



Appendix J

**Calpine Corporation's
Biological Resources
Mitigation Implementation Plan;
Dated Dec. 1998**

Sierra Nevada Customer Service Region

Final Draft

**BIOLOGICAL RESOURCES MITIGATION
IMPLEMENTATION PLAN**

for the

**SUTTER POWER PLANT PROJECT
SUTTER COUNTY, CALIFORNIA**

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December 1998

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1.0 INTRODUCTION

1.1 Background

Calpine Corporation (Calpine) plans to construct and operate a 500-MW gas-fired merchant power plant in central Sutter County, California approximately 7 miles southwest of Yuba City (Figure 1). Sutter Power Plant (SPP), the proposed project, will be built adjacent to Calpine's existing 49.5-MW Greenleaf 1 cogeneration facility. The current cogeneration facility occupies 12 acres of Calpine's 77-acre parcel on South Township Road. Calpine is expected to begin construction of the SPP in the second quarter of 1999 and will require approximately 16.0 acres of land for the SPP footprint. Habitats within the proposed footprint and access road include seasonal wetlands and disturbed annual grassland. The proposed SPP project consists of gas combustion turbines, zero discharge dry cooling towers, Heat Recovery Steam Generator (HRSG) emission stacks, operations buildings, and asphalt parking lots.

Ancillary facilities to the SPP include 14.9 miles of Pacific Gas and Electric (PG&E) natural gas pipeline and 4.0 miles of a 230-kV Western Area Power Administration (Western) electric transmission lines and a 2.2-acre switchyard to connect the SPP facility to existing utility lines (Figure 2). Expansion of two natural gas dehydrator stations in Sutter and Colusa counties is also part of the project.

The project site is bordered on the east by South Township Road, and on the north, west, and south sides by irrigated rice fields. Orchards dominate the land areas east of South Township Road and rice fields are dominant west of South Township Road to the Sutter Bypass. Access to the project site is from South Township Road.

The natural gas pipeline is proposed to run north on South Township Road, west along Oswald Road, north on Garmire Road, west on Girdner Road, south on South Meridian Road, and west to the dehydrator station on the east side of the Sacramento River. The gas pipeline will cross the Sutter Bypass and the Sutter National Wildlife Refuge (Sutter NWR) within the 100-foot-wide county road easement of Hughes Road.

The electric transmission line is proposed to run south along South Township Road from the SPP site and west on O' Banion Road to tie into the proposed switchyard south of O'Banion Road at the east levee of the Sutter Bypass (Figure 2). Transmission line poles are proposed to follow county roads.

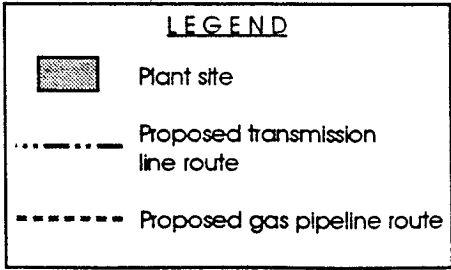
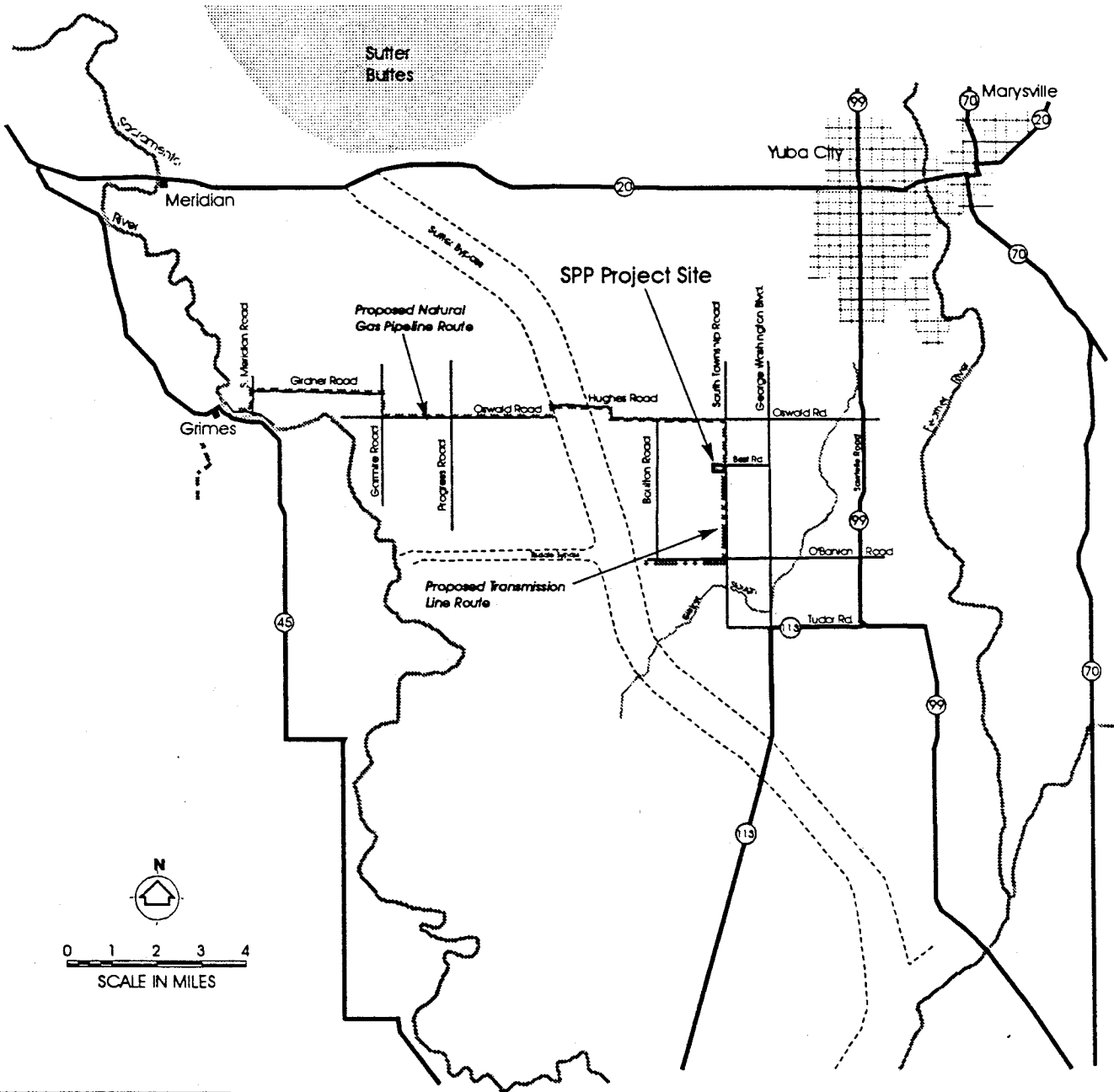


FIGURE 1

SUTTER POWER PLANT PROJECT

PROPOSED SUTTER POWER PLANT LOCATION MAP

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A gas gathering system will be upgraded along Poundstone Road south of Grimes in Colusa County. This proposed gas pipeline route is west of the Sacramento River in an agricultural area. The proposed location of the SPP project site and ancillary facilities is shown in Figure 2. The physical location is described as follows:

| | |
|-----------------------------------|-----------------------------------------------------------------------------------------|
| SPP project site: | Sutter County Gilsizer Slough Quadrangle Township 14N, Range 2E, ¼ NE, ¼ NE |
| Natural gas pipeline route: | Extends west onto Tisdale Weir and Grimes Quadrangles in Sutter and Colusa counties. |
| Electric transmission line route: | Gilsizer Slough Quadrangle. |

1.2 Project Impacts

Construction of the SPP facility and ancillary facilities will result in the loss of natural habitats in the project area. A total of 19.137 acres of habitat will be lost permanently to construction: 16.737 acres of annual grassland, 2.2 acres of rice, 0.1 acre of wheat, 0.1 acre of mature walnut orchard, and 3.0 acres of seasonal wetlands (although 5.83 acres will be mitigated for temporary construction impacts). Approximately 6 acres of disturbed grassland habitat (primarily on irrigation canal berms) will be temporarily disturbed during construction of the gas pipeline and electric transmission line poles.

Operation of the SPP could result in avian collisions with the new electric transmission line and HRSG stacks.

Maintenance of the SPP and Greenleaf 1 facility grounds currently includes annual disking. This activity reduces wetland vegetation productivity and potentially could result in the harm of giant garter snakes that may use the site for forage.

1.3 Purpose of the BRMIP

Calpine evaluated project impacts to biological resources as part of the AFC process. Calpine modified the project design to avoid sensitive biological resources to the furthest extent feasible. Mitigation measures were developed to minimize unavoidable project impacts. The Biological Resource Mitigation Implementation Plan (BRMIP) describes how Calpine will implement the mitigation measures developed to assure any action authorized, funded, or carried out by state or federal lead agencies is not likely to jeopardize the continued existence of endangered or threatened species. Western is the lead Federal agency and the CEC is the lead state agency for SPP project regulatory

compliance and licensing. Western will have oversight of the mitigation measures set forth by the USFWS and NMFS and require Calpine to adhere to the terms and conditions of the Incidental Take Statement in the Biological Opinions. Western will prepare a Mitigation Action Plan (MAP) outlining the implementation measures that will be used to show compliance with Federal laws and/or mitigation measures. The contents of a MAP is comparable to the BRMIP. The CEC will have oversight of the mitigation set forth by the CDFG Memorandum of Understanding and will also oversee federal mitigation requirements.

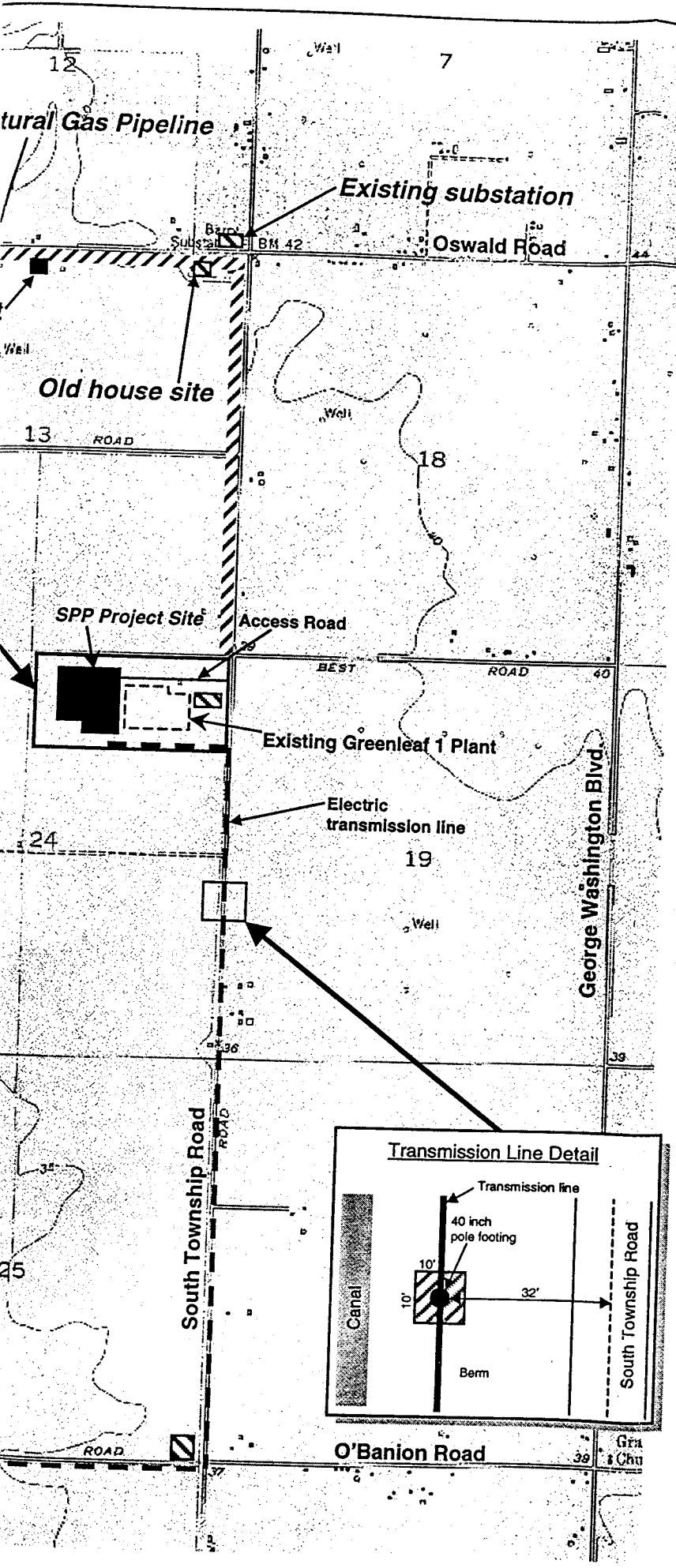
The purpose of the BRMIP is to provide a scope of mitigation measures and guidance for implementation of the mitigation measures developed to protect biological resources in the SPP project area. These measures apply to all temporary and permanent construction areas identified as the Implementation Areas (Figure 3). Calpine's employees and contractors will adhere to these measures during construction, operation, and maintenance of the proposed SPP, natural gas pipeline, and electric transmission line under direction and advice of the designated biologist. The mitigation measures are envisioned to fulfill the requirements of the Conditions of Certification in the CEC Final Staff Assessment (FSA) and other natural resource agencies. The Final BRMIP will include any conditions identified by the natural resources regulatory agencies as defined in Section 5.0 and Appendix H.

2.0 DESIGNATED BIOLOGIST









Calpine will designate a biologist who meets the qualifications outlined in the CEC Preliminary Staff Assessment (PSA) for the SPP (Appendix A). The designated biologist will conduct a worker education program, supervise implementation of the mitigation measures, consult with CEC, and advise project construction workers if there are changes in the proposed plans. The designated biologist will have the authority to stop work if project proponents do not follow the BRMIP. The designated biologist will submit monthly and annual reports to the CEC that document the results of the BRMIP measures.

3.0 IMPLEMENTATION AREAS

The implementation areas include those land areas that will be permanently or temporarily disturbed during construction, operation, and maintenance of the SPP facility, natural gas pipeline, electric transmission line, switchyard, and dehydrator stations. The mitigation measures developed for the SPP project will be enforced within



LEGEND

-  Proposed temporary laydown/staging/storage area and electric transmission line pull sites (to be revegetated if possible)
-  Transmission line route
-  May require Streambed Alteration Agreement (401 permit)
-  Waterway flow direction
-  Bore location
-  Permanent impact area
-  Temporary impact area (to be revegetated)
-  Chinook salmon, CV steelhead, Sacramento splittail

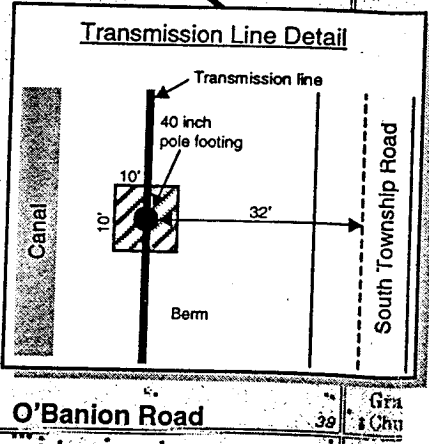
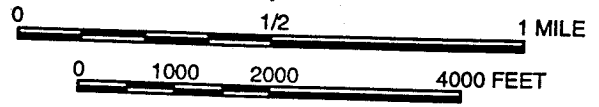
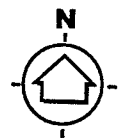
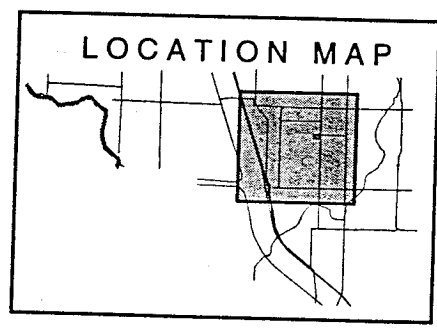
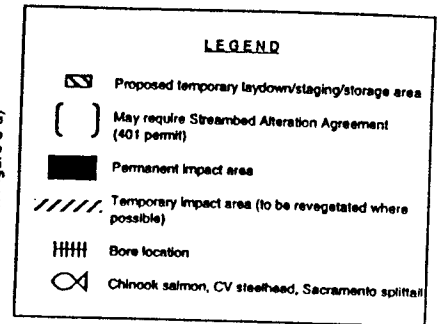
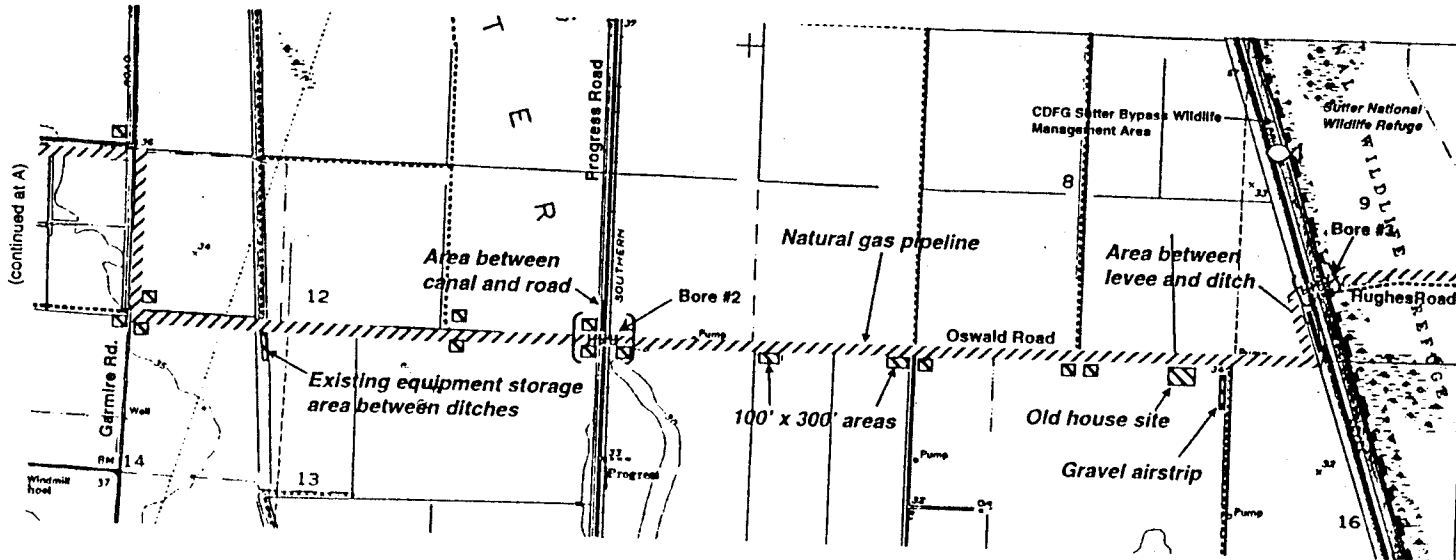


FIGURE 3a

SUTTER POWER PLANT PROJECT

MITIGATION IMPLEMENTATION AREAS



(continued from Figure 3-a)

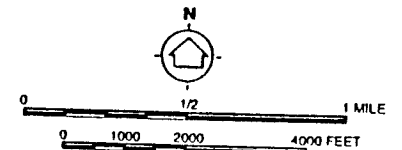
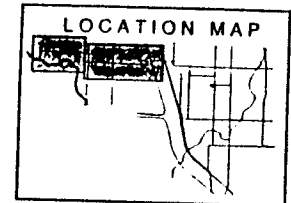
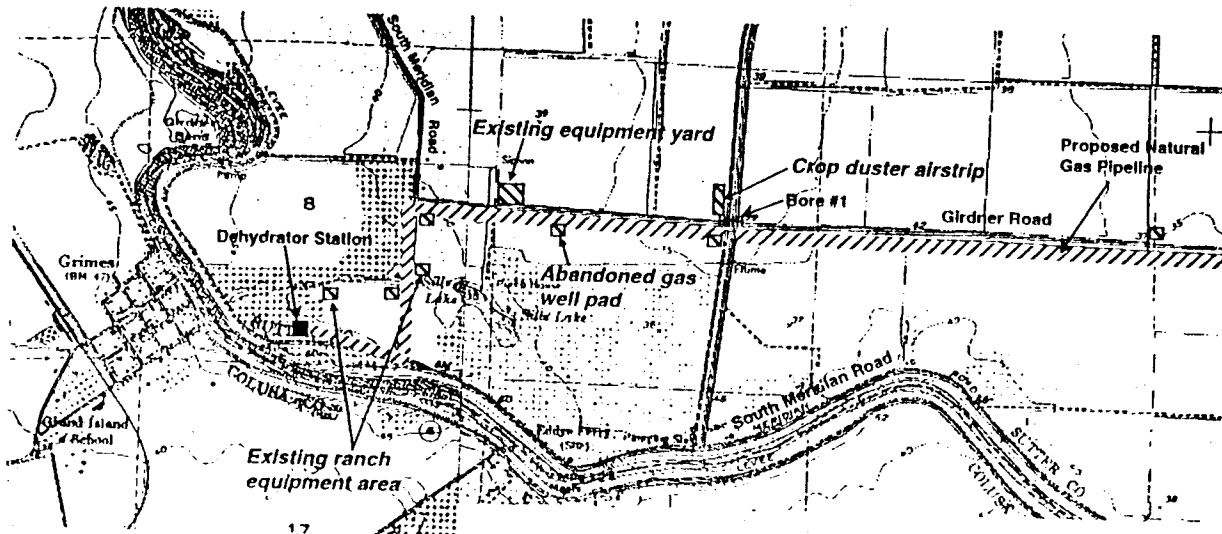
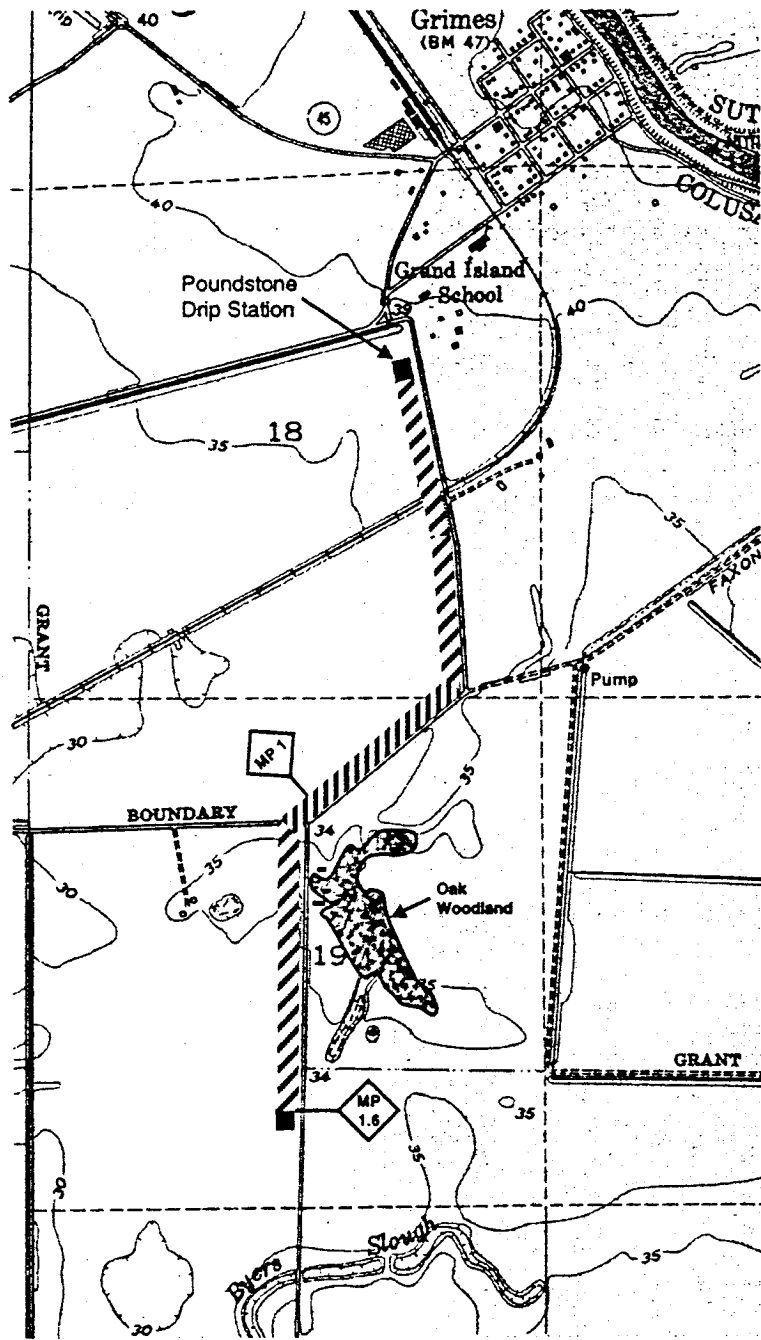






FIGURE 3b
SUTTER POWER PLANT PROJECT
MITIGATION IMPLEMENTATION ARE



LEGEND

-  Proposed temporary laydown / staging / storage area
-  Milepost
-  Permanent impact area
-  Temporary impact area

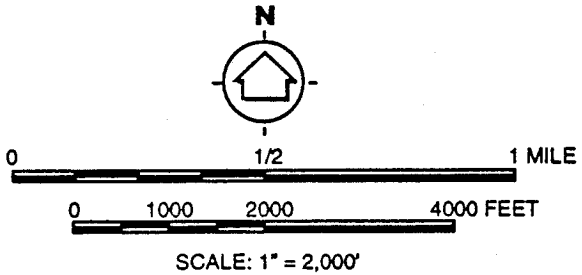
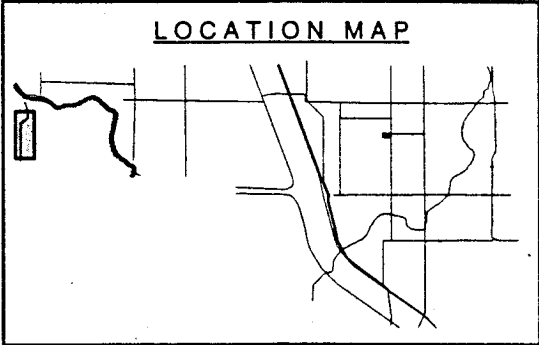


FIGURE 3c

SUTTER POWER PLANT PROJECT

MITIGATION IMPLEMENTATION AREAS

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the implementation areas. Figures 3a through 3c show the areas of permanent and temporary project impacts, revegetation areas, avoidance areas, areas requiring a Streambed Alteration Agreement or waiver, or a Department of the Army Section 401 of the Clean Water Act permit.

4.0 SENSITIVE BIOLOGICAL RESOURCES WITHIN THE IMPLEMENTATION AREAS

Special-status species that could occur in the SPP project area and vicinity were identified by the United States Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), CDFG, and from field surveys conducted during the impact analysis for the AFC. Wetlands within the project area were delineated and verified under the United States Army Corps of Engineers (USACE) wetland delineation procedure.

A detailed description of sensitive biological resources present within the SPP project areas is included in the AFC. Sensitive biological resources requiring mitigation from SPP project impacts include:

1. **Swainson's hawk** (*Buteo swainsoni*) is a California threatened species that nests along the Sutter Bypass, Sacramento River, and large isolated trees along farm roads from March through September. They forage for prey in crop fields and grassland habitats. Most Swainson's hawks winter in Central and South America. Swainson's hawks are sensitive to loss of forage and nesting areas and may therefore abandon nests if disturbed by construction activities. They are also vulnerable to collisions with electric transmission lines.
2. **Giant garter snake** (*Thamnophis gigas*) is a Federal and California threatened species, live year-round in the irrigation canals, rice fields, Gilsizer Slough, and marshes of the Sutter NWR. They spend most of their time in or very near water, where they forage for fish and frogs. Giant garter snakes hibernate in animal burrows above floodwaters from October through April. Giant garter snakes are sensitive to loss of habitat and are vulnerable to earth moving construction equipment, especially during hibernation.
3. **Waterfowl and migratory birds** (geese, ducks, herons, shorebirds, cranes, etc.) use the Pacific Flyway, as a major winter migration route. The bald eagle (*Haliaeetus leucocephalus*), a Federal threatened and California endangered species, forages

along the Sacramento River and flooded rice fields in the winter. The peregrine falcon (*Falco peregrinus anatum*), a Federal and California endangered species, the greater sandhill crane (*Crus canadensis tabida*), a California threatened species, and the Aluetian Canada goose (*Branta canadensis leucopareia*), a Federal threatened species, spend winters foraging in the Central Valley and have been observed in the project area. The American bittern (*Botaurus lentiginosus*), a Federal species of concern, and other herons and egrets forage in the rice fields and irrigation canals. Waterfowl and migratory birds are vulnerable to collisions with electric transmission lines.

4. **Salmon, steelhead, and splittail** occur in the Sutter Bypass. The Sutter Bypass is used during migration by adult spring- and fall-run chinook salmon (*Oncorhynchus tshawytscha*), proposed as Federal endangered and Federal threatened, respectively. The Central Valley steelhead (*Oncorhynchus mykiss*), proposed as Federal threatened, also migrates through the Sutter Bypass to spawning grounds. Juvenile salmon and steelhead use the bypass as rearing habitat on the way to the Pacific Ocean. The Sutter Bypass contains spawning habitat for Sacramento splittail (*Pogonichthys macrolepidotus*), a proposed threatened species. Fish in the Sutter Bypass are vulnerable to sedimentation from construction activities inside the banks and to adverse changes in water quality.
5. **Seasonal wetlands** occur on the SPP project site and in the Sutter NWR. The wetlands on site hold water only during the winter and dry up during the summer. They can be difficult to differentiate when dry. Wildlife, especially waterfowl and shorebirds, use wetlands as feeding areas during the winter. Seasonal wetlands can lose their functionality when soils become compacted or plowed, as this prevents rainwater from ponding and changes the hydrologic regime of the wetland.

5.0 CONDITIONS OF CERTIFICATION

Conditions of Certification of the SPP will be provided in the following environmental documents from the natural resource agencies and the CEC.

- California Energy Commission (CEC) Preliminary and Final Staff Assessments and Final Decision,
- United States Fish and Wildlife Service (USFWS) Biological Opinion (BO),
- United States Army Corps of Engineers' (USACE) Clean Water Act Section 404 Wetland Permit,

- National Marine Fisheries Service (NMFS) Biological Opinion (BO),
- California Department of Fish and Game's (CDFG) Memorandum of Understanding (MOU) under Section 2081 of the Fish and Game Code,
- CDFG Streambed Alteration Agreement or Waiver, and
- California Regional Water Quality Control Board (CRWQCB) Clean Water Act Section 401 Water Quality Certification.

The following table presents the conditions each agency requires of Calpine to ensure SPP project impacts to biological resources will not jeopardize the continued existence of endangered or threatened species.

Table 1. Biological Resources Conditions of Certification from Natural Resource Agencies for the Sutter Power Plant Project.

| Agency | Condition | | Responsible Party | Authorization or Permit |
|--------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------|
| CEC | BIO-1 | Provide CEC approved Designated Biologist with qualifications outlined in PSA. | Calpine | Final Decision |
| CEC | BIO-2 | Advise project proponents of biological resources conditions of certification, monitor implementation of mitigation measures, and notify CEC CPM of non-compliance. | Calpine and Designated Biologist | Final Decision |
| CEC | BIO-3 | Halt work if necessary to avoid non-compliance, tell project owner when to resume construction, and advise CPM of corrective actions required. | Calpine and Designated Biologist | Final Decision |
| CEC | BIO-4 | Prepare and implement a Worker Environmental Awareness Program for each worker on-site. | Calpine and Designated Biologist | Final Decision |
| CEC | BIO-5 | Enter into an Endangered Species Memorandum of Understanding (MOU) with CDFG and implement the terms of the agreement. | Calpine and Designated Biologist | Final Decision |
| | | | | |

| Agency | Condition | | Responsible Party | Authorization or Permit |
|--------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------|
| CEC | BIO-6 | Provide copies of the Biological Opinions from the USFWS and NMFS and implement the terms of the agreement. | Calpine and Designated Biologist | Final Decision |
| CEC | BIO-7 | Obtain a Streambed Alteration Agreement or waiver from CDFG for construction in waterways. | Calpine and Designated Biologist | Final Decision |
| CEC | BIO-8 | Implement giant garter snake mitigation measures before and during construction. | Calpine and Designated Biologist | Final Decision |
| CEC | BIO-9 | Implement Swainson's hawk mitigation measures before and during construction. | Calpine and Designated Biologist | Final Decision |
| CEC | BIO-10 | Implement measures to mitigate or avoid adverse project impacts to migratory birds and monitor avian collisions after construction of transmission line and HRSB stacks. | Calpine and Designated Biologist | Final Decision |
| CEC | BIO-11 | Implement measures to mitigate or avoid adverse project impacts to wetlands and monitor functionality after construction of SPP. | Calpine and Designated Biologist | Final Decision |
| CEC | BIO-12 | Prepare and submit a Biological Resources Mitigation Implementation Plan (BRMIP). | Calpine and Designated Biologist | Final Decision |
| CEC | BIO-13 | Provide a fund for mitigation credits that include habitat compensation, monitoring, and management before construction begins. | Calpine | Final Decision |
| USFWS | | | Western and Calpine | Biological Opinion |
| NMFS | | | Western and Calpine | Biological Opinion |
| USACE | | | Western and Calpine | 404 Permit |

| Agency | Condition | | Responsible Party | Authorization or Permit |
|--------|-----------|--|-------------------|----------------------------------------------|
| CDFG | | | CEC and Calpine | MOU Streambed Alteration Agreement Waiver |
| CRWQB | | | | Water Quality Certification |

(Summary of conditions from Appendix H will be included in Table 1 when available from the natural resource agencies)

6.0 MITIGATION MEASURES

Calpine developed mitigation measures in coordination with the CDFG, USFWS, NMFS, USACE, and CEC to minimize unavoidable project impacts to biological resources in the SPP project area. Table 2 presents the mitigation measures developed for each potential project impact that could affect sensitive biological resources. Mitigation measures for the SPP project include:

- Construction mitigation monitoring by designated biologist
- Worker environmental awareness training
- Construction zone limits
- Preconstruction surveys
- Timing restrictions on construction
- Modify project design: operations and maintenance
- Habitat compensation
- Erosion control and revegetation of disturbed areas
- Monitoring plans and reports

Table 2. Permanent and temporary project impacts from SPP construction, operation, and maintenance activities and proposed mitigation measures to minimize impacts.

| Permanent Project Impacts | Temporary Project Impacts | Proposed Mitigation Measures* |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General Wildlife | | |
| <p>Potential for waterfowl collisions with electric transmission line and disturbance of nest sites.</p> <p>If an evaporation pond is used, concentrated salt brine could adversely affect waterfowl and other wildlife.</p> | <p>Potential for disturbance of sensitive habitats</p> | <ol style="list-style-type: none"> 1. Set construction zone limits to minimize impacted areas and restrict access to sensitive habitats (Sutter NWR, wetlands, riparian, active nest trees) during critical periods. 2. Conduct preconstruction surveys to ensure that species not previously identified on site will not be impacted. Coordinate with the USFWS and CDFG for protective measures. 3. Provide a qualified biologist during all phases of construction to monitor activities as needed and respond to biological issues as they may arise. 4. Provide Worker Environmental Awareness Training. 5. Install bird flight diverters to shield wires to minimize collision potential. 6. Monitor electric transmission line collisions for significant effects. 7. Prevent wildlife from entering evaporation pond with cover or deflectors (if evaporation pond is used). |
| Swainson's Hawk (BIO-9) | | |
| <p>Loss of 19.137 acres forage habitat: <i>16.737 acres annual grassland [16.0 SPP site, 0.73 access road, 0.007 utility poles] and 2.4 acres crop land [2.2 rice for switchyard, 0.1 wheat and 0.1 walnut for dehydrators]</i></p> <p>Loss of potential nest trees (walnut trees)</p> <p>Potential collisions with electric transmission line.</p> | <p>Potential for nest disturbance if active nest within ½ mile of project activities.</p> | <ol style="list-style-type: none"> 1. Off-site habitat compensation at 1:1 for grassland and 0.5:1 for crop land for a total of 17.937 acres of forage habitat 2. Establish a fund with appropriate agencies to purchase and manage the replacement habitat. 3. Remove walnut trees before nesting season. 4. Incorporate oak trees in visual screen to offset loss of potential nest trees (walnut). 5. Conduct preconstruction surveys in 1999 and 2000 for active nest sites. 6. Avoid disturbance within ½ mile of nests from March 1 through August 15. Designated biologist to monitor if construction within ½ mile of nest site. 7. Worker Environmental Awareness Training. 8. Revegetation of habitats temporarily disturbed. 9. Install bird flight diverters to shield wires to minimize collision potential. |

| Giant Garter Snake (BIO-8) | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Loss of 4.907 acres of upland habitat (permanent impacts to 200-foot buffer along canals and rice fields)</p> <p><i>4.907 acres grassland and crop habitats [2.7-ac grassland for SPP, 2.2-ac crop for switchyard, 0.007-ac grassland for utility poles]</i></p> | <p>Disking site for fire control</p> <p>Soil disturbance (noise and vibrations) in 6 acres of upland habitats from trenching pipeline and augering holes for utility poles.</p> <p>Potential for take of giant garter snake from construction activities.</p> | <ol style="list-style-type: none"> 1. Off-site habitat compensation at 3:1 (to include one part aquatic to two parts upland) for a total of 9.814 acres upland and 4.907 acres of aquatic (wetland) to replace lost upland habitat. 2. Establish a fund for the acquisition of mitigation credits that will facilitate the purchase, enhancement, and management of habitat before construction begins. 3. Provide a biological monitor to conduct sweeps 24 hours prior to breaking ground in areas of construction. 4. Provide Worker Environmental Awareness Training. 5. Construct natural gas pipeline, and auger power poles during giant garter snake active period (May through October). 6. Provide biological monitor continually on site if construction is conducted during hibernation (October through May). 7. Revegetate habitats after construction. 8. Mow site instead of disking to minimize potential harm to snakes. 9. Construct hibernacula in strategic areas of upland habitat. 10. Use approved herbicide with no residual or migratory effects. |
| Migratory birds (BIO-10) | | |
| <p>Potential collisions with 145-foot tall HRSG emission stacks in flyway.</p> <p>Potential collisions with 4.0 miles of transmission wires.</p> | <p>Disturbance of migration activities.</p> | <ol style="list-style-type: none"> 1. Provide suitable space between conducting wires, install bird flight diverters on top ground wires. 2. Monitor and document mortalities from HSRG stacks and transmission wires in annual monitoring report. |
| Migratory Fish | | |
| <p>*NA</p> <p>(If using evaporative cooling, potential for contaminants in discharge water)</p> | <p>Potential sedimentation into canals that are tributaries to natural waterways and Sutter Bypass.</p> <p>Subsurface flow impacts from directional drill under Sutter Bypass water channels.</p> | <ol style="list-style-type: none"> 1. Implement erosion control plan to eliminate sedimentation. 2. Streambed Alteration Agreement or waiver that eliminates/minimizes impacts to fish and wildlife in natural waterways, including Sutter Bypass and canals that are tributaries to natural waterways. 3. Use dry cooling towers for zero discharge to irrigation canals and Sutter Bypass aquatic habitats, eliminating potential adverse impacts to fish from contaminants. |

| Giant Garter Snake (BIO-8) | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Loss of 4.907 acres of upland habitat (permanent impacts to 200-foot buffer along canals and rice fields)</p> <p><i>4.907 acres grassland and crop habitats [2.7-ac grassland for SPP, 2.2-ac crop for switchyard, 0.007-ac grassland for utility poles]</i></p> | <p>Disking site for fire control</p> <p>Soil disturbance (noise and vibrations) in 6 acres of upland habitats from trenching pipeline and augering holes for utility poles.</p> <p>Potential for take of giant garter snake from construction activities.</p> | <ol style="list-style-type: none"> 1. Off-site habitat compensation at 3:1 (to include one part aquatic to two parts upland) for a total of 9.814 acres upland and 4.907 acres of aquatic (wetland) to replace lost upland habitat. 2. Establish a fund for the acquisition of mitigation credits that will facilitate the purchase, enhancement, and management of habitat before construction begins. 3. Provide a biological monitor to conduct sweeps 24 hours prior to breaking ground in areas of construction. 4. Provide Worker Environmental Awareness Training. 5. Construct natural gas pipeline, and auger power poles during giant garter snake active period (May through October). 6. Provide biological monitor continually on site if construction is conducted during hibernation (October through May). 7. Revegetate habitats after construction. 8. Mow site instead of disking to minimize potential harm to snakes. 9. Construct hibernacula in strategic areas of upland habitat. 10. Use approved herbicide with no residual or migratory effects. |
| Migratory birds (BIO-10) | | |
| <p>Potential collisions with 145-foot tall HRSG emission stacks in flyway.</p> <p>Potential collisions with 4.0 miles of transmission wires.</p> | <p>Disturbance of migration activities.</p> | <ol style="list-style-type: none"> 1. Provide suitable space between conducting wires, install bird flight diverters on top ground wires. 2. Monitor and document mortalities from HSRG stacks and transmission wires in annual monitoring report. |
| Migratory Fish | | |
| <p>*NA</p> <p>(If using evaporative cooling, potential for contaminants in discharge water)</p> | <p>Potential sedimentation into canals that are tributaries to natural waterways and Sutter Bypass.</p> <p>Subsurface flow impacts from directional drill under Sutter Bypass water channels.</p> | <ol style="list-style-type: none"> 1. Implement erosion control plan to eliminate sedimentation. 2. Streambed Alteration Agreement or waiver that eliminates/minimizes impacts to fish and wildlife in natural waterways, including Sutter Bypass and canals that are tributaries to natural waterways. 3. Use dry cooling towers for zero discharge to irrigation canals and Sutter Bypass aquatic habitats, eliminating potential adverse impacts to fish from contaminants. |

| Wetlands (BIO-11) | | |
|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Loss of 5.83 acres of seasonal wetlands under SPP footprint and surrounding construction zone. | Potential for temporary disturbance to wetlands in Sutter NWR from vehicles and runoff. Disking site for fire control. | <ol style="list-style-type: none"> 1. Off-site replacement at 1:1 for 5.83 acres of like-kind wetlands. 1. Establish an endowment fund for the acquisition of mitigation credits that will facilitate the purchase, enhancement, and management of wetlands before construction begins. 2. Construct temporary construction zone fencing around wetlands in refuge near construction activities. 3. Route SPP stormwater runoff away from remaining wetlands. 4. Use mowing instead of disking as fire control on site. 5. Conduct aerial photography and field monitoring to document wetland protection efforts. 6. Mark and avoid all wetland areas within Sutter NWR. 7. Construct pipeline under or along Hughes Road. |
| <p>* Mitigation measures may change after negotiation with USFWS, CDFG, NMFS, and/or CEC are finalized. * NA: None Anticipated.</p> | | |

6.1 Construction Mitigation Monitoring by Designated Biologist

Calpine will designate a qualified biologist to implement the mitigation measures outlined in this BRMIP. The designated biologist and/or an approved representative under the direct supervision of the designated biologist will supervise construction activities in sensitive habitat areas, assist the construction engineer in preparing construction zone limits, present the Worker Environmental Awareness Training program, and advise Calpine on how best to avoid adverse impacts to biological resources. The designated biologist will implement the mitigation measures through the construction phase and monitor the electric transmission line impacts for at least three years (see Appendix G) after construction. The designated biologist will be on site during construction in giant garter snake habitat and in areas with active Swainson's hawk nests. The designated biologist will advise Calpine and the CEC concerning biological issues and will prepare Monthly Compliance Reports for submittal to the CEC CPM.

6.2 Worker Environmental Awareness Training

A Worker Environmental Awareness Training program will be instituted for all Calpine personnel and subcontractors who will be working on the SPP project sites. This program includes a classroom presentation with visual and written materials designed specifically for the SPP project area. The program identifies the types of SPP project

impacts that could occur from construction, operation, and maintenance activities and the project rules each worker is required to follow to protect sensitive biological resources in the SPP project area. All personnel who receive training will sign an affidavit declaring that they understand and will adhere to any project rules set forth in the program. The SPP Worker Environmental Awareness Training program is outlined in Appendix B.

6.3 Construction Zone Limits

Construction zone limits are developed to minimize construction impacts to sensitive habitats and rare plants in areas of construction. Calpine designed the project features to avoid sensitive areas to the greatest extent feasible during the engineering design phase and by designating construction zones. This will minimize unavoidable direct impacts to surface areas. Construction zones include the area of immediate surface disturbance and adjacent areas used by vehicles and workers. Construction zone limits will be set up within the implementation areas of the SPP footprint, the natural gas pipeline route, the electric transmission line pole footings, the switchyard footprint, and the dehydrator station footprints to keep construction impacts to designated areas (Figures 3a through 3c).

Construction zone limits can be designated with fencing, flagging, and/or signage placed between the impact area and sensitive habitats. The method chosen should match the impact (i.e. siltation fences around wetlands in Sutter NWR, flagging on protected trees, signage identifying sensitive species and habitats, etc.). A Worker Environmental Awareness Training program will be presented to all Calpine personnel and contractors that includes instruction on complying with construction zone limits. Documentation of the effectiveness of the construction zone limits will include photographs depicting conditions of the seasonal wetlands before and after construction of SPP.

The designated biologist will consult with the Sutter NWR manager prior to and during any construction through the refuge. Signage and/or flagging will mark sensitive habitats adjacent to the construction zones along the gas pipeline route within the Sutter NWR, including wetlands, riparian trees, and California hibiscus. Wetlands in the Sutter NWR include seasonal and perennial wetlands that encroach on the right-of-way for Hughes Road. All wetland areas in the Sutter NWR will be restricted from construction personnel and vehicle entry. The Worker Environmental Awareness Training Program will be implemented by the designated biologist to instruct workers on restrictions to those areas. Any nest sites located along the utility corridor routes during the preconstruction surveys will be marked and flagged. Laydown and parking areas (approximately 0.1 to 0.5 acres each) along the gas pipeline and electric transmission line

routes will be sited on previously disturbed areas and marked with flagging to minimize surface disturbance. One-hundred-fifty-foot square (approximately 0.5 acre) construction zone limits will be established for directional drilling equipment and operations at each bore location.

Construction zone limits will be established around the switchyard and drip stations facilities to minimize impacts to the agricultural crops in those areas.

Construction zone limits approximately ten-foot square will be established around each electric power pole footing to allow movement of construction workers and equipment. Heavy equipment such as cranes will remain on the road or other disturbed areas during construction of the poles. Construction zone limits will also be established for the crane operators and other heavy equipment to minimize impacts to vegetation and canal berm habitat. Silt fencing will be used in areas near irrigation canals. Any nest sites located in annual grassland habitats along the transmission line route during the preconstruction surveys will be flagged and marked for avoidance or transplantation.

Any unforeseen areas required for project activities not previously surveyed for biological resource impacts or approved by the designated biologist will not be disturbed until he/she determines that the disturbance will not cause significant impacts. The designated biologist will obtain clearance from the CEC (and other agencies if required) of the project changes and document approvals in writing through the Plan Modification Process (Appendix E).

The Designated Biologist will supervise construction activities in areas requiring avoidance or containing special-status species and provide the CEC with written records in the Monthly Compliance Reports documenting the construction monitoring activities.

6.4 Preconstruction Surveys

6.4.1 General Wildlife

Preconstruction surveys will be conducted 24 hours prior to ground breaking on the SPP project site and along the gas pipeline and electric transmission line routes for active nest sites, den sites, or other sensitive locations of native species. Any active site will be marked and recorded. If construction activities have the potential to harm sensitive sites, actions will be taken to avoid the location or move the nest with agency approval.

6.4.2 Swainson's hawk

Preconstruction field surveys (conducted under CDFG guidelines) to identify active nest sites will be conducted in the spring (April, May, and June), before construction begins. If nest sites are found to be within ½ mile of a project activity, the designated biologist, or appropriate representative identified by the designated biologist, will monitor the behavior of the nesting birds in relation to project activities. Construction in the forage areas of breeding birds will also be monitored to determine if disturbance could cause failure of birds to adequately provide for themselves and their young. The designated biologist will stop work if it appears the activities will obviously impede reproductive success.

6.4.3 Giant garter snake

Preconstruction field sweeps (conducted under CDFG and USFWS guidelines) will be conducted in all proposed project construction areas 24 hours before earth moving activities begin at that site. If giant garter snakes are found during the sweep, the designated biologist will make noise and vibrations to repel snakes from the construction area and notify the USFWS of the sighting. Removal of snakes will only be conducted with agency authorization. Snake fences will be installed where necessary around construction areas where snakes are likely to be found. The designated biologist will be on-site during construction activities in areas where snakes are found. Pipeline trenches left open overnight will be covered to prevent snakes from becoming trapped. If a snake should become trapped, the designated biologist will notify the USFWS and with authorization and/or assistance remove the snake and relocate it to a safe area.

The Designated Biologist will supervise construction activities in areas requiring avoidance or containing special-status species and provide the CEC with written records in the Monthly Compliance Reports documenting the construction monitoring activities.

6.5 Timing Restrictions on Construction

Timing construction activities to avoid sensitive nesting or hibernation periods in the SPP project areas will eliminate or reduce adverse impacts to sensitive species.

Construction of the natural gas pipeline and electric transmission line requires trenching and deep augering along irrigation canals that support habitat for threatened giant garter snakes. Giant garter snakes forage in rice fields, irrigation canals, and ponds for small fish, amphibians, and reptiles in the SPP project areas. They are actively foraging in warm months from May through September and hibernate in underground burrows (hibernacula) from October through April and are highly susceptible to earth moving

equipment during this time. Impacts to giant garter snakes can occur from the excavation of irrigation canals and hibernacula during hibernation periods. Calpine and PG&E will trench and auger in giant garter snake habitat only from May through September.

Construction of the natural gas pipeline and electric transmission line will occur in areas with riparian trees or isolated trees near agricultural crops that are suitable as Swainson's hawk nest trees. Swainson's hawks nest from March 1 through August 15 in the project area and migrate to Central and/or South American for the winter. Construction in areas ½ mile from active nests should be postponed until after August 15 or until the fledglings are no longer dependent on the nest tree. Because the Swainson's hawk nesting period occurs simultaneously with the active giant garter snake season, the construction seasons appear to conflict. Therefore, if construction cannot be scheduled outside the Swainson's hawk nesting season, CDFG will require intensive monitoring of active nest sites within ½ mile of construction activities. The designated biologist, or appropriate representative identified by the designated biologist, will monitor the behavior of the birds during courtship, nest building, incubation, and the period while raising their young in relation to project activities. The designated biologist will stop work if it appears the activities will impede reproduction.

6.6 Modify Project Design: Operations and Maintenance

Calpine and Western will modify the new electric transmission lines by installing colored bird flight diverters (BFDs) on the top ground wires to make the wires more visible to birds during flight and minimize bird collisions. BFDs are 15-inch-long PVC tubing coiled to a height of 7 inches, spaced 5 meters apart along the wires (see Appendix G). BFDs are especially effective at increasing visibility of wires during fog and rain events and have reduced avian collisions by 89 percent (Brown and Drewien 1995).

Mowing the Calpine property instead of disking the open areas around the SPP and Greenleaf 1 facility would reduce impacts to seasonal wetlands and giant garter snakes on the property. Maintenance activities should include mowing to a height of six inches after the SPP project is constructed.

6.7 Habitat Compensation

Habitat compensation will be implemented for permanent loss of seasonal wetlands, Swainson's hawk forage habitat, and giant garter snake upland habitat. A total of 19,137 acres of surface land will be permanently lost to construction of the SPP and ancillary facilities. These habitats will be compensated in off-site mitigation banks at various

ratios for a total of 38.488 acres. These habitats will be managed for wildlife in perpetuity. Consultations with federal and state agencies were conducted to determine the mitigation ratio for replacement habitats. Also, the CEC required that annual grassland, crops and wetlands used as Swainson's hawk forage habitat that are also used as giant garter snake habitat be mitigated separately for each species. Also, seasonal wetlands will be mitigated separately as wetland habitat and Swainson's hawk forage habitat. This results in a total of 38.488 acres of replacement habitat for the 19.137 acres lost. A Habitat Compensation Plan is presented in Appendix D that shows the locations of habitat compensation and the funding mechanism to purchase compensatory mitigation credits.

Seasonal wetlands encompassing 3.0 acres on the SPP site will be permanently lost to construction. An additional 2.83 acres may be indirectly impacted during construction. A total of 5.83 acres of seasonal wetlands will be replaced at a 1:1 ratio; for every one acre of wetland lost, one acre of wetland will be created in an off-site mitigation bank.

Swainson's hawk forage habitat lost from SPP construction includes: 16.0 acres of grassland and seasonal wetland (seasonal wetlands may be considered forage habitat when dry), 0.73 acres of grassland for the access road, 0.007 acres of grassland for the electric transmission line pole footings, 2.2 acres of rice crop at the switchyard location, and 0.2 acres of wheat and walnut crops at the drip station locations. Annual grassland and seasonal wetlands considered Swainson's hawk forage habitat will be replaced at a 1:1 ratio. Crop lands used as Swainson's hawk forage habitat will be replaced at a ratio of 0.5:1. A total of 19.137 acres of Swainson's hawk forage habitat will be lost to construction and 17.937 acres of forage habitat will be created/preserved off-site.

Giant garter snake upland habitat lost from SPP construction includes: 2.7 acres of grassland on-site, 0.007 acres of grassland for pole footings, and 2.2 acres of rice at the switchyard for a total of 4.907 acres of upland habitat. No aquatic habitat will be lost from SPP construction. Giant garter snake upland habitat will be replaced at a 3:1 ratio; for every acre of upland lost, three acres of replacement habitat (2/3 of which will be upland and 1/3 will be aquatic) will be preserved off-site. Replacement habitat includes 9.814 acres of upland habitat and 4.907 acres of aquatic habitat for a total of 14.721 acres that will be replaced in an off-site location.

Potential replacement habitat for Swainson's hawk and giant garter snake may be available in the Sutter NWR expansion project, Wildlands Inc. mitigation bank in Colusa and Placer counties, Gilsizer Slough conservation easement, Middle Mountain Foundation, or the Yolo County Land Trust. Mitigation credits for seasonal wetlands are

available at the Wildlands, Inc. mitigation bank. An endowment fund will be set up with a mitigation bank under approval from regulatory agencies (CEC, USFWS, USACE) and Calpine before construction of the SPP project begins. The fund will cover the costs to purchase land, construct habitats, manage the land area, and monitor success of construction.

If after construction the acreage of habitats lost from construction differs from the proposed amount, mitigation will be adjusted to reflect the necessary changes. A deposit in the amount that covers the proposed acres mitigated will be placed in the mitigation fund before construction begins and will be adjusted after completion of construction when evaluations of aerial photos determine exact acreage impacted. Calpine will settle final payment through Wildlands, Inc. or other approved mitigation bank under CDFG, USFWS, USACE, and/or CEC approval.

6.8 Erosion Control and Habitat Restoration in Disturbed Areas

Erosion control, stormwater runoff control, and revegetation of disturbed areas will be used to restore habitats in temporary construction areas. The SPP Erosion Control, Revegetation, and Stormwater Management Plan (Appendix F) will be implemented to protect waterways (irrigation canals, sloughs, and Sutter Bypass) from siltation that could affect fish and wildlife resources. A Section 401 of the Clean Water Act (CWA) water quality certification from the California Regional Water Quality Control Board (CRWQCB) will be obtained before construction begins. This certification documents that the project design and construction methods will not adversely affect surface water supplies. A Streambed Alteration Agreement from the CDFG may also be necessary for stream crossings in the Sutter Bypass and tributaries to natural waterways.

Stormwater will be controlled by the use of impermeable plastic construction barriers in areas of sensitive habitat, i.e. waterbodies and wetlands. Construction debris and other waste materials will be removed to an appropriate landfill after construction is complete in each project area.

Revegetation of temporary construction areas will be implemented with like-kind species (i.e., grassland species in grassland areas and crop species in crop areas). Revegetation of annual grassland is anticipated along the gas pipeline trench, around the electric power pole footings, and in areas adjacent to the SPP footprint. Revegetation of croplands will be conducted adjacent to the switchyard and Poundstone Drip Station. Revegetation will be conducted as soon as possible after disturbance and before the rains begin in November. Temporarily disturbed croplands will be replanted as directed by the property

owner. The SPP Erosion Control, Revegetation, and Stormwater Management Plan has a detailed description of the revegetation methods, including plant species, planting rates, and maintenance (Appendix F).

6.9 Monitoring Plans and Reports

Monitoring plans that identify the methods that will be used to monitor potential project impacts on biological resources were prepared for the remaining seasonal wetlands on-site (Appendix C) and to determine if the electric transmission line significantly affects special-status migratory birds in the project area (Appendix G).

Seasonal wetlands on the SPP site encompass a total of 8.67 acres. Construction of the SPP footprint will result in the loss of 3.0 acres and indirect impacts to 2.83 acres (for a total of 5.83 acres) of these wetlands. The remaining twenty-two seasonal wetlands (2.84 acres) will be preserved on-site. Impacts to some of these wetlands could occur from construction of the electric transmission line poles. No impacts to wetlands are expected from operation of the SPP. The On-Site Wetland Protection Plan addresses the methods that will be used to protect the remaining wetlands during construction and operation (Appendix C). A wetland monitoring report describing the effectiveness of the preservation mitigation measure will be prepared by Calpine and submitted to the CEC Compliance Project Manager (CPM) during construction of the SPP and after the first year of operation. If it can be shown that the wetlands were not adversely impacted by construction and operations would not impact them, Calpine will have the option to request staff to cease monitoring requirements.

A monitoring plan was developed to analyze whether the new electric transmission line and HRSG stacks cause significant impacts to special-status birds and waterfowl from collisions and/or electrocutions (Appendix G). The plan includes searches along the new transmission line during waterfowl migration season for special-status birds killed by collision with the line. An estimate of total collisions will be determined using dead bird searches and formulas detailed in the Avian Power Line Interaction Committee (APLIC) document, which includes measures to determine search, removal, habitat, and crippling biases (APLIC 1994). The calculated number of waterfowl and special-status bird collisions will be compared to the number of birds allowed to be taken in the USFWS Biological Opinion (Appendix H).

7.0 IMPLEMENTATION SCHEDULE

Implementation of the mitigation measures outlined in this BRMIP will be conducted throughout the construction and operation of the SPP project. Table 3 outlines a relative schedule for implementation of mitigation measures.

Table 3. Relative schedule for implementation of mitigation measures.

| Task | Timing |
|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Construction mitigation monitoring by designated biologist | April 1999 through December 2000 |
| Worker environmental awareness training | At project initiation |
| Construction zone limits | Prior to any surface disturbance. |
| Preconstruction surveys | Daily prior to surface disturbance for giant garter snake and at start of nesting season for Swainson's hawk each year of construction |
| Timing restrictions on construction | At initiation of project and after preconstruction surveys |
| Modify project design: operations and maintenance | At initiation of project and after construction of transmission line and HRSG stacks |
| Habitat compensation | Prior to project construction, expected first quarter of 1999 |
| Erosion control and revegetation of disturbed areas | Erosion control during construction and revegetation in October 1999 and 2000 after temporary disturbance |
| Monitoring plans and reports | Plans available prior to construction of transmission line for birds and before construction of SPP for wetlands and annual monitoring reports due as identified below. |
| On-site wetland monitoring | First quarter 1999 through 2001, annual report due July 31 |
| Bird collision monitoring | Fourth quarter 2000 through 2003, annual report due April 30 |
| Summary Report for Implementation and Success of Mitigation Measures | 30 days after construction completion (January 2001) |

8.0 IMPLEMENTATION MONITORING/VERIFICATION PROGRAM

Verification of mitigation will be documented on daily monitoring forms, Monthly Compliance Reports, and in the final BRMIP Summary of Mitigation Measures for the Sutter Power Plant Project that will be submitted to the CEC within 30 days after completion of construction. The avian collision and on-site wetland monitoring and annual reports will continue after the final BRMIP Summary report for the indicated duration.

Compliance of each mitigation measure will be monitored by the designated biologist according to the schedule in Table 3 and documented on compliance verification forms (Figure 4) for each site visit. The daily forms will record where, when, and how construction activities are performed and whether compliance was met. Monthly Compliance Reports will summarize the activities for each month. The summaries will include a discussion of whether the mitigation measures were successful, compared to the success criteria where applicable. It will also include all the plan modifications and remedial measures taken if the success criteria were not met during the mitigation monitoring process. Appendix D presents the process that Calpine will use to modify the BRMIP. Table 4 outlines the performance standards or success criteria for each mitigation measure.

A master compliance verification form will be managed by the designated biologist and included in the final compliance report to the CEC CPM (Figure 5).

Table 4. Monitoring tasks and criteria that determine successful implementation of mitigation measures.

| Mitigation Measure | Monitoring Type | Monitoring Duration | Monitoring Frequency | Success criteria |
|---------------------------------------------|---------------------------------------|------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------|
| Construction zone limits | on-site observation | throughout construction | daily or as needed | no adverse impact to surrounding habitats |
| Habitat Compensation | payment | in perpetuity | once | copy of receipt to CEC |
| Preconstruction surveys | direct observation | through construction | daily for ground disturbance and 3 times each spring for Swainson's hawk | summary in monthly compliance report |
| On-site wetland protection | monitor functionality and disturbance | through construction and one year of operation | annually | wetland indicators present in wetlands |
| Transmission line markers | direct observation | ten years | annually | presence of all markers |
| Transmission line and HRSG avian collisions | mortality count | three years or until no impact determined | three months in winter and one month in summer | estimated total collision does not exceed incidental take allowance |
| Worker Environmental Awareness Training | direct observation of attendance | throughout construction for new employees | at start of project construction | signed affidavits |
| Erosion Control and Revegetation Plan | direct observation of performance | two years after seeding | annually for two years | successful growth of vegetation in planted areas |

Figure 4. Compliance Verification Report Form.

| COMPLIANCE VERIFICATION REPORT | | |
|-----------------------------------------------------------|-------------------------------------|------------------------------------------------------|
| Report Number: | | |
| Project: | Date: | |
| Location: | Arrival time: | Departure time: |
| Responsible party: | | |
| Compliance monitor: | Discipline: | |
| Monitored mitigation measure: | | |
| | | |
| Frequency of monitoring: | | |
| | | |
| Compliance criteria: | | |
| Compliance: | <input type="checkbox"/> Acceptable | <input type="checkbox"/> Unacceptable: |
| | | <input type="checkbox"/> Remedial action implemented |
| | | <input type="checkbox"/> Require work stop |
| | | <input type="checkbox"/> Follow-up required |
| Activity: | | |
| | | |
| | | |
| Observations: | | |
| | | |
| | | |
| | | |
| | | |
| Recommendations: | | |
| | | |
| | | |
| | | |
| Report approval: | | |
| Print name: | Signature: | |
| Receipt acknowledged by resident construction supervisor: | | |
| Print name: | Signature: | |
| Date: | Time: | |
| Comments/Actions: | | |
| Data entered into Monthly Monitoring Report: | | |

Figure 5. Master Compliance Verification Report Form.

| MASTER COMPLIANCE VERIFICATION REPORT | | | | | | | | |
|---------------------------------------|--------------------------------------|----------------------------|-------------------------------------|----------------|----------------------|-----------------------------------|------------------------------|---------|
| Project: Sutter Power Plant Project | | | Location: Sutter County, California | | | | | |
| Project Owner: Calpine Corporation | | | | | | | | |
| Mitigation Measure | Responsible Party for Implementation | Date(s) for Implementation | Compliance Criteria | Date Completed | Signature of Monitor | Compliance Verification Report(s) | Responsible Oversight Agency | Remarks |
| HABITAT COMPENSATION | | | | | | | | |
| Wetlands | | | | | | | | |
| Swainson's hawk | | | | | | | | |
| Giant garter snake | | | | | | | | |
| RECONSTRUCTION SURVEYS | | | | | | | | |
| SWAINSON'S HAWK (1999) | | | | | | | | |
| SPP site | | | | | | | | |
| Gas pipeline | | | | | | | | |
| Drip stations | | | | | | | | |
| Transmission line | | | | | | | | |
| Switchyard | | | | | | | | |
| GIANT GARTER SNAKE (1999) | | | | | | | | |
| SPP site | | | | | | | | |

| Mitigation Measure | Responsible Party for Implementation | Date(s) for Implementation | Compliance Criteria | Date Completed | Signature of Monitor | Compliance Verification Report(s) | Responsible Oversight Agency | Remarks |
|--------------------------------------------------------------------------|--------------------------------------|----------------------------|---------------------|----------------|----------------------|-----------------------------------|------------------------------|---------|
| TRANSMISSION LINE MARKERS | | | | | | | | |
| 2000 | | | | | | | | |
| EROSION CONTROL AND REVEGETATION PLAN | | | | | | | | |
| 1999 | | | | | | | | |
| 2000 | | | | | | | | |
| AVIATION COLLISION MONITORING (Transmission Line and HRSG Stacks) | | | | | | | | |
| 2000 | | | | | | | | |
| 2001 | | | | | | | | |
| 2002 | | | | | | | | |
| ON-SITE WETLAND MONITORING | | | | | | | | |
| 1999 (baseline) | | | | | | | | |
| 2000 | | | | | | | | |
| 2001 | | | | | | | | |
| 2002 | | | | | | | | |

| Mitigation Measure | Responsible Party for Implementation | Date(s) for Implementation | Compliance Criteria | Date Completed | Signature of Monitor | Compliance Verification Report(s) | Responsible Oversight Agency | Remarks |
|------------------------------------------------|--------------------------------------|----------------------------|---------------------|----------------|----------------------|-----------------------------------|------------------------------|---------|
| CONSTRUCTION ZONE LIMITS | | | | | | | | |
| SPP site (1999) | | | | | | | | |
| Gas pipeline (1999) | | | | | | | | |
| Drip stations (1999) | | | | | | | | |
| Transmission line (1999) | | | | | | | | |
| Switchyard (1999) | | | | | | | | |
| SPP site (2000) | | | | | | | | |
| Gas pipeline (2000) | | | | | | | | |
| Drip stations (2000) | | | | | | | | |
| Transmission line (2000) | | | | | | | | |
| Switchyard (2000) | | | | | | | | |
| WORKER ENVIRONMENTAL AWARENESS TRAINING | | | | | | | | |
| 1999 | | | | | | | | |
| 2000 | | | | | | | | |

Prepared by Debra Crowe 10/21/98

| Mitigation Measure | Responsible Party for Implementation | Date(s) for Implementation | Compliance Criteria | Date Completed | Signature of Monitor | Compliance Verification Report(s) | Responsible Oversight Agency | Remarks |
|---------------------------|--------------------------------------|----------------------------|---------------------|----------------|----------------------|-----------------------------------|------------------------------|---------|
| Gas pipeline | | | | | | | | |
| Drip stations | | | | | | | | |
| Transmission line | | | | | | | | |
| Switchyard | | | | | | | | |
| SWAINSON'S HAWK (2000) | | | | | | | | |
| SPP site | | | | | | | | |
| Gas pipeline | | | | | | | | |
| Drip stations | | | | | | | | |
| Transmission line | | | | | | | | |
| Switchyard | | | | | | | | |
| GIANT GARTER SNAKE (2000) | | | | | | | | |
| SPP site | | | | | | | | |
| Gas pipeline | | | | | | | | |
| Drip stations | | | | | | | | |
| Transmission line | | | | | | | | |
| Switchyard | | | | | | | | |

9.0 REFERENCES

- APLIC (Avian Power Line Interaction Committee). 1994. Mitigating Bird Collisions with Power Lines: The State of the Art in 1994. Edison Electric Institute. Washington, D.C.
- Brown, W., and Drewien, R. 1995. Evaluation of Two Power Line Markers to Reduce Crane and Waterfowl Collision Mortality. Wildlife Society Bulletin, 1995. 23(2): 217-227.

APPENDIX A—DESIGNATED BIOLOGIST QUALIFICATIONS AND DUTIES

The designated biologist must be approved by the CEC CPM (Compliance Project Manager) at least 90 days prior to the start of ground-breaking activities and must meet the minimum qualifications outlined in the Conditions of Certification BIO-1 of the CEC's FSA for the SPP project.

The designated biologist for the SPP project construction is:

- Name:
- Address:
- Phone number:
- Degree:
- Field biology experience:
- Field experience in project area:
- Education and experience for required tasks:

Duties of the Designated Biologist include:

- Advise Calpine's Site Superintendent or Project Engineer on the implementation of the biological resources Conditions of Certification,
- Supervise or conduct mitigation and monitor compliance of mitigation measures, especially in areas requiring avoidance of sensitive habitats and/or species.
- Notify Calpine and the CEC CPM of non-compliance with any condition and the corrective actions taken, and advise the construction and operations engineer when to resume construction.
- Maintain written records of the tasks to include in the Monthly Compliance Reports to the CEC CPM.
- Develop and present the Worker Environmental Awareness Training program to Calpine personnel and their contractors.

APPENDIX B—WORKER ENVIRONMENTAL AWARENESS TRAINING PROGRAM

The Worker Environmental Awareness Training (WEAT) program (Condition of Certification BIO-4) consists of an on-site and/or classroom presentation that identifies the sensitive biological resources that could be encountered in the SPP project construction areas and the reasons for protecting these resources. The presentation includes the types of construction activities that could impact biological resources and the measures developed to avoid impacts. It will also include instruction on who to contact if sensitive habitats or species are found and the consequences of non-compliance with protective measures developed for the project.

This information will be presented to each worker during employee orientation sessions. In addition, the material will be available at the Construction Site Superintendent's field office. Each participant in the WEAT program will sign an affidavit declaring that the individual understands and will abide by the guidelines set forth in the program material. The person administering the WEAT program will also sign each statement. The signed affidavits will be kept on file for at least six months after termination of employment.

Types of construction impacts:

- Trenching along canal berms in giant garter snake habitat could result in the take of a threatened species.
- Open trenches may trap wildlife, including giant garter snakes.
- Disturbance of habitats from equipment will require restoration.
- Vehicle disturbance to protected wetlands on the site and in the Sutter NWR. These will be fenced, marked, and monitored in monthly status reports.
- Possible disturbance of nesting Swainson's hawk if found within ½ mile of construction activities.

Types of operation impacts:

- Disturbance of protected wetlands on site by disking instead of mowing, which is less damaging.
- Stormwater runoff must not contain hazardous waste or debris that would affect biological resources.
- The electric transmission line and HRSG stacks may cause migratory bird collisions.

Project construction rules:

- Stay in approved work area (construction zone limits)
- Use approved access roads only
- Keep out of exclusion areas such as wetlands
- Do not litter
- No pets, firearms or hunting
- No fires
- Smoke only in cleared areas
- Do not feed or disturb wildlife
- Clean up and report all hazardous material spills
- Report injured or dead wildlife using the Wildlife Observations Form (Figure B-1).

The WEAT program will also include presentations on:

- Federal and state regulations and fines imposed for non-compliance.
- Responsibilities of the designated biologist.
- Who to call when giant garter snakes or nest sites are found.
- Video or slides showing the sensitive areas in the SPP project area.
- Cards, baseball card size with photos of sensitive biological resources.
- Pamphlet with signature page.
- Costs/consequences for not following project rules.
- Poster for field office with photos, who to call, wetlands, project rules
- Monitoring requirements of designated biologist including photography of wetlands and other sensitive habitats before and after construction activities.

Figure B-1. Wildlife Observation Form

| WILDLIFE OBSERVATION FORM | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| To Record Animals Found In Sutter Power Plant Project Areas | |
| To be filled out by personell who find active nest sites and burrows, dens, and dead or injured wildlife, or other biological resources during daily construction activities. | |
| Name of employee: | |
| Date: | |
| Location of observation: | |
| Condition of wildlife: alive <input type="checkbox"/> dead <input type="checkbox"/> | |
| Possible cause of injury or death: | |
| Where is the animal currently? | |
| Is the resource in danger of project (or other) impacts? | |
| Comments: | |
| Please contact the Designated Biologist for questions and to report any wildlife, nest, or den in the project area that could be disturbed. The Designated Biologist will advise personnel on measures required by California Department of Fish and Game (CDFG) and United States Fish and Wildlife Service (USFWS) to protect fish, wildlife and vegetation from construction impacts. | |
| DESIGNATED BIOLOGIST: | PHONE: |
| COMPANY: | EMAIL: |
| ADDRESS: | |
| USFWS CONTACT: | |
| CDFG CONTACT: | |

APPENDIX C—ON-SITE WETLAND PROTECTION PLAN

WETLAND MONITORING PLAN

Note: This On-Site Wetland Protection Plan was developed to monitor wetlands remaining on site after construction of the evaporative cooling towers as part of the SPP facility. Evaporative cooling towers emit a fine mist potentially containing particulate matter and salts. The wetland monitoring section of this On-Site Wetland Protection Plan was to monitor for potential impacts from the cooling tower drift and indirect construction activities. Calpine Corporation has decided to replace the evaporative cooling towers with dry cooling towers that do not emit substances to the atmosphere or surrounding open areas. Potential impacts from cooling tower drift are no longer a part of the project and construction activities are not expected to occur in the area where the remaining wetlands are located. The CEC included the wetland monitoring requirements in their Preliminary Staff Assessment. Because Calpine has eliminated impacts from the construction and operation of SPP, the CEC will most likely not require monitoring of wetlands remaining on-site (Personal communication between Linda Spiegel (CEC Staff biologist) and Debra Crowe (project biologist), September 22, 1998). The wetland monitoring plan will be implemented only if the CEC and Calpine determine it to be necessary after final project review. The determination will be included in the CEC Final Decision for the project.

C.1. Introduction

As discussed in the previous sections, eight seasonal wetlands encompassing 5.83 acres will be lost to construction of the SPP on the Calpine property. Twenty-two seasonal wetlands encompassing 2.84 acres will remain on-site after construction (Figure C-1). As a Condition of Certification (BIO-11) of the SPP project, the CEC requires that the remaining wetlands on-site be monitored for functionality on an annual basis for the life of the project (expected 30 years), however, the monitoring frequency may be decreased or monitoring may cease if it can be shown the SPP has no impact on the remaining wetlands.

C.2. Protection of On-site Wetlands

Potential indirect impacts to remaining seasonal wetlands on-site include soil compaction from construction vehicles, debris and stormwater runoff into wetlands, disking for fire control, and temporary construction impacts to vegetation. Indirect impacts are not expected to occur, however, several protective measures will be implemented during

construction, operation, and maintenance of the SPP to ensure protection of the remaining wetlands on the Calpine property.

1. During construction of the SPP construction debris and runoff will be confined to immediate construction areas. Use of impermeable fence barriers would be implemented if construction is anticipated within 500 feet of remaining wetlands on-site and Sutter NWR wetlands.
2. During operation of the SPP, stormwater runoff will be routed away from wetlands to the discharge canal on site.
3. Construction vehicles will be limited to access roads and construction areas only. Construction zone limits that identify sensitive habitats by flagging and/or signage will be implemented.
4. If construction of the SPP unexpectedly requires construction vehicles to access wetland areas, the activity will be limited to months when the soils are dry and hard. A protective cloth/platform (temporary platform from railroad ties, wire mesh, or other material that supports heavy equipment) that protects against soil compaction will cover the wetland before access to vehicles is allowed.
5. Revegetation of disturbed habitats will be implemented after construction is complete (see SPP Erosion Control, Revegetation, and Stormwater Management Plan in Appendix F). Revegetation of habitats will include like-kind species, i.e., grassland species in grassland areas and wetland species in wetland areas.
6. The grasslands on-site, which include the seasonal wetlands, will be mowed during the summer for fire control instead of disking to preserve the integrity of wetland soils and potentially increase the number of wildlife species that inhabit the wetlands and grasslands. Mowing simulates the historic grazing that occurred in the area before farming and may allow soils to develop defined horizons. Wetlands with trees and cattails (former mosquito abatement ponds) will be left undisturbed as in previous years.
7. Preconstruction and post-construction aerial photographs will be taken and analyzed to determine the amount of wetland taken by the SPP or impacted outside the footprint. A monitoring report will be submitted to the CEC and USACE documenting wetland acreage affected by construction.

8. A fund to finance the monitoring program will be set up before construction is complete. The fund will cover the first year of monitoring costs and be updated if it is determined by Calpine and CEC that further monitoring is warranted (i.e. if SPP operations adversely affect wetland function).

The following sections of the monitoring plan outline the success criteria, field methods, monitoring schedule, monitoring reports, and suggested remedial actions if adverse wetland impacts are observed and attributed to SPP operations.

C.3 Wetland Monitoring Methods

Wetland ecosystems and surrounding landscapes are dynamic and constantly changing. Variability in the wetland ecosystems resulting from natural processes needs to be taken into account when monitoring over a period of time. Short-term changes in seasonal weather cycles such as temperature and precipitation (drought and floods) can produce variability in wetland function from year to year. Documenting change is useful but the ultimate objective is for the wetlands to retain a functional capacity. Because the wetlands on the SPP site are man-made and have developed to their present state over a relatively short period of time, they are expected to show changes over the monitoring period, probably for the better. Functional capacity of the seasonal wetlands on the SPP site includes the ability of the wetland to hold water and support wetland plant species, and in some instances are habitat for aquatic invertebrates.

Success Criteria

The seasonal wetlands on-site retain wetland parameters in that they have indicators of wetland hydrology, soil, and vegetation. Wetland indicators are defined in the 1987 USACE Wetland Delineation Manual. The wetland indicators observed for the SPP wetlands are included in the Sutter Power Plant Wetland Delineation Report (Foster Wheeler 1997).

The remaining seasonal wetlands on-site are expected to retain their current wetland functions during construction, operation, and maintenance of SPP. The success criteria for this project are identified as the presence of wetland indicators, which are described in the following paragraphs. Field data will be collected from the wetlands after construction to determine if success criteria are present. The data will be compared to a control wetland with similar wetland characteristics. If Calpine shows impacts to wetlands are a possibility from operations, they may use a control wetland in the Colusa National Wildlife Refuge (Colusa NWR), which receives inundation from rainfall similar to the wetlands on Calpine's property. A special-use permit is required from the refuge manager authorizing access to the control wetland. If the wetlands on-site retain wetland indicators after the first year of operation, it should be determined that adverse impacts from SPP operations are not occurring on-site and the frequency of monitoring should be decreased or stopped.

Wetland hydrology indicators include inundation and/or saturation of soils long enough to support wetland vegetation. The seasonal wetlands on-site obtain hydrological characteristics from direct precipitation and runoff from surrounding uplands during the

wet season (November to March). Adverse impacts to wetland hydrology can occur when 1) a source of inundation is cut off (drainage from surrounding uplands), drained (by trenches), or re-routed, or 2) if contamination of the water prevents wetland vegetation from growing, or 3) the wetland is filled, or 4) inundation does not occur long enough to support wetland vegetation (over a period of years), or 5) the contour slopes are modified which change the drainage pattern and direction. It should be noted that severe drought can temporarily have an affect on hydrology in a wetland but normally does not destroy a wetland.

Wetland soil indicators include presence of the underlying clay layer, low chroma, and/or concretions. Adverse impacts to wetland soils occur if 1) soils become compacted (deep tire ruts) or 2) the impermeable clay layer is punctured.

Wetland vegetation indicators include a predominance of plant species whose indicator status is FAC (facultative), FACW (facultative-wet), or OBL (obligate) as identified in Reed 1988. Adverse impacts to wetland vegetation occur if 1) the hydrology is absent (no inundation or saturation long enough to support wetland species), or 2) soils are modified (leveled or punctured) to where they do not retain water, or 3) contaminants from source water, or weed control affect productivity.

Field Methods for Data Collection

Baseline data was collected from the wetlands on-site during the wetland delineation activities in April 1997. Additional data and photographs will be collected from on-site wetlands and control wetland in the 1998-99 wet season before construction begins. These data will be used to compare data collected during the monitoring program.

Field data will be collected during the wet season (November to March) to determine wetland parameters of the remaining wetland on-site and the control wetland. Data will be recorded on data sheets (Figure C-2) for each wetland.

Collection of hydrology data will include depth and duration of inundation. Contact with SPP and Colusa NWR personnel will be initiated by the Designated Biologist to determine the start of inundation. Depth and drainage patterns will be identified during the field data collection each monitoring year. Observations of aquatic invertebrates and other wildlife species utilizing the wetland will be documented on the data sheets.

Wetland Monitoring

Figure C-2. Wetland Monitoring Data Sheet

| | | | | | |
|-------------------------------------------------------------------------------------------------|----------------|------------------|--------------------------------|----------------|------------------|
| Project: | | Date: | | Page of | |
| Survey objective: | | Observer(s): | | | |
| Equipment: | | Wetland ID No: | | Photo No: | |
| | | Time start: | | Time end: | |
| Weather conditions: (wind direction/speed, precipitation, visibility, cloud cover, temperature) | | | | | |
| VEGETATION | | | | | |
| | % | | | % | |
| Plant Species/layer | Relative Cover | Indicator Status | Plant Species/layer | Relative Cover | Indicator Status |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Percent Wetland Vegetation: | | | Is Wetland Vegetation Present? | | |
| HYDROLOGY | | | | | |
| Wetland Indicators: | | | | | |
| Water Depth (cm): | | | | | |
| Duration of Inundation (days) and Source | | | | | |
| Other Species | | | | | |
| Is Wetland Hydrology Present? | | | | | |
| SOILS | | | | | |
| Wetland Indicators | | | | | |
| Observed Disturbances | | | | | |
| Salt Accumulation | | | | | |
| Wetland Soils Present? | | | | | |
| NOTES | | | | | |
| | | | | | |
| Is Area Still a Wetland? | | | | | |

Soils will be monitored for compaction from vehicles or other disturbances. Soil sample pits will be obtained and analyzed for wetland soil indicators from representative wetland types.

Most wetland vegetation species occurring on the SPP site may be identified during the wet season, however, some annual species may require identification in the spring. Each species observed will be noted on the data sheets. The dominant species (greater or equal to 20 percent relative cover) will be identified. The wetland vegetation status will be determined if 50 percent or more of the dominant species are FAC, FACW, and/or OBL.

Photographs of each wetland will be obtained on an annual basis to document vegetation and hydrology. The photographs will be taken at the same vantage point each year. The vantage points will be included on Figure C-1 in the monitoring reports.

Monitoring Schedule

Wetland monitoring will be conducted annually during the wet season. Table C-1 identifies the monitoring schedule for wetland parameter data collection. Monitoring of the wetlands will be conducted during the two years of construction and for one year of operation and may be discontinued if Calpine and CEC Staff agree that the wetlands are not being adversely affected by SPP operations. If adverse or questionable adverse impacts are observed during the first year, monitoring will continue and remedial actions may be implemented.

Table C-1. Monitoring schedule and wetland parameters for field data collection.

| Wetland Parameter | Field Data Collection Date | Data to Collect |
|-------------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Hydrology | January | Wetland hydrology indicators, water depth, drainage patterns, duration of inundation, use by aquatic invertebrates and other wildlife species. |
| Soils | January | Wetland soil indicators, disturbance of contour slopes, vehicle traffic, accumulation of salts. |
| Vegetation | January and possibly April | Wetland vegetation indicators, dominant plant species, percent of relative cover, indicator status of species. |

Data Analysis and Monitoring Reports

The data collected during the monitoring program will be analyzed to determine if there is change in wetland indicators within the remaining wetlands on-site. Changes in wetland hydrology can be measured by a change in depth and duration of inundation. Each wetland will be evaluated for indicators of wetland hydrology, soil, and vegetation. These results will be compared to the baseline data and control wetland data to determine if there are changes in wetland function, i.e. capacity to hold water, vegetation changes from wetland to upland species, or soil disturbance. The table in Figure C-3 will be used as a summary sheet to document success criteria (wetland indicators) that are met for each wetland.

A monitoring report will be submitted to the CEC no later than July 31 of each year monitoring is completed. The report will contain the following:

1. Introduction
Includes the monitoring year and brief description of the project.
2. Field methods
Data collection methods used.
3. Results
Includes changes in SPP operation or maintenance activities, data collected, species observed.
4. Analysis of Impacts
Includes determination of changes in wetland indicators, comparison to control wetland, and whether success criteria are met.
5. Discussion and Recommendations
Includes recommendation for changes in monitoring frequency.

Wetland Parameter Summary

Figure C-3. Summary of wetland parameters for each seasonal wetland on the SPP site.

| Project: | | | | | | | | | | | | Survey date: | | | | | | | | | | | | |
|---------------------------------------------------------------------------------------------------------------|---------|---|---|---|---|---|---|---|----|----|----|--------------|----|----|----|----|----|----|----|----|----|----|----|--|
| Survey objective: | | | | | | | | | | | | Observer(s): | | | | | | | | | | | | |
| Wetland # | Control | 1 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 21 | 22 | 23 | 24 | 25 | |
| Wetland type* | | | | | | | | | | | | | | | | | | | | | | | | |
| Vegetation met? | | | | | | | | | | | | | | | | | | | | | | | | |
| Hydrology met? | | | | | | | | | | | | | | | | | | | | | | | | |
| Soil met? | | | | | | | | | | | | | | | | | | | | | | | | |
| Changes from baseline data | | | | | | | | | | | | | | | | | | | | | | | | |
| *V=transitional vernal pool, B=borrow pit, D=seasonal depression, M=mosquito abatement pond, P=perennial pond | | | | | | | | | | | | | | | | | | | | | | | | |
| Notes: | | | | | | | | | | | | | | | | | | | | | | | | |

Remedial Actions

Remedial actions are proposed remedies for adverse project impacts not initially anticipated to occur as part of the proposed project. Remedial actions that would ensure no net loss of wetlands would be implemented if adverse impacts (i.e. do not meet success criteria) occur from SPP operations. Adverse impacts could include fill of wetlands, destruction of hydrology or soil structure, or adverse water quality.

Adverse impacts are not expected to occur to wetlands remaining on-site after construction of SPP, either from operations or maintenance of the plant. However, if impacts are observed during the monitoring program, the following steps will be taken:

1. Evaluate if SPP operations are the cause of adverse impacts by a comparison to control wetlands (include analysis in annual monitoring report).
2. Contact CEC with adverse impact analysis results and possible solutions.
3. Identify if impact can be repaired immediately and/or easily with corrective measures to repair soil structure and/or contours, or enhance vegetation with plantings.
4. Continue monitoring for at least five years after adverse impact corrected.
5. If corrective action are not possible on-site, resort to off-site remedial action, such as off-site mitigation for wetland acreage impacted in an approved mitigation bank under consultation with USACE, USFWS, and CEC.

References

- Foster Wheeler (Foster Wheeler Environmental Corporation). 1997. Wetland Delineation Report Sutter Power Plant Project, Sutter County, California. Prepared for Calpine Corporation. June.
- Foster Wheeler. 1998. Biological Assessment Sutter Power Plant Project, Sutter County, California. Prepared for Western Area Power Administration. April.
- Reed, P.B., Jr. 1988. National list of plant species that occur in wetlands: California (Region 0). U.S. Fish and Wildlife Service Biological Report 88 (26.10). 135 pp.

APPENDIX D—HABITAT COMPENSATION PLAN

Location of Mitigation Lands

All habitats permanently lost to construction of the SPP facility, natural gas pipeline, electric transmission line and switchyard will be replaced and preserved in off-site areas. Habitats temporarily disturbed during construction will be restored to original vegetation types after construction.

Several potential locations were reviewed for mitigation purposes;

- Sutter NWR expansion project (Calpine would need to complete construction of habitats and monitor for 5 years before available to USFWS to complete mitigation),
- Middle Mountain Foundation (too new and not organized enough to meet monitoring and management requirements),
- CDFG Conservation Easement at Gilsizer Slough (surrounding lands are actively farmed),
- Yolo County Land Trust (transfers habitats outside of Sutter County),
- Wildlands, Inc. in Placer County (does not contain giant garter snake or Swainson's hawk habitat).
- Wildlands, Inc. in Colusa County (not fully established).

Ecologically, the preferred location for habitat replacement was within the Sutter NWR because it is in close proximity to the SPP site and contains similar habitats that will be lost to construction. The Sutter NWR is planning to purchase rice fields south of its property to expand the refuge by a maximum of 1,000 acres.

The second most preferred location for habitat mitigation is at the USFWS approved mitigation bank Wildlands, Inc. Wildlands, Inc. is constructing a new mitigation bank (Dolan Ranch Conservation Bank) in Colusa County under consultation with the USACE, USFWS and CDFG. The 252-acre property is west of the Sutter Buttes and Sacramento River approximately three miles south of the town of Colusa. It is on the east side of Highway 20 near the Colusa Airport and approximately 18 miles northwest of the SPP site. The new mitigation bank will be managed for seasonal wetlands, giant garter snake, and Swainson's hawk forage habitat. Mitigation credits are expected to be available by late 1998 or early 1999. The CDFG has given verbal authorization for Calpine to purchase credits for giant garter snake and Swainson's hawk in the Dolan Ranch Wildlands, Inc. mitigation bank and seasonal wetlands in the Placer County Wildlands, Inc. mitigation bank for the SPP project.

Table D-1. Habitat acres lost, replacement ratios, habitat replacement acres, and location of mitigation.

| Project Area | Total Acreage Lost | Swainson's hawk forage habitat | | Giant garter snake habitat | | Wetlands |
|-------------------------------|--------------------|--------------------------------|---------------|----------------------------|------------------|------------------|
| | | grassland* (acres) | Crop# (acres) | upland (acres) | aquatic+ (acres) | seasonal (acres) |
| SPP footprint and access road | 16.73 | 16.73 | 0 | 2.7 | 0 | 5.83 |
| Gas pipeline | 0* | 0* | 0* | 0* | 0 | 0 |
| Dehydrator stations | 0.2 | 0 | 0.2 | 0 | 0 | 0 |
| Electric transmission line | 0.007 | 0.007 | 0 | 0.007 | 0 | 0 |
| Switchyard | 2.2 | 0 | 2.2 | 2.2 | 0 | 0 |
| Total habitat acres mitigated | 19.137 | 16.737 | 2.4 | 4.907 | 0 | 5.83 |
| Mitigation ratio | | 1:1 | 0.5:1 | 3:1+ | -+ | 1:1 |
| Total replacement habitat | <u>38.488</u> | 16.737 | 1.2 | 9.814 | 4.907 | 5.83 |

*Temporary or indirect impacts to habitats only.
 #Because the function of cropland and dry seasonal wetlands for Swainson's hawk is forage habitat, croplands and wetlands lost to SPP project will be mitigated with annual grassland.
 +Giant garter snake aquatic habitat will not be lost but is a part of the mitigation replacement habitat for loss of upland habitat.

Funding Mechanism

An endowment fund will be set up with a mitigation bank (most likely Wildlands, Inc.) under approval from regulatory agencies (CEC, USFWS, USACE) and Calpine before construction of the SPP project begins. The endowment fund will include monies for habitat compensation and monitoring programs. The fund will include costs for the total proposed mitigation requirements, however, Calpine may be refunded excess mitigation payments after construction if the habitat acreage impacted by project construction is less than the proposed amount. Total habitat acreage impacted will be determined by aerial photography within 30 days after completion of construction and documented in a report to the CEC Compliance Project Manager.

APPENDIX E—PLAN MODIFICATION PROCESS

This BRMIP contains mitigation and implementation measures that protect biological resources from project impacts to the maximum extent feasible. However, it is possible that unforeseeable project or regulatory changes could occur before or during construction. Some of these changes would require changes and/or additions to the BRMIP. Project changes could be required if current construction plans are found to be unsuitable for the project. Regulatory changes could occur if a non-listed species becomes listed under the Federal and state Endangered Species Acts and is found in the project area.

If it becomes essential to change mitigation or implementation measures, the CEC CPM will notify Calpine and the designated biologist in writing that a change in project design (engineering, construction methods, etc.) may require a change in mitigation measures and/or implementation measures. Calpine and the designated biologist will then submit a Change Order within 30 days that outlines specific changes or suggestions that will minimize impacts from a change in construction methods or to newly listed species. Calpine and the designated biologist will then receive authorization from the CEC within 14 days (and other agencies if required) for the project changes. All requests and approvals will be in writing and included in the Monthly Compliance Reports.

APPENDIX F—EROSION CONTROL AND REVEGETATION PLAN

Erosion Control, Revegetation, and Storm-water Management Plan

1. Background
 - 1.1. Surface Erosion
 - 1.2. Mass Wasting
2. Hydrology
3. Methodology
 - 3.1. Construction
 - 3.1.1. General conditions
 - 3.1.1.1. Materials
 - 3.1.1.2. Equipment
 - 3.1.2. Erosion Control measures
 - 3.1.2.1. Surface Runoff control
 - 3.1.2.1.1. Temporary construction control measures
 - 3.1.2.1.2. Engineered structures
 - 3.1.2.2. Slope Protection
 - 3.1.2.3. Revegetation
 - 3.1.3. Non-storm-water Management
 - 3.2. Operation
 - 3.2.1. Storm-water management
 - 3.2.2. Erosion Control Monitoring
 - 3.2.3. Monitoring effectiveness of revegetation

1. Background

Erosional processes occur naturally in most areas. As the inclination of slopes increase, the intensity of erosion increases a corresponding amount. In addition, as the amount of vegetative or engineered cover decreases the amount of erosion increases a corresponding amount. Two general types of erosional processes occur in most areas. *Surface erosion* is the particle-by-particle removal of soil and rock fragments from the ground surface, usually by water, wind, or ice. *Mass wasting* is the downslope movement of soil/rock materials as more or less cohesive masses, at rates ranging from extremely slow to extremely rapid. Factors affecting various portions of the areas disturbed during construction will combine in various intensities, depending primarily on the site characteristics and climatic conditions. Erosion is initiated when a number of key

elements combine and reach a critical threshold level. The type of process that is initiated is dependent on the combination of site and climatic characteristics.

1.1. Surface Erosion

Surface erosion in the vicinity of the site consists of a number of processes. Erosional processes related to flowing water include sheet erosion, rill erosion, and gullying. Surface runoff is the primary agent of erosion that will impact areas disturbed by construction. Sheet and rill erosion will be the predominant type of surface erosion. Gullying may occur in areas where slopes exceed 10%; if areas are left unprotected during precipitation events. Aeolian (wind) erosion will occur in non-vegetated areas. The amount of aeolian erosion is primarily dependant on wind velocity and soil moisture content.

1.2. Mass Wasting

Debris flows consist of masses containing various combinations of soil, rock, water and vegetation that flow rapidly downslope in a viscous state. These commonly are initiated on steep slopes, pick up speed and more materials as they move downslope, and run out onto areas of flatter terrain or into stream channels. They typically occur when ground conditions are saturated, during intense, prolonged rainstorms. Landslides are similar to debris flows, except that their movement rates are generally very slow, and they may even occur in areas of very gentle slopes. Landslides are the result of a combination of factors, similar to debris flows, and usually include removal of downslope support beneath the mass of material, and high ground water or soil moisture levels. Only a few areas of the project, very limited in spatial extent, could be impacted in this way.

2. Hydrology

Average annual rainfall is between 17 and 18 inches. The rainy season typically occurs from November through March. January is the wettest month, with an average precipitation of 4.03 inches. Summers are dry, July being the driest month, with an average precipitation of 0.05 inches. Measurable rainfall occurs, on average, 58 days per year. The majority of construction involving disruption of surficial material is scheduled to take place during summer months, when surface runoff will be minimal.

3. Methodology

3.1 Construction

3.1.1 General conditions

No pollutants, other than sediment, are anticipated to be present in storm-water runoff from the site. The construction of the power plant and switch yard will permanently alter surface drainage patterns in those areas. The degree of alternation will be minimal, and primarily consist of a decrease in the infiltration rate of surface runoff. The construction of either the transmission lines or gas pipelines will not permanently alter surface drainage patterns.

3.1.1.1 Materials

The storage and handling of toxic materials during construction is addressed in section 8.12 of the application. Construction related debris will be stored and disposed of in an appropriate manner. Small trash items and miscellaneous debris will be placed into storage bins for periodic disposal. Salvageable wastes will be stored onsite in a manner to prevent contamination of storm-water runoff and will be removed periodically.

3.1.1.2 Equipment

Construction equipment will be stored in a manner to minimize contact with storm water. Construction equipment will be stored in areas outside the natural surface drainage patterns and away from areas where storm water will pool and percolate to ground-water. All equipment loading and unloading will be done in a manner to minimize the effects on natural drainage patterns. Equipment access areas may be graded or protected to minimize deterioration due to equipment travel. No off-road vehicular travel, or equipment operation, shall take place during times of high soil moisture conditions when the surface cannot support such equipment or vehicles without causing excessive damage to vegetation and/or surface soils.

Equipment storage, cleaning, fueling, and maintenance areas will be located and maintained in a manner to prevent any contaminants from adversely affecting the quality of storm-water runoff. If necessary, absorbent pads shall be placed to catch all leaks from equipment parked overnight. In addition, refueling of vehicles shall be prohibited within 100 feet of a waterway. All spills will be cleaned up immediately. Major equipment cleaning and maintenance shall not be conducted along any of the pipeline or transmission line construction corridors.

3.1.2 Erosion Control measures

Erosion control measures will be implemented to reduce erosion associated with construction and various project structures. Erosion control measures available for application include revegetation, use of slope protection systems, soil moisture control systems, temporary structures to reduce the impacts from surface runoff during construction, and permanent engineered structures, such as culverts and ditches, to re-direct surface runoff upon completion of construction.

3.1.2.1 Surface Runoff control

3.1.2.1.1 Temporary construction control measures

Temporary control measures are used to re-direct surface runoff, decrease the velocity of surface runoff, capture suspended sediment, and stabilize exposed soil. These measures are most commonly employed during construction. Straw bale dikes, sandbag dikes, and siltation fences, will be installed as necessary along construction perimeters. Because the majority of construction will take place during months of very low precipitation use of these control measures is likely to be limited to the power plant and switchyard areas.

Aeolian erosion of disturbed soil is likely to be of more widespread concern during the construction period. Abatement measures will be taken wherever necessary to limit the production of dust from wind erosion in amounts damaging to property, cultivated vegetation, or causing nuisance to persons living or traveling in the vicinity. The following control practices will be employed to reduce aeolian erosion: limit speed of construction vehicles, dust watering, and covering spoil piles and applying dust suppressants if the spoil pile will not be disturbed for a period longer than 21 days. Section 8.9.3.1 of the license application provides a more detailed description of how temporary erosion control measures will be implemented.

3.1.2.1.2 Engineered structures

Engineered structures may be used to support, reinforce, or protect a slope or facility. These structures are primarily for sites where other alternatives will not be effective. In general, engineered structures will be applied on steep, highly erodible slopes or in situations where it is impractical to use a non-structural alternative because of site use. Engineered structures may include retaining walls, slope drains, and structures specifically designed to protect drainage ditches/canals. Due to the topography of the area, it is not anticipated that these measures will be required.

3.1.2.2 Slope Protection

Slope protection systems are designed to facilitate establishment of vegetation on slopes where inclination, aspect, or the rate of ongoing surface erosion requires reinforcement of the growing vegetation while root structures are being established. Slope protection systems usually consist of some type of mesh to hold the seed or seedlings in place, supported by weights or pinning to keep the mesh from migrating down the slope. The use of such protection systems is expected to be extremely limited for this project.

3.1.2.3 Revegetation

The objectives of revegetation include establishment of root structures to hold soil in place, reduction of the intensity of falling rain on surficial soils, providing obstacles that reduce the rate of surface runoff, and minimize the loss of wildlife habitat in the area. Establishment of vegetation provides long-term (usually permanent), relatively low cost and maintenance-free erosion protection. Revegetation is not a suitable solution for stopping active mass wasting, because the new vegetation will move downslope with the mass of soil/rock. Thus, in the few areas susceptible to mass wasting, such as steep road embankments disturbed during pipeline construction, care will be exercised to prevent the initiation of mass wasting.

The main biological and ecological benefits of using local native plants in restoration and revegetation work are straightforward. Such material is genetically adapted to specifics of the local climates and microclimates, resulting in better establishment and longevity of those plants. Revegetation with native species (Table 1) also provides wildlife habitat for species in the area, such as Swainson's hawk and the giant garter snake. Indiscriminate use of non-native species, and non-locally adapted native species, potentially disrupts natural ecosystem processes by introducing weeds, as well as genetically native gene pools. Although the specifics of such impacts are being debated, most biologists would agree that the use of locally adapted plant material in environmental restoration activities is the preferred approach.

Disturbed areas will be provided with permanent vegetative cover. Seeding operations will take place after the slopes and other areas have received final grading. In addition, any concentrated flow of water will be diverted from the seeding area. The intent of the grading operation is to provide a reasonably smooth surface free of rills and gullies. Prior to seedbed preparation the soil may be tested to determine existing nutrient conditions. Chemical fertilizer, humus, manure, or other appropriate organic soil supplement(s) shall

be applied if the soil tests show that existing fertility of the topsoil was lost as a result of construction activities.

A range of seedbed preparation methods shall be used, after final grading is complete. The seedbed preparation method used for any individual site shall depend on various factors including size of area, slope, potential for erosion and landowner requirements. The seedbed shall be prepared to a depth of 3 to 4 inches, where possible, by harrowing, disking or mechanical raking to provide a firm seedbed. Seed will be dispersed by dry broadcasting where slopes are less than 2:1. Manually operated cyclone-type spreaders will be employed to uniformly broadcast the seed. After broadcasting, the seed will be manually raked, on contour, into the top 3/8-inches of soil.

Hydroseeding may be employed for slopes greater than 2:1. Hydroseeding shall consist of mixing and applying seed with fiber and water. Hydroseed mix shall be applied at a rate of 1,500 lbs/acre of fiber mulch, 80 lbs/acre of organic tackifier and seed mix, as described in Table 1 *Erosion Control Seed Mix*. Organic tackifier shall be Ecology Control, Terratack III or other tackifier of similar quality. Mixing of materials for application with hydroseeding equipment shall be performed in a tank with a built-in continuous agitation system of sufficient operation capacity to produce a homogeneous mixture, and a discharge system that will apply the mixture at a continuous and uniform rate.

To reduce aeolian erosion and erosion from surface runoff, sloped and other critical areas will be mulched after seeding. Mulch materials will consist of straw or hay free from grain, wheatseed, and mold. The mulch will be applied at a rate of approximately 1,500 lbs/acre as soon as possible after seeding. The mulch will be spread uniformly over the seeded area and then punched into the soil using a mulch tiller, a modified sheepsfoot roller, or a weighted agricultural disc.

3.1.3 Non-storm-water Management

Non-storm water discharges will be controlled to the extent feasible. Appropriate measures will be taken to ensure construction water does not pollute receiving waters. Portable sanitary facilities will be provided for construction workers, as necessary. Construction water will be limited to the quantities necessary to give sufficient dust and wind erosion control, provide sufficient moisture for compaction of soils, and to wash aggregate.

3.2 Operation

3.2.1 Storm-water management monitoring

Disturbed areas, and areas used for storage of materials, that are exposed to precipitation will be inspected for evidence of, or the potential for, pollutants entering the drainage system. After stabilization measures are in place for any portion of the construction site, inspections will be conducted at least once every month during summer months, and at least every two weeks during periods of significant rainfall, greater than 1.0 inch/week.

3.2.2 Erosion Control Monitoring

The inspection and maintenance schedule will be finalized during construction to ensure that erosion control requirements are being met. Initially construction activities will be monitored for erosion control effectiveness on a daily basis, starting with the initial disruption of surface conditions. Monitoring frequency may be extended if daily monitoring is determined to be excessive. However, monitoring during construction will be at least weekly. In addition to the regularly scheduled monitoring and inspection program, inspection will also occur following special events, such as significant large rainfall, spills, or discharges from construction activities. This schedule will be continued until all disturbed areas are stabilized. An Erosion Control/Storm Inspection Log will be maintained that documents field inspections and any maintenance and/or repair work performed. Where significant erosion has occurred, information on intensity and type of erosion shall be recorded, and the area will be repaired as necessary. The log shall also note areas that cannot be immediately repaired due to saturated soils or inaccessibility to equipment, and an estimate of when repairs will be initiated.

3.2.3 Monitoring effectiveness of revegetation

Vegetation restoration will be monitored following the completion of construction. Areas where vegetation is not re-established, or where erosion takes place will be identified, and appropriate remedial actions implemented. Potential actions will include additional seeding, installation of irrigation systems to promote vegetation growth, regrading, or installation of engineered structures to control surface-runoff. Corrective actions will be implemented as soon as feasible, but not later than the start of the next rainy season.

Vegetation monitoring will be conducted as part of routine project maintenance activities, and after major storm events. Areas that have been re-seeded will be monitored at least

annually for a period of 2 years following seeding. When needed, additional remedial measures will be implemented as part of the project maintenance program.

Table F1. Erosion Control Seed Mix

| Scientific Name | Common Name | Seed Application (lbs/acre) |
|---------------------------------|-------------------------|----------------------------------------|
| <i>Bromus carinatus</i> | California Native Brome | 9 |
| <i>Melica californica</i> | California Melicgrass | 4.5 |
| <i>Elymus glaucus</i> | Blue Wild Rye | 6 |
| <i>Eschscholzia californica</i> | California Golden Poppy | 1 |
| <i>Lupinus succulintus</i> | Arroyo Lupine | 1.5 |
| <i>Vulpia myuros</i> | Zorro Fescue | 7 |
| Total | | 29 |

APPENDIX G— AVIAN COLLISION MONITORING PLAN FOR SUTTER POWER PLANT ELECTRIC TRANSMISSION LINE AND HRSG STACK IMPACTS

INTRODUCTION

Project Description

Calpine Corporation (Calpine) is requiring a new 4.0-mile 230kV electric transmission line to connect their proposed Sutter Power Plant (SPP) project to existing Western Area Power Administration (Western) lines. The new electric transmission line will parallel existing roadways south from the proposed SPP site to the east levee of the Sutter Bypass (Figure G-1). The SPP also requires construction of two 145-foot tall Heat Recovery Steam Generator (HRSG) stacks at the plant site.

The transmission line route follows county roads. Sutter County is in the Pacific Flyway and is wintering grounds for large flocks of ducks, geese, cranes, and shorebirds. Several special-status birds winter in the project area, including Aleutian Canada goose, peregrine falcon, bald eagle, greater sandhill crane, and Swainson's hawk. Other raptors in the area include red-tailed hawk, Northern harrier, white-tailed kite, and turkey vulture. Public and agency concerns about project impacts warrant post-construction monitoring for avian collisions with the transmission lines and HRSG stacks. Agencies (USFWS and CDFG) are concerned that populations of special-status species could be adversely affected by collisions with the lines or stacks. Hunters are concerned about lines causing population decline of game birds such as geese, ducks, pheasants, and dove, however, they are also concerned that transmission lines will deter birds from coming into areas that they use as hunting grounds.

Transmission Line and HRSG Stack Descriptions

The proposed power poles are 106-foot tall, single metal poles with double circuit-upswept arms (Figure G-2). Two parallel ground wires will be strung from the top of the poles for protection from lightning. The ground wires are normally thinner in diameter than conductor wires and do not conduct electricity. The ground wires will include fiberoptic lines as communication conductors between the plant and switchyard. Cement footings for the power poles will be augured into the ground, spaced approximately 750 feet to 800 feet apart. Western will construct the lines for the project and are expected to begin construction in the fall of 1999.

The proposed HRSG stacks are 145 feet tall with a diameter of 18.5 feet each and will be positioned within the security fence of the plant site (Figure G-3). The stacks are 175 feet apart and constructed of steel. Red airplane collision avoidance lights will be placed at the top of the stacks. Nitrogen and oxygen are the primary gases expelled by the HRSG stacks.

Mitigation Measures

Mitigation measures were developed during the Application For Certification (AFC) and Endangered Species Act (ESA) Section 7 consultation for the SPP project. The USFWS, CDFG, and CEC were consulted for appropriate measures that would minimize avian impacts from collisions and electrocutions. The transmission line route was chosen to minimize the crossing of open areas potentially used as forage by migratory birds and raptors. The mitigation measures also include designing the conductor wires for spacing greater than the wing spans of large birds (43 inches on the vertical and 60 inches on the diagonal) to prevent electrocutions. The top ground wire will be fitted with Bird Flight Diverters (BFDs) to visually enhance the wire and subsequently deflect birds from colliding with hard to see wires. Annual monitoring of the lines will be conducted to determine if the lines are a significant impact to waterfowl and special-status birds that forage and/or nest in the area.

The top ground wire will be marked with BFDs along the proposed route (Figure G-1). Studies have shown BFDs may reduce avian collisions by 57% to 89% (APLIC 1994). The BFDs are preformed high-impact PVC spirals that thread onto the shield wires (Figure G-4). They are 7 to 15 inches long with two 7-inch tall spirals. Optimal spacing is 5 meters apart. The BFDs can be staggered if more than one ground wire is used to achieve the optimal 5-meter spacing (Figure G-4). They come in gray or yellow with UV stabilizers for exposure to sunlight. The BFDs are spun onto the ground wire after it is pulled into place on the poles.

OBJECTIVES OF MONITORING PLAN

Incidental Take

Projects subject to federal and state Endangered Species Act and Migratory Bird Treaty Act provisions require consultation with the USFWS, NMFS, and CDFG on project impacts to listed species. During the SPP project impact analysis, Calpine anticipated that special-status birds might be incidentally taken as a result of implementing the proposed project. A Biological Assessment for the SPP project was submitted to the

USFWS and NMFS to initiate formal Section 7 consultation on April 22, 1998, describing potential project impacts to special-status species and proposed mitigation measures that minimize impacts. The CEC initiated consultation with the CDFG. The USFWS, NMFS, and CDFG will issue Biological Opinions (BO) and a Memorandum of Understanding (MOU), respectively, that will identify the amount or extent of Incidental Take allowed by the project. Incidental take is defined as take (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect a listed species) that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Incidental take of listed species could occur incidental of the SPP project if special-status birds collide with the electric transmission lines or HRSG stacks.

The special-status bird species anticipated to be in the project area include bald eagle, peregrine falcon, greater sandhill crane, Aleutian Canada goose, and Swainson's hawk. These species are either listed as threatened or endangered by the USFWS and/or the CDFG. The proposed spacing of the conductor wires will most likely eliminate electrocution hazards to large birds, however, collisions could occur with the top ground wire or conductor wires.

The significance criteria used in this monitoring plan are the number of each listed bird species allowed by USFWS and CDFG to be taken incidental to the project. The significance criteria (number of birds allowed) will be defined in the BOs and MOU. This monitoring plan describes the methods that will be used to determine if the significance criteria are exceeded and whether BFDs deflect the waterfowl and special-status bird species sufficiently to meet the USFWS and CDFG Incidental Take requirements.

METHODS

Installation of Bird Flight Diverters

Western and/or Calpine will install the BFDs during construction of the transmission line following the recommended spacing and locations (Figure G-4). The BFDs will be placed on the ground wires after the wires are threaded onto the power poles. They will be staggered over the two ground wires to be spaced five meters apart so that each wire supports one-half of the markers. Conductor wires are normally large enough in diameter to be seen by birds in flight and should not require marking with BFDs.

Monitoring for Bird Collisions

Because the new electric transmission line and HRSG stacks will be constructed in an area known to be habitat for several special-status birds, monitoring is required by the USFWS to determine if the line adversely affects populations of these birds. Calpine

recognizes the need to protect special-status species from project impacts. This monitoring plan will focus on evaluating the number of special-status birds that may be killed from collisions with the top ground wire and conductor wires. The significance criteria used in this monitoring plan are the number of each special-status bird species allowed to be taken incidental to the project as defined by the USFWS and CDFG. The agencies and CEC will be notified when any special-status species is found dead from collisions during quarterly dead bird searches. Waterfowl and other non-listed birds will be monitored for collisions with the lines and HRSG stacks and will be included in the annual reports to the USFWS, CDFG, and CEC.

Dead Bird Searches

Field searches for dead birds and feather spots (location where feathers are left after removal of carcass by predator or scavenger) will be conducted along the new electric transmission line and in the area around the HRSG stacks on-site to determine if the project causes significant impacts to birds. Monitoring the transmission line for avian collisions will begin after construction is complete and BFDs are installed. Monitoring avian collisions with the HRSG stacks will occur after construction of the SPP is complete.

Analysis of the winter and summer dead bird searches includes evaluation of the field search results, computation of bias estimates and estimated total collisions (see below), and a comparison of observed collision mortality relative to the significance criteria.

The searchers will follow a zig-zag pattern through the search areas to allow observations of the entire area. Two people will simultaneously conduct the surveys on either side of the lines.

When dead birds are found, the following information will be collected: map location of each dead bird, species, sex, age (adult or juvenile), approximate time of death, physical condition (broken bones, burns, open wounds, gunshot wounds, discoloration, damage by scavengers, etc.), and probable cause of death. These data will be recorded on field data sheets (Figure G-5).

Searchers

Qualified biologists familiar with the above mentioned special-status birds will conduct the dead bird searches under supervision of the Designated Biologist. Additional information may also be obtained from SPP operations personnel that may find dead birds during daily activities. This information will be included in the annual reports. A

search bias will be calculated for each searcher (see section on Search Bias below) that will be included in the estimate of total collisions.

Dogs will not be used to conduct searches as there are too many variables in their results (wind, temperature, vegetation height) and a search bias would have to be calculated for each dog. Search equipment includes: binoculars, spotting scope, pin flags, and bird tags.

Search Area

Dead bird searches will be conducted along the marked 4.0-mile electric transmission line. The width of the search area is determined with relation to the height of the powerline poles (APLIC 1994). The searches will be conducted in a corridor 45 meters (147.6 feet) from the outer conductors on either side of the 230-kV transmission line (APLIC 1994).

Searches for dead birds around the HRSG stacks will be conducted in a 55-meter (180.4 feet) radius from the stacks. Most of this area is within the security fenceline of the SPP site.

Documentation of Results and Reporting

All data collected by each searcher during the dead bird searches will be recorded on data sheets in the field. Figure G-5 presents a sample data sheet that will be used. The data sheets will be included with a description of activities in the annual monitoring reports to the CEC. Monitoring reports will be submitted by March 31 of each monitoring year.

Monitoring Schedule

Aleutian Canada goose, peregrine falcon, greater sandhill crane, and bald eagle are expected to be in the project area as early as October and could be found through March. Swainson's hawks are expected to be in the project area from March through September. Surveys for dead bird searches along the transmission line and HRSG stacks will focus on the winter migration period when the majority of birds are in the area. Searches will be conducted once a month in December, January, and February to include the migratory birds and once in July to include the period when juvenile Swainson's hawks are most likely to fledge. The designated biologist will notify the Sutter NWR manager of the scheduled bird searches before going out each time. The Sutter NWR may conduct their own bird searches along the existing PG&E and Western transmission lines near the refuge simultaneously for comparison purposes.

The dead bird searches will be conducted for the first three years after the startup of the SPP and electric transmission line (expected fourth quarter of 2000). If monitoring shows non-significant impacts to migratory and special-status birds from the project at the end of three years, Calpine will request from the CEC, USFWS, and CDFG a reduction in monitoring frequency or cessation of monitoring. Annual monitoring reports will be submitted to the CEC by March 31 of each monitoring year.

DATA ANALYSIS

Biases can occur in searches for dead and injured birds. Four biases are identified that could cause an underestimation of the number of birds that collide with transmission lines: search bias, removal bias, crippling bias, and habitat bias (APLIC 1994). In order to compensate for the underestimation of avian collisions, these biases will be analyzed and included in the estimated total bird collisions for the project.

Search Bias

A search bias takes into consideration a searcher's ability and experience, terrain, and vegetation. A bias is measured for each searcher. Dead birds are randomly placed in the search area and the searcher tries to locate as many of the planted birds as possible. A search bias will be calculated for each searcher for each season of the year to adjust for changes in vegetation heights. The percent of "planted" birds not found determines the search bias. The formula for calculations is as follows:

$$SB = (TDBF/PBF) - TDBF,$$

Where SB = search bias, TDBF = total dead birds and feather spots found in the search area, and PBF = proportion of planted birds found during the recovery.

Example: if 8 dead birds are found, including 4 out of 5 of the planted birds:

$$SB = (8/(4/5)) - 8 = 2 \text{ birds will not be found by this particular searcher}$$

Removal Bias

A removal bias is determined to consider the number of birds scavengers remove from the search area before a search. To measure a removal bias, a number of dead birds are marked and placed in the search area and the condition of the birds are monitored daily for one week. Removal bias is the percentage of missing birds with no trace remaining after one week. A removal bias will be calculated for each season of the year. The formula to determine removal bias is:

$$RB = (TDBF + SB)/PNR - (TDBF + SB),$$

Where RB = removal bias by scavengers, PNR = proportion of "planted birds not removed by scavengers, TDBF = total dead birds found, and SB = search bias.

Example: if 8 dead birds are found and 4 out of 5 planted birds are recovered:

$$RB = (8 + 2)/(4/5) - (8 + 2) = 2.5 \text{ birds are expected to be removed by scavengers}$$

Habitat Bias

A habitat bias is used only when some portion of a search area is not accessible because of water or dense vegetation (i.e. Gilsizer Slough). The habitat bias estimates the percent of unsearchable habitat for each transmission line segment. Habitat bias should only be used in limited situations where unsearchable habitat is finely interspersed with searchable habitat and where searchers can demonstrate the number of birds found in searchable and unsearchable habitats are similar. Habitat bias should only be included in the calculation for estimate of total collisions if credible numbers are calculated on-site.

The formula to determine habitat bias is:

$$HB = (TDBF + SB + RB)/PS - (TDBF + SB + RB),$$

Where HB = habitat bias, and PS = proportion of area that is searchable

Example: if 95 percent of the search area is searchable:

$$HB = (8 + 2 + 2)/(95/100) - (8 + 2 + 2) = 0.6 \text{ birds may not be found}$$

Crippling Bias

A crippling bias is determined to consider the number of birds that fall or move outside the search area. Crippling bias is difficult to obtain (time and effort are involved in monitoring flights and collisions) and estimates from other studies may be inappropriate or misleading. Crippling bias should only be used in the estimate of total collisions if credible numbers are obtained on-site. The formula to determine crippling bias is:

$$CB = (TDBF + SB + RB + HB)/PBK - (TDBF + SB + RB + HB),$$

Where CB = crippling bias and PBK = the proportion of observed collisions falling within the search area.

Example: if 4 out 5 birds that collide with the lines land in the search area, then:

$$CB = (8 + 2 + 2 + 0.6)/(4/5) - (8 + 2 + 2 + 0.6) = 3.15 \text{ birds are expected to collide and go out of the search area}$$

Estimate of Total Collisions (ETC)

An estimate of total avian collisions can be calculated using the field search results and the above bias estimates. The ETC adds the total dead birds and feather spots found and each of the calculated biases. An ETC will be calculated for each special-status species found during the dead bird searches. The formula to determine ETC is:

$$ETC = TDBF + SB + RB + HB + CB,$$

Where ETC is the estimate of total avian collisions with the segment of line studied.

Example: if 8 birds are found during the search, then:

$ETC = 8 + 2 + 2 + 0.6 + 3.15 = 15.75$ birds are estimated to be killed from collisions with the wires in this segment

Habitat bias and crippling bias should be eliminated if reliable calculations are not available.

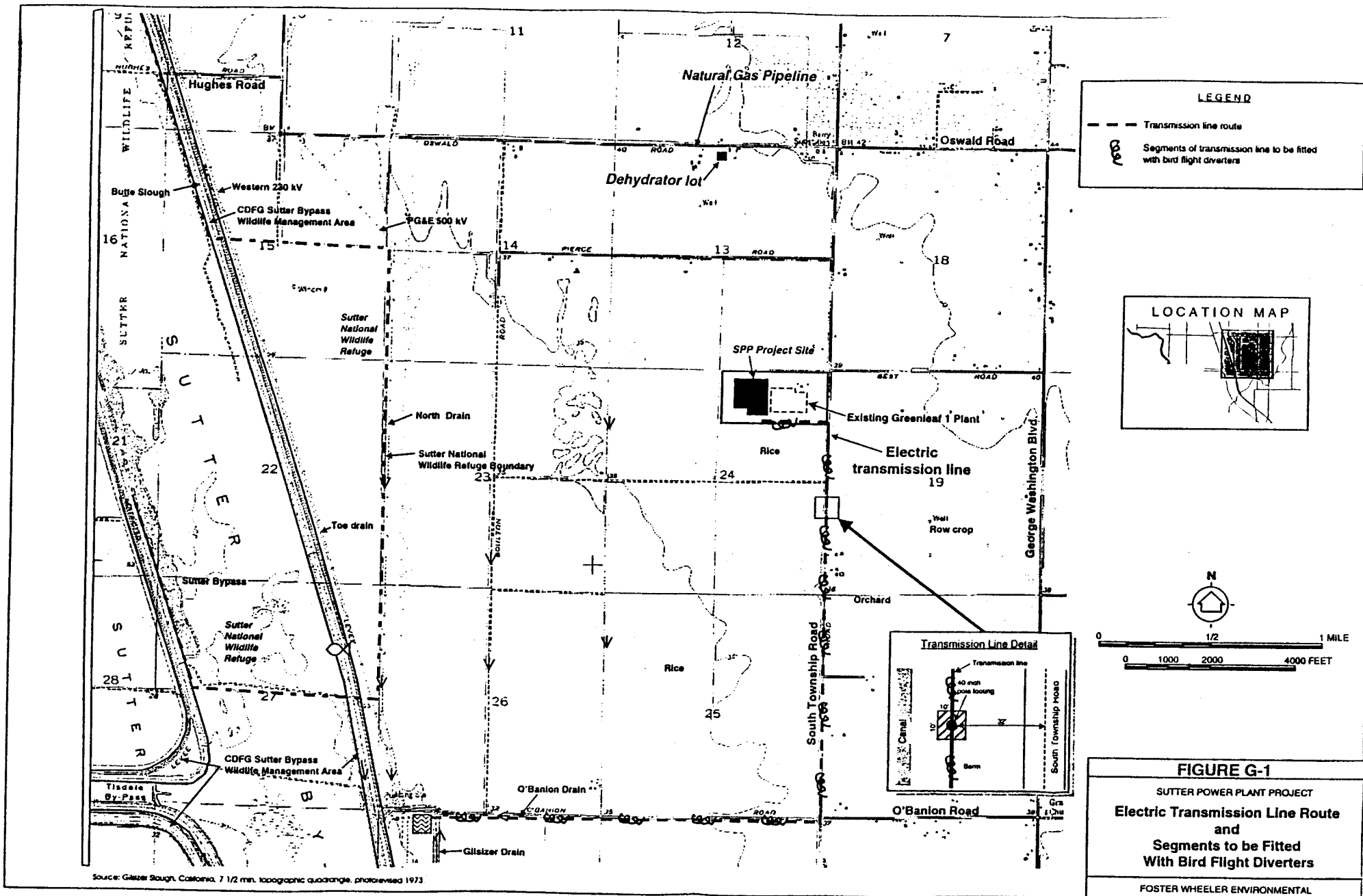
The estimate of total collisions will be determined for each special-status species and averaged over the first three-year monitoring period. The estimate of total collisions will be compared to the significance criteria set forth by the USFWS and CDFG. If the results of the dead bird searches are above the significance criteria after the first three years of monitoring, the monitoring program will continue on an annual basis and remedial actions may be implemented. If monitoring results show a decrease in the number of special-status birds incidentally taken by the project during the first three years or over the following three years, Calpine will ask for a decrease in frequency or cessation of monitoring. If during the dead bird searches large numbers of migratory and/or special-status birds are recorded during the dead bird searches, the USFWS, CDFG, and CEC will be notified immediately.

REMEDIAL ACTIONS

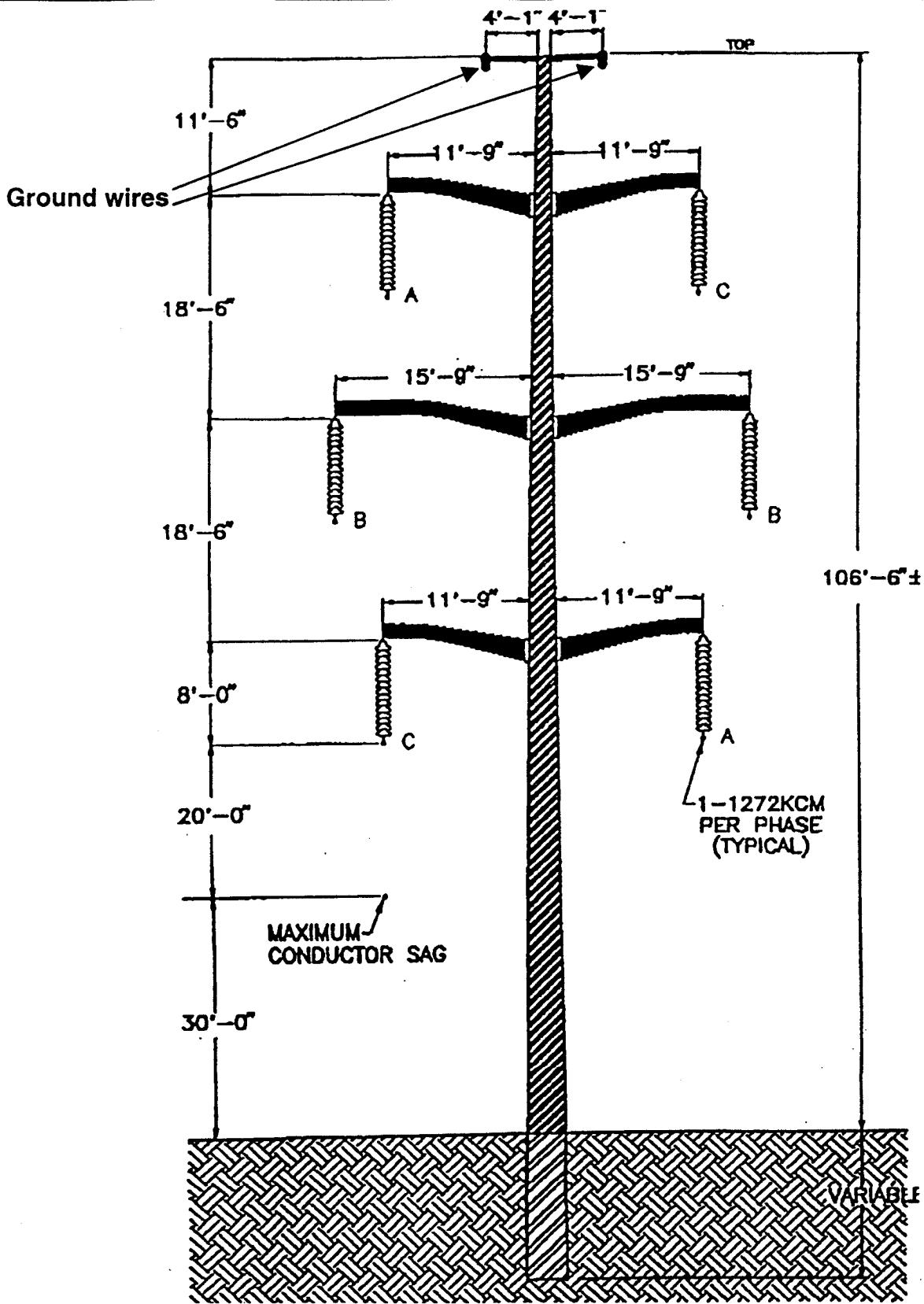
If it is determined by Calpine and verified by the USFWS, CDFG, and CEC that the electric transmission line and/or HRSG stacks causes significant impacts to migratory and special-status birds, remedial actions to decrease the incidental take at or below the significance criteria will be implemented.

Remedial actions may include:

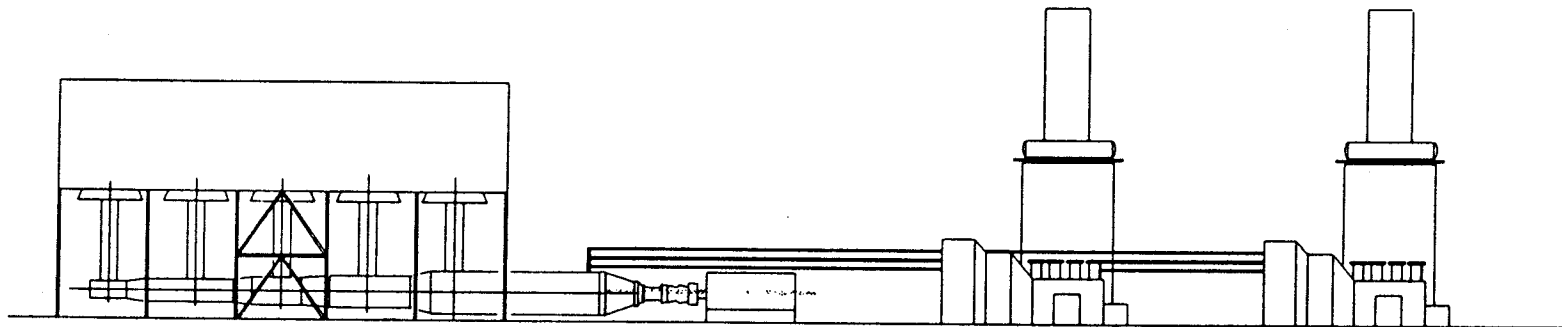
- Increase the number of BFDs along the top ground wires,
- Add BFDs to the conductor wires,
- Implement a study plan to determine the cause of excess avian collisions,
- Provide off-site compensation of breeding habitats, and/or
- Reinitiate formal consultation with USFWS and/or CDFG.



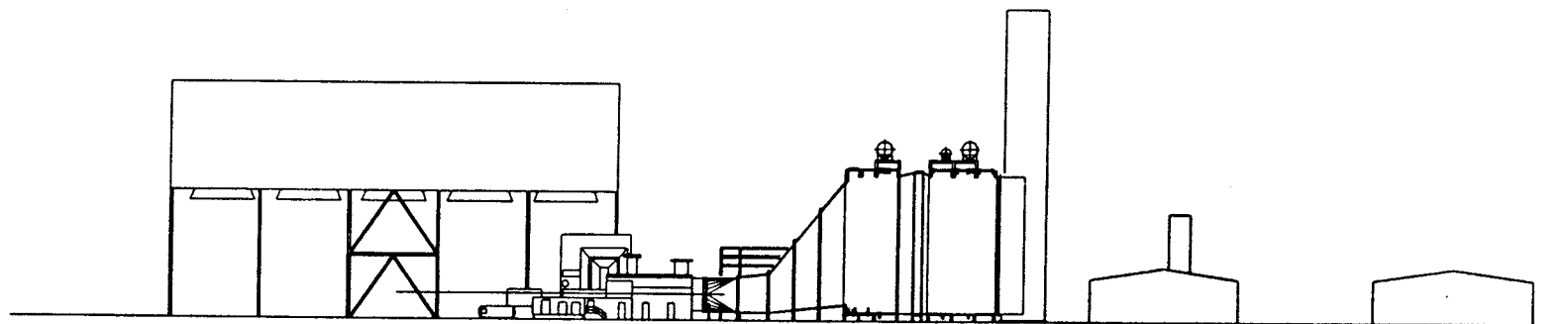
Source: Gasser Slough, California, 7 1/2 min. topographic quadrangle, photorevised 1973



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|--------------------------------------------------------------------------|
| FIGURE G-2 |
| SUTTER POWER PLANT PROJECT 230kV Transmission Line Pole Design |
| FOSTER WHEELER ENVIRONMENTAL |



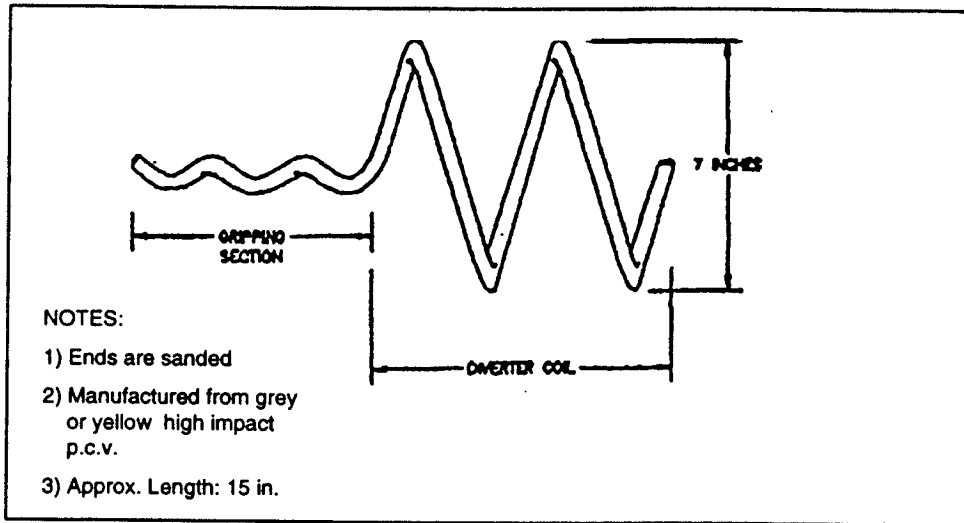
ELEVATION LOOKING NORTH



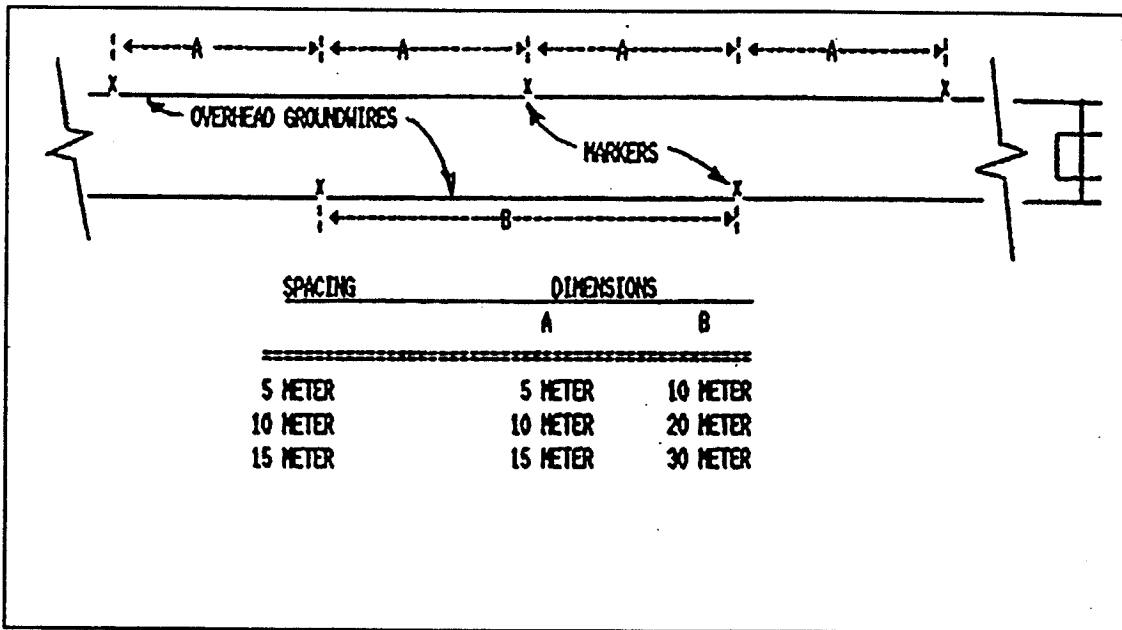
ELEVATION LOOKING WEST



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|------------------------------|
| FIGURE G-3 |
| SUTTER POWER PLANT PROJECT |
| ELEVATIONS |
| Foster Wheeler Environmental |



Dulmison bird flight diverter (BFD-7)



Marker spacing diagram for overhead groundwires

FIGURE G-4

SUTTER POWER PLANT PROJECT

**EXAMPLE OF BIRD FLIGHT
DIVERTER AND SUGGESTED
SPACING ON GROUND WIRES**

FOSTER WHEELER ENVIRONMENTAL

REFERENCES

APLIC (Avian Power Line Interaction Committee). 1994. Mitigating Bird Collisions with Power Lines: The State of the Art in 1994. Edison Electric Institute. Washington, D.C.

Brown, W., and Drewien, R. 1995. Evaluation of Two Power Line Markers to Reduce Crane and Waterfowl Collision Mortality. Wildlife Society Bulletin, 1995. 23(2): 217-227.

APPENDIX H—CONDITIONS OF CERTIFICATION

(forthcoming)

1. CALIFORNIA ENERGY COMMISSION CONDITIONS OF CERTIFICATION FOR BIOLOGICAL RESOURCES
2. CLEAN WATER ACT SECTION 404 PERMIT
3. CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD WATER QUALITY CERTIFICATION (CWA SECTION 401 PERMIT)
4. CALIFORNIA DEPARTMENT OF FISH AND GAME MEMORANDUM OF UNDERSTANDING
5. CALIFORNIA DEPARTMENT OF FISH AND GAME STREAMBED ALTERATION AGREEMENT OR WAIVER
6. UNITED STATES FISH AND WILDLIFE SERVICE AND NATIONAL MARINE FISHERIES SERVICE BIOLOGICAL OPINIONS



Appendix K

**California Energy Commission Brief
on Visual Resource Impacts in the
Matter of the Application for Certification
of the Sutter Power Project;
Dated Dec. 9, 1998**

Sierra Nevada Customer Service Region

STATE OF CALIFORNIA

Energy Resources Conservation
And Development Commission

| | | |
|-----------------------------------|---|---------------------|
| In the Matter of: |) | Docket No. 97-AFC-2 |
| |) | |
| Application for Certification for |) | BRIEF ON VISUAL |
| the Sutter Power Plant Project |) | RESOURCE IMPACTS |
| _____ |) | |

I. INTRODUCTION

Staff evaluated both the power plant and the transmission line for their impacts on visual resources. Staff determined that both the line and the power plant would cause significant impacts. With mitigation measures, including foliage screening, painting, and eliminating the steam plume with dry cooling, Staff concluded that the impact of the power plant itself was less than significant. (RT, 145:19.)¹ However, even after all mitigation agreed to by Calpine was applied, the impact of the transmission line would still be significant. (RT 145:20-23.)

Staff and Calpine each considered additional mitigation that might reduce the visual impact to less than significant levels. Measures considered included undergrounding the line, undergrounding the 12kV and 69kV lines on the opposite side of South Township Road, and an alternative transmission line route that would avoid South Township Road and O'Banion Road altogether. (RT 145:24-26.)

Upon investigation, each of these mitigation measures proved either infeasible or undesirable. (RT 146:1-10.) Undergrounding the transmission line would be significantly more expensive, and the Western Area Power Administration (WAPA) indicated that it would not be willing to build or operate such a line. Undergrounding the Pacific Gas & Electric (PG&E) lines on South Township Road was also expensive and probably infeasible, given that it is contrary to PG&E's policy to underground 69 kV lines. The alternative route across fields west of the power plant would have had impacts on agriculture and biological resources, including higher mortality to various birds (including state and federally listed species) because of proximity to the Sutter

¹ RT refers to the November 16, 1998, Reporter's Transcript unless a different date is indicated. Where a colon appears, the number preceding it is the page number; the number following the colon is the line number.

National Wildlife Refuge and the crossing of seasonally flooded rice fields. (See Exh. 51, p. 281.)

Acknowledging the limits of mitigation measures, Staff ultimately concluded that the impact of the transmission line to visual resources was "significant" under the California Environmental Quality Act (CEQA). Calpine provided its own assessment, concluding that the impact was "less than significant." The disagreement is addressed in this brief.

II. THE VISUAL IMPACT OF THE TRANSMISSION LINE IS SIGNIFICANT.

A. The landscape includes sensitive scenic resources.

The project viewshed is rural in character, with rice fields and orchards the prevalent agricultural elements. (FSA, p. 255.) The WAPA 230 kV and PG&E 500 kV transmission lines are visible from South Township Road, but are more than two miles distant, near the Sutter Bypass. (Ibid.) Sutter County describes the roadways along the nearby Sacramento River as "visually and aesthetically scenic." (FSA, p. 259.) The dominant physical feature in the area is the geographic formation known as the Sutter Buttes, which are visible from the viewshed. (Ibid.) Although there are no scenic roads or corridors in the project vicinity, views that include the Sutter Buttes are generally of high quality, and the scenic value of the Buttes is recognized in the County General Plan. (Ibid.)

The transmission line would run south from the power plant for about two miles adjacent to South Township Road, then turn west for approximately two miles adjacent to O'Banion Road. There are residences on South Township Road and east of South Township Road on O'Banion Road that will view the line, and whose view of the Sutter Buttes will be at least partly obstructed by the line. (FSA, p. 346, RT 163.) Sensitive receptors include not only residents in the area but travelers on the roads. (FSA, p. 259.)

B. The transmission line would be visually dominating from the vicinity of South Township and O'Banion roads.

The Staff analyzed visual impacts through the use of "Key Observation Points," or "KOPs", which are used to represent visual impacts from different general perspectives. (FSA, p. 259, 314.) Staff determined that the transmission line would cause a significant visual impact on the view area represented by KOP 5, the perspective from approximately 200 yards south of O'Banion on South Township Road. (FSA, p. 266.)

The visual impact at KOP 5 is depicted in visual simulations provided by the applicant. (See FSA, Vis. Res. Fig. 16; Priestley, Fig. Vis-12.) Currently, the only visual element rising above local orchards and residences is the wooden-

pole PG&E line, with poles less than 50 feet in height. (See FSA, Vis. Res. Fig. 15.) The proposed transmission line will become a new, dominating visual element more than 100 feet in height and with arms more than 30 feet across. (Exhibit 46.) The change in view created by the line will therefore be significant to viewers in the KOP 5 area, including the residents at the corner, residents further east from the corner, and travelers. (RT 156.)

The poles for the transmission line will be directly in the view of the Sutter Buttes for residents at the corner of O'Banion and further east on O'Banion. (RT 163-165, 12/1 RT 184-185.) For road travelers north from the intersection, the new poles "would cause a tunnel view effect," with overhead lines on both sides of the road on poles that contrast in form and scale. (FSA, p. 344.) These visual changes are "a substantial adverse effect on a scenic vista," and will "substantially degrade the existing visual quality of the site and its surroundings," two CEQA Guideline criteria for determining whether a visual impact is significant. (Cal. Code of Regs., tit. 14, Appendix G.)

III. CALPINE'S CRITICISMS OF THE STAFF'S CONCLUSIONS ARE WITHOUT MERIT.

A. Calpine's visual analysis is neither objective nor replicable by other analysts.

Calpine provided their own witness to challenge the Staff's conclusion that the visual impact was significant. His testimony criticized the Staff methodology and provided a different assessment, concluding that the impact was less than significant.

Calpine's witness criticized the Staff's method for being based on the Bureau of Land Management's (BLM) method. (Exh. 26, p. 57.) The basis for this criticism was never revealed, nor did the witness identify a published method he considered superior. (Ibid.) His criticism of Staff's use of the BLM method apparently concerns the use of matrices that assign ratings to different landscape features, while failing to "specify the criteria or thresholds that would allow another rater to apply the system." (Ibid.)

Calpine's argument implies that the Staff method is too simple, and needs even more criteria and elaboration to achieve replicability by other users. Yet, rather than offering a more sophisticated and objective approach, Calpine's witness provided instead an amorphous "overall landscape context". (Exh. 26, p. 58.)

This approach is not discussed in the published literature (RT 85-86), nor are there any identified rules, guidelines, or criteria for its application. (RT 84-86.) Under questioning, the Calpine witness could not describe how another

analyst would apply his approach. (See RT 80-85.) Important assumptions about such criteria as viewer sensitivity and scale dominance are not disclosed in the analysis, making it a “black box.” (RT 148-149.) There is absolutely no evidence in the record supporting Calpine’s suggestion that its seat-of-the-pants assessment is more objective and replicable than the BLM-based approach used by Staff.

A major problem with Calpine’s “overall” approach is that it fails to assess the visual dominance of the line for viewers in the vicinity of KOP 5. (RT 81-83.) Likewise, it failed to even mention the “tunneling effect” of the view from KOP 5. (RT 72:17-18.)

This omission is significant, in that Calpine’s visual analyst predecessor had identified this visual effect as “moderate to high.” (Exh. 10, Vis. Res. Data Request No. 6.) This assessment was based on “the visibility of two different transmission poles, the smaller existing wooden poles along the east side of South Township Road and the larger proposed steel poles along the west side.” (Ibid.) No other impact was identified by Calpine as “moderate to high” in significance. (11/16 TR 74-75.) Thus, while Calpine’s earlier analyst labeled this impact as the most severe impact associated with the transmission line, Calpine’s witness did not even address it in his testimony. (RT 72:18, 159.)

B. Calpine’s basis for concluding that the impact is less than significant is based on criteria that are illogical.

Calpine’s conclusion that the impact of the line from KOP 5 would be less than significant is based on reasoning that does not withstand scrutiny. The heart of that reasoning is on pages 67 and 68 of Exhibit 26, where Calpine provides the reasons it does not believe the visual impact to be significant.

1. “Power lines of varying voltage are visually prominent and not unexpected elements in rural portions of the Sacramento Valley landscape region.”

This statement, while true, is irrelevant to the issue of whether the project transmission line has a significant impact on visual resources. “Visual prominence,” which the applicant agreed means “conspicuous, highly visible” (RT 48:6), is entirely consistent with a significant impact. Likewise, that a given construction is “not unexpected” is totally irrelevant to impact significance. In modern society all sorts of projects—new freeways, high rise buildings, shopping malls, television towers—are “not unexpected.” Yet this scarcely diminishes their visual impact, nor does it render such impact less than significant.

The statement is also potentially misleading in that it fails to distinguish distribution lines (carried on small poles similar to telephone poles) from large transmission lines (i.e., 230 kV and above) that require much larger metal structures to carry their conductors. (RT 153-154.) Other than the PG&E and WAPA transmission lines two miles west of the project, Calpine's witness could not name any other major transmission lines in the project vicinity. (RT 64.)

Finally, this criterion indicates the underlying flaw of the amorphous "overall" approach used by Calpine's witness. The significance of an impact must be tied to the impact on viewers and locations. It needs to consider the dominance of the new element in the visual context. To label something "not unexpected" says little meaningful about its visual impact.

2. "The proposed alignment of the transmission line with the roads and other features of the areas rectilinear landscape would make them consistent with the overall structure of the areas landscape."

Ironically, "rectilinear alignment" actually serves to increase the visual impact of transmission lines to all but birds and aviators. This is because these alignments usually follow roadways, and roadways increase the number of sensitive receptors in the form of travelers and residences. (TR 52-53, 155:20-24.)

3. "Very small numbers of viewers would be affected."

Calpine's witness acknowledged that his analysis does not specify how many viewers must be affected for an impact to be significant. (RT 91.) He was unable to identify any policy, rule, or guideline in CEQA or the National Environmental Policy Act setting a minimum number of viewers for a finding of significance. (RT 89-90.) He was unaware of any public agency having adopted "thresholds of significance" regarding numbers of affected viewers (RT 90), and was unaware of any BLM policy regarding viewer numbers. (Ibid.)²

4. "The scenic qualities of this area have not been given formal or informal recognition and are not subject to any plans, policies, or regulations designed to protect them."

While relevant, this factor is only one of many that is important for determining impact significance. (RT 156.) Calpine's witness acknowledged that most visual resources are not subject to such formal protection. (RT 60-61.) He further acknowledged that formal recognition is not essential for an impact to be significant. (RT 60.)

² In fact, the BLM method would allow impacts to be described as unacceptable even where the number of viewers is quite small. (TR 152:15-21.)

As Calpine acknowledged, most of the world's visual attributes have not been formally assessed or protected, be they in small neighborhoods or the countryside. This hardly prevents them from having scenic value, or from having that value impaired by new, visually dominant projects. The County's General Plan gives formal recognition to views of the Sutter Buttes in the General Plan (FSA, p. 259); however, this recognition occurred only in 1996. (12/1 RT 187.) Presumably such values existed before formal recognition.

5. "The steel pole towers have a form that would make them consistent with the forms of the many wood poles that align roads in the area."

The opposite is true. The proposed structures would include three large crossarms to carry the six conductors as well as a smaller crossarm to carry the two shield wires. (RT 157; Exh. 46.) By contrast, the existing poles have only two relatively short crossarms carrying only small conductors. (Ibid.) Most important, the new steel poles will be much larger than the existing wooden poles—more than doubling their height. (Ibid.)

Calpine's contention is belied by the comparison of the new and existing transmission lines on South Township Road depicted in Exhibit 46. The contrast between the new and old poles is in reality even greater than depicted in Exhibit 46, in that the exhibit illustrates only scale. The difference between wood and steel poles makes the contrast between the existing poles and the new poles even greater.

IV. CONCLUSION

Appendix G of the CEQA Guidelines asks the analyst to evaluate whether the project would "have a substantial adverse impact on a scenic vista." Staff has concluded that the transmission line on South Township Road would have such an impact on viewers who live and drive in the vicinity of KOP 5. The views of the Sutter Buttes from this area are without doubt a scenic vista. The evidence indicates that the transmission poles will obstruct that vista for residents in the KOP 5 area and travelers headed north from KOP 5.

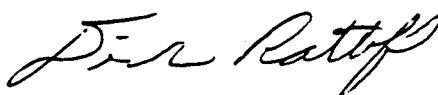
Calpine has criticized the Staff approach, contending that it harbors unclear assumptions that make it hard to replicate. Yet it offers no real alternative, presenting only an entirely subjective "overall" analysis that is impossible for an analyst to replicate. The criteria Calpine sets forth for finding "less than significant" impacts do not, when scrutinized, make sense.

The Staff visual analysis is a conventional analysis based on the predominant model used for this purpose. It arrives at a common-sense result that is best verified by

standing at the corner of South Township and O'Banion Roads and imagining the visual impact of a transmission line of the magnitude proposed.

Dated: December 9, 1998

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Dick Ratliff".

DICK RATLIFF
Senior Staff Counsel



Appendix L

**Department of Interior
Letter to Western;
Dated Jan. 6, 1999**

Sierra Nevada Customer Service Region



United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
600 Harrison Street, Suite 515
San Francisco, California 94107-1376

January 6, 1999

ER 98/734

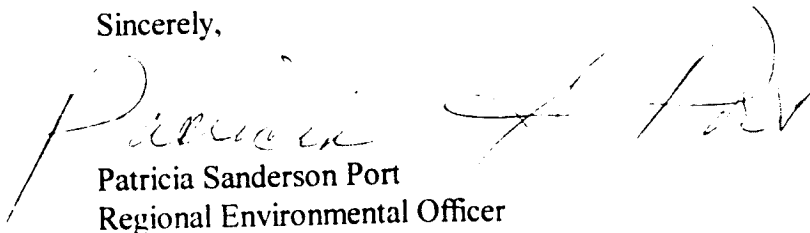
Loreen McMahon
Environmental Project Manager
Sierra Nevada Region
Western Area Power Administration
114 Parkshore Drive
Folsom, CA 95630-4710

Dear Ms. McMahon:

The Department of the Interior has reviewed the Draft Environmental Impact Statement (DEIS) for the Sutter Power Project, Sutter County, California, and has no comments to offer.

Thank you for the opportunity to comment on this document.

Sincerely,



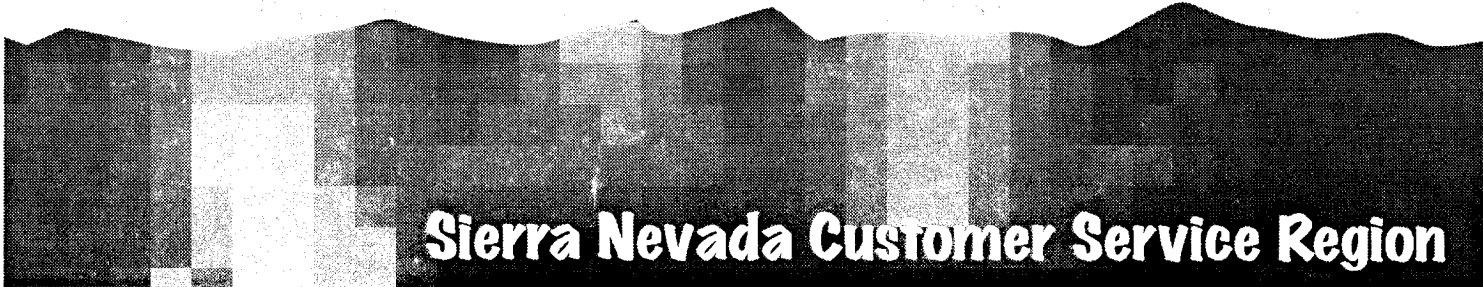
Patricia Sanderson Port
Regional Environmental Officer

cc: Director, OEPC (w/orig. incoming)
Regional Director, FWS, Region I
Paul Richins, Project Manager, California Energy Commission

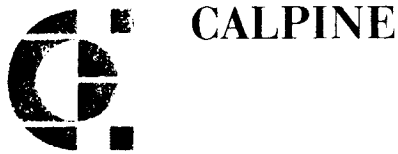


Appendix **M**

**Calpine Corporation Letter
to California Energy Commission Regarding
Process Water Mitigation;
Dated Feb. 26, 1999**



Sierra Nevada Customer Service Region



SUTTER POWER PLANT
POST OFFICE BOX 3330
YUBA CITY, CALIFORNIA 95992
530.821.0180
530.671.7435 (FAX)

February 26, 1999

Mr. Paul Richins
Project Manager
California Energy Commission
1526 9th Street, MS-15
Sacramento, CA 95814-5512

Subject: 97-AFC-2 (Sutter Power Plant) – Process Water Mitigation

Dear Mr. Richins:

Calpine Corporation has made a decision on how it will handle the process water generated from the Sutter Power Plant. In September 1998 we proposed a mitigation package that included a Dry Cooling Tower and zero discharge program. However, at that time we had not decided on which of the three possible methods would be used to “dispose” of the process water. The following outlines the processes that will be utilized:

Make-up Water

Make-up water for the steam cycle will be derived from a water treatment system utilizing a combination of Multimedia filters, Reverse Osmosis Membranes, degasifier, and an offsite regenerated demineralizer system. These components are all proven technologies regarding performance and reliability. The offsite regeneration of the demineralizer negates the need for the acid and caustic storage and handling systems to be on the site. The demineralized water will be stored in a 126,000-gallon stainless steel storage tank, providing over 24 hours of storage at base load operation.

Wastewater

Wastewater from the plant will be handled in two ways with most of the wastewater being recycled. That which is not recycled will be directed to the zero discharge treatment system. The recycled wastewater which includes the multimedia filter backwash, evaporative cooler (Combustion Turbine inlet air cooler) blowdown, plant equipment drains, and the boiler blowdown will go to a settling basin, where the solids will settle out of the water. The water discharge from the settling basin will be directed back into the water supply, upstream of the water treatment system.

The wastewater from the water treatment system will be forwarded to the zero discharge system. This system includes an evaporator, which converts most of the water into steam that is returned back into the steam system. The effluent from the evaporator is converted to a cake by a crystallizer. The cake will be sent to a landfill along with the facility's normal solid waste

disposal. Other power plants with similar zero discharge systems confirm the non-hazardous classification is likely. If, during the operation of the plant, the waste were determined to be hazardous, the waste would be sent to a hazardous waste landfill.

Sanitary waste

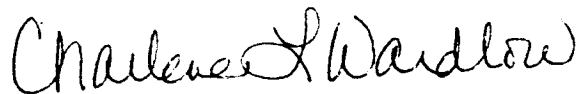
The sanitary waste will be processed in an on-site packaged sewage treatment plant. The effluent reclaimed water from the plant will be recycled back to the water treatment system.

Potable water/ Domestic water

A domestic water supply system will supply water throughout the plant for lavatories, eye wash stations, etc. The domestic water is raw well water that is chlorinated and filtered. Calpine will provide bottled water for drinking purposes.

Please call me at 707-527-6700, ext. 727 if you have any questions or need more information.

Sincerely,



Charlene L. Wardlow
Environmental Manager

cc: CEC Docket Unit (12 copies + original)
Sutter Power Plant Service List



Appendix

N

**State of California,
Office of Historic Preservation (SHPO)
Letter to Western;
Dated March 2, 1999**

Sierra Nevada Customer Service Region

STATE OF CALIFORNIA - THE RESOURCES AGENCY

GRAY DAVIS, Governor

**OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION**P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6824 Fax (916) 653-6824
calshpo@mail2.quiknet.com

March 2, 1999

Reply To: WAPA981217X

Ms. Loreen McMahon
Environmental Project Manager
Department of Energy
Western Area Power Administration
114 Parkshore Drive
Folsom CA 95630-4710

Re: Sutter Power Project, Yuba City Vicinity

Dear Ms. McMahon:

Thank you for consulting me about the subject undertaking in accordance with 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act.

Your recent letter also attempted to address the questions I had asked about the timing of the Section 106 consultation process relative to release of the DEIS. You may recall that my comments emphasized the propriety and advantages of initiating the Section 106 consultation process as far in advance of DEIS release as possible in order to demonstrate that a federal agency is implementing in good faith the requirements of 36 CFR § 800.1(b) pgrph. 2 and 36 CFR § 800.3(c).

You accounted for the timing issue I raised largely by saying that timing was a consequence of the way in which the California Energy Commission regulates power plant siting. However, your letter does not dissuade me from thinking that this issue also exists in part because of WAPA's deferential accommodation to the Commission's process. This accommodation is clearly of concern to me.

Pursuant to 36 CFR 800, WAPA has notified me that the undertaking will affect no historic properties. I assume that what WAPA may in fact have meant to say was that there are no historic properties that may be affected by the undertaking (36 CFR § 800.4(d)). Please let me know if my interpretation is incorrect.

Based on my review of the documentation submitted, I do not object to WAPA's determination. However, I suggest that conducting consultation with Native Americans exclusively by letter is not reasonable or sufficient. I saw no evidence in your submittal that any follow-up efforts were made to contact Native Americans by other means.

Page 38 of the Foster-Wheeler report lists conditions of certification imposed by the Commission to address potential project impacts on cultural resources. In view of WAPA's "no properties" determination, I do not understand why the Commission's conditions include provisions for anything other than monitoring and addressing discovery situations. Is the condition pertaining to pre-construction reconnaissance and staking intended to address minor alignment changes of some sort? If not, then what is the purpose of this condition?

I appreciate this opportunity to comment on the undertaking. If you have any questions, please call Hans Kreutzberg at 653-9107.

Sincerely,

A handwritten signature in black ink, appearing to read "Daniel Abeyta".

Daniel Abeyta, Acting
State Historic Preservation Officer