APPENDIX D

TRANSMISSION

APPENDIX D-1

RECONDUCTORING PROJECT
PRELIMINARY ENVIRONMENTAL ANALYSIS

MARSH LANDING GENERATING STATION TRANSMISSION SYSTEM ENGINEERING RECONDUCTORING PROJECT PRELIMINARY ENVIRONMENTAL ANALYSIS

Prepared By

URS

December 2008

TABLE OF CONTENTS

1.0 INTRODUCTION AND PURPOSE 1

2.0 PROJECT DESCRIPTION 3
- 2.1 PROJECT LOCATION 3
- 2.2 CONSTRUCTION METHODS 4

3.0 ANALYSIS OF RECONDUCTORING 9
- 3.1 BIOLOGICAL RESOURCES 9
- 3.2 CULTURAL RESOURCES 12
- 3.3 LAND USE 14
- 3.4 NOISE 15
- 3.5 TRAFFIC AND TRANSPORTATION 17
- 3.6 TRANSMISSION LINE SAFETY AND NUISANCE 18
- 3.7 VISUAL RESOURCES 19
- 3.8 SOIL AND WATER RESOURCES 20
- 3.9 TRANSMISSION SYSTEM ENGINEERING 23
- 3.10 GEOLOGY AND PALEONTOLOGY 24

4.0 CONCLUSIONS 27

5.0 REFERENCES 29

TABLES

Table 1 FEMA-designed Floodplains along Transmission Line Corridors

FIGURES

Figure 1 Project Location Map
Figure 2 Topographic Map

ATTACHMENTS

Attachment 1 Species Reported Occurring Within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generating Station

1.0 INTRODUCTION AND PURPOSE

Mirant Marsh Landing, LLC (Mirant Marsh Landing) has prepared this report in support of the Application for Certification (AFC) 08-AFC-03 for the Marsh Landing Generating Station (MLGS) in Contra Costa County, California. The proposed MLGS will consist of new natural-gas–fired generation facilities and ancillary systems. Four components of the project will be constructed: new generating units that will become the MLGS; electric and gas transmission lines adjacent to the facility; water supply and wastewater pipelines; and a water treatment facility at the Delta Diablo Sanitation District Bridgehead Lift Station.

The new MLGS units will be wholly within the existing Contra Costa Power Plant (CCPP) site. The MLGS will consist of a 930 megawatt (MW) facility with four power blocks: two Siemens FP10 combined-cycle units and two Siemens 5000F Simple Cycle units. The generator output from the MLGS will be stepped-up to 230-kilovolt (kV) transmission voltage.

The MLGS will connect to the existing Pacific Gas & Electric (PG&E) transmission switchyard adjacent to the CCPP site and the proposed MLGS project site. Three single-circuit 230-kV transmission lines will be required to connect the MLGS to the PG&E switchyard to facilitate delivery of the project's electrical output to the transmission grid. The transmission line interconnections will be approximately 1,700 feet in total length. They will be located mostly within the MLGS site, but will cross a small portion of the CCPP site and then connect directly into the PG&E switchyard boundaries.

As part of its Generator Interconnection Process Reform (GIPR) program, the California Independent System Operator (CAISO) is reforming its process for conducting System Impact Studies (SIS) for new power generation facilities. While the CAISO's reform process is under consideration by the Federal Energy Regulatory Commission (FERC), the CAISO will not accept new SIS requests. Projects such as MLGS that have requested interconnection studies before June 2, 2008 have been grouped into the "Transition Cluster." In the meantime, the California Energy Commission (CEC) directed Mirant Marsh Landing to have a third-party consultant prepare a SIS for the project so that the CEC can complete its AFC review process.

Utility System Efficiencies, Inc. (USE) prepared a preliminary SIS for the MLGS project. This preliminary study was submitted to the CEC on September 18, 2008. Results of the study, using the 2013 Summer Peak Full-loop base case, indicate that under normal and contingency conditions, some 230 kV transmission lines in the study area will be loaded above their line ratings. All of these lines are owned by PG&E. The lines that would be overloaded are:

- Contra Costa–Brentwood
- Contra Costa–Wind Master–Delta Pump
- Las Positas–Newark
- Cayetano–Lone Tree

The actual need for reconductoring will be determined after PG&E has completed the Final Design Study or Cost Study for the Generator Facility Interconnection Agreement for the MLGS

project, and reaches agreement with Mirant Marsh Landing concerning funding of the needed reconductoring. Mirant Marsh Landing's preference is to re-rate all of the lines mentioned above. If re-rating is infeasible, PG&E would apply to the California Public Utilities Commission (CPUC) for authority to implement the reconductoring project, and to recover the cost of the reconductoring from Mirant Marsh Landing or PG&E ratepayers.[1]

An analysis of the potential effects on the transmission system caused by operation of the proposed facility shows that reconductoring of the Contra Costa–Brentwood, Contra Costa–Wind Master–Delta Pump, Cayetano–Lone Tree, and Las Positas–Newark 230-kV transmission lines are reasonably foreseeable events (USE, 2008). Because of this, and the requirement under the California Environmental Quality Act (CEQA) to examine foreseeable subsequent projects that result from the project, the potential impacts of reconductoring as it may pertain to the MLGS are presented herein.

The purpose of this reconductoring analysis is to inform the CEC of the potential indirect environmental and public health effects of the MLGS project. This analysis describes typical reconductoring activities and examines the nature and scope of the probable impacts of typical reconductoring, should it occur. This report also includes measures for mitigating these impacts to a less-than-significant level that PG&E could consider during implementation of the reconductoring project.

[1] The process for determining the cost and funding obligations for transmission system upgrades in California is the subject of a current FERC proceeding and has not been finally determined.

2.0 PROJECT DESCRIPTION

This section identifies the transmission line segments that are likely to require reconductoring as a result of the licensing of the MLGS if PG&E determines that re-rating is not an option. It provides an overview of typical reconductoring components and the basic work involved.

Until PG&E completes its own studies and engineering design, detailed information for each of the reconductored transmission lines, such as the number of tower modifications required, conductor types, sizes, and lengths, cannot be provided. Therefore, for the purposes of this preliminary reconductoring impact analysis, typical information has been assumed, as described below.

2.1 PROJECT LOCATION

The preliminary SIS report concluded that four lines could be overloaded during normal or emergency operation and therefore would require reconductoring, should re-rating not be considered feasible. The four lines are the Contra Costa–Brentwood line, Contra Costa–Wind Master–Delta Pump line, Cayetano–Lone Tree line, and Las Positas–Newark line, all of which are rated at 230 kV. These transmission line corridors are shown on Figure 1 and Figure 2.

The Contra Costa–Brentwood line is approximately 10 miles long. It starts at the Contra Costa Substation and runs southeast approximately 6 miles, then turns to the east and terminates at the Brentwood Substation approximately 4 miles to the east. The transmission corridor passes through agricultural and residential areas in the City of Antioch. South of Lone Tree Way, the transmission line crosses an agricultural field and Sand Creek. The land uses south of the creek are undeveloped and potential grazing lands with a slightly hilly topography. As the transmission lines turn to the east, they cross a golf course and additional residential development of the City of Brentwood and terminate at the Brentwood Substation amidst agricultural uses.

The Contra Costa–Wind Master–Delta Pump line is approximately 18 miles long. It starts at the Contra Costa Substation adjacent to the MLGS site and continues southeast to the Windmaster Substation, terminating at the Delta Pumps Substation. Similar to the Contra Costa–Brentwood line, this line crosses residential and agricultural uses in the City of Antioch and several creeks. Farther south, the transmission line passes through undeveloped areas with moderate topography changes (less than 400 feet of elevation change) and some additional creeks and rural residential land uses. Wind turbines are to the west of the Delta Pumps Substation, which is at the California Aqueduct north of the Bethany Reservoir State Recreation Area.

The Cayetano–Lone Tree line is approximately 6 miles long. It begins at the Cayetano Substation, north of Livermore, California, in Alameda County and runs approximately 2.5 miles to the east through primarily agricultural and rural residential areas where the topography is fairly flat. The transmission line then turns to the north, crosses into Contra Costa County and continues for approximately 3.5 miles to the Lone Tree Substation, just south of Los Vaqueros Reservoir. The area south of the Lone Tree Substation is generally undeveloped, characterized by rolling hills with elevation change less than 100 feet, and wind turbines.

The Las Positas–Newark line is approximately 21 miles long. It begins at the Las Positas Substation northeast of Livermore runs approximately 6 miles south, passing through residential areas, agricultural fields, and industrial uses, and then turns to the southwest and continues approximately 15 miles to the Newark Substation, passing through agricultural and grazing lands and crossing a few small creeks. Southeast of the intersection of I-680 and Vallecitos Road, the transmission line passes through a processing facility then through more undeveloped, slightly hilly land. The transmission line then passes through the residential and commercially developed areas between Fremont and Milpitas to the Newark Substation, adjacent to the Cargill salt ponds.

2.2 CONSTRUCTION METHODS

Prior to beginning reconductoring, PG&E would coordinate with the CAISO for permission to take the existing line out of service. This action would ensure that adequate power is redistributed to substations and customers when the line is out of service.

The existing transmission corridor would be accessed by trucks, all-terrain vehicles, by foot, and by helicopter. To the extent possible, access would be over existing roads. Where access roads to towers are not available, new temporary spur roads would be constructed, with minimal grading and minimal land disturbance. Best Management Practices (BMPs) would be implemented during construction. The roads would be removed and the disturbed areas would be restored to original conditions after project completion. In developed areas, access to towers would be from public roads or through developed private property or commercial lots. No new access roads would be constructed through drainages or wetlands. Helicopters may be used to string the lines and transport workers and materials to the towers. Helicopter reconductoring methods have proven highly effective where the terrain makes access difficult or there is a need to avoid disturbance to sensitive resources.

Reconductoring would involve the replacement of the existing conductors with a heavier duty conductor that would increase the current carrying capacity of the line. Reconductoring would also involve replacing insulators and installing temporary crossing structures to project roadways and existing utilities while installing the new conductors.

In general, reconductoring is accomplished by disconnecting the old line and using it like a rope to pull the new line through the temporary pulleys, called “travelers” or “sheave blocks,” mounted on each tower, until it reaches the other end. If the old line is not in good enough condition to be used to pull in the new line, it would be used to pull a carrier cable, or “sock line,” through the pulleys to the end of the segment to be replaced; the sock line would then be used to pull in the new line.

Typically, a work crew is set up at each end of the segment that is being replaced. Each crew generally consists of two large tractor trailer units, which either feed out the new line or wind in the old line on spools mounted on the trailers, plus various machinery such as cranes and two or three utility trucks carrying tools, other materials, and workers, for a total of about 10 trucks and about 20 workers involved in the work at any one time. One crew sets up at a "pull site" near a tower at one end of the pull, and the other at a “tensioning site” near a tower at the other end of the pull. The tensioning crew would employ a special tensioner truck, which is essentially a large

drum winch that is used to put back tension on the line being pulled. Each pull generally is limited to about 2 to 3 miles, and the crews generally pull three cables (one three-phased circuit) at once. Each pull station and tensioning station requires a construction staging area of approximately one acre. In residential or developed areas, the pull and tension sites can be selected to provide adequate space for construction staging.

The tensioning site crew either climbs the tower or uses a truck-mounted aerial bucket (also called a "cherry-picker") to access the tower, disconnects the old conductors, and attaches them through the tensioner truck to the new conductor on spools on the large trucks. The pull site crew also climbs the tower, disconnects the lines, and attaches them to the spools in the large trucks below the tower. Temporary clearance structures are placed at road crossings and other locations where the new conductors may accidentally come in contact with electrical or communication facilities or vehicular traffic during installation.

It is anticipated that all reconductoring work would be done within the existing PG&E right-of-way along the existing transmission lines and within the footprint of the existing substations. Temporary construction areas outside of the right-of-way would include material storage and laydown areas, temporary construction yards, and helicopter landing areas. These areas would be selected by engineering and construction personnel during the design phase. Approximately 2 to 5 acres are typically needed for transmission line projects. Work crews will have a great deal of flexibility in choosing the locations of the pull and tension sites and temporary staging areas; crews can generally select sites that avoid many environmental impacts. Use of private lands for temporary construction staging along the transmission corridors would be negotiated by PG&E at the time of reconductoring.

Because the potential for environmental impact is generally nonexistent except at the pull and tensioning sites, this analysis focuses on examining potential effects at the likely pulling and tensioning sites, as well as at other locations that could be disturbed by truck movement, such as the substation sites and sites near towers that may require modification as part of the reconductoring. Activities outside of the pull and tensioning sites are generally restricted to (1) accessing the towers (either by climbing or using a truck-mounted aerial bucket) to place the pulleys and to remove the conductor from-the pulleys and refasten it once stringing is completed; and (2) work on the tower structures to repair or replace spars that are damaged, or to replace insulators.

While determining the specific location of pull and tensioning sites is not feasible at this time, they are generally sited at "angle" towers, which are located where the line makes a change in direction of more than 10 degrees. Pulling the old lines and reeling out the new conductors is easier at these locations because the pulling and tensioning equipment can be arranged in line with the transmission line. Conversely, the crews try to avoid pulling the line through one or more angle towers because the conductors cannot be efficiently pulled through such an angle. Pulling and tensioning can also take place at "deadend" sites, which are towers where the transmission line is physically connected to the tower, rather than merely passing through the insulator clamps, and in general is where one spool of cable is spliced to the next spool. Deadend sites are generally at angle towers, but also can be located at towers that are in-line with the route, rather than at an angle to the route. Deadend towers have significant structural strength

and resist the forces of pulling. The locations of angle and deadend towers on the lines described above are not known at this time. The exact locations will be determined when PG&E develops final engineering plans for the reconductoring.

Reconductoring may require raising the height of the transmission towers to accommodate different sag characteristics of the new conductors. The new conductors may sag closer to the ground on hot days when the lines are fully loaded, and therefore some towers may need to be raised, typically on the order of 10 to 25 feet. This can be done through one of three methods: a "top cage" extension, where additional structure is added to the top of the tower to raise its top to the required level; a "waist cage" extension, where the top half of the tower is separated from the bottom half at about its mid-level, additional structure is inserted, and the top is replaced onto the new part of the structure; and a "base cage" extension, where the tower is separated from its concrete base, new structure is installed on the base, and then the tower is placed back on top of the new structure.

If the towers are modified, the existing concrete foundations may require some limited work. The need for foundation work would be determined during inspections conducted by PG&E during engineering design for the reconductoring project. Foundation work could range from patching minor cracks in the concrete, to complete replacement of the foundation, which would require excavation work around the base of the tower. If any of the towers need to be modified, work crews would also set up equipment at those towers as part of the reconductoring project. For the vast majority of reconductoring projects, however, excavation work near the towers is not needed.

The work areas needed to modify the height of towers would be similar in size to those for the pulling and tensioning sites. The equipment would consist of a truck-mounted crane capable of lifting the existing tower off its base, plus three or four smaller support vehicles. Workers would attach the crane to the tower, then separate the portion that would be elevated, and pull that portion up to provide clearance for the new structure. The new structure is welded or bolted in place, and the existing structure is then lowered back onto the new structure and welded or bolted in place. In most cases, the existing conductors would not need to be removed from the tower while it is modified. Some work may be required on tower foundations or footings.

During the reconductoring process, work crews may replace the insulators on the transmission towers on the line. This work usually involves accessing the tower with a truck-mounted aerial bucket or by climbing, removing the old insulator strings, and installing new ones. The new insulators are delivered and held in place by the aerial bucket and or rigging attached to the tower, or, for towers that cannot be accessed by truck, by helicopter. The towers are also inspected for corrosion prior to reconductoring and, if necessary, will be repaired. Repairs can include corrosion removal by mechanical means, regalvanizing, and repainting.

Modifications may be required at the substations where each of the lines terminates. These modifications would all occur within the existing footprint of the substations and could include replacing circuit breakers, bus structures, and switches.

A schedule for the reconductoring has not been developed at this time. However, it is anticipated that each reconductoring project could take approximately 4 to 6 months. Workers would occupy each pull and tension site for about 3 days. The reconductoring work would probably occur during times of relatively low electrical demand to protect system reliability while the lines are out of commission.

At the end of construction, all temporary structures will be removed. Construction debris will be removed and hauled away for recycling or disposal. Areas disturbed during construction will be returned to pre-construction conditions, unless otherwise agreed to with the landowner.

3.0 ANALYSIS OF RECONDUCTORING

This analysis focuses on the relevant technical areas that the CEC evaluates as a part of the AFC process for power plants. The relevant technical areas discussed for reconductoring include biological resources, cultural resources, geologic hazards, land use, noise and vibration, palaeontological resources, soils and water resources, traffic and transportation, transmission line safety, transmission system design, and visual resources. Other technical areas typically included in the CEC's evaluation of proposed projects are not included in this report because the potential for impacts due to reconductoring are considered not applicable or non-existent.

3.1 BIOLOGICAL RESOURCES

This section provides an analysis of the potential impacts to biological resources that could occur as a result of the proposed reconductoring of transmission lines associated with the MLGS project.

Potential impacts to biological resources could result at construction work sites during the reconductoring. These sites include pull and tensioning sites where new conductors will be placed in existing towers, towers that may require modification, staging areas, laydown yards, and access roads. Impacts may include disturbance, injury or death of special-status species or their nests, temporary ground or habitat disturbance, or temporary visual, wind, or noise disturbances. Avoidance and minimization measures are proposed to avoid, eliminate, and reduce these impacts to a less-than-significant level, or compensate for any impacts. The final reconductoring project will be subject to approval by the CPUC, and may incorporate additional avoidance and minimization measures or BMPs as required by the CPUC.

As described in Chapter 2, the proposed project involves reconducting of four transmission line segments.

Impacts of Reconductoring

This section presents the potential impacts to biological resources associated with the construction and operation of the proposed reconductoring transmission line segments. Potential impacts to biological resources during reconductoring of the transmission lines could occur at the pull and tensioning sites, the tower locations, and the temporary staging or laydown yard locations; specific locations and sizes of those sites have not yet been determined.

Impacts would most likely occur at the angle towers where conductor pull and tension sites and tower modification activities are required. Large trucks and other vehicles employed to perform the work could potentially damage, injure, or kill sensitive plant or animal species, compact soil, crush dens or burrows, destroy nests, introduce non-native species, or lead to soil erosion and sedimentation. Additionally, indirect impacts such as noise and visual disturbances could affect sensitive species during construction activities.

Although in-depth field investigation was not conducted as part of this preliminary evaluation, aerial photographs suggest that the primary vegetation community is California grassland. These areas are often dominated by non-native annual grasses and are used for grazing. Other vegetation types that may be present within the impact area could include buckwheat/sage scrub, oak woodlands, riparian woodlands and scrub, agriculture, and urban. While transmission lines may cross streams and wetland areas, towers are not expected to be located within these areas, and as such, no work is expected to occur within these communities.

A review of the California Natural Diversity Database (CNDDB) (California Department of Fish and Game, 2008) indicates that several historic occurrences of special-status species have been reported within 2 miles of the transmission lines (see Attachment 1). Based on habitat presumed to be present in the vicinity, the potential for each species to occur in the work area was evaluated. In total, eight species are highly likely to occur within the project area because suitable habitat is present for these species and there are numerous occurrences in the vicinity of the project. The eight species that are highly likely to breed, forage, aestivate, or dwell within the work or staging areas are: California tiger salamander (*Ambystoma californiense*), California red-legged frog (*Rana draytonii*), San Joaquin kit fox (*Vulpes macrotis mutica*), American badger (*Taxidea taxus*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), burrowing owl (*Athene cunicularia*), big tarplant (*Blepharizonia plumosa*), and stinkbells (*Fritillaria agrestis*) (see Attachment 1).

Forty-seven species are considered to have low or moderate potential to occur in the project area. Habitat for these species is present, but the habitat is either limited in the project area or the species is very rare in the vicinity of the project area. Twenty-one species known to occur within 2 miles are unlikely to occur in the project area due to lack of available habitat within the project area (see Attachment 1).

The primary concern regarding impacts to biological resources is injury or death to sensitive species or habitats occurring within the transmission corridor or staging areas. Indirect impacts may disturb these species to the point of inhibiting successful nesting, breeding, foraging, aestivation, or other activity essential for maintaining a viable population. Attachment 1 lists sensitive species that are known to occur within 2 miles of the transmission corridor. Should suitable habitat be present within or near the impact area, these species could be directly or indirectly impacted as a result of this project.

Direct and indirect impacts to sensitive species may occur from a variety of construction activities such as clearing of staging areas, movement of equipment, or walking around the construction site. Potential impacts include noise, wind (if a helicopter is used), vegetation removal, crushing of plants and animals including ground-nesting birds, introduction of invasive species, disruption of food sources, release of liquids, and visual disturbance.

Mitigation

Avoidance and minimization measures may be implemented to reduce impacts. Potential avoidance and minimization measures include:

- Conduct rare plant surveys during the appropriate blooming season for the project area and areas within 150 feet of the project area.
- Conduct mammal burrow surveys prior to construction in all areas with potential ground disturbance (including vehicle traffic).
- Conduct pre-construction nesting bird surveys. Raptor surveys should be conducted within 0.5 mile of the project disturbance areas, whereas passerine surveys should be conducted within 150 feet of the project area.
- Avoid, to the maximum extent possible, any activity that necessitates tree, shrub, or ground cover disturbance.
- Clear vegetation during the non-breeding season for migratory birds (August 16 through February 14). If vegetation needs to be removed between February 15 and August 15, a nesting bird survey should be conducted beforehand. Activity near active nests should be avoided until the young have fledged. Buffer distances from nests are dependent on the species; a minimum buffer of 150 feet would be established.
- Depending on the results of the botanical, mammal, and bird surveys, construction activities may be restricted to avoid impacts to sensitive species. The months, season or time or day would be established for each sensitive species.
- Maintain vehicles to prevent leaks or spills, and keep a spill cleanup kit readily available at all work sites.
- Implement erosion control BMPs, as necessary, to prevent impacts to waterways, wetlands, and/or vernal pools. This may include installing silt fences or fiber rolls to reduce erosion and sedimentation. Weed-free erosion control would be used.
- Establish boundaries for staging and construction areas.
- Delineate and identify all Environmental Sensitive Areas, including habitats of sensitive species and wetlands and other waters (streams) of the United States.
- Use existing roadways to the maximum extent possible.
- Clean construction equipment with a pressure washer to minimize the potential spread invasive and non-native plants.
- Minimize the footprint of staging areas and activities to complete the project.
- Designate areas to sort and store staging materials.
- Limit vehicle use to control emissions.
- Store, re-fuel, and maintain heavy equipment more than 150 feet from wetlands, streams and water bodies.
- Limit heavy equipment to that with the least adverse effects (minimally sized with rubber tires).

Conclusion

Construction activities for this project are not expected to have adverse impacts on the surrounding environment or sensitive species. However, impacts cannot be fully evaluated until specific biological surveys are conducted and project plans are developed (with exact locations of staging and work areas). Before construction activities are initiated it will be necessary to consult with various regulatory agencies (e.g., U.S. Fish and Wildlife, California Department of Fish and Game, and U.S. Army Corps of Engineers). The implementation of botanical surveys, wildlife surveys, BMPs, and the proposed avoidance and minimization measures will reduce the potential impacts to sensitive species associated with the project.

3.2 CULTURAL RESOURCES

Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, and/or scientific importance. Numerous laws, regulations, and statutes on both the federal and state levels seek to protect and target the management of cultural resources.

The sections of transmission lines that could be reconductored for the MLGS project are all found within the eastern San Francisco Bay Area and adjoining sections of Sacramento-San Joaquin River Delta. This region has been one of the most intensively archaeologically studied areas in California. Studies have shown that human settlement in the region probably began sometime during the early Holocene period ca. 10,000 years ago.

The transmission lines in the Antioch and Tracy area were constructed prior to the 1920s and the lines between Newark and Tracy and Antioch and Clayton existed by the 1910s. The Contra Costa–Lone Tree–Cayetano line was likely constructed in conjunction with the construction of the CCPP in the early 1950s. Given their age, any of these lines and associated substations may themselves qualify as historical resources. It should be noted, however, that many of these lines have been modified in the last 20 years, and the Cayetano–Lone Tree line was modified within the last five years, which could affect their eligibility as historical resources.

Impacts of Reconductoring

Potential impacts to archaeological resources caused by the identified reconductoring projects could occur where ground-disturbing activities are necessary. Areas of disturbance include the pull and tensioning sites, where cable is drawn across the ground surface between towers, the transmission towers and substations requiring upgrade, and within the confines of temporary access routes and temporary construction areas.

Modification and/or replacement of the transmission towers and substations, if they are historical resources, could be an impact to cultural resources associated with the built environment.

Mitigation

It is recommended that once PG&E develops a work plan for the reconductoring work, including the identification of the temporary construction staging areas, access routes and extent of tower and substation modification, additional cultural resource surveys be conducted. A California Historical Resources Information System (CHRIS) record search that encompasses all of the areas that might be affected by reconductoring activities as well as surveys of the transmission corridors to identify cultural resources (including structures greater than 45 years old) should be conducted prior to construction activities.

Should resources be identified by either the record search or the site reconnaissance survey, measures should be implemented to protect the resources. This includes evaluating the resources' eligibility for the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR) and whether the aspects of the cultural resource that makes it significant will be impacted by the project. Work crews will have flexibility in determining staging areas and pull and tensioning sites and can locate these activities to avoid identified cultural resources.

It is recommended that ground disturbance at archaeologically sensitive pull site locations or other areas where key project activities are occurring be monitored for cultural resource exposure. If cultural material is identified, ground disturbance should halt until the find can be evaluated. Additional mitigation measures would include formal site recordation, evaluation, and, if appropriate, data recovery and curation. Previously identified archaeological sites should be evaluated and if they meet the criteria for eligibility to either register and they cannot be avoided, data recovery should be conducted as a mitigation measure.

An impact to a historical resource is significant if the impact results in the material impairment of its significance. Whether actions of a project constitute a significant impact depends upon which criteria are applicable to the cultural resource. To ensure that there will not be a significant impact to a cultural resource, it is necessary to evaluate the potential resource according to criteria for eligibility to either the NRHP or the CRHR. It is appropriate to consider potential cultural resources that may be older than 45 years or exceptional for eligibility to the NRHP or the CRHR. After it is determined whether potential cultural resources meet the criteria for eligibility to the NRHP or the CRHR, then it is necessary to consider whether physical alteration may be an impact. Whether the resource has unique features may or may not play a role in whether it meets the criteria for eligibility to either register and is not a valid criterion for deciding whether or not to evaluate the resource.

Recordation may serve as mitigation for some impacts to NRHP- or CRHR-eligible historic resources.

Conclusion

Contingent on the outcome of the record search and the surveys, some of the proposed reconductoring routes could contain sensitive archaeological resources. Depending on the scope

of work associated with the reconductoring project, such as whether it would include new foundations or raising the height of some towers, some of the resources may be adversely affected as a result of the reconductoring effort. In general, after all cultural resources are identified and a determination is made regarding whether they meet the criteria for eligibility to either the NRHP or the CRHR, except in cases where a cultural resource is demolished, mitigation is usually possible through avoidance, recordation, or data recovery.

3.3 LAND USE

The land use analysis focuses on the project's compatibility with existing and planned land uses. The anticipated reconductoring involves transmission lines within four existing utility transmission corridors in Alameda and Contra Costa Counties, in the cities of Antioch, Brentwood, Livermore, and Newark.

Reconductoring these lines would require access to the transmission corridors at various points. This includes the temporary construction staging areas along the transmission lines, which may be co-located with the terminus points of each line at the substations.

The transmission lines pass through a variety of undeveloped land and agricultural land as well as commercial, industrial, and residentially developed areas as described in Section 2.1. It is assumed that PG&E has rights of access to all of their facilities for maintenance and upgrade work such as this reconductoring work. Areas needed for temporary construction staging along the transmission corridors would be negotiated with private landowners by PG&E at the time of reconductoring. In addition, work areas would be delineated so as to avoid sensitive agricultural, biological and cultural resources.

The Contra Contra–Windmaster–Delta Pumps line passes through areas mapped by the California Department of Conservation as Farmland of Statewide Importance, and Farmland of Local Importance, as well as a few areas mapped as Prime Farmland. The majority of the transmission corridor crosses developed and grazing land (which are not considered important farmlands). The majority of the Contra Costa–Brentwood line passes through developed land, with some sections of Farmland of Local Importance and Prime Farmland. The Cayetano–Lone Tree line crosses areas mapped as Grazing Land and Farmland of Local Importance. Similarly, the Las Positas–Newark line crosses small pockets of Farmland of Statewide Important and Unique Farmland, while the vast majority of the corridor passes through grazing and developed land.

Impacts of Reconductoring

Reconductoring of each line would be expected to last no longer than six months and therefore any disruption to adjacent land uses would be temporary. The locations of pull and tension sites would be selected to minimize the impacts to surrounding land uses (i.e., avoiding residential areas and areas mapped as important farmland). The appropriate land management agency and landowner(s) would approve these locations. Outside of the pull and tension sites, the construction work would be virtually unnoticeable from adjacent land uses.

The right-of-way for each transmission corridor would be restored to pre-project conditions when reconductoring activities are complete. Agricultural uses temporarily disrupted could be restored and no permanent impacts would be expected. Project-related debris would be removed from the right-of-way and disposed of at an appropriately licensed facility. Ruts and other similar disturbances would be smoothed. Any areas requiring revegetation would be seeded with a weed-free seed mix approved by the appropriate land management agency and landowner(s).

Mitigation

To reduce potential disruption to adjacent land uses during and after construction it is recommended that the following mitigation measures be implemented:

- Landowners adjacent to the transmission utility corridors should be notified of the upcoming project activities.
- The transmission corridor, construction staging areas and temporary access roads should be restored to pre-project condition once construction is complete.
- Construction staging areas, pull and tension sites, and temporary access roads should be sited to reduce or avoid impacts to land uses (i.e., avoiding nearby residences, areas designated as important farmland, and dividing communities).

Conclusion

Potential impacts to land use would be short term and confined to the work areas within existing transmission corridors and as negotiated with private landowners. Reconductoring would not change the existing land use or displace any existing uses. Implementation of the mitigation measures described above would avoid significant land use impacts along the electrical transmission line route related to reconductoring.

3.4 NOISE

Reconductoring the four transmission lines described above would require operation of heavy equipment at pull and tensioning sites, and at transmission towers that may require modification. Heavy equipment operation could disturb adjacent noise-sensitive land uses during the temporary construction period. After the reconductoring work is complete and the lines are operational, changes in corona noise levels are not anticipated.

Impacts of Reconductoring

Reconductoring work would require operation of construction-type equipment at the pull and tensioning sites. In some cases, a helicopter may be used to string line. A period of 4 to 6 months is estimated to complete the reconductoring of a line. Workers would occupy each pull or tension site for about 3 days as that part of the line segment is replaced. The workers would then move on to the next pull and tension sites and set up to replace that section of the line. The expected noise levels would not be likely to disturb surrounding agricultural or undeveloped land

uses. At adjacent residences, the increase in noise would be a noticeable temporary increase in the ambient noise levels. Although construction noise would be required to comply with local ordinances, it may still be disruptive. Therefore, to mitigate the temporary impacts in residential areas from construction-related noise, the work should only occur during daylight hours.

The reconductoring of the lines is not expected to substantially increase corona noise levels. Corona noise is a function of the line voltage and the condition of the line. Because voltage would remain the same after reconductoring and the condition of the line would be upgraded, corona noise may actually be reduced.

Mitigation

Given the temporary nature of noise impacts from reconductoring, the impacts would be expected to be less than significant. However, a detailed design has not yet been completed. Therefore, to ensure that potential construction-related noise impacts would be minimized, the following mitigation measures should be considered:

- Construction noise emission shall comply with all local laws, ordinances, regulations, and standards regarding hours of construction activity and permitted noise levels affecting adjacent uses.
- All construction equipment should be operated and maintained to minimize noise generation. Equipment and vehicles using internal combustion engines shall be equipped with mufflers, air-inlet silencers where appropriate, and other shrouds or noise-reducing features, in good operating condition that meets or exceed original factory specifications. Mobile or fixed "package equipment" shall be equipped with shrouds and noise control features that are readily available for that type of equipment.
- The use of noise-producing signals, including horns, whistles, electronic alarms, and sirens and bells, will be for safety warning purposes only.
- No construction-related public address, loudspeaker, or music system shall be audible at any adjacent noise-sensitive land use.
- The construction contractor shall implement a noise complaint process and hotline number for the surrounding community. The project owner will have the responsibility and authority to receive and resolve noise complaints.

Conclusion

By implementing mitigation measures similar to those that were proposed in the AFC for construction of the MLGS facility, potential noise impacts from reconductoring work would be less than significant.

3.5 TRAFFIC AND TRANSPORTATION

The majority of reconductoring activities would take place over undeveloped and agricultural lands in Contra Costa and Alameda counties. The transmission lines proposed for reconductoring also pass through industrial, commercial, and residentially developed areas of the cities of Antioch, Brentwood, Livermore, and Newark. The existing transportation network is comprised of local, regional and interstate roadways and would be used for transportation of equipment and access to the transmission corridor and temporary construction staging areas.

The reconductoring would require a crew of approximately 10 trucks and about 20 workers involved in the work at any one time at pull and tension sites, which would be located 2 to 3 miles apart.

The existing transmission corridor would be accessed by trucks, all-terrain vehicles, by foot, and by helicopter. To the extent possible, access would be over existing roads. Where access roads are not available to towers, new temporary spur roads would be constructed. The roads would be removed and the disturbed area would be restored to original conditions after project completion. In developed areas, access to towers would be from public roads or though developed private property or commercial lots. Helicopters may be used to string the lines and transport workers and materials to the towers.

Impacts of Reconductoring

Movement of heavy machinery on local roads would occur intermittently, but infrequently over the 4- to 6-month reconductoring project schedule. Reconductoring could result in the following impacts:

- Use of undesignated access roads or public roads could affect local traffic and create safety hazards.
- Use of public roads for parking construction vehicles and worker vehicles could affect local traffic.
- Occasionally during overhead construction projects, materials could fall onto the roadway, which would create a safety hazard.

Mitigation

Potential impacts related to traffic and transportation can be avoided through the following mitigation measures:

- All reconductoring-related vehicle movements outside the transmission right-of-way should be restricted to pre-designated access or specified public roads. Should unforeseeable circumstances occur during reconductoring activities, resulting in the disturbance of more areas than initially requested, the project owner should obtain permission from the landowner.

- All reconductoring-related parking should take place on pre-designated and contractor-acquired staging areas. The project owner should develop a parking and staging plan for all phases of project construction.
- Install netting, or provide other protective measures, as a safety precaution to reduce the potential for construction materials falling on motorists, bicyclists, or pedestrians during the tensioning/cable pulling process where reconductoring activities require the crossing of roadways.

Conclusion

The reconductoring activities proposed for the MLGS would not result in any substantial traffic or transportation impacts to local roadways. The small number of traffic trips generated from the reconductoring activities would not result in significant impacts. Additionally, implementation of the above mitigation measures would reduce any potential traffic and transportation impacts resulting from reconductoring to less-than-significant levels.

3.6 TRANSMISSION LINE SAFETY AND NUISANCE

The identified reconductoring would involve the substitution of new conductors for existing ones as necessary for effective and safe transmission of the additional energy from MLGS. The magnitude of electromagnetic fields (EMF) associated with transmission lines depends on line voltage and current levels. The potential for perceivable field impacts and significant field exposures would depend on the chosen design, the current levels, and distance from the line, which would be determined by PG&E at a later date.

Impacts of Reconductoring

Because the retrofitted lines would be operated at the same voltage (230 kV) as the existing lines, the magnitude of the electric field along each route would not change from current levels. The only field-related change from the retrofit (and its related increases in current flow) would be with respect to the magnetic field, whose intensity depends directly on current levels. Since the retrofitted lines would remain within their existing routes, the retrofit-related increases in magnetic field intensity could lead to corresponding increases in human exposure to line magnetic fields. The residences adjacent to the transmission lines, line workers, and individuals in transit under the transmission line would be subject to an increase or change in EMF exposure.

Mitigation

The CPUC’s way of ensuring the appropriate management of fields from high-voltage power lines (in light of the current health concern) is to require incorporation of specific field-reducing measures in the design for new or retrofitted lines. The applicable measures for the proposed MLGS lines and the lines that might be retrofitted are those specified in PG&E's guidelines prepared in compliance with current CPUC requirements. The reconductored lines would be constructed consistent with this CPUC policy as related to field strengths, perceivable field

effects, electric shocks, and human exposure. Since the reconductored lines would be designed and operated according to standard PG&E practices, it is expected that these lines would be operated in accordance with the applicable health and safety laws, ordinances, regulations and standards.

Conclusion

If the identified 230 kV lines are reconductored, they would be designed, built and operated (within their existing routes) according to CPUC's requirements, by PG&E consistent with their own guidelines to address transmission line safety and nuisance. Therefore, impacts would be less than significant.

3.7 VISUAL RESOURCES

This analysis examines the potential visual resource impacts associated with the anticipated reconductoring of lines in four transmission corridors described above.

The transmission lines traverse a variety of undeveloped, agricultural, industrial, commercial, and residentially developed lands in Contra Costa and Alameda counties. The transmission lines (and towers and substations) are existing features within an extensive utility network in the area.

Temporary construction staging areas would be required for storing equipment and materials near the construction sites. Existing transmission lines would be replaced with new lines. Substation facilities would require upgrades to components. Transmission towers may be modified or raised.

Impacts of Reconductoring

Construction equipment and activities would likely be visible at various locations along the transmission lines to motorists and nearby residences. Reconductoring of each line would be expected to last 4 to 6 months, with construction activity moving along the corridor approximately every three days. At the end of the construction period, all construction areas and rights-of-way would be restored to pre-project conditions. Therefore the adverse visual impacts associated with construction would be short term and less than significant.

Reconductoring involves replacement of existing electrical transmission wires with new wires. This change to the transmission lines would be undetectable to viewers of the lines. Upgrades to switches and breakers at the substations may also be required as a part of the reconductoring project. These changes would be minor and would occur within the fenced-in structures of the substation, and would not be expected to result in a change in the visual characteristics of the substation. Until the project is in the final design stages, it is not known whether it would be necessary to raise the height of existing towers or replace towers with stringer towers in order to accommodate the sag requirements and heavier weight of the new wires. Because the existing transmission line and towers are an established part of the setting for the areas surrounding them, the adverse visual impacts that could occur due to changes in tower height or design would likely

not be significant. However, a detailed design has not yet been completed. Therefore, to ensure that potential visual impacts would be minimized, the mitigation measures described below should be considered.

Mitigation

With the incorporation of the following typical mitigation measures, visual impacts associated with the reconductoring activities would be less than significant:

- During project construction, the work site should be kept clean of debris and construction waste.
- Construction staging areas should be selected to minimize views from public roads, and residences.
- All evidence of construction activities, including ground disturbance due to staging and storage areas, should be removed and remediated upon completion of construction. Construction areas and rights-of-way should be restored to their original grade and contouring. Any vegetation removed in the course of construction should be replaced on a one-to-one in-kind basis.
- Transmission towers that are modified or replaced should be treated with non-glare finishes and painted in colors that would blend with the surrounding environment.
- Non-specular conductors should be used.
- Insulators should be non-reflective and non-refractive.

Conclusion

Construction of the reconductoring project would require only temporary disturbance of the rights-of-way and construction staging areas. After reconductoring, the construction areas will be returned to pre-project conditions as described in the mitigation measures above.

The reconductoring project has the potential to cause long-term visual impacts. Feasible mitigation measures are available to reduce potential impacts of the modified/replaced transmission towers and conductors and insulators, and therefore visual impacts would be reduced to a less-than-significant level.

3.8 SOIL AND WATER RESOURCES

The transmission lines traverse a variety of undeveloped, agricultural, industrial, commercial and residentially developed lands. The transmission corridors generally cross the alluvial plains associated with the Sacramento-Bay Delta, the foothills of the coast range and through the Tri-valley area to the southeastern edge of the San Francisco Bay. Soils types and characteristics vary across this topography. The transmission lines cross several waterbodies:

Contra Costa–Brentwood line

- East Antioch Creek
- Contra Costa Canal
- Sand Creek
- Deer Creek
- Dry Creek
- Marsh Creek

Contra Costa–Windmaster–Delta Pumps line

- East Antioch Creek
- Contra Costa Canal
- Sand Creek
- Deer Creek
- Dry Creek
- Kellogg Creek
- Frisk Creek
- Brushy Creek
- California Aqueduct

Cayetano–Lone Tree

- Bee Barn Creek

Las Positas–Newark line

- Las Positas Creek
- Arroyo Mocho
- Arroyo del Valle
- San Antonio Creek
- Calaveras Creek
- Sheridan Creek
- Mission Creek

The transmission lines that may require reconductoring cross two water supply canals, the Contra Costa Canal and the California Aqueduct.

The Contra Costa Canal is approximately 48 miles long and is owned by the U.S. Bureau of Reclamation, but is operated and maintained by the Contra Costa Water District (CCWD). It begins at Rock Slough, near Oakley, California, and generally runs from east to west. With the exception of the first 4 miles, the canal is concrete lined. The primary purpose of the canal is to deliver drinking water from the Delta to treatment plants in Contra Costa County for distribution to customers.

The California Aqueduct was constructed in the 1970s and supplies agricultural and municipal areas in southern California. The California Aqueduct is the major conveyance feature for the California State Water Project, which brings water from northern to southern California. The aqueduct is 444 miles long and is mostly an open concrete-lined canal. Some portions of the aqueduct are underground pipelines, tunnels, and channels. The canal width and depth vary, but it is generally approximately 50 feet wide and approximately 30 feet deep.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for areas crossed by the transmission lines (FEMA, n.d.) were reviewed. The FIRMs show that the transmission lines pass over the FEMA-designated 100-year floodplain areas (i.e., FEMA-designated Zone A, which is the flood insurance rate zone that corresponds to areas within the 100-year floodplain zone). The floodplains are associated with the following waterbodies: East Antioch Creek, Sand Creek, Kellogg Creek, Brushy Creek, Las Positas Creek,

Arroyo Mocho, Arroyo del Valle, and Calaveras Creek. Approximately 1.8 miles, or less than 1 percent of the total transmission line to be reconductored, crosses through floodplain areas (see Table 1).

Table 1
FEMA-designated Floodplains along Transmission Line Corridors

Transmission Line	Approximate length of transmission line to be reconductored (miles)	Approximate length of 100-year Floodplain Area Crossed (miles)
Contra Costa–Brentwood	10	0.2
Contra Costa–Windmaster–Delta Pumps	18	0.2
Cayetano–Lone Tree	6	0
Las Positas–Newark	21	1.4
Total	55	1.8

Impacts of Reconductoring

During reconductoring projects, it may be necessary to raise the height of several towers to allow for greater conductor sag. Inspections prior to starting the reconductoring work may reveal that some towers require new foundations, which may increase the potential for earth disturbance and erosion. The transmission lines cross several water conveyance features; however, construction activities for tower modifications would not occur within any watercourses; therefore, impacts to water quality for construction and operation of the transmission lines would be less than significant. By implementing BMPs such as sediment trapping devices, limiting the amount of exposed areas at a given time, restabilizing disturbed areas, and avoiding earth-disturbance activities within watercourses, the overall impacts related to erosion and water quality would be less than significant.

Until surveys and design are completed, it is unknown whether any towers are located within floodplain areas, and whether they require modification. Impacts to floodplains during construction would be less than significant because construction activities would be temporary and would not require extensive grading. Changes to tower foundations would not be expected to substantially alter the floodplain; therefore, permanent impacts would be considered less than significant.

If existing towers are used or reinforced without construction of new foundations and footings, the potential for impacts to soils and water resources would be significantly reduced. Work sites using larger truck-mounted equipment and temporary construction staging areas can be selected to reduce potential impacts. For example, work sites can be located away from water bodies and in areas less susceptible to erosion. Standard construction BMPs also can be implemented to reduce erosion potential and protect waterbodies.

Mitigation

The following mitigation measures should be implemented for any ground-disturbing activities (i.e., tower foundation work, pull and tensioning sites, temporary access roads and temporary construction staging areas) to reduce any potential water resources and soils impacts to a less-than-significant level:

- Perform construction in accordance with an Erosion and Sediment Control Plan (ESCP). The ESCP should address erosion and sediment control BMPs during construction and revegetation measure following construction.
- If construction could affect land in aggregate greater than 1 acre, a Storm Water Pollution Prevention Plan (SWPPP) would be required by the Regional Water Quality Control Board (RWQCB) as required by the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity (SWRCB, 1999) or the NPDES General Permit for Storm Water Discharges Associated with Construction Activity from Small Linear Underground/Overhead Projects (SWRCB, 2003).
- Use existing roads and rights-of-way to the extent possible.
- Revegetate construction areas and restore them to pre-project conditions.
- Minimize grading to the extent possible. When required, grading should be conducted away from water courses to reduce potential for the material to enter the watercourse.
- Site construction staging areas, pull and tensioning sites, and temporary access roads to avoid important agricultural lands and soils, water courses and their associated floodplains.

Conclusion

Significant environmental impacts to soils and water resources related to the construction and operation of the reconductoring project would be avoided by implementing the mitigation measures described above.

3.9 TRANSMISSION SYSTEM ENGINEERING

Reconductoring of the transmission lines described above, would involve removing the existing conductors and replacing them with higher-rated conductors, in a manner that complies with applicable safety and reliability standards. Each of these new conductors will significantly increase the ratings of the transmission lines. Insulators could also be removed and replaced with new strings, which would increase the line's capability to withstand voltage surges.

Impacts of Reconductoring

During construction, applicable safety and reliability laws, ordinances, regulations and standards would be implemented. These include CPUC General Order 95, Title 8 California Code of Regulations Construction Safety Orders, and PG&E Construction Standards. Additionally, to maintain system reliability, the CAISO must be advised per the CAISO scheduling protocol of scheduled circuit outages prior to occurrence. Such outages are scheduled about 30 days prior to occurrence and are verified just prior to actual outage. In the event that system reliability requires restoring such circuits, a "no work order" is given, and where practicable, circuits are restored.

Reconductoring of the transmission circuits described above would result in local system benefits, in that it would provide considerably greater flexibility in routing power in the area, even if the MLGS was not built. The reconductoring project would not only ensure that the MLGS project could generate power at its rated capacity, but would increase the capacity and reliability of power deliveries to and from the Greater Bay Area.

Mitigation

To mitigate potential safety and reliability impacts the above-stated laws, ordinances, regulations, and standards and CAISO scheduling protocols would be used. The CPUC ensures conformance with the above safety requirements; the CAISO would ensure conformance with its reliability requirements.

Conclusion

Conformance with applicable safety and reliability is likely to occur and would be successful in mitigating any safety or reliability implications of reconductoring.

3.10 GEOLOGY AND PALEONTOLOGY

The transmission lines discussed above for possible reconductoring are located in the central and eastern portion of the Coast Ranges physiographic province at the confluence of the Coast Ranges and the Sacramento River Delta. The Contra Costa–Brentwood and Contra Costa–Windmaster–Delta Pumps lines traverse the foothills of Mount Diablo, including the northernmost Altamont Hills as well as portions of the San Joaquin River Delta area. The Cayetano–Lone Tree and Las Positas–Newark lines cross the Tassajara Hills from the Livermore Valley area to the eastern edge of San Francisco Bay across the East Bay Hills.

This area contains active buried faults of the Coast Ranges-Sierran Block Boundary Zone (CRSBBZ), in addition to the Hayward, Calaveras and Marsh-Creek-Greenville Faults of the San Andreas Fault System.

As described for the MLGS AFC, fossil sites have been identified in sediments of Quaternary age in the vicinity of the proposed reconductoring work. Underlying rock units in the region

have been assigned a high sensitivity rating for their potential to contain paleontological resources.

Impacts of Reconductoring

No new facilities, including electrical transmission towers, are anticipated to be constructed as part of reconductoring related to the MLGS; therefore, the impacts to geologic and paleontologic resources would be limited to areas of potential ground disturbance, including temporary access routes, temporary construction staging areas and pull and tensioning sites. These sites would not require significant grading or other disturbance of soils at depth. Tower and tower foundations may be modified as a part of reconductoring, and the tower foundations would be inspected and evaluated for landsliding potential. If modification is required, the towers and towers foundations would be designed by a California-registered professional geotechnical engineer to address unstable slopes and seismic design criteria. As a result, geologic hazards should have minimal impact on the reconductoring work.

Since the geologic units present along electrical line linear routes may contain significant paleontologic resources, mitigation measures will be necessary to ensure that impacts are less than significant.

Mitigation

Though not anticipated for the reconductoring work identified above, there is a potential to uncover significant paleontological resources during any ground-disturbing activities that may be associated with the reconductoring of the electrical lines, such as during any needed excavation required to upgrade tower foundations. Therefore, the following mitigation measures should be implemented for work that includes excavation:

- Prior to construction, a qualified paleontologist should be retained to both design a monitoring and mitigation program and implement the program during all project-related ground disturbance. The paleontological resource monitoring and mitigation program should include:
  - Preconstruction coordination
  - Construction monitoring
  - Emergency discovery procedures
  - Sampling and data recovery, if needed
  - Preparation, identification, and analysis of the significance of fossil specimens salvaged, if any
  - Museum storage of any specimens and data recovered

- Reporting.

Earth-moving construction activities should be monitored wherever these activities will disturb previously undisturbed sediment. Monitoring will not need to be conducted in areas where sediments have been previously disturbed or in areas where exposed sediments will be buried but not otherwise disturbed.

- Pre-construction meetings will be held with key construction personnel to provide brief discussions pertaining to paleontological resource significance, visual identification, and fossil discovery notification procedures. A qualified paleontologist will consult with the project geologist and project engineer on a periodic basis regarding the scheduling and extent of subsurface excavations, particularly where undisturbed areas may be encountered.
- Prior to the start of construction, construction personnel involved with earth-moving activities should be informed that fossils may be discovered during excavating; that these fossils are protected by laws; on the appearance of common fossils; and on proper notification procedures. This worker training should be prepared and presented by a qualified paleontologist.

Conclusion

Impacts associated with geologic hazards or geologic and paleontological resources would be less than significant with the implementation of the mitigation measures described above.

4.0 CONCLUSIONS

Chapters 2 and 3 of this report describe the process and the potential impacts of reconductoring the Contra Costa–Brentwood, Contra Costa–Windmaster-Delta Pumps, Cayetano–Lone Tree and Las Positas–Newark transmission lines. This analysis presents the potential indirect environmental and public health effects of the MLGS project.

As the owner of the transmission lines, PG&E will be responsible for the design and construction associated with the reconductoring and compliance with all applicable LORS. With the implementation of BMPs and appropriate mitigation measures, reconductoring of the transmission lines described above has very little potential for creating significant, unmitigated impacts to public safety or the environment.

5.0 REFERENCES

CDFG (California Department of Fish and Game), 2008. California Natural Diversity Database RareFind 3, November.

FEMA (Federal Emergency Management Agency), n.d. Flood Insurance Rate Maps, Contra Costa and Alameda Counties, California.

SWRCB (State Water Resources Control Board), 1999. National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity (General Permit) Water Quality Order 99-08-DWQ.

SWRCB (State Water Resources Control Board), 2003. National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity from Small Linear Underground/Overhead Projects, Water Quality Order 2003-0007-DWQ.

USE (Utility System Efficiencies, Inc.), 2008. System Impact Study for the Marsh Landing Generating Station, September.

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Amphibians							
Ambystoma californiense	California tiger salamander	T	CSC	N/A	NO	Needs underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water sources for breeding.	High
Rana draytonii	California red-legged frog	T	CSC	N/A	YES	Habitat is characterized by dense, shrubby riparian vegetation associated with deep (2.5 feet), still or slow-moving water. Juvenile frogs seem to favor open, shallow aquatic habitats with dense submergents. Breeds in pools with emergent vegetation; typically absent in pools where predatory fish are present; require adequate hibernacula such as small mammal burrows and moist leaf litter.	High
Spea hammondi	Western spadefoot toad	None	CSC	N/A	NO	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	Moderate
Invertebrates							
Apodemia mormo langei	Lange's metalmark butterfly	E	None	N/A	NO	Inhabits stabilized dunes along the San Joaquin River. Endemic to Antioch dunes, Contra Costa County. Primary host plant is *Eriogonum nudum* var. *auriculatum*; feeds on nectar of other wildflowers, as well as host plant.	Low
Branchinecta conservatio	Conservancy fairy shrimp	E	None	N/A	NO	Endemic to the grasslands of the northern two-thirds of the Central Valley; found in large, turbid pools. Inhabits astatic pools located in swales formed by old, braided alluvium; filled by winter/spring rains, which last until June.	Low
Branchinecta longiantenna	Longhorn fairy shrimp	E	None	N/A	NO	Endemic to the eastern margin of the Central Coast Mountains in seasonally astatic grassland vernal pools. Inhabits small clear water depressions in sandstone and clear to turbid clay/grass bottomed pools in shallow swales.	Moderate

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Branchinecta lynchi	Vernal pool fairy shrimp	T	None	N/A	YES	Known to occur in a wide range of vernal pool habitats in the southern and Central Valley areas of California, and in two vernal pool habitats within the "Agate Desert" area of Jackson County, Oregon. Occupies a variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools. Although the species has been collected from large vernal pools, including one exceeding 25 acres, it tends to occur in smaller pools. It is most frequently found in pools measuring less than 0.05 acre.	Moderate
Desmocerus californiacus dimorphus	Valley elderberry longhorn beetle	T	None	N/A	NO	The species is nearly always found on or close to its host plant, elderberry (*Sambucus* species). In order to serve as habitat, the shrubs must have stems that are 1.0 inch or greater in diameter at ground level. Use of the plants by the animal is rarely apparent. Frequently, the only exterior evidence of the shrub's use by the beetle is an exit hole created by the larva just before the pupal stage. Adults are active feeding and mating from March to June.	Moderate
Elaphrus viridis	Delta green ground beetle	T	None	N/A	NO	Restricted to the margins of vernal pools in the grassland area between Jepson Prairie and Travis Air Force Base. Prefers the sandy mud substrate where it slopes gently into the water, with low-growing vegetation, 25 to 100 percent cover.	None
Euphydryas editha bayensis	Bay checkerspot butterfly	T	None	N/A	NO	Restricted to native grasslands on outcrops of serpentine in the vicinity of San Francisco Bay.	Low
Lepidurus packardi	Vernal pool tadpole shrimp	E	None	N/A	NO	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools are commonly found in grass-bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	Moderate

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Mammals							
Vulpes macrotis mutica	San Joaquin kit fox	E	T	N/A	NO	The historical range included the California Central Valley and adjacent foothills, but has since been reduced to the southern and western portions of the San Joaquin Valley. Inhabits grasslands and agricultural areas. Can be found on virtually every soil type.	High
Corynorhinus townsendii	Townsend's big-eared bat	None	CSC	N/A	NO	Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	Moderate
Lasiurus blossevillii	Western red bat	None	CSC	N/A	NO	Roosts primarily in trees, 2 to 40 feet above ground, from sea level up through mixed conifer forests. Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	Moderate
Reithrodontomys raviventris	Salt marsh harvest mouse	E	E	N/A	NO	Only in the saline emergent wetlands of San Francisco Bay and its tributaries. Pickleweed (*Salicornia* sp.) is primary habitat. Does not burrow; builds loosely organized nests. Requires higher areas to escape floods.	None
Taxidea taxus	American badger	None	CSC	N/A	NO	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents.	High
Plants							
Amsinckia grandiflora	Large-flowered fiddleneck	E	E	1B.1	NO	Cismontane woodland, valley and foothill grassland. Annual grassland in various soils. 900 to 1,800 feet.	Moderate
Arctostaphylos auriculata	Mt. Diablo manzanita	None	None	1B.3	NO	Chaparral. In canyons and on slopes. On sandstone. 400 to 1,640 feet.	Low

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Astragalus tener var. *tener*	Alkali milk-vetch	None	None	1B.2	NO	Alkali playa, valley and foothill grassland, vernal pools. Low ground, alkali flats, and flooded lands; in annual grassland or in playas or vernal pools. 3 to 560 feet.	Moderate
Atriplex cordulata	Heartscale	None	None	1B.2	NO	Chenopod scrub, valley and foothill grassland, meadows. Alkaline flats and scalds in the Central Valley, sandy soils. 3 to 500 (2,000) feet.	Moderate
Atriplex depressa	Brittlescale	None	None	1B.2	NO	Chenopod scrub, meadows, playas, valley and foothill grassland, vernal pools. Usually in alkali scalds or alkali clay in meadows or annual grassland; rarely associated with riparian, marshes, or vernal pools. 3 to 1,050 feet.	Moderate
Atriplex joaquiniana	San Joaquin spearscale	None	None	1B.2	NO	Chenopod scrub, alkali meadow, valley and foothill grassland. In seasonal alkali wetlands or alkali sink scrub with *Distichlis spicata*, *Frankenia*, etc. 3 to 820 feet.	Moderate
Blepharizonia plumosa	Big tarplant	None	None	1B.1	NO	Valley and foothill grassland. Dry hills and plains in annual grassland. Clay to clay-loam soils; usually on slopes and often in burned areas. 50 to 1,500 feet.	High
California macrophylla	Round-leaved filaree	None	None	1B.1	NO	Cismontane woodland, valley and foothill grassland. Clay soils. 50 to 4,000 feet.	Moderate
Campanula exigua	Chaparral harebell	None	None	1B.2	NO	Chaparral. Rocky sites, usually on serpentine in chaparral. 1,000 to 4,100 feet.	Low
Centromadia parryi ssp. *congdonii*	Congdon's tarplant	None	None	1B.2	NO	Valley and foothill grassland. Alkaline soils, sometimes described as heavy white clay. 3 to 750 feet.	Moderate
Chorizanthe robusta	Robust spineflower	E	None	1B.1	NO	Robust spineflower is commonly associated with cismontane woodland, coastal dunes, coastal scrub. Sandy terraces and bluffs or in loose sand. 10 to 450 feet.	None
Cordylanthus mollis	Soft bird's-beak	E	R	1B.2	NO	Prefers coastal salt marsh with saltgrass (*Distichlis* sp.), pickelweed (*Salicornia* sp.) and alkali heath (*Frankenia* sp.), etc. 0 to 12 feet.	None

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Cordylanthus mollis ssp. *hispidus*	Hispid bird's-beak	None	None	1B.1	NO	Meadows, playas, valley and foothill grassland. In damp alkaline soils, especially in alkaline meadows and alkali sinks with *salt grass (Distichlis* sp.). 33 to 510 feet.	Low
Cordylanthus palmatus	Palmate-bracted bird's-beak	E	E	1B.1	NO	Found in chenopod scrub and valley and foothill grassland. Usually on Pescadero silty clay which is alkaline, with saltgrass (*Distichlis* sp.*)*,and alkali heath *(Frankenia* sp.*)*, etc. 20 to 500 feet.	Low
Cryptantha hooveri	Hoovers cryptantha	None	None	1A	NO	Valley and foothill grassland. In coarse sand. ? to 500 feet.	Moderate
Deinandra bacigalupii	Livermore tarplant	None	None	1B.2	NO	Meadows and seeps. Alkaline meadows. 500 to 600 feet.	Low
Delphinium recurvatum	Recurved larkspur	None	None	1B.2	NO	Chenopod scrub, valley and foothill grassland, cismontane woodland. On alkaline soils; often in valley saltbush or valley chenopod scrub. 10 to 2,250 feet.	Moderate
Eriogonum truncatum	Mt. Diablo buckwheat	None	None	1B.1	NO	Chaparral, coastal scrub, valley and foothill grassland. Dry, exposed clay or sandy substrates. 330 to 1,080 feet.	Moderate
Eryngium aristulatum var. *hooveri*	Hoover's button celery	None	None	1B.1	NO	Vernal pools, alkaline depressions, roadside ditches and other wet places near the coast. 20 to 150 feet.	Moderate
Erysimum capitatum spp.	Contra Costa wallflower	E	E	1B.1	NO	Stabilized dunes of sand and clay near Antioch along the San Joaquin river. 10 to 65 feet.	None
Eschscholzia rhombipetala	Diamond-petaled California poppy	None	None	1B.1	NO	Valley and foothill grassland. Alkaline, clay slopes and flats. 0 to 3,200 feet.	Moderate
Fritillaria agrestis	Stinkbells	None	None	4.2	NO	Cismontane woodland, chaparral, valley and foothill grassland. Sometimes on serpentine; mostly found in nonnative grassland or in grassy openings in clay soil. 33 to 5,100 feet.	High

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Helianthella castanea	Diablo helianthella	None	None	1B.2	NO	Broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland. Usually in chaparral/oak woodland interface in rocky, azonal soils. Often in partial shade. 80 to 3,800 feet.	Moderate
Hesperolinon breweri	Brewer's western flax	None	None	1B.2	NO	Chaparral, cismontane woodland, valley and foothill grassland. Often in rocky serpentine soil in serpentine chaparral and serpentine grassland. 100 to 2,900 feet.	Low
Lasthenia conjugens	Contra Costa goldfields	E	None	1B.1	YES	Valley and foothill grassland, vernal pools, cismontane woodland. Extirpated from most of its range; extremely endangered. Vernal pools, swales, low depressions, in open grassy areas. 3 to 1,450 feet.	Moderate
Lathyrus jepsonii var. *jepsonii*	Delta tule pea	None	None	1B.2	NO	Freshwater and brackish marshes. Often found with cattails (*Typha* spp.), Suisun marsh aster(*Aster lentus*), California rose (*Rosa calificornia*), rushes (*Juncus* spp.), bulrushes (*Scirpus* spp.), etc. Usually on marsh and slough edges.	None
Lilaeopsis masonii	Mason's lilaeopsis	None	R	1B.1	NO	Freshwater and brackish marshes, riparian scrub. Tidal zones, in muddy or silty soil formed through river deposition or river bank erosion. 0 to 33 feet.	None
Limosella subulata	Delta mudwort	None	None	2.1	NO	Riparian scrub, freshwater marsh, brackish marsh. Probably the rarest of the suite of delta rare plants. Usually on mud banks of the delta in marshy or scrubby riparian associations; often with Mason's lilaeopsis (*Lilaeopsis masonii)*. 0 to 10 feet.	None
Madia radiata	Showy golden madia	None	None	1B.1	NO	Valley and foothill grassland, cismontane woodland, chenopod scrub. Mostly on adobe clay in grassland or among shrubs. 80 to 3,700 feet.	Moderate
Navarretia prostrata	Prostrate vernal pool navarretia	None	None	1B.1	NO	Coastal scrub, valley and foothill grassland, vernal pools. Alkaline soils in grassland, or in vernal pools. Mesic, alkaline sites. 50 to 2,300 feet.	Moderate

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Neostapfia colusana	Colusa grass	T	None	1B.1	NO	Usually in large, or deep vernal pool bottoms; adobe soils. 20 to 360 feet.	Low
Oenorthera deltoids spp.	Antioch Dunes evening-primrose	E	E	1B.1	NO	Remnant river bluffs and sand dunes east of Antioch. 0 to 100 feet.	None
Plagiobothrys glaber	Hairless popcorn-flower	None	None	1A	NO	Meadows and seeps, marshes and swamps. Coastal salt marshes and alkaline meadows. 20 to 590 feet.	Low
Streptanthus albidus ssp. *peramoenus*	Most beautiful jewel-flower	None	None	1B.2	NO	Chaparral, valley and foothill grassland, cismontane woodland. Serpentine outcrops, on ridges and slopes. 400 to 2,400 feet.	Low
Suaeda californica	California sea blite	E	T	1B.1	NO	Margins of coastal salt marshes. 0 to 0 feet.	None
Symphyotrichum lentum	Suisun Marsh aster	None	None	1B.2	NO	Marshes and swamps (brackish and freshwater). Most often seen along sloughs with *Phragmites*, *Scirpus*, *Rubus*, *Typha*, etc. 0 to 10 feet.	None
Trifolium depauperatum var. *hydrophilum*	Saline clover	None	None	1B.2	NO	Marshes and swamps, valley and foothill grassland, vernal pools. Mesic, alkaline sites. 0 to 1,000 feet.	Low
Tropidocarpum capparideum	Caper-fruited tropidocarpum	None	None	1B.1	NO	Valley and foothill grassland. Alkaline clay. 0 to 1,500 feet.	Moderate
Reptiles							
Actinemys marmorata	Western pond turtle	None	CSC	N/A	NO	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches with aquatic vegetation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat for egg-laying.	Low
Anniella pulchra pulchra	Silvery legless lizard	None	CSC	N/A	NO	Sandy or loose loamy soils under sparse vegetation. Soil moisture is essential. Prefers soils with high moisture content.	Low

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Masticophis laterali euryxanthus	Alameda whipsnake	T	T	N/A	YES	Restricted to valley-foothill hardwood habitat of the coast ranges between vicinity of Monterey and North San Francisco Bay. Inhabits south-facing slopes and ravines where shrubs form a vegetative mosaic with oak trees and grasses.	High
Phrynosoma coronatum (frontale population)	Coast (California) horned lizard	None	CSC	N/A	NO	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial and abundant supply of ants and other insects.	Moderate
Thamnophis gigas	Giant garter snake	T	T	N/A	NO	Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals and irrigation ditches. This is the most aquatic of the garter snakes in California.	Low
Fish							
Acipenser medirostris	Green sturgeon	T	None	N/A	NO	Spawns in the Sacramento River at temperatures between 46 and 57 ºF. Preferred spawning substrate is large cobble, but can range from clean sand to bedrock.	None
Archoplites interruptus	Sacramento perch	None	CSC	N/A	NO	Historically found in the sloughs, slow-moving rivers, and lakes of the central valley. Prefers warm water. Aquatic vegetation is essential for young. Tolerates wide range of physio-chemical water conditions.	None
Hypomesus transpacificus	Delta smelt	T	T	N/A	YES	Euryhaline species, primarily living in brackish water. Shortly before spawning, adults migrate upstream from the brackish-water habitat and disperse widely into river channels and tidally-influenced backwater sloughs, spawning in shallow, fresh or slightly brackish water upstream of the mixing zone.	None
Oncorhynchus mykiss	Central California Coastal steelhead	T	None	N/A	NO	From Russian River, south to Soquel Creek but not including Pajaro River. Also San Francisco and San Pablo Bay basins.	None
Oncorhynchus mykiss	Central Valley steelhead	T	None	N/A	NO	Populations can be found in the Sacramento and San Joaquin Rivers and their tributaries.	None

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Oncorhynchus tshawytscha	Central Valley spring-run chinook salmon	T	None	N/A	NO	Sacramento River below Keswick Dam. Spawns in the Sacramento River but not in tributary streams. Requires clean, cold water over gravel beds with water temperatures between 43 and 57 ºF for spawning.	None
Oncorhynchus tshawytscha	Winter-run chinook salmon	E	None	N/A	NO	Sacramento River below Keswick Dam. Spawns in the Sacramento River but not in tributary streams. Requires clean, cold water over gravel beds with water temperatures between 43 and 57 ºF for spawning.	None
Birds							
Agelaius tricolor	Tricolored blackbird	None	CSC	N/A	NO	Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few miles of the colony.	Moderate
Athene cunucularia	Western burrowing owl	None	CSC	N/A	NO	Open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably the California ground squirrel.	High
Buteo swainsoni	Swainson's hawk	None	T	N/A	NO	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	Moderate
Charadrius alexandrinus nivosus	Western snowy plover	T	None	N/A	NO	Sandy beaches, salt pond levees and shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	None
Falco peregrinus anatum	American peregrine falcon	FD	E	N/A	NO	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nests consist of a scrape on a depression or ledge in an open site.	Low

Attachment 1
Species Reported Occurring within 2 Miles of Transmission Line Reconductoring for the Marsh Landing Generation Station

Scientific Name	Common Name	Federal	State	CNPS	Critical Habitat	Preferred Habitat	Potential to Occur
Haliaeetus leucocephalus	Bald eagle	FD	E	N/A	NO	Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests within 1 mile of water. Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.	Low
Melospiza melodia pusillula	Alameda song sparrow	None	CSC	N/A	NO	Resident of salt marshes bordering south arm of San Francisco bay. Inhabits pickleweed (*Salicornia* sp.) marshes; nests low in gumplant (*Grindelia* sp.) bushes (high enough to escape high tides) and in pickleweed.	Low
Rallus longirosris obsoletus	California clapper rail	E	E	N/A	NO	Salt water and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco bay. Associated with abundant growths of pickleweed (*Salicornia* ssp.), but feeds away from cover on invertebrates from mud-bottomed sloughs.	None
Riparia riparia	Bank swallow	None	T	N/A	NO	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting holes.	Low
Sternula antillarum	California least tern	E	E	N/A	NO	Nests along the coast from San Francisco Bay south to Northern Baja California. Colonial breeder on bare sparsely vegetated, flat substrates: sand beaches, alkali flats, land fills, or paved areas.	None

Source:
California Department of Fish and Game, California Natural Diversity Database RareFind 3, November 2008

Key:
Federal and Endangered Species Act
- E Federally Endangered
- T Federally Threatened
- FD Federally Delisted

California Endangered Species Act
- CSC California Department of Fish and Game Species of Special Concern
- R State Rare
- E State Endangered
- T State Threatened

California Native Plant Society

1A. Presumed extinct in California
1B. Rare or Endangered in California and elsewhere
2. Rare or Endangered in California, more common elsewhere
4. Plants of limited distribution-watch list

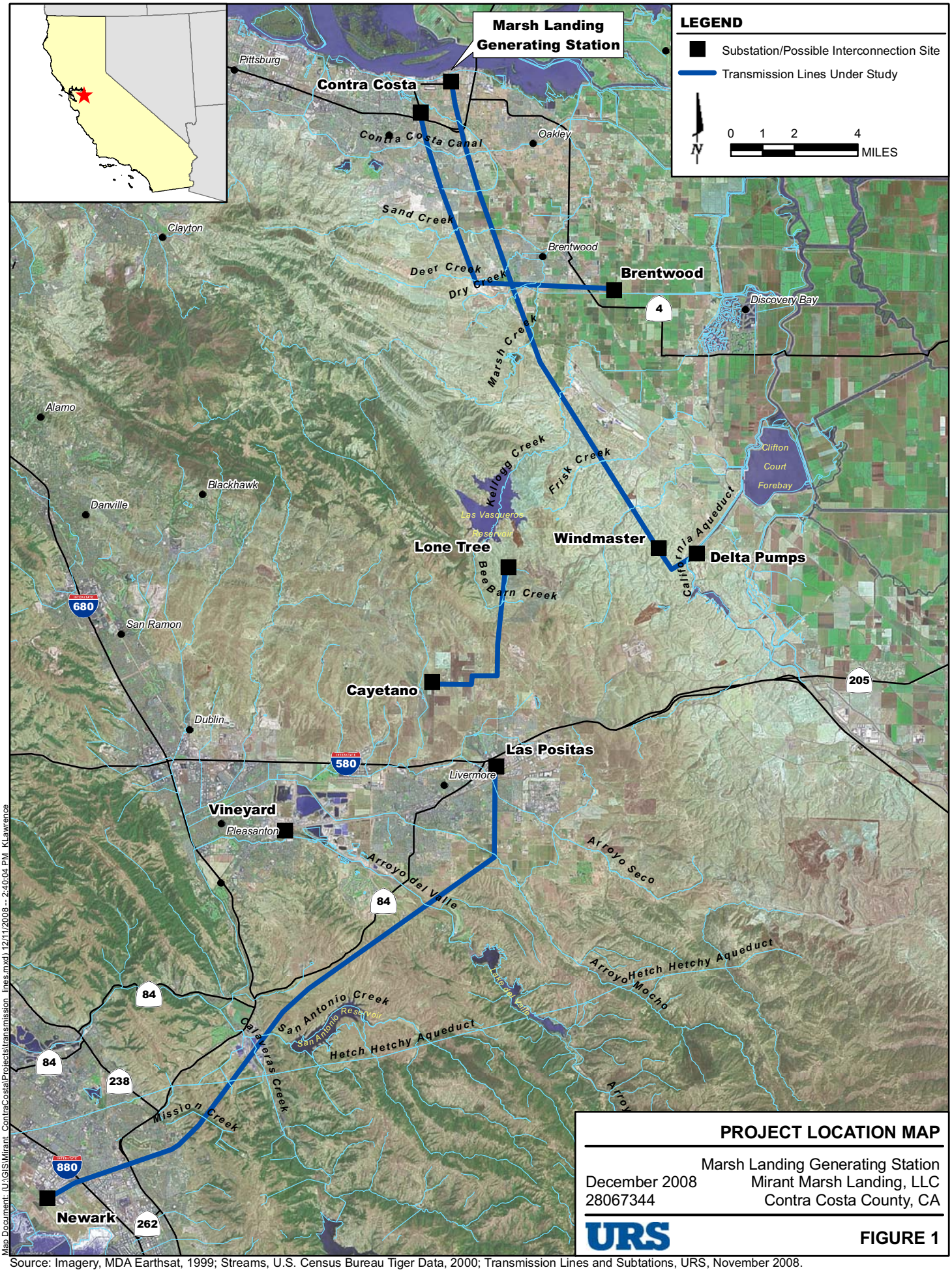
.1 Seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat)
.2 Fairly endangered in California (20-80% occurrences threatened)
.3 Not very endangered in California (less than 20% of occurrences threatened or no current threats known)

Critical Habitat

Yes – The proposed project area falls within the critical habitat area, as defined by the USFWS
No – The project area does not overlap USFWS designated critical habitat

Potential To Occur

High – These species are considered highly likely to occur in the project area because aerial imagery suggests that suitable habitat is present within the project area for these species and there are numerous occurrences in the vicinity of the project area.
Moderate – These species are considered moderately likely to occur in the project area because while habitat appears to be present, it is limited or there are few nearby occurrences.
Low – These species are considered to have a low likelihood of occurring in the project area because habitat appears to be limited and there are few nearby occurrences; however, there is some potential.
None – These species are not expected to occur in the project area due to lack of suitable habitat (based on aerial imagery) or because the project area is out of the species range or elevation requirements.



PROJECT LOCATION MAP

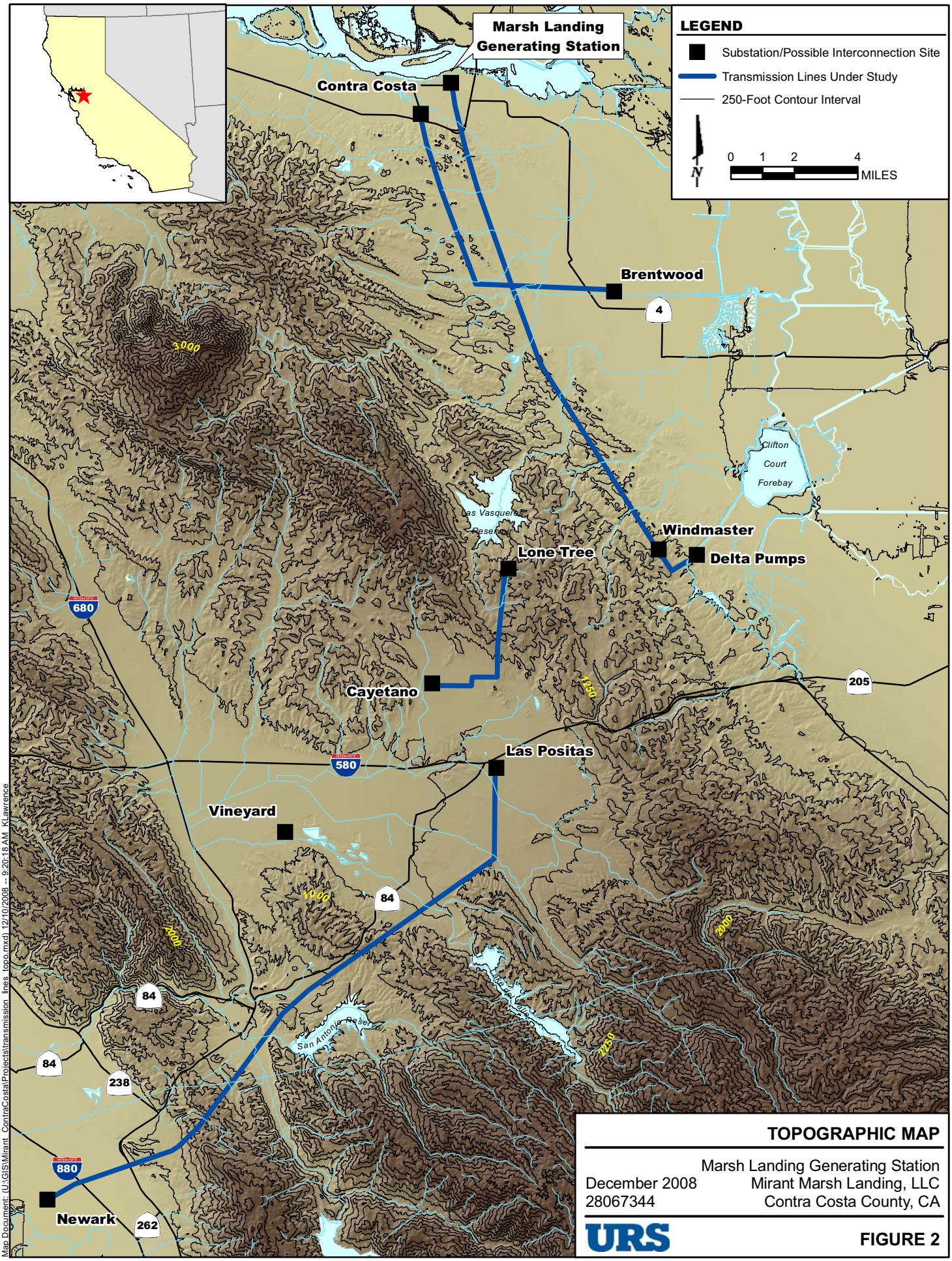
Marsh Landing Generating Station
December 2008 Mirant Marsh Landing, LLC
28067344 Contra Costa County, CA

URS

FIGURE 1

Source: Imagery, MDA Earthsat, 1999; Streams, U.S. Census Bureau Tiger Data, 2000; Transmission Lines and Subtations, URS, November 2008.

Map Document: (U:\GIS\Mirant_ContraCosta\Projects\transmission_lines.mxd) 12/11/2008 -- 2:40:04 PM KLawrence



Map Document: (U:\GIS\Mirant_ContraCosta\Projects\transmission_lines_topo.mxd) 12/10/2008 -- 9:20:18 AM KLawrence

TOPOGRAPHIC MAP

Marsh Landing Generating Station
December 2008 Mirant Marsh Landing, LLC
28067344 Contra Costa County, CA

URS

FIGURE 2