken to protect human health and the environment. If the soil is classified as hazardous, it will be properly managed on location and transported in accordance with the U.S. Department of Transportation regulations using a Uniform Hazardous Waste Manifest to a Class I Landfill or other appropriate soil treatment or recycling facility. If potentially-contaminated groundwater is encountered, then groundwater samples will be collected and tested to determine appropriate treatment and disposal. Hazardous materials will be transported, used, and disposed of in accordance with applicable rules, regulations, and SCE standard protocols designed to protect the environment, workers, and the public.	Reduce hazardous materials-related impacts.

Table 5.1-1: Applicant Proposed Measures

APM Number	Description	Justification
HAZ-3	**Prepare and Implement a Fire Management Plan.** A Fire Prevention and Emergency Response Plan would be developed to ensure the health and safety of construction workers, SCE personnel, and the public during Project construction. The Plan shall cover: • The purpose and applicability of the plan • Responsibilities and duties • Procedures for fire reporting, response, prevention, and evacuation routes • Coordination procedures with federal and local fire officials • Crew training, including fire safety practices and restrictions • Method for verification that Plan protocols and requirements are being followed A Project-specific fire prevention plan for construction of the project shall be prepared by SCE and submitted to CPUC, BLM, CALFIRE, Inyo, Kern and San Bernardino Counties, and local municipal fire agencies for review prior to initiation of construction	Reduce hazardous materials-related impacts.
NOI-1	**Implement Best Management Practices for Construction Noise.** SCE shall employ the following noise-control techniques, at a minimum, to reduce construction noise exposure at noise-sensitive receptors during construction: • To the extent feasible, construction activities shall be confined to daytime, weekday and weekend established by the applicable local jurisdiction. In the event construction is required beyond those hours, SCE will notify the appropriate local agency or agencies regarding the description of the work, location, and anticipated construction hours. • Construction equipment shall use noise reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer. • Construction traffic and helicopter flight shall be routed away from residences and schools, where feasible. • Unnecessary construction vehicle use and idling time shall be minimized. If a vehicle is not required for use immediately or continuously for construction activities, its engine shall be shut off.	Reduce noise-related impacts.

Table 5.1-1: Applicant Proposed Measures

APM Number	Description	Justification
PAL-1	**Develop Paleontological Resource Mitigation and Monitoring Plan.** SCE shall prepare a Paleontological Resources Mitigation and Monitoring Plan (PRMMP), utilizing findings of the paleontological resource survey and technical report, to guide all paleontological management activities during project construction. The PRMMP shall be submitted to the BLM and CPUC for review and approval at least 60 days prior to the start of construction. The PRMMP shall be prepared by a qualified paleontologist, based on Society of Vertebrate Paleontology (SVP) 2010 guidelines, and meet all regulatory requirements. The qualified paleontologist shall have a Master's Degree or Ph.D. in paleontology or geology, have local paleontology knowledge, and shall be familiar with paleontological procedures and techniques. The PRMMP will include, but not be limited to, the following sections: • Paleontological Resource Monitoring and Reporting: Detail monitoring procedures and methodologies, which shall require a qualified paleontological monitor for all construction-related ground disturbance that reach approximate depths for significant paleontological resources in sediments with moderate (PFYC 3a) to very high (PFYC 5) sensitivity. Sediments of undetermined sensitivity shall be monitored on a part-time basis as outlined in the PRMMP. Sediments with very low or low sensitivity will not require monitoring. Paleontological monitors shall meet standard qualifications per the SVP (2010). • Unanticipated Discovery Protocol: Detail procedures for halting construction, defining work stoppage zones, notifying stakeholders, and assessing the paleontological find for scientific significance. If indicators of potential microvertebrate fossils are found, screening of a test sample shall be carried out as outlined in SVP 2010. • Data Analysis and Reporting: Detail methods for data recovery, analysis in a regional context, reporting of results within one year of completion of field studies, curation of all fossil specimens in an accredited museum repository approved by the BLM and CPUC, and dissemination of reports to appropriate repositories.	Reduce impacts to paleontological resources.
PAL-2	**Monitor Construction for Paleontological Resources.** Based upon the paleontological sensitivity assessment and Paleontological Resource Mitigation and Monitoring Plan consistent with Mitigation Measure PAL-1 (Develop Paleontological Resource Mitigation and Monitoring Plan), SCE will conduct full-time construction monitoring through its qualified paleontological monitor(s) in areas determined to have moderate (PFYC 3a) to very high (PFYC 5) sensitivity. Quaternary paleosols will be included in the PFYC 3a designation. Sediments of very low (PFYC 1), low (PFYC 2), or unknown (PFYC 3b) sensitivity shall not be monitored, unless geologic mapping is found to be in error. Paleontological resource monitors per SVP (2010) shall have the equivalent of the following qualifications: • BS or BA degree in geology or paleontology and one-year experience monitoring in the state or geologic province of the specific project. An associate degree and/or demonstrated experience showing ability to recognize fossils in a biostratigraphic context and recover vertebrate fossils in the field may be substituted for a degree. An undergraduate degree in geology or paleontology is preferable, but is less important than documented experience performing paleontological monitoring, or • AS or AA in geology, paleontology, or biology and demonstrated two years of experience collecting and	Reduce impacts to paleontological resources.

Table 5.1-1: Applicant Proposed Measures

APM Number	Description	Justification
	salvaging fossil materials in the state or geologic province of the specific project, or • Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in the state or geologic province of the specific project. Monitors must demonstrate proficiency in recognizing various types of fossils, in collection methods, and in other paleontological field techniques. Copies of Monitoring Reports shall be submitted to the BLM and CPUC on a weekly basis.	
PAL-3	**Final Reporting and Curation.** At the conclusion of laboratory work, a final report will be prepared describing the results of the paleontological monitoring efforts associated with the project. The report will include a summary of the field and laboratory methods, an overview of the Proposed Project area geology and paleontology, a list of taxa recovered (if any) and their scientific significance, and recommendations. If the monitoring effort produced fossils, then a copy of the report will also be submitted to the designated museum repository. All significant fossils collected will be prepared in a properly equipped paleontology laboratory to a point ready for curation no more than 60 days after all fieldwork analyses are completed. Preparation will include the careful removal of excess matrix from fossil materials and stabilizing and repairing specimens, as necessary. Following laboratory work, all fossil specimens will be identified to the lowest taxonomic level, catalogued, analyzed, and delivered to an accredited museum repository for permanent curation and storage. The cost of curation is assessed by the repository and is the responsibility of SCE.	Reduce impacts to paleontological resources.
TCR-1	**Conduct Tribal Construction Monitoring.** An archaeological monitor and tribal monitor who is culturally affiliated with the project area shall be present for all ground-disturbing activities within or directly adjacent to a previously identified TCR(s). The archaeological and tribal monitors will consult the CRMP (APM CUL-1) to determine other areas that tribal monitoring may occur and to determine when to increase or decrease the monitoring effort should the monitoring results indicate a change is warranted. Copies of monitoring reports shall be submitted to the BLM and CPUC on a monthly basis.	Reduce impacts to tribal cultural resources.
TCR-2	**Develop Tribal Engagement Plan.** Based on the results of consultation with NAHC-provided tribal contacts, SCE shall prepare a tribal engagement plan for the proposed project, which will outline the process by which Native American tribes will be engaged and informed throughout the proposed project. The tribal engagement plan will be included within the CRMP to be prepared for the proposed project (APM CUL-1).	Reduce impacts to tribal cultural resources.
TRA-1	SCE shall follow its standard safety practices, including installing appropriate traffic control devices between work zones and transportation facilities, posting adequate signs, and using proper construction techniques. SCE is a member of the California Inter-Utility Coordinating Committee, which published the Manual on Uniform Traffic Control Devices, as amended for the state of California (CA MUTCD; CALTRANS 2018) and using standard templates from the California Temporary Traffic Control Handbook. (CATTCH 2018) This handbook was previously known as the California Joint Utility Traffic Control Manual. (CJUTCM 2010) SCE will follow the recommendations in this manual regarding basic standards for the safe movement of traffic on highways and streets in accordance with Section 21400 of the CVC. These recommendations include provisions for safe access of police, fire, and other rescue vehicles.	Reduce traffic flow-related impacts.
TRA-2	SCE would consult with the FAA regarding helicopter flight plans that would take place during construction.	Reduce impacts from helicopter activities.

Table 5.1-1: Applicant Proposed Measures

APM Number	Description	Justification
WET-1	**Avoid and/or Minimize Impacts to Jurisdictional Waters, Wetlands, and Riparian Habitats.** The project shall avoid and/or minimize impacts to all state and federally jurisdictional waters, wetlands, and riparian habitat that occur within the Project area to the maximum extent feasible. All grading, fill, staging of equipment, infrastructure construction or removal, and all other construction activities shall be designed, sited, and conducted outside of state and federally jurisdictional waters, wetlands, and riparian habitat to the maximum extent feasible. The implementation of appropriate Best Management Practices (BMPs) (e.g., silt fencing, straw wattles, secondary containment, avoiding fueling in close proximity to waters, etc.) shall be utilized to ensure that indirect impacts to jurisdictional waters, wetlands and riparian areas are avoided or minimized to the maximum extent feasible. BMPs are also necessary to reduce the risk of an unintended release of sediments or other materials into jurisdictional waters. New and upgraded roadways will use at-grade type stream crossings where possible. Stockpiled and bermed sediment will be redistributed or removed from the site so as not to cause water impoundment or induce hydromodification. New poles will be sited outside stream channels to the extent possible. If permanent impacts to waters, wetlands, and riparian habitats are unavoidable, they shall be mitigated for at a minimum of a 1:1 ratio, or at a ratio determined by the applicable Resource Agencies (i.e., U.S. Army Corps of Engineers, the State Water Resources Control Board/Regional Water Quality Control Boards, and California Department of Fish and Wildlife). Temporary impacts to jurisdictional waters shall be returned to pre-existing contours upon completion of the work.	Reduce impacts to jurisdictional waters, wetlands, and riparian habitats.

5.2 Description of Project Alternatives and Impact Analysis

This section identifies and compares the construction and operation of the IC Project's Full-Rebuild Concept with alternatives identified by SCE. Section 15126.6(d) of the CEQA Guidelines requires that an environmental impact report (EIR) include "sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project." Although a PEA document is not an EIR, this section summarizes the relative impact of the alternatives to the Full-Rebuild Concept identified by SCE for each CEQA environmental issue area. In addition, SCE continues to develop and evaluate alternatives beyond those identified and analyzed in this Chapter 5. SCE expects to supplement this PEA with an additional report regarding the potential feasibility and environmental impacts associated with such additional alternatives.

The IC Project objectives are as follows:

- Ensure compliance with CPUC General Order 95 and NERC Facility Ratings for this project by 2025
- Continue to provide safe and reliable electrical service
- Meet IC Project needs while minimizing environmental impacts
- Design and construct the physical components of the Full-Rebuild Concept Project in conformance with industry and/or SCE's approved engineering, design, and construction standards for substation and subtransmission system projects.

These objectives were used to develop and evaluate a range of reasonable alternatives to the Full-Rebuild Concept. Several corrective actions were considered but dismissed as infeasible as they would not feasibly attain most of the objectives or other considerations. However, a select few corrective actions were determined to be feasible and were bundled into comprehensive alternatives to the Full-Rebuild Concept.

5.2.1 Electrical System Line Clearance Evaluation Methodology

5.2.1.1 Line Rating Evaluation Methodology

SCE filed a discrepancy remediation mitigation plan to the Western Electricity Coordination Council (WECC) for the subtransmission lines included in the IC Project in 2007. The mitigation plan identified discrepancies along existing lines that required remediation and identified the corresponding CAISO Transmission Register rating for each line. The initial target was to remediate all identified discrepancies along the existing subtransmission lines to be consistent with the CAISO Transmission Register rating in place in 2008. SCE identified the spans that did not satisfy the ratings due to clearance discrepancies, which in turn led to the development of various corrective actions to address the clearance discrepancies. Because the lines are existing subtransmission lines currently used to provide service to existing load and generation customers, the mitigation plan considered addressing all discrepancies along the existing subtransmission lines and did not focus on constructing new lines in different corridors. Consequently, no line route alternatives were developed.

5.2.2 Alternatives Development

The following sections include an evaluation of five types of corrective actions for the individual line Segments that comprise the IC Project: Decommission and Remove; Operating Voltage Increase; Energy Storage; Derate Only; and Derate and Remediate Remaining GO 95 Discrepancies. The feasibility of these categories is summarized below in Table 5.2-1. Based on the feasibility of each corrective action for each Segment (i.e. Segments 1, 2, 3N, 3S, and 4 as shown in Figures 5.2-1 through 5.2-9), six Comprehensive Project Alternatives, A through F, were identified as summarized in Table 5.2-2.

Table 5.2-1: Feasibility of Corrective Actions

Project Segment	Rebuild	Decommission and Remove	Operating Voltage Increase	Energy Storage	Derate Only	Derate and Remediate Remaining GO 95 Discrepancies
1	YES	NO	N/A	NO	NO	NO
2	YES	NO	NO	NO	NO	NO
3N	YES	NO	N/A	NO	NO	YES
3S	YES	NO	N/A	NO	NO	YES
4	YES	NO	N/A	NO	NO	YES

Table 5.2-2: Full-Rebuild Concept and Feasible Alternatives

Project Segment	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E (Proposed Project)	Full-Rebuild Concept
1	Rebuild*	Rebuild*	Rebuild*	Rebuild*	Rebuild*	Rebuild
2	Rebuild*	Rebuild*	Rebuild*	Rebuild*	Rebuild*	Rebuild
3N	Rebuild*	Rebuild as double-circuit pole line (see Section 5.2.2.5.4)	Rebuild as double-circuit pole line (see Section 5.2.2.5.4)	Derate and Remediate Remaining GO 95 Discrepancies (see Section 5.2.2.5.3)	Derate and Remediate Remaining GO 95 Discrepancies (see Section 5.2.2.5.3)	Rebuild
3S	Rebuild*	Derate and Remediate Remaining GO 95 Discrepancies (see Section 5.2.2.5.4)	Derate and Remediate Remaining GO 95 Discrepancies (see Section 5.2.2.5.4)	Rebuild as double-circuit pole line (see Section 5.2.2.5.3)	Rebuild as double-circuit pole line (see Section 5.2.2.5.3)	Rebuild
4	Derate and Remediate Remaining GO 95 Discrepancies (see Section 5.2.2.5.5)	Rebuild*	Derate and Remediate Remaining GO 95 Discrepancies (see Section 5.2.2.5.5)	Rebuild*	Derate and Remediate Remaining GO 95 Discrepancies (see Section 5.2.2.5.5)	Rebuild

* The Full-Rebuild Concept described in *Chapter 3—Project Description* includes a full rebuild of Segments 1, 2, 3N, 3S, and 4. Rebuilt segments identified in each Comprehensive Alternative would have the same scope as described in the corresponding segment of the Full-Rebuild Concept.

5.2.2.1 Decommissioning and Removal

SCE analyzed the potential for decommissioning the existing subtransmission lines included under the Full-Rebuild Concept. Under this corrective action, the existing subtransmission infrastructure would be deenergized and removed; no replacement infrastructure would be installed. These Alternatives, as discussed by Segment below, were deemed not feasible.

5.2.2.1.1 Decommissioning and Removal—Segment 1

In Segment 1, the Control-Haiwee-Inyokern 115 kV Subtransmission Line and Control-Coso-Haiwee-Inyokern 115 kV Subtransmission Line connect the Control 115 kV subtransmission portion of the system to the rest of SCE's electric system. These subtransmission lines are also used to provide system inter-ties with the Los Angeles Department of Water and Power (LADWP) system at the Haiwee and Inyo substations.

The Control 115 kV subtransmission portion of the system, located in Inyo and Mono counties, provides service to loads out of the Casa Diablo, Coso, Lee Vining, and Sherwin 115 kV substations and the Deep Springs, Fish Lake, Lundy, Mount Tom, White Mountain, and Zack 55 kV substations. In addition, the Control 115 kV subtransmission portion of the system integrates a total of 53.7 MW of existing hydropower generation connected at Bishop Creek, Lundy, Poole, and Rush Creek substations and 92 MW of existing geothermal generation connected at Casa Diablo and Control substations to the rest of the CAISO controlled system. The generation total served out of the Control 115 kV subtransmission portion of the system would likely increase in the future with the inclusion of new generation seeking interconnection via the FERC and/or CPUC mandated interconnection process: Currently, a total 40.7 MW of additional geothermal generation located in Mono County is seeking interconnection to distribution served out of the Casa Diablo Substation, increasing the total hydropower and geothermal generation to 186.4 MW. Technical studies performed for the 40.7 MW of additional geothermal generation did not identify a need for upgrades of the existing subtransmission lines that comprise Segment 1 with the CAISO Transmission Register rating in place in 2007.

Decommissioning and removing the existing subtransmission infrastructure would result in disconnecting the Control 115 kV subtransmission portion of the system from the rest of SCE's electric system (see Figure 5.2-1). This would eliminate the system tie with LADWP at Haiwee Substation, would eliminate service to load served out of the Coso Substation, and would result in the Control 115 kV subtransmission portion of the SCE system being solely connected to LADWP and NV Energy via the Inyo and Silver Peak phase-shifted system ties. As a result of this corrective action, service to load and generation in the Control 115 kV subtransmission portion of the SCE service area would require the use of the electric facilities owned by LADWP and NV Energy. Such use would require necessary upgrades to SCE and LADWP facilities, and may potentially require upgrades to NV Energy facilities.

Decommissioning and removing the existing Control-Haiwee-Inyokern 115 kV Subtransmission Line and Control-Coso-Haiwee-Inyokern 115 kV Subtransmission Line would result in adverse impact to local Control area load and generation resources, and would eliminate SCE's ability to provide back-up service to LADWP. Safe and reliable electrical service to both load demand and existing small hydropower and geothermal renewable energy resources would not be maintained. Load would be subjected to service interruption following loss of the Inyo phase-shifted system tie and generation would be subjected to significant amounts of curtailment, with possible shut-down of renewable resources without the connection to the remaining portion of SCE's electrical system. Consequently, decommissioning and removal of Segment 1 is not feasible.

5.2.2.1.2 Decommissioning and Removal—Segment 2

The Kramer-Inyokern-Randsburg No.1 115 kV Subtransmission Line, together with the Kramer-Inyokern-Randsburg No.3 115 kV Subtransmission Line, both located in Segment 2 in San Bernardino and Kern counties, connect the Inyokern 115 kV, and by extension the Control 115 kV, subtransmission portions of the system to the rest of SCE's electric system.

The Inyokern 115 kV subtransmission portion of the system provides service to loads out of the Downs, Inyokern, and Searles 115 kV substations. In addition, the Inyokern 115 kV subtransmission portion of the system integrates a total of 80 MW of existing geothermal generation connected at Calgen to the rest of the CAISO-controlled system, and would integrate 20 MW of solar photovoltaic generation currently under development at Inyokern. The total amount of existing hydropower and geothermal generation interconnected to the Control and Inyokern subtransmission portions of the system that rely on the Kramer-Inyokern-Randsburg No.1 115 kV Subtransmission Line and Kramer-Inyokern-Randsburg No.3

115 kV Subtransmission Line to export power is 225.7 MW; this would increase to 286.4 MW with the development of an additional 40.7 MW of geothermal in the Control area and 20 MW of solar photovoltaic generation in the Inyokern area.

Decommissioning and removing the existing subtransmission infrastructure would result in the elimination of one of the two subtransmission lines that are used to provide service to load and generation served out of the Downs, Inyokern, Randsburg, and Searles 115 kV substations as well as all of the Control area load and generation (see Figure 5.2-2). Adverse impacts would occur to local Inyokern and Control area load and generation resources. Safe and reliable electrical service to both load demand and existing small hydropower and geothermal renewable energy resources would not be maintained. Consequently, decommissioning and removal of Segment 2 is not feasible.

5.2.2.1.3 Decommissioning and Removal—Segment 3N

In Segment 3N, the Coolwater-Kramer 115 kV Subtransmission Line, located in San Bernardino County, is used as part of the CAISO network to provide service to load totaling approximately 135 MW served out of Baker, Dunn Siding, Gale, Mountain Pass, Tiefort, and Tortilla 115 kV substations. This subtransmission line is also used to integrate generation out of the Coolwater, Gale, SEGS2, Tiefort, and Tortilla 115 kV substations. Furthermore, this subtransmission line is used to support power flows from renewable resources located in the Ivanpah/Eldorado Competitive Renewable Energy Zones (CREZ) delivered on the Coolwater-Baker-Dunn Siding-Ivanpah-Mountain Pass 115 kV line located in Segment 4, which also has discrepancies along the existing line that requires remediation.

Decommissioning and removing the existing Coolwater-Kramer 115 kV Subtransmission Line would result in the elimination of one of the two subtransmission lines connecting the Kramer Substation and the Coolwater Substation (see Figure 5.2-3).

The removal of the Coolwater-Kramer 115 kV Subtransmission Line would expose local area load to service interruption resulting from potential voltage collapse under loss of the Kramer-Tortilla 115 kV Subtransmission Line, loss of the Coolwater-SEGS2-Tortilla 115 kV Subtransmission Line, or loss of connection to Eldorado (loss of both transformer banks at Ivanpah Substation or loss of both Eldorado-Ivanpah 220 kV transmission lines [not shown in Figure 5.2-3]). Under such outage conditions, voltage collapse conditions at Baker, Dunn Siding, Gale, Mountain Pass, Tiefort, and/or Tortilla substations would likely occur. As an example, with removal of the Coolwater-Kramer 115 kV Subtransmission Line, loads served out of the Baker, Dunn Siding, Gale, Mountain Pass, Tiefort, and Tortilla 115 kV substations, totaling approximately 135 MW, would be radially served from the Ivanpah Substation via a single 93.74-mile 4/0 ACSR 115 kV line following loss of the Kramer-Tortilla 115 kV Subtransmission Line. The voltage collapse condition would be attributed to the 93.74-mile distance, radial connection to the Ivanpah Substation following outage condition, amount of load, type of conductor used, and the resulting line loading relative to transmission line surge impedance loading (SIL), which is a key driver to a voltage collapse condition. As a result of such unreliable system performance, the decommissioning and removal of Segment 3N is not feasible.

5.2.2.1.4 Decommissioning and Removal—Segment 3S

In Segment 3S, the Kramer-Tortilla 115 kV Subtransmission Line and Coolwater-SEGS2-Tortilla 115 kV Subtransmission Line, both located in San Bernardino County, are used as part of the CAISO network to provide service to load totaling approximately 135 MW served out of Baker, Dunn Siding, Gale, Mountain Pass, Tiefort, and Tortilla 115 kV substations. These subtransmission lines are also used to integrate generation out of the Coolwater, Gale, SEGS2, Tiefort, and Tortilla 115 kV substations.

Furthermore, these subtransmission lines are used to support power flows from renewable resources located in the Ivanpah/Eldorado Competitive Renewable Energy Zones (CREZ) delivered on the Coolwater-Baker-Dunn Siding-Ivanpah-Mountain Pass 115 kV line located in Segment 4, which also has discrepancies along the existing line that require remediation.

Decommissioning and removing the existing Kramer-Tortilla 115 kV Subtransmission Line and Coolwater-SEGS2-Tortilla 115 kV Subtransmission Line would result in the elimination of one of the two subtransmission lines connecting the Kramer Substation to the Coolwater Substation and complete disconnection of the Tortilla Substation from SCE's electric system (see Figure 5.2-4).

The removal of the Kramer-Tortilla 115 kV and Coolwater-SEGS2-Tortilla 115 kV subtransmission lines would expose local area load to service interruption resulting from completely disconnecting the Tortilla Substation from the electric grid and from potential voltage collapse at Baker, Dunn Siding, Gale, Mountain Pass, and Tiefort substations under loss of the Coolwater-Kramer 115 kV Subtransmission Line or loss of connection to Eldorado Substation (loss of both transformer banks at Ivanpah Substation or loss of both Eldorado-Ivanpah 220 kV transmission lines [not shown in Figure 5.2-4]).

Under such outage conditions, voltage collapse conditions at Baker, Dunn Siding, Gale, Mountain Pass, and/or Tiefort substations would likely occur. As an example, with removal of the Kramer-Tortilla 115 kV Subtransmission Line and Coolwater-SEGS2-Tortilla 115 kV Subtransmission Line, loads totaling approximately 69 MW served out of the Baker, Dunn Siding, Gale, Mountain Pass, and Tiefort 115 kV substations would be radially served from the Ivanpah Substation via a single 93.74-mile 4/0 ACSR 115 kV subtransmission line following loss of the Coolwater-Kramer 115 kV Subtransmission Line. The voltage collapse condition would be attributed to the 93.74-mile distance, radial connection to the Ivanpah Substation following the outage condition, type of conductor used, and the resulting line loading relative to transmission line surge impedance loading (SIL), which a key driver to a voltage collapse condition as discussed above. As a result of such unreliable system performance, decommissioning and removal of Segment 3S is not feasible.

5.2.2.1.5 Decommissioning and Removal—Segment 4

In Segment 4, the Coolwater-Baker-Dunn Siding-Ivanpah-Mountain Pass 115 kV Subtransmission Line, located in San Bernardino County, is used as part of the CAISO network to provide service to load served out of Baker, Dunn Siding, and Mountain Pass substations totaling approximately 20 MW. This subtransmission lines is also used to support power flows from renewable resources located in the Ivanpah/Eldorado Competitive Renewable Energy Zones (CREZ).

The decommissioning and removal of the existing Coolwater-Baker-Dunn Siding-Ivanpah-Mountain Pass 115 kV Subtransmission Line would result in the disconnection of service to Dunn Siding, Baker, and Mountain Pass substations (Figure 5.2-5). Eliminating service to these substations is not feasible, because in doing so customers served from these substations would have no electrical service. Therefore, the decommissioning and removal of Segment 4 is not feasible.

5.2.2.2 Operating Voltage Increase—Segment 2 Only

SCE developed and evaluated corrective actions to increase operating voltage where existing transmission facilities are located because if operating voltage were increased, it might allow for removal of an existing line, avoiding a rebuild. However, increasing operating voltage was a possible consideration only for Segment 2 because of all Segments, only Segment 2 includes existing transmission facilities under

CAISO control that could be leveraged to provide for an operating voltage increase without the need for the construction of extensive 220 kV transmission lines (see Figure 5.2-6).

An Operating Voltage Increase would utilize the existing Kramer-Inyokern-Randsburg No.3 115 kV Subtransmission Line, which is mostly constructed to a 220 kV design standard, and the existing Kramer-BLM West 220 kV transmission line, to provide additional transmission capacity in order to allow the removal of the 48 mile-long Kramer-Inyokern-Randsburg No.1 115 kV Subtransmission Line, located in Segment 2. This would require the construction of a new double-breaker-double-bus or breaker-and-a-half 220 kV switchyard, installation of two 220/115 kV transformer banks, and a new double-breaker double-bus 115 kV switchrack at Inyokern Substation. Two-line service to the new 220 kV switchrack would be provided by looping the existing Kramer-BLM West generation tie line in-and-out of the new 220 kV switchrack and installing a new 220 kV line position at Kramer to enable operation of the existing Kramer-Inyokern-Randsburg No.3 115 kV line to its 220 kV design standard. In addition, new facilities would be required to support a new 220/33 kV tapped substation at or near the existing Randsburg Substation. The new facilities would include a single 220/33 kV transformer bank to provide service to the load currently served out of the existing Randsburg 115/33 kV Substation.

In addition, note that an Operating Voltage Increase for Segment 2 would be approximately three times the cost of rebuilding Segment 2 due to the cost of new substation facilities. Additional cost components were not included in this rough order-of-magnitude cost, including those related to engineering redesign efforts, additional environmental impacts, or additional construction management overhead costs.

The Operating Voltage Increase for Segment 2 alternative was not carried forward for further analysis.

5.2.2.3 Energy Storage

SCE evaluated Energy Storage for use in Segments 1, 2, 3N/3S, and 4. The goal of Energy Storage would be to reduce the loading of the subtransmission lines, and by doing so eliminate existing discrepancies along the subtransmission lines. However, Energy Storage was deemed not feasible because it does not eliminate the clearance discrepancies identified along the Segments; this is discussed in the sections below.

5.2.2.3.1 Energy Storage—Segment 1

The Segment 1 Energy Storage corrective action would include the construction of a new energy storage facility located in the Control 115 kV subtransmission portion of the system specifically to address clearance issues related to line loadings on the Control-Haiwee-Inyokern and Control-Coso-Haiwee-Inyokern 115 kV subtransmission lines. Energy storage facilities function by absorbing power (while charging) and in turn produce power (while discharging). For the use of energy storage to be effective as an alternative to mitigate clearance issues, it would need to store power to sufficiently reduce the power flow on the lines at all times in which violations are expected to occur and maintain power flow at sufficiently reduced values during output of the stored power at all times.

This portion of the system consists of a total of 145.7 MW of existing hydropower and geothermal generation, which is expected to increase to 186.4 MW with the addition of 40.7 MW of new geothermal generation currently under development in Mono County. These generation resources are considered baseload resources, meaning they operate during all periods of the day with relatively consistent output. Because the generation resources in this area are in operation at all periods of the day, the use of energy storage facilities would serve to increase power flow values on the lines during the discharging of stored energy. In this specific area, energy storage would add to the power flow values on the lines when discharging and thus would potentially exacerbate the identified clearance issues rather than serve to

mitigate them. As such, an alternative for Segment 1 that includes energy storage is not considered a feasible corrective action to address the identified line clearance issues. Additional ground-disturbing impacts associated with Energy Storage were not analyzed.

5.2.2.3.2 Energy Storage—Segment 2

The Segment 2 Energy Storage corrective action includes the construction of a new energy storage facility located in the Inyokern 115 kV subtransmission portion of the system as a means of reducing loading on the existing Kramer-Inyokern-Randsburg No.1 115 kV Subtransmission Line. Energy would be stored during portions of the day and released during other time periods when loading on these lines is lower. The Inyokern portion of the system, together with the Control area, consists of a total of 225.7 MW of existing hydropower and geothermal generation; this would increase to 286.4 MW with the addition of 40.7 MW of new geothermal generation located in Mono County and 20 MW of solar photovoltaic generation located in Ridgecrest, both of which are currently under development. The hydropower and geothermal generation resources are considered baseload resources that operate during all periods of the day while the solar photovoltaic operates only during daytime periods. Because the majority of the generation resources is baseload, the use of energy storage would serve to reduce line loadings during charging of the storage, but would increase line loadings thus requiring mitigation for discrepancies during discharge of the storage as the geothermal and hydropower resources would be in operation during energy discharge. Consequently, Energy Storage is not a feasible corrective action in this area to address line clearance issues associated with line loadings that are predominately generation export related. Additional ground-disturbing impacts associated with Energy Storage were not analyzed.

5.2.2.3.3 Energy Storage—Segment 3N/3S

The Segment 3N/3S Energy Storage Alternative includes the construction of new energy storage facilities at Tortilla Substation and Coolwater Substation as a means of reducing loading on the existing Coolwater-Kramer, Kramer-Tortilla, and Coolwater-SEGS2-Tortilla 115 kV subtransmission lines. Such facilities would store energy during portions of the day and release the energy during other time periods when loading on these lines is lower. This portion of the system currently consists of a total of 72.9 MW of existing solar photovoltaic generation interconnected at Gale Substation (13.8 MW), SEGS2 Substation (20 MW), Tiefort Substation (19.1 MW non-export), and Tortilla Substation (20 MW). This amount of generation would increase with the development of 144 MW of solar photovoltaic generation and 100 MW of energy storage, identified to assist with addressing the "Duck Curve" issue identified by the CAISO, both of which replace the recently-retired Alta natural gas generation units 1 and 2. Further, based on the number of new interconnection requests received by CAISO and SCE, increases in the development of solar photovoltaic generation is anticipated in the area. Because the area would become a net generation export area, adding energy storage would only serve to shift daytime loadings to another time period of the day. This would not address line clearance violations; rather the clearance issues would persist, but would just occur at other hours of the day when the energy storage seeks to discharge. There would remain a need to remediate the discrepancies. Consequently, an Energy Storage Alternative is not a feasible corrective action in this area to address line clearance issues associated with line loadings that would become predominately generation export related as generation resources further develop. Additional ground-disturbing impacts associated with Energy Storage were not analyzed.

5.2.2.3.4 Energy Storage—Segment 4

The Segment 4 Energy Storage corrective action includes the construction of a new energy storage facility as a means of reducing loading on the existing Coolwater-Baker-Dunn Siding-Ivanpah-Mountain Pass 115 kV Subtransmission Line during times of high line loading. Such high loading occurs during

high solar production from resources feeding into Eldorado and/or Ivanpah substations, during high imports through Path 46/49, or both. Such a facility would theoretically store energy during portions of the day and release the energy during other time periods when loading on this subtransmission line is presumed to be lower. It is important to note that this subtransmission line operates in parallel with numerous 500 kV and 220 kV transmission lines owned by SCE and LADWP. This results in line flow on the Coolwater-Baker-Dunn Siding-Ivanpah-Mountain Pass 115 kV Subtransmission Line at any time that power is flowing on the 500 kV and 220 kV transmission lines. Based on the Western Electricity Coordinating Council (WECC) Path Rating Catalogue, the maximum amount of east-to-west flow on the northern portion of Path 46 (West of the Colorado River) is 6,914 MW. This amount of flow would result in line flows on Segment 4 that result in line clearance issues. The amount of line flow is further compounded due to the large amount of solar interconnections in the Ivanpah/Eldorado area.

During periods of high line loading due to east-to-west flows of generation from Ivanpah Substation (more than 940 MW of solar generation currently interconnected) and Eldorado Substation and/or imports from Nevada/Arizona, the energy storage facilities could be charged, acting as a load and absorbing some of the power flow. However, the continued operation of the line in parallel with numerous 500 kV and 220 kV lines would continue to result in power flow on the line, even with the installation of more than 1,000 MW of energy storage at Ivanpah Substation. Furthermore, because the energy storage facility must release its stored energy at some point, the release of the stored energy would result in line loading values that drive significant clearance infractions. As power flow on this subtransmission line is predominately driven by parallel operation of the line with numerous 500 kV and 220 kV transmission lines, the large amount of generation already interconnected at Ivanpah and Eldorado substations, and imports from east-to-west, no amount of energy storage would address the clearance violations on Segment 4.

5.2.2.4 Derating Only

SCE evaluated the potential for derating the subtransmission lines included in the Full-Rebuild Project as a means to remediate existing discrepancies. This corrective action analyzes derating the lines only, without any accompanying upgrades to facilities. Operating a subtransmission line at a lower (derated) amperage reduces the maximum operating temperature at which the conductors that comprise these circuits operate. The reduction in the operating temperature would cause the conductors to 'sag' less; that is, the distance between the ground and the conductor would be increased. Therefore, some existing discrepancies along a subtransmission line can be remediated purely by operating the line at a lower amperage. In order to ensure safe and reliable service to load and generation is maintained, derated values were identified for each segment taking into account load forecast through the ten-year planning horizon and both existing and planned generation projects which have already undergone transmission planning studies and have received a study report as part of the FERC mandated Generation Interconnection Process. Derating alone, without upgrades, as discussed by Segment below, was deemed not feasible as additional mitigation would still be necessary in order to address clearance infractions.

5.2.2.4.1 Derating Only—Segment 1

Ratings on the Control-Haiwee-Inyokern 115 kV Subtransmission Line and the Control-Coso-Haiwee-Inyokern 115 kV Subtransmission Line, as currently modeled in the Transmission Planning Process (TPP) CAISO base cases, reflect a normal rating of 83 MVA (417 Amp) and 80 MVA (402 Amp), respectively, and an emergency rating of 106 MVA (532 Amp) and 88 MVA (442 Amp), respectively.

SCE performed power flow studies which indicate that the maximum loading on these subtransmission lines occur during maximum generation conditions coupled with minimum load. Under this condition, the maximum loading on the Control-Haiwee-Inyokern 115 kV Subtransmission Line and the Control-Coso-

Haiwee-Inyokern 115 kV Subtransmission Line, both located in Segment 1, was identified to approach 340 Amps following loss of one of the lines.

Derating the Control-Haiwee-Inyokern 115 kV Subtransmission Line and the Control-Coso-Haiwee-Inyokern 115 kV Subtransmission Line to the identified 340 Amps would only remediate approximately 6 percent of the 1,681 discrepancies identified on these subtransmission lines and would require further remediation of the remaining 94 percent of Segment 1. Consequently, derating Segment 1 was dismissed.

5.2.2.4.2 Derating Only—Segment 2

Ratings on the Kramer-Inyokern-Randsburg No.1 115 kV Subtransmission Line, as currently modeled in the TPP CAISO base cases, reflect a normal rating of 214 MVA (1,074 Amp) and an emergency rating of 267 MVA (1,340 Amp). SCE performed power flow studies which indicate that the maximum loading on this subtransmission line occurs during maximum generation conditions coupled with minimum load. Under this condition, the maximum loading on the Kramer-Inyokern-Randsburg No.1 115 kV Subtransmission Line, located within Segment 2, was identified to approach 730 Amps following loss of the Kramer-Inyokern-Randsburg No.3 115 kV Subtransmission Line.

Derating the Kramer-Inyokern-Randsburg No.1 115 kV Subtransmission Line to 730 Amps would only remediate approximately 3 percent of the 335 discrepancies identified on this subtransmission line and would require further remediation of the remaining 97 percent of Segment 2. Consequently, derating Segment 2 was dismissed.

5.2.2.4.3 Derating Only—Segment 3N/3S

Ratings on the Coolwater-Kramer 115 kV Subtransmission Line (in Segment 3N) and Kramer-Tortilla 115 kV Subtransmission Line and Coolwater-SEGS2-Tortilla 115 kV Subtransmission Line (in Segment 3S) as currently modeled in the TPP CAISO base cases, reflect a normal rating of 189 MVA (949 Amp), 194 MVA (974 Amp), and 194 MVA (974 Amp), respectively, and an emergency rating of 255 MVA (1,280 Amp), 263 MVA (1,320 Amp), and 263 MVA (1,320 Amp), respectively. SCE performed power flow studies which indicate that the maximum loading on these lines occur during maximum generation conditions coupled with minimum load. Under this condition, the maximum loading on the Coolwater-Kramer 115 kV Subtransmission Line (Segment 3N), Kramer-Tortilla 115 kV Subtransmission Line (Segment 3S), and Coolwater-SEGS2-Tortilla 115 kV Subtransmission Line (Segment 3S) were identified to be approximately 860 Amps, 725 Amps, and 972 Amps, respectively. The derating would only remediate approximately 35 percent of the 500 discrepancies identified in these Segments, and would require further remediation of the remaining 65 percent of discrepancies identified along these Segments. Consequently, derating Segment 3N/3S was dismissed as infeasible.

5.2.2.4.4 Derating Only—Segment 4

Ratings on the Coolwater-Baker-Dunn Siding-Ivanpah-Mountain Pass 115 kV Subtransmission Line as currently modeled in the TPP CAISO base cases, reflect a normal rating of 83 MVA (417 Amp) and an emergency rating of 106 MVA (532 Amp). SCE performed power flow studies which indicate that the maximum east-to-west loading on this line occurs during maximum generation conditions from renewable resources located in the Ivanpah/Eldorado Competitive Renewable Energy Zones (CREZ) delivered on the Coolwater-Baker-Dunn Siding-Ivanpah-Mountain Pass 115 kV Subtransmission Line coupled with maximum load at Gale, Tiefort, and Tortilla substations and minimum generation at Coolwater, Gale, Tiefort, and Tortilla substations. Under this condition, the maximum loading on the Coolwater-Baker-Dunn Siding-Ivanpah-Mountain Pass 115 kV Subtransmission Line was identified to be approximately 340 Amps.

Conversely, the maximum west-to-east line loading on the Coolwater-Baker-Dunn Siding-Ivanpah-Mountain Pass 115 kV Subtransmission Line occurs during minimum generation conditions from renewable resources located in the Ivanpah/Eldorado Competitive Renewable Energy Zones (CREZ) coupled with minimum load at Gale, Tiefort, and Tortilla substations and maximum generation at Coolwater, Gale, Tiefort, and Tortilla substations. Under this condition, the maximum loading on the Coolwater-Baker-Dunn Siding-Ivanpah-Mountain Pass 115 kV Subtransmission Line was identified to be approximately 360 Amps. Derating the line to 360 Amps would only remediate approximately 32 percent of the 510 discrepancies identified on this subtransmission line and would require further remediation of the remaining 68 percent of discrepancies identified along Segment 4. Consequently, derating Segment 4 was dismissed.

5.2.2.5 Derating with Upgrades

Further evaluation of the potential for derating the subtransmission lines included in the Full-Rebuild Concept with additional upgrades was performed as a means to remediate existing discrepancies. The derated values identified for each Segment, taking into account load forecast through the ten-year planning horizon and both existing and planned generation projects which have already undergone transmission planning studies and have received a study report as part of the FERC mandated Generation Interconnection Process, were used to develop a Derating/Discrepancy Remediation corrective action for each Segment. Derating with Upgrades, as discussed by Segment below, was deemed feasible for Segments 3N/3S and Segment 4 only.

5.2.2.5.1 Derate and Remediate Remaining GO 95 Discrepancies—Segment 1

Derating the Control-Haiwee-Inyokern 115 kV Subtransmission Line and the Control-Coso-Haiwee-Inyokern 115 kV Subtransmission Line is not feasible as the derate of these subtransmission lines only addresses 6 percent of the total number of discrepancies on these subtransmission lines as discussed above. Additional upgrades would be necessary to remediate the remaining 94 percent of the existing discrepancies on these subtransmission lines. These upgrades would involve building new infrastructure to address the identified spans that would still have a criteria violation. The new infrastructure would be located 50 feet from the existing line arrangement which would drive the need to also rebuild the 6 percent portion due to alignment requirements. Consequently, this would result in effectively a rebuild of Segment 1 and would be nearly identical to the Full-Rebuild Concept. This corrective action would not have a significant reduction in environmental impacts as compared to the Full-Rebuild Concept as described in *Chapter 3—Project Description*. Rebuilding 94 percent of the Control-Haiwee-Inyokern 115 kV Subtransmission Line and the Control-Coso-Haiwee-Inyokern 115 kV Subtransmission Line located in Segment 1 would likely impact system reliability by having non-homogenous subtransmission lines with new components interspersed with a very small amount of aging infrastructure; keeping up to 6 percent of aging infrastructure along Segment 1 would result in future operational impacts in repair and maintenance of the line. Because the additional mitigation results in effectively a rebuild of the Control-Haiwee-Inyokern 115 kV Subtransmission Line and the Control-Coso-Haiwee-Inyokern 115 kV Subtransmission Line located in Segment 1, and because the system reliability benefits of a homogenous, new-built subtransmission lines outweighs the minimal cost savings, this corrective action was dismissed as infeasible.

5.2.2.5.2 Derate and Remediate Remaining GO 95 Discrepancies—Segment 2

Derating the Kramer-Inyokern-Randsburg No.1 115 kV Subtransmission Line located in Segment 2 is not feasible as the derate of this subtransmission line only addresses 3 percent of the total number of discrepancies on this subtransmission line as discussed above. Additional upgrades would be necessary to remediate the remaining 97 percent of the existing discrepancies on this subtransmission line, which would effectively result in a rebuild of Segment 2, and would not result in a significant reduction in the environmental impacts as compared to the Full-Rebuild Concept as described in *Chapter 3—Project*

Description. In effect, this corrective action would be nearly identical to the Full-Rebuild Concept. Rebuilding 97 percent of the Kramer-Inyokern-Randsburg No.1 115 kV Subtransmission Line located in Segment 2 would likely impact system reliability by having non-homogenous subtransmission lines with new components interspersed with a very small amount of aging infrastructure; keeping up to 3 percent of aging infrastructure along Segment 2 would result in future operational impacts in repair and maintenance of the line and future environmental disturbance. Because the additional mitigation results in effectively a rebuild of Segment 2, and because the system reliability benefits of a homogenous, new-built subtransmission line outweighs the minimal cost savings to be realized by derating with upgrades for Segment 2, this corrective action is not feasible for Segment 2.

5.2.2.5.3 Derate and Remediate Remaining GO 95 Discrepancies—Segment 3N

The existing Coolwater-Kramer 115 kV Subtransmission Line, located in Segment 3N, can be derated with the rebuild of the existing Kramer-Tortilla 115 kV Subtransmission Line and Coolwater-SEGS2-Tortilla 115 kV Subtransmission Line in Segment 3S with a double-circuit 115 kV subtransmission line and partial mitigation of the Coolwater-Kramer 115 kV Subtransmission Line in Segment 3N to support the identified derated value. This corrective action is shown in Figure 5.2-7.

As a result of this corrective action, a new double-circuit line would be constructed next to the existing single-circuit line in Segment 3S to minimize outage requirements, thus addressing adverse system impacts during construction. The existing single-circuit line located in Segment 3S would be removed once the new double-circuit line is complete and ready to be energized. The addition of a second circuit in Segment 3S, resulting in a total of three circuits between Kramer Substation and Coolwater Substation, would result in lowering line flows on the Coolwater-Kramer 115 kV Subtransmission Line in Segment 3N from 860 Amps down to 615 Amps. The number of clearance infractions on the Coolwater-Kramer 115 kV Subtransmission Line would be reduced from 241 spans down to 163 spans. As part of this corrective action, a 115 kV line position at both Kramer Substation and Coolwater Substation would have to be equipped and additional space within the Mechanical and Electrical Equipment Room (MEER) at Kramer Substation would be required to support installation of the new line. MEER space at Coolwater is not available, thereby requiring the installation of a new MEER and corresponding telecommunications room at the Coolwater 115 kV Substation. In addition, a new Remedial Action Scheme may be required to address thermal overload beyond the identified derated values on Segment 3N depending on how much generation is ultimately developed and interconnected to substations or transmission lines serving this specific area. An outline of the work based on preliminary engineering that may be performed under this corrective action is as follows:

- New double-circuit 115 kV line between Kramer 115 kV Substation and Coolwater 115 kV Substation in Segment 3S to replace the existing Kramer-Tortilla 115 kV Subtransmission Line and Coolwater-SEGS2-Tortilla 115 kV Subtransmission Line
  - Install approximately 320 TSPs.
  - Install two ACCC ‘Dove’ conductor circuits: one to replace the existing Kramer-Tortilla 115 kV Subtransmission Line and Coolwater-SEGS2-Tortilla 115 kV Subtransmission Line, and one to construct the new Coolwater-Kramer No.2 115 kV Subtransmission Line.
  - Install approximately 44 miles of OPGW and/or ADSS fiber optic cable, and install system protection and telecommunications-associated equipment at existing substations
  - Install marker balls on overhead wire where determined to be appropriate
- Provide new 115 kV line position at Kramer Substation for new Coolwater-Kramer No.2 115 kV circuit
  - Install three new insulators on the existing substation steel A-frame and conductor for the reduced tension span to a new getaway structure.

  - Remove static/shield conductor, fall restraint cabling, and static/shield mast on the north terminal A-Frame.
  - Install three new insulators on the existing substation steel for the tap to the bus and install new single-phase, oil filled, voltage transformer, to include foundation, structural steel, and low voltage cabling.
  - Install new center-break group-operated line and bus side disconnects, both for the breaker, complete with structural steel.
  - Install one new SF6 circuit breakers and low voltage cabling – foundation previously installed.
  - Install cabling between existing breakers for the open position to existing MEER for new relay and protection racks.

- Provide new 115 kV line position at Coolwater Substation for new Coolwater-Kramer No.2 115 kV circuit
  - Install three new insulators on the existing substation steel A-frame.
  - Install conductor between the steel A-frame and an existing lattice tower outside the substation (the getaway structure).
  - Install three new insulators on the existing substation steel for the tap to the bus and install a new single-phase, oil filled, voltage transformer, to include foundation, structural steel, and low voltage cabling.
  - Install three new surge arresters on the existing structural steel 115 kV terminal position.
  - Install new center-break group-operated line and bus side disconnects, two for each breaker (for a total of four), complete with new foundations and structural steel.
  - Install two new SF6 circuit breakers with foundations and low voltage cabling.
  - Install two new oil filled Substation Service Voltage Transformers (SSVT), complete with foundations, structural steel, high voltage disconnect/protection, and low voltage wiring.
  - Install new MEER with new cabling and all associated relays and protection components, battery system, and required power sources for the complete 115 kV substation.
  - Install two independent station light and power sources

- Remove existing Kramer-Tortilla 115 kV line terminations at both Kramer and Tortilla substations and use existing equipment at these locations for the replacement Kramer-Tortilla 115 kV Subtransmission Line.
- Remove existing Coolwater-SEGS2-Tortilla 115 kV line termination at both Coolwater and Tortilla substations and use existing equipment at these locations for replacement Coolwater-SEGS2-Tortilla 115 kV Subtransmission Line.
- Remove existing Kramer-Tortilla 115 kV Subtransmission Line and Coolwater-SEGS2-Tortilla 115 kV Subtransmission Line.
  - Remove existing 115 kV conductor along the entire length of Segment 3S
  - Remove existing subtransmission structures along the entire length of Segment 3S

- Derate the existing Kramer-Coolwater 115 kV Subtransmission Line. This would remediate approximately 78 of the 241 identified discrepancies along Segment 3N, thus leaving 163 discrepancies to be remediated.
- Remediate the remaining 163 discrepancies in Segment 3N
  - Replace approximately108 existing structures with approximately 108 replacement TSPs, LWS (or equivalent) poles, or LWS H-frames to remediate the remaining discrepancies. Replacement structures would be installed as described in Section 3.7.2, Subtransmission Line Construction (Above Ground).

- Replace existing conductor with 795 SAC conductor where necessary due to height of replacement structures or physical condition of existing conductor.
- Install fault-return conductor on replacement LWS poles and/or LWS H-frames for grounding protection, where necessary.
- Rehabilitate existing access and spur roads as described in Section 3.7.1.3, Access Roads and/or Spur Roads, as necessary to access structure replacement work areas.

Work at Kramer Substation would occur within the existing substation fence. Work at Coolwater Substation would primarily occur within the existing substation fence with some minor work outside the substation area. At Coolwater Substation, some trench and cable work would be required between the existing communications building (which is located outside the substation fence on an adjacent power plant facility) and the new MEER (to be located inside the substation fence line).

Compared to the Full-Rebuild Concept described in *Chapter 3—Project Description*, derating and upgrading in Segment 3N would require the installation of 183 fewer structures. In addition, this corrective action would avoid the rehabilitation of portions of the existing access and spur roads. Further, derating and upgrading Segment 3N would avoid the installation of up to 44 miles of conductor in Segment 3N, and the need to establish associated conductor stringing areas along the alignment. This would ensure a continued safe and reliable electrical service; therefore, the Derate and Remediate Remaining GO 95 Discrepancies in Segment 3N corrective action is feasible and is carried through for analysis in this Chapter.

5.2.2.5.4 Derate and Remediate Remaining GO 95 Discrepancies—Segment 3S

The existing Kramer-Tortilla 115 kV Subtransmission Line and the Coolwater-SEGS2-Tortilla 115 kV Subtransmission Line, both located in Segment 3S, can be derated with the rebuild of the existing Coolwater-Kramer 115 kV Subtransmission Line in Segment 3N with a double-circuit 115 kV and partial mitigation of the existing Kramer-Tortilla 115 kV Subtransmission Line and Coolwater-SEGS2-Tortilla 115 kV Subtransmission Line to support the identified derated value. This corrective action is shown in Figure 5.2-8.

As part of this corrective action, a new double-circuit line would be constructed next to the existing single-circuit line in Segment 3N. The existing single-circuit line located in Segment 3N would be removed once the new double-circuit line is complete and ready to be energized. The addition of a second circuit in Segment 3N, resulting in a total of three circuits between Kramer Substation and Coolwater Substation, would result in lowering line flows on the Kramer-Tortilla 115 kV Subtransmission Line and the Coolwater-SEGS2-Tortilla 115 kV Subtransmission Line from 725 Amps and 975 Amps, respectively, down to 610 Amps and 680 Amps, respectively. The number of clearance infractions on the Kramer-Tortilla 115 kV Subtransmission Line and the Coolwater-SEGS2-Tortilla 115 kV Subtransmission Line would be reduced from 259 spans down to 94 spans. A 115 kV line position at both Kramer Substation and Coolwater Substation would have to be equipped and additional space within the MEER at Kramer Substation would be required to support installation of the new line. MEER space at Coolwater Substation is not available, thereby requiring the installation of a new MEER and corresponding telecommunications room at the Coolwater 115 kV Substation. In addition, a new Remedial Action Scheme may be required to address thermal overload beyond the identified de-rated values on Segment 3S depending on how much generation is ultimately developed and interconnected to substations or transmission lines serving this specific area. An outline of the work based on preliminary engineering that may be performed under this corrective action is as follows:

- New double-circuit 115 kV line between Kramer 115 kV Substation and Coolwater 115 kV Substation in Segment 3N replacing the existing Coolwater-Kramer 115 kV Subtransmission Line

  - Install approximately 291 double-circuit TSPs.
  - Install two ACCC 'Dove' circuits: one to replace the existing Coolwater-Kramer 115 kV Subtransmission Line and one to construct the new Coolwater-Kramer No.2 115 kV circuit.
  - Install approximately 44 miles of OPGW and/or ADSS fiber optic cable, and install system protection and telecommunications-associated equipment at existing substations
  - Install marker balls on overhead wire where determined to be appropriate

- Provide new 115 kV line position at Kramer Substation for the new Coolwater-Kramer No.2 115 kV circuit
  - Install three new insulators on the existing substation steel A-frame and conductor for the reduced tension span to a new getaway structure.
  - Remove static/shield conductor, fall restraint cabling, and static/shield mast on the north terminal A-Frame.
  - Install three new insulators on the existing substation steel for the tap to the bus and install new single-phase, oil filled, voltage transformer, to include foundation, structural steel, and low voltage cabling.
  - Install new center-break group-operated line and bus side disconnects, both for the breaker, complete with structural steel.
  - Install one new SF6 circuit breakers and low voltage cabling – foundation previously installed.
  - Install cabling between existing breakers for the open position to existing MEER for new relay and protection racks.

- Provide new 115 kV line position at Coolwater Substation for the new Coolwater-Kramer No.2 115 kV circuit
  - Install three new insulators on the existing substation steel A-frame.
  - Install conductor between the steel A-frame and an existing lattice tower outside the substation (the getaway structure).
  - Install three new insulators on the existing substation steel for the tap to the bus and install a new single-phase, oil filled, voltage transformer, to include foundation, structural steel, and low voltage cabling.
  - Install three new surge arresters on the existing structural steel 115 kV terminal position.
  - Install new center-break group-operated line and bus side disconnects, two for each breaker (for a total of four), complete with new foundations and structural steel.
  - Install two new SF6 circuit breakers with foundations and low voltage cabling.
  - Install two new oil filled Substation Service Voltage Transformers (SSVT), complete with foundations, structural steel, high voltage disconnect/protection, and low voltage wiring.
  - Install new MEER with new cabling and all associated relays and protection components, battery system, and required power sources for the complete 115 kV substation.
  - Install two independent station light and power sources

- Remove the existing Coolwater-Kramer 115 kV Subtransmission Line
  - Remove existing 115 kV conductor along the entire length of Segment 3N
  - Remove existing subtransmission structures along the entire length of Segment 3N

- Derate the existing Kramer-Tortilla 115 kV Subtransmission Line and Coolwater-SEGS2-Tortilla 115 kV Subtransmission Line. This would remediate approximately 165 of the 259 identified discrepancies along Segment 3S, leaving 94 discrepancies to be remediated.
- Remediate the remaining 94 discrepancies in Segment 3S
  - Install 2 new LWS multi-pole structures.

- Replace 62 existing structures with approximately 59 LWS H-frames and 3 LWS multi-pole structures. New and replacement structures would be installed as described in Section 3.7.2, Subtransmission Line Construction (Above Ground).
- Replace existing conductor with new 795 SAC conductor where necessary due to height of replacement structures or physical condition of existing conductor.
- Install fault-return conductor on replacement LWS poles and/or LWS H-frames for grounding protection, where necessary.
- Rehabilitate existing access and spur roads as described in Section 3.7.1.3, Access Roads and/or Spur Roads, as necessary to access structure replacement work areas.

Work at Kramer Substation would generally occur within the existing substation fence. Work at Coolwater Substation would primarily occur within the existing substation fence with some minor work outside the substation area. At Coolwater Substation, some trench and cable work would be required between the existing communications building (which is located outside the substation fence on an adjacent power plant facility) and the new MEER (to be located inside the substation fence line).

This corrective action would require the installation of the same number of TSPs in Segment 3N as described for the Full-Rebuild Concept. This corrective action would avoid the rehabilitation of portions of the existing access and spur roads. Further, the corrective action would avoid the installation of up to 44 miles of conductor in Segment 3S, and the need to establish associated conductor stringing areas along the alignment. Derating with Upgrades for Segment 3S would ensure a continued safe and reliable electrical service; therefore, the Derate and Remediate Remaining GO 95 Discrepancies—Segment 3S corrective action is feasible and is carried through for analysis in this Chapter.

5.2.2.5.5 Derate and Remediate Remaining GO 95 Discrepancies—Segment 4

The existing Coolwater-Baker-Dunn Siding-Ivanpah-Mountain Pass 115 kV Subtransmission Line, located in Segment 4, can be derated with the installation of a new four-element ring-bus substation at Baker Substation and implementation of a control scheme that would monitor line flow and "sectionalize" the line if line flows across the "sectionalizing" circuit breaker exceed a predefined ampere value. This corrective action is shown in Figure 5.2-9.

The high voltage bus at the Baker Substation is currently operated as a switch-operated, sectionalized bus, distribution substation configuration. There are two power transformers that are protected through power fuses with one transformer on each side of the 115 kV line sectionalizing switch. Construction of the Baker ring-bus would consist of removing the existing A-frame and line-sectionalizing switch assembly and installing a new 115 kV A-frame terminal structure, new high voltage equipment on and below the terminal structure, three new circuit breakers, one independent station light and power source, below grade cable installation throughout the entire substation, and connections to the existing MEER. An outline of the work based on preliminary engineering that may be performed under this corrective action for Segment 4 is as follows:

- Install new Baker 115/33/12 kV Ring-Bus Substation
  - Install six new insulators on a new substation A-frame structure. New structural steel, foundations, and electrical equipment would be necessary.
  - Install three new surge arrestors on the new A-frame structural steel.
  - Install new center-break group-operated line and bus side disconnects; disconnects to be mounted on new A-frame structure.
  - Install three new SF6 circuit breakers with foundations and low voltage cabling.

    - Install wiring to the MEER with new cabling and all associated relays and protection components, battery system, and required power sources.

- Derate the existing Coolwater-Baker-Dunn Siding-Ivanpah-Mountain Pass 115 kV Subtransmission Line. This would remediate approximately 436 of the 510 identified discrepancies along this subtransmission line, leaving 74 discrepancies to be remediated.
- Remediate the remaining 74 discrepancies in Segment 4
    - Install 2 new LWS H-frames
    - Replace 61 existing structures with approximately 59 LWS H-frame structures and 2 TSP H-frame structures. New and replacement structures would be installed as described in Section 3.7.2, Subtransmission Line Construction (Above Ground).
    - Replace existing conductor with new 795 SAC conductor where necessary due to height of replacement structures or physical condition of existing conductor.
    - Install fault-return conductor on replacement LWS poles and/or LWS H-frames for grounding protection, where necessary.
    - Rehabilitate existing access and spur roads as described in Section 3.7.1.3, Access Roads and/or Spur Roads, as necessary to access structure replacement work areas.

Compared to the Full-Rebuild Concept described in *Chapter 3—Project Description*, the Derate and Remediate Remaining GO 95 Discrepancies—Segment 4 corrective action would require the installation of approximately 71 fewer TSPs, 7 fewer multi-pole or H-frame TSP structures, and up to 544 fewer LWS poles and LWS H-frames. In addition, this corrective action would avoid the rehabilitation of portions of the existing access and spur roads. Further, this corrective action for Segment 4 would avoid the installation of up to 96 miles of conductor, and the need to establish associated conductor stringing areas along the alignment. The reduced scope of work in Segment 4 may also permit a reduction in the number of staging yards established and used under the corrective action for Segment 4. Therefore, the Derate and Remediate Remaining GO 95 Discrepancies—Segment 4 corrective action is feasible and is carried through for analysis in this Chapter.

5.2.2.6 Comprehensive Alternatives

Six comprehensive Alternatives were developed from the specific Segment corrective actions analyzed above in Sections 5.2.2.1 through 5.2.2.5 as summarized in Table 5.2-2. These Alternatives are packaged as follows:

- Alternative A – Rebuild Segments 1, 2, 3N, and 3S, and Derate with Upgrades for Segment 4
- Alternative B – Rebuild Segments 1, 2, and 4, and Derate Segment 3S with Upgrades for Segment 3N
- Alternative C – Rebuild Segments 1 and 2, Derate Segment 3S with Upgrades for Segment 3N, and Derate with Upgrades for Segment 4
- Alternative D – Rebuild Segments 1, 2, and 4 and Derate Segment 3N with Upgrades for Segment 3S
- Alternative E – Rebuild Segments 1 and 2, Derate Segment 3N with Upgrades for Segment 3S and Derate with Upgrades for Segment 4
- Full Rebuild Concept – Rebuild Segments 1, 2, 3N, 3S, and 4 as described in Chapter 3

The Full-Rebuild Concept that is described in *Chapter 3—Project Description* involves the rebuild of Segments 1, 2, 3N, 3S, and 4. Each of the Alternatives described above include a subset of the Full-Rebuild Concept namely the rebuild of subtransmission infrastructure in Segments 1 and 2 under each of the Alternatives; the rebuild of infrastructure in Segment 3N under Alternatives A, B, and C, and the Full Rebuild Concept; the rebuild of infrastructure in Segment 3S under Alternatives A, D, and E, and the Full

Rebuild Concept; and the rebuild of infrastructure in Segment 4 in Alternatives B, D, and the Full Rebuild Concept. Of these six comprehensive Alternatives, SCE identified Alternative E as the Proposed Project.

5.2.2.7 No Project Alternative

CEQA requires an evaluation of the No Project Alternative so that decision makers can compare the impacts of approving the Proposed Project with the impacts of not approving the Proposed Project (CEQA Guidelines, Section 15126.6(e)). Under the No Project Alternative, no construction or modification of the existing electrical system would occur. Therefore, the No Project Alternative would not meet any of the Proposed Project's objectives. Further, under the No Project Alternative, SCE would be in violation of the mitigation plan agreed to with WECC. The No Project Alternative would also result in continuing violations of CPUC GO 95. Thus, the No Project Alternative is not feasible as it could not be accomplished considering SCE's need to comply with CPUC GO 95.

5.2.2.8 Substation Site Alternatives

Subtransmission line clearance remediation cannot be accomplished with the installation of a new substation. Consequently, no substation site alternatives were considered.

5.2.2.9 Subtransmission Line Route Alternatives

As discussed above, all subtransmission lines included under the Full-Rebuild Concept are currently used to provide service to existing load and generation customers. The mitigation plan requires that discrepancies along the existing subtransmission lines be remediated and SCE did not focus on constructing new lines in different corridors for this reason as well as the fact that constructing a new line in a different corridor would likely have greater environmental impacts. Consequently, no line route alternatives exist or were developed.

5.2.3 Environmental Impacts

A comparison of the potential environmental impacts associated with the Full-Rebuild Concept as described in *Chapter 4—Environmental Impact Assessment Summary* and the potential impacts associated with the other five alternatives—Alternatives A, B, C, D, and E—is provided in Table 5.2-3.

In summary and on balance, each of Alternatives A through E present impacts that are less than those for the Full-Rebuild Concept:

- Alternative A offers reduced environmental impacts in Segment 4.
- Alternatives C and E offer reduced environmental impacts in Segments 3N, 3S, and 4.
- Alternatives B and D offer reduced environmental impacts in Segments 3S and 3N, respectively, due to the reduced scope of work in these Segments; potential impacts in Segments 1, 2, and 4 would be identical to those of the Full-Rebuild Concept.

A summary of the drivers behind the reduced potential impacts under Alternative A through E, as shown in Table 5.2-3, is presented here by CEQA Resource Area:

- Aesthetics. Impacts to aesthetics would be reduced under Alternatives A through E, as each of these Alternatives includes the installation of fewer subtransmission structures than the Full-Rebuild Concept, and those subtransmission structures to be installed under Alternatives A through E would be functionally equivalent to those included in the Full-Rebuild Concept.
- Agricultural and Forestry Resources. The work under Alternatives A through E in areas where Unique Farmland is located would be identical to that under the Full-Rebuild Concept.

- Air Quality. Impacts to air quality would be reduced under Alternatives A through E as the scope of work under each Alternative is less than that under the Full-Rebuild Concept. A reduced scope of work would equate to reduced air emissions.
- Biological Resources. Impacts to biological resources would be reduced under Alternatives A through E as each Alternative includes the installation of fewer subtransmission structures than the Full-Rebuild Concept. With installation of fewer subtransmission structures, ground disturbance and construction activities would be reduced, thus reducing the potential for impacts to biological resources.
- Cultural Resources. An analysis of potential impacts to cultural resources under all Alternatives would be provided at the conclusion of pedestrian surveys and preparation of technical reports.
- Energy. The Full-Rebuild Concept would result in no impacts to any Energy criterion. Because Alternative A through E would be constructed on the same lands as the Full-Rebuild Concept, and are of similar scope, no impacts would be realized under any Alternative.
- Geology and Soils. Geology and Soils-related impacts would be reduced under Alternatives A through E compared to the Full Rebuild Concept, as each Alternative includes the installation of fewer subtransmission structures than the Full-Rebuild Concept. With installation of fewer subtransmission structures, ground disturbance and construction activities would be reduced, thus reducing the potential for Geology and Soils-related impacts.
- Greenhouse Gases. Greenhouse gas emissions would be reduced under Alternatives A through E as the scope of work under each Alternative is less than that under the Full-Rebuild Concept. A reduced scope of work would equate to reduced greenhouse gas emissions.
- Hazards and Hazardous Materials. Hazards and Hazardous Materials-related impacts would be reduced under Alternatives A through E as each of these Alternatives includes the installation of fewer subtransmission structures than the Full-Rebuild Concept. With installation of fewer subtransmission structures, construction activities would be reduced, thus reducing the potential for Hazards and Hazardous Materials-related impacts.
- Hydrology and Water Quality. Hydrology and Water Quality-related impacts would be reduced under Alternatives A through E as each of these Alternatives has a smaller scope of work than the Full-Rebuild Concept. With a reduced scope of work, construction activities would be reduced, thus reducing the potential for Hydrology and Water Quality-related impacts.
- Land Use and Planning. The Full-Rebuild Concept would result in no impacts to any Land Use and Planning criterion. Because each of Alternatives A through E would be constructed on the same lands as the Full-Rebuild Concept, and are of similar scope, no impacts would be realized under Alternatives A through E.
- Mineral Resources. The Full-Rebuild Concept would result in no impacts to any Mineral Resources criterion. Because Alternatives A through E would be constructed on the same lands as the Full-Rebuild Concept, and are of similar scope, no impacts would be realized under Alternatives A through E.
- Noise. Noise-related impacts would be reduced under Alternatives A through E as each of these Alternatives has a smaller scope of work than the Full-Rebuild Concept. With a reduced scope of work, construction activities would be reduced, thus reducing the potential for Noise-related impacts.
- Population and Housing. The Full-Rebuild Concept would result in no impacts to any Population and Housing criterion. Because Alternatives A through E would each be constructed on the same lands as the Full-Rebuild Concept, and are of similar scope, no impacts would be realized under Alternatives A through E.

Table 5.2-3: Comparison of Impacts from Full-Rebuild Concept and Alternatives

CEQA Resource Area	Full-Rebuild Concept	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E (Proposed Project)
Aesthetics	LTSI	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact
Agricultural and Forestry Resources	NI	Equivalent Impact	Equivalent Impact	Equivalent Impact	Equivalent Impact	Equivalent Impact
Air Quality	SUI	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact
Biological Resources	LTSI with APMs	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact
Cultural Resources	TBD	TBD	TBD	TBD	TBD	TBD
Energy	NI	NI	NI	NI	NI	NI
Geology and Soils	LTSI	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact
Greenhouse Gases	NI	Equivalent Impact	Equivalent Impact	Equivalent Impact	Equivalent Impact	Equivalent Impact
Hazards and Hazardous Materials	LTSI with APMs	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact
Hydrology and Water Quality	LTSI	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact
Land Use and Planning	LTSI	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact
Mineral Resources	NI	Equivalent Impact	Equivalent Impact	Equivalent Impact	Equivalent Impact	Equivalent Impact
Noise	LTSI with APMs	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact
Population and Housing	NI	Equivalent Impact	Equivalent Impact	Equivalent Impact	Equivalent Impact	Equivalent Impact
Public Services	NI	Equivalent Impact	Equivalent Impact	Equivalent Impact	Equivalent Impact	Equivalent Impact
Recreation	LTSI	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact
Transportation and Traffic	LTSI with APMs	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact
Tribal Cultural Resources	TBD	TBD	TBD	TBD	TBD	TBD
Utilities and Service Systems	LTSI	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact
Wildfire	LTSI	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact
Cumulative Impacts	LTSI with APMs	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact	Lesser Impact

Notes:
LTSI: Less than Significant Impact
NI: No Impact
SUI: Significant and Unavoidable Impact

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- Public Services. The Full-Rebuild Concept would result in no impacts to the Public Services criterion. Because Alternatives A through E would be constructed on the same lands as the Full-Rebuild Concept, and are of reduced scope, no impacts would be realized under Alternatives A through E.
- Recreation. The Full-Rebuild Concept would result in less than significant impacts under the Recreation criteria. Because Alternatives A through E would be constructed on the same lands as the Full-Rebuild Concept, and are of similar scope, equivalent impacts would be realized under Alternatives A through E.
- Transportation. The Full-Rebuild Concept would result in less than significant transportation-related impacts. Because Alternatives A through E would be constructed in the same alignment as the Full-Rebuild Concept, and would be of a reduced scope, reduced impacts would be realized under Alternatives A through E.
- Tribal Cultural Resources. An analysis of potential impacts to tribal cultural resources under all Alternatives would be provided at the conclusion of pedestrian surveys and preparation of technical reports.
- Utilities and Service Systems. The Full-Rebuild Concept would result in less than significant impacts to the Utilities and Service Systems criteria. Because Alternatives A through E would be constructed on the same lands as the Full-Rebuild Concept, and are of reduced scope, reduced impacts would be realized under Alternatives A through E.
- Wildfire. Wildfire-related impacts would be reduced under Alternatives A through E as each of these Alternatives has a smaller scope of work than the Full-Rebuild Concept. With a reduced scope of work, construction activities would be reduced, thus reducing the potential for Wildfire-related impacts.

5.3 Growth Inducing Impacts

Section 15126.2(d) of the CEQA Guidelines states that environmental documents should "...discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly in the surrounding environment..."

A project could be considered to have growth-inducing effects if it:

- Either directly or indirectly fosters economic or population growth or the construction of additional housing in the surrounding area
- Removes obstacles to population growth
- Requires the construction of new community facilities that could cause significant environmental effects
- Encourages and facilitates other activities that could significantly affect the environment, either individually or cumulatively

An EIR must describe any growth-inducing impacts of a proposed project including "the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment" (Pub. Res. Code § 21100(b)(5); CEQA Guidelines §§ 15126(d), 15126.2(d)). Examples of projects that are growth-inducing are the expansion of urban services into a previously unserved or under-served area, the creation or extension of transportation links, and the removal of major obstacles to growth. It is important to note that these direct forms of growth have secondary effects including expanding the size of local markets and attracting additional economic activity to the area.

Typically, the growth-inducing potential of a project would be considered significant if it fosters growth or a concentration of population above what is assumed in local and regional land use plans, or in

projections made by regional planning authorities. Significant growth-inducing impacts could also occur if a project provides infrastructure or service capacity to accommodate growth levels beyond those permitted by local or regional plans and policies.

5.3.1 Would The Project Either Directly or Indirectly, Foster Economic or Population Growth or the Construction of Additional Housing in the Surrounding Area?

No Impact. As presented in Chapter 2, the fundamental objective of the Full-Rebuild Concept is to remediate identified discrepancies to ensure compliance with CPUC GO 95. The Full-Rebuild Concept would not induce economic growth, as it would not provide new electrical service or electrical service to areas that are currently unserved or underserved. In addition, the Full-Rebuild Concept does not include any new infrastructure such as publicly accessible roads that could either directly or indirectly foster economic or population growth.

As presented in Section 4.14, Population and Housing, the Full-Rebuild Concept would not foster, either directly or indirectly, population growth in the area. SCE expects to utilize up to approximately 200 workers per day. The labor demands of the Full-Rebuild Concept would be met by existing SCE employees or by hiring specialty electrical transmission contractors. Given the small number of positions required for construction of the Full-Rebuild Concept and the short term of the construction period, no population growth would be fostered, either directly or indirectly, by the rebuilding of the subtransmission lines.

As further presented in Section 4.14, the Full-Rebuild Concept would not displace any existing housing or people, and thus would not foster either directly or indirectly the construction of additional housing. Therefore, no impacts would occur under this criterion.

5.3.2 Would the Project Remove Obstacles to Population Growth?

No Impact. Growth in Inyo County, Kern County, San Bernardino County, and the City of Barstow is planned and regulated by applicable local general plans and planning and zoning ordinances. The provision of electricity is generally not considered an obstacle to growth nor does the availability of electrical capacity by itself normally ensure or encourage growth. Other factors such as economic conditions, land availability, population trends, availability of water supply or sewer services, and local planning policies have a more direct effect on growth. The Full-Rebuild Concept, which is proposed to remediate GO 95 discrepancies on existing circuits rather than providing new electrical service, would not remove obstacles to population growth. Therefore, no impacts would occur under this criterion as a result of the Full-Rebuild Concept.

5.3.3 Would the Project Require the construction of New Community Facilities that Could Cause Significant Environmental Effects?

No Impact. As discussed in Section 4.14, Population and Housing, the Full-Rebuild Concept would not include the construction of housing, nor would it trigger population growth that could result in the construction of any new or upgraded community facilities such as parks or libraries. In addition, the Full-Rebuild Concept would not build public roads that would provide new access to undeveloped or underdeveloped areas, or extend the need for public services to new areas. Therefore, the Full-Rebuild Concept would not require the construction of new community facilities that could cause significant environmental effects.

5.3.4 Would the Project Encourage or Facilitate other Activities that Could Significantly Affect the Environment, Either Individually or Cumulatively?

No Impact. As discussed in Section 4.21, Cumulative Analysis, the Full-Rebuild Concept would not encourage or facilitate other activities that could significantly affect the environment, either individually or cumulatively. The Full-Rebuild Concept would not build new permanent access or spur roads that would provide new access to undeveloped or underdeveloped areas. Although the Full-Rebuild Concept would increase the reliability of electric transmission by replacing aging infrastructure (which is prone to failure) with new infrastructure (which is less prone to failure), the Full-Rebuild Concept would not provide a new source of electricity that would encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. Further, as presented in Chapter 2, resolving existing GO 95 discrepancies is the driver for the Purpose and Need for the IC Project, not future generation interconnections. Other factors, most notably public policy and federal land management policy, would be most likely to influence whether or not additional activities would result in interconnections to any facility associated with the IC Project.

5.4 Suggested Applicant Proposed Measures to Address GHG Emissions

Since 2010, GHGs have been incorporated into the CEQA Guidelines Appendix G checklist as an additional environmental issue area. Potential GHG impacts resulting from the Full-Rebuild Concept are discussed within Section 4.8 of this PEA. Because no potentially significant impacts related to GHG emissions would occur as a result of the Full-Rebuild Concept, no APMs are proposed.

5.5 Mandatory Findings of Significance

This section of the PEA provides an analysis of the mandatory findings of significance associated with construction of the Full-Rebuild Concept. In accordance with the CEQA Guidelines Section 15064 (a through h), this PEA section provides substantial evidence that is used to support the determination of whether the Full-Rebuild Concept would result in significant environmental impacts.

5.5.1 Significance Criteria

Appendix G of the CEQA Guidelines provides the criteria used in determining whether project related impacts would be significant. Impacts resulting from the Full-Rebuild Concept could be considered significant if they have the potential to create substantial impacts when the following questions are considered. Would the Project:

- Have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?
- Have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?
- Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

5.5.1.1 Impact Analysis

Does the Proposed Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Significant and Unavoidable Impact. The Full-Rebuild Concept would not degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major period of California history or prehistory.

The Full-Rebuild Concept would involve short-term construction activities, consisting of replacing existing structures with replacement structures located proximate to the existing structures. With the implementation of APMs and compliance with applicable regulations designed to protect the environment, construction would not substantially degrade the quality of the environment. The Full-Rebuild Concept would result in less than significant impacts to existing habitats, wetlands, and waterways. Therefore, the Full-Rebuild Concept would not substantially reduce the habitat of a fish or wildlife species.

The Full-Rebuild Concept would not have substantial impacts on wildlife habitat or designated or proposed critical habitat and would have no impacts on wildlife refuges. It would not require substantial clearing of vegetation. Any placement of fill in waterways would comply with federal and state wetlands and waterways regulations, and no discharges of domestic or industrial effluent would occur that could threaten the survival of a species. The Full-Rebuild Concept's impacts on biological resources would be less than significant with incorporation of APMs. Therefore, the Full-Rebuild Concept would not cause a fish or wildlife population to drop below self-sustaining level or threaten to eliminate a plant or animal community.

The Full-Rebuild Concept would have less than significant impacts on special-status plants and animals. It would not involve construction of a highway, levee, or other major infrastructure that could restrict the range of a species. Therefore, the Full-Rebuild Concept would not restrict the range of a rare or endangered plant or animal and any biological impacts would be less than significant.

The Full-Rebuild Concept would not eliminate important examples of the major periods of California history or prehistory. With incorporation of APMs, impacts to cultural resources would be less than significant.

Overall, the Full-Rebuild Concept would not substantially degrade the quality of the environment and all environmental impacts, except for construction air quality impacts, would be reduced to less than significant with the incorporation of APMs. In particular, the Full-Rebuild Concept's annual emissions of NO_x and CO and daily emissions of VOCs, NO_x and CO would exceed established significance thresholds. Compliance with the regulatory requirements would reduce air quality impacts but not to a less than significant level. Therefore, significant and unavoidable impacts are anticipated during construction of the Full-Rebuild Concept. These impacts would occur over the duration of construction and would be temporary.

Does the Proposed Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

Significant and Unavoidable Impact. As discussed in Section 4.21, the Full-Rebuild Concept, with the incorporation of APMs, would not result in any cumulatively considerable impacts to any environmental resource category except for Air Quality.

As presented in Section 4.3, Air Quality, the Full-Rebuild Concept would have a significant and unavoidable impact to air quality. In particular, the Full-Rebuild Concept's annual construction emissions of NO_x and CO and daily construction emissions of VOCs, NO_x and CO would exceed established significance thresholds. As further discussed in Section 4.3, the Full-Rebuild Concept is located in air basins that are classified as nonattainment for ozone and PM_{10}. Construction emissions of VOC and NO_x (ozone precursors) and CO emissions would exceed the applicable significance thresholds. Therefore, construction of the Full-Rebuild Concept would result in a cumulatively considerable net increase of a criteria pollutant; this cumulative impact is significant and unavoidable.

Does the Proposed Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Less than Significant Impact. The Full-Rebuild Concept would not result in environmental impacts that would have substantial direct or indirect effects on human beings, including noise, traffic, or potential for hazards from hazardous materials or accidents in close proximity to residential or recreational areas. As presented in Chapter 4, the direct and indirect impacts of the Full-Rebuild Concept's construction would be less than significant for all resource areas except for Air Quality. Because most construction activities are located in uninhabited areas, and because air pollutant emissions dissipate rapidly with distance, emissions from construction of the Full-Rebuild Concept would not cause a substantial adverse direct or indirect effect on human beings, and impacts would be less than significant.

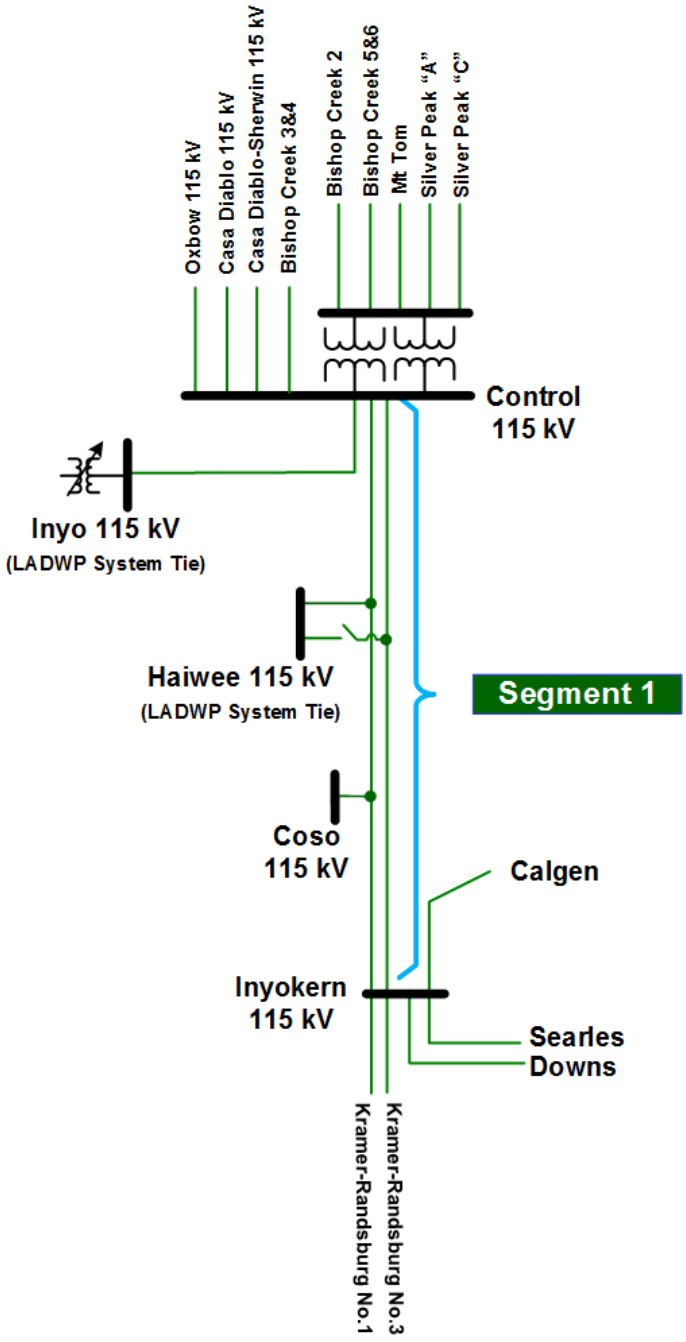
5.6 Irreversible and Irretrievable Commitment of Resources

Pursuant to Section 15126.2(c) of the CEQA Guidelines, an EIR must address significant irreversible and irretrievable environmental changes that would be caused by a Project. These changes include uses of nonrenewable resources during construction and operation, long-term or permanent access to previously inaccessible areas, and irreversible damages that may result from Project-related accidents.

Development of the Full-Rebuild Concept would require a permanent commitment of natural resources resulting from the direct consumption of fossil fuels, construction materials, the manufacture of new equipment that largely cannot be recycled at the end of the Full-Rebuild Concept's useful lifetime, and energy required for the production of materials. The construction of the Full-Rebuild Concept would entail the use of non-renewable resources; however, the volume of these resources that would be committed to the Full-Rebuild Concept is small, and therefore impacts resulting from the Full-Rebuild Concept would be less than significant.

Accidents, such as the release of hazardous materials, can trigger irreversible environmental damage. As discussed in Section 4.9, Hazards and Hazardous Materials, construction of the Full-Rebuild Concept would involve the use of small quantities of miscellaneous hazardous substances, such as gasoline, diesel fuel, hydraulic fluid, solvents, and oils. An accidental spill of any of these substances could impact water and/or groundwater quality and, if a spill were to occur of significant quantity, the release could pose a

hazard to construction workers, the public, and the environment. Improper storage, use, handling, or accidental spilling of such materials could result in a hazard to the public or the environment. Considering the small volumes of hazardous materials that would be used for the Full-Rebuild Concept, and the emergency response plans and other procedures that would be employed, accidental release is unlikely. State and federal regulations and safety requirements, as described in the regulatory setting in Section 4.9, would ensure that public health and safety risks are minimized. Therefore, no significant irreversible changes from accidental releases would occur.



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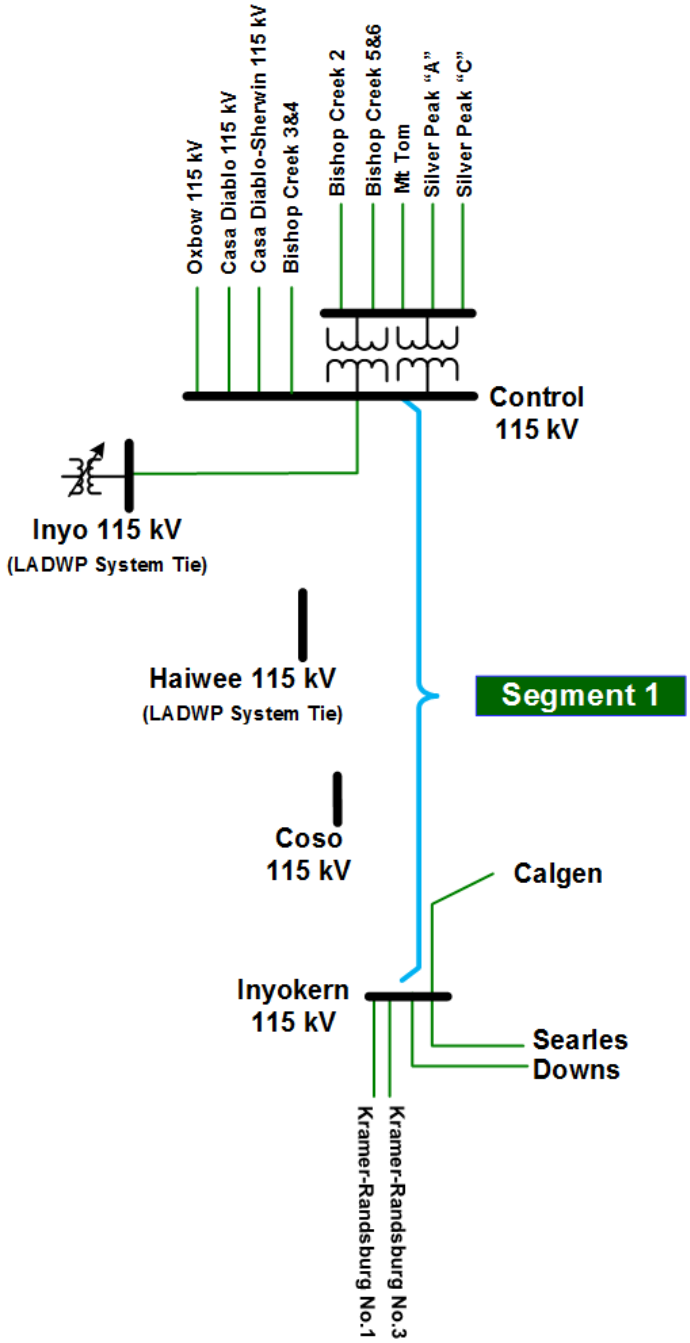


SYSTEM TOPOLOGY--
AFTER DECOMISSIONING AND REMOVAL

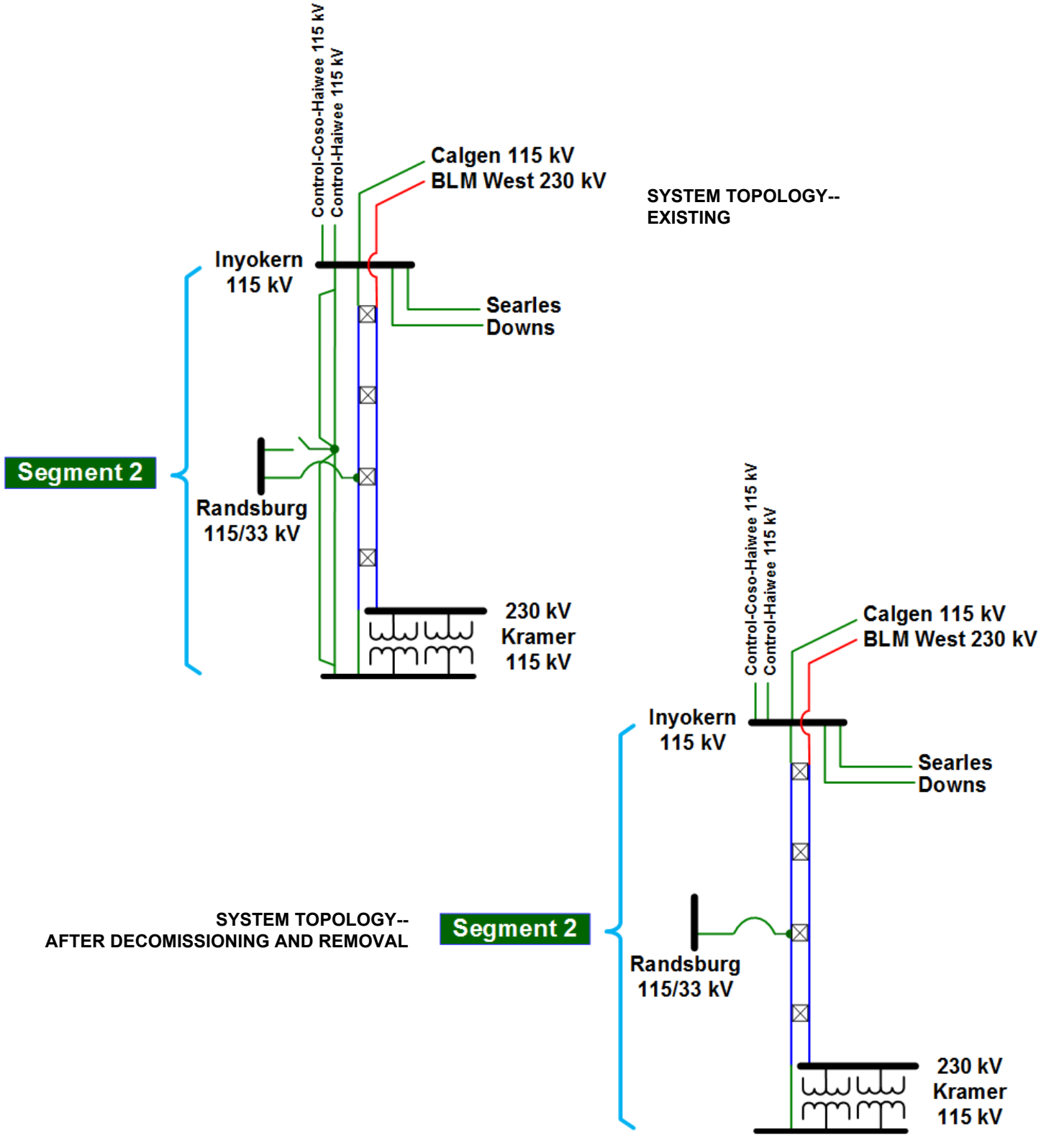
IVANPAH-CONTROL PROJECT

DECOMISSIONING AND REMOVAL:
SEGMENT 1 ALTERNATIVE

ARCADIS

SOUTHERN CALIFORNIA EDISON

FIGURE
5.2-1



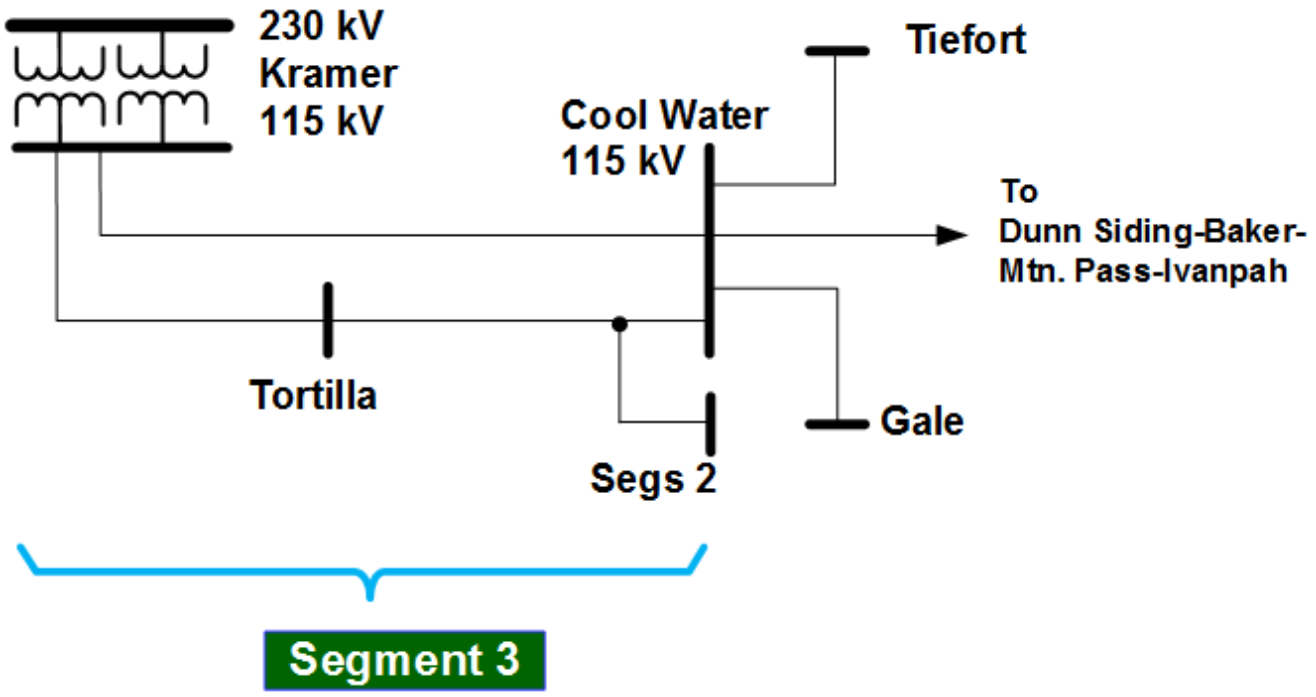
IVANPAH-CONTROL PROJECT

DECOMISSIONING AND REMOVAL:
SEGMENT 2 ALTERNATIVE

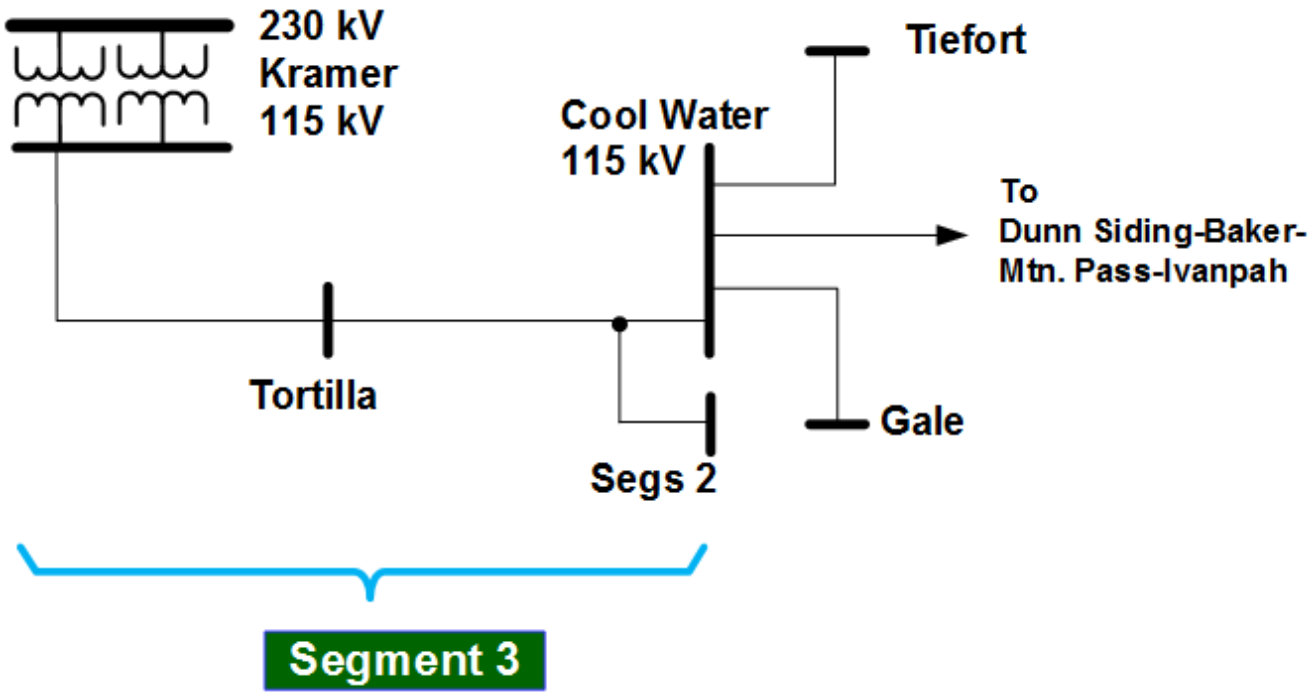
ARCADIS

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

FIGURE
5.2-2



SYSTEM TOPOLOGY--EXISTING, SEGMENTS 3N AND 3S



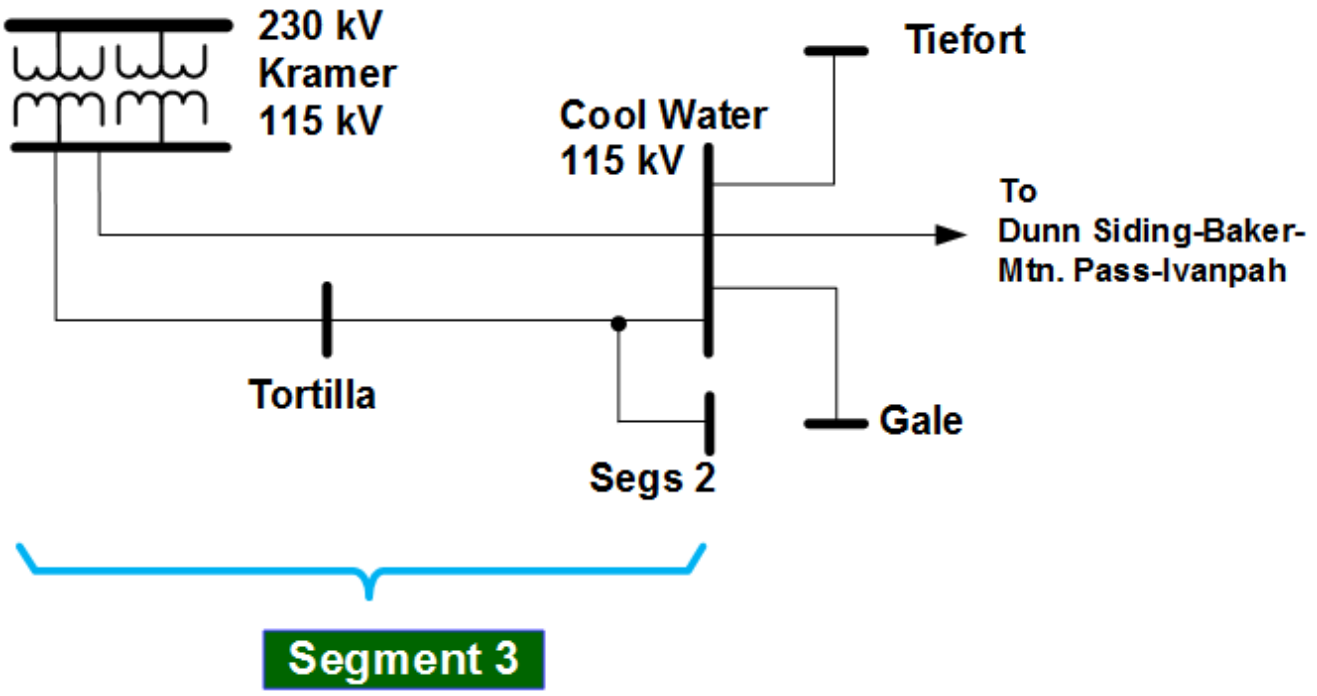
SYSTEM TOPOLOGY--AFTER DECOMISSIONING AND REMOVALOF SEGMENT 3N

IVANPAH-CONTROL PROJECT

DECOMISSIONING AND REMOVAL:
SEGMENT 3N ALTERNATIVE

ARCADIS | SOUTHERN CALIFORNIA EDISON

FIGURE
5.2-3



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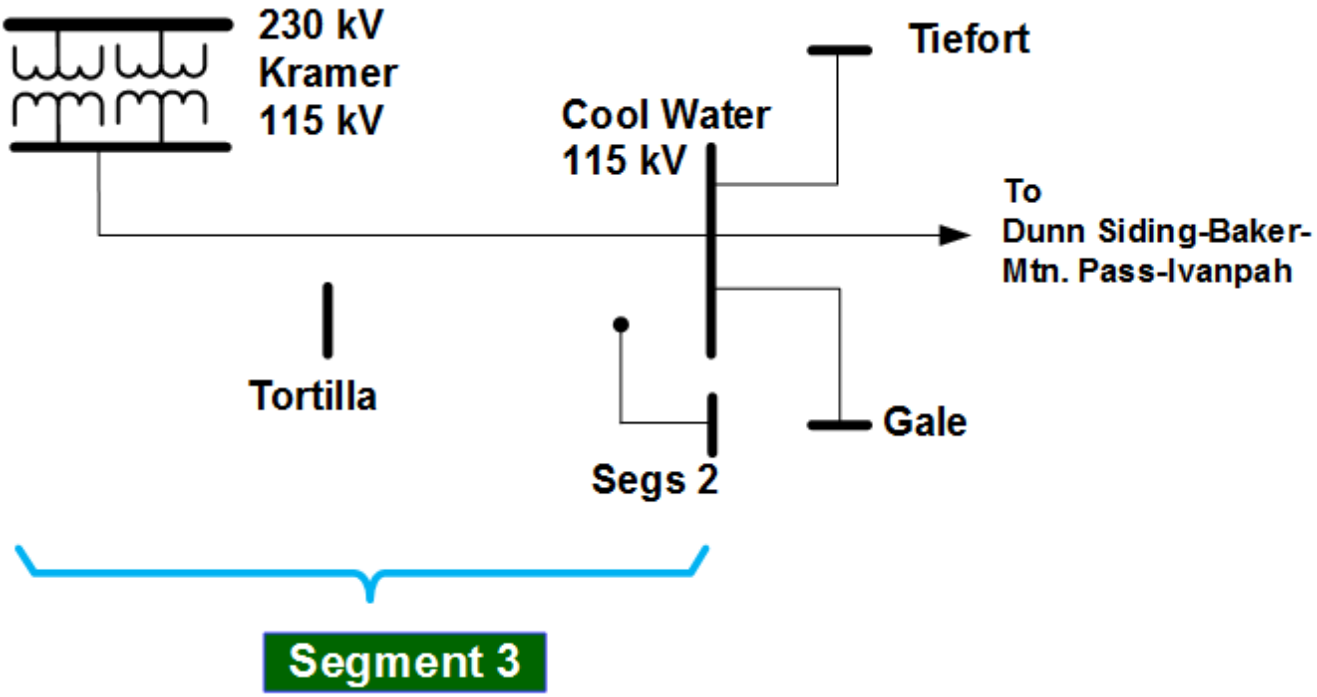


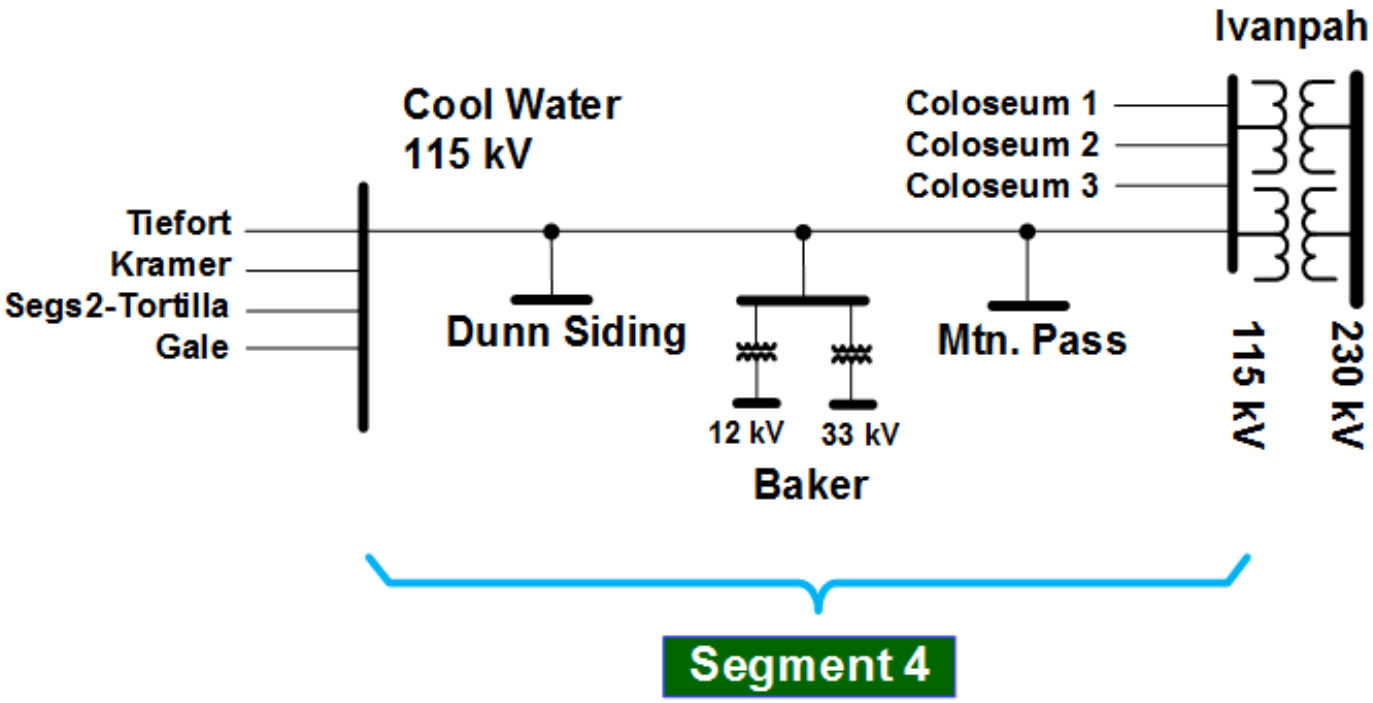
SYSTEM TOPOLOGY--AFTER DECOMISSIONING AND REMOVALOF SEGMENT 3S

IVANPAH-CONTROL PROJECT

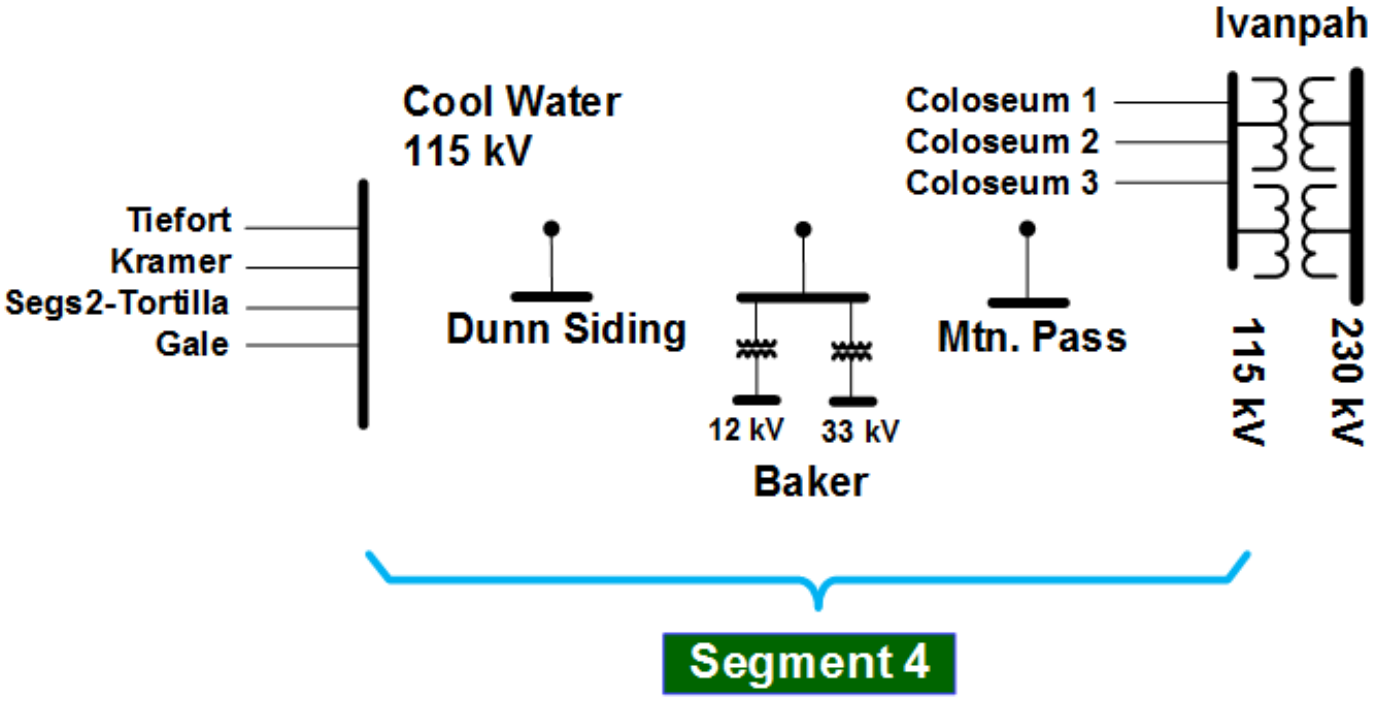
DECOMISSIONING AND REMOVAL:
SEGMENT 3S ALTERNATIVE

ARCADIS | SOUTHERN CALIFORNIA EDISON

FIGURE
5.2-4



SYSTEM TOPOLOGY--EXISTING, SEGMENT 4



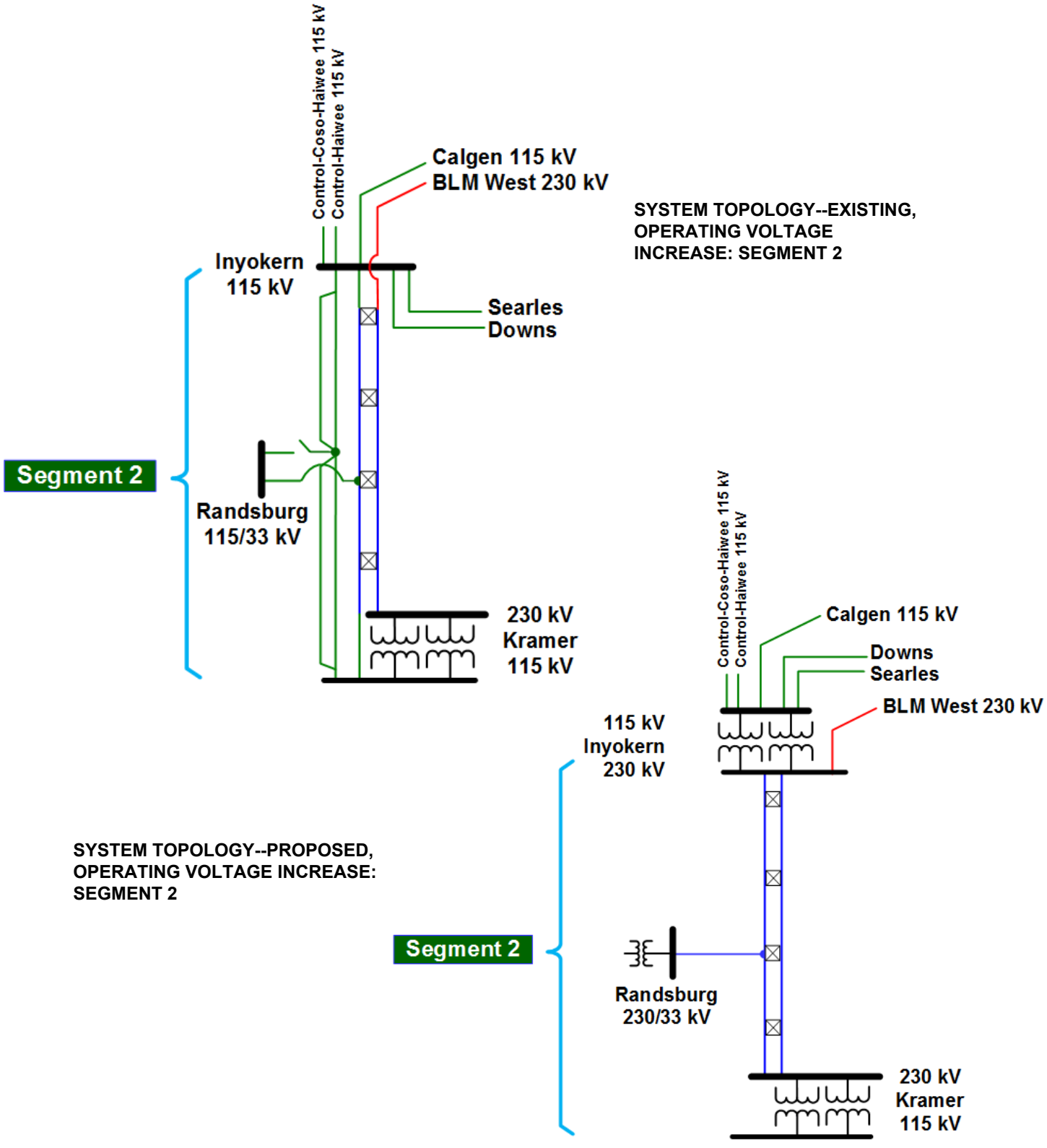
SYSTEM TOPOLOGY--AFTER DECOMISSIONING AND REMOVALOF SEGMENT 4

IVANPAH-CONTROL PROJECT

DECOMISSIONING AND REMOVAL: SEGMENT 4 ALTERNATIVE

ARCADIS | SOUTHERN CALIFORNIA EDISON

FIGURE 5.2-5



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OPERATING VOLTAGE INCREASE: SEGMENT 2

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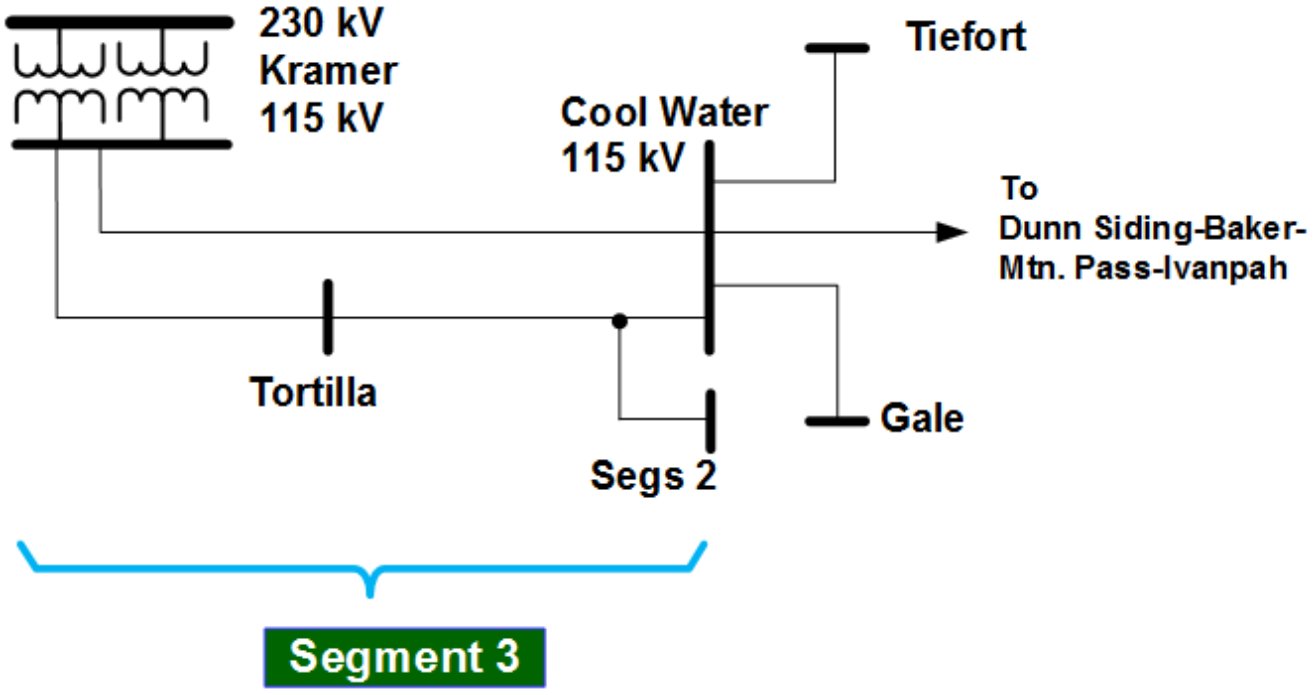
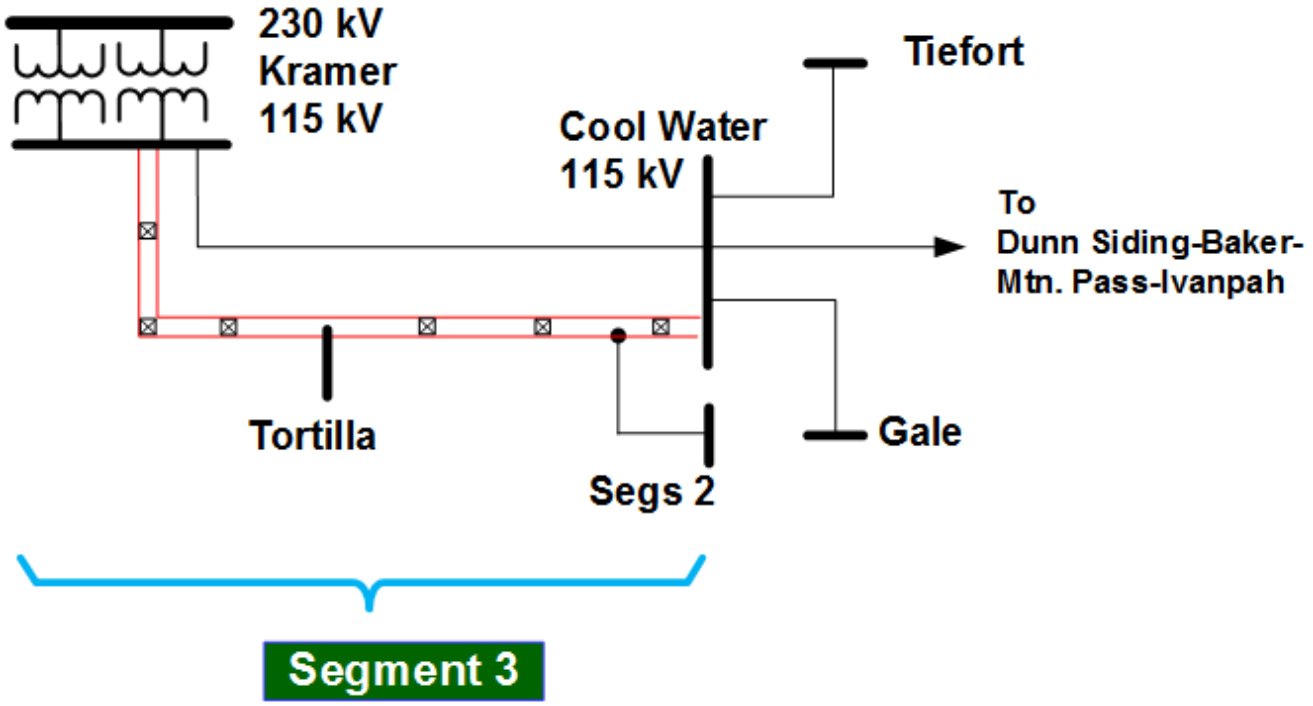
FIGURE 5.2-6



SYSTEM TOPOLOGY--EXISTING, SEGMENTS 3N AND 3S



SYSTEM TOPOLOGY--DERATE EXISTING CIRCUIT IN SEGMENT 3N, REMEDIATE REMAINING GO 95 DISCREPANCIES IN SEGMENT 3N, AND REBUILD SEGMENT 3S WITH DOUBLE-CIRCUIT POLE LINE

IVANPAH-CONTROL PROJECT

DERATE SEGMENT 3N AND REMEDIATE REMAINING DISCREPANCIES, REBUILD 3S WITH DOUBLE-CIRCUIT POLE LINE

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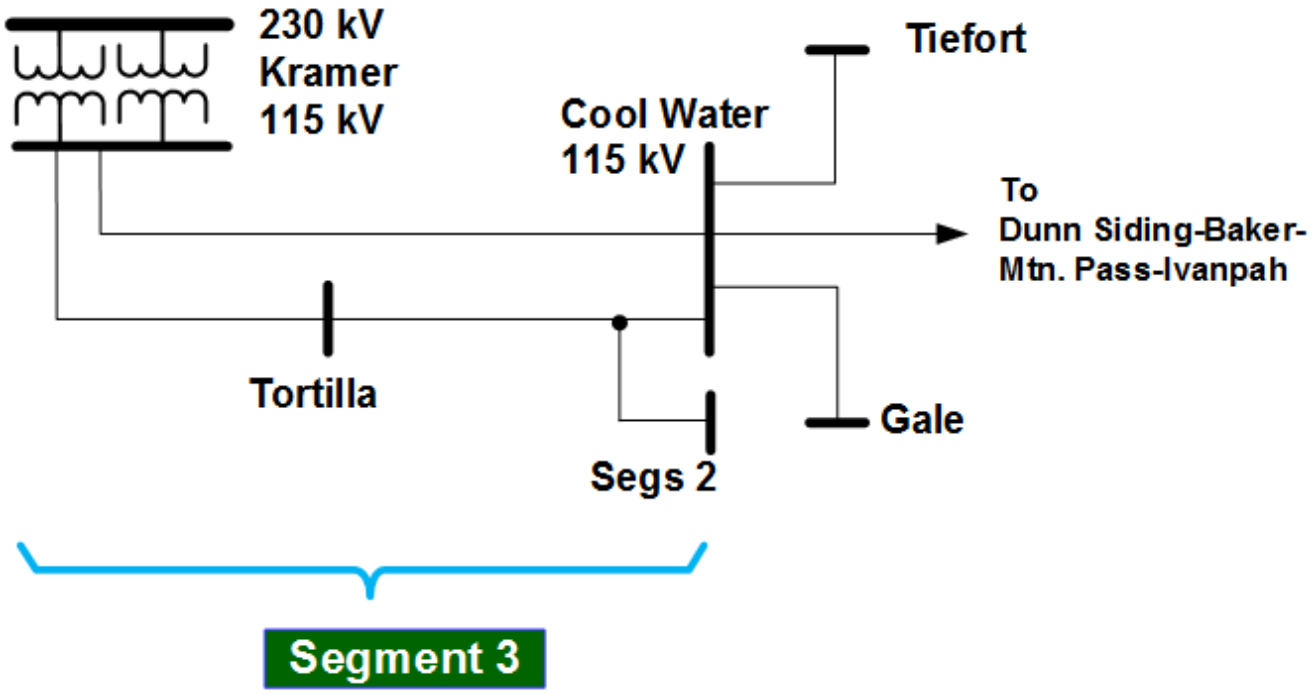
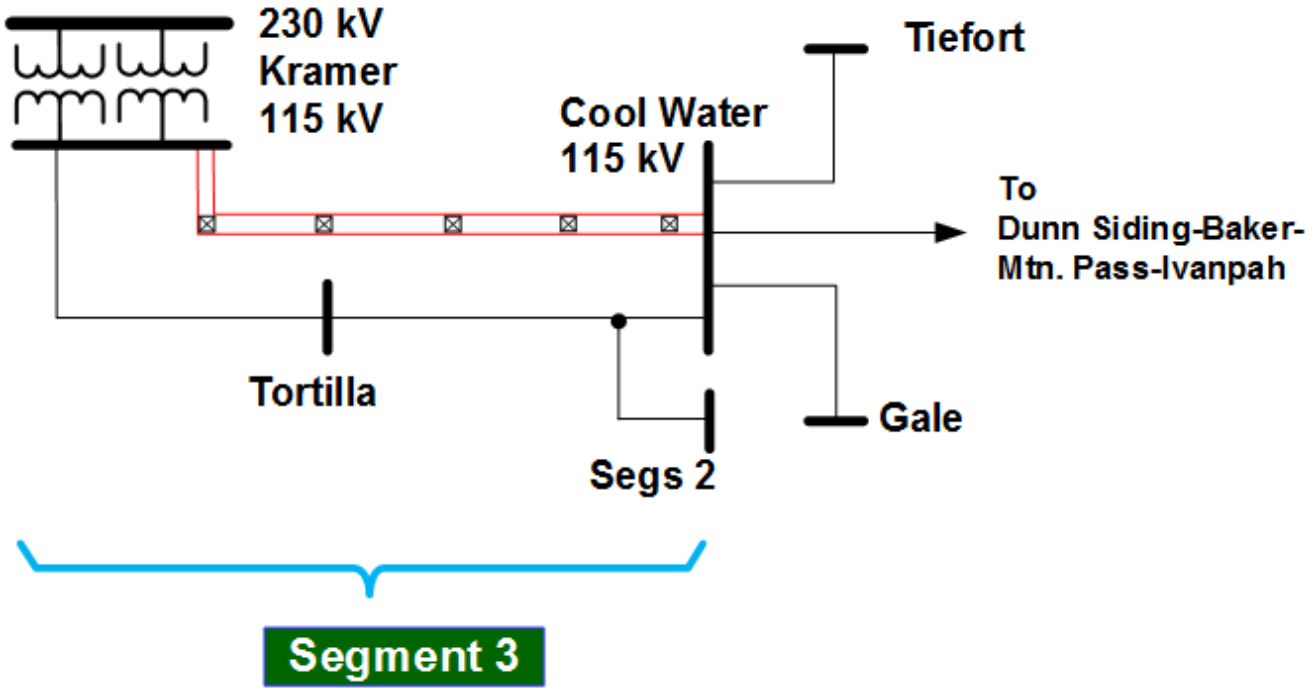
FIGURE
5.2-7



SYSTEM TOPOLOGY--EXISTING, SEGMENTS 3N AND 3S



SYSTEM TOPOLOGY--DERATE EXISTING CIRCUIT IN SEGMENT 3S, REMEDIATE REMAINING GO 95 DISCREPANCIES IN SEGMENT 3S, AND REBUILD SEGMENT 3N WITH DOUBLE-CIRCUIT POLE LINE

IVANPAH-CONTROL PROJECT

DERATE SEGMENT 3S AND REMEDIATE REMAINING DISCREPANCIES, REBUILD 3N WITH DOUBLE-CIRCUIT POLE LINE

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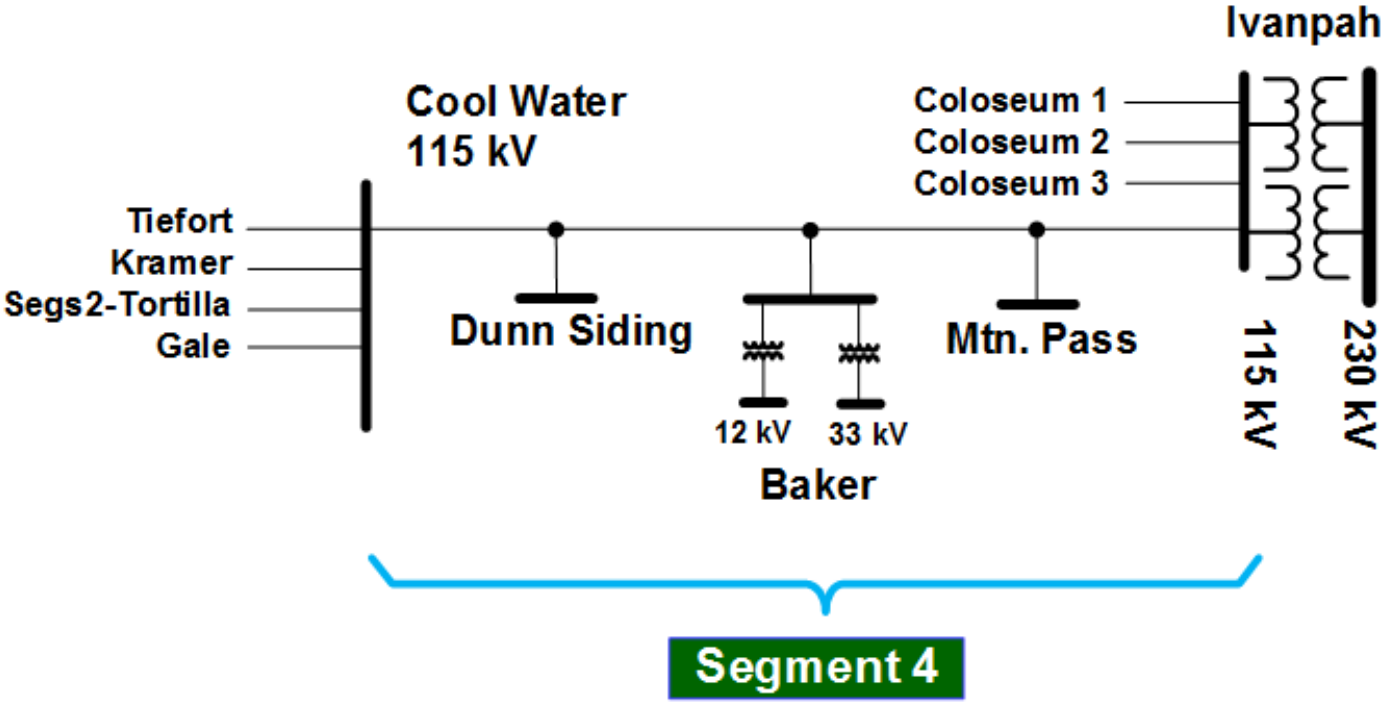
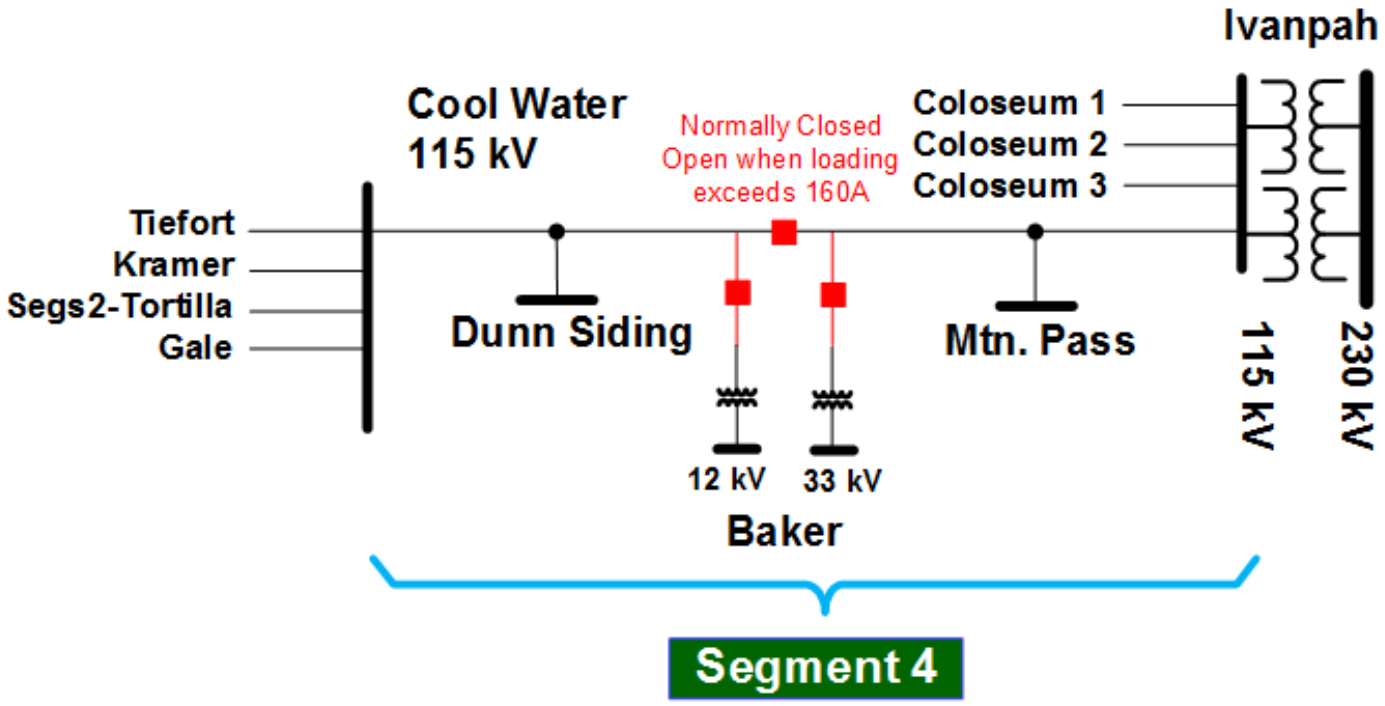
FIGURE
5.2-8



SYSTEM TOPOLOGY--EXISTING, SEGMENT 4



SYSTEM TOPOLOGY--DERATE SEGMENT 4 AND REMEDIATE REMAINING DISCREPANCIES ALTERNATIVE

IVANPAH-CONTROL PROJECT

DERATE SEGMENT 4 AND REMEDIATE REMAINING DISCREPANCIES

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FIGURE 5.2-9

Chapter 6 Other Process-Related Data Needs

In accordance with the requirements of the California Public Utilities Commission (CPUC) General Order 131-D (GO 131-D), a list that includes all parcels within 300 feet of the proposed facilities was prepared and is provided below. The list includes the Assessor's Parcel Number, owner mailing address, and the physical address of each property within the 300-foot radius. The list is intended to allow for future public noticing of all those identified. The list is found in Appendix J.

No other process-related data needs were identified for this Proponent's Environmental Assessment (PEA). This PEA contains information responsive to the requirements of GO 131-D, Appendix G of the State California Environmental Quality Act (CEQA) Guidelines and the CPUC's Working Draft Proponent's Environmental Assessment (PEA) Checklist for Transmission Line and Substation Projects, December 2008.

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