FINAL ENVIRONMENTAL ASSESSMENT

GILL RANCH LONG-TERM PERMITS FOR CROSSING UNDER THE SAN LUIS CANAL AND SAN LUIS DRAIN

Appendix A
Mitigation and Monitoring Program

February 2010

1: INTRODUCTION TO MMRP

1.1 Project Summary

Gill Ranch Gas Storage, LLC (GRS) is proposing to develop the Gill Ranch Gas Storage Project (Project), located approximately 20 miles west of Fresno, near the town of Mendota. The Project includes the storage of natural gas in depleted reservoirs in an existing natural gas production field known as the Gill Ranch Gas Field (Gas Field). The storage and delivery capability of the gas field would be 20 billion cubic feet (Bcf) of working gas and 650 million cubic feet per day (MMcfd) of peak deliverability.

The Project would include new high deliverability Injection/Withdrawal (IW) wells, wellhead surface facilities, and gathering pipelines from each well pad. Up to 15 new IW wells would be drilled in three separate reservoirs. Existing well sites would be used to the extent practical. Only one Project-related well would be located in Fresno County.

Up to seven new Observation/Monitoring (OM) wells would be drilled into the storage formations, outside of the active working gas portion of the reservoirs. One salt-water disposal well would be constructed to properly dispose of water from the IW wells during withdrawal operations.

The operating facility and compressor would be located near the center of the Project Area. The facilities would be located on a 10-acre site and include:

- Control room
- Approximately 45,000 brake horsepower (BHP) compressor station
- Gas dehydration and processing equipment
- Flow and pressure equipment
- Metering
- Communication equipment
- Maintenance facility
- Substation
- Salt water disposal well

An approximately 27-mile, 30-inch diameter gas transmission pipeline would be constructed between Pacific Gas and Electric's (PG&E) existing Line 401 near Interstate 5 and the proposed compressor station site. The pipeline would be designed to transport up to 650 MMcfd.

An approximately 9.75-mile electric power line would be constructed between PG&E's existing Dairyland-Mendota 115-kV power line on Avenue 7½ and the Storage Field central compressor station site. Approximately 4.3 miles of the new power line would be installed by replacing old poles with new wood poles in existing PG&E electric distribution line corridors. No power lines or electric distribution lines currently exist along approximately 1 mile of the proposed power line route along Avenue 7½.

GRGS and PG&E submitted applications to the California Public Utilities Commission (CPUC) for a Certificate of Public Necessity on July 29, 2008. GRS would be the operator of the Project during the development, permitting, and construction phases, and from at least 3 years from the date commercial operation begins.

1.2 Mitigation Monitoring and Reporting Requirements

The California Public Utilities Commission (CPUC) has prepared an Initial Study (IS)/Mitigated Negative Declaration (MND) (with the assistance of RMT, Inc.), pursuant to the California Environmental Quality Act (CEQA) to identify and evaluate potential environmental impacts associated with the Project. Mitigation measures are defined in the IS to reduce potentially significant impacts of Project construction and operation. All measures designated as mitigation measures reduce potential impacts to the associated resource to less than significant levels.

Approval of the project would require implementation and monitoring of all of the mitigation measures identified in the IS. CEQA Section 15097(a) requires that:

> "…In order to ensure that the mitigation measures and project revisions identified in the EIR or negative declaration are implemented, the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigate or avoid significant environmental effects. A public agency may delegate reporting or monitoring responsibilities to another public agency or to a private entity which accepts the delegation; however, until mitigation measures have been completed the lead agency remains responsible for ensuring that implementation of the mitigation measures occurs in accordance with the program."

CEQA Section 15097(c) defines monitoring and reporting responsibilities of the lead agency.

> "(c) The public agency may choose whether its program will monitor mitigation, report on mitigation, or both. "Reporting" generally consists of a written compliance review that is presented to the decision making body or authorized staff person. A report may be required at various stages during project implementation or upon completion of the mitigation measure. "Monitoring" is generally an ongoing or periodic process of project oversight. There is often no clear distinction between monitoring and reporting and the program best suited to ensuring compliance in any given instance will usually involve elements of both. The choice of program may be guided by the following:
>
> > (1) Reporting is suited to projects which have readily measurable or quantitative mitigation measures or which already involve regular review. For example, a report may be required upon issuance of final occupancy to a project whose mitigation measures were confirmed by building inspection.
> >
> > (2) Monitoring is suited to projects with complex mitigation measures, such as wetlands restoration or archeological protection, which may exceed the expertise of

the local agency to oversee, are expected to be implemented over a period of time, or require careful implementation to assure compliance.

(3) Reporting and monitoring are suited to all but the most simple projects. Monitoring ensures that project compliance is checked on a regular basis during and, if necessary after, implementation. Reporting ensures that the approving agency is informed of compliance with mitigation requirements."

1.3 Purpose of MMRP

This Mitigation Monitoring and Reporting Program (MMRP) is meant to facilitate implementation and monitoring of the mitigation measures to ensure that measures are executed. This process protects against the risks of non-compliance.

The purpose of the MMRP is to:

- Summarize the mitigation required for the project
- Comply with the requirements of CEQA and the CEQA Guidelines
- Clearly define parties responsible for implementing and monitoring the mitigation measures
- Provide a clear methodology and framework for verifying and reporting that the mitigation measures were implemented on a timely basis

1.4 MMRP Execution

1.4.1 OVERVIEW

This MMRP system is designed to assist the Applicants in implementing and reporting on the mitigation measures defined in the IS/MND. The MMRP would also facilitate monitoring of the measures by the CPUC, who would have the ultimate discretion in designating and approving the Environmental Monitor(s) and Environmental Inspector(s), to ensure compliance. Implementation of the MMRP requires close coordination between the CPUC and the Applicants.

As the lead agency under CEQA, the CPUC is required to monitor the Project to ensure that the required mitigation measures and Applicant Proposed Measures are implemented during construction and operation. The CPUC would be responsible for ensuring full compliance with the provisions of the MMRP and has primary responsibility for its implementation. The purpose of the MMRP is to document that the mitigation measures required and adopted by the CPUC are implemented, and that mitigated environmental impacts are reduced to the level identified in the certified MND.

As provided by the California Environmental Quality Act (CEQA) (see Guidelines section 15097(a)), the CPUC may delegate duties and responsibilities for monitoring to other environmental monitors or consultants, or public agencies, as deemed necessary. The number of construction monitors assigned to the project will depend on the number of concurrent construction activities and their locations. The CPUC, however, will ensure that each person with delegated duties or responsibilities is qualified to monitor compliance.

Any study or plan required by a mitigation measure may also require the approval of the CPUC and must allow the noted amount of time for an adequate review. When a mitigation measure requires that a mitigation action or program be developed during the design phase of the project, the Applicants must submit the final program to the CPUC for review and approval at least 60 days before the start of construction, and/or implementation of that program, whichever comes first.

Other agencies and jurisdictions may require additional review time. It is the responsibility of the environmental monitor assigned to the project to ensure that appropriate agency reviews and approvals are obtained.

The CPUC along with its environmental monitors would also ensure that any variance process or deviation from the procedures identified under the MMRP is consistent with CEQA requirements; no project variance would be approved by the CPUC if it creates new significant impacts. As defined in this section, a variance should be strictly limited to minor project changes that would not trigger other permit requirements, that does not increase the severity of an impact or create a new impact, and that clearly and strictly complies with the intent of the mitigation measure. A proposed Project change that has the potential for creating significant environmental effects would be evaluated to determine whether supplemental CEQA review is required. Any proposed deviation from the approved Project, adopted mitigation measures, and Applicant-Proposed Measures, and correction of such deviation, shall be reported immediately to the CPUC and the environmental monitor assigned to the construction spread for their review and approval. In some cases, a variance may also require approval by a CEQA responsible agency.

1.4.2 ENFORCEMENT RESPONSIBILITY

The CPUC is responsible for enforcing the procedures adopted for monitoring through the environmental monitor assigned to each construction phase or spread. The environmental monitor shall note problems with monitoring, notify appropriate agencies or individuals about any problems, and report the problems to the CPUC.

The CPUC has the authority to halt any construction, operation, or maintenance activity associated with the Project if the activity is determined to be a deviation from the approved project or adopted mitigation measures. The CPUC may assign this authority to the environmental monitor for each construction phase or spread.

1.4.3 MITIGATION COMPLIANCE RESPONSIBILITY

The Applicants are responsible for successfully implementing all adopted mitigation measures in the MMRP. The MMRP contains criteria that define adequate implementation. Standards for successful mitigation also are implicit in many mitigation measures that include such requirements as obtaining permits or avoiding a specific impact entirely.

Additional mitigation success thresholds would be established by applicable agencies with jurisdiction through the permit process and through the review and approval of specific plans for the implementation of mitigation measures.

The Applicant shall inform the CPUC and its monitors in writing of any mitigation measures that are not or cannot be successfully implemented. The CPUC in coordination with its monitors would assess whether alternative mitigation is appropriate and specify to the Applicants the subsequent actions required.

1.4.4 DISPUTE RESOLUTION

It is expected that the adopted MMRP would reduce or eliminate many potential disputes. However, even with the best preparation, disputes may occur. In such event, the following procedure will be observed:

- **Step 1.** Disputes and complaints (including those of the public) should be directed first to the CPUC's designated Project Manager for resolution. The Project Manager would attempt to resolve the dispute.

- **Step 2.** Should this informal process fail, the CPUC Project Manager may initiate enforcement or compliance action to address deviations from the Proposed Project or adopted MMRP.
- **Step 3.** If a dispute or complaint regarding the implementation or evaluation of the MMRP or the mitigation measures cannot be resolved informally or through enforcement or compliance action by the CPUC, any affected participant in the dispute or complaint may file a written “notice of dispute” with the CPUC's Executive Director. This notice should be filed in order to resolve the dispute in a timely manner, with copies concurrently served on other affected participants. Within 10 days of receipt, the Executive Director or designee(s) shall meet or confer with the filer and other affected participants for purposes of resolving the dispute. The Executive Director shall issue an Executive Resolution describing his/her decision, and serve it on the filer and other affected participants.
- **Step 4.** If one or more of the affected parties is not satisfied with the decision as described in the Resolution, such party(ies) may appeal it to the Commission via a procedure to be specified by the Commission. Parties may also seek review by the Commission through existing procedures specified in the Commission's Rules of Practice and Procedure for formal and expedited dispute resolution, although a good faith effort should first be made to use the foregoing procedure.

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2: IMPLEMENTATION TABLES

2.1 Introduction

This chapter of the MMRP includes tables that facilitate the implementation of all mitigation measures presented in the IS/MND.

The measures are identified by environmental resources. Mitigation measures span all phases of the project, including pre-construction, construction, and project operation.

Each table is further divided into the following columns:

1) Mitigation Measure	2) Implementation/Monitoring Method	3) Monitoring Entity	4) Implementation Schedule

1) Column 1 includes the text of the mitigation measure to be implemented.
2) Column 2 includes the method of implementation
3) Column 3 includes the entity responsible for monitoring implementation, it is assumed that the Applicants would be responsible for implementation of all measures.
4) Column 4 includes the implementation schedule

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2.2 Gill Ranch Gas Storage Project MMRP Table

Table 2.2-1: Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
Aesthetics			
Mitigation Measure Aesthetics-1: All compressor station structures shall be painted or use integral coloring that is a shade of "Carlsbad Canyon" as identified in the Bureau of Land Management's (BLM's) published color chart (Standard Environmental Colors Chart CC-001). All finishes shall be flat and non-reflective. Compressor station structures that shall be painted include, but are not limited to: a) Compressor station and operations buildings b) Exposed auxiliary equipment or equipment housings c) Contact towers d) Exposed piping, tanks and vessels	CPUC to approve color scheme prior to painting CPUC to confirm structures have been painted with approved color scheme.	CPUC Project Manager and designated monitor	During construction
Galvanized equipment need not be painted. The Applicants shall provide to the California Public Utilities Commission (CPUC) materials samples for CPUC staff review and approval at least 30 days prior to construction of the compressor station.	CPUC to approve materials samples	CPUC Project Manager	30 days prior to construction of compressor station
Mitigation Measure Aesthetics-2: Security fencing shall be galvanized with a flat, low reflective finish.	CPUC to approve fencing design prior to installation CPUC to confirm presence of appropriate fencing	CPUC Project Manager or designated monitor	During construction
Mitigation Measure Aesthetics-3: Gas interconnection facilities shall be painted a shade of "Covert Green" as identified in the BLM's published color chart (Standard Environmental Colors Chart CC-001). All finishes shall be flat and non-reflective.	CPUC to approve color scheme prior to painting CPUC to confirm that structures have been painted appropriately with approved color scheme	CPUC Project Manager or designated monitor	During construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
Materials samples will be provided to CPUC for CPUC staff review and approval at least 30 days prior to construction of the interconnect facilities.	CPUC to approve materials samples	CPUC staff	30 days prior to construction of interconnect facilities
Mitigation Measure Aesthetics-4: Night lighting for construction at the horizontal directional drilling (HDD) site, if required, shall be fully shielded and directed away from residential areas. Lights shall be turned out in areas where they are no longer needed.	CPUC on-site monitor to check lighting during construction	CPUC designated monitor	During nighttime construction periods
Mitigation Measure Aesthetics-5: The Applicants' drilling plan shall specify that lights shall be fully shielded and directed inward on the work area.	CPUC shall confirm the directive is present in the drilling plan	CPUC Project Manager	Prior to construction
Mitigation Measure Aesthetics-6: Injection and Withdrawal (IW) and observation and monitoring (OM) well pad lighting shall be used only when the site is accessed for monitoring or servicing.	CPUC shall confirm with appropriate GRS personnel	CPUC Project Manager or designated monitor	During nighttime monitoring and servicing (project operations phase) at IW and OM well pads
Mitigation Measure Aesthetics-7: All permanent outdoor site and building lighting shall be directed at the ground and immediate area around the mounting pole or building wall. All permanent outdoor lighting shall be fully shielded such that all light emitted by the fixture, either directly from the lamp or a diffusing element, or indirectly by reflection or refraction from any part of the luminaire, is projected below the horizontal. Poles used for site lighting shall not exceed a height of 35 ft.	CPUC shall review lighting design prior to construction. CPUC shall confirm appropriate lighting is installed	CPUC Project Manager or designated monitor	Prior to construction and just after construction
Mitigation Measure Aesthetics-8: The pipeline interconnect site lighting shall only be used when the site is accessed for monitoring or servicing.	CPUC shall confirm with appropriate GRS personnel	CPUC Project Manager	During nighttime monitoring and servicing (during project operations) at pipeline interconnect site

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
Agricultural Resources			
Mitigation Measure Agriculture-1: The Applicants shall prepare and implement an Agricultural Impact Mitigation Plan. The Plan shall be submitted to the CPUC for CPUC staff review and approval at least 45 days prior to the start of construction.[1]	CPUC shall review the Agricultural Impact Mitigation Plan	CPUC staff	45 days prior to construction
The Plan shall include measures that will reduce impacts to agricultural operations during construction of the proposed facilities, in coordination with landowners. Measures shall include, but are not limited to: a) Farmers shall be compensated for the loss of crops during construction of the proposed facilities. b) Agricultural fields shall be surveyed and regraded where needed to their original elevation following construction where needed. c) Follow-up elevation surveys and finish grading shall be provided, if necessary, to ensure that the field grading and irrigation flows are not adversely affected. d) Fences and irrigation facilities shall be replaced or repaired to their original condition following construction. e) The Applicants shall coordinate with owners of land adjacent to the pipeline route regarding temporary blockage of access to the owner's parcel due to pipeline construction. Alternative access routes shall be provided, or farmers shall be provided breaks in spoil piles, trenches, or pipe strings to accommodate their need for field access during construction. f) Topsoil shall be restored to preconstruction conditions as soon after construction is completed as practical. g) Soils in the temporary construction easements located above the Westland Water District water pipeline shall not be	CPUC shall confirm measures are in plan	CPUC staff	45 days prior to construction

[1] Throughout this MMRP, where Applicants are required to submit plans for CPUC staff review and approval by a specified date, it is anticipated that such review and approval will occur after the specified date for submittal.

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
scrapped, leveled, or removed during construction			
Mitigation Measure Agriculture-2: The Applicants shall prepare and implement a Post-Construction Crop Monitoring and Mitigation Plan.	CPUC shall review plan prior to completion of construction and shall verify that the plan is implemented after construction through an on-site monitor	CPUC designated monitor	Prior to and during construction
The Plan shall be submitted to the CPUC for CPUC staff review and approval at least 45 days prior to the start of construction.	CPUC shall review the Post-Construction Crop Monitoring and Mitigation Plan	CPUC staff	45 days prior to construction
The Plan shall include measures that will reduce impacts to agricultural operations after construction of the proposed facilities, in coordination with landowners. The Applicants shall identify remaining soils and agricultural impacts associated with construction that require mitigation and shall implement the measures in the Plan.			
Follow-up restoration or appropriate measures included in the Plan shall include, but shall not be limited to: a) Crop monitoring shall be conducted for two consecutive cropping seasons following the completion of facility construction and restoration of construction areas and construction staging areas. b) On-site monitoring of growing crops shall be conducted at least two times during each growing season during the two-season crop monitoring period. c) Gill Ranch Storage, LLC (GRS) shall correct trench settlement, as necessary, to maintain pre-construction grades. In agricultural land where trench settling is excessive and cannot be restored by touch-up surface grading, GRS shall import topsoil. d) GRS shall require the contractor to remove all imported rock material during Easement Area restoration activities. GRS	CPUC shall confirm measures are in plan	CPUC staff	45 days prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
shall remove and dispose the excess rock from the Easement Area where cultivation or soil settlement results in excessive surface rock compared to adjacent areas not disturbed by construction. e) GRS shall correct irrigation system deficiencies/problems resulting from pipeline construction. f) GRS shall correct subsurface drainage systems repairs that fail due to pipeline construction, provided those repairs were made by GRS. Subsurface drain line breaks or other damages to subsurface drainage systems that occur within the Easement Area shall be corrected to the extent that such breaks are the result of pipeline construction. g) Subsurface drainage facilities or other measures shall be installed to restore these affected areas to pre-construction conditions. h) GRS shall monitor the Easement Area for noxious weed infestations in conjunction with crop production monitoring described above. GRS shall take the appropriate measures to control any new noxious weed infestations that were not occurring within the Easement Area prior to pipeline construction.			
Mitigation Measure Agriculture-3: The Applicants shall participate in land conservation programs that are currently being developed in Fresno and Madera Counties. Madera County's program will create permanent conservation easements to preserve agricultural land and native habitat. Madera County will manage the program and the easements. Fresno County is developing a similar program that will be administered by a qualified land trust.	CPUC shall confirm Applicant participation in land conservation programs in Fresno and Madera counties	CPUC Project Manager	During appropriate phase of project
The Applicants' participation in the programs shall comply with the following guidelines: a) The Applicants shall pay fees into the conservation program to permanently preserve an appropriate quantity of land to fully mitigate Project impacts. The Applicants shall permanently	CPUC shall confirm measures are in conservation agreement	CPUC staff	During project operation

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
preserve at least 20.35 ac (19.54 ac in Madera County and 0.81 ac in Fresno County). Additional land, included as 1.00 ac of contingency and access road land in this Project's Initial Study analysis of impacts to agriculture, shall be preserved at a 1:1 ratio in the county in which the land was converted to non-agricultural use. b) Prior to construction, the Applicants shall enter into an agreement with each County to fully mitigate the farmland that is actually converted within that County either through acquisition of easements or other real property interests in prime farmland to ensure that the required acreage is permanently retained in productive agriculture (County Farmland Mitigation Agreement). The County Farmland Mitigation Agreement shall provide that in lieu of actually acquiring interest in real property, the Applicants shall either pay a fee to the County to fund a County agricultural land preservation program or directly fund a qualified third party approved by the County that will acquire easements or other real property interests in prime farmland. c) To the extent that a suitable conservation program is available in either County prior to construction of the Project, all payments of fees or funding for easement acquisition required by the County Farmland Mitigation Agreement for that County shall be completed by the Applicants prior to commencement of construction. d) If a suitable conservation program is not available in either County prior to commencement of construction of the Project, the Applicants shall post a bond prior to construction, in an amount reasonably determined by the County to provide for implementation of the farmland mitigation described above. The Applicants shall use the bond money to participate in a suitable farmland conservation program or regional land trust, following the above guidance for the area of land to be preserved. The conservation agreement shall be in place prior to the start of Project operations. The Applicants shall submit			

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
the name of the trust/conservation program, prior to the signing of the agreement, to the CPUC for approval. e) If the Applicants find that the desired amount of conservation in each county cannot be obtained with a good faith effort (e.g., if a County does not contain land available for conservation, or if programs require a purchase of a denomination of land so as to make purchase in both counties inappropriate), then the amount of land to be preserved in each County may be adjusted with the approval of CPUC staff. The amount of land to be preserved shall still be at least 20.35 ac.			
Air Quality			
Mitigation Measure Air Quality-1: The Applicants shall participate in the San Joaquin Valley Air Pollution Control District's (SJVAPCD's) Voluntary Emission Reduction Agreement program to offset construction-generated emissions of NOX. An agreement for the Applicant to make a one-time payment that will result in NO_X emission reductions equivalent to at least 26 tons shall be signed prior to the commencement of construction activities. The payment shall be the amount that has been determined by the District to be sufficient to fund projects resulting in equivalent emission reductions of 26 tons of NO_x.	CPUC shall confirm signed agreements between Applicants and SJVAPCD	CPUC Project Manager	Prior to construction
Mitigation Measure Air Quality-2: Construction workers shall meet at staging areas and be transported (in carpools) to jobsites, as practicable. These staging areas will be located in Fresno and Madera Counties, as shown in Figure 2.3-4..	CPUC shall confirm carpooling is taking place through coordination with appropriate GRS personnel	CPUC Project Manager	During project construction
Mitigation Measure Air Quality-3: Unnecessary construction vehicle and equipment idling shall be minimized.	CPUC to verify through on-site monitoring	CPUC designated monitor	During construction
Construction foremen shall include briefing to crews on vehicle use as part of pre-construction conferences. Those briefings shall include discussion of limiting idling.	CPUC shall verify with construction foreman	CPUC Project Manager	Prior to construction
Mitigation Measure Air Quality-4: All off-road construction diesel engines shall meet Tier 2 California Emission Standards for Off-Road CI Engines.	CPUC shall confirm engine standards met through documentation	CPUC Project Manager or designated monitor	Prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
Mitigation Measure Air Quality-5: The Applicants shall participate in US EPA's Natural Gas STAR Program. A memorandum of understanding (MOU) with the US EPA shall be signed prior to initial startup of the compressor station. Within 6 months after signing the MOU, the Applicants shall prepare an implementation plan that includes best management practices (BMPs) identified by the Natural Gas STAR program for transmission and distribution facilities. The implementation plan shall incorporate Partner Reported Opportunities that cost-effectively reduce methane emissions.	CPUC shall verify through review of the MOU and implementation plan	CPUC Project Manager	Prior to start of operations
Within 45 days after completion of one calendar year of participation in the program, the Applicants shall submit an annual report documenting the previous year's emission-reduction activities and corresponding methane emission reductions.	CPUC shall verify through review of documentation	CPUC Project Manager	Within 45 days of construction of one calendar year of participation in the program
Copies of all documents shall be submitted to the CPUC.	CPUC shall verify through review of documentation	CPUC Project Manager	Upon completion of each document or report
Mitigation Measure Air Quality-6: GRS shall enter into an agreement with Pacific Gas & Electric Company (PG&E) to participate in the ClimateSmart™ Program. A copy of the agreement shall be provided to CPUC prior to the start of operation of the compressor station. If a future program renders this agreement redundant (e.g., if GRS can demonstrate that the same benefits are achieved via PG&E's participation in a future cap and trade program), then the GRS agreement may be terminated, subject to review and approval by the CPUC.	CPUC shall verify through review of documentation/ agreements	CPUC Project Manager	Prior to start of operations
Mitigation Measure Air Quality-7: The Applicants shall use alternate fuels, such as biodiesel, where feasible (e.g. fire water pump).	CPUC shall confirm alternate fuel use through contractor documentation	CPUC Project Manager	All phases of project, as appropriate
Mitigation Measure Air Quality-8: GRS shall conduct a greenhouse gas emissions and facility-wide energy efficiency audit.	CPUC shall confirm energy audit has occurred through review of audit documentation	CPUC Project Manager	During project operation
Mitigation Measure Air Quality-9: The Applicants shall replace breakers within 30 days once sulfur hexafluoride (SF_6) leakage rates exceed one percent.	CPUC shall confirm status/documentation	CPUC Project Manager	During project operation

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
Mitigation Measure Air Quality-10: GRS shall develop a sulfur hexafluoride (SF_6) inventory and participate in the SF_6 Emission Reduction Partnership for Electric Power Systems.	Applicant shall confirm replacement with documentation submitted to the CPUC	CPUC staff	During project operation
Biological Resources			
Mitigation Measure Biology-1 (APM Biology-1): Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) The Applicants shall develop a BRMIMP in advance of any Project-related ground disturbance activities, to fully disclose the required mitigation measures with which the Project must comply during Project construction and operation. The BRMIMP shall be developed in consultation with the CPUC and biological resource agencies and include the protection measures identified in this IS/MND.	CPUC shall confirm preparation of the BRMIMP through review of the document	CPUC Project Manager	Prior to construction
The BRMIMP shall include, but not be limited to: a) Species impact avoidance and minimization measures; b) Habitat compensation strategy; c) Environmental compliance reporting requirements; d) Pre-construction survey methods; e) Construction monitoring procedures; f) Worker Environmental Awareness Program; g) Frac-out contingency plan; h) Post-construction clean-up plan; i) Restoration plan. The BRMIMP shall identify: j) All biological resources mitigation, monitoring, and compliance conditions specified in any acquired permits for the Project; k) All sensitive biological resources that may be impacted by the Project, or that will be avoided or mitigated by the Applicants;	CPUC shall verify inclusion of all requirements in BRMIMP	CPUC Project Manager	Prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
l) All required mitigation measures/avoidance strategies for each sensitive biological resource; m) All locations, on a map of suitable scale, of laydown areas and areas requiring temporary protection and avoidance during construction; n) Pre- and post-construction site photographs of all natural areas disturbed during Project construction activities; o) Duration of biological, cultural resource, and paleontological monitoring and a description of monitoring methodologies and frequency; p) Success criteria; q) Remedial measures to be implemented if success criteria are not met; and r) A discussion of biological resource-related facility closure measures.			
Mitigation Measure Biology-2 (APM Biology-2a): The following measures shall be applied during construction: a) All construction activities shall be limited to the Project right of way (ROW), designated staging areas, and access roads. b) No pets or firearms shall be permitted on the Project site. c) In sensitive habitat areas (i.e., habitats that potentially support listed species or sensitive habitat), orange construction fencing shall be installed to delineate the work area and prevent equipment from entering sensitive areas. All site workers shall be informed about the importance of maintaining any designated protection or exclusion areas. Sensitive resource areas shall be identified by a qualified biologist to reduce the potential for degrading existing habitat and attracting sensitive wildlife species and their predators to the area, and all trash shall be properly contained and removed from the work site and disposed of	CPUC shall verify implementation through on-site monitoring	CPUC designated monitor	During construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
regularly. d) All construction debris and trash shall be disposed of properly, and food-related trash shall be removed from the site when work activities are complete at the end of each day. e) During construction, all Project-related vehicle and equipment traffic shall be restricted to established roads or access routes, and shall observe a maximum 15 miles per hour speed limit within the work areas, except on County roads and highways.			
Mitigation Measure Biology-3 (APM Biology-2b): The vehicle and equipment access routes and work area shall be delineated in the field (e.g., by staking, flagging, or fencing, as appropriate) prior to initiating pipeline construction.	CPUC shall verify implementation through on-site monitoring	CPUC designated monitor	Prior to pipeline construction
Mitigation Measure Biology-4 (APM Biology-3): The Applicants shall develop and implement a Worker Environmental Awareness Program (WEAP) pursuant to which each of their employees, as well as employees of contractors and subcontractors who work on the Project site or related facilities during construction and operation, are informed about the sensitive biological resources potentially occurring in the Project Area. A copy of the WEAP shall be submitted to the CPUC at least 30 days prior to construction.	CPUC shall confirm preparation and implementation of WEAP through review of the WEAP and on-site monitoring during construction	CPUC staff and designated monitor	Review WEAP 30 days prior to construction and monitor during construction
An employee training session shall be conducted before groundbreaking to explain any sensitive biological resource and special-status species concerns as well as applicable regulations.	On-site monitoring	CPUC designated monitor	Prior to construction
The WEAP shall: a) Provide for on-site or classroom presentation in which supporting written material is made available to all participants; b) Discuss the locations and types of sensitive biological resources within the Project area and adjacent areas; c) Present the reasons for protecting these resources; d) Present the meaning of various temporary and permanent habitat protection measures; e) Present what to do if previously unidentified sensitive resources	CPUC shall review WEAP to confirm measures are included	CPUC staff	30 days prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
are encountered; and f) Identify whom to contact if there are further comments and questions about the material discussed in the program.			
The program shall be administered by a field contract representative or qualified biologist with knowledge of the local area and associated sensitive resources.	CPUC shall review qualifications of trainer	CPUC staff	30 days prior to construction
Each participant in the on-site WEAP shall sign a statement declaring that the individual understands and shall abide by the guidelines set forth in the program materials. The Designated Biologist or Field Representative administering the program shall also sign each statement.	CPUC shall verify through review of documentation	CPUC Project Manager	Prior to construction
Mitigation Measure Biology-5 (APM Biology-4): The Applicants shall select a Designated Biologist prior to the start of any ground disturbance activities. The Designated Biologist shall meet the following minimum qualifications: a) A bachelor's degree in wildlife biology, zoology, botany, ecology, or a closely related major; b) Three years of experience in field biology; c) One year of field experience with resources found in or near the Project Area; and d) Additional education and experience appropriate for the biological resource tasks that must be addressed during Project construction and operation.	CPUC shall review qualifications of selected biologist	CPUC Project Manager	Prior to construction
The Designated Biologist shall be present onsite during all ground disturbing activities that have the potential to impact plants, wildlife or sensitive habitat (i.e., habitats that potentially support listed species or sensitive habitat). The Designated Biologist shall: a) Ensure compliance with environmental permits and approvals as summarized in the BRMIMP; b) Ensure implementation and compliance with the WEAP; and c) Have the authority to halt construction at any time if biological resources are in being negatively impacted.	CPUC shall verify through on-site monitor	CPUC designated monitor	During construction related ground disturbing activities

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
Mitigation Measure Biology-6 (APM Biology-5): Wildlife entrapment prevention measures shall be employed during construction, operation and maintenance of the Project in order to prevent wildlife entrapment. Such measures shall include but shall not be limited to the following: a) Stored piping shall be temporarily capped in order to prevent wildlife from taking up residence within construction materials. b) Well cellars and other cavities associated with the Project shall be appropriately designed and managed to prevent entrapment. c) Potential entrapment of ground dwelling and burrowing species in open trenches during construction shall be avoided by providing covers over short spans of open trench or providing escape ramps at regular intervals in long spans. d) Trenches shall be inspected on a daily basis by a biological monitor prior to onset of construction or backfilling.	CPUC shall verify through on-site monitoring	CPUC designated monitor	During construction, operation, and maintenance
Mitigation Measure Biology-7 (APM Biology-7): No fewer than 14 days and no more than 30 days prior to the onset of any Project-related ground or vegetation disturbing activity during the life of the Project, qualified biologist shall survey the impact area for presence of special-status animals as identified in Table 3.5-2.	CPUC shall confirm appropriate surveys and documentation have been submitted	CPUC Project Manager	No fewer than 14 days and no more than 30 days prior to the onset of construction
In the event that special-status animals are detected during these surveys, appropriate impact avoidance, protection, and/or compensation measures shall be developed in consultation with the California Department of Fish and Game (CDFG) and the US Fish and Wildlife Service (USFWS). Proof of consultation shall be submitted to the CPUC within 30 days of the beginning of construction. Examples of measures to be considered and implemented based on agency consultations include, but are not limited to: a) Project scheduling to avoid active nesting/breeding/aestivation/refugia sites; b) Project modifications to avoid active nests or burrows of protected species; c) Inspection or observation of burrows (e.g., with tracking medium or	CPUC shall verify that appropriate measures have been negotiated through review of documentation/proof of consultation	CPUC Project Manager	30 days prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
using a fiber-optic endoscope) to determine occupancy; d) Hand excavation and collapsing of burrows to allow animals to escape and avoid subsequent occupancy during construction; e) Capture and relocation of animals from affected areas; f) Installation of exclusionary fencing.			
Mitigation Measure Biology-8 (APM Biology-15): Areas subject to ground or vegetation disturbance shall be surveyed for active nests by a qualified biologist within 15 days of the start of construction when construction is scheduled to occur during the bird nesting season (February 1 to September 30). If an active nest of protected bird species is observed, the location shall be recorded with a Global Positioning System (GPS) unit and the avoidance area shall be delineated at the required distance from the nest (e.g., with staking and flagging), and awareness of the avoidance area shall be included in the regular construction briefings.	CPUC shall confirm surveys have taken place within the appropriate time frame through review of documentation	CPUC Project Manager	Within 15 days prior to construction
The nest shall be avoided (no construction activities or surface disturbance within 200 ft, or the distance specified in the BRMIMP) until no longer occupied (as determined by the biological monitor) unless a special purpose permit for removal of the nest is obtained from the USFWS.	CPUC shall verify through on-site monitoring	CPUC designated monitor	During construction
Mitigation Measure Biology-9 (APM Biology-13): Preconstruction surveys for nesting Swainson's hawks shall be performed within 0.5 mi of the Project Area according to established protocol (Entrix 2008). Surveys shall be timed to allow for full completion as specified in the protocol, before the onset of construction, using the CDFG-endorsed protocol in effect at that time.	CPUC shall confirm surveys have taken place within the appropriate time frame through review of reports	CPUC Project Manager	Prior to construction
If any nests are located in the survey area, no construction activities shall occur within 500 ft of the nest until such time that the young have fledged or the nest has been abandoned as determined by a qualified biological monitor.	CPUC shall verify through on-site monitoring	CPUC designated monitor	During construction
Mitigation Measure Biology-10 (APM Biology-16): Areas subject to ground disturbance shall be surveyed for nesting burrowing owls prior to start of construction according to established guidelines (CDFG 1995).	CPUC shall confirm surveys have taken place within the appropriate time frame through review of reports	CPUC Project Manager	Prior to construction
Appropriate avoidance, minimization, or protection measures shall be determined	CPUC shall confirm that	CPUC Project	Prior to

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
in consultation with CDFG in the event an active nest is located in an area subject to disturbance, or within the typical setback (i.e., occupied burrows or nests within 150 feet of an area subject to disturbance during the non-breeding season, or within 250 ft of an area subject to disturbance during the breeding season).	appropriate mitigation has been negotiated through review of documentation of consultation	Manager	construction
Mitigation Measure Biology-11 (Addendum to APM Biology-15): An appropriate buffer shall be established around active avian nests in consultation with CDFG if an active avian nest is identified during nesting season (February 1 through September 30). The buffer will vary by species, but raptors typically require a 250-ft buffer whereas smaller migratory birds may only require a 50-ft buffer.	CPUC shall confirm appropriate buffers have been negotiated through review of documentation of consultation CPUC shall verify through on-site monitoring	CPUC Project Manager and designated monitor	Prior to and during construction
Mitigation Measure Biology-12 (Addendum to APM Biology-16): A protocol-level pre-construction burrowing owl survey shall be conducted within 250 ft of areas subject to disturbance. The survey shall occur between February 1 and September 30. Appropriate avoidance, minimization, or protection measures shall be determined in consultation with CDFG in the event that construction is located within 150 feet of occupied burrows or nests during the non-breeding season, or within 250 ft of an area subject to disturbance during the breeding season.	CPUC shall confirm surveys have taken place within the appropriate time frame through review of reports	CPUC Project Manager	Prior to construction
Mitigation Measure Biology-13: A protocol-level pre-construction burrowing owl survey shall be conducted within 250 ft of areas subject to disturbance during the non-breeding season (October 1 through January 31).	CPUC shall confirm surveys have taken place within the appropriate time frame through review of reports	CPUC Project Manager	Prior to construction
Appropriate avoidance, minimization, or protection measures shall be determined in consultation with CDFG in the event that an active burrow is located within 150 feet of occupied burrows or nests during the non-breeding season, or within 250 ft of an area subject to disturbance during the breeding season. This may require the passive relocation of the owls and the purchase of compensation mitigation at a ratio of 6.5 ac per pair or unpaired individual.	CPUC shall confirm that appropriate mitigation has been negotiated through review of documentation of consultation and review of agreements if compensation mitigation is required CPUC shall verify through on-site monitoring	CPUC Project Manager and designated monitor	Prior to and during construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
Mitigation Measure Biology-14 (APM Biology-12): A 100-ft diameter buffer shall be established and maintained around all elderberry plants with a stem diameter of 1.0 in or greater at ground level as described in *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999a). These buffers shall be delineated using construction fencing. In the event that complete avoidance of elderberry shrubs, including a 100 ft buffer, is not possible, surveys for beetle exit holes shall be performed on all elderberry plants with a stem diameter of 1.0 in or greater at ground level and all minimization, protection, and compensation measures shall be implemented as described in the Conservation Guidelines.	CPUC shall confirm appropriate buffer will be marked and protected, as specified through on-site monitoring	CPUC Project Manager and designated monitor	Prior to and during construction
Mitigation Measure Biology-15 (APM Biology-20): Giant Garter Snake Impact Avoidance and Minimization Standard avoidance and minimization measures shall be implemented in suitable habitat as described in Appendix C of the USFWS Programmatic Consultation with the US Army Corps of Engineers (USACE) for 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter, and Yolo Counties, California (1997). These measures include, but are not limited to:	CPUC shall confirm appropriate implementation through on-site monitoring	CPUC Project Manager and designated monitor	Prior to and during construction
a) Schedule construction activity within suitable habitat to occur during the active period for giant garter snake (between May 1 and October 1). The USFWS shall be consulted to determine if additional measures are necessary to minimize and avoid take if activities cannot be avoided in suitable habitat between October 2 and April 30.	CPUC shall confirm measure has been implemented through on-site monitoring	CPUC Project Manager	Prior to and during construction
b) Confine clearing to the minimal area necessary to facilitate construction activities. Flag and designate avoided giant garter snake habitat within or adjacent to the Project area as Environmentally Sensitive Areas. This area shall be avoided by all construction personnel and equipment.	CPUC shall confirm measure has been implemented through on-site monitoring	CPUC designated monitor	During construction
c) Construction personnel shall receive USFWS approved worker environmental awareness training. This training instructs workers to recognize giant garter snakes and their habitat(s).	CPUC shall verify through review of documentation	CPUC designated monitor	Prior to construction
d) Suitable habitat shall be surveyed for giant garter snakes within 24 hours prior to construction activities and repeated if a	CPUC shall verify through review of documentation	CPUC Project Manager	24 hours prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
lapse in construction activity of 2 weeks or greater has occurred. If a snake is encountered during construction, activities shall cease until appropriate corrective measures have been completed or it has been determined that the snake will not be harmed. Any sightings or incidental take shall be reported to the USFWS within 24 hours.			
e) Any dewatered habitat shall be left dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat.	CPUC shall confirm measure has been implemented through on-site monitoring	CPUC designated monitor	During construction
f) After completion of construction activities, remove any temporary fill and construction debris and, wherever feasible, restore disturbed areas to pre-project conditions. Restoration work may include such activities as replanting species removed from banks or replanting emergent vegetation in the active channel.	CPUC shall confirm measure has been implemented through on-site monitoring	CPUC designated monitor	Post construction
Mitigation Measure Biology-16 (APM Biology-8): Following the completion of construction in natural areas, the ROW shall be recontoured to pre-Project contours, and sequestered top soil shall be replaced in such a manner that historic drainage patterns are maintained. All graded areas shall be revegetated with an appropriate native seed mix specific to the surrounding vegetation community. Revegetation of all disturbed sites shall be maintained and monitored for an appropriate period of time to ensure successful restoration.	CPUC shall confirm all specified contouring and revegetation activities have taken place as specified through on-site monitoring	CPUC Designated monitor	Post construction
Mitigation Measure Biology-17 (APM Biology-18): Qualified biologists shall survey the area to be directly impacted by construction in order to determine presence of potentially suitable habitat for Nelson's antelope ground squirrel. Pre-construction surveys shall be performed at appropriate times and under appropriate environmental conditions, in consultation with CDFG during the life of the Project. Potentially suitable habitat is defined as non-cultivated areas with sandy loam soils, widely-spaced alkali scrub vegetation, and dry washes. Appropriate measures shall be determined and implemented in consultation with CDFG to avoid impacts if surveys indicate presence of Nelson's antelope squirrel in the Project Area.	CPUC shall confirm surveys have taken place within the appropriate time frame through review of documentation	CPUC Project Manager	Prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
Mitigation Measure Biology-18 (APM Biology-19): Pre-construction/pre-activity surveys for San Joaquin kit fox active dens shall be conducted no fewer than 14 days and no more than 30 days prior to the onset of any ground-disturbing activity. Surveys will identify and characterize all potential den sites. Pre-construction surveys for active dens of San Joaquin kit fox shall follow CDFG and/or USFWS approved protocols currently in effect at the time of the survey and standardized recommendations for protection of the species prior to or during ground disturbance.	CPUC shall confirm surveys have taken place within the appropriate time frame through review of report	CPUC Project Manager	No fewer than 14 days and no more than 30 days prior to construction
Appropriate mitigation measures shall be implemented as specified in any USFWS Biological Opinion/Incidental Take Statement and the CDFG 2081(b)-(c) Incidental Take Permit and associated mitigation plan that may be issued for the Project if active dens are located in the Project Area. Documentation shall be submitted to the CPUC to confirm compliance.	CPUC shall confirm measure has been implemented through on-site monitoring	CPUC designated monitor	During construction
Mitigation Measure Biology-19 (APM Biology-10): Vehicle movements and ground-disturbing activities in biologically sensitive areas along the gas pipeline and electric power line shall be conducted in such a way as to avoid or minimize the mobilization of sediment. Appropriate Best Management Practices (BMPs) shall be employed. The BMPs shall be presented in the Erosion and Sediment Control Plan, which would be reviewed and approved by the CPUC, as described in Mitigation Hydrology-4. This mitigation shall apply to construction in the following areas, at a minimum: a) Wetlands feature on west side of Fresno Slough at MP 17.5; b) Power line alignment across Chowchilla Bypass Canal.	CPUC shall confirm measure has been implemented through on-site monitoring	CPUC designated monitor	During construction
Mitigation Measure Biology-20: An onsite restoration program shall be developed for the wetland near MP 17.5 and submitted to the responsible agency (i.e., including but not limited to the USACE, CDFG, and the Regional Water Quality Control Board [RWQCB]) and the CPUC at least 45 days prior to the start of Project activities in this area.	CPUC shall review restoration program	CPUC Project Manager	Prior to construction
The objective of this mitigation measure is to replace the habitat impacted as a result of gas pipeline construction at a 1:1 ratio. The restoration plan shall include but shall not be limited to the following information: a) Designate locations onsite to restore lost habitat. Appropriate	CPUC shall verify that all measures are in plan	CPUC staff	Prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
habitat shall be created in the exact project footprint of areas temporarily impacted or in suitable areas with similar characteristics to those areas impacted. b) Describe the methods by which the restoration will occur, including area to be restored, species to be planted, and plant installation guidelines. c) Develop a timetable for implementation of the restoration plan. All plantings shall be installed at the beginning of the year's rainy season, between November and January, to maximize natural watering and optimal temperatures. d) Develop a monitoring plan and performance criteria. The mitigation site shall be monitored for a 5-year period. e) Describe remedial measures to be performed in the event that initial restoration measures are unsuccessful in meeting the performance criteria, including the resetting of the five year monitoring period if established criteria are not satisfied. f) Describe activities to follow restoration activities. These shall include weed control, removal of tamarisk, irrigation, and control of herbivory by livestock and wildlife.			

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
Mitigation Measure Biology-21 (APM Biology-6): The following measures shall be implemented during construction to minimize the incidence of sediment mobilization: a) Clearing of vegetation shall be confined to the minimal area needed to conduct the construction activities; b) All excavated material shall be sidecast in upland habitat areas within the work area; c) Drainages and wetlands shall be protected from potential impacts from construction activities through installation of orange construction fencing backed by silt fencing. This shall prevent all excavated material, Project equipment, and sediment from impacting sensitive habitat adjacent to or downslope from construction sites; and d) At completion of the construction work all disturbed soils shall be stabilized by compaction and the entire construction site shall be recontoured to preconstruction grades.	CPUC shall confirm measure has been implemented through on-site monitoring	CPUC designated monitor	During construction
Cultural Resources			
Mitigation Measure Cultural-1 (APM Cultural-1) a) Additional studies shall be conducted in areas where cultural resources were previously identified prior to construction to determine potential Project-specific direct and indirect impacts on historical resources and develop appropriate mitigation measures in order to comply with federal and state laws. Any cultural resources that will be directly affected by the Project shall be evaluated for significance according to the criteria of the National Register of Historic Places (NRHP) and/or California Register of Historic Resources (CRHR), as appropriate. Boundary definition using more detailed surface and subsurface investigations shall be required at each previously documented site because the boundaries of these resources and their spatial relationship to the impact area are unclear. Significance evaluations shall be conducted to determine whether an isolate qualifies as a historical	CPUC shall verify through review of documentation	CPUC Project Manager	Prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
resource or if it is determined that a cultural resources site occurs within the Project Area boundaries. The Applicants shall coordinate with the CPUC and the CSLC with respect to lands under its jurisdiction to determine the disposition of any artifacts or resources that may be collected.			
b) Subsurface testing shall be conducted at each isolate location to determine if buried cultural deposits are associated with it because of the high potential for buried cultural deposits. An isolated artifact does not qualify as a historical resource under the California Environmental Quality Act (CEQA). Further management of the isolate shall not be required if no buried cultural deposits are observed during subsurface testing at the isolate locations. The site shall be evaluated and its significance determined if subsurface testing reveals that the isolate is associated with a larger buried deposit.	CPUC shall verify through review of documentation	CPUC Project Manager	Prior to construction
c) Significance evaluations may require additional archival and background research, additional field documentation, or other studies. Evaluation of archaeological properties may require test excavations, backhoe trenching, or other forms of subsurface investigation; laboratory processing and analysis of recovered remains; and a variety of special technical studies. These evaluations shall define the qualities of the resource that make it significant and assess site integrity as a means for judging the nature and extent of Project impacts. Significance evaluations and impact assessments shall be performed by appropriately qualified specialists meeting the Secretary of Interior's Professional Qualifications Standards (CFR 190: 44740–44741). Any artifacts and other remains that may be collected from the field, along with field records and other documentation, shall be curated at an institution capable of providing secure, long-term storage, care, and access to the public.	CPUC shall verify through review of documentation	CPUC Project Manager	Prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
d) A technical report documenting the results of isolate testing, subsurface boundary definition, resource evaluations, and other studies shall be prepared and provided to the relevant professional at the County, the State Historic Preservation Officer (SHPO), and the CPUC. The confidential technical report sections shall discuss the importance of historical and archaeological resources identified during the study, identify the potential for significant impacts, and discuss adequate and feasible mitigation measures. The report shall adhere to professional standards outlined by SHPO in Archaeological Resource Management Reports (ARMR): Recommended Contents and Format (Jackson 1990 as cited in Entrix 2008).	CPUC shall verify through review of documentation	CPUC Project Manager	Prior to construction
e) Additional impact mitigation shall be required if the Project cannot be redesigned to avoid the resource if studies determine that “historic properties’, or “unique archaeological resources” will be affected by the proposed Project. Impact mitigation may take a variety of forms depending on the nature of the site and the nature and extent of impacts. Site avoidance is the preferred mitigation measure. Portions of the resources outside the impact area may be preserved in an exclusion zone—a fenced area where construction equipment and personnel are not permitted – if historical or unique archaeological resources cannot be avoided entirely. One or a combination of the following measures shall be implemented where avoidance is infeasible and historical and unique archaeological resources will be jeopardized by the Project: 1) Data recovery excavation; 2) Additional analysis of existing collections; 3) Additional archival/historical research; 4) Photographic documentation; 5) Archaeological monitoring during construction,	CPUC shall verify the development of appropriate mitigation	CPUC Project Manager	Prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
followed by data recovery excavation or other appropriate measures if significant archaeological remains are exposed.			
Final decisions regarding impact mitigation shall be made in consultation with the Applicants, regulatory agencies, the county involved, technical specialists, Native American tribes, and other interested parties.	CPUC shall verify through review of documentation	CPUC Project Manager	Prior to construction
f) A Data Recovery Plan shall be prepared and implemented if data recovery is the recommended mitigation, and shall detail how mitigation will be conducted, procedures for protection and avoidance for cultural resources, and curation of cultural materials collected during the project. The plan, if required, shall be submitted to the CPUC for CPUC staff review and approval at least 30 days prior to ground-disturbing activity. Data recovery performed in association with the Project shall be supervised by appropriately qualified specialists meeting the Secretary of Interior's Professional Qualifications Standards (CFR 190: 44740–44741).	CPUC shall verify through review of the plan	CPUC staff	30 days prior to construction
g) Artifacts and other remains collected from the field, along with field records and other documentation, shall be curated at an institution capable of providing secure, long-term storage, care, and access to the public.			
Mitigation Measure Cultural-2 (APM Cultural-2): A buried site testing (BST) plan shall be prepared and implemented prior to construction in Project areas sensitive for buried archaeological sites. The plan shall be submitted to the CPUC at least 60 days prior to construction for CPUC staff review and approval.	CPUC shall review the Buried Site Testing Plan	CPUC staff	Prior to construction
The plan shall specify the areas to be tested, the methods and procedures to be used, and the protocols to follow upon discovery of cultural materials. Highly sensitive areas for buried archaeological sites that will require BST include those portions of the project that are adjacent to the San Joaquin River, Fresno Slough, and other active and remnant waterways within the Project boundaries. The BST shall utilize the combination of controlled mechanical sampling of sediments and the manual screening of those sediments in an effort to locate buried	CPUC shall verify inclusion of measures in plan	CPUC staff	Prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
archaeological deposits. The following procedures and measures shall be followed: a) Mechanized sampling shall be accomplished principally by using a backhoe to excavate trenches approximately 15 ft long at standard intervals within the target area. b) Sampling of the backhoe trenches shall be controlled by mechanically excavating the sediments in standard levels, and in the process, setting aside one backhoe bucket load of sediment from each level for manual screening through 0.25-inch mesh. c) Test units (1 meter by 1 meter) shall be excavated by hand to further explore the site's depositional history, cultural and natural stratigraphy, and to gather data for site evaluation when intact cultural deposits are uncovered during the exploratory backhoe trenching. d) Further investigations or mitigation shall not be necessary if BST indicates that a cultural resource does not meet established significance criteria, lacks integrity, or will not be impacted by the Project. e) Mitigative treatment shall be required if significant buried cultural resources will be impacted by construction. f) The BST shall be performed by appropriately qualified specialists meeting the Secretary of Interior's Professional Qualifications Standards (CFR 190: 44740–44741). Significance evaluation and treatment measures shall follow protocols described in Mitigation Measure Cultural-1.			

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
Mitigation Measure Cultural-3 (APM Cultural-3) a) The Applicants shall retain the services of a qualified professional archaeologist (as defined above) to monitor trenching, grading, or other ground disturbance within Project areas that were not subject to the subsurface investigations proposed in Mitigation Measures Cultural-1 and -2. The archaeologist shall have the authority to halt construction should a potential historic resource be located during construction activities.	CPUC shall verify through on-site monitoring	CPUC designated monitor	During construction
b) The Applicants shall educate all contractors and subcontractors employees about the potential for archaeological discoveries during construction. An archaeologist shall provide a brief training session to all construction personnel on the appropriate responses to such discoveries. The orientation shall include a description of the kinds of cultural resources that might be encountered during construction and the steps to be taken if such finds are unearthed.	CPUC shall verify through review of training documentation	CPUC Project Manager	Prior to construction
c) All excavation, construction, and related development work shall cease in the vicinity of a find if buried or concealed cultural resources are discovered during excavation, construction, or related development work until a qualified archaeologist properly investigates the find using the identification and evaluation procedures discussed in Mitigation Measure Cultural-1. Appropriate mitigation or protective measures shall be taken following any procedures described in Mitigation Measure Cultural-1 if the discovery is determined to be a significant historical resource that will be affected by the Project.	CPUC shall verify compliance through on-site monitoring	CPUC designated monitor	During construction
Mitigation Measure Cultural-4: The Applicants shall continue Native American consultation to identify those areas that may be culturally sensitive.	CPUC shall confirm continued Native American consultation through review of documentation	CPUC Project Manager	Prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
The report required under Mitigation Measure Cultural-1(f) shall report on specific measures taken in order to avoid, minimize, mitigate, and compensate for any disruption of cultural resources.	CPUC shall verify inclusion in report through review of report	CPUC staff	Prior to construction
Mitigation Measure Cultural-5: The Applicants shall prepare and implement a Paleontological Resources Discovery and Management Plan. The plan shall include guidelines for recognition of high value fossil remains for site employees. The plan shall be submitted to the CPUC for CPUC staff review and approval at least 30 days prior to the start of construction.	CPUC shall confirm the preparation of the plan	CPUC staff	Prior to construction
a) Employees shall undergo, as a part of their site-specific training, a short class (less than 1 day) on recognizing paleontological resources in the area, and on how to report their findings. b) The on-site environmental monitor shall have the authority to stop excavation in the event of discovery of a suspected paleontological resource. The following steps shall be taken if a suspected high-value fossil (such as a vertebrate) is found: 1) The environmental inspector shall be notified of the potential find, its location and time of finding. The find shall initially be documented in a daily field report. 2) All construction activity related to excavation in the area shall cease until further notice. 3) A qualified paleontologist shall be contacted to arrive on-site to inspect the potential find. 4) If the suspected find is deemed a unique paleontological resource, the area shall then be excavated under the direction of a qualified paleontologist, and remains shall be catalogued and removed from the site to an appropriate facility (a local university, museum, or other institution dedicated to the preservation of paleontological artifacts).	CPUC shall verify measures are included in plan through review of plan	CPUC staff	Prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
5) Further construction at the site may begin at the discretion of the qualified paleontologist. c) Security measures shall be enacted during the course of a paleontological excavation to protect the resource from vandalism and theft.			
Mitigation Measure Cultural-6 (APM Cultural-4): State Health and Safety Code Section 7050.5 requires that work stop immediately if human remains are found. No further disturbance shall occur until the Fresno or Madera County Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code 5097.98. The coroner has 24 hours to notify the NAHC if the remains are determined to be of Native American descent. The commission shall then contact the most likely descendent (MLD) of the deceased Native American, who will then serve as a consultant on how to proceed with the remains (e.g., avoidance, reburial). Work at the site shall not resume until such remains have been treated in the manner agreed upon by all interested parties. The Applicants shall ensure that a burial agreement has been drafted prior to construction, and shall submit a copy to the CPUC prior to construction. A burial agreement is a signed agreement between the Applicants and the Native American party designated by the NAHC as the MLD to specify the procedures and protocols to follow upon discovery of aboriginal human remains and associated funerary objects during construction or Project related activities.	CPUC shall confirm that appropriate measures have been taken through review of documentation	CPUC Project Manager	During construction, if necessary
Geology and Soils			
Mitigation Measure Geology-1: At least 30 days prior to construction, the Applicants shall prepare and submit to the CPUC for CPUC staff review and approval an Earthquake Response Plan for responding to and reducing effects from earthquakes and earthquake-related hazards during construction and operations, such as increased pipe stress due to liquefaction, and landslides in trenches or effects to wells and well casing.	CPUC shall confirm the preparation of the plan	CPUC staff	At least 30 days prior to construction
Mitigation measures shall include shoring trenches, blowout prevention, and methods to complete, re-complete, abandon, or re-abandon wells to mitigate the impacts of a seismic event.	CPUC shall verify inclusion of measures in plan through review of plan	CPUC staff	At least 30 days prior to construction
Mitigation Measure Geology-2: A Seismic Monitoring Plan shall be prepared by the Applicants and submitted to the CPUC for CPUC staff review and approval at	CPUC shall confirm the	CPUC staff	At least 30 days prior to

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
least 30 days prior to construction.	preparation of the plan		construction
The Plan shall include, but is not limited to, the following measures: a) Seismic shaking conditions shall be monitored in areas underlain by unconsolidated sediment, as mapped by pre-construction geotechnical studies. b) Structures shall be routinely monitored, and shall be inspected as soon as possible after seismic events. c) Monitoring shall utilize available instrumentation (e.g., accelerographs) monitored by the California Integrated Seismic Network, or accelerographs installed for the Project. d) Reported observations shall be further inspected and any necessary corrective actions shall be taken to avoid, reduce, or remediate impacts to facilities, including, wells, pipelines, and public health and safety as soon as practicable. e) Seismic monitoring results shall be compiled into an annual report and presented to the California Department of Conservation Division of Oil, Gas, and Geothermal Resources (DOGGR) and the CPUC within 60 days of the end of the reporting period. Results of monitoring after a significant seismic event, and any repairs required, shall be reported to the DOGGR and CPUC within 1 month of the event.	CPUC shall verify inclusion of measures through review of report	CPUC staff	At least 30 days prior to construction
Mitigation Measure Geology-3: Recommendations presented in the geotechnical report (URS 2008) shall be implemented, including but not limited to the following: a) A geotechnical investigation shall be conducted for the HDD (horizontally directional drilling) crossings at the California Aqueduct and the San Joaquin River, to provide data for a liquefaction analysis for those locations. b) The depth and setback of the HDD crossings shall be adjusted as necessary to avoid potential impacts to the pipeline caused by liquefaction.	CPUC shall verify implementation through on-site monitoring	Designated monitor	Prior to and during construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
Mitigation Measure Geology-4: The Applicants shall implement a monitoring inspection, maintenance, and repair program for the pipeline, surface facilities (including wells), and electric power line. The program shall include various methods to detect and measure potential effects of subsidence, such as deflections of the pipeline or wells due to differential settlement. The plan shall include actions the Applicants will take to correct or mitigate identified subsidence. Actions will include excavation and recompaction, as appropriate, of areas subject to subsidence that could result in damage to project facilities, or repairs to wells.	CPUC shall confirm inclusion of measures in plan through review of plan	CPUC staff	At least 30 days prior to construction
The plan shall be submitted to the CPUC for CPUC staff review and approval at least 30 days prior to operation	CPUC shall verify submittal	CPUC staff	At least 30 days prior to construction
For well repairs, the Applicants shall implement the appropriate remedial actions consistent with DOGGR procedures outlined in California Code of Regulations §1723 *et. seq.* in consultation with the DOGGR.	DOGGR shall verify adherence to regulations through review of documentation	DOGGR	During well repairs
Hazards and Hazardous Materials			
Mitigation Measure Hazards-1: The Applicants shall prepare a Hazardous Materials and Waste Management Plan. The plan shall be submitted to the CPUC for CPUC staff review and approval at least 30 days prior to Project construction.	CPUC shall confirm the preparation of the plan	CPUC staff	At least 30 days prior to construction
The plan shall include, but not be limited to, the following: a) No refueling or servicing shall be done within the Project work area without absorbent material or drip pans underneath to contain spilled fuel or lubricants. b) Any fluids drained from machinery during servicing shall be collected in leak-proof containers and taken to an appropriate disposal or recycling facility. If such activities result in spillage or accumulation of a product on the soil, the contaminated soil shall be assessed and disposed of properly. Under no circumstances shall contaminated soils be added to a construction spoils pile. c) Mobile refueling trucks shall be independently licensed and regulated to haul and dispense fuels, to ensure that the	CPCU shall confirm inclusion of measures in plan through review of plan	CPUC staff	At least 30 days prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
appropriate spill prevention techniques are implemented. d) All maintenance materials (i.e., oils, grease, lubricants, antifreeze, and similar materials) shall be stored at designated staging areas. These materials shall be placed in a designated area away from site activities and sensitive resources if they are required during field operations. e) During construction, all vehicles and equipment required on site shall be parked or stored at least 100 feet from water bodies, wetlands, known archaeological sites, and other sensitive resource areas during construction. These areas shall be identified on the construction drawings, as appropriate. All wash-down activities shall be conducted at least 100 feet from sensitive environmental resources. f) Fluids drained for maintenance shall be either transferred directly into disposal trucks for immediate transportation or shall be temporarily stored in appropriate tanks on site until regularly scheduled trucks can haul it away. g) Used fluids removed from site shall be delivered to an appropriate disposal or recycling facility. h) Storage tanks for both new and used fluids shall be installed with secondary containment, either integral to the tanks or external. i) Diesel fuel and petroleum-based lubricants shall be stored only at designated staging areas.			
Mitigation Measure Hazards-2: A Hazardous Materials Contingency Plan shall be created, and submitted to the CPUC at least 30 days prior to the start of construction for CPUC staff review and approval.	CPUC shall confirm the preparation of plan	CPUC staff	At least 30 days prior to construction
The plan shall be implemented if an accidental spill occurs or if any subsurface hazardous materials are encountered during construction.	CPUC shall verify through on-site monitoring	CPUC designated monitor	During construction
Provisions outlined in this plan shall include phone numbers of county and state agencies and primary, secondary, and final cleanup procedures. The plan shall include but not be limited to the following:	CPUC shall confirm inclusion of measures through review of plan	CPUC staff	At least 30 days prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
a) All hazardous material spills or threatened releases, including those of petroleum products such as gasoline, diesel, and hydraulic fluid, regardless of the quantity spilled, shall be immediately reported if the spill has entered or threatens to enter a water of the state, or has caused injury to a person or threatens injury to public health. b) If asbestos containing transite pipe is encountered, the pipe shall be removed by Hazmat trained employees from the path of the trench and stockpiled to the side. Containment and removal may be carried out simultaneously with the continuation of the trenching. c) If hydrocarbon contaminated soils are encountered, they shall be stockpiled, sampled, labeled, and removed. If groundwater is encountered with identifiable hydrocarbons, samples shall be obtained, and the area of the contamination shall be demarcated, and work may continue outside that zone, until remedial measures make it safe to proceed in that area. d) If natural gas or volatiles are encountered in the soil or ambient air, then air monitoring shall be conducted. If it is in a trench or excavation, that area shall be considered a permit-required confined space, and no one shall enter, until all permit-required confined space procedures are carried out, or until the atmosphere has been shown to be safe, and the space is reclassified as non-permit (per 8CCR 5157/ 29CFR 1910.146). e) In cases where an unknown material is discovered, the area shall be shut down until fully assessed. Work may continue in areas that are not affected.			
Mitigation Measure Hazards-3: Project contractors shall prepare a site-specific Health and Safety Plan (HSP) to ensure that no impacts shall occur if hazardous soils or other materials are encountered during construction or operation of the Project.	CPUC shall confirm the preparation of plan	CPUC staff	At least 30 days prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
The HSP shall include elements that establish worker training, engineering controls, and monitoring. The HSP also shall establish emergency response procedures and security measures to prevent unauthorized entry to cleanup sites and to reduce hazards outside the investigation/cleanup area.	CPUC shall verify inclusion of measures through review of plan	CPUC staff	At least 30 days prior to construction
The plan shall be submitted to the CPUC at least 30 days prior to construction for CPUC staff review and approval.	CPUC shall confirm the preparation of plan	CPUC staff	At least 30 days prior to construction
Mitigation Measure Hazards-4: Chemicals stored on-site shall be managed by inventory and periodic inspection. Material Safety Data Sheets and a location map of chemicals stored and/or used on-site shall be maintained and kept available on-site.	CPUC shall verify through on-site monitoring	CPUC designated monitor	During construction
Mitigation Measure Hazards-5: All personnel working at the facility shall be trained in general and specific hazardous chemical safety issues and response procedures.	CPUC shall verify through review of documentation	CPUC Project Manager	Prior to construction
Mitigation Measure Hazards-6: The Applicant shall use the DigAlert System to identify foreign underground structures prior to pipeline trenching. The owners of all foreign underground structures shall be notified in writing and shall be telephoned prior to excavating near their facilities.	CPUC shall verify through on-site monitoring	CPUC designated monitor	Prior to construction
Mitigation Measure Hazards-7: Underground structures shall be crossed by boring or ditching under them unless the owner of the structures allows the natural gas pipeline to be installed over them.	CPUC shall confirm compliance through review of project plans	CPUC Project Manager	Prior to construction
The trench shall be hand dug in areas in close proximity to existing pipelines and other structures.	CPUC shall verify through on-site monitoring	CPUC designated monitor	During construction
A minimum clearance of 1 foot shall be maintained, where feasible, between such lines or structures and the line being laid, unless otherwise specified.	CPUC shall confirm compliance through review of project plans	CPUC Project Manager	Prior to construction
Special procedures, such as placement of protective materials between the pipeline and existing structure, shall be followed to protect existing structures where this clearance is not feasible.	CPUC shall verify through on-site monitoring	CPUC designated monitor	During construction
Mitigation Measure Hazards-8: Pipe and/or pipe coating damaged by construction work shall be repaired. Special care shall be taken to protect other	CPUC shall verify through on-site monitoring	CPUC designated monitor	During construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan			
Mitigation Measure	**Implementation/ Monitoring Method**	**Monitoring Entity**	**Implementation Schedule**
pipelines and coatings in the vicinity of the new pipeline construction.			
Mitigation Measure Hazards-9: In the event that soils suspected of being contaminated, based on evidence from visual, olfactory, or from portable chemical monitoring devices, are removed during excavation activities along the pipeline corridor, the excavated soil shall be tested and, if contaminated above soil action levels, shall be disposed of at a licensed waste facility. Any excavated areas which have an odor due to contaminated soil shall be covered while one or more samples are being tested to determine the level of contamination. The presence of known or suspected contaminated soil or groundwater shall require the supervision of testing and investigation by a licensed professional geologist or engineer, as appropriate to meet state and federal regulations.	CPUC shall verify through on-site monitoring	CPUC designated monitor	During construction
Mitigation Measure Hazards-10: The Applicants shall prepare an Emergency Response Plan. The plan shall be submitted at least 30 days prior to Project construction to the CPUC for CPUC staff approval, and to other agencies for approval, as appropriate.	CPUC shall confirm the preparation of plan	CPUC staff	At least 30 days prior to construction
The plan shall include, but not be limited to, the following sections: a) **Initial Response:** This section shall include the procedures for the immediate internal and external notifications of the appropriate facility personnel at Gill Ranch Storage and response organizations including local fire departments in the event of an accident. These notification procedures shall include a description of the information that should be reported and the applicable reporting requirements. This section shall also include notification names and phone numbers (agencies, employees, emergency medical personnel, public, and media). This section shall include the procedures for the establishment of a response management system, a preliminary assessment of the situation, and the response resources and mitigating actions including the implementation of a tactical plan and mobilization of resources. This section shall include response checklists and decision flowcharts and brief descriptions of actions to be taken to control different types of incidents. References to information contained in other sections of the plan shall be included in the checklists. This section shall identify potential hazards and the associated initial	CPUC shall verify inclusion of measures through review of plan	CPUC staff	At least 30 days prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
response steps for each event. b) **Sustained Actions:** This section shall address the transition of a response from the initial emergency stage to the sustained action stage where more prolonged mitigation and recovery actions progress under a response management structure, if applicable. In addition, mobilization, evacuation, or shelter-in-place procedures that involve the surrounding community or areas of the facility other than the immediate vicinity of the release shall be addressed in this section. c) **Termination and Follow-up Procedures:** This section shall include procedures to ensure that the person in charge of mitigating the incident can, in coordination with federal, state, or local emergency responders, terminate the response. Follow-up actions associated with termination of a response (e.g. accident investigation, response critique, plan review, follow-up reports) shall also be outlined in this section.			
Mitigation Measure Hazards-11: The Applicants shall implement a Gas Monitoring Plan (Appendix G) that is summarized briefly here. The Gas Monitoring Plan shall address the type and frequency of gas monitoring locations and well tests, both surface and subsurface; the frequency of well-site inspections by a qualified operator; monitoring requirements for abandoned well-sites; and reporting requirements. The Plan shall include appropriate designs for gas monitoring probes that may be permanent or temporary designs, which are constructed to collect representative samples of soil gas from shallow soil depths within approximately 5 feet of the ground surface. Details of the design of the probes shall be presented in the Gas Monitoring Plan. Permanent or temporary gas monitoring probes shall be constructed in accordance with specifications cited in California's Advisory for Active Soil Gas Investigations (California EPA 2003), Section 2.2. Any proposed revisions to the Gas Monitoring Plan presented in Appendix G shall be submitted to CPUC for CPUC staff approval and to DOGGR for approval at least 45 days prior to operation. The data gathered from the first phase of the plan shall establish the baseline methane gas levels in the shallow soil at key locations on site, including each IW well and the existing 17 wells that penetrate the Starkey Formation, and document	CPUC shall confirm through review of documentation	CPUC Project Manager	During operation

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
gas composition information. Any residence or other building located within the boundaries of the Gill Ranch Storage Field that is occupied at some point during the period of measurement (quarterly, or as modified) shall also be included as a monitoring point. After completing the first fill cycle, additional gas monitoring data shall be collected at regular (quarterly) intervals for the first year from each IW well, the existing 17 wells, and any other identified monitoring point such as occupied buildings, and shall be compared to the baseline data. Following the first year and annually thereafter, provided there is no or *de minimus* evidence of gas migration to the surface, the Project operator may provide the CPUC Energy Division with information demonstrating the *de minimus* change in concentrations and may request approval from the Energy Division for a change in monitoring frequency. In the event any gas monitoring data exceeds an acceptable quantifiable concentration, the plan shall outline the next steps in the response, such as evaluating whether the concentrations constitute a risk to health and safety or the environment, and evaluating the composition of the gas to evaluate whether it is the injected gas or gas from another source. In addition, leakage surveys shall be conducted along existing County and private farm roads in the Project Area. The leakage surveys will be conducted annually in conjunction with the transmission pipeline leakage surveys. In the event an anomaly is identified, or elevated gas concentrations above background are detected in the shallow soils during monitoring, the Applicants shall further investigate to determine the cause and source of the anomaly. The Gas Monitoring Plan outlines conditions that require Immediate Action to protect human health and safety and property, and those which require Timed Action (within 6 months or less) to remedy any identified leaks. Documentation of monitoring results shall be sent to DOGGR and the CPUC at quarterly intervals (or as modified) at a minimum.			
Mitigation Measure Hazards-12: The Applicants shall drill an early test well in an optimum location to gather geologic data, information and rock and core samples. The location of the early test well shall be approved by the DOGGR prior to drilling. Cores of the cap rock from depths above the First Starkey and Second Starkey and reservoir rock shall be collected and sent to a testing lab for extensive studies of various parameters including threshold pressure. Test data on new core samples shall be sent to the CPUC technical team and the DOGGR for review. The Applicants shall use this information to refine the development plans in	Applicant shall provide all criteria information to DOGGR	DOGGR	Prior to drilling for project development

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
coordination with the DOGGR, and define the cap rock threshold pressure and a margin of safety for storage operations. If new data indicates that cap rock strength is different (substantially lower) than indicated by previous tests, operating and injection pressures shall be reduced to maintain an appropriate level of safety consistent with DOGGR safety guidelines.			
Mitigation Measure Hazards-13: The Applicants shall conduct annual temperature monitoring inside IW well casings. A temperature tool shall be run into each injection and observation well to measure temperature anomalies. In the event an anomaly is identified, or elevated gas concentrations are detected in the shallow soils during monitoring conducted as part of Mitigation Measure Hazards-11, the Applicants shall further investigate to determine the cause and source of the anomaly. In the event there is a casing integrity issue, practicable steps shall be taken in a concerted effort to minimize the impact of the leak until repairs can be made. Leaks shall be repaired as soon as possible in the case of a leak that is potentially hazardous to human health, as soon as reasonable without causing additional hazards, and no later than 4 months and the documentation shall be sent to DOGGR; a copy shall be submitted to the CPUC.	CPUC shall confirm through review of documentation	CPUC Project Manager	Post construction
Mitigation Measure Hazards-14: The Applicants shall come to a written agreement with the DOGGR regarding the alternative methods proposed for well casing construction and the DOGGR Field Rule 507-003 requirement to un-land the well casings every 5 years. The agreement shall be completed prior to construction, or the casing shall be constructed in accordance with DOGGR Field Rule 507-003.	Applicant will supply evidence of a written agreement with the DOGGR containing all specified criteria	CPUC	Prior to construction
Mitigation Measure Hazards-15: As provided in the Gas Monitoring Plan (Appendix G), the Applicants shall conduct a quarterly leak detection survey on the 11 wells located off of the Storage Field structure for the first year of operation. Once the wells are located, the site coordinates shall be recorded and a leakage survey shall be conducted within a 15-ft radius around the well. The first survey shall be conducted, and the results provided to the CPUC, at least 2 weeks prior to initial injection. If after the first year no leaks have been recorded, then the Applicants may petition the DOGGR for the leak detection survey at these locations to be conducted less frequently.	CPUC shall verify through review of documentation	CPUC	Prior to construction and ongoing for 5 years after project completion
Mitigation Measure Hazards-16: If routine surface or subsurface gas monitoring indicates that a well may be leaking (methane concentrations above background,	Applicant shall provide documentation confirming	CPUC Project Manager	During operation

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
gas bubbles, distressed vegetation), the Applicants shall report it immediately to the DOGGR and implement the appropriate remedial actions consistent with DOGGR procedures outlined in California Code of Regulations Section 1723 *et. seq.* in consultation with the DOGGR. The Applicants shall submit all well remediation and repair records to the DOGGR. Well repairs shall be made as soon as possible in the case of a leak requires immediate action according to the Gas Monitoring Plan, and as soon as practicable, and no longer than 6 months in the case of a leak that requires timed action according to the Gas Monitoring Plan. The documentation shall be sent to DOGGR and the CPUC.	specified actions have taken place to the CPUC		
Mitigation Measure Hazards-17: The proposed pipeline shall be designed, constructed, and operated with the specific intent of minimizing the probability of dig-in damage or rupture using the following measures: a) The proposed pipeline shall be located in a private easement unless environmental issues or conflicts with existing infrastructure necessitate placement within the public right-of-way. b) The proposed pipeline shall be buried with a minimum depth of cover of 60 inches. National codes generally require a minimum of 36 inches. c) The proposed pipeline shall have a warning tape placed in the pipeline trench approximately 2 feet above the pipe. d) The proposed pipeline shall have warning signs and markers as required by applicable codes. e) The Applicants shall become members of the Underground Service Alert (USA North) Underground Facility Damage Prevention Service that provides facility marking, information, or clearance to dig to excavators and facility owners.	CPUC shall confirm through review of documentation	CPUC Project Manager	Prior to construction
Mitigation Measure Hazards-18: The gas transmission pipeline design shall exceed that required by the US Department of Transportation (DOT) 49 CFR §192 for the Project area. In Class 1 locations, the pipeline shall be designed to meet Class 2 requirements utilizing a minimum design factor of 0.6, and in Class 2 locations, the pipeline shall be designed to meet Class 3 requirements utilizing a minimum design factor of 0.5.	CPUC shall confirm through review of documentation	CPUC Project Manager	Prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
Pipeline designations are listed in Table 3.8-3.			
Mitigation Measure Hazards-19: The Applicants shall prepare a Pipeline Integrity Management Plan in accordance with DOT regulations. The plan shall be submitted to the CPUC and the DOT for review and approval at least 30 days prior to Project operation.	CPUC shall confirm the preparation of plan	CPUC staff	At least 30 days prior to operation
The plan shall include, but not be limited to, the following: a) Identification of all Covered Segments; b) A baseline assessment plan for Covered Segments; c) Identification of potential threats to Covered Segments; d) A direct assessment plan; e) Provisions for remediating conditions found during an integrity assessment; f) A process for continual evaluation and assessment; g) Preventative and mitigative measures to protect covered segments; h) Performance measures to assess whether the integrity management program is effective; i) Record keeping requirements; j) A management of change process; k) A quality assurance process; l) A communication plan; m) A process for ensuring that each integrity assessment is conducted in a manner that minimizes environmental and safety risks; n) A baseline assessment plan which identifies segments to be assessed, methods selected to assess each pipeline segment, the basis for selecting each assessment method, and a priority-based	CPUC shall verify inclusion of measures in plan through review of plan	CPUC staff	At least 30 days prior to operation

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
schedule for completing the assessment.			
Mitigation Measure Hazards-20: The Applicants shall prepare a Fire Protection Plan. The plan shall be submitted to the CPUC for CPUC staff review and approval and local fire protection authorities for review and approval at least 30 days prior to Project construction.	CPUC shall confirm the preparation of plan	CPUC staff	At least 30 days prior to construction
The plan shall include fire protection and prevention methods for all components of the project during construction and operation and maintenance.	CPUC shall confirm inclusion of measures in plan through review of plan	CPUC staff	At least 30 days prior to construction
Hydrology and Water Quality			
Mitigation Measure Hydrology-1: The Applicants shall prepare a Construction Groundwater Management Plan that includes a protocol for sampling and analyzing the quality of dewatering effluent during construction for comparison with existing ground water.	CPUC shall confirm the preparation through review of the plan	CPUC staff	At least 30 days prior to construction
The Plan shall be submitted to the CPUC for CPUC staff review and approval at least 30 days prior to construction.	CPUC shall verify submittal of plan	CPUC staff	At least 30 days prior to construction
If effluent quality is questionable (i.e., if the concentration levels of various contaminants are greater than concentrations required by drinking water standards), the Applicant shall comply with applicable RWQCB regulations (e.g., Resolution Nos. R5-2006-0061, R5-2003-0008, and R5-2008-0081, as appropriate), and coordinate with the RWQCB as needed to design and implement approved treatment methods and disposal options.	CPUC shall verify inclusion of measures through review of plan	CPUC staff	At least 30 days prior to construction
Mitigation Measure Hydrology-2: The Applicants shall prepare a Hydrostatic Test Water Management Plan that specifies the source(s) of raw water to be used for hydrostatic testing, includes a representative chemical analysis of the water quality from each proposed source, and describes how and where the hydrotest water shall be disposed of once testing is completed.	CPUC shall verify inclusion of measures in plan	CPUC staff	At least 30 days prior to hydrostatic testing
The Plan shall be submitted to the CPUC for CPUC staff review and approval at least 30 days prior to any hydrostatic testing.	CPUC shall confirm the preparation of plan through review of plan	CPUC staff	At least 30 days prior to hydrostatic testing

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
Mitigation Measure Hydrology-3: The Applicants shall prepare a Construction Groundwater Management Plan covering the entire length of pipeline that specifies appropriate measures to minimize impacts of trench dewatering on local groundwater and wetland or groundwater-dependent habitats. The Plan shall include both management measures, such as scheduling trench construction during the dry season, as well as construction methods, such as limiting the length of open trench in sensitive areas.	CPUC shall verify inclusion of measures in plan through review of plan	CPUC staff	Prior to construction
The Plan shall be submitted to the CPUC for review and approval.	CPUC shall verify submittal of plan	CPUC staff	Prior to construction
Mitigation Measure Hydrology-4: The Applicant shall prepare an Erosion and Sediment Control Plan describing best management practices (BMPs), such as shallow retention/infiltration basins, bioswales, and infiltration trenches, to be used at the gas storage field site to control and manage erosion and sediment, control and treat runoff, and promote infiltration of runoff from new impervious surfaces. The plan shall also address construction within the pipeline and power line corridors, with particular emphasis on construction in sensitive areas, as described in Mitigation Measure Biology-19. BMPs, where applicable (e.g., for bioswales) shall be designed based on specific criteria from recognized BMP design guidance manuals. The Plan shall also include “housekeeping” measures to prevent rainfall contacting building materials and avoid introducing chemicals into runoff during project construction. Locations and designs of specific BMPs shall be provided in the Grading and Drainage Plan for the Project.	CPUC shall verify inclusion of measures in plan through review of plan	CPUC staff	At least 30 days prior to construction
The Erosion and Sediment Control Plan shall be submitted to the CPUC, Madera County and Fresno County for review and approval at least 30 days prior to the commencement of construction.	Named agencies shall verify submittal	CPUC staff, Madera County, Fresno County	At least 30 days prior to construction
The Erosion and Sediment Control Plan shall be revised and updated as needed, and re-submitted to the CPUC, Madera County, and Fresno County, if the nature of the construction or operation activities evolve and are not adequately addressed by the existing approved Erosion and Sediment Control Plan.	CPUC shall verify through on-site monitoring	Designated monitor	During construction
Mitigation Measure Hydrology-5: The Applicants shall prepare a Frac-Out Contingency Plan which outlines how boring entry and exit points shall be sited, proposed depths of drilling, how HDD progress will be monitored, and how inadvertent releases of drilling fluids to surface waters will be contained.	CPUC shall verify inclusion of measures in plan through review of plan	CPUC staff	Prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
The Plan shall be submitted to the CPUC for review and approval at least 30 days prior to the commencement of HDD activity.	CPUC shall verify submittal of plan	CPUC staff	Prior to construction
Mitigation Measure Hydrology-6: The Applicants shall prepare and implement a Grading and Drainage Plan that incorporates detailed engineering plans for grading of the site in order to preserve existing drainage patterns to the extent feasible and direct runoff away from active construction areas.	CPUC shall verify inclusion of measures in plan through review of plan	CPUC staff	Prior to construction
The plan shall be submitted to the CPUC for review and approval at least 30 days prior to the commencement of construction.	CPUC shall verify submittal of plan	CPUC staff	Prior to construction
Noise			
Mitigation Measure Noise-1: The contractor shall prepare and implement a Noise Control Plan during construction to avoid or reduce noise impacts on nearby residents. The plan shall be submitted to the CPUC for CPUC staff review and approval at least 45 days prior to construction.	CPUC shall verify submittal of plan	CPUC staff	At least 45 days prior to construction
The following specific measures shall be incorporated into the construction contract specifications to reduce and control noise generated from construction-related activities; however, the Noise Control Plan is not limited to these measures: a) Stationary construction equipment shall be located as far from sensitive receptors as feasible. b) Equipment shall be turned off when not in use and not allowed to idle. c) Temporary equipment enclosures or noise barriers shall be used where required to avoid exceeding local standards. d) Haul truck trips shall occur primarily during daytime hours, however after daytime trips shall be permitted for those trips used in support of 24 hour operations (e.g., well drilling, HDD construction, etc.). Other noise-generating activities associated with construction (e.g., equipment movement for maintenance purposes, or to relocate equipment from one area of the project to another) shall be limited to the hours of 6 am to 9 pm during weekdays, and between the hours of 7am to 5 pm on weekends, with special allowance for safety considerations.	CPUC shall verify inclusion of measures through review of plan.	CPUC staff	At least 45 days prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
e) Best available noise control techniques (including mufflers, intake silencers, ducts, engine closures, and acoustically attenuating shields or shrouds) shall be required for all construction equipment and trucks. The construction contractor(s) shall retain an acoustical engineer to design sound abatement measures that will meet the local noise standards if needed. f) If impact equipment (e.g., jack hammers and pavement breakers) is used during construction, hydraulically or electric-powered equipment shall be used wherever practical to avoid the noise associated with compressed-air exhaust from pneumatically powered tools. However, where use of pneumatically powered tools is unavoidable, an exhaust muffler on the compressed-air exhaust shall be used (a muffler can lower noise levels from the exhaust by up to about 10 decibels [dB]). External jackets on the tools themselves shall be used, where feasible, which can achieve a reduction of 5 dB. Quieter procedures, such as drilling rather than impact equipment, shall be used whenever construction comes within 900 ft of sensitive receptors. g) Stationary noise sources (e.g., pumps, generators, and compressors) shall be located as far from sensitive receptors as possible. If such equipment must be located within 900 ft of receptors, adequate muffling, enclosures and/or barriers shall be used as needed to ensure that local noise standards are met. Enclosure openings or venting shall face away from sensitive receptors. Enclosures shall be designed by a registered engineer regularly involved in noise control analysis and design. Operation of any stationary equipment beyond the time limits specified shall meet applicable noise ordinance noise limits. h) Material stockpiles and maintenance/equipment staging shall be located as far as possible from residences within the designated staging areas. i) Construction notification shall be sent to all residences within 900 ft of the construction location at least 7-days prior to the beginning of construction.			

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
j) An operator contact person shall be designated for responding to construction-related issues, including noise. The name and phone number of the liaison shall be clearly posted at construction areas and on all advance notifications. This person shall take steps to resolve complaints, including periodic noise monitoring, if necessary. k) An acoustical engineer shall measure actual sound levels at the short-term and long-term monitoring stations as shown in Figure 3.12-2 within 2 weeks of construction. Necessary sound abatement features shall be designed, if necessary, to ensure that long-term operations meet or exceed the local ordinance limits. Additional design features may include use of quieter equipment or further insulation of noise-generating equipment.			
Transportation and Traffic			
Mitigation Measure Traffic-1: A Traffic Control Plan shall be developed prior to Project construction. The plan shall be submitted to the CPUC for CPUC staff review and approval at least 30 days prior to construction.	CPUC shall verify submittal of plan.	CPUC staff	At least 30 days prior to construction.
The Traffic Control Plan shall conform to the state's *Manual of Temporary Traffic Controls for Construction and Maintenance Work Areas*. Elements of the Traffic Control Plan shall include, but not necessarily be limited to, the following: a) Circulation and detour plans shall be developed to minimize impacts on street circulation. Flaggers and/or signage shall be used to guide vehicles through or around the construction zone. b) Sufficient staging areas for trucks accessing construction zones shall be provided to minimize disruption of access to adjacent land uses, particularly at entries to on-site pipeline construction near residences. c) All access restrictions expected to occur during construction shall be identified. A plan for notifying the affected businesses, homes, emergency services, and other facilities and for ensuring adequate access at all times shall be developed and implemented.	CPUC shall verify inclusion of measures in plan through review of plan.	CPUC staff	At least 30 days prior to construction.

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
d) Construction vehicle movements shall be controlled and monitored through the enforcement of standard construction specifications by on-site inspectors. e) Along roads with volume/capacity (V/C) ratios corresponding with level of service (LOS) D or a poorer rating during peak traffic hours, worker vehicles and truck trips shall be scheduled outside the peak morning and evening commute hours to the extent feasible. f) Lane closures during peak hours shall be avoided to the extent feasible. Outside of allowed working hours or when work is not in progress, roads shall be restored to normal operations, and any open trenches on roadways or access ways shall be plated. g) Where possible, pipeline construction work in roadways shall be limited to a width that, at a minimum, maintains alternating one-way traffic flow past the construction zone. If the work zone width will not allow a 10-ft-wide paved travel lane, then the road shall be closed to through-traffic (except emergency vehicles), and detour signing on alternative access roads shall be used. h) All equipment and materials shall be stored in designated contractor staging areas on or adjacent to the worksite in a manner that minimizes traffic obstructions and maximizes sign visibility. i) Parking areas for construction workers shall be identified, either within the construction staging area and construction zone or, if necessary, at a nearby location, with mass transportation provided between the parking area and the worksite. j) Roadside safety protocols shall be implemented pursuant to the *Manual of Uniform Traffic Control Devices* and in consultation with Fresno County and Madera County Public Works Departments. Advance “Road Work Ahead” warning signs and speed control (including signs informing drivers of state-legislated doubled fines for speed infractions in a construction zone) shall be provided to achieve required speed reductions for safe traffic flow through the			

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
work zone. k) Roadway rights-of-way shall be repaired and restored to their original conditions or better upon completion of construction. l) Project-related information signs at each construction spread shall contain a contact number for the public to call to report traffic problems at construction sites to applicable local jurisdictions and to a Project phone number that is staffed 24 hours per day, 7 days per week. m) The first 100 ft of all gravel/dirt access ways created at the project site shall be stabilized so as to reduce wear on existing paved surfaces (e.g., with use of track-out devices). Track-out devices or other stabilizing surface materials shall be removed following construction completion, subject to landowner agreement.			
Utilities and Service Systems			
Mitigation Measure Utilities-1: The Applicants shall develop a Water Conservation and Solid Waste Minimization Plan. The plan shall be submitted to the CPUC for CPUC staff review and approval at least 30 days prior to the start of the construction phase of the Project.	CPUC shall verify submittal of plan	CPUC staff	At least 30 days prior to construction
The plan shall include, but not be limited to, the following: a) The pipeline shall be tested in at least three segments, and the water from one segment shall be reused, if feasible, in one or both of the other two segments. b) The Applicants shall improve existing roads within the Gill Ranch Storage Field that access the injection/withdrawal well sites and the central compressor facility from the existing main access roads with all-weather surface material to reduce the amount of water that would be used for dust suppression in compliance with air quality regulations. c) Onsite operation personnel shall be served by an onsite sanitary disposal system that includes a tank that shall be periodically cleaned and wastes disposed of at an appropriate offsite facility.	CPUC shall verify inclusion of measures through review of plan	CPUC staff	At least 30 days prior to construction

Table 2.2-1(Continued): Mitigation Monitoring and Reporting Plan

Mitigation Measure	Implementation/ Monitoring Method	Monitoring Entity	Implementation Schedule
d) Drought-tolerant landscaping shall be used if landscaping is installed. e) The Applicants shall provide adequate onsite trash collection and service to maintain a healthy and sanitary environment. f) The Applicants shall maintain proper storage and containment of solid waste. g) The Applicants shall provide adequate separation receptacles to facilitate recycling. h) The Applicants shall use post-consumer recycled products to the extent feasible during construction and operation. i) The Applicants shall reuse and/or recycle construction and demolition waste including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard to the extent feasible. If recycling and/or reuse is not feasible, Applicants shall properly dispose of construction and demolition waste.			

FINAL ENVIRONMENTAL ASSESSMENT

GILL RANCH LONG-TERM PERMITS FOR CROSSING UNDER THE SAN LUIS CANAL AND SAN LUIS DRAIN

Appendix B
Gill Ranch gas Storage Project Biological Opinion

February 2010

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In reply refer to:
81420-2008-F-1325 -2

DEC 22 2009

Mr. Paul M. Maniccia
Acting Chief, California South Branch
U.S. Army Corps of Engineers
1325 J Street
Sacramento, CA 95814-2922

Subject: Biological Opinion for the Gill Ranch Gas Storage Project (SPK-2008-00448) in Madera and Fresno Counties, California

Dear Mr. Maniccia:

This document transmits the US Fish and Wildlife Service's (Service) biological opinion based on the proposed Gill Ranch Gas Storage Project (proposed project) in Madera and Fresno Counties, California and the proposed project's effects on the federally endangered San Joaquin kit fox *(Vulpes macrotis mutica)* (kit fox), federally threatened giant garter snake *(Thamnophis gigas)* (snake), federally endangered blunt-nosed leopard lizard *(Gambelia silus)* (lizard), and the federally threatened Valley elderberry longhorn beetle *(Desmocerus californicus dimorphus)* (beetle). This document is issued pursuant to section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act). Your May 21, 2009 request for formal consultation, received in our office on May 22, 2009 did not contain all the information necessary to initiate formal consultation. We received complete information to initiate consultation for the proposed project with your letter dated September 24, 2009.

We concur with the Army Corps of Engineers (ACOE) determination that this project is not likely to adversely affect the blunt-nosed leopard lizard and the Valley elderberry longhorn beetle. The lizard occupies areas of open sparse vegetation with low relief in the habitats including Nonnative Grassland, Valley Sink Scrub, and Valley Saltbrush Scrub as described by Holland (1986). Suitable habitat for the lizard within the project action area is limited to an approximately one mile long and 95 foot wide pipeline alignment that will be temporarily disturbed during pipeline construction. This section of the pipeline alignment is located along the north side of Whitebridge Road, west of the Fresno Slough and east of North San Benito Avenue. The approximately 100 acre parcel containing this section of pipeline alignment is isolated from similar habitat by the Fresno Slough and associated wetlands to the north and east and irrigated farmland to the south and west. The isolation and small size of the parcel and the

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limited extent of the action area with this parcel make this project not likely to adversely affect the blunt-nosed leopard lizards. The applicant has agreed to conduct preconstruction surveys following survey protocol as written in the *Approved Survey Methodology for the Blunt-Nosed Leopard Lizard, California Department of Fish and Game, May 2004* (CDFG 2004). If blunt-nosed leopard lizards are observed within the action area during the pre-construction surveys or at any other time during or prior to construction of the pipeline, then the ACOE will need to reinitiate consultation with the Service.

There are 19 elderberry shrubs within 100 feet of proposed construction, operation, or maintenance activities associated with the proposed project. Seventeen of the elderberry shrubs are situated along public access roads and the passage of project vehicles along these public roads is the only project activity that will occur within 100 feet of these shrubs. The remaining two elderberry shrubs (EB-03, EB-04 in the Biological Assessment) are both 90 feet from the overhead power line right-of-way. Both of these shrubs occur along Lone Willow Slough which is a highly degraded depression with marginal riparian characteristics. The two shrubs have a combined total of four stems over one inch in diameter and there are no exit holes. The applicant has agreed to follow the measures in the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999) to avoid effects to elderberry shrubs. Therefore the Service concurs this project may affect, but will not likely adversely affect the Valley elderberry longhorn beetle.

The San Joaquin kit fox and the giant garter snake are likely to be adversely affected by the proposed project. Construction activities will occur in giant garter snake habitat during both the dormant and active seasons. However all activity will occur on existing roads or at a distance 200 feet or greater from each water source's bank-full measure except for along the south bank of the San Joaquin River. Along the south bank of the San Joaquin River, proposed project activities will occur during the dormant season within 200 feet of the bank. Therefore, this project will adversely affect the giant garter snake. However, the effects of this project on the snake are small and therefore fall within the parameters of the *Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter, and Yolo Counties, California* (GGS Programmatic) (USFWS 1997). The applicant has agreed to follow the guidelines of the GGS programmatic to minimize effects to the snake. Therefore this proposed project will be appended to the GGS Programmatic (Enclosure).

This document represents the Service's biological opinion on the effects of the action on the endangered kit fox. The findings and recommendations in this consultation are based on: (1) *Gill Ranch Gas Storage Project Biological Assessment*, (biological assessment) prepared in March 2009 by Entrix, Inc,(2) *Supplemental Biological Assessment Information for the Gill Ranch Gas Storage* Project prepared in September 2009 by Entrix, Inc. , *Additional Supplemental Biological Information,* prepared in October 2009 by Entrix, Inc, (3) electronic mail (emails) June - October 2009, and (4) other information available to the Service.

Consultation History

March 6, 2008	Maryann Owens, Shelley Buranek of the Service, and Zachary Simmons of the ACOE, met with Tim Murphy of Gill Ranch Gas (applicant), and Entrix Inc, consultants for the applicant during the ACOE Clean Water Act Section 404 permit (404 permit) pre-application meeting.
April 2, 2008	Shelley Buranek and Maryann Owens of the Service visited the proposed project site with the applicant and Entrix, Inc. The Service discussed alternative routes for the proposed project gas pipeline to avoid potential Fresno kangaroo rat habitat and to minimize effects to the giant garter snake.
April 8, 2008	Shelley Buranek and Maryann Owens of the Service visited and reviewed alternative routes for the proposed project gas pipeline route.
May 22, 2009	The Service received from the ACOE a copy of the biological assessment for the proposed project and a letter initiating formal consultation with the Service.
July 09, 2009	The Service sent a letter to the ACOE requesting information necessary to evaluate effects of the project on listed species.
September 24, 2009	The Service received a letter from the ACOE with responses to the Service request of July 9, 2009 for additional information. Consultation is initiated.
September 29, 2009	The Service met with ACOE and applicant to discuss San Joaquin kit fox and giant garter snake minimization measures. The applicant requested expedited biological opinion.
October 02, 2009	The Service received a letter from the applicant outlining the reasons needed for an expedited biological opinion.
October 14, 2009	The Service received responses from the applicant to additional questions on the construction of the proposed project.

BIOLOGICAL OPINION

Description of the Proposed Action

The applicant proposes to construct and operate a natural gas storage field by utilizing depleted natural gas reservoirs in an existing natural gas field. The project is designed to store 20 billion cubic feet of natural gas and deliver 650 million cubic feet per day of natural gas to the existing Pacific Gas and Electric 401 Natural Gas Line in western Fresno County. The project consists of a 5,020 acre gas storage field and associated facilities, approximately 27 miles of 30-inch natural gas pipeline to connect the storage field with the Pacific Gas and Electric (PG&E) 401 natural gas pipeline near interstate highway 5, and approximately 9.3 miles of new 115 kilovolt (kV) electric power line. Surface facilities in the gas storage field will occupy approximately 22 acres. The remaining surface area of the gas storage field will remain in agricultural production. Currently the gas storage field area contains orchards and irrigated agriculture. The applicant estimates construction of the project to occur over 12 months beginning in the last quarter of 2009 or first quarter of 2010.

Project Location

The proposed storage field is located approximately 20 miles west of Fresno and approximately 7 miles northeast of the City of Mendota in western Madera and western Fresno Counties. The storage field encompasses approximately two miles of the San Joaquin River shoreline. The majority of the proposed storage field is north and east of the San Joaquin River but there are three proposed operation and monitoring wells located on the south side of the San Joaquin River. The proposed route for the approximately 27 mile, 30 inch natural gas pipeline heads west along Avenue 3, crosses the Chowchilla Canal, than heads south along San Mateo Avenue, crosses the San Joaquin River, continues south along the west side of San Mateo Avenue to Whitebridge Road (Highway 180). At Whitebridge Avenue the pipeline will head west to Highway 33, than south along highway 33 to West Lincoln Avenue, than west to the tie-in at the PG&E 401 natural gas line (Figure 1). The proposed route for the 19.3 miles of new electric power line proceeds west from the storage field along Avenue 3, crosses the Chowchilla Canal, heads north along the Chowchilla Canal Road to Ripperdan Avenue/Avenue 7, heads west along Avenue 7 to the existing tie-in with the PG&E Dairyland-Mendota 115 kV power line.

General Construction Details

Project-related ground disturbance will be limited to the construction right-of-way, equipment staging areas, pipe storage yards, borrow and disposal areas, and access roads. The construction right-of-way width for the Project will not exceed 85 feet for the pipeline ROW and 40 feet for the power line ROW. Vehicle traffic associated with the project construction will use designated access roads. The project components are located adjacent to existing paved and unpaved roads, and no new access roads are required. Equipment staging areas include lay down areas for equipment, piping, and other construction related supplies, as well as space for contractor trailers and worker parking.

Storage Field Reservoir and Surface Facilities
The Storage Field Reservoir will develop storage for natural gas at depths of 5,700 feet and 6,300 feet. These storage areas will be accessed from 12 surface sites each containing multiple wellheads. New surface sites include one new injection well pad, seven observation and monitoring well pads, and one or two salt-water disposal wells. There are three existing injection well pads on the site. Upon these four well pads, 15 new injection wells will be drilled into three separate gas reservoirs. Each reservoir will be operated in a pressure range between 500 to 3700 pounds per square inch (psi). All new wells will be located either on existing developed well pads or in agricultural fields (primarily field and row crops). No new roads will be created through native or fallow lands to access the well pads.

A mobile drilling rig will be used to drill the injection wells and observation and monitoring wells once each new well pad site is prepared and contoured. The drill rig will operate 24 hours a day, 7 days per week until each well is drilled and completed. After drilling of a well is complete, the drill rig will be relocated to the next position. Water based fluids (brine fluid) that replicates the naturally occurring fluid in the gas reservoirs will be used as drilling fluid. This fluid will be contained onsite in temporary tanks and then trucked offsite to an appropriate disposal facility.

Three of the new observation and monitoring wells may be located south of the San Joaquin River. To access these three wells during construction and operation, the applicant will use existing public roads and bridges, and private farm roads in the immediate vicinity of the wells. The applicant will avoid the San Joaquin river channel crossing at San Mateo Avenue to the extent feasible. If observation and monitoring wells are constructed south of the San Joaquin River, construction will result in an increase of an estimated 30 to 40 truck trips per day crossing the river for a period of approximately 12 days. Operation and maintenance of these three wells would require one to two truck trips per week.

Central Compressor Facility
The central compressor facility will occupy approximately 10 acres near the center of the storage field. The central compressor facility consists of a 45,000 break horsepower compressor, gas dehydration, and processing equipment; flow and pressure control equipment; an electrical substation, the salt water disposal well, and other facilities. The compressor will be driven by electric motors and be used intermittently throughout the year, mostly during injection operations. When in use the compressors will typically run 24 hours per day. During some times of the year, equipment could operate about 10 days per month; at other times it could operate for two or more months at a time. The compressor facility will be enclosed by a chain link fence. At the fence line, the highest noise levels will be an estimated 71 A-weighted decibels (dBA). This is equivalent to the noise of busy traffic or a hair dryer. These noise levels would apply during both daytime and nighttime.

During gas withdrawal operations and before the natural gas enters the proposed project transmission pipeline, free salty water is removed from the natural gas using ethylene glycol. Salt water disposal wells will be used to inject this salty water into a sand body within the

Miocene deltaic Santa Margarita Formation. The Santa Margarita Formation contains four mappable delta sequences in the area of the Gill Ranch Gas Field. The injection zone is in the third delta sequence and is approximately 3,200 feet to 3,400 feet below ground surface. There are numerous laterally extensive claystone beds between the injection zone and the fresh water base which is located at approximately 1,000 feet below ground surface. These claystone beds will prevent the vertical migration of the injected water into fresh water aquifers, fresh ground water, or the San Joaquin River. The salt water disposal well will be designed and constructed in accordance with applicable California Division of Oil, Gas, and Geothermal Resources (DOGGR) regulations.

Gas Transmission Pipeline

The approximately 27 mile 30-inch gas transmission pipeline will be constructed using standard trenching and boring techniques. The pipeline construction right-of-way (ROW) will measures up to 95 feet in width along the alignment during construction except in limited cases where the construction ROW must be expanded to allow addition space at boring locations. The permanent pipeline ROW will be 50 feet. The pipeline is expected to take three to four months to construct and will be completed in sections of approximately 20,000 linear feet (approximately 3.8 miles). Each section will take four days to complete.

Horizontal directional drilling (HDD) will be used to cross under four water features. HDD is a trenchless method of installing underground pipes, conduits and cables along a prescribed bore path by using a surface launched drilling rig, with minimal impact on the surrounding area. This technique is used for pipeline construction in sensitive habitats so as to eliminate the long-term potential for pipeline scour or erosion in stream beds and banks. HDD involves mud rotary drilling to create a boring through which a pipeline is placed. A drilling fluid (usually a slurry of bentonite clay suspended in water is pumped through the drill bit to remove the soil and rock fragments created by the drilling process. Under some conditions, the migration of drilling fluid through subsurface materials can result in the inadvertent return of drilling fluids to the surface. This phenomenon is referred to as a "frac-out." Temporary impacts to water quality can occur if inadvertent return of drilling mud escapes through a fissure in the soil/rock structure to the surface. In order to ensure that such potential impacts to water quality are less than significant, the Applicant has developed a Frac-Out Contingency Plan which was included as part of the Biological Assessment.

Construction related activities associated with HDD activities include; off-road vehicle driving, HDD drilling, equipment stockpiling, placement of dredge spoils. Dredge spoils during HDD operations will consist of the native earthen cutting from the drill bore encapsulated in the water, and benonite slurry that is used to provide viscosity during drilling. During HDD operations, spoils will be contained onsite in either a temporary earthen ditch or in temporary tanks. Cuttings will be separated from the benonite slurry, and the reclaimed bentonite slurry will be re-circulated into the drill bore. At the completion of HDD operations, excess dredge spoils such as the native soil cuttings will either be used to backfill the HDD tie-in excavation, or trucked offsite for disposal as an appropriate soil handling facility. In either case the spoils will not remain at the worksite, and will not be used in or near waters. Excess bentonite slurry is either

hauled offsite, or it is used by local farmers for soil augmentation. In either case, the excess bentonite will not remain at the worksite.

Three of the water features are potential habitat for the giant garter snake. In this region of the giant garter snake range, the Service has determined that temporary activities such as HDD drilling, that occur at a distance greater than 200 feet from bank-full or are conducted on foot are unlikely to adversely affect the giant garter snake (Glen Wiley, biologist, US Geological Survey *in litt.,* September 2009). Bank-full describes the edge of the water channel. Water flowing above this level is on the floodplain. Table One identifies the water features that will be crossed by the gas pipeline and the distance from each bank the applicant proposes to begin the horizontal directional drilling. Along the Fresno Slough, Chowchilla Canal, and the north bank of the San Joaquin River, the applicant will confine construction related activities to existing paved or graveled roads or to a distance greater than 200 feet from bank-full. Along the south bank of the San Joaquin River construction activities will occur within 200 feet of bank-full. The applicant was unable to move construction activities out past the 200 foot distance because there is a bend in the river at this point. To avoid the bank by 200 feet on all sides would require the HDD to drill an additional 385 feet which would greatly increase the possibility of a frac-out. During the HDD process, approximately 1.03 acre within 200 feet of the south bank of the San Joaquin will be disturbed. As mentioned at the beginning of this biological opinion, the effects of this disturbance to the giant garter snake fall within the parameters of the GGS Programmatic and this project is therefore appended to the GGS Programmatic.

Table one. Water features that will be crossed by the gas pipeline and the distance from each bank that the HDD drill rig will begin drilling.

Water Feature	*Drilling distance from water feature bank*
Fresno Slough west bank	515 feet
Fresno Slough east bank	1,970 feet
San Joaquin River south bank	150 feet
San Joaquin River north bank	335 feet
Lone Willow Slough/Chowchilla Canal west bank	475 feet
Chowchilla Canal east bank	595 feet
California aqueduct	Not applicable

Electric Power Line

The approximately 9.3 miles of 115 kV utility lines will consist of 60 to 70 foot high wooden power line poles. Two 120 feet tall steel poles will be used on either side of the Chowchilla Canal to span the length of the canal. The power line will be constructed within existing the public road ROW were PG&E currently maintains an easement. Land use along the power line route is primarily agricultural (row crops and orchard). The power line will connect with the existing Dairyland-Mendota 115 kV power line at an existing steel pole along Avenue 7 ½ (Firebaugh Boulevard).

Proposed Avoidance and Minimization Measures
The applicant proposes to purchase 14.58 acres in a Service approved conservation bank to minimize the effect of the temporary loss of 48.6 acres of San Joaquin kit fox habitat caused by construction activities along the pipeline and utility corridor. This value of 14.48 acres was calculated as a ratio of 0.3 acre for every 1 acre of temporary disturbance.

The applicant proposes to contribute $56,650 to the Service's Giant Garter Snake Fund. This monetary contribution is to partially offset the negative effects to all garter snakes on the 1.03 acres within 200 feet of the south bank of the San Joaquin River that will be disturbed during placement of the natural gas pipeline.

Biological Resources Mitigation and Monitoring Plan
The applicant will develop a mitigation and monitoring plan prior to construction to fully disclose the required mitigation measures with which the applicant and the applicant's representative must comply during the construction, and operation of the proposed project. This plan shall include: species avoidance and minimization measures outlined in this biological opinion; environmental compliance reporting requirements; preconstruction survey methods; construction monitoring procedures; a Worker Environmental Awareness Program; the frac-out contingency plan; post-construction clean-up, restoration, and monitoring; success criteria; remedial measures to be implemented if success criteria are not met; and a discussion of biological resource-related facility closure measures. Prior to ground disturbance activities the applicant will select a environmental manager (Environmental Manager) to ensure compliance with the measures in the biological opinion and the biological resources mitigation and monitoring plan.

Biological Monitoring
Prior to ground disturbing activities the applicant will select a qualified biologist (Qualified Biologist) to conduct the field resource monitoring and the environmental awareness program. The Qualified Biologist will have a bachelor's degree in wildlife biology, zoology, botany, ecology, or a closely related major; three years experience in field biology; one year of field experience with the resources found in or near the action area; and ability to demonstrate the appropriate education and experience for the biological resources task that must be addressed during the proposed project construction and operation. The Qualified Biologist will be present onsite during all ground disturbing activities that have the potential to impact plants, wildlife, or native habitat. The Qualified Biologist shall ensure compliance with environmental permits and approvals as summarized in this biological opinion; ensure implementation and compliance with the Worker Environmental Awareness Program; and have the authority to halt construction at any time if biological resources are being negatively impacted.

Work Area Enforcement and Exclusion Area
All construction activities will be limited to the Project ROW, designated staging areas, and access roads. In sensitive habitat areas (i.e., habitats that potentially support listed species or sensitive habitat) orange construction fencing will be installed to delineate the work area and prevent equipment from entering sensitive areas. All site workers will be informed about the

importance of maintaining any designated protection or exclusion areas during the Worker Awareness Training Program discussed below. Sensitive resource areas will be identified by the Qualified Biologist.

During construction, all Project-related vehicle and equipment traffic will be restricted to established roads or access routes, and will observe a maximum 20-mile an hour speed limit within the work areas, except on County roads and highways. Prior to initiating pipeline construction activities, the vehicle and equipment access routes and work area will be delineated in the field (e.g., by installing construction fencing).

No firearms or pets shall be allowed on the project site and no pets shall be permitted on the project site (pets are prohibited to prevent harassment, mortality or destruction of sensitive species or their habitats).

To reduce the potential for degrading existing habitat and attracting sensitive wildlife species and their predators to the area, all food related trash will be properly contained and removed from the work site at least once per week.

Worker Awareness Training

The Applicants will develop and implement a Worker Environmental Awareness Program. Their employees, as well as employees of contractors and subcontractors who work on the Project site or related facilities during construction and operation will be informed about the sensitive biological resources potentially occurring in the Action Area. An employee training session will be conducted before groundbreaking to explain any sensitive biological resource and special status species concerns as well as applicable regulations. The Worker Environmental Awareness Program will:

- Provide for on-site or classroom presentation in which supporting written material is made available to all participants;

- Discuss the locations and types of sensitive biological resources within the Action Area and adjacent areas;

- Present the reasons for protecting these resources;

- Present the meaning of various temporary and permanent habitat protection measures;

- Present what to do if previously unidentified sensitive resources are encountered;

- Identify whom to contact if there are further comments and questions about the material discussed in the program; and

The Worker Awareness Program will be administered by a Qualified Biologist with knowledge of the local area and associated sensitive resources. Each participant in the Worker

Environmental Awareness Program shall sign a statement declaring that the individual understands and shall abide by the guidelines set forth in the program materials. The Qualified Biologist or Field Contract Representative shall also sign each statement.

Pre-construction San Joaquin Kit Fox Surveys

No less than 14 days and no more than 30 days prior to the onset of any project-related ground or vegetation-disturbing activity during the life of the Project, qualified biologists will survey the areas subject to surface disturbance for the presence of kit fox dens. Surveys will follow the San Joaquin kit fox survey protocol for the northern range (USFWS 1999). Surveys will identify and characterize all potential den sites. If dens are located in an area subject to project related surface disturbance then the avoidance and minimization measures listed below shall apply.

Potential or known kit fox dens that occur within the footprint of the proposed project must be monitored for three days with tracking medium or an infra-red beam camera to determine the current use. If no kit fox activity is observed during this period, the dens should be destroyed immediately to preclude subsequent use.

If kit fox activity is observed at the den during this period the following apply.

If the occupied den is a natal or pupping den, destruction of the den will be delayed until the adults and pups have vacated the den and the applicant has written approval from the Service to proceed with destruction of the natal or pupping den.

If the occupied den is not a natal or pupping den, the den should be monitored for at least five consecutive days from the time of the initial observation of occupancy to allow any resident animals to move to another den during its normal activity. Use of the den can be discouraged during this time by partially plugging its entrance(s) with soil in such a manner that any resident animal can escape easily. Only when the den is determined to be unoccupied may the den be hand excavated under the direction of the Qualified Biologist.

If the animal is still present after five or more consecutive days of plugging and monitoring, the den may be hand excavated when, in the judgment of the Qualified Biologist, it is temporarily vacant, for example during the animal's normal foraging activities.

Dens should be fully excavated, filled with dirt, and compacted to ensure that kit foxes cannot reenter or use the den during the construction period.

If at any point during excavation a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring the den as described above should be resumed.

Wildlife Entrapment

Wildlife entrapment prevention measures will be employed during construction, operation, and maintenance of the Project in order to prevent wildlife entrapment. Stored piping will be temporarily capped in order to prevent wildlife from taking up residence within construction

materials. Before capping open pipes stored at the project site, the pipes will be inspected for kit foxes. Well cellars and other cavities associated with the Project will be appropriately designed and managed to prevent entrapment. Potential entrapment of ground dwelling and burrowing species in open trenches during construction will be mitigated by providing covers over short spans of open trench or providing escape ramps at regular intervals 0.25 mile intervals in long spans. Trenches will be inspected on a daily basis by a biological monitor prior to onset of construction or backfilling. If any kit fox are discovered in the trench, a ramp will be placed nearby and the kit fox will be allowed to leave the trench unaided, before construction work will resume on that section of the pipeline. If the kit fox is injured the Service will be immediately contacted for advice.

Giant Garter Snake Impact Avoidance and Minimization

Standard avoidance and minimization measures will be implemented in suitable habitat as described in Appendix C of the USFWS *Programmatic Consultation with the U.S. Army Corps of Engineers for 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter, and Yolo Counties, California.*

These measures include, but are not limited to:

- Confine clearing to the minimal area necessary to facilitate construction activities.

- Flag and designate giant garter snake habitat within or adjacent to the Action Area as Environmentally Sensitive Areas. This area should be avoided by all construction personnel and equipment.

- Suitable habitat will be surveyed for giant garter snakes within 24-hours prior to construction activities and repeated if a lapse in construction activity of two weeks or greater has occurred.

- If a snake is encountered during construction, activities shall cease until appropriate corrective measures have been completed or it has been determined that the snake will not be harmed.

- Any sightings or incidental take will be reported to the USFWS within 24 hours.

- Any dewatered habitat will be left dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat.

- After completion of construction activities, the applicant will remove any temporary fill and construction debris and wherever feasible, restore disturbed areas to pre-project conditions.

Restoration work may include such activities as replanting species removed from banks or replanting emergent vegetation in the active channel.

Construction Site Restoration and Revegetation in Natural Areas
Following the completion of construction in natural areas, the ROW will be recontoured to pre-project contours, and sequestered top soil will be replaced in such a manner that historic drainage patterns are maintained. All graded areas will be revegetated with an appropriate native seed mix specific to the surrounding vegetation community. Revegetation of all disturbed sites will be maintained and monitored for an appropriate period of time to ensure successful restoration.

Seed Bank Retention and Noxious Weed Containment in Natural Areas
During construction in natural areas, the seed bank will be preserved in the construction area. The upper six inches of topsoil will be scalped and temporarily stockpiled until site restoration is initiated. Upon completion of construction, the topsoil and salvaged vegetation will be redistributed over the surface of the construction site, thus disseminating the original seed bank over the construction areas. In addition, clearing of vegetation will be confined to the minimal area needed to conduct the construction activities. To prevent the spread of invasive weeds, invasive exotic plants will be removed from the work area. When equipment is mobilized from an area infested with exotic plant species, the tires and undercarriages of all vehicles and construction equipment will be sprayed or washed to prevent the spread of noxious weed seeds into an unaffected area. Washing will occur prior to entering sensitive resource areas (i.e., any areas with native vegetation). Noxious weed washing stations will be located at ingress/egress points near any sensitive resource areas.

Erosion Control and Sedimentation
The following measures will be implemented during construction to minimize the incidence of sediment mobilization:

- Clearing of vegetation will be confined to the minimal area needed to conduct the construction activities;

- All excavated material will be side cast in upland habitat areas within the work area;

- Any work near or adjacent to any drainage or wetland would be protected through installation of orange construction fencing backed by silt fencing. This will prevent all excavated material, Project equipment, and sediment from impacting sensitive habitat adjacent to or down slope from construction sites; and

- At completion of the pipeline construction work all disturbed soils would be stabilized by compaction and the entire construction site will be re-contoured to preconstruction grades.

Frac-out Contingency Plan
HDD methods will be used where the pipeline will cross the California Aqueduct, San Joaquin River, Fresno Slough, and Chowchilla Bypass Canal. The applicant will install conductor casing in shallow portions of the HDD boring where there is unconsolidated sediments that may not adequately contain the drilling fluids. In addition, the applicant will implement a Frac-Out

Contingency Plan to address potential impacts of muds that could enter surface waters. Elements of the Frac-Out Contingency Plan are summarized below.

- Monitor the quality and quantity of drilling fluid return and provisions for the abatement of drilling fluid loss;
- Install conductor casing where geotechnical recommendation deems appropriate in unconsolidated sediments and/or intensely weathered and fractured bedrock;
- Visually monitor stream channels and wetlands during drilling of HDD under these features;
- Stop drilling when return of drilling mud slows or ceases or a spill is observed by the driller or biological monitor;
- Contain the spill (by measures such as silt fencing/hay bales);
- Pump drilling mud from the containment area to a drill rig or frac truck; and
- Refrain from drilling until containment is completed.

Action Area

The action area of this proposed project comprises all areas to be affected directly or indirectly by the Federal action, not merely the immediate area involved in the action. The action area for the proposed project is the 5,020 acre gas storage field, the 27 miles of pipeline and the associated 85 foot wide ROW; and the 9.3 miles of utility line and the associated 40 foot ROW, pipe storage yards, borrow and disposal areas, and access roads.

Analytic Framework for the Jeopardy Determination

In accordance with policy and regulation, the jeopardy analysis in this Biological Opinion relies on four components: (1) the Status of the Species, which evaluates the San Joaquin kit fox, and giant garter snake range-wide condition, the factors responsible for that condition, and its survival and recovery needs; (2) the Environmental Baseline, which evaluates the condition of the San Joaquin kit fox and giant garter snake in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the San Joaquin kit fox and the giant garter snake; (3) the Effects of the Action which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the San Joaquin kit fox and the giant garter snake; and (4) Cumulative Effects, which evaluates the effects of future, non-Federal activities in the action area on the San Joaquin kit fox and the giant garter snake.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the San Joaquin kit fox and the giant garter snake current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the

likelihood of both the survival and recovery of the San Joaquin kit fox and the giant garter snake in the wild.

The jeopardy analysis in this Biological Opinion places an emphasis on consideration of the range-wide survival and recovery needs of the San Joaquin kit fox and the giant garter snake and the role of the action area in the survival and recovery of the San Joaquin kit fox and the giant garter snake as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Status of the Species

San Joaquin Kit Fox
The Service listed the San Joaquin kit fox as an endangered species on March 11, 1967 (Service 1967) and the State of California listed kit fox as a threatened species on June 27, 1971. *The Recovery Plan for Upland Species of the San Joaquin Valley, California* (Recovery Plan) includes this canine (Service 1998).

In the San Joaquin Valley before 1930, the range of the San Joaquin kit fox extended from southern Kern County north to Tracy, San Joaquin County, on the west side, and near La Grange, Stanislaus County, on the east side (Grinnell *et al.* 1937; Service 1998). Historically, this species occurred in several San Joaquin Valley native plant communities. In the southernmost portion of the range, these communities included Valley Sink Scrub, Valley Saltbush Scrub, Upper Sonoran Subshrub Scrub, and Annual Grassland. San Joaquin kit foxes also exhibit a capacity to utilize habitats that humans have altered. The animals are present in many oil fields, grazed pasturelands, and "wind farms" (Cypher 2000). Kit foxes can inhabit the margins and fallow lands near irrigated row crops, orchards, and vineyards, and may forage occasionally in these agricultural areas (Service 1998). The San Joaquin kit fox seems to prefer more gentle terrain and decreases in abundance as terrain ruggedness increases (Grinnell *et al.* 1937; Warrick and Cypher 1998).

The kit fox is often associated with open grasslands, which form large contiguous blocks within the eastern portions of the range of the animal. The listed canine also utilizes oak savanna and some types of agriculture (e.g. orchards and alfalfa), although the long-term suitability of these habitats is unknown (Jensen 1972; Service 1998). Kit foxes often den adjacent to, and forage within, agricultural areas (Bell et. al.1994). Although agricultural areas are not traditional kit fox habitat and are often highly fragmented, they can offer sufficient prey resources and denning potential to support small numbers of kit foxes.

Adult San Joaquin kit foxes are usually solitary during late summer and fall. In September and October, adult females begin to excavate and enlarge natal dens (Morrell 1972), and adult males join the females in October or November (Morrell 1972). Typically, pups are born between February and late March following a gestation period of 49 to 55 days (Egoscue 1962; Morrell 1972; Spiegel and Tom 1996; Service 1998). Mean litter sizes reported for San Joaquin kit foxes

include 2.0 on the Carrizo Plain (White and Ralls 1993), 3.0 at Camp Roberts (Spencer and Egoscue 1992), 3.7 in the Lokern area (Spiegel and Tom 1996), and 3.8 at the Naval Petroleum Reserve (Cypher *et al.* 2001). Pups appear above ground at about age 3-4 weeks, and are weaned at age 6-8 weeks. Reproductive rates, the proportion of females bearing young, of adult San Joaquin kit foxes vary annually with environmental conditions, particularly food availability. Annual rates range from 0-100%, and reported mean rates include 61% at the Naval Petroleum Reserve (Cypher *et al.* 2000), 64% in the Lokern area (Spiegel and Tom 1996), and 32% at Camp Roberts (Spencer and Egoscue 1992). Although some yearling female kit foxes will produce young, most do not reproduce until age 2 years (Spencer and Egoscue 1992; Spiegel and Tom 1996; Cypher *et al.* 2001). Some young of both sexes, but particularly females may delay dispersal, and may assist their parents in raising the following year's litter of pups (Spiegel and Tom 1996). The young kit foxes begin to forage for themselves at about four to five months of age (Koopman *et al.* 2000; Morell 1972).

Although most young kit foxes disperse less than 8 kilometers (5 miles) (Scrivner *et al.*1987), dispersal distances of up to 122 kilometers (76.3 miles) have been documented for the San Joaquin kit fox (Service 1998). Dispersal can be through disturbed habitats, including agricultural fields, and across highways and aqueducts. The age at dispersal ranges from 4-32 months (Cypher 2000). Among juvenile kit foxes surviving to July 1 at the Naval Petroleum Reserve, 49% of the males dispersed from natal home ranges while 24% of the females dispersed (Koopman *et al.* 2000). Among dispersing kit foxes, 87% did so during their first year of age. Most, 65.2%, of the dispersing juveniles at the Naval Petroleum Reserve died within 10 days of leaving their natal home den (Koopman *et al.* 2000). Some kit foxes delay dispersal and may inherit their natal home range.

Kit foxes are reputed to be poor diggers, and their dens are usually located in areas with loose-textured, friable soils (Morrell 1972). However, the depth and complexity of their dens suggest that they possess good digging abilities, and researchers observed kit fox dens on a variety of soil types (Service 1998). Some studies have suggested that where hardpan layers predominate, kit foxes create their dens by enlarging the burrows of California ground squirrels *(Spermophilus beecheyi)* or badgers *(Taxidea taxus)* (Jensen 1972; Morrell 1972; Orloff *et al.*1986). In parts of their range, particularly in the foothills, kit foxes often use ground squirrel burrows for dens (Orloff *et al.*1986). Kit fox dens are commonly located on flat terrain or on the lower slopes of hills. About 77 percent of all kit fox dens are at or below midslope (O'Farrell 1984), with the average slope at den sites ranging from 0 to 22 degrees (O'Farrell 1984; Orloff *et al.*1986). Natal and pupping dens generally occur in flatter terrain. Common locations for dens include washes, drainages, and roadside berms. Kit foxes also commonly den in human-made structures such as culverts and pipes (O'Farrell 1984).

Natal and pupping dens may include from two to 18 entrances and are usually larger than dens that are not used for reproduction (O'Farrell and McCue 1981). Natal dens may be reused in subsequent years (Egoscue 1962). O'Farrell (1984) speculated that natal dens are located in the same location as ancestral breeding sites (O'Farrell 1984). Active natal dens are generally 1.9 to 3.2 kilometers (1.2 to 2 miles) from the dens of other mated kit fox pairs (Egoscue 1962;

O'Farrell and Gilbertson 1979). Natal and pupping dens usually can be identified by the presence of scat, prey remains, matted vegetation, and mounds of excavated soil (i.e. ramps) outside the dens (O'Farrell 1984). However, some active dens in areas outside the valley floor often do not show evidence of use (Orloff *et al.* 1986). During telemetry studies of kit foxes in the northern portion of their range, 70 percent of the dens that were known to be active showed no sign of use (e.g., tracks, scats, ramps, or prey remains) (Orloff *et al.* 1986). In another more recent study in the Coast Range, 79 percent of active kit fox dens lacked evidence of recent use other than signs of recent excavation (Jones and Stokes Associates 1997).

A kit fox can use more than 100 dens throughout its home range, although on average, an animal will use approximately 12 dens a year for shelter and escape cover (Cypher *et al.*2001). Kit foxes typically use individual dens for only brief periods, often for only one day before moving to another den (Ralls *et al.* 1990). Possible reasons for changing dens include infestation by ectoparasites, local depletion of prey, or avoidance of coyotes *(Canis latrans).* Kit foxes tend to use dens that are located in the same general area, and clusters of dens can be surrounded by hundreds of hectares of similar habitat devoid of other dens (Egoscue 1962). In the southern San Joaquin Valley, Morrell (1972), found kit foxes used up to 39 dens within a denning range of 129 to 195 hectares (320 to 482 acres) (Morrell 1972). O'Farrell (1984) in the southern San Joaquin Valley reported an average den density of one den per 28 to 37 hectares (69 to 92 acres).

Kit fox use dens for temperature regulation, shelter from adverse environmental conditions, and escape from predators. Kit foxes excavate their own dens, use those constructed by other animals, and use human-made structures (culverts, abandoned pipelines, and banks in sumps or roadbeds). At the Naval Petroleum Reserve, individual kit foxes used an average of 11.8 dens per year (Koopman *et al.* 1998).

The diet of the San Joaquin kit fox varies geographically, seasonally, and annually, based on temporal and spatial variation in abundance of potential prey. Known prey species of the kit fox include white-footed mice *(Perornyscus* spp.), insects, California ground squirrels, kangaroo rats *(Dipodomys* spp.), San Joaquin antelope squirrels, black-tailed hares *(Lepus ca4fornicus),* and chukar *(Alectoris chukar)* (Jensen 1972, Archon 1992), listed in approximate proportion of occurrence in fecal samples. Kit foxes also prey on desert cottontails *(Sylvilagus auduboniz),* ground-nesting birds, and pocket mice *(Perognathus* spp.).

San Joaquin kit foxes are primarily nocturnal, although individuals are occasionally observed resting or playing (mostly pups) near their dens during the day (Grinnell *et al.* 1937). Kit foxes occupy home ranges that vary in size from 1.7 to 4.5 square miles (White and Ralls 1993). A mated pair of kit foxes and their current litter of pups usually occupy each home range. Other adults, usually offspring from previous litters, also may be present (Koopman *et al.*2000), but individuals often move independently within their home range (Cypher 2000). Average distances traveled each night range from 5.8 to 9.1 miles and are greatest during the breeding season (Cypher 2000).

Kit foxes maintain core home range areas that are exclusive to mated pairs and their offspring (White and Ralls 1993, Spiegel 1996, White and Garrott 1997). This territorial spacing behavior eventually limits the number of foxes that can inhabit an area owing to shortages of available space and per capita prey. Hence, as habitat is fragmented or destroyed, the carrying capacity of an area is reduced and a larger proportion of the population is forced to disperse. Increased dispersal generally leads to lower survival rates and, in turn, decreased abundance because greater than 65 percent of dispersing juvenile foxes die within 10 days of leaving their natal range (Koopman *et al.*2000).

Estimates of fox density vary greatly throughout its range, and have been reported as high as 1.2 animals per square kilometer (3.11 per square miles) in optimal habitats in good years (Service 1998). At the Elk Hills in Kern County, density estimates varied from 0.7 animals per square kilometer (1.86 animals per square mile) in the early 1 980s to 0.01 animals per square kilometer (0.03 animals per square mile) in 1991 (Service 1998). Kit fox home ranges vary in size from approximately 2.6 square kilometers to 31.2 square kilometers (1 to 12 square miles) (Spiegel and Disney1996; Service 1998). Knapp (1979) estimated that a home range in agricultural areas is approximately 2.5 square kilometers (1 square mile). Individual home ranges overlap considerably, at least outside the core activity areas (Morrell 1972; Spiegel and Disney1996).

Mean annual survival rates reported for adult San Joaquin kit foxes include 0.44 at the Naval Petroleum Reserve (Cypher *et al.*2000), 0.53 at Camp Roberts (Standley *et al.* 1992), 0.56 at the Lokern area (Spiegel and Disney 1996), and 0.60 on the Carrizo Plain (Ralls and White 1995). However, survival rates widely vary among years (Spiegel and Disney 1996; Cypher *et al.*, 2001). Mean survival rates for juvenile San Joaquin kit foxes (<1 year old) are lower than rates for adults. Survival to age 1 year was 0.14 at the Naval Petroleum Reserve (Cypher *et al.* 2001), 0.20 at Camp Roberts (Standley *et al.* 1992), and 0.21 on the Carrizo Plain (Ralls and White 1995). For both adults and juveniles, survival rates of males and females are similar. San Joaquin kit foxes may live to ten years in captivity (McGrew 1979) and 8 years in the wild (Berry *et al.*1987), but most kit foxes do not live past 2-3 years of age.

The status (i.e., distribution, abundance) of the kit fox has decreased since its listing in 1967. This trend is reasonably certain to continue into the foreseeable future unless measures to protect, sustain, and restore suitable habitats, and alleviate other threats to their survival and recovery, are implemented. The following paragraphs further describe threats that are seriously affecting the kit fox.

Loss of Habitat

Less than 20 percent of the habitat within the historical range of the kit fox remained when the Service listed the subspecies in 1967, and there has been a substantial net loss of habitat since that time. Historically, San Joaquin kit foxes occurred throughout California's Central Valley and adjacent foothills. Extensive land conversions in the Central Valley began as early as the mid-1800s with the Arkansas Reclamation Act. By the 1930's, the range of the kit fox had been reduced to the southern and western parts of the San Joaquin Valley (Grinnell *et al.*1937). The primary factor contributing to this restricted distribution was the conversion of native habitat to

irrigated cropland, industrial uses (e.g., hydrocarbon extraction), and urbanization (Laughrin 1970, Jensen 1972; Morrell 1972, 1975). Approximately one-half of the natural communities in the San Joaquin Valley were tilled or developed by 1958 (Service 1980).

This rate of loss accelerated following the completion of the Central Valley Project and the State Water Project, which diverted and imported new water supplies for irrigated agriculture (Service 1995). Approximately 1.97 million acres of habitat, or about 66,000 acres per year, were converted in the San Joaquin region between 1950 and 1980 (California Department of Conservation 1994). The counties specifically noted as having the highest wildland conversion rates included Kern, Tulare, Kings, and Fresno. Kit fox occupy all of these counties. From 1959 to 1969 alone, an estimated 34 percent of natural lands were lost within the then- known kit fox range (Laughrin 1970).

By 1979, only approximately 370,000 acres out of a total of approximately 8.5 million acres on the San Joaquin Valley floor remained as non-developed land (Williams 1985, Service 1980). Data from the CDFG (1985) and Service file information indicate that between 1977 and 1988, essential habitat for the blunt-nosed leopard lizard, a species that occupies habitat that is also suitable for kit foxes, declined by about 80 percent - from 311,680 acres to 63,060 acres, an average of about 22,000 acres per year (Service 2000). Virtually all of the kit fox habitat lost was plowed and converted to irrigated cropland.

During 1990 to 1996, a gross total of approximately 71,500 acres of habitat were converted to farmland in 30 counties (total area 23.1 million acres) within the Conservation Program Focus area of the Central Valley Project. This figure includes 42,520 acres of grazing land and 28,854 acres of "other" land, which is predominantly native habitat. During this period, approximately 101,700 acres were converted to urban land use within the Conservation Program Focus area (California Department of Conservation 1994, 1996, 1998, 2000). This figure includes 49,705 acres of farmland, 20,476 acres of grazing land, and 31,366 acres of "other" land, which is predominantly comprised of native habitat. Because these assessments included a substantial portion of the Central Valley and adjacent foothills, they provide the best scientific and commercial information currently available regarding the patterns and trends of land conversion within the kit fox's geographic range.

In summary, more than one million acres of suitable habitat for kit foxes have been converted to agricultural, municipal, or industrial uses since the listing of the kit fox. In contrast, less than 500,000 acres have been preserved or are subject to community-level conservation efforts designed, at least in part, to further the conservation of the kit fox (Service 1998). Land conversions contribute to declines in kit fox abundance through direct and indirect mortalities, displacement, reduction of prey populations and denning sites, changes in the distribution and abundance of larger canids that compete with kit foxes for resources, and reductions in carrying capacity. Kit foxes may be buried in their dens during land conversion activities (C. Van Horn, Endangered Species Recovery Program, Bakersfield, personal communication to S. Jones, Fish and Wildlife Service, Sacramento, 2000), or permanently displaced from areas where structures are erected or the land is intensively irrigated (Jensen 1972, Morrell 1975). Furthermore, even

moderate fragmentation or loss of habitat may significantly impact the abundance and distribution of kit foxes. Capture rates of kit foxes at the Naval Petroleum Reserve in Elk Hills were negatively associated with the extent of oil-field development after 1987 (Warrick and Cypher 1998). Likewise, the California Energy Commission found that the relative abundance of kit foxes was lower in oil-developed habitat than in nearby undeveloped habitat on the Lokern (Spiegel 1996). Researchers from both studies inferred that the most significant effect of oil development was the lowered carrying capacity for populations of both foxes and their prey species owing to the changes in habitat characteristics or the loss and fragmentation of habitat (Spiegel 1996, Warrick and Cypher 1998).

Dens are essential for the survival and reproduction of kit foxes that use them year-round for shelter and escape and in the spring for rearing young. Hence, kit foxes generally have dozens of dens scattered throughout their territories. However, land conversion reduces the number of typical earthen dens available to kit foxes. For example, the average density of typical, earthen kit fox dens at the Naval Hills Petroleum Reserve was negatively correlated with the intensity of petroleum development (Zoellick *et al.*. 1987), and almost 20 percent of the dens in developed areas were found to be in well casings, culverts, abandoned pipelines, oil well cellars, or in the banks of sumps or roads (Service 1993). These results are important because the California Energy Commission found that, even though kit foxes frequently used pipes and culverts as dens in oil-developed areas of western Kern County, only earthen dens were used to birth and wean pups (Spiegel 1996). Similarly, kit foxes in Bakersfield use atypical dens, but have only been found to rear pups in earthen dens (P. Kelly, Endangered Species Recovery Program, Fresno, personal communication to P. White, Fish and Wildlife Service, Sacramento, April 6, 2000).

Hence, the fragmentation of habitat and destruction of earthen dens could adversely affect the reproductive success of kit foxes. Furthermore, the destruction of earthen dens may also affect kit fox survival by reducing the number and distribution of escape refuges from predators. Land conversions and associated human activities can lead to widespread changes in the availability and composition of mammalian prey for kit foxes. For example, oil field disturbances in western Kern County have resulted in shifts in the small mammal community from the primarily graminivorous species that are the staple prey of kit foxes (Spiegel 1996), to species adapted to early successional stages and disturbed areas (e.g., California ground squirrels)(Spiegel 1996). Because more than 70 percent of the diets of kit foxes usually consist of abundant leporids *(Lepus, Sylvilagus)* and rodents (e. g., *Dipodomys* spp.), and kit foxes often continue to feed on their staple prey during ephemeral periods of prey scarcity, such changes in the availability and selection of foraging sites by kit foxes could influence their reproductive rates, which are strongly influenced by food supply and decrease during periods of prey scarcity (White and Garrott 1997, 1999).

Extensive habitat destruction and fragmentation have contributed to smaller, more-isolated populations of kit foxes. Small populations have a higher probability of extinction than larger populations because their low abundance renders them susceptible to stochastic (i.e., random) events such as high variability in age and sex ratios, and catastrophes such as floods, droughts, or disease epidemics (Lande 1988, Frankham and Ralls 1998). Similarly, isolated populations are

more susceptible to extirpation by accidental or natural catastrophes because their recolonization has been hampered. These chance events can adversely affect small, isolated populations with devastating results. Extirpation can even occur when the members of a small population are healthy, because whether the population increases or decreases in size is less dependent on the age-specific probabilities of survival and reproduction than on raw chance (sampling probabilities). Owing to the probabilistic nature of extinction, many small populations will eventually lose out and go extinct when faced with these stochastic risks (Caughley and Gunn 1995).

Oil fields in the southern half of the San Joaquin Valley also continue to be an area of expansion and development activity. This expansion is reasonably certain to increase in the future owing to market-driven increases in the price of oil. The cumulative and long-term effects of oil extraction activities on kit fox populations are not fully known, but recent studies indicate that moderate- to high-density oil fields may contribute to a decrease in carrying capacity for kit foxes owing to habitat loss or changes in habitat characteristics (Spiegel 1996, Warrick and Cypher 1998). There are no limiting factors or regulations that are likely to retard the development of additional oil fields. Hence, it is reasonably certain that development will continue to destroy and fragment kit fox habitat into the foreseeable future.

Competitive Interactions with Other Canids

Several species prey upon San Joaquin kit foxes. Predators (such as coyotes, bobcats, non-native red foxes, badgers *(Taxidea taxus),* and golden eagles *(Aquila chrysaetos)* will kill kit foxes. Badgers, coyotes, and red foxes also may compete for den sites (Service 1998). The diets and habitats selected by coyotes and kit foxes living in the same areas are often quite similar (Cypher and Spencer 1998). Hence, the potential for resource competition between these species may be quite high when prey resources are scarce such as during droughts (which are quite common in semi-arid, central California). Land conversions and associated human activities have led to changes in the distribution and abundance of coyotes, which compete with kit foxes for resources.

Coyotes occur in most areas with abundant populations of kit foxes and, during the past few decades, coyote abundance has increased in many areas owing to a decrease in ranching operations, favorable landscape changes, and reduced control efforts (Orloff *et. al..* 1986, Cypher and Scrivner 1992, White and Ralls 1993, White *et al.* 1995). Coyotes may attempt to lessen resource competition with kit foxes by killing them. Coyote-related injuries accounted for 50-87 percent of the mortalities of radio collared kit foxes at Camp Roberts, the Carrizo Plain Natural Area, the Lokern Natural Area, and the Naval Petroleum Reserves (Cypher and Scrivner 1992, Standley *et al.* 1992, Ralls and White 1995, Spiegel 1996). Coyote-related deaths of adult foxes appear to be largely additive (i.e., in addition to deaths caused by other mortality factors such as disease and starvation) rather than compensatory (i.e., tending to replace deaths due to other mortality factors (White and Garrott 1997). Hence, the survival rates of adult foxes decrease significantly as the proportion of mortalities caused by coyotes increase (Cypher and Spencer 1998, White and Garrott 1997), and increases in coyote abundance may contribute to significant declines in kit fox abundance (Cypher and Scrivner 1992, Ralls and White 1995, White *et*

al. 1996). There is some evidence that the proportion of juvenile foxes killed by coyotes, increases as fox density increases (White and Garrott 1999). This density-dependent relationship would provide a feedback mechanism that reduces the amplitude of kit fox population dynamics and keeps foxes at lower densities than they might otherwise attain. In other words, coyote-related mortalities may dampen or prevent fox population growth, and accentuate, hasten, or prolong population declines.

Land-use changes also contributed to the expansion of nonnative red foxes into areas inhabited by kit foxes. Historically, the geographic range of the red fox did not overlap with that of the San Joaquin kit fox. By the 1970's, however, introduced and escaped red foxes had established breeding populations in many areas inhabited by San Joaquin kit foxes (Lewis *et al.* 1993). The larger and more aggressive red foxes are known to kill kit foxes (Ralls and White 1995), and could displace them, as has been observed in the arctic when red foxes expanded into the ranges of smaller arctic foxes (Hersteinsson and Macdonald 1982). The increased abundance and distribution of nonnative red foxes will also likely adversely affect the status of kit foxes because they are closer morphologically and taxonomically, and would likely have higher dietary overlap than coyotes, potentially resulting in more intense competition for resources. Two documented deaths of kit foxes due to red foxes have been reported (Ralls and White 1995), and red foxes appear to be displacing kit foxes in the northwestern part of their range (Lewis *et al.* 1993). At Camp Roberts, red foxes have usurped several dens that were used by kit foxes during previous years (Spencer et al 1992). In fact, opportunistic observations of red foxes in the cantonment area of Camp Roberts have increased 5-fold since 1993, and no kit foxes have been sighted or captured in this area since October 1997. Also, a telemetry study of sympatric red foxes and kit foxes in the Lost Hills area has detected spatial segregation between these species, suggesting that kit foxes may avoid or be excluded from red fox-inhabited areas (P. Kelly, Endangered Species Recovery Program, Fresno, pers. comm. to P. White, Fish and Wildlife Service, Sacramento, April 6, 2000). Such avoidance would limit the resources available to local populations of kit foxes and possibly result in decreased fox abundance and distribution.

Disease

Wildlife diseases do not appear to be a primary mortality factor that consistently limits kit fox populations throughout their range (Standley and McCue 1992). However, central California has a high incidence of wildlife rabies cases (Schultz and Barrett 1991), and high seroprevalences of canine distemper virus and canine parvovirus indicate that kit fox populations have been exposed to these diseases (Standley and McCue 1992). Hence, disease outbreaks could potentially cause substantial mortality or contribute to reduced fertility in seropositive females, as was noted in closely related swift foxes *(Vulpes velox).*

For example, there are some indications that rabies virus may have contributed to a catastrophic decrease in kit fox abundance at Camp Roberts, San Luis Obispo County, California, during the early 1990's. San Luis Obispo County had the highest incidence of wildlife rabies cases in California during 1989 to 1991, and striped skunks *(Mephitis mephitis)* were the primary vector (Barrett 1990, Schultz and Barrett 1991, Reilly and Mangiamele 1992). A rabid skunk was trapped at Camp Roberts during 1989 and two foxes were found dead due to rabies in 1990

(Standley *et al.* 1992). Captures of kit foxes during annual live trapping sessions at Camp Roberts decreased from 103 to 20 individuals during 1988 to 1991. Captures of kit foxes were positively correlated with captures of skunks during 1988 to 1997; suggesting that some factor(s) such as rabies virus was contributing to concurrent decreases in the abundances of these species. Also, captures of kit foxes at Camp Roberts were negatively correlated with the proportion of skunks that were rabid when trapped by County Public Health Department personnel two years previously. These data suggest that a rabies outbreak may have occurred in the skunk population and spread into the fox population. Macdonald and Voight (1985) observed a similar time lag in disease transmission and subsequent population reductions in Ontario, Canada, although in this instance, the transmission was from red foxes to striped skunks.

Pesticides and Rodenticides

Pesticides and rodenticides pose a threat to kit foxes through direct or secondary poisoning. Kit foxes may be killed if they ingest rodenticide in a bait application, or if they eat a rodent that has consumed the bait. Even sublethal doses of rodenticides may lead to the death of these animals by impairing their ability to escape predators or find food. Pesticides and rodenticides may also indirectly affect the survival of kit foxes by reducing the abundances of their staple prey species. For example, the California ground squirrel, which is the staple prey of kit foxes in the northern portion of their range, was thought to have been eliminated from Contra Costa County in 1975, after extensive rodent eradication programs. Field observations indicated that the long-term use of ground squirrel poisons in this county severely reduced kit fox abundance through secondary poisoning and the suppression of populations of its staple prey (Orloff *et al.* 1986).

Kit foxes occupying habitats adjacent to agricultural lands are also likely to be exposed to insecticides applied to crops owing to runoff or aerial drift. Kit foxes could be affected through direct contact with sprays and treated soils, or through consumption of contaminated prey. Data from the California Department of Pesticide Regulation indicate that acephate, aldicarb, azinphos methyl, bendiocarb, carbofuran, chlorpyrifos, endosulfan, s-fenvalerate, naled, parathion, permethrin, phorate, and trifluralin are used within one mile of kit fox habitat. A wide variety of crops (alfalfa, almonds, apples, apricots, asparagus, avocados, barley, beans, beets, bok choy, broccoli, cantaloupe, carrots, cauliflower, celery, cherries, chestnuts, chicory, Chinese cabbage, Chinese greens, Chinese radish, collards, corn, cotton, cucumbers, eggplants, endive, figs, garlic, grapefruit, grapes, hay, kale, kiwi fruit, kohlrabi, leeks, lemons, lettuce, melons, mustard, nectarines, oats, okra, olives, onions, oranges, parsley, parsnips, peaches, peanuts, pears, peas, pecans, peppers, persimmons, pimentos, pistachios, plums, pomegranates, potatoes, prunes, pumpkins, quinces, radishes, raspberries, rice, safflower, sorghum, spinach, squash, strawberries, sugar beets, sweet potatoes, Swiss chard, tomatoes, walnuts, watermelons, and wheat), as well as buildings, Christmas tree plantations, commercial/industrial areas, greenhouses, nurseries, landscape maintenance, ornamental turf, rangeland, rights of way, and uncultivated agricultural and non-agricultural land, occur in close proximity to San Joaquin kit fox habitat.

Efforts have been underway to reduce the risk of rodenticides to kit foxes (Service 1993). The Federal government began controlling the use of rodenticides in 1972 with a ban of Compound 1080 on Federal lands pursuant to Executive Order. Aboveground application of strychnine

federally listed wildlife species. "Harm" (i.e., "take") is further defined to include habitat modification or degradation that kills or injures wildlife by impairing essential behavioral patterns including breeding, feeding, or sheltering. Congress established two provisions (under sections 7 and 10 of the Act) that allow for the "incidental take" of listed species of wildlife by Federal agencies, non-Federal government agencies, and private interests. Incidental take is defined as "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." Such take requires a permit from the Secretary of the Interior that anticipates a specific level of take for each listed species. If no permit is obtained for the incidental take of listed species, the individuals or entities responsible for these actions could be liable under the enforcement provisions of section 9 of the Act if any unauthorized take occurs. There are numerous examples of section 9 violations and noncompliance with the terms and conditions of existing biological opinions on file at the Sacramento Fish and Wildlife Office. The most egregious violations, and those with the most evidence, are being pursued when Service Law Enforcement and California Department of Fish and Game Enforcement are able to do so.

Risk of Chance Extinction Owing to Small Population Size, Isolation, and High Natural Fluctuations in Abundance

Historically, kit foxes may have existed in a metapopulation structure of core and satellite populations, some of which periodically experienced local extinctions and recolonization (Service 1998). Today's populations, however, exist in an environment drastically different from the historic one and extensive habitat fragmentation has resulted in geographic isolation, smaller population sizes, and reduced genetic exchange among populations; all of which increase the vulnerability of kit fox populations to extirpation. Populations of kit foxes are extremely susceptible to the risks associated with small population size and isolation because they are characterized by marked instability in population density. For example, the relative abundance of kit foxes at the Naval Petroleum Reserves, California, decreased 10-fold during 1981 to 1983, increased 7-fold during 1991 to 1994, and then decreased 2-fold during 1995 (Cypher and Scrivner 1992, Cypher and Spencer 1998).

Many populations of kit fox are at risk of chance extinction owing to small population size and isolation. This risk has been prominently illustrated during recent, drastic declines in the populations of kit foxes at Camp Roberts and Fort Hunter Liggett. Captures of kit foxes during annual live trapping sessions at Camp Roberts decreased from 103 to 20 individuals during 1988 to 1991. This decrease continued through 1997 when only three kit foxes were captured (White *et al* 2000). A similar decrease in kit fox abundance occurred at nearby Fort Hunter Liggett, and only 2 kit foxes have been observed on this installation since 1995 (L. Clark, Wildlife Biologist, Fort Hunter Liggett, pers. comm. to P. White, Service, Sacramento, February 15, 2000). It is unlikely that the current low abundances of kit foxes at Camp Roberts and Fort Hunter Liggett will increase substantially in the near future owing to the limited potential for recruitment. The chance of substantial immigration is low because the nearest core population on the Carrizo Plain is distant (greater than 16 miles) and separated from these installations by barriers to kit fox movement such as roads, developments, and irrigated agricultural areas. Also, there is a relatively high abundance of sympatric predators and competitors on these installations that

contribute to low survival rates for kit foxes and, as a result, may limit population growth (White *et al.* 2000). Hence, these populations may be on the verge of extinction.

The destruction and fragmentation of habitat could also eventually lead to reduced genetic variation in populations of kit foxes that are small and geographically isolated. Preliminary genetic assessments indicate that historic gene flow among populations was quite high, with effective dispersal rates of at least one to four dispersers per generation (M. Schwartz, University of Montana, Missoula, pers. comm. on March 23, 2000, to P. White, Service, Sacramento, California). This level of genetic dispersal should allow for local adaptation while preventing the loss of any rare alleles. Based on these results, it is likely that northern populations of kit foxes were once panmictic (i.e., randomly mating in a genetic sense), or nearly so, with southern populations. In other words, there were no major barriers to dispersal among populations. Current levels of gene flow also appear to be adequate, however, extensive habitat loss and fragmentation continues to form more or less geographically distinct populations of foxes, which could potentially reduce genetic exchange among them. An increase in inbreeding and the loss of genetic variation could increase the extinction risk for small, isolated populations of kit foxes by reducing fecundity, juvenile survival, and lifespan (Lande 1988, Frankham and Ralls 1998).

Other populations that may be showing the initial signs of genetic isolation are the Lost Hills area and populations in the Salinas-Pajaro River watershed (i.e., Camp Roberts and Fort Hunter Liggett). Preliminary estimates of the mean number of alleles per locus from foxes in these populations indicate that allelic diversity is lower than expected. Although these results may, in part, be due to the small number of foxes sampled in these areas, they may also be indicative of an increase in the amount of inbreeding due to population subdivision (M. Schwartz, University of Montana, Missoula, personal. communication to P. J. White, Fish and Wildlife Service, Sacramento, California on March 23, 2000). Further sampling and analyses are necessary to adequately assess the effects of these potential genetic bottlenecks.

Arid systems are characterized by unpredictable fluctuations in precipitation, which lead to high frequency, high amplitude fluctuations in the abundance of mammalian prey for kit foxes (Goldingay *et al.*1997, White and Garrott 1999). Because the reproductive and neonatal survival rates of kit foxes are strongly depressed at low prey densities (White and Ralls 1993; White and Garrott 1997, 1999), periods of prey scarcity owing to drought or excessive rain events can contribute to population crashes and marked instability in the abundance and distribution of kit foxes (White and Garrott 1999). In other words, unpredictable, short-term fluctuations in precipitation and, in turn, prey abundance can generate frequent, rapid decreases in kit fox density that increase the extinction risk for small, isolated populations.

The primary goal of the recovery strategy for kit foxes identified in the Recovery Plan is to establish a complex of interconnected core and satellite populations throughout the species' range. The long-term viability of each of these core and satellite populations depends partly upon periodic dispersal and genetic flow between them. Therefore, kit fox movement corridors between these populations must be preserved and maintained. In the northern range, from the Ciervo Panoche in Fresno County northward, kit fox populations are small and isolated, and have

exhibited significant decline. The core populations are the Ciervo Panoche area, the Carrizo Plain area, and the western Kern County population. Satellite populations are found in the urban Bakersfield area, Porterville/Lake Success area, Creighton Ranch/Pixley Wildlife Refuge, Allensworth Ecological Reserve, Semitropic/Kern National Wildlife Refuge (NWR), Antelope Plain, eastern Kern grasslands, Pleasant Valley, western Madera County, Santa Nella, San Luis NWR, and Contra Costa County. Major corridors connecting these population areas are on the east and west side of the San Joaquin Valley, around the bottom of the Valley, and cross-valley corridors in Kern, Fresno, and Merced Counties.

Giant Garter Snake
A description of the status of the snake is presented in the GGS Programmatic. The Service obtained the following information on giant garter snakes subsequent to the development of the GGS Programmatic.

The proposed project is located within the San Joaquin Basin snake sub-population, in the San Joaquin Valley Recovery Unit (Service 2003). Forty-five CNDDB (2008) records are known from the San Joaquin Basin. These records include Los Banos Creek, Agatha Canal, Mud Slough, Fresno Slough, Volta Wildlife Area, Mendota Wildlife Area, and other locations within the area.

The giant garter snake is rare in the San Joaquin Valley where it is believed to occur only at sites in the northern end of the valley. In 1980, it was determined that the snakes could no longer be found south of Fresno (Hansen and Brode 1980). The CDFG conducted studies in the Los Banos Wildlife Complex and the Mendota Wildlife Area to better understand the status of giant garter snake in the San Joaquin Valley Recovery Unit (Dickert 2002, 2003). Giant garter snakes have been found at Volta Wildlife Area in the Los Banos Wildlife Complex; however, giant garter snakes have not been found in the San Luis NWR (Williams and Wunderlich 2003). The estimated total population size for Volta is 45 individuals, approximately 5.6 snakes per mile (3.5 snakes per kilometer). The total Mendota catch was only 14 garter snakes in Fresno Slough. Five of the 14 snakes had lumps on their bodies suggestive of a parasitic nematode infection (Dickert 2002, 2003). Snakes neither as small nor large as those found in the Sacramento Valley were captured in the San Joaquin Basin. This may be due to the much smaller population size, or could reflect a true scarcity of these size classes in the northern San Joaquin Valley sub-populations. Such low snake numbers are illustrative of a tenuously small population, much smaller than found in Sacramento Valley. However, 10 of the 31 snakes found at Volta weighed less than 40 grams indicating that the giant garter snakes have been breeding at Los Banos Wildlife Complex. In 2008- 2009, the Service funded a study of giant garter snakes in the San Joaquin Valley Recovery Unit. Fourteen snakes were captured in San Joaquin County and one snake in the Mendota Wildlife Refuge in Fresno County (Eric Hansen, wildlife biologist, personal communication to S. Buranek, Fish and Wildlife Service, Sacramento, October 27, 2009).

Recent genetic work on giant garter snake population structure indicates three genetic entities within the species which follow the pattern of subdivision revealed by the mitochondrial DNA

and color pattern variants: north, central, and south (Paquin 2001). The southern proposed management unit, analogous to the San Joaquin Basin, was found to have very low snake numbers and severely degraded habitat (*i.e.* 60% of sites which supported giant garter snakes in the 1970s have now been replaced by inadequate habitat). Paquin (2001) proposes that concordance of the mitochondrial marker showing genetic isolation of southern populations and unique color pattern should afford giant garter snake populations in the southern extent of their range greater protection. She suggests that Federal and state management agencies responsible for the protection of threatened and endangered species should consider elevating the protection status of San Joaquin Basin giant garter snakes to endangered.

Los Banos Creek, Agatha Canal, Mud Slough, Fresno Slough, Volta Wildlife Area, and Mendota Wildlife Area are important as snake habitat and movement corridors for the animal. The recovery strategy for the snake includes maintenance and/or creation of habitat corridors between existing sub-populations to enhance population interchange and offset threats to the species (Service 2003). Much of the land use within the San Joaquin Valley Recovery Unit is dominated by agriculture and is not suitable for the giant garter snake. Establishment of non-native predators, such as the bullfrog (*Rana catesbiana*), human alteration of water regimes, and outright habitat destruction such as wetland draining, as well as stream channelization, have reduced giant garter snake populations (Wylie *et al.* 2003). Water pollution in the form of agricultural runoff and drift from aerial application of pesticides and herbicides as well as subsurface agricultural draining, which carries toxic loads of selenium, may also affect snake sub-populations in the San Joaquin Valley (Service 2003). Remaining waterways and associated wetlands, therefore, provide vital permanent aquatic and upland habitat for snakes in an otherwise very limited habitat. The scarcity of remaining suitable habitat, flooding, stochastic processes, and continued threats of habitat loss pose a severe and imminent threat to snakes in the San Joaquin Basin.

Environmental Baseline

San Joaquin Kit Fox

There has never been a comprehensive survey of San Joaquin kit foxes or their habitat in western Fresno or Madera County. What is known comes from incidental sightings, local surveys, and aerial photos. There are approximately 25 recorded sightings of San Joaquin kit foxes within 10 miles of the action area (CDFG 2008). San Joaquin kit foxes have been documented to move ten miles or more in a single night. Five of these sightings are within the action area (Entrix 2009). Two potential kit fox dens where discovered along the proposed project pipeline route during field surveys (Wolf 2008 and Entrix 2009).

The proposed project location is within the linkage area for the kit fox Ciervo-Panoche core recovery area and kit fox satellite recovery area number four. Areas of suitable habitat that exist within the potential project footprint and adjacent to the project site that might be directly or indirectly affected by the project – the action area;- include ruderal lands, retired farmlands, and row cropland. These lands provide denning and foraging habitat, although farming activities have likely reduced denning opportunities and prey base. Kit foxes are able to travel through

fallow and active agricultural fields and old orchards for both local movement and long distance dispersal. The proposed Gill Ranch Gas Storage, project is within ten miles of multiple kit fox incidental sightings, and the project area contains habitat components that can be used by the kit fox for feeding, resting, mating, or other essential behaviors. Therefore the Service has determined it is reasonable certain that kit fox occur in the action area, particularly along the gas pipeline route.

Giant Garter Snake
Environmental Baseline information is available in the GGS Programmatic. The Service obtained the following information on the giant garter snake subsequent to the development of the GGS Programmatic The proposed project action area encompasses parts of the Fresno Slough and is adjacent to the population at the Mendota Wildlife Area. According to the CNDDB (2008), the nearest snake records are within the proposed project site where the project pipeline crosses the Fresno Slough. Snakes have been documented to move up to 5 miles (8 kilometers) over a few days in response to dewatering of habitat (Wylie *et al.* 1997), to use up to more than 8 miles (12.9 kilometers) of linear aquatic habitat over the course of a few months, and to have a home range as large as 14.5 miles^2 (3744 hectares) (Wylie and Martin 2004). The action area contains habitat components that can be used by the snake for feeding, resting, mating, and other essential behaviors, as well as for a movement corridor. Because of the biology and ecology of the snake, the presence of suitable habitat within the proposed project, and observations of the species, the Service has determined that the snake is reasonably certain to occur within the action area.

Effects of the Proposed Action

San Joaquin Kit Fox
The San Joaquin kit fox will be harmed and harassed by the construction, operation, and maintenance of the Gill Ranch Gas Storage Project.

Harm will result from the destruction of potential kit fox dens during the construction of the gas pipeline. Harassment of kit fox will result from the temporary disturbance from construction of the pipeline and utility line. For 24 months there will be temporary construction activities on 48.6 acres within the project footprint, along the pipeline route, and along the new utility corridor. Temporary fencing and placement of construction equipment piles will block access. There will be an increase in the number of humans at the site. Construction of trenching to lay pipeline may destroy burrows and individuals of small mammals, the kit fox prey. All of these factors are likely to temporarily displace kit fox from the 48.6 acres of temporary construction. Kit fox displaced from the temporary construction area may move into unfamiliar areas which will increase their risk of predation and increase the difficulty of finding required resources such as food and shelter. Any kit fox that remain in the area may experience disruption of normal behavior including foraging due to a reduction of the availability of the prey base, sheltering due to destruction of burrows, and dispersal due to a reduced ability to travel over the temporary construction site. Additionally, kit fox remaining in the temporary construction area will be at a

greater risk of predation due to increase in night lighting, and destruction of any sheltering burrows.

The applicant proposes to partially offset effects of the temporary disturbance through the acquisition of pre-approved minimization acreage of 14.8 acres at a Service-approved conservation bank. Purchase of these minimization acres will also assist in meeting recovery goals outlined in the Service's Recovery Plan (Service 1998). However, harassment to individuals resulting from the construction and operation of this project are inherent in this activity and unavoidable.

Giant Garter Snake
Effects of small projects are analyzed in the GGS Programmatic and are incorporated here by reference. Specifically, the project will harm or harass all dormant giant garter snakes hibernating within the 1.03 acre of construction activity along the south bank of the San Joaquin River. These snakes may be killed or injured or displaced during construction activities associated with horizontal directional drilling and placement of the gas pipeline such as soil compaction, digging of trenches for drill spoils and the drilling of the bore hole for the gas pipeline.

Cumulative Effects

Cumulative effects are those effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The California Department of Finance (2004) projects that from the years 2000 to 2050, the human population will increase by 139 percent in the San Joaquin Valley (from 3.3 million people to 7.9 million people). There will likely be many development projects that occur during this timeframe due to increases in human population growth that will continue to imperil the San Joaquin kit fox and hamper recovery efforts.

The County of Fresno approved a biogas facility and associated pipeline on the southeast corner of State Highway Route 180 and James Road approximately eight miles west of the town of Kerman. The construction schedule of the biogas facility is unknown. A small educational facility with a wildlife viewing platform at State Highway Route 180 and San Mateo Road is under review by the County of Fresno. The City of Mendota has approved the construction of a five MW solar power facility on a 40 acre parcel within a mile of the proposed project pipeline route. None of these projects received review under the Act.

The Service is unaware of any other future actions that are reasonably certain to occur in the action area.

Conclusion

After assessing the current status of the San Joaquin kit fox and giant garter snake, the environmental baseline for the action area, effects of the proposed action, and cumulative effects, it is the Service's biological opinion that the proposed action is not likely to jeopardize the continued existence of the San Joaquin kit fox or giant garter snake.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulations pursuant to Section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by ACOE so that they become binding conditions of any grant or permit issued to an applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The Army Corps of Engineers has a continuing duty to regulate activities covered by this incidental take statement. If the Army Corps of Engineers: (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

San Joaquin Kit Fox
The Service anticipates incidental take of the San Joaquin kit fox will be difficult to detect or quantify for the following reasons: when this mammal is not foraging, mating, or conducting other surface activity, it inhabits dens or burrows; the animal may range over a large territory; it is primarily active at night; it is a highly intelligent animal that is often extremely shy around humans; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Take of this species also may be difficult to quantify due to seasonal fluctuations in their behaviors and consequential exposure to threats.

Therefore, the Service estimates harm and harassment to the kit fox in the form of the temporary disturbance of 48.6 acres of kit fox habitat. Upon implementation of the following reasonable and prudent measures, incidental take associated with the Gill Ranch Gas Storage Project on these acres in the form of harm or harassment to San Joaquin kit foxes from loss or alteration of habitat, excavation of unoccupied dens and burrows, and loss of forage/prey will become exempt from the prohibitions described under section 9 of the Act for direct impacts. Other forms of incidental take including mortality are not authorized in this biological opinion. Harassment, harm, and the displacement of individuals due to the construction, maintenance and operations of the proposed project, and the associated pipeline and power lines project will be exempt form the prohibitions described under section 9 of the Act, provided that such harm or harassment: 1) is the result of bona fide project activities; and 2) that all terms and conditions specified below are fully implemented.

Giant Garter Snake
The Service anticipates incidental take of the giant garter snake will be difficult to detect or quantify for the following reasons: the snake hibernates in burrows, cracks and crevices and therefore injured or dead individuals are unlikely to be discovered during construction activities.

Therefore, the Service estimates all giant garter snakes on 0.57 acre of habitat along the south bank of the San Joaquin river will be killed, injured, or harassed during the temporary disturbance of construction activities.

Effect of the Take
The Service has determined that this level of anticipated take is not likely to result in jeopardy to the San Joaquin kit fox.

Reasonable and Prudent Measures
The following reasonable and prudent measures are necessary and appropriate to minimize the effects of the Gill Ranch Gas Storage project on the San Joaquin kit fox, and giant garter snake.

All equipment caches, pipe storage areas, additional work areas shall be on previously disturbed lands with natural lands or ruderal habitats avoided to the extent practicable.

Worker Training Program shall be available in languages other than English if necessary.

Worker Training Program will include a segment on applicable penalties and enforcement for violation of the Endangered Species Act as can be found in Section 11 of the Act.
Trenches for kit fox.

Terms and Conditions
In order to be exempt from the prohibitions of section 9 of the Act, ACOE will include as a condition of any permit issued for this project, the requirement to complete all proposed conservation measures and to comply with all other conditions of the biological opinion. These terms and conditions are nondiscretionary.

Reporting Requirements

1. The project proponents shall submit a post-construction compliance report prepared by the monitoring biologists to the Sacramento Fish and Wildlife Office within thirty (30) calendar days of the completion of construction activity. This report shall detail the following: (1) start and completion dates of project construction; (2) pertinent information concerning the success of the project in meeting avoidance and minimization measures; (3) an explanation of failure to meet such measures, if any and recommendations for remedial actions and request for approval from the Service, if necessary; (4) known project effects on the San Joaquin kit fox and giant garter snake, if any; (5) occurrence of incidental take of kit fox or snakes, if any; and (6) other pertinent information.

2. The project proponents must report immediately to the Service any information about take or suspected take of federally-listed species not authorized in this biological opinion or the unauthorized take (mortality or death) of a San Joaquin kit fox. The project proponents must notify the Service within 24 hours of receiving such information. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal. In the case of a dead animal, the individual animal should be preserved, as appropriate, and held in a secure location until instructions are received from the Service regarding the disposition of the specimen or the Service takes custody of the specimen. The Service contact persons are Deputy Assistant Field Supervisor, Endangered Species Program at (916) 414-6600 and Daniel Crum, Resident Agent-in-charge of the Service's Office of Law Enforcement at (916) 414-6660.

3. Any contractor or employee who during routine operations and maintenance activities inadvertently kills or injures a State-listed wildlife species must immediately report the incident to their representative and the Army Corps of Engineers. This representative and the Army Corps of Engineers must contact the California Department of Fish and Game immediately in the case of a dead or injured listed species. The California Department of Fish and Game contact for immediate assistance is State Dispatch at (916) 445-0045.

CONSERVATION RECOMMENDATIONS

There are no conservation recommendations for this project.

REINITIATION—CLOSING STATEMENT

This concludes formal consultation on the proposed Gill Ranch Gas Storage Project in Fresno and Madera Counties, California. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or

action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or, (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have questions regarding this biological opinion, please contact Susan P. Jones, Chief of the San Joaquin Valley Branch or Shelley Buranek at (916) 414-6600.

Sincerely,

FOR Susan Moore
Field Supervisor

Enclosures
US Fish and Wildlife Service Programmatic Formal Consultations for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects of the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, Solano, Stanislaus, Sutter, and Yolo Counties California. Reference number 1-2-F-97-149.

Instructions for Providing Funds to the Giant Garter Snake Species Fund

Agreement Between the United States Fish and Wildlife Service and the Center for Natural Lands Management.

Agreement Between the United States Fish and Wildlife Service, Giant Garter Snake Conservation Fund Participants and the Center for Natural Lands Management.

cc:
Justin Sloan, California Department of Fish and Game, Fresno, California
Virginia Gardner, ENTRIX, Inc., Santa Barbara, California
Ann L. Trowbridge, Gill Ranch Gas Storage, LLC, Sacramento, California
Judi K. Mosley, Pacific Gas and Electric Company, San Francisco, California

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
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Sacramento, California 95821-6340

IN REPLY REFER TO:

1-1-F-97-149

November 13, 1997

Mr. Art Champ
Chief, Regulatory Branch
Department of the Army
U.S. Army Engineer District,
Sacramento Corps of Engineers
Sacramento, California 95814-2922

Reference only
Not for mitigation or
monitoring guidance

Subject: Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California.

Dear Mr. Champ:

This transmits our programmatic formal consultation pursuant to section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.)*, regarding actions that the U.S. Army Corps of Engineers (Corps) may permit, pursuant to section 404 of the Clean Water Act, for projects with limited effects on the federally listed as threatened giant garter snake *(Thamnophis gigas)* or its habitat. Corps projects that meet the conditions specified below, or that the U.S. Fish and Wildlife Service (Service) determines will have similar effects, may be appended to this programmatic consultation. The geographic scope of this consultation includes eleven counties within the jurisdiction of the Service's Sacramento Fish and Wildlife Office. These eleven counties are: Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California.

The purpose of this programmatic consultation is to expedite Corps permitted projects, including activities which may qualify for authorization under Nationwide permitting, with relatively small effects on the giant garter snake and its habitat. Projects which exceed the programmatic threshold will require individual biological opinions. The Service will re-evaluate this programmatic consultation annually to ensure that its continued application will not result in unacceptable effects on the giant garter snake or its habitat. Restricting this programmatic consultation to projects with permanent impacts of less than 3.00 acres (1.21 hectares) and temporary impacts of less than 20.00 acres (8.09 hectares) of giant garter snake habitat per project will limit the effects of the programmatic process on the giant garter snake and its habitat. Tracking and restricting project effects over time will serve to minimize cumulative effects at local and regional levels.

Consultation History

On June 25, 1997, June Deweese, Kelly Hornaday, Alison Willy and Steve Miller of my staff met with Kathy Norton of the Corps to discuss developing a programmatic biological opinion for projects with relatively small effects on giant garter snakes. Kathy Norton provided a list of Corps permits that would likely affect giant garter snakes and would likely result in only minor or temporary effects. The Corps August 20, 1997, request for formal consultation was received August 22, 1997. The Service submitted an administrative draft biological opinion to the Corps on September 19, 1997.

We received comments from members of your staff on the administrative draft of the programmatic biological opinion on October 2, 1997. We have addressed your comments by incorporating your suggestions into the programmatic biological opinion, and by providing clarification within the opinion where necessary concerning your request for a 10-day notification for formal consultation. Due to staffing constraints, the Service cannot notify the Corps whether separate formal biological opinion will be required. However, upon receipt of requests for formal Section 7 consultation, the Service will make every effort to promptly determine whether there is sufficient information to complete section 7 consultation and whether it is appropriate to append proposed projects to the programmatic biological opinion, and will respond within thirty days of receipt of request for consultation. A complete administrative record of this consultation is contained at the Service's Sacramento Fish and Wildlife Office.

Definitions

Giant Garter Snake Habitat. The giant garter snake inhabits marshes, sloughs, ponds, small lakes, low gradient streams, other waterways and agricultural wetlands such as irrigation and drainage canals and rice fields, and the adjacent uplands. Essential habitat components consist of (1) adequate water during the snake's active period (i.e., early spring through mid-fall) to provide a prey base and cover; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat; (3) upland habitat for basking, cover, and retreat sites; and (4) higher elevation uplands for cover and refuge from flood waters. For the purposes of this programmatic opinion, a basic giant garter snake habitat unit will incorporate 2.00 acres (0.81 hectares) of surrounding upland for every 1.00 acre (0.40 hectare) of aquatic habitat. The 2.00 acres (0.81 hectares) of upland also may be defined as 218 linear feet (66 meters) of bankside habitat which incorporates adjacent uplands to a width of 200 feet (61 meters) from the edge of the bank.

Disturbance Area. Primary disturbance acreage will be determined by project area; however, disturbance area may exceed project boundaries because a 200-foot radius (61 meters) from the edge of giant garter snake aquatic habitat is incorporated to include essential habitat components and determine potential take. Disturbance may be temporary and/or permanent and should

consider: (1) opportunities to avoid habitat within the project area; (2) area of dewatering and period of time dewatered; and (3) temporary haul roads and equipment staging areas. The 200-foot radius (61 meters) also will be used to evaluate aquatic habitat disturbance during temporary alterations, i.e., upstream and downstream from berms placed for temporary dewatering.

Temporary Impacts. Temporary impacts are project activities which temporarily remove essential habitat components, but can be restored to preproject conditions of equal or greater habitat values. Projects which are to be considered temporary impacts must be able to implement the project and restore the affected habitat within two seasons.

Permanent Impacts. Permanent impacts are those project activities which result in loss of habitat and/or permanently remove essential habitat components. Temporary projects which exceed two seasons to complete will be considered permanent impacts and require mitigation equal to permanent impacts. Temporary projects which exceed two seasons may partially compensate the permanent impact ratio by completing restoration of the affected habitat.

Season. A season is defined as the calendar year period between May 1 and October 1, the active period for giant garter snake when mortality is less likely to occur. Project impacts and restoration of habitat that can be completed within this period or, if necessary, within the same calendar year with an approved extension, will be considered occurring within one season for the purposes of mitigation.

Monitoring. The following level of monitoring is required when specified: (1) photo documentation included in a report notifying the Service when the habitat restoration or creation was completed, what materials were used, plantings (if specified) and justification of any substitutions to the Service recommended guidelines included in Appendix A; (2) photo documentation and progress report submitted one year from restoration implementation, or years one, two, and five for replacement habitat; (3) justification from release of any further monitoring, if requested; and (4) recommendations for remedial actions and request for approval from the Service, if necessary.

Programmatic Consultation Guidelines

Initial project authorization under this programmatic opinion is dependent upon the following criteria:

1. Impacts will not exceed permanent losses of 3.00 acres (1.21 hectares) of giant garter snake habitat. Giant garter snake habitat includes both upland and aquatic habitat components. The aquatic habitat component of giant garter snake habitat will not exceed more than 1.00 acre (0.40 hectare) of the total permanent losses.

2. Impacts will not exceed permanent loss of 218 linear feet (66 meters) of bankside habitat.

3. Impacts will not exceed 20.00 acres (8.09 hectares) of temporary disturbance to giant garter snake habitat. This total includes both upland and aquatic habitat components of giant garter snake habitat.

4. The Scope of Work is one or more of the types listed below and routinely authorized under the Corps Nationwide permitting program, or by individual permit as appropriate.

Implementing Procedure

The following process will be used when implementing future proposed projects under this biological opinion:

1. The Corps will submit a letter requesting that the proposed project be appended to this programmatic biological opinion and provide the Service with a copy of the permit application package and a brief environmental assessment (see Appendix B, List of Items Needed to Complete Consultation).

2. The Service will review the proposed project to determine: (1) if the project is not likely to adversely affect giant garter snakes; (2) is appropriate to append to this programmatic biological opinion; or (3) needs a separate biological opinion.

3. Upon appending a proposed project to the programmatic biological opinion, the Service will determine whether one or a combination of the following is required: (1) restoration of the project site; (2) creation of replacement habitat and number of acres required; (3) a deed restriction or conservation easement on replacement habitat; (4) establishment of an endowment fund for management of large mitigation areas; (5) level of monitoring required to ensure success of mitigation implemented.

BIOLOGICAL OPINION

Description of the Proposed Action

Projects which meet the above criteria will be assigned to Level 1 through 3 by the amount of temporary and/or permanent impacts. All created habitat will be protected under a Service-approved conservation easement. The compensation ratio needed to mitigate project impacts will correspond to each of the three impact levels identified as follows:

Level 1

Level 1 project impacts result in minimal environmental effects, such as repair, rehabilitation, or replacement of previously authorized structures, installation of scientific measuring devices,

survey activities, temporary recreational structures, utility lines installation by boring underneath irrigation canals or creek channels, and temporary cofferdams. Level 1 projects would include those routinely authorized under Nationwide Permit numbers 3, 5, 6, 11, 12, and 33. The work would not result in any permanent loss of habitat and the temporary disturbance area would not exceed 20.00 acres (8.09 hectares) of habitat.

1. Impacts

   A. No permanent loss of giant garter snake habitat

   B. Less than 20.00 acres (8.09 hectares) of temporary disturbances

   C. Temporary impacts will be restored to preproject conditions within the same season or, at most, the same calendar year

2. Mitigation

   A. Restoration of temporary impacts to giant garter snake habitat

   B. One year of monitoring with a photo documentation report due one year from the restoration implementation showing pre- and post-project area photos

Level 2

Level 2 project impacts also include activities routinely authorized under Nationwide Permits, but the project implementation needs greater than one season to complete. Projects authorized under Nationwide Permit No. 30 (i.e., land management for wildlife) also would qualify for Level 2 mitigation.

1. Impacts

   A. No permanent loss of giant garter snake habitat

   B. Less than 20.00 acres (8.09 hectares) of temporary disturbances

   C. Two (2) seasons of temporary disturbances

2. Mitigation

   A. Restoration of temporary impacts to giant garter snake habitat

   B. One year of monitoring restored habitat with a photo documentation report due one year from implementation of the restoration showing pre- and post-project area photos

C. Replacement of affected giant garter snake habitat at a 1:1 ratio

D. All replacement habitat must include both upland and aquatic habitat components. Upland and aquatic habitat components must be included in the replacement habitat at a ratio of 2:1 upland acres to aquatic acres

E. Five years of monitoring additional replacement habitat with photo documentation report due each year

Level 3

Level 3 project impacts may include minor discharges into wetland habitats, such as outfall structures, bank stabilization less than 218 linear feet (66 meters), road crossings, bridge replacements or improvements, single family housing construction, and wetland and riparian restoration and creation activities.

Projects may include those routinely authorized under Nationwide Permit numbers 7, 13, 14, 18, 26, 27, and 29, or could be projects requiring individual permitting and full Public Notice. Level 3 impacts may result in permanent losses of less than 3.0 acres of giant garter snake habitat and less than 1.0 acre (0.40 hectare) of aquatic giant garter snake habitat, and temporary disturbances of less than 20.00 acres (8.09 hectares) of giant garter snake habitat. Projects with temporary disturbances which require more than two seasons to complete will be categorized as Level 3 impacts.

1. Impacts

A. Less than 3.00 acres (1.21 hectares) permanent loss of giant garter snake habitat (includes aquatic and upland habitat)

B. Less than 1.0 acre (0.40 hectare) permanent loss of aquatic giant garter snake habitat

C. Less than 218 linear feet (66 meters) permanent loss of bank habitat

D. Less than 20.00 acres (8.09 hectares) of temporary disturbances over greater than two seasons

2. Mitigation

A. Replacement of affected giant garter snake habitat at a 3:1 ratio

B. All replacement habitat must include both upland and aquatic habitat components. Upland and aquatic habitat components must be included in the replacement habitat at a ratio of 2:1 upland acres to aquatic acres

C. If restoration of habitat is a component of the replacement habitat, one year of monitoring restored habitat with a photo documentation report due one year from implementation of the restoration with pre- and post-project area photos

D. Five years of monitoring replacement habitat with photo documentation report due each year

TABLE 1 - SUMMARY OF GIANT GARTER SNAKE PROGRAMMATIC MITIGATION LEVELS

	IMPACTS: DURATION	IMPACTS: ACRES	MITIGATION: COMPENSATION
LEVEL 1	1 season	Less than 20 and temporary	Restoration
LEVEL 2	2 seasons	Less than 20 and temporary	Restoration plus 1:1 replacement
LEVEL 3	More than 2 seasons and temporary Permanent loss	Less than 20 and temporary Less than 3 acres total giant garter snake habitat AND Less than 1 acre aquatic habitat; OR Less than 218 linear feet bank habitat	3:1 Replacement (or restoration plus 2:1 replacement) 3:1 Replacement

Section 404 Options

1. If the project proponent is required to replace permanently lost wetland habitat to meet obligations pursuant to section 404 of the Clean Water Act, the 404 wetland acreage, mitigated at a minimum ratio of 1:1, may fulfill a portion of the Level 3 acreage with a 3:1 mitigation obligation required for replacing giant garter snake habitat, if the wetland acreage provides giant garter snake habitat. In-kind, on-site mitigation is preferred; however, off-site out-of-kind mitigation may be accepted on a case by case basis.

Example. A 3.00 acre (1.21 hectares) parcel of giant garter snake habitat containing one acre of wetlands is lost, 3.00 acres (1.21 hectares) of wetlands will need to be created and a minimum of 6.00 (2.43 hectares) acres of uplands surrounding these wetlands will need to be preserved for giant garter snake mitigation. To satisfy the mitigation requirements of 404, the project proponent will need to replace 1.00 acre (0.40 hectare) of wetlands. This acre of wetlands will be credited against the total mitigation obligation. The project proponent would not be asked to create the 404 wetland component in addition to the giant garter snake aquatic habitat component.

2. Bankside or riparian habitat which has greater than 25 percent canopy may contribute to the functional values of the aquatic resources and may require 404 mitigation. If the project proponent is required to replace riparian habitat to meet obligations under 404, this acreage may not be subtracted from the Level 3 with a 3:1 mitigation obligations for giant garter snake habitat. Riparian woodlands do not provide suitable habitat because of excessive shade, lack of basking sites, and absence of prey populations.

Preservation Options

If the project proponent needs to mitigate at Level 3 and wishes to secure existing giant garter snake habitat by fee title or conservation easement, preservation of the giant garter snake habitat may be credited against, but may not exceed, 50 percent of the aquatic habitat replacement. Because Level 2 impacts require restoration of existing habitat, preservation of additional habitat to mitigate for Level 2 impacts is not an option. Level 2 requires full restoration of the temporary impacts plus construction of additional habitat at a 1:1 replacement ratio.

Example. A 3.0 acre parcel of giant garter snake habitat containing one acre of wetlands is lost. The project proponent must replace permanently lost habitat at a 3:1 ratio. Therefore, 3.00 acres (1.21 hectares) of wetlands will need to be created and a minimum of 6.00 acres (2.43 hectares) of uplands surrounding these wetlands will need to be preserved for giant garter snake mitigation. The mitigation parcel purchased to construct giant garter snake habitat contains 3.00 acres (1.00 acre of wetlands and 2.00 acres of uplands) of existing giant garter snake habitat on a portion of the property. The 1.00 acre (0.40 hectare) of wetlands may be subtracted from the aquatic component because the acreage is less than 50 percent of the aquatic habitat needed to be constructed (3.0 acres). In addition, the 2.00 acres of uplands may be subtracted from the total of 6.00 acres (2.43 hectares) of surrounding uplands needed for the upland mitigation component. After crediting the existing preservation habitat in this example towards the total compensation needed, a total of 2.00 acres (0.81 hectare) of aquatic habitat remain to be constructed and 4.00 additional acres (1.62 hectares) of uplands surrounding the aquatic habitat need to be preserved.

Status of the Species

The Service published a proposal to list the giant garter snake as an endangered species on December 27, 1991 (56 FR 67046). The Service reevaluated the status of the giant garter snake

before adopting the final rule. The giant garter snake was listed as a threatened species October 20, 1993 (58 FR 54053).

Fitch (1940) described the historical range of the species as extending from the vicinity of Sacramento and Contra Costa Counties southward to Buena Vista Lake, near Bakersfield, in Kern County. Prior to 1970, the giant garter snake was recorded historically from 17 localities (Hansen and Brode 1980). Five of these localities were clustered in and around Los Banos, Merced County, and the paucity of information makes it difficult to determine precisely the species' former range. Nonetheless, these records coincide with the historical distribution of large flood basins, fresh water marshes, and tributary streams. Surveys over the last two decades have located the giant garter snake as far north as the Butte Basin in the Sacramento Valley.

As recently as the 1970s, the range of the giant garter snake extended from near Burrel, Fresno County (Hansen and Brode 1980), northward to the vicinity of Chico, Butte County (Rossman and Stewart 1987). California Department of Fish and Game (CDFG) studies (Hansen 1988) indicate that giant garter snake populations currently are distributed in portions of the rice production zones of Sacramento, Sutter, Butte, Colusa, and Glenn Counties; along the western border of the Yolo Bypass in Yolo County; and along the eastern fringes of the Sacramento-San Joaquin River delta from the Laguna Creek-Elk Grove region of central Sacramento County southward to the Stockton area of San Joaquin County.

The giant garter snake is one of the largest garter snakes, reaching a total length of at least 160 cm. Females tend to be slightly longer and stouter than males. The weight of adult female giant garter snakes is typically 1.1-1.5 pounds (500-700 grams). Dorsal background coloration varies from brownish to olive with a checkered pattern of black spots, separated by a yellow dorsal stripe and two light colored lateral stripes. Background coloration and prominence of black checkered pattern and the three yellow stripes are geographically and individually variable (Hansen 1980). The ventral surface is cream to olive or brown and sometimes infused with orange, especially in northern populations.

Endemic to wetlands in the Sacramento and San Joaquin valleys, the giant garter snake inhabits marshes, sloughs, ponds, small lakes, low gradient streams, and other waterways and agricultural wetlands, such as irrigation and drainage canals and rice fields. Giant garter snakes feed on small fishes, tadpoles, and frogs (Fitch 1941, Hansen 1980, Hansen 1988). Habitat requisites consist of: (1) adequate water during the snake's active season (early-spring through mid-fall) to provide food and cover; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat during the active season; (3) grassy banks and openings in waterside vegetation for basking; and (4) higher elevation uplands for cover and refuge from flood waters during the snake's dormant season in the winter (Hansen 1980). Giant garter snakes are typically absent from larger rivers and other water bodies that support introduced populations of large, predatory fish, and from wetlands with sand, gravel, or rock substrates (Hansen 1980, Rossman and Stewart 1987, Brode 1988, Hansen 1988). Riparian woodlands do not provide suitable habitat because of excessive shade, lack of basking sites, and absence of prey populations (Hansen 1980).

The giant garter snake inhabits small mammal burrows and other soil crevices above prevailing flood elevations throughout its winter dormancy period (i.e., November to mid-March). Giant garter snakes typically select burrows with sunny exposure along south and west facing slopes. Giant garter snakes also use burrows as refuge from extreme heat during their active period. The Biological Resources Division (BRD) of the USGS (Wylie et al. 1997) has documented giant garter snakes using burrows in the summer as much as 165 feet (50 meters) away from the marsh edge. Overwintering snakes have been documented using burrows as far as 820 feet (250 meters) from the edge of marsh habitat. During radio-telemetry studies conducted by the BRD giant garter snakes typically moved little from day to day. However, total activity varied widely between individuals. Snakes have been documented moving up to 5 miles (8 kilometers) over the period of a few days (Wylie et al. 1997).

The breeding season extends through March and April, and females give birth to live young from late July through early September (Hansen and Hansen 1990). Brood size is variable, ranging from 10 to 46 young, with a mean of 23 (Hansen and Hansen 1990). Young immediately scatter into dense cover and absorb their yolk sacs, after which they begin feeding on their own. Although growth rates are variable, young typically more than double in size by one year of age (G. Hansen, pers. comm.). Sexual maturity averages three years in males and 5 years for females (G. Hansen, pers. comm.).

The giant garter snake currently is only known from a small number of populations. The status of these populations and the threats to these snakes and their habitats are detailed in the final rule that listed the giant garter snake as threatened (58 FR 54053). A number of land use practices and other human activities currently threaten the survival of the giant garter snake throughout the remainder of its range. Although some giant garter snake populations have persisted at low levels in artificial wetlands associated with agricultural and flood control activities, many of these altered wetlands are now threatened with urban development. Cities within the current range of the giant garter snake that are rapidly expanding include: (1) Chico, (2) Yuba City, (3) Sacramento, (4) Galt, (5) Stockton, (6) Gustine, and (7) Los Banos.

Environmental Baseline

Surveys over the last two decades have located the giant garter snake as far north as the Butte Basin in the Sacramento Valley. Currently, the Service recognizes 13 separate populations of giant garter snake, with each population representing a cluster of discrete locality records (58 FR 54053). The 13 extant populational clusters largely coincide with historical riverine flood basins and tributary streams throughout the Central Valley (Hansen 1980, Brode and Hansen 1992): (1) Butte Basin, (2) Colusa Basin, (3) Sutter Basin, (4) American Basin, (5) Yolo Basin--Willow Slough, (6) Yolo Basin--Liberty Farms, (7) Sacramento Basin, (8) Badger Creek--Willow Creek, (9) Caldoni Marsh, (10) East Stockton--Diverting Canal and Duck Creek, (11) North and South Grasslands, (12) Mendota, and (13) Burrel/Lanare. These populations span the Central Valley from just southwest of Fresno (i.e., Burrell-Lanare) north to Chico (i.e., Hamilton Slough). The 11 counties where the giant garter snake is still presumed to occur are: Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo.

In 1994, the BRD (then the National Biological Survey [NBS]) began a study of the life history and habitat requirements of the giant garter snake in response to an interagency submittal for consideration as an NBS Ecosystem Initiative. Since April of 1995, the BRD has further documented occurrences of giant garter snakes within some of the 13 populations identified in the final rule. The BRD has studied populations of giant garter snakes at the Sacramento and Colusa National Wildlife Refuges within the Colusa Basin, at Gilsizer Slough within the Sutter Basin, and at the Badger Creek area of the Cosumnes River Preserve within the Badger Creek-Willow Creek area. These populations, along with the American Basin population of giant garter snakes represent the largest extant populations. With the exception of the American Basin, these populations are largely protected from many of the threats to the species. Outside of these protected areas, giant garter snakes in these population clusters are still subject to all threats identified in the final rule. The remaining nine population clusters identified in the final rule are distributed discontinuously in small isolated patches and are vulnerable to extirpation by stochastic environmental, demographic, and genetic processes. All 13 population clusters are isolated from each other with no protected dispersal corridors. Opportunities for recolonization of small populations which may become extirpated is unlikely given the isolation from larger populations and lack of dispersal corridors between them.

Effects of the Proposed Action

Proximity of the action - Projects which meet the criteria for inclusion in this consultation will be permitted under the Corps' Nationwide Permits or individual permits, as appropriate. All permits will be issued for projects that will impact wetlands, and thus all permitted activities may occur in potential giant garter snake habitat. Projects may involve direct work in aquatic giant garter snake habitat, such as dredging and filling, and construction of outfall or other structures in canals and waterways. Other activities associated with the permitted project may occur adjacent to aquatic giant garter snake habitat and thus may impact upland giant garter snake habitat or adjacent seasonal wetlands that provide seasonal foraging habitat. These activities may include grading, clearing, mowing, and equipment staging and access.

Distribution - Nationwide Permits and individual permits are issued for projects throughout the 11 counties from which the giant garter snake is currently known. Projects may occur throughout the range of the giant garter snake.

Timing - Most projects affecting wetlands are carried out during the dry season, from April through November. The active period of the giant garter snake is May 1 to October 1. During this period direct impacts are lessened because snakes are actively moving and avoiding danger. Projects occurring outside this period will have greater impacts to giant garter snakes since they are less likely to actively avoid danger, and essential feeding, reproductive, and sheltering behaviors may be disrupted.

Dispersal from wintering sites and breeding occurs from mid-March through April. Snakes are more vulnerable when they first become active. After the winter inactive period, initial

successful foraging is critical to reproductive success, particularly for breeding females, and to juvenile survival. Snakes are also seeking mates and breeding at this period. Disturbance during this time may lessen reproductive success.

Snakes begin their winter inactive period in October. Snakes are vulnerable during their inactive period when they are occupying burrows and soil crevices because they are unlikely to leave their retreat sites and may be crushed, trapped, or buried during movement of heavy equipment or excavation.

Juveniles are born late July to early September, and because of their small size they may be vulnerable to predation when disturbed from cover. Adequate feeding before the inactive period is critical for juvenile survival through the winter. Disturbance of juveniles, disruption of normal foraging activity, or removal of prey base may reduce survival of juveniles through the inactive period.

Disturbance duration and frequency - Projects that would qualify for this programmatic consultation may have both temporary and permanent impacts. Projects may be completed within one season, or may require two or more seasons to complete. Some projects may result in permanent loss of habitat and in increased disturbance frequency associated with maintenance and recreation activities. Temporary loss of habitat and temporary disturbance may result from repairs, modifications, or maintenance (e.g., temporary fill for a construction access or detour, dredging of canals or waterways). Increased disturbance frequency from recreation, traffic, feral or domestic animals, or human intrusion may be an indirect effect of some projects. Completed projects that require routine maintenance activities in proximity to habitat have future potential to cause harm, harassment, or injury.

Disturbance intensity and severity - Projects which would qualify for this consultation have either small permanent impacts of less than 3.00 acres (1.21 hectares) of giant garter snake habitat or temporary impacts which can be restored at completion of the project. Projects qualifying under this opinion are expected to have only small effects on giant garter snake populations.

Direct effects - Construction activities may remove vegetative cover and basking sites necessary for thermoregulation, fill or crush burrows or crevices, dewater habitat and remove the prey base. Temporary fill of canals and waterways will remove giant garter snake habitat and may obstruct movement of giant garter snakes. Because giant garter snakes utilize small mammal burrows and soil crevices as retreat sites, giant garter snakes may be crushed, buried, or otherwise injured from construction activities. Snakes may be run over by construction equipment or other vehicles accessing the construction sites. The disturbance from construction activities may also cause giant garter snakes to move into areas of unsuitable habitat where they will experience greater risk of predation or other sources of mortality. Silting, fill, or spill of oil or other chemicals could cause loss of prey items on or downstream of the project sites.

Indirect effects - Utility lines, road improvements, drainage facility improvements, recreational structures such as boat ramps, and flood control projects, are all potentially growth inducing and may have indirect effects to giant garter snakes. These include: vehicular mortality, human intrusion, predation from domestic and feral animals, predation from raccoons (*Procyon lotor*), skunks (*Mephitis mephitis*), opossum (*Didelphis virginiana*) and other species attracted to suburban developments, dumping of garbage causing contamination or injury, reduced water quality from urban runoff contributing to a reduced prey base, and introduction of exotic species such as predatory game fish which may prey on juveniles or compete with giant garter snakes for prey. Increases in severity and frequency of flooding may be associated with development and may inundate overwintering snakes or force snakes to seek new flood refugia during their inactive period. Other potential habitat alterations include changes in fluvial morphology and floodplain configurations for flood control, resulting in lack of refugia, loss of aquatic corridors, and restriction of movement. Land conversions may change stream and wetland hydrology. Conversion of seasonal wetlands to perennial wetlands may allow populations of non-native predatory game fish or bullfrogs (*Rana catesbiana*), which may eat juvenile snakes and compete for prey, to become established or invade to nearby marshes, sloughs, and other wetlands supporting giant garter snake.

Beneficial effects. The programmatic process will expedite projects resulting in less than 3.00 acres (1.21 hectares) of permanent impacts to giant garter snake habitat and may encourage applicants to avoid greater impacts which would require a lengthier permit process. Project planning efforts that stay within the programmatic guidelines may facilitate giant garter snake recovery by resulting in significantly less habitat loss over time. Occupied habitat protected under conservation easements will provide population components that are not threatened by the factors that contributed to listing the species. The Service anticipates that the mitigation implemented now will lead to the development of protected habitat areas distributed across the landscape. Local communities can use these preserved areas as foundations for future habitat conservation plans.

Cumulative Effects

Cumulative effects include the effects of future State, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

An undetermined number of future land use conversions and routine agricultural practices are not subject to Federal authorization or fundings and may alter the habitat or increase incidental take of giant garter snakes and are, therefore, cumulative to the proposed project. These additional cumulative effects include: (1) unpredictable fluctuations in aquatic habitat due to water management; (2) dredging and clearing vegetation from irrigation canals; (3) discing, mowing, ornamental cultivation, and routine grounds maintenance of upland habitat;

(4) increased vehicular traffic on access roads adjacent to aquatic habitat; (5) use of burrow fumigants on levees and other potential upland refugia; (6) contaminated runoff from agriculture and urbanization; and (7) predation by feral animals and pets.

Conclusion

After reviewing the current status of the giant garter snake, the environmental baseline for the action areas, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the projects which meet the qualifications for this programmatic consultation, and will be evaluated for cumulative take and habitat losses annually, are not likely to jeopardize the continued existence of the giant garter snake. No critical habitat has been designated for these species, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined by the Service as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding and sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, and sheltering. Incidental take is defined by the Service as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act, provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are nondiscretionary and must be implemented by the Corps so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o) (2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Incidental Take

The Service anticipates incidental take of giant garter snakes will occur. The project sizes and impacts authorized under this programmatic will vary, but are expected to have small effects. Giant garter snakes are secretive and notoriously sensitive to human activities. Individual snakes

are difficult to detect unless they are observed, undisturbed, at a distance. Most close-range observations represent chance encounters that are difficult to predict. The Service anticipates the following forms of incidental take:

1. The number of giant garter snakes that may be found in 250 acres (100 hectares) of habitat per year will be disturbed, harassed, harmed, or killed by project activities resulting in temporary impacts and permanent impacts, especially from dewatering, channel reconfiguration, and use of heavy equipment within or near aquatic habitat.

2. Fifty acres (20 hectares) of giant garter snake habitat per year may be permanently lost.

Effect of the Take

In the accompanying biological opinion, the Service has determined that this level of anticipated take is not likely to result in jeopardy to the giant garter snake or destruction or adverse modification of critical habitat.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize incidental take of giant garter snakes.

1. Harassment, harm, or take of giant garter snakes during construction activities associated with implementing the projects shall be minimized (refer also to Appendix C, Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat).

2. Impacts of temporary losses and degradation of habitat of giant garter snakes shall be minimized and, to the greatest extent practicable, habitat restored to its pre-project condition. More than two season and temporary loss on any permanent loss of habitat shall be compensated.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Corps must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. The terms and conditions are non-discretionary.

1. The following terms and conditions implement reasonable and prudent measure number one:

   A. All construction activity within giant garter snake habitat shall be conducted between May 1 and October 1. This is the active period for giant garter snakes and direct impacts are lessened, because snakes are actively moving and avoiding

danger. More danger is posed to snakes during their inactive period, because they are occupying underground burrows or crevices and are more susceptible to direct effects, especially during excavation. Between October 2 and April 30 contact the Service's Sacramento Fish and Wildlife Office to determine if additional measures are necessary to minimize and avoid take.

B. Any dewatered habitat must remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat.

C. Construction personnel shall participate in a Service-approved worker environmental awareness program. Under this program, workers shall be informed about the presence of giant garter snakes and habitat associated with the species and that unlawful take of the animal or destruction of its habitat is a violation of the Act. Prior to construction activities, a qualified biologist approved by the Service shall instruct all construction personnel about: (1) the life history of the giant garter snake; (2) the importance of irrigation canals, marshes/wetlands, and seasonally flooded areas, such as rice fields, to the giant garter snake; and (3) the terms and conditions of the biological opinion. Proof of this instruction shall be submitted to the Sacramento Fish and Wildlife Office.

D. Within 24-hours prior to commencement of construction activities, the site shall be inspected by a qualified biologist who is approved by the Service's Sacramento Fish and Wildlife Office. The biologist will provide the Service with a field report form documenting the monitoring efforts within 24-hours of commencement of construction activities. Information that should be included in a field report form is provided in Appendix D. The monitoring biologist needs to be available thereafter; if a snake is encountered during construction activities, the monitoring biologist shall have the authority to stop construction activities until appropriate corrective measures have been completed or it is determined that the snake will not be harmed. Giant garter snakes encountered during construction activities should be allowed to move away from construction activities on their own. Capture and relocation of trapped or injured individuals can only be attempted by personnel or individuals with current Service recovery permits pursuant to section 10(a)1(A) of the Act. The biologist shall be required to report any incidental take to the Service immediately by telephone at (916) 979-2725 and by written letter addressed to the Chief, Endangered Species Division, within one working day. The project area shall be re-inspected whenever a lapse in construction activity of two weeks or greater has occurred.

E. Clearing of wetland vegetation will be confined to the minimal area necessary to excavate toe of bank for riprap or fill placement. Excavation of channel for removal of accumulated sediments will be accomplished by using equipment located on and operated from top of bank, with the least interference practical for emergent vegetation.

F. Movement of heavy equipment to and from the project site shall be restricted to established roadways to minimize habitat disturbance.

2. The following terms and conditions implement reasonable and prudent measure number two:

A. Preserved giant garter snake habitat shall be designated as Environmentally Sensitive Areas and shall be flagged by a qualified biologist approved by the Service and avoided by all construction personnel.

B. After completion of construction activities, any temporary fill and construction debris shall be removed and, wherever feasible, disturbed areas shall be restored to pre-project conditions. Restoration work may include replanting emergent vegetation (refer to Appendix A, Mitigation Criteria for Restoration and/or Replacement of Giant Garter Snake Habitat).

C. More than two season and temporary permanent losses of habitat shall be compensated at the ratios described in Table 1 and meet the criteria listed in Appendix A, Mitigation Criteria for Restoration and/or Replacement of Giant Garter Snake Habitat).

D. All wetland and upland acres created and provided for the giant garter snake shall be protected in perpetuity by a Service-approved conservation easement or similarly protective covenants in the deed. The conservation easement on the mitigation habitat shall be recorded at the county recording office within 60 days of groundbreaking. The easement/deed, including a title report for the land area, shall be reviewed and approved by the Service prior to recording in the appropriate County Recorders Office(s). A true copy of the recorded easement/deed shall be provided to the Service within 30 days after recordation. Standard examples of deed restrictions and conservation easements are available from the Service upon request.

E. The Corps shall ensure compliance with the Reporting Requirements below.

Reporting Requirements

The Service-approved biologist shall notify the Service immediately if giant garter snakes are found on site as detailed in term and condition 1D, and will submit a report including date(s), location(s), habitat description, and any corrective measures taken to protect the snake(s) found. The Service-approved biologist shall submit locality information to the California Department of Fish & Game (CDFG), using completed California Native Species Field Survey Forms or their equivalent, no more than 90 calendar days after completing the last field visit of the project site. Each form shall have an accompanying scale map of the site such as a photocopy of a portion of the appropriate 7.5 minute U.S. Geological Survey map and shall provide at least the following

information: township, range, and quarter section; name of the 7.5' or 15' quadrangle; dates (day, month, year) of field work; number of individuals and life stage (where appropriate) encountered; and a description of the habitat by community-vegetation type.

A post-construction compliance report prepared by the Service approved monitoring biologist shall be forwarded to the Chief, Endangered Species Division, at the Sacramento Fish and Wildlife Office within 60 calendar days of the completion of each project. This report shall detail (I) dates that construction occurred; (ii) pertinent information concerning the applicant's success in meeting project mitigation measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on federally listed species, if any; (v) occurrences of incidental take of federally listed species, if any; and (vi) other pertinent information.

The Sacramento Fish and Wildlife Office is to be notified within three working days of the finding of any dead listed species or any unanticipated harm to the species addressed in this biological opinion. The Service contact person for this is the Chief, Endangered Species Division at (916) 979-2725.

Review Requirements

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the effects of incidental take that might otherwise result from the proposed action. With implementation of this measure, the Service believes that no more than 200 acres (80 hectares) of habitat will be temporarily disturbed and no more than 50 acres (20 hectares) of habitat will be permanently lost per year for the duration authorized under this opinion, or a total of 5 years. In addition, the number of giant garter snakes that may be found within 250 acres (100 hectares) of habitat per year may be disturbed, harassed, harmed, or killed as a result of actions permitted under this opinion. If, during the course of the action, this minimized level of incidental take is exceeded prior to the annual review, such incidental take represents new information requiring review of the reasonable and prudent measures provided. The Corps must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures. This programmatic opinion will expire 5 years from the date of issuance. Issuance of a new programmatic opinion will be subject to evaluation of the recovery of the species.

CONSERVATION RECOMMENDATIONS

Section 7 (a) (1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the

agency's 7(a)(1) responsibilities for these species.

1. As a Recovery Plan for the giant garter snake is developed, the Corps should assist the Service in its implementation.

2. The Corps should incorporate into bidding documents the enclosed "Standard Avoidance and Minimization Measures for Construction Activities in Giant Garter Snake Habitat" when appropriate.

3. The Corps, in partnership with the Service, should develop maintenance guidelines for Corps projects that will reduce adverse effects of routine maintenance on giant garter snakes and their habitat. Such actions may contribute to the delisting and recovery of the giant garter snake by preventing degradation of existing habitat and increasing the amount and stability of suitable habitat.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the projects described in this opinion. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation. In addition, if the Corps discovers that the conditions of the permit have not been followed, the Corps should review its responsibilities under section 7 of the Act and reinitiate formal consultation with the Service. We appreciate the cooperation of the Corps throughout this consultation process.

If you have any questions regarding this biological opinion, please contact Kelly Hornaday of my staff at (916) 979-2120.

Sincerely,

Dale A. Pierce

for Wayne S. White
Field Supervisor

Mr. Art Champ

Enclosures (Appendices A-D)

cc: AES, Portland, OR
CESAC, Regulatory Branch
FWS-SFO, Wetlands Branch
CDFG, Region 2, David Zezulak

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Personal Communications

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Appendix A

Mitigation Recommendations for Restoration and/or Replacement of Giant Garter Snake Habitat

Replacement and Restoration Guidelines are provided together, as the two types of mitigation may not be mutually exclusive. Replacement of habitat may also require restoration of some areas. Preserved habitat may additionally be improved for giant garter snake by using some of the restoration guidelines.

Reference sites

A nearby reference site should be chosen both for restoration of giant garter snake habitat and for creation of replacement habitat. The reference site will be used to determine the success of mitigation efforts. For restoration of habitat, the pre-project condition may be used as a reference site if adequate documentation exists. For creation of replacement habitat or for restoration where pre-project conditions are not documented, the reference site should be nearby or adjacent and should represent high quality giant garter snake habitat.

Restoration of giant garter snake habitat

Restoration may include incorporating some of the Replacement guidelines to enhance habitat value for giant garter snake. Restoration should follow the guidelines outlined below:

1. Restoring giant garter snake habitat includes minimizing impacts of project activities to the existing habitat, including using silt fencing, designating environmentally sensitive areas, using protective mats, preventing runoff, and providing worker awareness training. Measures to minimize impacts include:

    a. Avoid construction activities within 200 feet from the banks of giant garter snake aquatic habitat. Confine movement of heavy equipment to existing roadways to minimize habitat disturbance.

    b. Construction activity within habitat should be conducted between May 1 and October 1. This is the active period for giant garter snakes and direct mortality is lessened, because snakes are expected to actively move and avoid danger. Between October 2 and April 30 contact the Service's Sacramento Fish and Wildlife Office to determine if additional measures are necessary to minimize and avoid take.

    c. Confine clearing to the minimal area necessary to facilitate construction activities. Flag and designate avoided giant garter snake habitat within or adjacent to the project area as Environmentally Sensitive Areas. This area should be avoided by all construction personnel.

Appendix A

d. Construction personnel should receive Service-approved worker environmental awareness training. This training instructs workers to recognize giant garter snakes and its habitat(s).

e. 24-hours prior to construction activities, the project area should be surveyed for giant garter snakes. Survey of the project area should be repeated if a lapse in construction activity of two weeks or greater has occurred. If a snake is encountered during construction, activities shall cease until appropriate corrective measures have been completed or it has been determined that the snake will not be harmed. Report any sightings and any incidental take to the Service immediately by telephone at (916) 979-2725.

f. Any dewatered habitat should remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat.

2. Remove all construction debris and stockpiled materials.

3. Regrade area to preexisting contour, or a contour that would improve restoration potential of the site.

4. Replant and hydroseed the restoration area. Recommended plantings consist of a) wetland emergents, b) low-growing cover on or adjacent to banks, and c) upland plantings/hydroseeding mix to encourage use by other wildlife. Riparian plantings are not appropriate because shading may result in lack of basking sites. Native plantings are encouraged except where non-natives will provide additional values to wildlife habitat and will not become invasive in native communities. The applicant should obtain cuttings, plantings, plugs, or seeds, from local sources wherever possible. The applicant should attempt to restore conditions similar to that of adjacent or nearby habitats.

a. Emergent wetland plants recommended for giant garter snake habitat are California bulrush (*Scirpus californicus*), cattail (*Typha* spp.), and water primrose (*Ludwigia peploides*). Additional wetland plantings may include common tule (*Scirpus acutus*), Baltic rush (*Juncus balticus*), or duckweed (*Lemna* spp.).

b. Cover species on or adjacent to the bank may include California blackberry (*Rubus vitifolius*) or wild grape (*Vitis californica*), along with the hydroseeding mix recommended below.

c. Upland plantings/hydroseeding mix: Disturbed soil surfaces such as the levee slopes should be hydroseeded to prevent erosion. The Service recommends a mix of 20-40 percent native grass seeds [such as annual fescue (*Vulpia* spp.), California brome (*Bromus carinatus*), wild rye (*Elymus glaucus*), and needle grass (*Nasella* spp.)], 2-10 percent native forb seeds, five percent rose clover (*Trifolium hirtum*), and 5percent alfalfa (*Medicago sativa*). Approximately 40-68

percent of the mixture may be non-aggressive European annual grasses [such as wild oats (*Avena sativa*), wheat (*Triticum* ssp.), and barley (*Hordeum vulgare*)]. The Corps will not include aggressive non-native grasses, such as perennial ryegrass (*Lolium perenne*), cheatgrass (*Bromus tectorum*), fescue (*Festuca* spp.), giant reed (*Arundo donax*), medusa-head (*Taeniatherum caput-medusae*), or Pampas grass (*Cortaderia selloana*) in the hydroseed mix. The Corps will not include endophyte-infected grasses in the mix. One-hundred percent native grass and forb mixes may also be used.

Replacement of giant garter snake habitat

Location

Replacement location should be within the same population cluster boundaries (population clusters are defined in 58 FR 54053) as the habitat lost. For example: The boundaries of the Sacramento Basin population cluster are approximately, Highway 16 to the north, Sacramento River to the west, Twin Cities Road to the south, and the Folsom Aqueduct to the east. Habitat lost within this area must also be replaced within this area.

Habitat components

Giant Garter Snake Habitat. The giant garter snake inhabits marshes, sloughs, ponds, small lakes, low gradient streams, other waterways and agricultural wetlands such as irrigation and drainage canals and rice fields, and the adjacent uplands. Essential habitat components consist of (1) adequate water during the snake's active period, (early spring through mid-fall) to provide a prey base and cover; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat; (3) upland habitat for basking, cover, and retreat sites; and (4) higher elevation uplands for cover and refuge from flood waters. For the purposes of this programmatic opinion, a basic giant garter snake habitat unit will incorporate 2.00 acres (0.81 hectares) of surrounding upland for every 1.00 acre (0.40 hectare) of aquatic habitat. The 2.00 acres (0.81 hectares) of upland also may be defined as 218 linear feet (66 meters) of bankside habitat which incorporates adjacent uplands to a width of 200 feet (61 meters) from the edge of the bank.

Replacement habitat must provide the above mentioned essential habitat components and include the following:

1. All replacement habitat must include both upland and aquatic habitat components. Upland and aquatic habitat components must be included in the replacement habitat at a ratio of 2:1 upland acres to aquatic acres

2. A semi-permanent or permanent aquatic habitat which provides water during the active period for giant garter snakes (April through October) with suitable vegetative cover present. Linear or meandering channels with slow flowing water over mud or silt

substrate are preferred.

3. Upland basking and retreat sites with low growing vegetation cover adjacent to aquatic habitat, and upland retreats and flood refugia with partially buried broken concrete or animal burrows.

4. Small fish and amphibian larvae for foraging, but predatory "gamefish" (bass, *Micropterus* spp.; sunfish, *Lepomis* spp.; catfish, *Ictalurus* spp. and *Ameirus* spp.) absent or controlled.

5. An adequate buffer (at least 200 feet) from roadways to reduce vehicular mortality.

6. Follow planting recommendation provided above under restoration guidelines.

Monitoring of mitigation areas

Habitat restoration

Restoration of habitat should be monitored for one year from implementation of restoration. Monitoring reports documenting the restoration effort should be submitted to the Service: (1) upon completion of the restoration implementation; and (2) one year from restoration implementation. Monitoring reports should include photodocumentation, when restoration was completed, what materials were used, plantings (if specified) and justification of any substitutions to the Service recommended guidelines. Monitoring reports should also include recommendations for remedial actions and approval from the Service, if necessary, and justification from release of any further monitoring, if requested.

Creation of replacement habitat

Replacement habitat should be monitored for 5 years from implementation of mitigation. Hydrology of the mitigation area should be monitored for the first two years after creation of wetlands. The monitoring effort should continue for three additional years to ensure success criteria are met. Monitoring reports documenting the mitigation implementation should be submitted to the Service: (1) upon completion of wetland creation; (2) yearly for the first two years of monitoring; (3) 5 years from implementation of mitigation. Monitoring reports should include photodocumentation, when restoration was completed, what materials were used, plantings (if specified) and justification of any substitutions to the Service recommended guidelines. Monitoring reports should also include recommendations for remedial actions and approval from the Service, if necessary, and justification from release of any further monitoring, if requested.

Appendix A

Success criteria for replacement habitat:

1. At completion of monitoring, the cover measured on the mitigation area should be 90 percent of cover measured on the reference site.

2. At completion of monitoring, the species composition measured on the mitigation area should be 90 percent of that measured on the reference site.

3. At completion of monitoring, wetlands created on the mitigation site should meet Corps jurisdictional criteria.

Maintenance and management of replacement giant garter snake habitat

1. A final management plan of replacement habitat must be approved by the Service.

2. All maintenance activities should follow Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat.

3. Additional guidance includes:

   a. Canal Maintenance - Hand clearing of canals is preferred for removal of excessive vegetation or debris. Any equipment should be operated from the bank top. Excavate from only one side of the canal during a given year. Avoid excavating the banks above the high water level. Preferably, one side of the canal should be left undisturbed indefinitely (the prefered side would be the west or north side) so that emergent vegetation and bank side cover is left in place.

   b. Place the spoils from canal clearing in a designated location, rather than along bank tops. This will prevent burying or crushing snakes basking on the banks, or trapping snakes taking cover in burrows or bank-top soil crevices.

   c. Vegetation control - Uplands should not be disced. Leave vegetation on levees and canal sides wherever possible. Mowing to control vegetation should take place July through September and mower blades should be raised at least six inches to avoid injuring snakes and to leave some grassy cover.

   d. Traffic - Control vehicle access to avoid vehicular mortality of giant garter snakes.

4. Use a water maintenance regime that will maintain some open water to provide vegetated edge for giant garter snake to forage along.

5. Eradicate/control non-natives and invasive exotics.

Appendix A

Compatible uses of giant garter snake replacement habitat

Rice farming is a compatible land use for adjacent properties.

Uses of giant garter snake replacement habitat that are incompatible with the habitat of giant garter snake, or represent threats to giant garter snakes include row cropping uplands, orchards on uplands, OHV use, and combining with riparian mitigation sites which require dense cover or SRA habitat.

Appendix B

Items necessary for the Service to complete formal consultation on projects with impacts to giant garter snake

1. A description of the specific area that may be affected by the action, including:

   a. Precise location of the project site clearly delineated on either an original or high quality copy of a U.S. Geological Survey topographic map (exact scale, 7.5 minute, 1" = 2,000 ft.). The map should include quad name(s), county name(s), legal location, and project name.

   b. Area (in acres) affected by the proposed project, including total area of the project, estimated area of giant garter snake habitat filled/destroyed, and estimated area of habitat temporarily disturbed. Also include linear feet of bank habitat disturbed and linear feet of aquatic habitat (canal, waterway, marsh) dewatered, filled, excavated, or cleared of vegetation. Giant garter snake habitat includes both aquatic and upland habitat. Aquatic habitat may be seasonal or perennial marshes, sloughs, ponds, small lakes, low gradient streams, and irrigation and drainage canals.

   c. Detailed map of proposed project site in addition to the location map specified above. This map should include the following items: potential habitat of giant garter snake on-site, and on adjacent property where habitat crosses property boundary, location and type of potential impacts (i.e., buildings, other structures, roads, riprap, staging areas, haul roads, stockpiling areas, borrow sites) on proposed site, and other listed or proposed species locations/habitats.

   d. Detailed map of any proposed mitigation site location, including distance from the project site and proximity to existing habitat.

2. A description of the action to be considered, including:

   a. Any dewatering and time period of dewatering

   b. Project schedule/timing of project

   c. Type of project by category (development, mitigation banking, utilities or infrastructure project).

   d. Any grading, dredging, excavation, or clearing of vegetation required

3. A description of all listed species or critical habitat that may be affected by the action.

Appendix B

Projects may affect more ~~than one~~ federally listed or proposed species, and may require consultation on more than one species. Including an evaluation of the potential effects of the action on listed and proposed species will give the Service the opportunity to concur with the agency's determination, or to recommend formal consultation. If the action may affect a listed or proposed species, but is not likely to adversely affect the species, the Service will include this determination with completion of the formal consultation on giant garter snake. If formal consultation is required on other species in addition to giant garter snake, the Service will work with the Corps to include all necessary species into the formal consultation process.

4. A description of the manner in which the action may affect any listed species or critical habitat and an analysis of any cumulative effects

    a. Analysis of direct and indirect effects

    b. Analysis of cumulative effects

    c. Include any mitigation plan and mitigation measures that the applicant proposes. Proposed mitigation should include monitoring and management plans for restored and replacement habitat. **To expedite consultation, such plans and measures should be developed during the informal consultation process with the Service.**

5. Relevant reports, including any EIS, EA, or BA prepared

6. Any other relevant available information

Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat

GIANT GARTER SNAKE
(*Thamnophis gigas*)

HABITAT TYPE:

Marshes, sloughs, ponds, small lakes, low gradient streams, irrigation and drainage canals, and rice fields. Permanent aquatic habitat, or seasonally flooded during the snake's active season (early-spring through mid-fall), with herbaceous wetland vegetation, such as cattails and bulrushes, grassy banks (often salt grass), and uplands for cover and retreat sites during the snake's active season and for refuge from flood waters during the dormant season (winter). Giant garter snakes are typically absent from larger rivers and other water bodies that support introduced populations of large, predatory fish, and from wetlands with sand, gravel, or rock substrates. Riparian woodlands typically do not provide suitable habitat because of excessive shade, lack of basking sites, and absence of giant garter snake prey.

AVOIDANCE AND MINIMIZATION MEASURES:

Avoid construction activities within 200 feet from the banks of giant garter snake aquatic habitat. Confine movement of heavy equipment to existing roadways to minimize habitat disturbance.

Construction activity within habitat should be conducted between May 1 and October 1. This is the active period for giant garter snakes and direct mortality is lessened, because snakes are expected to actively move and avoid danger. Between October 2 and April 30 contact the Service's Sacramento Fish and Wildlife Office to determine if additional measures are necessary to minimize and avoid take.

Confine clearing to the minimal area necessary to facilitate construction activities. Flag and designate avoided giant garter snake habitat within or adjacent to the project area as Environmentally Sensitive Areas. This area should be avoided by all construction personnel.

Construction personnel should receive Service-approved worker environmental awareness training. This training instructs workers to recognize giant garter snakes and their habitat(s).

24-hours prior to construction activities, the project area should be surveyed for giant garter snakes. Survey of the project area should be repeated if a lapse in construction activity of two weeks or greater has occurred. If a snake is encountered during construction, activities shall cease until appropriate corrective measures have been

completed or it has been determined that the snake will not be harmed. Report any sightings and any incidental take to the Service immediately by telephone at (916) 979-2725.

Any dewatered habitat should remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat.

After completion of construction activities, remove any temporary fill and construction debris and, wherever feasible, restore disturbed areas to pre-project conditions. Restoration work may include such activities as replanting species removed from banks or replanting emergent vegetation in the active channel.

Compensate loss and disturbance of giant garter snake habitat according to Table 1. Mitigation ratios are based on the acreage and on the duration of disturbance.

TABLE 1 - SUMMARY OF GIANT GARTER SNAKE PROGRAMMATIC MITIGATION LEVELS

	IMPACTS: DURATION	IMPACTS: ACRES	MITIGATION: COMPENSATION
LEVEL 1	1 season	Less than 20 and temporary	Restoration
LEVEL 2	2 seasons	Less than 20 and temporary	Restoration plus 1:1 replacement
LEVEL 3	More than 2 seasons and temporary Permanent loss	Less than 20 and temporary Less than 3 acres total giant garter snake habitat AND Less than 1 acre aquatic habitat; OR Less than 218 linear feet bank habitat	3:1 Replacement (or restoration plus 2:1 replacement) 3:1 Replacement

Giant garter snake habitat includes 2.0 acres of surrounding upland habitat for every 1.0 acre of aquatic habitat. The 2.0 acres of upland habitat also may be defined as 218 linear feet of bankside habitat which incorporates adjacent uplands to a width of 200

feet from the edge of each bank. Each acre of created aquatic habitat should be supported by two acres of surrounding upland habitat. Compensation may include creating upland refuges and hibernacula for the giant garter snake that are above the 100-year flood plain.

A season is defined as the calendar year period between May 1 and October 1, the active period for giant garter snake when mortality is less likely to occur.

Information to Include in a Project Monitoring Report for Giant Garter Snake

1. Date

2. Surveyor

3. Project information (should include the following):
   a. Project name
   b. Location
   c. Project impacts and acres impacted

4. Survey information (should include the following):
   a. Time of day
   b. Temperature at start and end of survey. Include ambient temperature, temperature at ground level, and at approximately 3 inches above ground level.
   c. Weather conditions (include wind conditions and cloud cover)
   d. Acres/area surveyed

5. Site description (may include the following):
   a. Habitat types present, substrate/soils, etc.
   b. Topography/elevation
   c. Surrounding land-use/activity
   d. Description of project features

6. Habitat characteristics:
   a. Burrows/potential hibernacula present? (Y/N)
   b. Amount and type of cover present, including upland and emergent vegetation
   c. Prey species present? (Y/N)
   d. Distance to nearest available habitat
   e. Other species observed

7. Giant garter snakes present? (Y/N) If observed provide the following information:
   a. Number of individuals, and if possible to determine, whether juveniles or adults
   b. Location(s)
   c. Describe behavior and activity
   d. Describe protective measures implemented

8. Describe on site mitigation and avoidance measures implemented (fencing, dewatering, worker awareness training, etc.). Include any difficulties implementing measures and corrective measures taken.

Report all sightings to the US Fish and Wildlife Service, Sacramento Fish and Wildlife Office at (916) 979-2725, and to the California Department of Fish and Game (CDFG). The monitoring biologist must submit all sightings to CDFG Natural Diversity Data Base (NDDB) using a California Native Species Field Survey Form and provide copies to CDFG and the Service .

Appendix C
Standard Avoidance and Minimization Measures
During Construction Activities in Giant Garter Snake (*Thamnophis gigas*) Habitat

HABITAT TYPE:

Marshes, sloughs, ponds, small lakes, low gradient streams, irrigation and drainage canals, and rice fields. Permanent aquatic habitat, or seasonally flooded during the snake's active season (early-spring through mid-fall), with herbaceous wetland vegetation, such as cattails and bulrushes, grassy banks (often salt grass), and uplands for cover and retreat sites during the snake's active season and for refuge from flood waters during the dormant season (winter). Giant garter snakes are typically absent from larger rivers because of lack of suitable habitat, and from wetlands with sand, gravel, or rock substrates. Some riparian woodlands may not provide suitable habitat because of excessive shade, lack of basking sites, and absence of giant garter snake prey.

AVOIDANCE AND MINIMIZATION MEASURES:

1. Avoid construction activities within 200 feet from the banks of giant garter snake aquatic habitat. Confine movement of heavy equipment to existing roadways to minimize habitat disturbance.

2. Construction activity within habitat should be conducted between May 1 and October 1. This is the active period for giant garter snakes and direct mortality is lessened, because snakes are expected to actively move and avoid danger. Between October 2 and April 30 contact the Service's Sacramento Fish and Wildlife Office to determine if additional measures are necessary to minimize and avoid take.

3. Confine clearing to the minimal area necessary to facilitate construction activities. Flag and designate avoided giant garter snake habitat within or adjacent to the project area as Environmentally Sensitive Areas. This area should be avoided by all construction personnel.

4. Construction personnel should receive Service-approved worker environmental awareness training. This training instructs workers to recognize giant garter snakes and their habitat(s).

5. 24-hours prior to construction activities, the project area should be surveyed for giant garter snakes. Survey of the project area should be repeated if a lapse in construction activity of two weeks or greater has occurred. If a snake is encountered during construction, activities shall cease until appropriate corrective measures have been completed or it has been determined that the snake will not be harmed. Report any sightings and any incidental take to the Service immediately by telephone at (916) 414-6600.

6. Any dewatered habitat should remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat.

7. After completion of construction activities, remove any temporary fill and construction debris and, wherever feasible, restore disturbed areas to pre-project conditions.

Restoration work may include such activities as replanting species removed from banks or replanting emergent vegetation in the active channel.

8. Follow the conservation measures in Table 1 to minimize the effects of loss and disturbance of habitat on giant garter snakes. Replacement ratios are based on the acreage and on the duration of disturbance.

TABLE 1 - SUMMARY OF GIANT GARTER SNAKE CONSERVATION MEASURES

	IMPACTS: DURATION	**IMPACTS:** ACRES	**CONSERVATION MEASURE:** COMPENSATION
LEVEL 1	1 season	Less than 20 and temporary	Restoration
LEVEL 2	2 seasons	Less than 20 and temporary	Restoration plus 1:1 replacement
LEVEL 3	More than 2 seasons and temporary	Less than 20 and temporary	3:1 Replacement (or restoration plus 2:1 replacement)
	Permanent loss	Less than 3 acres total giant garter snake habitat AND Less than 1 acre aquatic habitat; OR Less than 218 linear feet bank habitat	3:1 Replacement

Giant garter snake habitat includes 2.0 acres of surrounding upland habitat for every 1.0 acre of aquatic habitat. The 2.0 acres of upland habitat also may be defined as 218 linear feet of bankside habitat which incorporates adjacent uplands to a width of 200 feet from the edge of each bank. Each acre of created aquatic habitat should be supported by two acres of surrounding upland habitat. Compensation may include creating upland refuges and hibernacula for the giant garter snake that are above the 100-year flood plain.

A season is defined as the calendar year period between May 1 and October 1, the active period for giant garter snake when mortality is less likely to occur.

Instructions for Providing Funds to the Giant Garter Snake Species Fund

When fully executed, the enclosed Deposit Agreement fulfills in part the conservation measures described for the Gill Ranch Gas Storage project, in accordance with the biological opinion (file no. 81420-2008-F-1325-2). This biological opinion, issued by the U.S. Fish and Wildlife Service (Service), describes conservation measures needed to minimize the adverse effects of this project on the federally threatened giant garter snake.

The Deposit Agreement (i.e., the enclosed document entitled "Agreement Between the United States Fish and Wildlife Service, Giant Garter Snake Conservation Fund Participant, and The Center for Natural Lands Management") is between the Gill Ranch Storage, LLC (Participant), the Service, and The Center for Natural Lands Management. If you are satisfied with the Deposit Agreement, sign this agreement. Also enclosed is a partially completed Payment Receipt. Please ensure that the Participant Information section of the Payment Receipt is accurate. Then forward the Deposit Agreement, the Payment Receipt, and a check made payable to the Giant Garter Snake Conservation Fund Account for the amount specified in the Deposit Agreement, to:

The Center for Natural Lands Management
215 West Ash Street
Fallbrook, California 92028

You may retain the enclosed copy of the document entitled "Agreement Between the United States Fish and Wildlife Service and The Center for Natural Lands Management" for your records. In addition, you and the Service will receive copies of the signed Deposit Agreement and completed Payment Receipt after processing by The Center for Natural Lands Management. When the Service receives the payment receipt and a copy of the signed Deposit Agreement, completion of this portion of the conservation measures for the Gill Ranch Gas Storage project will be considered fulfilled.

AGREEMENT BETWEEN THE UNITED STATES FISH AND WILDLIFE SERVICE, GIANT GARTER SNAKE CONSERVATION FUND PARTICIPANT AND THE CENTER FOR NATURAL LANDS MANAGEMENT

This Agreement is entered into this _____day of _____, by and between the United States Fish and Wildlife Service (the "Service"), The Center for Natural Lands Management (the "CNLM") and the Gill Ranch Storage, LLC (Participant).

For good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, the parties hereby agree as follows:

1. Biological opinion 81420-2008-F-1325-2 dated _____ between the Service and the U.S. Army Corps of Engineers, issued under section 7 of the Endangered Species Act of 1973, as amended, (ESA), evaluates the impacts of the Participant's activities on the giant garter snake (*Thamnophis gigas*) and its habitat and specifies alternative measures available to the Participant to minimize the take of giant garter snake incidental to the Participant's activities. In accordance with the biological opinion, the Participant elects and hereby agrees to deposit a giant garter snake fee established by the Service in the amount of fifty-five thousand dollars ($55,000) (the "Giant Garter Snake Conservation Fee") into one or more accounts at a financial institution reasonably acceptable to the CNLM and the Service in such investments as are approved by the Service (the "Giant Garter Snake Conservation Fund Account"), as a means of minimizing the incidental take of giant garter snake resulting from the Participant's activities and otherwise reducing the impacts of the Participant's activities on giant garter snakes and their habitat.

2. The Service agrees that the total amount of the Giant Garter Snake Conservation Fee deposited by the Participant in the Giant Garter Snake Conservation Fund Account, with the exception of the management fee identified in paragraph 6 of this Agreement, shall be used, at the direction of the Service, to purchase 1.0 conservation credits in one or more of the Service approved giant garter snake conservation banks or for the reimbursement of the purchase of land or conservation easements, adequately managed, endowed and protected to provide permanent protection and perpetual management of giant garter snake habitat.

3. The Service agrees that any portion of the Giant Garter Snake Conservation Fee deposited by the Participant into the Giant Garter Snake Conservation Fund Account in excess of the amount used to purchase 1.0 conservation credits or for the purchase of land or conservation easements shall be refunded at the direction of the Service to the Participant within 30 days of receipt by the CNLM of written notice from the Service setting forth the amount to be refunded to the Participant.

4. The Service and the Participant jointly acknowledge and agree that the Giant Garter Snake Conservation Fee shall be managed and dispersed in accordance with the "AGREEMENT BETWEEN THE UNITED STATES FISH AND WILDLIFE SERVICE AND THE CENTER FOR NATURAL LANDS MANAGEMENT" dated 20 October 2006 (Service-CNLM Agreement), the receipt of a copy of which the Participant hereby acknowledges. If for any reason the Service-CNLM Agreement is

terminated, the Service shall ensure that the Giant Garter Snake Conservation Fee deposited by the Participant into the Giant Garter Snake Conservation Fund Account will be used in accordance with this Agreement to satisfy the Participant's obligations under the biological opinion/HCP referenced above in paragraph 1, and the CNLM shall have no further liabilities or obligations hereunder.

5. The Participant acknowledges and agrees that it has voluntarily elected to deposit the Giant Garter Snake Conservation Fee into the Giant Garter Snake Conservation Fund Account in satisfaction of its obligations under the section 7 biological opinion and in lieu of carrying out other alternative conservation measures identified by the Service as available to the Participant to minimize the impacts of the Participant's activities on giant garter snakes and their habitat.

6. The Participant further acknowledges that the CNLM's fee for administering the Giant Garter Snake Conservation Fund Account (Administration Fee) is 2.5% of the Giant Garter Snake Conservation Fee specified above in paragraph 1 and agrees to the deduction of said Administration Fee from the total Giant Garter Snake Conservation Fee deposited.

7. **Participant's check made payable to the Giant Garter Snake Conservation Fund Account shall be forwarded together with a fully executed copy of this Agreement and the Payment Receipt form to The Center for Natural Lands Management at 215 West Ash Street, Fallbrook, California 92028.**

8. Participant acknowledges and agrees that the CNLM's sole obligation pursuant to the terms and conditions of the AGREEMENT BETWEEN THE UNITED STATES FISH AND WILDLIFE SERVICE AND THE CENTER FOR NATURAL LANDS MANAGEMENT and this Agreement (the "Agreements") is to accept the Giant Garter Snake Conservation Fee, deposit the Giant Garter Snake Conservation Fee into the Giant Garter Snake Conservation Fund Account and to disburse the Giant Garter Snake Conservation Fee solely at the direction of the Service, subject to the terms and conditions of the Agreements. The CNLM is accepting the Giant Garter Snake Conservation Fee solely as an accommodation to the Service and the Participant. Participant acknowledges and agrees that acceptance, deposit and disbursement of the Giant Garter Snake Conservation Fee by the CNLM does not create any liability or duty to Participant and Participant hereby releases the CNLM from any and all liability or claims due to the existence of these Agreements or Participant's development.

9. Participant acknowledges and agrees that the CNLM has made no representations or warranties to the Participant whatsoever and Participant assumes all risks related to its proceeding with development activities, in reliance on the section 7/section 10 (a)(1)(B) authorization issued by the Service. Participant does hereby agree to indemnify the CNLM, defend and hold the CNLM harmless from and against any and all claims, damages, losses, liabilities, costs and expenses, including without limitation, attorneys' fees arising out of or in any way connected with or related to the Agreements or Participant's development.

10. Participant acknowledges and agrees that the Service has made no representations or warranties to the Participant whatsoever and Participant assumes all risks related to its proceeding with development activities, in reliance on the section 7 authorization issued by the Service. Participant does hereby agree to indemnify the Service, defend and hold the Service harmless from and against any and all

claims, damages, losses, liabilities, costs and expenses, including without limitation, attorneys' fees arising out of or in any way connected with or related to the Agreements, the Giant Garter Snake Conservation Fund Account, Participant's development and/or any action related to section 7 of the ESA. In addition, Participant agrees to indemnify the Service, defend and hold the Service harmless from and against any and all claims, damages, losses, liabilities, costs and expenses, including without limitation, attorneys' fees in the event that any claim is brought against the Service for any act or omission arising out of or any acts it takes pursuant to the Agreements or Participant's development.

11. This Agreement may be executed in several counterparts and all counterparts so executed shall constitute one agreement which shall be binding on all of the parties, notwithstanding that all of the parties are not signatory to the original or the same counterpart. If any provision of this Agreement is held invalid, the other provisions shall not be affected thereby. This Agreement represents the entire agreement of the parties and may not be amended except by a writing signed by each party hereto. Each party to this Agreement warrants to the other that it is duly organized, validly existing and, if a corporation, qualified to do business in the State of California, and that it and the respective signatories have full right and authority to enter into and consummate this Agreement and all related documents.

In witness whereof, this Agreement is executed as of the date and year first above written, at

_____, California.

UNITED STATES FISH AND WILDLIFE SERVICE

By: Kenneth Sanchez

Name: KENNETH SANCHEZ

Title: ASST FIELD SUPERVISOR

THE CENTER FOR NATURAL LANDS MANAGEMENT

By:

Name:

Title:

Gill Ranch Storage, LLC (PARTICIPANT)

By:

Name:

Title:

U. S. FISH & WILDLIFE SERVICE
GIANT GARTER SNAKE CONSERVATION FUND ACCOUNT
PAYMENT RECEIPT

PROJECT PARTICIPANT INFORMATION

Name: Gill Ranch Storage, LLC

Address: Attention: Ann L. Trowbridge, Day Carter & Murphy LLP 3620 American River Drive, Suite 205 Sacramento, California 95864

Telephone: (916) 570-2500, ext 103

Contact: Ann L. Trowbridge

PROJECT INFORMATION

Project Name: Gill Ranch Gas Storage Project

Project Location: West of Mendota, North of Kerman California along the along the San Joaquin River

County: Fresno and Madera Counties

Project Description: Gas Injection Storage into Depleted Natural Gas Field, with associated Gas Pipeline to PGE 404 line.

Service File #: 81420-2008-F-1325-2 Corps/Other File #: SPK-2008-00448

Total Acres Impacted: 1.0 acre

FEE INFORMATION

Credits Purchased: 1.0 acre

Total Payment Amount: $55,000

PAYMENT INFORMATION

Payee: Giant Garter Snake Conservation Fund Account

Payer:

Amount:

Method of Payment: Check No. _____ Money Order No. _____ Wire Transaction

Received by: Name:_____ Title:

_____ Date:
(Signature)

AGREEMENT BETWEEN THE
UNITED STATES FISH AND WILDLIFE SERVICE
AND
THE CENTER FOR NATURAL LANDS MANAGEMENT

This Agreement is made this 20th day of October, 2006, by and between the United States Fish and Wildlife Service ("Service") and the Center for Natural Lands Management ("CNLM"), hereinafter referred to collectively as the "Parties."

I. RECITALS

This Agreement is based on the following facts, intentions and expectations:

A. The Service and the CNLM wish to cooperate in facilitating the development of a regional program to conserve federally listed giant garter snakes (*Thamnophis gigas*) in California. A major goal of this program is to provide an effective, efficient means by which consulting Federal or State agencies and/or private individuals (hereafter collectively referred to as the "Proponents"), can, in accordance with the Endangered Species Act of 1973, as amended, 16 U.S.C. 1533 et seq. (ESA), minimize and mitigate certain impacts of their projects on giant garter snakes, and carry out their obligations in a manner that allows the Service to maximize protection for this species and its habitat. Pursuant to this Agreement, third parties who voluntarily elect to do so, will, at the direction of the Service, deposit fees into one or more accounts as defined in Paragraph II.A.2(a). Upon receipt of written instructions from the Service and solely at the direction of the Service, the CNLM will cause the disbursement of the funds held in the account to Service-approved giant garter snake conservation banks, or for the purchase of land or conservation easements to provide permanent protection and perpetual management of habitat for giant garter snakes. The Service has developed this process in consultation with representatives of the development and environmental communities in an effort to facilitate planned natural resource conservation while ensuring the implementation of conservation measures to minimize and mitigate the adverse effects of development projects on giant garter snakes.

B. The Service, a constituent agency within the U.S. Department of the Interior, is mandated under the ESA and other Federal conservation laws, to protect and conserve wildlife, fish and plant species. The Service has jurisdiction over the conservation, protection, enhancement and management of fish, wildlife, native plants and habitat necessary for biologically sustainable populations of these species.

C. The CNLM is a non-profit corporation of the State of California that was created in 1990 to preserve native plants and animals in their natural environments and protect the diversity of species with consideration for their complicated interrelationships.

D. The Service is authorized to enter into this Agreement by the ESA, 15 U.S.C. 1531 et seq., the Fish and Wildlife Coordination Act, 16 U.S.C. 661-666c, and the Fish and Wildlife Act of 1956, 16 U.S.C. 742(f) et seq.

E. The purpose of this Agreement is to facilitate the preservation, restoration, enhancement, and creation of giant garter snake habitat by providing a means for third parties to expedite their compliance with the ESA through payment of a Giant Garter Snake Conservation Fee to be used to conserve giant garter snake habitat.

II. AGREEMENT

In consideration of the recitals set forth above, the covenants herein and other consideration, the receipt and adequacy of which are hereby acknowledged, the Parties agree as follows:

A. Obligations of the Parties

1. The Service

(a) The Service shall establish Giant Garter Snake Conservation Fees to minimize the effects of projects, which require review under section 7 or section 10 of the ESA, resulting in take of giant garter snakes, or otherwise adversely affect the giant garter snake and its habitat. The Service shall notify the Federal agency and Proponent, if any is involved, of the availability and amount of the voluntary Giant Garter Snake Conservation Fee, the payment of which will satisfy, in whole or in part, the Proponent's obligations under the ESA to address impacts on the giant garter snake or its habitat,

(b) The Service shall inform each Proponent in writing that payment of a Giant Garter Snake Conservation Fee into the Giant Garter Snake Conservation Fund Account (as defined herein below) is voluntary and that other options are available to satisfy the Proponent's obligation under the ESA to address the impacts of its project on giant garter snakes and their habitat. The Service shall provide each Proponent with a copy of this Agreement prior to the Proponent's payment of a Giant Garter Snake Conservation Fee and advise the Proponent that the CNLM's Fee for administering the Giant Garter Snake Conservation Fund Account shall be the amount set forth below in Paragraph II.A.2(b) of this Agreement. An additional agreement, a form of which is attached hereto as Exhibit A, shall be executed by the Service, the CNLM and the Proponent for each fee deposited to the Giant Garter Snake Conservation Fund Account.

(c) The Service will direct all Giant Garter Snake Conservation Fees deposited in the Giant Garter Snake Conservation Fund Account in accordance with this Agreement, and interest and earnings thereon, and all disbursements from the Account, with the exception of the Management Fee identified under Paragraph II.A.2(b) below, to finance the acquisition and management of giant garter snake habitat to offset project impacts to such habitat as provided in Paragraph II.A.1(a) above.

(d) The Service shall be solely responsible for identifying and approving appropriate giant garter snake conservation lands to be acquired and managed with Giant Garter Snake Conservation Fees and shall direct the CNLM to disburse funds from the Giant Garter Snake Conservation Fund Account for such acquisition and management including restoration and creation when appropriate. The Service shall keep a record of all conservation bank transactions and shall provide the CNLM with reasonable access and copies of such records.

2. The CNLM

(a) Giant Garter Snake Conservation Fees will be deposited into one or more interest-bearing accounts ("Giant Garter Snake Conservation Fund Account") at a reputable financial institution reasonably acceptable to the Service. Any interest or earnings accrued shall remain with the account.

(b) Upon deposit by the CNLM of the Giant Garter Snake Conservation Fee in the Giant Garter Snake Conservation Fund Account the CNLM shall deduct from the Giant Garter Snake Conservation Fund Account, a Management Fee, set at the rate of two point five percent (2.5%) of each deposit in the Giant Garter Snake Conservation Fund Account to defray the costs associated with administration of the Account.

(c) The CNLM shall provide to the Service on or before December 31, an annual accounting showing the deposits, interest and earnings received, and disbursements of all sums made pursuant to this Agreement during the period beginning October 1 and ending on September 30.

(d) Duly authorized employees of the CNLM shall disburse all funds in the Giant Garter Snake Conservation Fund Account solely at the written direction of the Service.

III. SPECIAL TERMS AND CONDITIONS

A. Giant Garter Snake Conservation Fees deposited with the CNLM in accordance with this Agreement shall not be used for the "creation" of giant garter snake habitat, or acquisition of land for "creation" of giant garter snake habitat, unless approved in writing by the Service.

B. This Agreement does not impose upon the CNLM any obligation to acquire or manage any giant garter snake habitat.

C. This Agreement does not impose upon the CNLM any obligations to maintain an accounting of the biological values associated with Giant Garter Snake Conservation Fees deposited or disbursed pursuant to this Agreement or to match Giant Garter Snake Conservation Fees deposited with specific giant garter snake habitat acquisitions.

D. Nothing in this Agreement shall prohibit the disbursement of Giant Garter Snake Conservation Fees to enable the purchase of a land parcel otherwise appropriate for use as a conservation bank or other conservation purpose because a portion of the parcel is not suitable for giant garter snake habitat conservation. Because giant garter snake habitat may occur within a larger land parcel that is only available as a single unit, disbursements from the Giant Garter Snake Conservation Fund Account may be made to acquire an entire parcel.

E. Notwithstanding anything contained herein to the contrary, the CNLM shall have no obligation pursuant to this Agreement other than to deposit and disburse the Giant Garter Snake Conservation Fees in accordance with this Agreement, subject to the terms and conditions hereof.

IV. EFFECTIVE DATE

This Agreement shall take effect immediately upon execution by the Service and the CNLM.

V. TERM OF AGREEMENT

Except as otherwise provided herein, this Agreement shall be in effect for a period of four (4) years from the effective date hereof.

VI. AMENDMENTS

Amendments to this Agreement may be proposed by either Party and shall become effective upon the written agreement of both Parties.

VII. TERMINATION

This Agreement may be terminated by either Party without cause at any time upon thirty (30) days written notice to the other Party. Upon termination, the CNLM shall provide the Service with an accounting for the Giant Garter Snake Conservation Fund Account in accordance with the procedure set forth in Paragraph II.A.2(c) of this Agreement. All funds remaining in the account shall be transferred to an entity designated by the Service to receive such funds. Within 30 days following final disbursal of funds, the CNLM shall provide the Service a final accounting showing the deposits (including interest accrued thereon) and disbursements of all sums received pursuant to this Agreement, from the date of the last annual accounting through the date of final disbursement.

VIII. MISCELLANEOUS PROVISIONS

A. Entire Agreement

This Agreement and its related Exhibits contain the entire agreement of the Parties with respect to the matters covered by this Agreement, and no other agreement, statement, or promise made by either Party, or to any employee, officer, or agent of either Party, which is not contained in this Agreement shall be binding or valid.

B. Interpretation and Headings

The language in all parts of this Agreement shall in all cases be simply construed according to its fair meaning and not strictly for or against either Party. Headings of the paragraphs of this Agreement are for the purpose of convenience only and the words contained in such headings shall in no way be held to explain, modify, amplify, or aid in the interpretation, construction, or meaning of the provisions of this Agreement.

C. Notices

All notices, demands, or requests from one Party to the other Party may be personally delivered, sent by facsimile, sent by recognized overnight delivery service, or sent by mail, certified or registered, postage prepaid, to the addresses stated in this paragraph and shall be effective at the time of personal delivery, facsimile, transmission, or mailing.

The Service: U.S. Fish and Wildlife Service
2800 Cottage Way, W-2605
Sacramento, CA 95825-1846
Attention: Chief, Endangered Species Division
Telephone: 916/ 414-6600
Facsimile: 916/ 414-6712

The CNLM: Center for Natural Lands Management
425 East Alvarado Street, Suite H
Fallbrook, CA 92028-2960
Attention: Sherry Teresa, Executive Director
Telephone: 760/731-7790
Facsimile: 760/731-7791
E-mail: cnlmpres@aol.com

Either Party may change the address to which such notices, demands, requests or other communications may be sent by giving the other Party written notice of such change. The Parties agree to accept facsimile transmitted signed documents and agree to rely on such documents as if they bore original signatures. Each Party agrees to provide to the other Party, within seventy-two (72) hours after transmission, such documents bearing the original signatures.

D. Successors and Assigns

This Agreement, and the rights and obligations thereunder shall not be transferred or otherwise assigned by the CNLM without the prior written approval of the proposed transferee/assignee by the Service.

E. Execution

This Agreement may be executed in several counterparts and all counterparts so executed shall constitute one agreement which shall be binding on all of the parties, notwithstanding that all of the parties are not signatory to the original or the same counterpart. If any provision of this Agreement is held invalid, the other provisions shall not be affected thereby. This Agreement represents the entire agreement of the parties and may not be amended, except in writing signed by each party hereto. Each party to this Agreement warrants to the other that it is duly organized, validly existing and, if a corporation, qualified to do business in the State of California, and that it and the respective signatories have full right and authority to enter into and consummate this Agreement and all related documents.

IN WITNESS WHEREOF, the Parties have executed this Agreement as of the date set forth above:

UNITED STATES FISH AND WILDLIFE SERVICE

By: Kenneth Sanchez

Name: KENNETH SANCHEZ

Title: ASST FIELD SUPERVISOR

Date: 10/23/06

THE CENTER FOR NATURAL LANDS MANAGEMENT

By: Michael C. Stroud

Name: Michael C. Stroud

Title: Director of Operations

Date: October 20, 2006

Enclosure (Form of Three Party Agreement and Payment Receipt)

FINAL ENVIRONMENTAL ASSESSMENT

GILL RANCH LONG-TERM PERMITS FOR CROSSING UNDER THE SAN LUIS CANAL AND SAN LUIS DRAIN

Appendix C
Environmental Documents

February 2010

Healer, Rain L

From: Lewis, Jennifer
Sent: Monday, February 01, 2010 2:46 PM
To: Healer, Rain L
Subject: RE: Gill Ranch EA-09-166
Attachments: Gill Ranch PD ESA 02012010.doc

Rain,

I had a chance to look back over an earlier draft acknowledging Service's BO covers the Gill Ranch Project to cross under SLC and SLD. I changed some of the language to make the letter read a little smoother but overall, there are no changes.

If you should have any comments or questions, please do not hesitant to ask me for clarification.

Jennifer L. Lewis
Wildlife Biologist
U. S. Bureau of Reclamation
South-Central California Area Office
work: 559-487-5197
1243 "N" Street
Fresno, CA 93721-1831

From: Healer, Rain L
Sent: Thursday, January 28, 2010 3:10 PM
To: Lewis, Jennifer
Subject: RE: Gill Ranch EA-09-166

Sigh. I am sooo jealous.

From: Lewis, Jennifer
Sent: Thursday, January 28, 2010 3:09 PM
To: Healer, Rain L
Subject: RE: Gill Ranch EA-09-166

Every place away from my cube might be considered fun? I will be joining Stephen to the San Joaquin River near Sack Dam and wearing a biological monitor's hat ☺.

Jennifer L. Lewis
Wildlife Biologist
U. S. Bureau of Reclamation
South-Central California Area Office
work: 559-487-5197
1243 "N" Street
Fresno, CA 93721-1831

From: Healer, Rain L
Sent: Thursday, January 28, 2010 3:07 PM
To: Lewis, Jennifer
Subject: RE: Gill Ranch EA-09-166

That would be fine. Thank you. Do you get to go somewhere fun?

From: Lewis, Jennifer
Sent: Thursday, January 28, 2010 3:06 PM
To: Healer, Rain L
Subject: RE: Gill Ranch EA-09-166

Rain,

I happen to still be working on your short concurrence review. I will be out in the field tomorrow. Would Tuesday or late Monday work?

Jennifer L. Lewis
Wildlife Biologist
U. S. Bureau of Reclamation
South-Central California Area Office
work: 559-487-5197
1243 "N" Street
Fresno, CA 93721-1831

From: Healer, Rain L
Sent: Wednesday, January 27, 2010 1:01 PM
To: Lewis, Jennifer
Subject: RE: Gill Ranch EA-09-166

I am still waiting on NEPA review and with Patti gone and Michael so busy, I am not sure when that will happen. If you would like to keep working on it that is fine with me. I was hoping to start the process for posting the document, but not sure if I will be able to in the next couple of days. Thank you for working on it for me.

Rain

From: Lewis, Jennifer
Sent: Wednesday, January 27, 2010 12:59 PM
To: Healer, Rain L
Subject: Gill Ranch EA-09-166

Rain,

I wrote a review for you to attach to the administrative record. It is not the greatest but am unsure when you needed a copy?

Thank you,

Jennifer L. Lewis
Wildlife Biologist
U. S. Bureau of Reclamation
South-Central California Area Office
work: 559-487-5197
1243 "N" Street
Fresno, CA 93721-1831

Jennifer L. Lewis
Wildlife Biologist
work: 559-487-5197

jllewis@usbr.gov
U. S. Bureau of Reclamation
South-Central California Area Office

Gill Ranch Storage EA-09-166 ESA Effects Analysis

1 Background

The Bureau of Reclamation (Reclamation) proposes to award Gill Ranch Storage, LLC (GRS) two 50-year licenses to cross Reclamation's rights-of-way (ROW). The licenses would allow GRS to install a 30-inch diameter natural gas pipeline under the San Luis Canal/Aqueduct (SLC: Section 11, T15S, R13E) and the San Luis Drain (SLD: Section 8, T14S, R15E) in Fresno County. Installation of the pipeline would use horizontal directional drilling techniques and will take approximately four days to complete for both the SLC and SLD.

The purpose for the proposed action is to facilitate a larger project (Storage Project) to construct and operate a natural gas storage field by utilizing depleted natural gas reservoirs in an existing natural gas field (Entrix 2009). The project is designed to store 20 billion cubic feet of natural gas and deliver 650 million cubic feet per day of natural gas to the existing PG&E 401 Natural Gas Line in Madera and Fresno Counties. Storage Project-related ground disturbance is limited to the construction right-of-way, equipment staging areas, pipe storage yards, borrow and disposal areas, and access roads.

The U.S. Army Corps of Engineers (Corps) initiated Endangered Species Act (ESA) consultation as the lead Federal Agency for the Storage Project under the National Environmental Policy Act (NEPA). The species of concern included the federally endangered San Joaquin kit fox (*Vulpes macrotis mutica*), federally threatened giant garter snake (*Thamnophis gigas*), federally endangered blunt-nosed leopard lizard (*Gambelia silus*), and the federally threatened Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). U.S. Fish and Wildlife Service (USFWS) issued a Biological Opinion (BO) covering the project activities on Reclamation's ROW to install the pipeline under the SLC and SLD (BO# 81420-2008-F-1325-2 and Corps project# SPK-2008-00448) (USFWS 2009).

USFWS concurred with the Corps that the Storage Project was not likely to adversely affect the blunt-nosed leopard lizard and the Valley elderberry longhorn beetle. The Corps agreed to conduct preconstruction surveys for the blunt-nosed leopard lizard and to follow measures to avoid effects to elderberry shrubs (USFWS 2009). The Service also found that the Storage Project was likely to adversely affect the San Joaquin kit fox and the giant garter snake. Service added the Storage Project to the existing 1997 *Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter, and Yolo Counties, California* (GGS Programmatic) (USFWS 1997). The Corps agreed to follow guidelines of the GGS Programmatic as appended by USFWS (2009). In addition, the Corps has proposed to purchase land in Service-approved conservation bank to minimize temporary loss of kit fox habitat (USFWS 2009).

Jennifer L. Lewis
Wildlife Biologist
work: 559-487-5197

jllewis@usbr.gov
U. S. Bureau of Reclamation
South-Central California Area Office

2 Impact Avoidance and Minimization Measures

To protect biological resources, proposed measures will be incorporated into the project. See Appendix A of the completed EA-09-166 for complete measures GRS shall follow.

3 Action Area

The action area includes two sites surrounded by actively farmed land. Adjacent to the SLC and SLD, are field and row crops, and deciduous orchards (Entrix 2009). Typical orchards found in the Project Area include pistachio and almond trees.

4 Threatened, Endangered, Proposed Threatened or Proposed Endangered Species

The USFWS's Database: http://www.fws.gov/sacramento/es/spp_list.htm was accessed January 13, 2010 to determine federal protected species known or with the potential to occur in Chaney Ranch Quad and Tranquility Quad (Document #100113015403 and #100113120844, respectively) (Table 1). The California Department of Fish and Game Natural Diversity Database (CNDDB 2010) were queried to determine the likelihood of listed species to occur within the Action Area (Figs. 1-2).

Table. 1. Sensitive Species That May Occur in Project Site

Species	***Status***[1]	***Summary basis for ESA determination***[2]
Amphibians		
California red-legged frog (*Rana aurora draytonii*)	T	**Absent**. No individuals documented in this area.
Bird		
burrowing owl (*Athene cunicularia*)	MBTA	**Possible**. CNDDB-recorded occurrences show this species present in Action Area.
Swainson's hawk (*Buteo swainsoni*)	MBTA	**Possible**. CNDDB records documented and suitable habitat for nesting and foraging present in Action Area.
Fish		
Central Valley Steelhead (*Oncorhynchus mykiss*)	T, NMFS	**Absent**. No natural waterways within the species' range will be affected by the proposed action.
Delta smelt (*Hypomesus transpacificus*)	T	**Absent**. No natural waterways within the species' range will be affected by the proposed action.
Invertebrates		
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	T	**Absent**. No individuals documented in this area.
Vernal pool fairy shrimp (*Branchinecta lynchi*)	T	**Absent**. No individuals or suitable seasonal wetland habitat occurs in area of effect.
Mammals		
Fresno kangaroo rat (*Dipodomys nitratoides exilis*)	E, X	**Absent**. No individuals or habitat in area of effect.

giant kangaroo rat (*Dipodomys ingens*)	E	**Absent**. No individuals or habitat in area of effect.
San Joaquin kit fox (*Vulpes mactotis mutica*)	E	**Present**. CNDDB records indicate this species occurs in the project area. The area could possible be used for denning or as foraging habitat. GRS shall implement environmental protective measures as specified by Service.
Plant		
palmate-bracted bird's-beak (*Cordylanthus palmatus*)	E	**Absent.** Habitat is lacking and rare plant surveys conducted by Entrix in April, May and August 2008 did not detect populations of this plant.
San Joaquin woolly-threads (*Monolopia congdonii*)	E	**Absent.** Habitat is lacking and rare plant surveys conducted by Entrix in April, May and August 2008 did not detect populations of this plant.
Reptiles		
Blunt-nosed leopard lizard (*Gambelia sila*)	E	**Unlikely**. Cultivation of row crops destroys or prevents construction of burrows.
Giant garter snake (*Thamnophis gigas*)	T	**Possible**. Suitable habitat occurs within Fresno Slough near SLD.

1 Status= Listing of Federally special status species, unless otherwise indicated
E: Listed as Endangered
MBTA: Birds protected under the Migratory Bird Treaty Act
NMFS: Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service
T: Listed as Threatened
X: Critical Habitat designated for this species
2 Definition Of Occurrence Indicators
Present: Species recorded in area and habitat present
Possible: Species recorded in area but habitat suboptimal or lacking entirely
Unlikely: Species records dated over ten years within a 3-mile radius
Absent: Species not recorded in study area and/or habitat requirements not met
3 CNDDB = California Department of Fish and Game Natural Diversity Database 2010

5 Critical Habitat

The Proposed Action does not fall within designated or proposed critical habitat for any of the federally listed wildlife species identified by the USFWS.

6 Special Status Species Occurring or Potentially Occurring in the Project Area

The San Joaquin kit fox is federally listed as an endangered species. Critical habitat has not been designated for this species. Kit foxes excavate their own dens, or use other animals, and human-made structures (culverts, abandoned pipelines, and banks in sumps or roadbeds). Kit foxes currently inhabit western and southern San Joaquin valley in grassland and scrubland communities. Primary reasons for the species decline include loss and degradation of habitat (USFWS 1998).

The project area occurs within the known range for San Joaquin kit fox. There are many recorded occurrences of San Joaquin kit fox within and surrounding the Project Area (CNDDB 2010; Figs. 1-2). Kit fox could utilize the area for foraging in nearby orchards, or for movement purposes. Yet, because the project area occurs in actively cultivated fields, habitat quality for kit fox would be poor (Warrick et al. 2007). Farming activities likely have reduced denning opportunities and prey base.

Blunt-nosed leopard lizard is a federally endangered species and occurs in the San Joaquin Valley region in expansive, arid areas with scattered vegetation. These lizards will use small mammal burrows for shelter or can construct shallow tunnels under exposed rocks or earth berms (Warrick et al. 1998). Agricultural development and urbanization have largely degraded and fragmented their habitat. Other threats to their survival are collision with automobiles or off-road vehicles. This lizard cannot survive on lands under cultivation but may use edges adjacent if suitable habitat.

There are records for blunt-nosed leopard lizard within the vicinity of the Action Area (Figs. 1-2). Potential habitat for the species may exist along an approximately 0.1 mile segment of the proposed pipeline route near the intersection of SR 180 and West Panoche Road near SLD (Entrix 2008). However, Entrix conducted a series of protocol level surveys at the Project Site in 2008 and 2009 and did not identify any individuals (Entrix 2009). No effect to the lizards was determined and therefore, no mitigation would be required, as based on the issued USFWS BO.

The giant garter snake is endemic to the Central Valley wetland habitats, and includes freshwater marshes, low-gradient streams, as well as man-made waterways, drainage canals, irrigation ditches, slough habitats, and adjacent uplands (USFWS 1993, 1999a). These waterways typically contain cattails and other herbaceous vegetation for cover or foraging.

Recorded occurrences of giant garter snake indicate this species occurs at the Fresno Slough located 515 feet from the SLD (CNDDB 2010; Fig. 2). Construction related activities have been restricted to existing paved or graveled roads. Additionally, agricultural canals provide a scarcity of vegetation cover and the regular maintenance and modifications that occur during agricultural operations makes for poor habitat quality for giant garter snake. USFWS determined disturbances during construction activities are small and fall within the parameters of the GGS Programmatic (USFWS 2009).

In addition to the species discussed above, birds protected under the federal Migratory Bird Treaty Act (MBTA) have the potential to occur within the Action Area and include burrowing owl (*Athene cunicularia*) and Swainson's hawk (*Buteo swainsoni*). Suitable nesting and foraging habitat does exist along both the SLC and SLD (Entrix 2008).

The burrowing owl is a yearlong resident and frequents open, dry annual or perennial grasslands, deserts, and scrublands characterized by low growing vegetation. CNDDB-recorded occurrences indicate this species ~2 miles south of SLD Project Site (Fig. 2). There is also a report located 2.2 miles from the Area just west of the Fresno Slough (Fig.

2). Surveys for burrowing owls did not find evidence of their presence or any occupied burrows yet; suitable habitat is present throughout the project boundaries.

Swainson's hawk is associated with riparian corridors adjacent to grasslands and agricultural lands of California's Central Valley during spring and summer (England et al. 1997). They nest in trees, forage over pastures and agricultural fields, and prey largely on small mammals and insects. Suitable nesting and foraging habitat exists within project boundaries (Entrix 2009). CNDDB records indicate this species occurs 3.7 miles of SLD (Fig. 2). Surveys conducted by Entrix (2009) did observe a Swainson's hawk nesting along Fresno Slough.

Figure 1. Gill Ranch Long-Term Permit Crossing under San Luis Canal

Project: CEC-09-166

Miles 0 1 2 3

U.S. Department of the Interior
Bureau of Reclamation
Mid-Pacific Region

Jennifer L. Lewis
Wildlife Biologist
work: 559-487-5197

jllewis@usbr.gov
U. S. Bureau of Reclamation
South-Central California Area Office

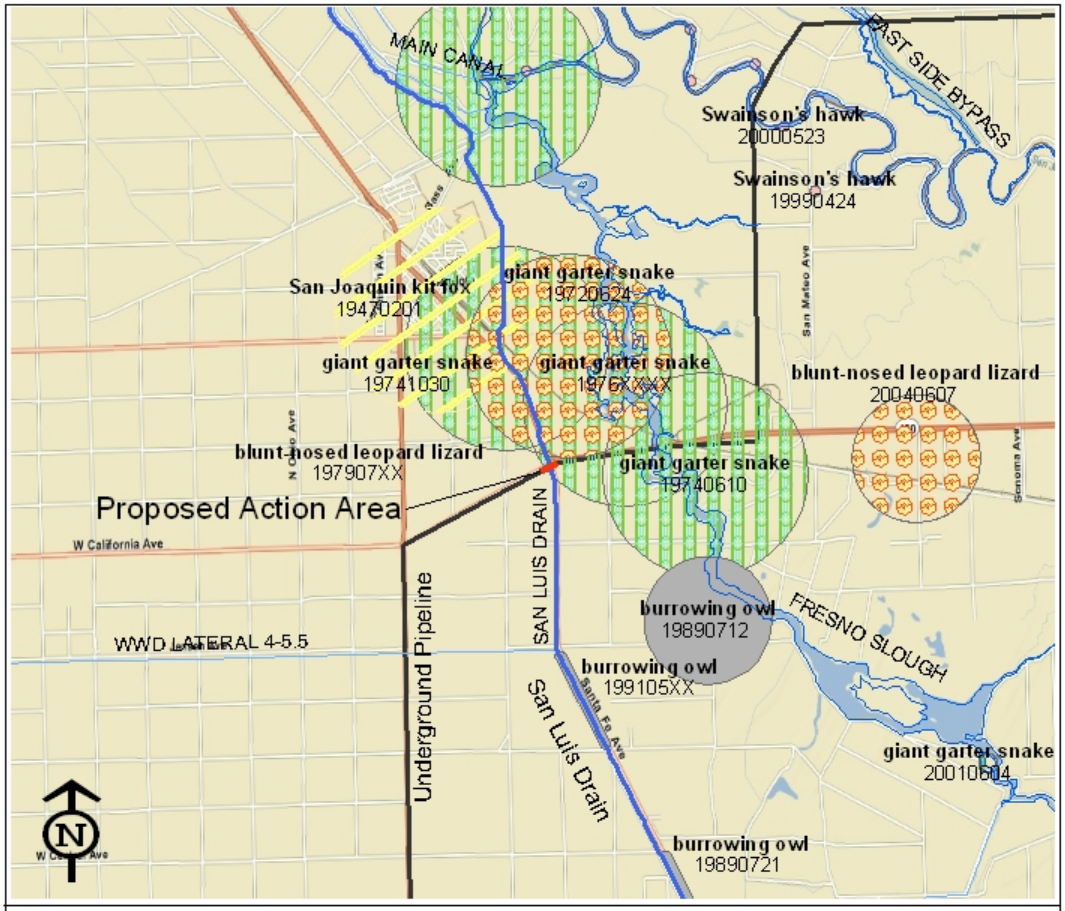


Figure 2. Gill Ranch Long-Term Permit Crossing under San Luis Drain

Project: CEC-09-166

Miles 0 1 2 3

U.S. Department of the Interior
Bureau of Reclamation
Mid-Pacific Region

7 Environmental Consequences

There is potential for San Joaquin kit fox, giant garter snake, and any nesting burrowing owl and Swainson's hawk to be harassed or harmed by the construction, operation, and maintenance of the Storage Project. Construction equipment could also pose an obstacle for movement through the area.

In addition, San Joaquin kit fox, giant garter snake, and burrowing owls could become entrapped during construction, operation, and maintenance of the Project.

The following measures will be followed so avoid and or minimize potential impacts to listed species:

- A kit fox pre-activity survey and avoidance measures shall be implemented to avoid and minimize impacts (USFWS 1999b). Loss of habitat to kit fox will be mitigated, as agreed between USFWS and GSR.

- Drilling activities will occur at a distance greater than 200 feet from the Fresno Slough are unlikely to adversely affect the giant garter snake (USFWS 2009). In suitable habitat, Giant Garter Snake Impact Avoidance and Minimization Standard avoidance and minimization measures shall be implemented.

- A preconstruction survey shall be conducted 14-30 days prior to any ground disturbance for burrowing owls (CDFG 1995). If burrowing owls are present, GSR shall implement mitigation measure, as directed by CDFG.

- Any open trenches or piping will be capped.

- Preconstruction surveys for nesting Swainson's hawk shall be performed 0.5 miles of the Project Area following established protocol (CDFG 1994). If active nests are located in the area of disturbance, appropriate avoidance, minimization, and protection measures would be followed in consultation with CDFG.

8 Conclusion

Reclamation has determined that the Proposed Action is consistent with the current USFWS issued BO. The project proponents must report immediately to the USFWS within 24 hours any information of unauthorized take (mortality or death) of federally-listed species as caused directly or indirectly during activities associated with this Project. No additional federally listed or proposed species or critical habitat occurs in the area that would be affected by the Proposed Action.

9 References

CDFG (California Department of Fish and Game). 1994. Staff report regarding mitigation for impacts to Swainson's hawks (*Buteo swainsoni*) in the Central Valley of California. California Department of Fish and Game, Sacramento, CA.

CDFG (California Department of Fish & Game). 1995. Staff Report on Burrowing Owl Mitigation. California Department of Fish and Game, Sacramento, CA.

CNDDB (California Natural Diversity Database). 2010. California Department of Fish and Game's Natural Diversity Database, Version 3.1.1. RareFind 3 (computer application). January 6, 2010.

England, A. S., M. J. Bechard, and C. S. Houston. 1997. Swainson's hawk (*Buteo swainsoni*) in A. Poole and F. Gill (eds.), The Birds of North America, No. 265. The Academy of Natural Sci., Philadelphia, PA, and The American Ornithologists' Union. Washington, D.C.

Entrix, Inc. 2008. Proponent's Environmental Assessment for the Gill Ranch Gas Storage Project. Prepared for GRS and PG&E and submitted to the California Public Utilities Commission.

Entrix, Inc. 2009. Mitigated Negative Declaration/Initial Study. Gill Ranch Gas Storage Project. Prepared for the California Public Utilities Commission.

USFWS (U.S. Fish and Wildlife Service). 1993. Endangered and threatened wildlife and plants; determination of threatened status for the giant garter snake. Federal Register 58: 54053-54066.

USFWS (U.S. Fish and Wildlife Service). 1997. Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter, and Yolo Counties, California. Reference Number I-I-F-97-149. US Fish and Wildlife Service, Sacramento, California.

USFWS (U.S. Fish and Wildlife Service). 1998. Recovery plan for the upland species of the San Joaquin Valley, California. Portland, OR.

USFWS (U.S. Fish and Wildlife Service). 1999a. Draft recovery plan for the giant garter snake (*Thamnophis gigas*). U.S. Fish and Wildlife Service, Portland, OR. 192 pp.

USFWS (U.S. Fish and Wildlife Service). 1999b. Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance. Sacramento California. June, 1999.

USFWS (U.S. Fish and Wildlife Service). 2009. U.S. Fish and Wildlife Service Biological Opinion for the Gill Ranch Gas Storage Project (SPK-2008-00448) in Madera and Fresno Counties, California. Reference number 81420-2008-F-1325-2, December 22, 2009.

USFWS (U.S. Fish and Wildlife Service). 2010. Sacramento Fish and Wildlife Office. Endangered Species List. Available http://www.fws.gov/sacramento/es/spp_list.htm. Accessed: January 13, 2010.

Warrick,G.D., T. Kato, and B.R. Rose. 1998. Microhabitat use and home range characteristics of blunt-nosed leopard lizards. Journal of Herpetology 32: 183-191.

Warrick, G. D., H. O. Clark, Jr., P. A. Kelly, D. F. Williams, and B. L. Cypher. 2007. Use of agricultural lands by kit foxes. Western North American Naturalist 67: 270-277.

Healer, Rain L

From: Barnes, Amy J
Sent: Friday, January 15, 2010 2:40 PM
To: Healer, Rain L
Cc: MPR Cultural Resources Section
Subject: 09-166 Gill Ranch Storage Crossing Under San Luis Canal and San Luis Drain (10-SCAO-056)

Tracking #10-SCAO-056

Project: 09-166 Gill Ranch Storage Crossing Under San Luis Canal and San Luis Drain

Location: Fresno County.
SLC: sec. 11, T. 15 S., R. 13 E., Mount Diablo Meridian, Chaney Ranch 7.5' USGS topographic quadrangle
SLD: sec. 8, T. 14 S., R. 15 E., Mount Diablo Meridian, Tranquility 7.5' USGS topographic quadrangle

The proposed activities associated with Reclamation issuing two 50-year licenses to Gill Ranch Storage, LLC (GRS) for installing a 30-inch diameter natural gas pipeline under Reclamation's San Luis Canal/Aqueduct (SLC) and the San Luis Drain (SLD) will have no potential to affect historic properties. GRS proposes to conduct 1,600 linear feet of horizontal direction drilling (HDD) to cross under the SLC and 250 feet of jack and bore drilling under the SLD for the gas pipeline. HDD will involve mud rotary drilling by a surface drilling rig to create a boring 25 feet below the center line of the SLC to place the pipeline. The jack and bore method will involve two pits on either side of the SLD for drilling beneath the drain. The pipeline under the SLD will be placed between 6 and 10 below the bottom of the drain. Drilling, staging, and stockpiling of materials will occur outside of Reclamation right-of-way. The pipeline will only pass through Reclamation's right-of-way without disturbing the SLC or SLD.

As the proposed action has no potential to affect historic properties pursuant to 36 CFR Part 800.3(a)(1), no additional consideration under Section 106 of the National Historic Preservation Act is required.

Thank you for the opportunity to review the proposed action. Please place a copy of this concurrence with the CEC administrative record. Please also include the following changes to the EA.

Affected Environment
3.4 Cultural Resources

A cultural resource is a broad term that includes prehistoric, historic, architectural, and traditional cultural properties. The National Historic Preservation Act (NHPA) of 1966 is the primary Federal legislation that outlines the Federal Government's responsibility to cultural resources. Section 106 of the NHPA requires the Federal Government to take into consideration the effects of an undertaking on cultural resources listed on or eligible for inclusion in the National Register of Historic Places (NRHP). Those resources that are on, or eligible for inclusion in, the NRHP are referred to as historic properties.

The Section 106 process is outlined in the Federal regulations at 36 Code of Federal Regulations (CFR) Part 800. These regulations describe the process that the Federal agency (Reclamation) takes to identify cultural resources and the level of effect that the proposed undertaking will have on historic properties. In summary, Reclamation must first determine if the action is the type of action that has the potential to affect historic properties. If the action is the type of action to affect historic properties, Reclamation must identify the area of potential effects (APE), determine if historic properties are present within that APE, determine the effect that the undertaking will have on historic properties, and consult with the State Historic Preservation Office (SHPO), to seek concurrence on Reclamation's findings. In addition, Reclamation is required through the Section 106 process to consult with Indian Tribes concerning the identification of sites of religious

or cultural significance, and consult with individuals or groups who are entitled to be consulting parties or have requested to be consulting parties.

The San Joaquin Valley is rich in historical and prehistoric cultural resources. Cultural resources in this area are generally prehistoric in nature and include remnants of native human populations that existed before European settlement. Prior to the 18th Century, many Native American tribes inhabited the Central Valley. It is possible that many cultural resources lie undiscovered across the valley. The San Joaquin Valley supported extensive populations of Native Americans, principally the Northern Valley Yokuts, in the prehistoric period. Cultural studies in the San Joaquin Valley have been limited. The conversion of land and intensive farming practices over the last century has probably destroyed many Native American cultural sites.

The approval of the Proposed Action is the type of activity that has no potential to affect historic properties. Drilling under the SLC and SLD from outside of Reclamation's right-of-way will not impact their structural integrity. There will be no modification to the water conveyance facilities and no new land will be put into agricultural production as a direct result of permitting two gas pipeline crossings. Given the constructed nature of the SLC and SLD, there is no potential for intact archaeological deposits within the canal bed or along the berms of the canal and drain. Because the action will result in no potential to affect historic properties, there will be no impacts to cultural resources as a result of the implementation of the Proposed Action.

No Action
Under the No Action Alternative, there are no impacts to cultural resources since there would be no change in operations and no ground disturbance. Conditions related to cultural resources would remain the same as exiting conditions.

Proposed Action
The proposed action is administrative in nature and is the type of activity that has no potential to affect historic properties pursuant to the regulations at 36 CFR Part 800.3(a)(1). There will be no modification of water conveyance facilities and no activities that will result in ground disturbance. Because there is no potential to affect historic properties, no cultural resources will be impacted as a result of implementing proposed action.

Section 4 Consultation and Coordination
4.3 National Historic Preservation Act (16 USC § 470 et seq.)

Section 106 of the National Historic Preservation Act requires federal agencies to evaluate the effects of federal undertakings on historical, archaeological and cultural resources. Due to the nature of the proposed project, there will be no effect on any historical, archaeological, or cultural resources and no further compliance actions are required.

Healer, Rain L

From: Rivera, Patricia L
Sent: Wednesday, January 13, 2010 11:22 AM
To: Healer, Rain L
Subject: RE: EA-09-166 Gill Ranch Long-term permits

Rain,

I reviewed the proposed action to issue two 50-year licenses to Gill Ranch Storage, LLC (GRS) for the installation of a 30-inch diameter natural gas pipeline under the San Luis Canal/Aqueduct (SLC) and the San Luis Drain (SLD). The pipeline route and crossings of the SLC and SLD can be found in Figure 1.

Construction Activities at the San Luis Canal
Construction activities associated with the SLC would include 1,600 linear feet of horizontal direction drilling (HDD) to cross under the SLC. HDD would involve mud rotary drilling by a surface launched drilling rig to create a boring for placement of the pipeline. Drilling fluid (usually a slurry of bentonite clay suspended in water) would be pumped through the drill bit to remove soil and rock fragments created by the drilling process. Soil cuttings would be separated from the bentonite slurry and
used to backfill HDD excavation. Any left-over soil cuttings and slurry would be hauled off-site for disposal. The top of the pipe would be a minimum of 25 feet below the centerline of the SLC and no surface alterations of the SLC would be required.

Construction Activities at the San Luis Drain
Construction activities associated with the SLD would include installation by conventional jack and bore methods of 250 linear feet of gas pipeline under the SLD at approximately milepost 17. Jack and bore method excavation would be up to 8 feet deep. Pipeline construction rights-of way (ROW) would measure up to 95 feet in width with a permanent ROW of 50 feet. The SLD would be returned to its present conditions once construction was complete.

Staging and Timing
Staging and stockpiling of materials would be outside of Reclamation ROW but within the ROW established for the Project. Installation of the pipeline would take approximately four days to complete for both the SLC and SLD.

The proposed action doese not affect Indian Trust Assets. The nearest ITA is Table Mountain Rancheria approximately 43 miles NE of the project location.

Patricia

Thanks.

Ellie

FINAL ENVIRONMENTAL ASSESSMENT

GILL RANCH LONG-TERM PERMITS FOR CROSSING UNDER THE SAN LUIS CANAL AND SAN LUIS DRAIN

Appendix D
Proposed Projects in the Vicinity of the Proposed Action

February 2010

Table 3.18-1: Cumulative Projects

Project Name	Project Components and Schedule	Location	Status
City of Kerman			
Kerman Neighborhood Shopping Center	75,000-square-foot retail space on 8.5 acres (9 parcels) Construction start expected in 2009 and completion expected in 3 to 5 years	Southeast (SE) corner of Whitesbridge Avenue (SR 80) and Madera Avenue (SR 145)	Approved
Autumn Ridge Senior Facility	34-bed senior facility with 28 units Construction delayed Completion schedule unknown	Stanislaus Ave. between Golden Rod and 16th (Stanislaus needs to be extended and 16th Street has not yet been constructed)	Approved
Northeast Annexation Project	48 acres total 3 commercial tracts 106 combined single family homes and apartment units 20-acre school site (includes 10 acres for joint City/County District ball field and playground) Project is being developed in stages	Corner of Golden Rod and SR 180	No final permits for development to date
Rite-Aid Pharmacy	17,300-square-foot Rite-Aid pharmacy Construction begins early 2009 Expected completion end of 2009	Northeast (NE) corner of Kearney and Madera (SR 145)	Approved
La Quinta Inn	58-unit motel Construction may begin early 2009	Intersection of Madera Avenue (SR 145) and Whitesbridge Avenue (SR180)	Approved
City of Mendota			
Cleantech of America	5-Megawatt solar power facility on 40 acre parcel Construction schedule unknown	SE portion of Mendota east of SR 33, co-located with existing biomass facility	Approved
City of Firebaugh			
El Sendoro Ranch	579 single family residence lots 5 neighborhood parks 11 acres of future Planned Unit Development Construction schedule unknown	NE portion of Firebaugh, between SR 33, Behymer Avenue, and Clyde Fannon Road	Approved
Lake Joallan	122 residential lots 4 parks Construction delayed Completion schedule unknown	SE portion of Firebaugh adjacent to San Joaquin River	Approved

Table 3.18-1 *(Continued)*: Cumulative Projects

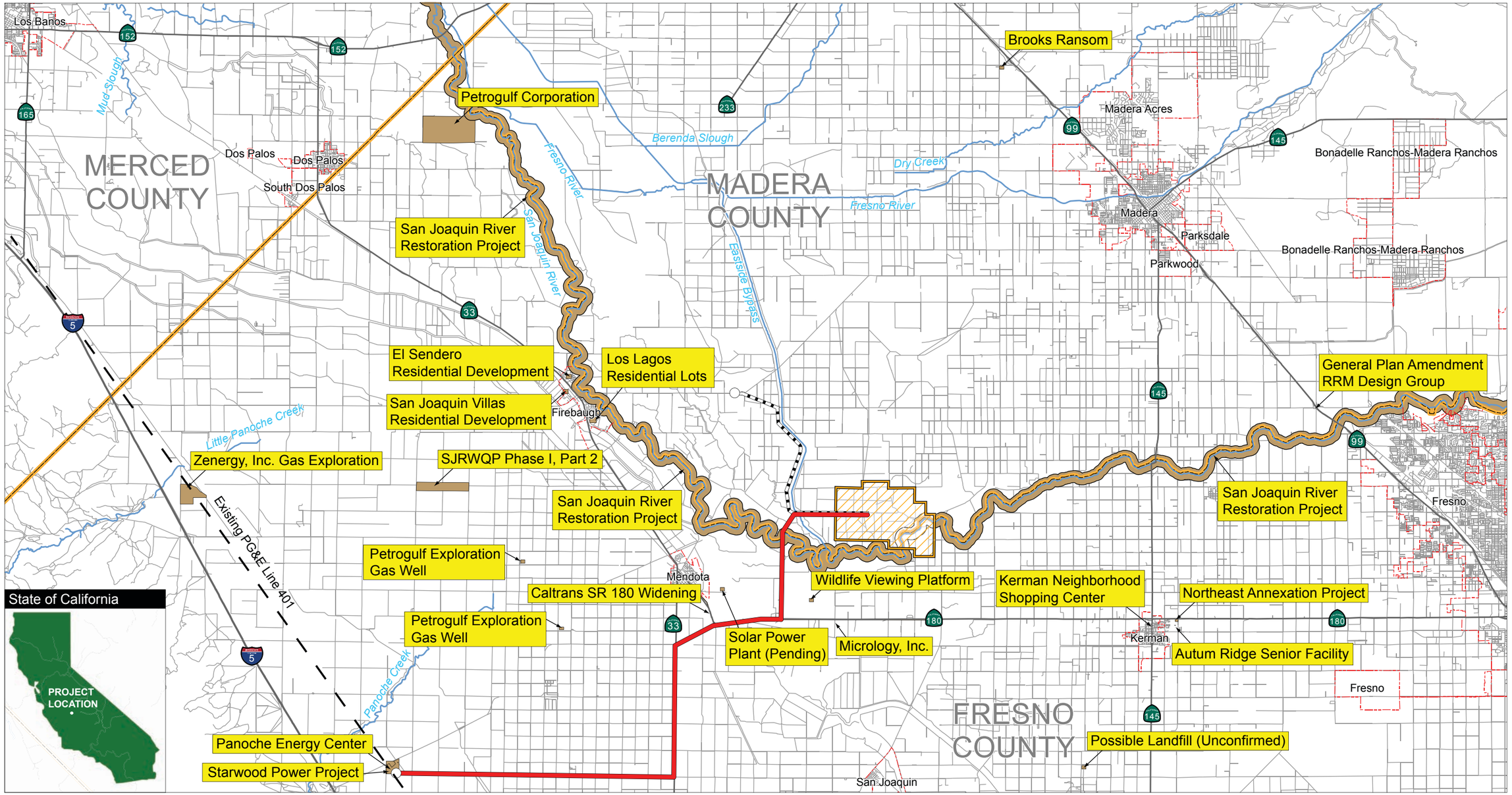
Project Name	Project Components and Schedule	Location	Status
Los Lagos (formerly Valle Del Sol)	186 residential lots 1 park Project being developed in stages	SE portion of Firebaugh east of Helm Canal Road, south of Firebaugh High School	No final permits for development to date
San Joaquin Villas	21 condominium units Construction expected Spring 2009 Expected completion end of 2009	Northwest (NW) portion of Firebaugh, east side of SR 33, approximately 0.3 miles north of intersection with Clyde Fannon Road	Approved
County of Fresno			
Zenergy, Inc. Gas Exploration Well	Exploratory gas well and production facilities on an 0.85-acre portion of a 13.45-acre parcel A 20,328-foot pipeline would connect the production site with an existing pipeline located SE of the subject parcel if natural gas is discovered	15 miles west of the City of Firebaugh. North side of West Shields Avenue between Interstate 5 and West Oxford Ave	Approved; no permits issued to date
Petrogulf Corporation	Exploratory gas well and production facilities on an 0.86-acre portion of a 322.22-acre parcel 1,400-ft pipeline would connect the production site with the existing Arroyo Pipeline, located on the sample parcel of land, f natural gas is discovered	Approximately 10 miles west of the City of Firebaugh. West side of Fairfax Avenue between West Carmellia Avenue and Mint Road	Approved; pump and electrical permits issued
Microgy, Inc.	Biogas Facility and approximately 6 miles of 6--inch diameter gas pipeline on private land Construction schedule unknown	SE corner SR 180 and James Road, approx 8 miles west of the City of Kerman and approximately 3 miles east of San Mateo Avenue	Approved
Kelpetro Operating, Inc	3 exploratory oil wells	Approximately 19 miles SE of Kerman; SE intersection of South Grantland and Cerini Avenue, near community of Lanare	Proposed; under review
Petrogulf Corporation	Exploratory gas well	Approximately 5 miles NW of Mendota; SE corner of West Shields Avenue and North Lyon Avenue	Proposed; under review
Petrogulf Corporation	Exploratory gas well	Southwest (SW) intersection of Whitesbridge Avenue and North Washoe approximately 4.5 miles SW of Mendota	Proposed; under review
Not known	Wildlife viewing platform	1.5 miles NE of intersection of SR 180 and San Mateo Avenue	Under review

Table 3.18-1 *(Continued)*: Cumulative Projects

Project Name	Project Components and Schedule	Location	Status
Not known	Landfill	4.5 miles SW of Kerman; near intersection of American Avenue and Lassen Avenue	Status unknown
San Joaquin River Water Quality Improvement Project Phase I, Part 2	Acquisition of up to 2,900 acres of land to expand the existing 4,000-acre Phase I In-Valley Treatment/ Drainage Reuse Facility	7 miles west of Russell Avenue and east to approximately Fairfax Avenue	Under review
Caltrans	SR 180 road widening between Fresno/Kings Slough and Mendota	SR 180 between Fresno/Kings Slough and the City of Mendota	Under construction
Panoche Energy Center	400-Megawatt peaker power plant Fresno County	West Panoche Road, approximately 2.5 northeast of Interstate 5	Under construction
Starwood Power Project	120-Megawatt peaker power plant	West Panoche Road, approximately 2.5 miles NE of Interstate 5	Under construction
County of Madera			
Brooks Ransom	Grain storage warehouse and rail offloading facilities with an average of four trucks per day	West side of Avenue 20 1/2, approximately 0.4 miles south of the intersection Avenue 20 1/2 and Road 21	Under review
General Plan Amendment	Amendment to the 1995 General Plan to designate the boundaries of a future planning area, Joaquin Bend	NE, NW and SE sides of the intersection of Avenue 7 and Highway 99	Under review
Rezoning and General Plan Amendment	Rezoning and General Plan Amendment for commercial use	Intersection of Road 15 ½ and Hwy 152, Chowchilla, approximately 20 miles north of Avenue 7 and Road 16 intersection	Approved
Andrew Quady Winery	General Plan Amendment to allow winery	North side of Avenue 13, approximately 0.1 mile from intersection with Road 24, Madera; approximately 10 miles NE of Avenue 7 / Road 16 intersection	Under review
Costa View Farms	Dairy	SE corner of Avenue 17 and Road 12, Madera	Approved
Frank Borges	Dairy	SE corner Avenue 14 and Road 9, Madera, approx. 10 miles NW of Avenue 7 / Road 16 intersection	Approved
Jose Soares	Dairy	East side Road 1, approximately 1.5 miles south of intersection with Avenue 21, Madera, approximately 20 miles NW of Avenue 7 / Road 16 intersection	Approved

SOURCE: Entrix 2008

Figure 3.18-1: Cumulative Projects and the Proposed Project Elements



SOURCE: RMT Inc. 2009