THE GRIMES PIPELINE AMENDMENT TO THE SUTTER ENERGY CENTER (97-AFC-02)

PREPARED FOR:

Calpine Construction Finance Company, L.P.
4160 Dublin Boulevard
Contact: Ms. Barbara McBride, Western Regional Director, Environmental Health and Safety
Work Phone: (925) 557-2238
Cell Phone: (925) 570-0849
Email: Barbara.McBride@Calpine.com
and
CPN Pipeline Company
60 River Road
Rio Vista, CA 94571
Contact: Chris Delaney, Engineering Manager
707.374.1516

PREPARED BY:

ICF International
630 K Street, Suite 400
Sacramento, CA 95814
Contact: Susan Bushnell
Work Phone: 916.737.3000
Cell Phone: 916.752.0959
Email: sbushnell@icfi.com

March 2011

ICF INTERNATIONAL

ICF International. 2011. *The Grimes Pipeline Amendment to the Sutter Energy Center (97-AFC-02)*. March. (ICF 00776.10.) Sacramento. Prepared for Calpine Construction Finance Company, L.P. and CPN Pipeline Company.

Contents

Tables and Figures

Acronyms and Abbreviations

APE	area of potential effects
AG	General Agriculture
AG-20	Agriculture—20 Acre Minimum Parcel Size
AG-80	Agriculture—80 Acre Minimum Parcel Size
BMPs	best management practices
Calpine	Calpine Construction Finance Company, L.P
CDFG	California Department of Fish and Game
CEC	California Energy Commission
CFR	Code of Federal Regulations
CO	carbon monoxide
CPN	CPN Pipeline Company
DPM	diesel particulate matter
FBE	Fusion Bond Epoxy
LORS	laws, ordinances, regulations and standards
MBTA	Migratory Bird Treaty Act
MM	master meter
NPDES	National Pollutant Discharge Elimination System
NO_X	oxides of nitrogen
O&M	operations and maintenance
PG&E	Pacific Gas & Electric
PHMSA	Pipeline and Hazardous Materials Safety Administration
PM 10	particulate matter 10 microns or less in diameter
PM 2.5	particulate matter 2.5 microns or less in diameter
ROG	reactive organic gases
SEC	Sutter Energy Center
Section 106	Section 106 of the National Historic Preservation Act
SHPO	California State Historic Preservation Officer

SVP	Society for Vertebrate Paleontology
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
VELB	valley elderberry longhorn beetle

1. Introduction

1.1 Overview of Amendment

Calpine Construction Finance Company, L.P. (CCFC) and CPN Pipeline Company, both wholly owned subsidiaries of Calpine Corporation, propose this Amendment to allow the Sutter Energy Center (SEC) to be served by a new 2.8-mile 6-inch natural gas pipeline (herein referred to as the "Grimes Pipeline Project" or the "Project"). Currently, SEC receives natural gas from Pacific Gas & Electric's (PG&E's) natural gas transmission system via the 20-inch Sutter Pipeline, which connects to the SEC and is owned and operated by CPN Pipeline Company. The Grimes Pipeline Project, which will flow gas from north to south, will interconnect to the existing Sutter Pipeline west of the SEC site on Girdner Road just west of Hageman Road at the new Grimes Station (Figure 1).

The Grimes Pipeline Project will allow the SEC to directly access local natural gas from the Grimes natural gas field in the Sacramento Basin to the north and west of the Project site. Once constructed, the proposed pipeline will be capable of transporting approximately 10 million standard cubic feet per day of natural gas from Venoco Inc.'s and other gas producers' existing gas wells north of the community of Grimes. It is important to note, however, that the quantity of natural gas delivered to the SEC will not be increased over existing deliveries. Instead, the Grimes Pipeline adds fuel supply diversity to the SEC.

To facilitate deliveries from the local gas field suppliers, the Grimes Pipeline Project will include a new gas metering station with related facilities near its southern terminus to be called "Grimes Station." Grimes Station will be located on approximately 0.5 acre on Girdner Road just west of Hageman Road, approximately 400 feet from the Grimes Pipeline's first point of interconnection with the existing 20-inch Sutter pipeline that serves SEC. Upstream of Grimes Station, natural gas meters will also be installed at Venoco Inc.'s existing Eastside and 32-33-3 master meter (MM) gas field sites. As explained below, the Grimes pipeline will also be owned and operated by the Project owner's affiliate, CPN Pipeline Company. [1]

1.2 Summary of Environmental Impacts

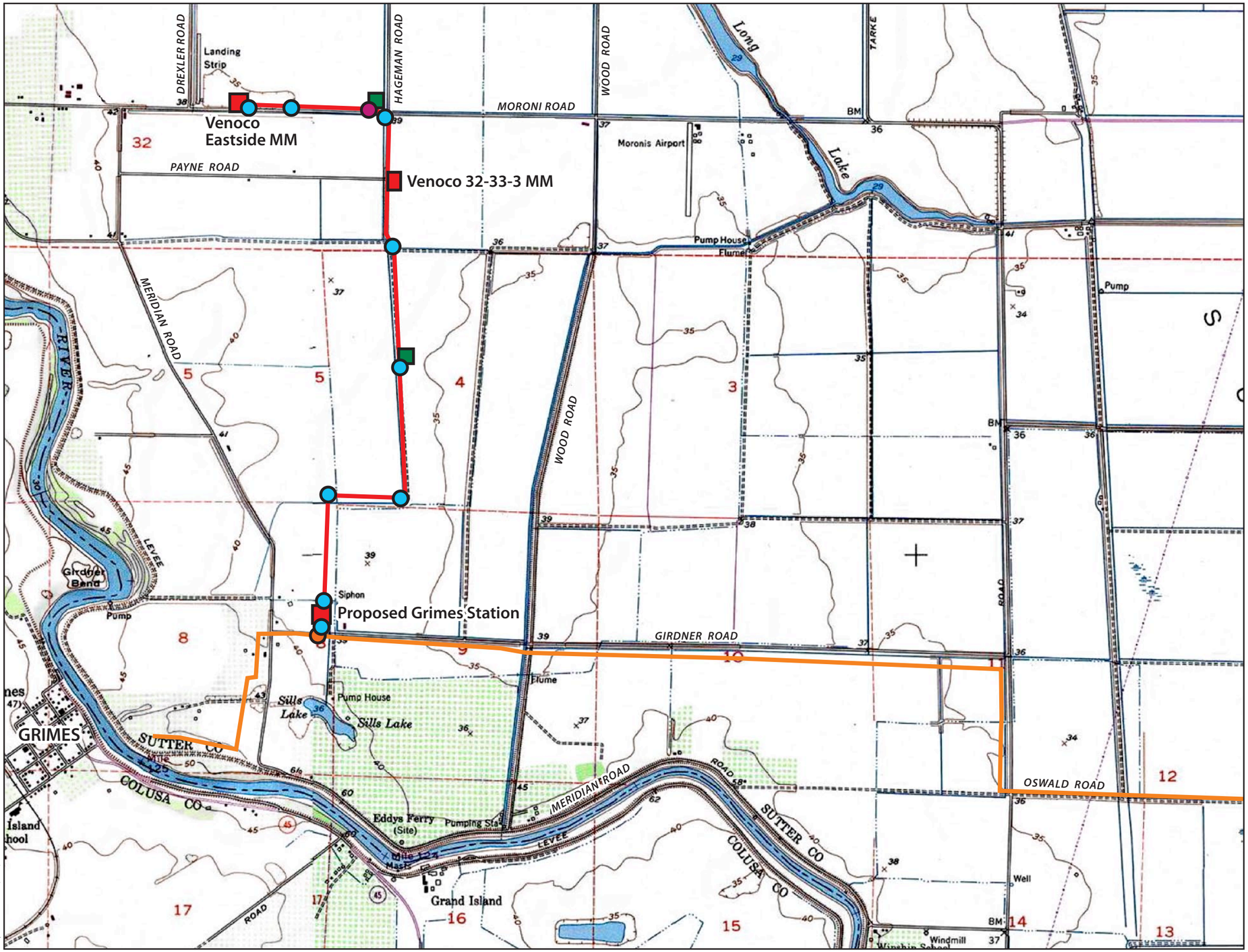
Section 1769(a)(1)(E) of the California Energy Commission's (CEC's) Siting Regulations requires the Amendment to address any potential environmental impacts of the Project and, if any significant adverse impacts are identified, to proposed measures to mitigate such impacts. In addition, Section 1769(a)(1)(F) requires a discussion of the effects a modification might have on the Project's ability to comply with applicable laws, ordinances, regulations, and standards (LORS). Section 3.0 of this Amendment addresses potential environmental impacts and the consistency of the Project with all applicable LORS. The analysis contained in Section 3.0 concludes that the Project will not result in any significant adverse impacts and that the Project will comply with applicable LORS. The Project owner has proposed 28 Conditions of Certification in Section 4.0 of this Amendment incorporating several environmental management plans that are applicable to the Project to ensure both compliance with applicable LORS and no unmitigated significant effects on the environment.

[1] Please see Section 2.3 for a description of the Project owners.

1.3 Consistency of Amendment with License

Section 1769 (a)(1)(D) of the Commission's Siting Regulations requires a discussion of whether the proposed modifications are based on new information that changes or undermines the assumptions, rationale, findings, or other bases of the final decision. This section also seeks an explanation of why the requested changes should be permitted.

This Amendment is not based upon new information that changes or undermines any basis for the final decision. The Project will allow access to new sources of natural gas, providing fuel supply diversity. The potential to access these sources of gas will improve the economics and the reliability of the SEC. Therefore, the Project is consistent with the Final Decision approving the SEC. The requested changes should be permitted to allow the SEC to access economical, local supplies of natural gas.



Legend

- Proposed 6-inch Natural Gas Pipeline
- Existing 20-inch Sutter Energy Center Gas Pipeline
- Below Ground Hot Tap and Valve
- Proposed Construction Laydown Area
- Venoco's Existing Master Meter Sites and Proposed Grimes Station Site
- 4" Side Tap Valve
- Bore

N

1,000 0 1,000 2,000 3,000 4,000

feet

Scale = 1:24,000

Base Map:
National Geographic TOPO
Gilsizer Slough, CA (1973), Tilsdale Weir, CA (1973)

Graphics... 0076.10 (12-10) rm

ICF INTERNATIONAL

Figure 1
Grimes Pipeline Project Location

2. Description of the Grimes Pipeline Amendment

2.1 Necessity of Proposed Change

Sections 1769 (a)(1)(B) and (C) require a discussion of the necessity for the proposed modification, and whether the modification is based on information known by the petitioner during the certification proceeding, and, if so, an explanation of why the issue was not raised at that time.

The Grimes Pipeline Project will allow the SEC project to access local natural gas from the Grimes natural gas field in the Sacramento Basin. Currently, SEC receives natural gas from PG&E's natural gas transmission system via the Sutter Pipeline. Directly accessing local natural gas supplies will provide increased reliability and the economic benefits of diversity of supply. The Grimes Pipeline is not based on information known by the petitioner during the certification proceeding in 1997–1999.

2.2 Project Components

The Grimes Pipeline Project includes the following components.

- A 2.8-mile, 6-inch Grimes Pipeline, connecting the local natural gas fields in the Grimes area to the north and west of SEC to the existing Sutter Pipeline (Figure 1).
- The Grimes Station, a natural gas metering station and related facilities (Figure 2).

Each of the major Project components is described below and is shown in Figure 1 and in the Project alignment maps (contained in Appendix A). Representative photographs of the Project area are shown in Appendix B.

2.2.1 The Grimes Pipeline

The Grimes Pipeline will allow the SEC to be served by a new 2.8-mile 6-inch natural pipeline. Currently, SEC receives natural gas from PG&E's natural gas transmission system via the 20-inch Sutter Pipeline, which runs west to east to the SEC (Figure 3). The Grimes Pipeline, which will flow gas from north to south, will interconnect to the existing Sutter Pipeline, located west of the SEC site on Girdner Road and just west of Hageman Road at the new Grimes Station.

The Grimes Pipeline will allow the SEC to directly access local natural gas from the Grimes natural gas field in the Sacramento Basin to the north and west of the project site. Once constructed, the proposed pipeline will be capable of transporting approximately 10 million standard cubic feet per day of natural gas from Venoco Inc.'s and other gas producers' existing gas wells north of the community of Grimes. However, the quantity of natural gas delivered to the SEC will not be increased over existing deliveries.

To facilitate deliveries from the local gas field suppliers, the Grimes Pipeline project will include a new gas metering station with related facilities near its southern terminus, to be called "Grimes Station." Grimes Station will be located on approximately 0.5 acre on Girdner Road just west of Hageman Road, approximately 400 feet from the Grimes Pipeline's first point of interconnection with the existing 20-inch natural gas pipeline that serves SEC. Upstream of Grimes Station, natural

gas meters will also be installed at Venoco Inc.'s existing Eastside and 32-33-3 MM gas field sites. As explained below, the Grimes Pipeline will be owned and operated by the Project owner's affiliate, CPN Pipeline Company. [2]

The Grimes Pipeline crosses through agricultural fields (primarily cultivated rice fields) and under only two Sutter County public roads (Wilbur and Hageman Roads near their intersection). The Grimes Pipeline also crosses 11 drainages that will be crossed by either boring under (auger or horizontal drilling methods) or trenching through the drainages.

The Grimes Pipeline alignment, as shown in Figures 1 and 3, avoids or substantially lessens any of the significant impacts of the Grimes Pipeline by avoiding natural habitats. The alignment also follows the most direct route between the natural gas fields' collection systems and the Sutter Pipeline.

Further, the alignment best satisfies the landowners' needs and preference as evidenced by both the temporary and the permanent easements for the pipeline right-of-way that have already been secured.

The pipeline construction approach is described in detail in the technical reports contained in the Appendices E and Gof this Amendment. As described in these Appendices, the pipeline right-of-way will be restored in coordination with landowners.

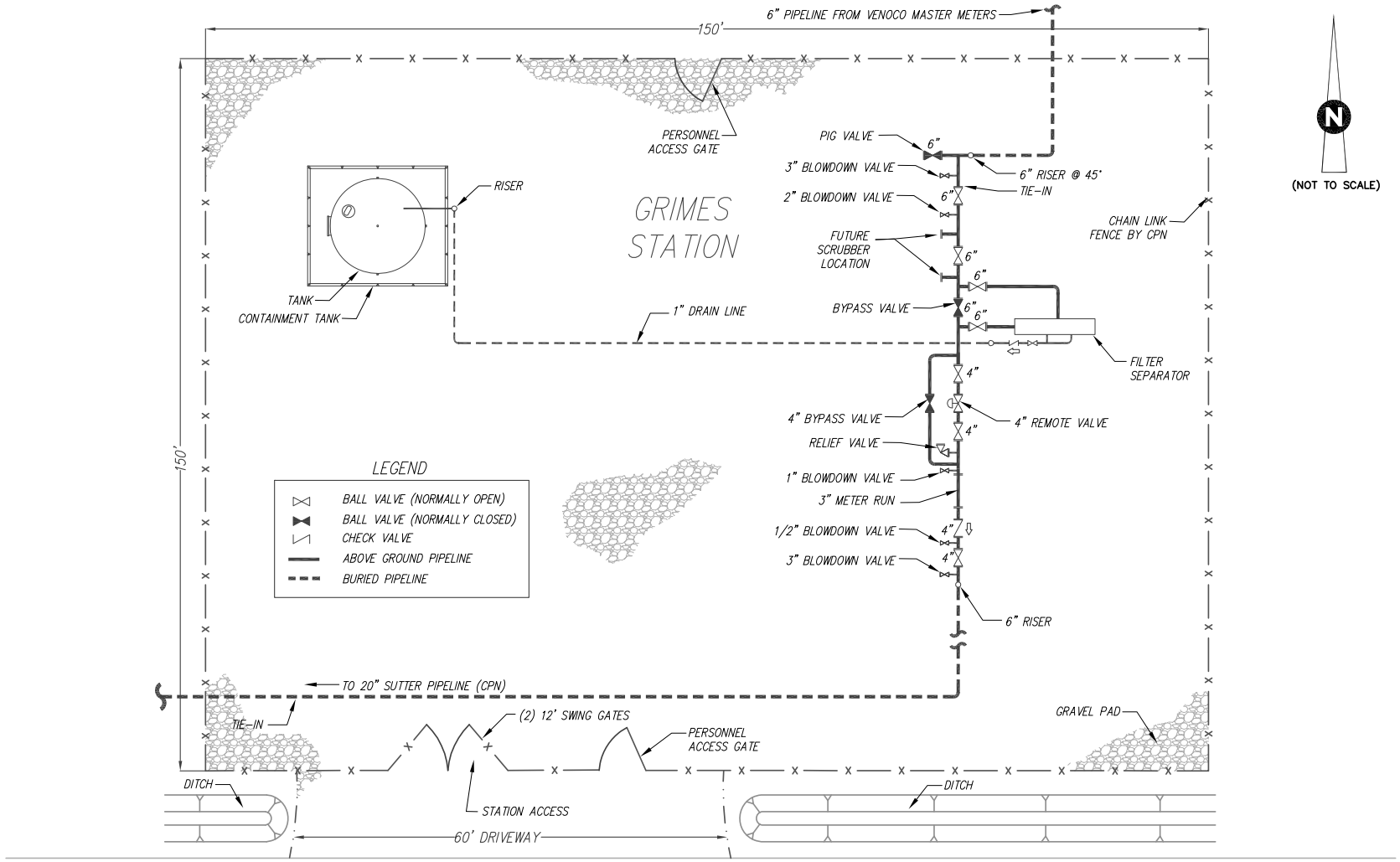
Construction of the Grimes Pipeline is planned for summer and fall 2011 with completion in late fall 2011.

2.2.2 Grimes Station

The Grimes Station is on Girdner Road just west of Hageman Road. The site is currently an agricultural field planted with row crops. The Grimes Station facility will be a 150-by-150-foot approximately 0.5-acre area with a 3-foot-thick gravel pad. The facility layout is shown in Figure 2 and includes the following components.

- A natural gas master meter to measure the flow into the Sutter Pipeline.
- A horizontal filter-separator to ensure that high-quality gas is received. The filter will be approximately 9 feet long, 2 feet in diameter, and 5 feet above ground level.
- A pig receiver to conduct in-line inspections and perform maintenance activities on the gas pipeline.
- A flow control valve to control flow through the pipeline and shut down if necessary during an emergency or other conditions.
- An aboveground 100-barrel drain tank to collect any liquids that might be present in the natural gas and that are removed in the filter-separator. This tank will be an atmospheric tank with a vent on top. The tank will be fully contained within a secondary steel tank to prevent uncontrolled runoff. The tank will be 8 feet tall and 10 feet in diameter.
- Communication equipment (powered by solar panels when solar power is available) for the Project owner to remotely monitor conditions at the site and operate control valves, if necessary.

[2] Please see Section 2.3 for a description of the Project Owners.



PREPARED BY:

GTS ENGINEERING & CONSULTING

130 Amber Grove Drive, Suite 134
Chico, Ca 95973; (530)893-6711

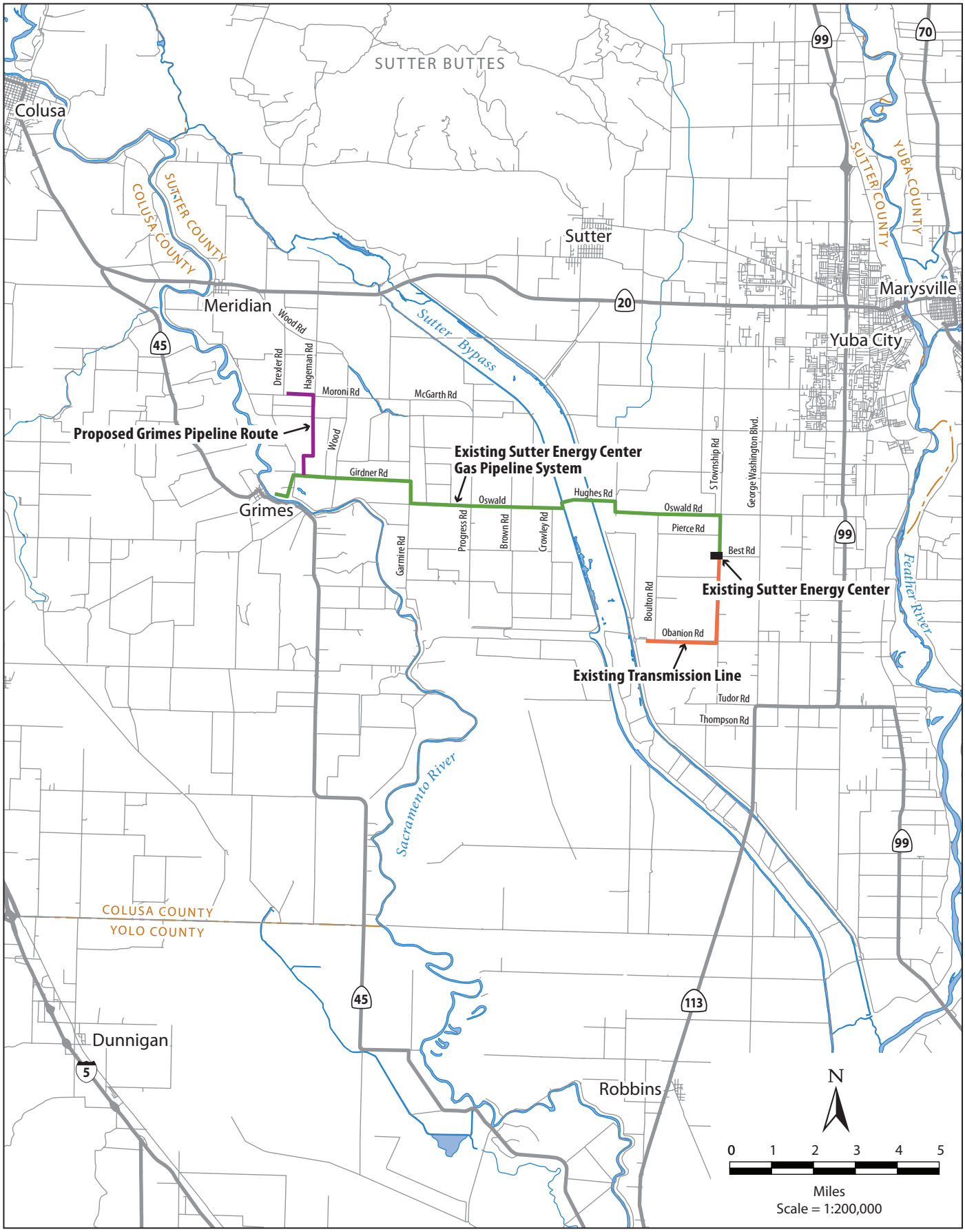
CPN PIPELINE

60 RIVER RD.
RIO VISTA, CA 94571

Graphics ... 00776.10 (1-11)

ICF INTERNATIONAL

Figure 2
Grimes Station Layout



ICF INTERNATIONAL

Figure 3
Grimes Pipeline Project Vicinity

- Provisions for a future gas scrubber to assist in liquid removal, if such is determined to be necessary in the future. The scrubber dimensions will be 10 feet long, 3 feet in diameter, and 5 feet above ground level.
- A 60-foot-wide access road off Girdner Road.

The approximately 0.5-acre gravel pad will accommodate the above-described facilities as well as equipment and vehicle access and turnouts. The site will be protected by a 6-foot-tall chain-link fence with three barbed-wire arms and will be graveled for operations and maintenance purposes. Two maintenance worker access gates and a vehicle access gate will be installed at the site entrance from Girdner Road (Figure 2). No lighting, other utilities, generators, or pumps are required for the Grimes Station Pipeline. Two meters will be installed upstream of the Grimes Station, one at Venoco's existing Eastside MM site and the other at the 32-33-3 MM site. These meters will serve as the custody transfer points for the natural gas.

Construction is planned for summer and fall 2011 with completion in late fall 2011.

2.3 Project Ownership

Calpine Construction Finance Company, L.P. owns the SEC and is the holder of the CEC Certification. Calpine Construction Finance Company, L.P. and CPN Pipeline Company are both wholly owned subsidiaries of Calpine Corporation. Concurrent with this Amendment, these parties are submitting a petition for Calpine Construction Finance Company to transfer ownership of the existing Sutter Pipeline to CPN Pipeline Company. Similarly, the Grimes Pipeline will also be owned and operated by the CPN Pipeline Company. Accordingly, CCFC and CPN Pipeline Company request that the approval be issued in the name of "CPN Pipeline Company".

3. Environmental Analysis of the Grimes Pipeline Project

This section provides an analysis of the potential impacts of the Grimes Pipeline Project on each of the environmental areas considered by the Commission in reviewing Applications and Amendments. Additionally, the LORS have been reviewed to determine the Grimes Pipeline Project's consistency with applicable LORS.

3.1 Air Quality and Greenhouse Gas Emissions

Construction activities associated with the Grimes Pipeline Project will generate emissions of ROG, oxides of nitrogen (NO_X), carbon monoxide (CO), particulate matter 10 microns or less in diameter (PM 10), and particulate matter 2.5 microns or less in diameter (PM 2.5). The primary sources of these temporary construction-related emissions include mobile and stationary construction equipment exhaust, employee vehicle exhaust, and site clearing activities. Construction-related emissions will be of short duration and will cease once construction activities are completed after the 2 to 3-month summer construction period. In addition, construction activities will be conducted in accordance with the Feather River Air Quality Management District's rules and regulations for dust control. A Fugitive Dust Control Plan will be developed and implemented as part of the Project

After construction is completed, the Project will operate independently. Routine maintenance will be scheduled on an as needed basis, but these will be minor and will include systems checks and site upkeep. Criteria air pollutants associated with maintenance activities will be generated by the maintenance person's vehicle used to travel to the site, but these will be insignificant. No pumps or other diesel- or gasoline-powered stationary equipment will be installed as a result of the Project. In addition, the Project is not expected to generate any detectable odors beyond the immediate Grimes Station fence line and there are no nearby receptors. The construction and operation of the Grimes Pipeline will conform with all applicable LORS related to air quality and will not result in significant air quality impacts.

Construction of the Grimes Pipeline involves heavy-duty diesel-powered construction equipment and on-road gasoline-powered vehicles. Fuel consumption by these pieces of equipment result in greenhouse gas (GHG) emissions, including carbon dioxide, methane, and nitrogen dioxide. Since construction of the pipeline will take approximately 2 to 3 months, these GHG emissions will be temporary. Operation of the Project will involve periodic maintenance, including use of an on-road vehicle for inspections. GHG emissions generated by this vehicle will not be significant. In addition, the purpose of the Grimes Pipeline is to diversify the Sutter Energy Center fuel supply. The Grimes Pipeline will neither change the operational profile of the SEC nor increase the amount of fuel produced. Thus, the Grimes Pipeline will not cause an increase in operational GHG emissions attributable to the operations of the SEC.

Although there are no adopted, enforceable federal or state LORS applicable to construction emissions of the Grimes Pipeline, CEC has applied a "best practices" threshold for construction activities. (See for example, the Final Commission Decision Approving the Avenal Energy Project (08-AFC-01) at p. 102). CPN Pipeline Company proposes to undertake a similar approach for the Grimes Project by: (1) limiting vehicle idling time and shutting down equipment when not in use; (2)

performing regular preventive maintenance to manufacturer specifications; (3) using low-emitting diesel engines meeting federal emissions standards for construction equipment, whenever available; and (4) using equipment that meets the latest criteria emissions standards. Implementation of these measures will reduce potential GHG emissions to a less-than-significant level.

3.2 Biological Resources

Biological surveys were conducted in the Project area to characterize the Project area for this Amendment. The survey area included the area of the proposed Project components and a 1,000-foot-buffer around the Project components (the biological study area is shown in Appendix A). The survey focused on characterizing the Project area and potential impacts on vegetation communities, wetlands, and species-status species that could be directly or indirectly affected by Project construction and operational activities. In addition, the survey corridor for special-status[3] and nesting raptors covered a 0.5-mile radius around the proposed Project components right-of-way.

The methods used to identify biological resources in the study area comprised a prefield investigation, coordination with the resource agencies (discussed throughout this section), and various levels of field surveys. A detailed description of these methods is provided in the *Biological Resources Study Report* contained in Appendix C of this Amendment.

The baseline information used to characterize the vegetation, waters of the United States, and special-status wildlife of the Project area and to conduct the impact analysis for the Project is presented below. LORS and permits applicable for the protection of biological resources are described. The U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS), and California Department of Fish and Game (CDFG) were consulted to determine if sensitive biological resources could be affected by the Grimes Pipeline. Through agency consultations, Project modifications, and appropriate mitigation measures, the Project will conform to all applicable LORS for protection of biological resources affected by the Grimes Pipeline.

References are provided in Appendix C. Resumes of biologists that participated in the wetland delineation and biological surveys are provided in Appendix D. The draft Biological Assessment that was submitted to USACE to support its initiation of consultation under Section 7 of the federal Endangered Species Act is contained in Appendix E. USACE initiated consultation with USFWS on February 8, 2011.

3.2.1 Special-Status Species

Table 1 in Appendix C lists the special-status species that were identified during the prefield effort as having the potential to occur in the Project region. Figure 4 shows the location of special-status species that have been documented in the Project region. No special-status plants have been documented in the Project area and none were located during the surveys conducted by ICF International (ICF) in fall 2010.

Based on a review of existing information and habitat assessments conducted for the proposed Project, the Project area has the potential to support potential habitat for several special-status

[3] "Special status" as used herein conforms to the agencies' use of that term and includes more than just those species listed as either endangered or threatened under state and federal law, such as, for example, species of special concern. See Table 1 of Appendix C.

wildlife species (Table 1 in Appendix C): giant garter snake, Swainson's hawk, valley elderberry longhorn beetle, tricolored blackbird, and western pond turtle. The Project area also supports potential nesting habitat for a variety of special-status and common nesting raptors. Each of these species is described below.

3.2.1.1 Giant Garter Snake

The giant garter snake is state- and federally listed as threatened (58 FR 54053–54065, October 20, 1993). The species inhabits marshes; sloughs; ponds; small lakes; and low-gradient waterways such as small streams, irrigation and drainage canals, and rice fields. Giant garter snakes feed on small fish, tadpoles, and frogs (Fitch 1940; Hansen 1988). The giant garter snake requires the habitat components listed below.

- Adequate water during the active season (early spring through mid-fall) to provide food and cover.
- Emergent wetland vegetation such as cattails (*Typha* spp.) and bulrushes (*Scirpus* spp.) to provide escape cover and foraging habitat.
- Grassy banks for basking.
- Higher elevation uplands for cover and refuge from winter floods during the dormant season (i.e., November to mid-March) (Hansen and Brode 1980; Hansen 1988; 58 FR 54053–54065, October 20, 1993).

Giant garter snakes are absent from large rivers and other water bodies that support introduced populations of large, predatory fish; wetlands with sand, gravel, and rock substrates; and natural and artificial waterways where weeds are controlled routinely, either mechanically or chemically, and where bank soils are compacted regularly (Hansen and Brode 1980; Rossman and Stewart 1987; Hansen 1988). Giant garter snakes are usually also absent from riparian woodlands because the woodlands have excessive shade and lack basking areas and prey populations (Hansen and Brode 1980).

The wetland habitats where giant garter snakes are known to occur contain permanent or seasonal water, mud bottoms, and vegetated dirt banks (Fitch 1940; Hansen and Brode 1980). In portions of the species' range where rice is grown, this species has adapted well to the vegetated artificial waterways used to flood rice fields (Hansen and Brode 1980). Prior to wetland reclamation, occupied potential habitats probably consisted of freshwater marshes and low-gradient streams. In the Project area, potential habitat occurs within the rice fields and drainages that occur within the proposed gas pipeline corridor. USFWS also considers adjacent uplands within 200 feet from the edge of these waters as potential habitat for giant garter snake (U.S. Fish and Wildlife Service 1997). Rice fields and drainages provide aquatic potential habitat while the associated uplands provide potential areas for basking and cover during the active season and cover for hibernation during the winter. Rice fields are important for giant garter snakes because they provide a reliable prey base at the appropriate time of year when snakes are pregnant or giving birth.

Based on guidance from USFWS (Ben Watson) and CDFG (Jenny Marr) for other projects in the region, it was determined that rice fields, drainages, and other water bodies in the action area could provide potential aquatic habitat for giant garter snakes. It was also determined that the rice berms and adjacent earthen roads and fallow vegetated, agricultural fields (not unvegetated disked fields) within 200 feet of these waters could provide potential upland habitat for giant garter snakes.

Figure 4
CNDDB Record Search

Legend

- Project 10-Mile Buffer

CNDDB Records

- Plant
- Animal
- Terrestrial Community

Plants	Number of Occurences
Baker's navarretia	1
brittlescale	1
Colusa layia	2
Ferris' milk-vetch	1
heartscale	1
palmate-bracted bird's-beak	5
round-leaved filaree	1
San Francisco campion	1
San Joaquin spearscale	2
veiny monardella	1
woolly rose-mallow	6
Wright's trichocoronis	2

Animals	Number of Occurences
bank swallow	17
cackling (=Aleutian Canada) goose	5
California black rail	1
California linderiella	1
giant garter snake	20
greater sandhill crane	1
hoary bat	3
Marysville California kangaroo rat	2
pallid bat	1
Sacramento Valley tiger beetle	1
San Joaquin pocket mouse	1
Swainson's hawk	53
tricolored blackbird	8
valley elderberry longhorn beetle	2
vernal pool fairy shrimp	1
vernal pool tadpole shrimp	1
western pond turtle	1
western red bat	3
western yellow-billed cuckoo	1
white-faced ibis	1
Yuma myotis	1

Terrestrial Communities	Number of Occurences
Coastal and Valley Freshwater Marsh	1
Great Valley Cottonwood Riparian Forest	3
Great Valley Mixed Riparian Forest	4
Great Valley Willow Scrub	1
Northern Hardpan Vernal Pool	1

0 1 2 4 Miles

Area of Interest

ICF INTERNATIONAL

Based on the presence of known occurrences of giant garter snake in the Project region (Figure 4), it was determined that there is a high potential for this species to occur in the Project area.

3.2.1.2 Swainson's Hawk

Swainson's hawk is listed as threatened by CDFG, is a USFWS bird species of conservation concern, and is protected under the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code Section 3503.5. The MBTA and Section 3503.5 prohibit the "take" of migratory birds, nests, and young. In the Central Valley, this hawk typically nests in oak or cottonwood trees in or near riparian habitats; in oak groves; in roadside trees; and in lone trees. Swainson's hawks prefer nesting sites that provide sweeping views of nearby foraging grounds consisting of grasslands, irrigated pasture, alfalfa, hay, and row and grain crops. Swainson's hawks are migratory, wintering from Mexico to Argentina and breeding in California and elsewhere in the western United States. They generally arrive in the Central Valley in mid-March and begin courtship and nest construction immediately upon arrival at the breeding sites. The young fledge in early July, and most Swainson's hawks leave their breeding territories by late August or early September.

Swainson's hawks are known to nest and forage in the Project area. As shown in Figure 4, there are several documented nest sites along the Sacramento River corridor. Row crops provide potential foraging habitat in the study area. Rice and fallow fields are not considered potential foraging habitat. Based on the presence of known nest sites, there is a high potential for these hawks to nest and forage in the Project area.

3.2.1.3 Valley Elderberry Longhorn Beetle

Valley elderberry longhorn beetle (VELB) is federally listed as threatened (FR 45:52803) and is closely associated with blue elderberry, an obligate host for beetle larvae. Potential elderberry shrubs were considered to be all plants with stem diameters greater than or equal to 1.0 inch at the base. Elderberry shrubs with diagnostic exit holes on the stems have hosted beetle larvae in the recent past (typically, the last 3–5 years depending on stem size and growth) and are considered occupied habitat.

During the field surveys, the locations of two potential elderberry shrubs were mapped and examined for evidence of VELB occupation (Sheet 8 in Appendix A of the Amendment). One shrub is located in the riparian drainage within 100 feet of the gas pipeline construction corridor. The other shrub is located within the biological study area but is more than 100 feet from the construction area. No exit holes were observed in either shrub. However, it was assumed that the elderberry shrubs could provide potential habitat for VELB.

3.2.1.4 Tricolored Blackbird

Tricolored blackbird is a USFWS bird species of conservation concern and is protected under the federal MBTA (16 U.S.C. 703B711); it is also a state species of special concern. Tricolored blackbird colonies have been documented in the Project region (Figure 4), but are not known to occur in the Project area (California Natural Diversity Database 2010). There is a moderate potential for this species to nest in blackberry thickets along drainages at the southern end of the proposed gas pipeline corridor.

3.2.1.5 Western Pond Turtle

The western pond turtle (pond turtle) is a state species of special concern. Pond turtles inhabit aquatic habitats such as ponds, marshes, or streams with rocky or muddy bottoms and vegetative cover. They occasionally leave the water to bask, and females leave the water from May through July to lay eggs as far as 0.25 mile from water.

Perennial irrigation ditches and drainages in the Project area provide potential breeding and movement corridors for pond turtles. Although potential habitat is present, it is regularly disturbed for agricultural operations. Therefore, there is a low potential for pond turtles to occur in the Project area based on the disturbed conditions and lack of pond turtle records in the Project region.

3.2.1.6 Other Special-Status and Non-Special-Status Migratory Birds and Raptors

Several non-special-status migratory birds (including waterfowl) and raptors could nest in and adjacent to the study area, based on the presence of potential nesting habitat (wetlands and annual grasslands). The breeding season for most birds is generally from February 16 to August 15. The occupied nests and eggs of these birds are protected by federal and state laws, including the MBTA and California Fish and Game Code Sections 3503 and 3503.5. CDFG is responsible for overseeing compliance with the codes and makes recommendations on nesting bird and raptor protection.

Several special-status migratory birds and raptors have either been documented in the Project region or have the potential to occur in the region (Table 1). Other non-special-status birds that were observed during the reconnaissance field surveys include red-tailed hawk, American kestrel, killdeer, western meadowlark (*Sturnella neglecta*), northern mockingbird (*Mimus polyglottos*), red-winged blackbird, western kingbird (*Tyrannus verticalis*), and mourning dove. These generally common species are locally and regionally abundant.

The Project region also provides potential habitat for resident and wintering waterfowl (including mallard, northern pintail [*Anas acuta*], cinnamon teal [*Anas cyanoptera*], ruddy duck [*Oxyura jamaicensis*], American wigeon [*Anas americana*], and northern shoveler [*Anas clypeata*]). These species are most abundant during winter (October through January) and are actively hunted by the numerous duck clubs located in the Project region.

3.2.2 Waters of the United States, Including Wetlands

Waters of the United States within the proposed Project area include rice field wetland, wetland drainage, riparian drainage, and other waters drainages. Acreages of waters of the United States, including wetlands, have been verified by USACE. CPN Pipeline Company received a verification letter from USACE on January 12, 2010. A more detailed description is provided in the wetland delineation report (contained in Appendix F).

3.2.3 Conclusions

As described in the *Biological Resources Study Report* (Appendix C), the Grimes Pipeline Project will not result in any permanent or long-term significant impacts. Mitigation measures will be implemented as part of the Project to avoid or minimize impacts on special-status species—giant garter snake, Swainson's hawk, valley elderberry longhorn beetle, tricolored blackbird, western

pond turtle—and other special-status and non-special-status migratory birds and their potential habitats. No permanent impacts are expected on any wetlands or other water bodies that may qualify as waters of the United States or waters of the State because mitigation measures will be implemented as part of the Project to avoid water bodies (e.g., irrigation ditches and canals) or minimize short-term impacts on wetlands by restoring the pipeline corridor to preconstruction conditions. In addition, the Grimes Pipeline Project will comply with the applicable LORS (see Table 5 in the *Biological Resources Study Report*, contained in Appendix C). Therefore, potential impacts on biological resources associated with the Project will be less than significant.

Table 5 in Appendix C describes the applicable LORS pertaining to biological resources for the Grimes Pipeline. Recommended Conditions are set forth in Section 4 of this Amendment. The construction and operation of the Grimes Pipeline will not result in any significant unmitigated impacts and will conform with all applicable LORS related to biological resources.

3.3 Cultural Resources

A draft cultural resources inventory report prepared for USACE contained the information necessary to consult with the California State Historic Preservation Officer (SHPO) under Section 106 of the National Historic Preservation Act (Section 106) and its implementing regulations, 36 CFR 800 (ICF International 2011b) (contained in Appendix G). Resumes for the archaeologists that participated in the surveys and prepared the cultural resources technical report are provided in Appendix D. The Methods and Results sections of this Appendix describe efforts to identify cultural resources in the area of potential effects (APE). These methods consisted of a records search and review of pertinent archaeological, ethnographic, and historical sources; correspondence with Native Americans and historical societies; and a pedestrian survey of the APE.

No cultural resources were identified. No cultural resources were observed as a result of the pedestrian field survey of the Grimes Pipeline. There are no known cultural resources located within the Grimes Pipeline that are eligible for listing in the National Register of Historic Places or the California Register of Historic Resources. The Project will not result in potential impacts greater than those analyzed in the AFC, and no LORS will change as a result of the proposed Project. Therefore, any potential cultural resources impacts associated with the Grimes Pipeline Project will be less than significant and the Project will conform with all applicable LORS related to cultural resources.

3.4 Geologic Resources and Hazards

There are no active earthquake faults within the Project area and its vicinity, based on the latest Alquist-Priolo earthquake fault zone maps (Bryant, W. and E. Hart. 2007. Fault-Rupture Hazard Zones in California. Available: http://www.quake.ca.gov/gmaps/ap/ap_maps.htm. California Department of Conservation. Accessed: February 14, 2011). Consequently, the hazard of earthquake ground rupture within and in the vicinity of the project site is low.

The fault nearest to the Project site is the Willows Fault Zone (Jennings, C. and W. Bryant. 2010. 2010 Fault Activity Map of California. Geologic Data Map No. 6. California Department of Conservation, California Geological Survey. Sacramento, CA.), which lies approximately 8 miles north-northwest of the Project site. The Willows Fault Zone is a pre-Quaternary fault zone, which

indicates that movement last occurred more than 1.6 million years ago; it does not show any evidence of displacement during the Quaternary period.

The Project site and its vicinity have a low to moderate potential for earthquake-induced ground shaking (Branum, D., S. Harmsen, E. Kalkan, M. Petersen, and C. Wills. 2008. Earthquake shaking potential for California. Map Sheet 48. California Department of Conservation, California Geological Survey, Sacramento, CA.) from distant active faults. The Project site is in Seismic Hazard Zone 3 (Leyendecker, E., D. Perkins, S. Algermissen, P. Thenhaus, and S. Hanson. 1995. Spectral Response Maps and their Relationship with Seismic Design Forces in Building Codes. OFR-95-596. U.S. Geological Survey.) Of the two zones in California, Zone 3 is subject to an overall lower seismic hazard than Zone 4.

No liquefaction hazard maps are known to exist for the Project site vicinity. However, based on the low to moderate ground shaking hazard, the nature of the sediments that underlie the Project site, and professional judgment, the hazard of liquefaction is inferred to be low.

The Grimes Pipeline will not result in potentially significant impacts. In addition, the Grimes Pipeline complies with the applicable LORS. Therefore, there are no geologic resources or hazard impacts associated with the Project.

3.5 Hazardous Materials Management

After the Grimes Pipeline Project is constructed in summer/fall 2011, it will be maintained on a regular basis with a local operator onsite at least once a week. Normal operations and maintenance (O&M) activities will be very minor, entailing checks on valve operation, liquid levels, control logic, and site upkeep as necessary. The Grimes Pipeline falls under the jurisdiction of the federal Pipeline and Hazardous Materials Safety Administration (PHMSA), which is a branch of the U.S. Department of Transportation (USDOT). The pipeline will be designed, built, and operated in strict compliance with the regulations found in 49 Code of Federal Regulations (CFR) Parts 190–192 and ASME B31.8. Part 192 specifies minimum safety standards regarding materials, design, construction, corrosion control, operations, and maintenance for pipeline facilities and the transportation of natural gas.

Part 192 includes the requirement to establish a written plan governing O&M activities. Under Part 192.615, each pipeline operator must establish an emergency plan that includes procedures to minimize the hazards in a natural gas or hazardous materials pipeline emergency.

The Project will be designed, constructed, and maintained in a manner that protects employees, the public, and the environment. The following elements are part of the Project and will enhance operational efficiencies and provide for greater safety.

- **Design Pressure**: The design pressure of the Grimes gas line is 1,440 pound-force per square inch gauge (psig). Normal operating pressures are expected to be in the range of 600–800 psig so the pipeline will have excess design capacity.
- **Pipe Material Specification**: The gas pipeline material will be API 5L X42 steel with a yield strength of 42,000 psig. The manufacturing method will be ERW. These approved material specifications and manufacturing methods are some of the most commonly used in the industry today.

- **Pipe Wall Thickness**: The gas pipeline will have a wall thickness of 0.282 inch, which is 57% greater than required by code.
- **Class Location**: Under DOT regulations, the pipeline route is determined to be a Class 1 location. However, as a conservative measure the pipeline will be designed for a higher class (Class 3).
- **Welding**: The pipeline will be welded together using approved weld procedures that comply with the industry standard API 1104, which complies with federal regulations. All of the welds will be inspected using x-ray or other approved methods. They will all be visually inspected. All welders will be tested and qualified in advance.
- **Pressure Test**: The gas line will be hydrostatically tested to a minimum of 2,160 psig with water for 8 hours, which is 50% greater than the design pressure of 1,440 psig.
- **Coatings**: The entire length of the gas pipeline will be coated with approximately 16 mils of FBE for protection against corrosion. This is an industry standard widely used. FBE provides excellent resistance to external corrosion.
- **Burial Depth**: The conventional trench sections of the pipeline will be buried a minimum of 60 inches, which is 24 inches more than the Code requirement of 36 inches. The crossings under roads, canals, and drainage ditches will be 10–15 feet below the bottom of the feature.
- **Gas Shutoff Capability**: CPN Pipeline Company will employ continuous monitoring of the gas pipeline. The gas control system will send an alarm to a manned control room in the event of a sudden or major loss of pressure that may result from a pipeline leak. Depending on the situation, personnel can be immediately sent to the location to close emergency valves.
- **Surface Inspection**: As per code requirements, CPN Pipeline Company will conduct foot patrols and leak surveys once a year along the entire pipeline route. In addition, aerial surveys will be conducted once a month.
- **Cathodic Protection**: A cathodic protection system will be employed on this pipeline as a secondary protection against external corrosion. The cathodic protection system will surveyed at least once a year to ensure that it is in good working condition.

The chemical inventory for the SEC will not change with the Grimes Pipeline Project. The Grimes Pipeline will not result in any further modifications to the SEC chemical inventory, will not result in any potentially significant impacts, and will be in compliance with applicable LORS. In addition, as part of the Project, CPN Pipeline Company will develop and implement a Construction Hazardous Materials Spill Response Plan. Therefore, any potential hazardous materials management impacts will be less than significant, and the Project will comply with applicable LORS.

3.6 Land Use

Sutter County has local land use jurisdiction over the Project area. The General Plan land use designations are AG-20 (Agriculture—20 Acre Minimum Parcel Size) and AG-80 (Agriculture—80 Acre Minimum Parcel Size), and allowable uses include necessary public utility and safety facilities. The Zoning designation is AG (General Agriculture), and allowable uses include communication/utility substations, as well as gas storage and transmission lines, with a use permit from Sutter County.

The Grimes Station site and a section of the pipeline right of way are located on lands that are under Williamson Act contracts. Table 1 lists the parcels and acreages that are currently under Williamson Act contract.

Table 1. Williamson Act Contracts Identified in the Project Area

APN	Lot No.	Total Acreage of Contract Lands	Project Component Located On Contract Lands
21-030-010	493	34.37	Gas pipeline/ right of way
21-040-010	496	6.56	Grimes Station
21-040-011	495	28.4	Gas pipeline/ right of way
21-040-012	494	25.25	Gas pipeline/ right of way
21-020-002	491	36.42	Gas pipeline/ right of way
21-020-003	490	35.48	Gas pipeline/ right of way
21-020-004	489	35.02	Gas pipeline/ right of way
21-020-005	488	30.17	Gas pipeline/ right of way
21-020-006	487	27.56	Gas pipeline/ right of way

An underground natural gas pipeline is a "compatible use" as that term is used in the Williamson Act. The Williamson Act specifically provides that gas and electric facilities are compatible uses within any agricultural preserve. (See Govt. Code Sec. 51238(a)(1).) In addition, a "compatible use" is "any use determined by the county or city administering the . . . contract." (See Govt. Code Sec. 51202(e).) Sutter County has determined that "utility substation, gas storage and transmission lines" are compatible uses, which are allowed on lands under a Williamson Act contract. (See Sutter County Uniform Compatible Use Rules for Agricultural Preserves.) In addition, construction of an underground pipeline will conform to the principles of compatibility specified in the Williamson Act. (See Govt. Code Sec. 51238.1.) The underground pipeline will *not*: (1) significantly compromise long-term agricultural capacity on the parcel or other contracted lands, (2) significantly displace or impair agricultural production, and (3) will not result in a significant removal of adjacent contracted lands. Of the approximately 12.5 acres of land that are crossed by the Project and are under Williamson Act ccontracts, the Project would temporarily disturb , 11.2 acres of Williamson Act contract lands associated with construction of the underground gas pipeline and an additional 0.8 acre of temporary impact to Williamson Act contract lands to construct the Grimes Station. Only 0.5 acre of Williamson Act contract land will be permanently impacted to construct the Grimes Station.

Thus, the Grimes Pipeline is a compatible use, and there is no need to cancel, in whole or in part, the Williamson Act Contract. Sutter County would, but for the Commission's exclusive jurisdiction over thermal power plants and related facilities per Public Resources Code Sec. 25500 *et seq*., require only that a Use Permit be issued for the Grimes Pipeline (Leanne Mueller, Senior Planner, Sutter County Community Services Department, Pers. Comm.). The information contained in this Amendment satisfies Sutter County's CEQA and other requirements for a Use Permit (though no Use Permit will be issued by Sutter County given the Commission's jurisdiction). Accordingly, with respect to the parcel listed in Table 1, the Grimes Pipeline is a compatible use and no changes or cancellation of the Williamson Act ccontracts would be required.

The Grimes Pipeline Project is consistent with General Plan land use designations of AG-20 and AG-80, the County zoning designation of AG, and Uniform Compatible Use Rules for Agricultural Preserves.

Construction of the Grimes Pipeline will temporarily affect approximately 28.8 acres of land, and approximately 0.5 acre will be permanently occupied by the Grimes Station, as shown in Table 2.

Table 2. Temporary and Permanent Land Disturbance Acreages Required to Construct and Operate the Grimes Pipeline Project

Component	Permanent	Temporary	Total
Grimes Station	0.5	0.3	0.8
Grimes Pipeline System (includes bore/HDD work areas)	0.0	27.3	27.3
Interconnection With Existing Sutter Pipeline	0.0	0.2	0.2
Temporary material and equipment staging areas	0.0	1.0	1.0
Total Project land disturbance requirements	0.5	28.8	29.3

Agricultural use of the parcels themselves is not likely to be affected substantially because the natural gas pipeline will be underground, construction will be temporary, the permanent easement area is narrow, and adjacent agricultural uses will not be significantly impaired or displaced. The Grimes Pipeline will have a less-than-significant impact on land use and will comply with the applicable LORS.

3.7 Noise and Vibration

The Grimes Pipeline Project is located in a rural agricultural area. Existing noise sources include equipment from ongoing and seasonal agricultural operations and local road traffic.

Sutter County does not have a noise ordinance. As such there are no enforceable limits on construction noise in the county. The Sutter County General Plan noise element identifies noise level limits for permanent stationary sources but those limits do not apply to construction activity.

During pipeline construction it is assumed that an excavator, truck, and crane could operate concurrently, resulting in a combined noise level of 79 dBA-L_{eq} at 50 feet. Horizontal drilling will be used for pipeline installation under existing roadways. The combined noise level of the boring jack and power unit is 81 dBA-L_{eq} at 50 feet. During construction of the Grimes Station is it assumed that truck, grader, and crane could operate concurrently, resulting in a combined noise level of 82 dBA-L_{eq} at 50 feet.

There are no sensitive noise receptors such as residences located along the pipeline alignment. There is one residence about 1,000 feet west of the Grimes Station site. Although noise levels will be higher than existing noise levels at that location from construction of the station, no adverse affect is expected because work will be temporary and will be conducted during daytime hours when noise from tractors and trucks associated with agricultural activities commonly occurs in the area. No adverse vibration effects from construction are expected because no highly dynamic equipment such as a pile driver will be used and because there are no residences immediately adjacent to the pipeline.

No lighting, other utilities, generators, or pumps are required for the Grimes Pipeline or Grimes Station. Accordingly, there will be no significant noise impacts associated with operation of the pipeline.

Operation of the Grimes Pipeline will not involve the use of any noise-producing equipment. In addition, construction activities are expected to be limited to daytime hours (7 a.m. to 5 p.m.—possibly until 7p.m.—Monday through Saturday). Therefore, any construction and operational noise impacts will be less than significant and the Grimes Pipeline will comply with applicable LORS. In addition, CPN Pipeline Company will have a dedicated telephone number for public reporting of undesirable noise conditions and a noise complaint resolution process involving documentation of noise complaints and resolution. Accordingly, with regard to noise, the Grimes Pipeline will not result in any significant unmitigated impacts and will conform with all applicable LORS

3.8 Paleontological Resources

Paleontological resources are preserved fossil remains of prehistoric plants and animals generally found in sedimentary rock formations. LORS applicable to protection of paleontological resources are described below.

The northern 75% of the Project area exists in a nearly level basin landform area within the Sutter Basin. The southern 25% appears to exist on a nearly level natural levee of the Sacramento River, which lies approximately 1–2 miles west of the Project area. Because the alluvium that underlies the Project area was deposited during the Holocene Epoch (i.e., the past 10,000 years) after the end of the Pleistocene, it has a low potential for containing significant paleontological resources.

An ICF soil scientist conducted an online search of geological and paleontological literature for the Project vicinity in December 2010. No information was identified in the search that suggested that fossils have been found in the age of the sediments that underlie the Project area within the depth of soil that will be disturbed by Project construction.

The literature search showed that the formations underlying the Project area are of low paleontological sensitivity (i.e., consisting of sediments that were deposited less than 10,000 years before present). In accordance with the Society for Vertebrate Paleontology (SVP) standard procedures for assessment and impact (Society for Vertebrate Paleontology. 1994. Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources: Standard Procedures. Manuscript), a field survey was not conducted as recommended by the SVP because the relative sensitivity of the Project area was discoverable through literature and record searches. The Project area has low paleontological sensitivity because, by definition, it exists in an area that is or recently (in geological terms) was subject to rapid sedimentation, such that the sedimentary deposits older than 10,000 years are very unlikely to be found within the sediment depth that will excavated by the Grimes Pipeline.

The SVP guidelines call for a pre-licensing field survey when the paleontological sensitivity of the geological units that outcrop in a Project area is unknown. With respect to the Grimes Pipeline, the results of the literature search and absence of records of previous fossil finds indicated that no field survey was required.

The likelihood of Project construction activities encountering sensitive paleontological resources is low. Consistent with guidance from the SVP, areas that are not sedimentary in origin and that have not been known to produce fossils previously are typically deemed low sensitivity and monitoring is usually not needed during Project construction. The Grimes Pipeline is located adjacent to existing paved roads and farm access roadways that have been previously disturbed by agricultural and road maintenance activities. Because the Grimes Pipeline has been subjected to previous ground

disturbance activities and any new excavation will be relatively shallow, any potential paleontological resource impacts will be less than significant, and the Project will comply with applicable LORS.

3.9 Public Health

Construction of the Grimes Pipeline Project will involve the use of diesel-powered equipment, which can emit toxic air contaminants such as diesel particulate matter (DPM). However, elevated health risks to the public and one potentially sensitive receptor, a rural residence located approximately1,000 feet from the Grimes Station site, are considered unlikely and the insignificant DPM emissions during construction will be temporary and cease once construction is complete. Moreover, DPM emissions during construction will be dispersed along the pipeline right-of-way as the pipe is installed during the 2-3 month construction period and will not be localized in one area.

No toxic pollutants will be emitted by the Grimes Pipeline operations. The pipeline is buried 6 feet within the right-of-way. The delivery of natural gas through pipelines has the potential to release small quantities of non-odorized natural gas at the Grimes Station from piping components (e.g., valves), from the aboveground drainage tank, or during pigging operations or other maintenance activities. Such gas emissions are infrequent, small, and will quickly be dissipated by even light winds. As stated previously, one potentially sensitive receptor is located approximately 1,000 feet from the Grimes Station site. Because any gas emitted at the Grimes Station will be relatively minor and dispersed quickly, this impact is not considered significant, and the Project will comply with applicable LORS related to public health.

3.10 Socioeconomics

It is estimated that the Grimes Pipeline Project will require approximately 2-3 months of construction activity. Construction of the Grimes Pipeline will result in some local purchases of materials or use of local construction labor (up to 25 workers), which will be an economic benefit to the county. Also, approximately 28.8 acres of farmland will be temporarily affected by the Grimes Pipeline (as shown in Table 2). Given that more than 315,000 acres in Sutter County are designated for agricultural use, the resulting temporary loss of agricultural production in the county will not be significant, and landowners will be compensated via the easements and other agreements already in place. Operation of the Grimes Pipeline will be economically beneficial because it will directly connect a local natural gas supply to the SEC, providing fuel supply diversity. Also, the Grimes Pipeline does not pass through any populated areas. Accordingly, the Grimes Pipeline will avoid disproportionately high and adverse impacts on any populations, including minority and low-income populations. Construction and operation of the Grimes Pipeline will not significantly affect population levels, housing, fiscal resources, education, public services, or utilities. (To the contrary, it will likely have a beneficial effect on utilities by providing a new local source of natural gas for the SEC.) Therefore, the Grimes Pipeline will not result in potential socioeconomic impacts and will comply with applicable LORS.

3.11 Soils

A map of the soils in the Project area and associated hydric soil information are provided in the wetland delineation report contained in Appendix F of this Amendment. The landform and hydrologic characteristics of the soils are summarized in Table 3. Morphologically, the soils that formed on a basin (i.e., Capay and Cropley series) are very deep and have a fine-loamy texture. The soils that formed on a floodplain (i.e., Shanghai and Nueva series) are deep and have a fine-loamy texture.

Table 3. Summary of Soils in the Project Area

Soil Map Symbol	Soil Map Unit Name	Geomorphic Surface	Drainage Class	Permeability (slowest layer)	Existing Flooding Frequency*	Existing Seasonal High Water Table* (feet)/Type of Water Table	Hydric Status of Primary Component of Map Unit**
104	Capay silty clay, 0 to 2 percent slopes	basins and basin rims	moderately well	slow	Rare	>6.0 n/a	Hydric
108	Capay silty clay, wet, 0 to 2 percent slopes	basins and basin rims	moderately well	slow	Rare	4.0–5.0 apparent	Hydric
146	Nueva loam, wet, 0 to 1 percent slopes	floodplains	somewhat poor	moderately slow	Rare	4.0–5.0 apparent	Non-hydric
163	Shanghai silt loam, clay substratum, 0 to 2 percent slopes	floodplains	somewhat poor	slow	Rare	4.0–5.0 apparent	Hydric
167	Shanghai silty clay loam, 0 to 2 percent slopes	floodplains	somewhat poor	moderately slow	Rare	3.0–5.0 apparent	Hydric

Sources: Lytle 1980; Soil Survey Staff 2010.

* *Water table* refers to a saturated zone in the soil. The figures represent the depth to the top (upper limit) of the seasonal saturated zone in most years. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence (i.e., redoximorphic features) of a saturated zone in the soil.

** *Primary Component* refers to the soil that makes up approximately 85% or more of the map unit. The remaining soils in the map unit (i.e., inclusions) are not indicated here. The inclusions may or may not be hydric.

With the implementation of appropriate best management practices (BMPs) that will be required under the National Pollutant Discharge Elimination System (NPDES) permit, the total project soil loss is considered to be a minimal amount and will not constitute a significant impact. The Project will also comply with the appropriate LORS.

3.12 Traffic and Transportation

Construction of the Grimes Pipeline may temporarily affect traffic where it crosses several rural roadways and intersections, such as the intersection of Moroni Road and Hageman Road (see Figures 1 to 3). The pipeline will be placed under the roads through the use of boring, and the number of workers (25) and vehicles at each site are not expected to be substantial, but some temporary disruptions could occur because vehicles will access the construction sites using these

existing roadways. As part of the Project, CPN Pipeline Company will develop and implement a Traffic Control Plan to mitigate potential impacts during construction. Implementation of the Project traffic control plan for the construction period (July to September) in the affected area will be adequate to reduce traffic impacts to a less-than-significant level.

No permanent alterations to the area roadways are proposed. Operation of the Grimes Pipeline will normally involve one daily vehicle trip to the pipeline, meters, and Grimes Station. This trip will not constitute a substantial increase in traffic, and none of the components will interfere with traffic flow because they will be buried or located outside the roadway rights-of-way. Also, no vehicle travel on state highways, transportation of inhalable or explosive materials, opening or excavation on county roads, or use of oversized vehicles is anticipated under the Project. Therefore, the Grimes Pipeline will not result in significant unmitigated traffic and transportation impacts and will comply with applicable LORS.

3.13 Visual Resources

The Grimes Pipeline will be buried and will not have any effect on visual resources in the Project area. The Grimes Station will be a low-profile facility surrounded by fencing, consistent with other agricultural- and natural gas–related facilities in the vicinity. Construction-related visual impacts will be temporary. The Project will comply with the applicable LORS and any potential visual resource impacts will be less than significant.

3.14 Water Resources

The Grimes Pipeline Project parallels or crosses a number of irrigation canals and drainage ditches. The ditches and canals appear to drain generally to the south. Other drainage water from the Project area may reach a toe drain along the east levee of the Sacramento River, where drainage water is pumped into the river at certain times of the year.

Irrigation water is applied to the rice fields in the Project area using a conventional flow-through irrigation system, in which water is delivered from a canal into the top paddy of the overall field then flows through several paddies to the bottom paddy. Weir boxes placed along each check control water flow rates and water depth in the individual paddies.

Dewatering will be necessary in rice fields and other areas where the groundwater intercepts the pipeline trench or where stormwater runoff flows into the trench. The water will be pumped into nearby agricultural ditches. The water will be filtered for sediment, where necessary, and pumped into nearby agricultural ditches.

Before the pipeline system is placed in service, it will be hydrostatically tested. Hydrostatic testing will be conducted in accordance with the requirements of USDOT pipeline safety regulations (49 CFR Part 192), CPN Pipeline Company testing specifications consistent with industry standards, and applicable permits. This step entails filling the pipeline with water, increasing the pressure to 150% of the maximum operating pressure, and holding for a period of time. A maximum of 23,000 gallons of water will be used for hydrostatic testing. This water will be likely obtained from existing public or private water supplies (local purveyors, local groundwater, or municipal sources) and this use is temporary. No chemicals or other materials will be added to the test water, and the test water will

be discharged at one time from each hydrotest segment. The water will be either reused in the next segment or released into an onsite filtering system (composed of hay bales) and discharged into existing drainage ditches.

Potential construction-related impacts on water resources from dewatering and hydrotesting will be temporary and measures will be implemented as part of the Project Stormwater Pollution Prevention Plan to minimize potential water quality impacts. The Grimes Pipeline's water usage will not result in any significant impacts, and will comply with applicable LORS.

3.15 Waste Management

A majority of the hazardous substances used in the Project area and Sutter County by other entities are associated with agricultural operations and production. Pesticides, including insecticides and herbicides, are widely used through both aerial and ground applications. Current and historical uses of the Project area include rice and row crop agriculture. The majority of the agricultural operations within the Project area are rice production. Installation of the pipeline within the construction right-of-way will require temporary removal of land currently used for rice production and other crops.

A title search of properties within the Grimes Pipeline right-of-way and Grimes Station site showed that there are no environmental liens or activity and use limitations on the properties.

Based upon the current and historical (since 1920s) agricultural land use in the Project right-of-way and a title search of the properties traversed by the Grimes Pipeline and Grimes Station site, the potential for hazardous waste contamination or releases from hazardous waste contamination is unlikely. Additional information from a Phase 1 Study records search and site survey following ASTM E1527-05 Standard Practices for Environmental Site Assessments will be forwarded to CEC in early March.

Very little solid waste is anticipated to be generated as a result of construction of the Grimes Pipeline. All soil excavated for construction will be used to backfill trenches, and very little vegetation is expected to be removed. No wastewater or hazardous wastes will be generated during operation of the Grimes Pipeline.

Overall, the Grimes Pipeline will have a less-than-significant impact on waste management and will comply with applicable LORS.

3.16 Worker Safety and Fire Protection

Worker safety plans and protocols will be developed and used similar to those that have been developed for other CEC-approved projects. As part of the Grimes Pipeline Project, CPN Pipeline Company will develop and implement a Fire Protection Plan and a Construction Safety and Health Plan to provide for fire protection and ensure worker safety. In addition, the Grimes Pipeline will comply with applicable LORS.[4] Therefore, potential impacts are less than significant.

[4] As a natural gas facility located upstream of the SEC site, the Grimes Pipeline will obviously have no effect on the disciplines of Transmission Line Safety and Nuisance or Transmission System Engineering.

4. Proposed Modifications to the Conditions of Certification

Consistent with the requirements of the Commission Siting Regulations Section 1769 (a)(1)(A), this section addresses the proposed modifications to the SEC Conditions of Certification. The proposed Conditions of Certification for the subjects most applicable to the temporary construction-related impacts for an underground pipeline (biological, cultural, and paleontological resources) are described below.

Many of the original 1999 Conditions of Certification for the SEC have been fully satisfied and no longer appear on the SEC Annual Compliance Report. Other 1999 Conditions were related to activities on the SEC power plant site are not applicable to the Grimes Pipeline, which is located several miles upstream from the SEC power plant site.

To avoid confusion with the original 1999 Conditions and to appropriately tailor the new requirements unique to the Grimes Pipeline, the 1999 Conditions, to the extent applicable, have been modified to specifically address the site-specific conditions and impacts related to the Grimes Pipeline Project. To distinguish these proposed 2011 Conditions as applicable to the Grimes Pipeline, the letters "GP" have been added to the applicable Conditions.

4.1 Biological Resources

The proposed Conditions of Certification for Biological Resources provided below apply to the biological resources that may be affected by the Grimes Pipeline Project. Proposed Conditions BIO-1-GP through BIO-9-GP, Condition BIO-11-GP, and Condition BIO-12-GP are based upon the 1999 Conditions. Condition BIO-10 of the 1999 Decision, related to construction of the power line to avoid raptor and other bird issues, is not applicable to an underground facility like the Grimes Pipeline; moreover, CEC approved the SEC's request to discontinue this condition on August 2, 2006. Accordingly, there is no Condition BIO-10-GP for the Grimes Pipeline.

DESIGNATED BIOLOGIST

BIO-1-GP Construction related earth disturbance activities shall not begin until an Energy Commission Compliance Project Manger (CPM) approved designated biologist is available on site.

Protocol: the designated biologist must meet the following minimum qualifications;

1) a bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field;

2) three years of experience in field biology or current certification of nationally recognized biological society, such as the Ecological Society of America or The Wildlife Society;

3) one year of field experience with resources found in or near the project area: and

4) ability to demonstrate to the satisfaction of the CPM the appropriate education and experience for the biological resource tasks that must be addressed during project construction and operation.

Verification: If, within 10 days of receiving the resume of the proposed designated biologist, the CPM determines that the proposed designated biologist is unacceptable, the project owner shall submit another individual's name and qualifications for consideration.

If the approved designated biologist needs to be replaced, the project owner shall obtain approval of a new designated biologist by submitting to the CPM the name, qualifications, address, and telephone number of the proposed replacement.

No disturbance will be allowed in any designated sensitive area(s) until the CPM approves a new designated biologist and that designated biologist is on-site.

At least 10 days prior to the start of commencement of construction, the project owner shall submit to the CPM for approval, the name, qualifications, address, and telephone number of the individual selected by the project owner as the designated biologist. If a designated biologist resigned or is replaced the information on the proposed replacement as specified in the Condition must be submitted in writing to the CPM for review and approval.

BIO-2-GP The CPM approved designated biologist shall perform the following duties:

1) advise the project owner's supervising construction chief inspector and resident engineer on the implementation of the biological resource Conditions of Certification;

2) Supervise or conduct mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as wetlands and special status species; and 3) notify the project owner and the CPM of any non-compliance with any Condition.

Verification: The designated biologist shall maintain written records of the task described above, and summaries of these records shall be submitted along with the Monthly Compliance Reports to the CPM.

BI0-3-GP The project owner's supervising construction chief inspector shall act on the advice of the designated biologist to ensure conformance with the biologist resources Conditions of Certification.

Protocol: The project owner's supervising construction chief inspector shall halt, if needed, all construction activities in areas specifically identified by the designated biologist as sensitive to assure that potential significant biological resource impacts are avoided.

The designated biologist shall:

1) tell the project owner and supervising construction chief inspector when to resume construction and

2) advise the CPM if any corrective actions are needed or have been instituted.

Verification: Within two working days of a designated biologist's notification of non compliance with a Biological Resources Condition or a halt of construction, the project owner shall notify the CPM by telephone of the circumstances and actions being taken to resolve the problem or the non-compliance with a Condition.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

BIO-4-GP The project owner shall develop and implement a Worker Environmental Awareness Program in which each of its own employees, as well as employees of contractors and subcontractors, who work on the Grimes Pipeline Project and Grimes Station site during construction and operation, are informed about biological resource sensitivities associated with the project.

Protocol: The Worker Environmental Awareness Program

1) shall be developed by the designated biologist and consist of an on-site or classroom presentation in which supporting written material is made available to all participants;

2) must discuss the locations and types of sensitive biological resources on the project site and adjacent areas:

3) must present reasons for protecting these resources; and

4) must present the meaning of habitat protection measures; and

5) must identify who to contact if there are further comments and questions about the material discussed in the program.

Verification: At least 10 days prior to the start of commencement of construction, the project owner shall provide copies of the Worker Environmental Awareness Program and all supporting written materials prepared by the designated biologist and the name and qualifications of the person(s) administering the program to the CPM for approval. The project owner shall state in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date

Each participant in the on-site Worker Environmental Awareness Program shall sign a statement declaring that the individual understands and shall abide by the guidelines set forth in the program material. Each statement shall also be signed by the person administering the Worker Environmental Awareness Program.

The signed statements for the construction shall be kept on file by the project owner and made available for examination by the CPM for a period of at least six (6) months after the start of operation of the Grimes pipeline.

CALIFORNIA DEPARTMENT OF FISH AND GAME CONSISTENCY DETERMINATION

BIO-5-GP The project owner shall apply to the California Department of Fish and Game (CDFG), asking for the Department's recommendations to the Commission regarding a consistency determination (per Section 2080.1 of the California Fish and Game Code).

Verification: At least 10 days prior to the start of construction, the project owner shall submit to the CPM a copy of the owner's request for CDFG's recommendations to the Commission on the consistency determination.

US FISH AND WILDLIFE SERVICE SECTION 7 BIOLOGICAL OPINION

BIO-6-GP Prior to construction of the Grimes Pipeline Project, the project owner shall provide final copies of the Biological Opinion per Section 7 of the federal endangered species act obtained from the U.S. Fish and Wildlife Service (USFWS) and incorporate the terms of the agreement into the Biological Resources Mitigation Implementation and Monitoring Plan. In the alternative, the project owner may satisfy this condition by receiving a No Effect Letter from the USFWS.

Verification: At least 10 days prior to the start of commencement of construction for the Grimes Pipeline Project, the project owner shall submit to the project CPM copies of the final USFWS Biological Opinion or, in the alternative, the final No Effect Letter.

CALIFORNIA DEPARTMENT OF FISH AND GAME STREAMBED ALTERATION AGREEMENT

BIO-7-GP The project owner shall apply to the California Department of Fish and Game (CDFG), asking for the Department's recommendations to the Commission regarding a Streambed Alteration Agreement for the project.

Verification: At least 10 days prior to the start of construction, the project owner shall submit to the CPM a copy of the owner's request for CDFG's recommendations to the Commission on the Streambed Alteration Agreement.

GIANT GARTER SNAKE (GGS) IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-8-GP[5] Construction within 200 feet of canals with potential GGS habitat must follow USFWS construction guidelines. The project Applicant shall minimize all gas pipeline construction within 200 feet of canals with potential GGS habitat to the greatest extent possible. All pipeline construction within GGS areas shall incorporate measures as described in the USFWS GGS construction guidelines including but not limited to the following:

- Any dewatered potential habitat shall 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 during construction or drilling operations.
- No fencing or other materials shall be utilized within 200 feet of potential GGS habitat that could potentially entangle or otherwise harm GGS.
- All construction that must occur within 200 feet of canals with potential GGS habitat shall occur within the GGS active period (May 1-October 1). USFWS must approve in writing any construction work within potential GGS habitat that must be conducted outside of this time window before construction activities commence.

Verification: The project owner shall submit a report to USFWS and the CPM if any GGS are found within work areas no more than 24 hours after the sighting is made. The report shall include monitoring results; a description of resolution of construction/snake conflict, and any additional monitoring that was required. The monthly monitoring report shall include updates on construction work occurring within potential GGS habitat.

SWAINSON'S HAWK IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-9-GP The project owner shall ensure the following measures are implemented to mitigate or avoid project impacts to Swainson's hawks:

1) The designated biologist shall conduct preconstruction surveys during March through June during construction period to determine if an active nest site is within 0.5 mile of construction activities.
2) Design the project to avoid removal of nest trees within 0.1 mile of nest trees.
3) The designated biologist shall monitor construction activities that occur within 0.5 mile of an active nest site between March 1 and August 15 or until fledglings are no longer dependent on the nest tree. The monitoring plan shall be acceptable to CDFG.

Verification: At least 10 days prior to commencement of construction, the project owner shall provide to the project CPM for review and approval written documentation (BRMIMP, BIO-12) that the above measures will be accomplished by the applicant and specifying the procedures used or that will be used to implement these measures.

WETLAND IMPACT AVODIANCE AND MINIMIZATON MEASURES

BIO-11-GP Consistent with the wetlands delineation performed for the project, the project owner shall mark and avoid all wetlands on site that will not be directly taken.

[5] Based on Condition BIO-13 of the Commission's December 2010 Final Decision in the Almond 2 Powerplant case (CEC-800-2010-018-CMF).

Verification: At least 10 days prior to commencement of construction, the project owner shall provide to the project CPM for review and approval written documentation (BRMIMP, BIO-12) that the above measures will be accomplished by the licensee and specifying the procedural terms for implementing these measures.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN (BRMIMP)

BIO-12-GP The project owner shall submit to the CPM for review and approval a copy of the amended Biological Resources Mitigation Implementation and Monitoring Plan for the Grimes Pipeline Project.

Protocol: The Biological Resources Mitigation Implementation and Monitoring Plan shall identify:

- all sensitive biological resources to be impacted, avoided, or mitigated by project construction and operation;
- all conditions agreed to in the USFWS Biological Opinion and CDFG consistency determination recommendations to the Commission;
- all applicable mitigation, monitoring and compliance conditions included in the Amendment;
- all conditions agreed to in the USACE Clean Water Act Permits;
- all conditions specified in the Streambed Alteration Agreement recommendations of CDFG, if required;
- required mitigation measures for each sensitive biological resource;
- a detailed description of measures that will be taken to avoid or mitigate temporary disturbances from construction activities;
- all locations, on a map of suitable scale, of laydown areas and areas requiring temporary protection and avoidance during construction;
- aerial photographs of all areas to be disturbed during project construction activities - one set prior to site disturbance and one set subsequent to completion of mitigation measures. Include planned timing of aerial photography and a description of why times were chosen;
- monitoring duration for each type of monitoring and a description of monitoring methodologies and frequency;
- description of habitat restoration in disturbed areas and erosion control
- a process for proposing plan modifications to the CPM and appropriate agencies for review and approval.

Verification: At least 10 days prior to commencement of construction, the project owner shall provide the CPM with the final version of the Biological Resources Mitigation Implementation and Monitoring Plan for the Grimes Pipeline Project, and the CPM will determine the plan's acceptability within 5 days of receipt of the final plan. The project owner shall notify the CPM five working days before implementing any modifications to the Biological Resource Mitigation Implementation and Monitoring Plan.

Within 90 days after completion of construction, the project owner shall provide to the CPM, for review and approval, a written report identifying which items of the Biological Resource Mitigation Implementation and Monitoring Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which condition items are still outstanding.

4.2 Cultural Resources

As described in Section 3.2, *Cultural Resources*, of this Amendment, the following Conditions of Certification are proposed for implementation as part of the Grimes Pipeline Project to ensure that buried cultural resources are adequately documented and avoided. These conditions are based upon Conditions of Certification for cultural resources approved in the 1999 Commission Decision for the SEC and follow the respective numbered conditions in the 1999 Conditions of Certification . To distinguish these proposed 2011 Conditions as applicable to the Grimes Pipeline, the letters "GP" have been added to the applicable Conditions. CCFC and CPN Pipeline Company recommend the following cultural resources Conditions of Certification for the Grimes Pipeline Project.

DESIGNATED CULTURAL RESOURCES SPECIALIST

CUL-1-GP Prior to the start of project construction (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), the project owner shall provide the California Energy Commission Compliance Project Manager (CPM) with the name(s) and qualifications of its designated cultural resource specialist and mitigation team members. The designated cultural resource specialist shall be responsible for implementing all the cultural resource Conditions of Certification, using qualified personnel to assist him or her in project-related field surveys, monitoring, data collection and artifact recovery, mapping, mitigation, analysis of recovered cultural resources and data, or report preparation. After CPM approval of the Cultural Resource Monitoring and Mitigation Plan (described below in condition CUL-3), the designated cultural resource specialist and team shall be available to implement the mitigation plan prior to, and throughout construction of the project.

Protocol: The project owner shall provide the CPM with a resume or statement of qualifications for its designated cultural resources specialist and mitigation team members. The resume(s) shall include the following information:

1) The resume for the designated cultural resource specialist shall demonstrate that the specialist meets the following minimum qualifications: a graduate degree in archaeology, anthropology, California history, or cultural resource management; at least three years of cultural resource mitigation and field experience in California, including at least one year's experience leading cultural resource field surveys; leading site mapping and data recording; marshalling equipment necessary and leading archaeological resource recovery operations; preparing recovered materials for analysis and identification; recognizing the need for appropriate sampling and/or testing in the field and in the lab; directing the analyses of mapped and recovered materials and data; completing the identification and inventory of recovered cultural materials; and the preparation of appropriate reports to be filed with the receiving curation repository, the appropriate regional information center(s), and the CPM.

2) The resume for the designated cultural resource specialist shall include a list of specific projects the specialist has previously worked on; the role and responsibilities of the specialist for each project listed; and the names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

3) If additional personnel will be assisting the designated cultural resource specialist in project-related field surveys, monitoring, data and artifact recovery, mapping, mitigation, material analysis, or report preparation, the project owner shall also provide names, addresses, and resumes for these mitigation team members.

4) If the CPM determines that the qualifications of the proposed cultural resource specialist are not in concert with the above requirements, the project owner shall submit another individual's name and qualifications for consideration.

5) If the previously approved, designated cultural resource specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM approval of the new designated cultural

resource specialist by submitting to the CPM the name and qualifications of the proposed replacement specialist, at least ten (10) days prior to the termination or release of the preceding designated cultural resource specialist.

Verification: At least 30 days prior to the start of construction on the project, the project owner shall submit the name and resume for its designated cultural resource specialist to the CPM for review and written approval. Ten (10) days prior to start of construction, the project owner shall confirm in writing to the CPM that the previously approved designated cultural resource specialist and the team of assistants are prepared to implement the monitoring and mitigation measures for cultural resources, as described in the Cultural Resources Monitoring and Mitigation Plan, prepared per condition CUL-3, below.

At least ten (10) days prior to the termination or release of a designated cultural resource specialist, the project owner shall obtain CPM approval of the new designated cultural resource specialist by submitting to the CPM the name and resume of the proposed replacement specialist.

CUL-2-GP Prior to the start of construction, the project owner shall provide the designated cultural resource specialist and the CPM with maps and drawings for the Grimes Pipeline Project. The final center lines and right-of-way boundaries shall be provided on 7.5 minute quad maps, and the location of all the various areas where surface disturbance may be associated with the project-including pipe pulling sites, laydown sites and the Grimes Station and tap sites.

Verification: At least 10 days prior to the start of construction on the project, the project owner shall provide the designated cultural resource specialist~~,~~ and CPM~~,~~ with final maps at appropriate scale(s) and drawings for all project facilities. Copies of all requests for more detailed maps by the designated cultural resource specialist shall also be submitted in writing to the CPM.

CULTURAL RESOURCES MONITORING AND MITIGATION PLAN

CUL-3-GP Prior to the start of project construction, the designated cultural resource specialist shall prepare a draft Cultural Resources Monitoring and Mitigation Plan to identify general and specific measures to minimize potential impacts to significant cultural resources. The CPM will review, and must approve in writing, the draft Cultural Resources Monitoring and Mitigation Plan.

Protocol: The Cultural Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures:

a. A discussion of the sequence of project-related tasks, such as construction monitoring; mapping and data recovery; preparation for recovery of cultural resources; preparation of recovered materials for analysis, identification, and inventory; preparation of preliminary and final reports; and preparation of materials for curation.

b. An identification of the person(s) expected to assist with each of the tasks identified in a, above, and a discussion of the mitigation team leadership and organizational structure, and the inter-relationship of tasks and responsibilities.

c. If sensitive areas are identified during construction, the designated cultural resource specialist shall identify measures such as flagging or fencing to prohibit or otherwise restrict access to sensitive resource areas. The discussion should address how these measures will be implemented prior to the start of construction and how long they will be needed to protect the resources from project-related effects.

d. Where the need for monitoring of project construction activities has been determined,~~-~~the designated cultural resource specialist, in consultation with the CPM, will establish a schedule for the monitor(s) to be present. If the designated cultural resource specialist determines that the likelihood of encountering cultural resource or sites in certain areas is slight, monitoring may be discontinued in that location.

e. If cultural resources are encountered during earth disturbing activities, the designated cultural resource specialist shall have the authority to halt or redirect construction in the immediate vicinity of the find until the specialist can determine the significance of the find. The designated cultural resource specialist shall act in accordance with the following procedures:

   - The project owner, or designated representative, shall inform the CPM within one working day of the discovery of any potentially significant cultural resources and discuss the specific measure(s) proposed to mitigate potential impacts to these resources.
   - The designated cultural resource specialist, representatives of the project owner, and the CPM shall confer within 5 working days of the notification of the CPM, if necessary, to discuss any mitigation measures already implemented or proposed to be implemented, and to discuss the disposition of any finds.
   - The SHPO will be consulted on potential eligibility, effect, and proposed mitigation measures. The U.S. Army Corps of Engineers will initiate the consultations with the SHPO.
   - All required data recovery and cultural resource impact mitigation shall be completed as expeditiously as possible.

f. All isolates encountered will be recorded and mapped; all lithic scatters and/or cultural resource sites will be recorded and mapped and all diagnostic artifacts will be collected for analysis; and all recovered cultural resource materials will be prepared and delivered for curation into a retrievable storage collection in a public repository or museum which meets the Title 36 Code of Federal Regulations 79 standards for the curation of cultural resource materials.

g. The identification of the public institution that has agreed to receive any maps and data, records, reports, and any cultural resource materials recovered during project-related monitoring and mitigation work. Also include a discussion of any requirements or specifications for materials delivered for curation and how they will be met. The name and phone number of the contact person at the institution shall be included as well.

Verification: At least 10 days prior to the start of construction on the project, the project owner shall provide the CPM with a copy of the draft Cultural Resources Monitoring and Mitigation Plan prepared by the designated cultural resource specialist. The will provide written approval or disapproval of the proposed Cultural Resources Monitoring and Mitigation Plan within 10 days of receipt of the submittal. If the draft plan is not approved, the project owner, the designated cultural resource specialist and the CPM shall meet to discuss comments and work out necessary changes.

CULTURAL RESOURCES PRECONSTRUCTION RECONNAISSANCE

CUL-4-GP Prior to the start of project construction, the project owner shall conduct a preconstruction reconnaissance and staking in all areas expected to be affected by construction and operation of the proposed project and its associated linear facilities. The staking of the linear facilities shall use the final design, centerlines, rights-of-way, and mile posts delineated in the construction drawings and maps prepared under condition of certification CUL-2. The designated cultural resource specialist will use the mile post stakes and boundary markers to identify sensitive areas with the potential to produce cultural resources and for implementation of specific measures, as described in condition CUL-8, below.

Verification: A least ten (10) days prior to the start of construction, the project owner will complete a pre-construction reconnaissance and staking of the post miles and right-of-way boundaries in all areas expected to be affected by construction and operation of the proposed project and its associated linear facilities.

CULTURAL RESOURCES WORKER TRAINING PROGRAM

CUL-5-GP Prior to the start of construction on the project, the designated cultural resource specialist shall prepare an employee training program. The designated cultural resource specialist shall submit the training program to the CPM for review and written approval.

Protocol: The training program will address the potential to encounter cultural resources during project-related site preparation and construction activities, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources. The training program shall also include the set of reporting procedures that workers are to follow if any cultural resources are encountered during project activities. This training program may be combined with other training programs prepared for paleontological and biological resources, hazardous materials, or any other areas of interest or concern.

Verification: At least 10 days prior to the start of construction on the project, the project owner shall submit to the CPM for review, comment, and written approval, the proposed employee training program and set of reporting procedures the workers are to follow if cultural resources are encountered during project construction.

The CPM shall provide written approval or disapproval of the employee training program and set of procedures within 15 days after receipt of the submittal. If the draft training program is not approved, the project owner, the designated cultural resource specialist, and the CPM~~,~~ shall confer as needed to achieve any necessary changes.

CUL-6-GP Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated cultural resource specialist shall provide the approved training to construction supervising chief inspector and resident engineer and workers who operate ground-disturbing equipment. The project owner and construction manager shall provide the workers with the approved set of procedures for reporting any cultural resources that may be discovered during project-related ground disturbance.

Verification: Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated cultural resource specialist shall present the CPM-approved training program on the potential for project impacts to sensitive cultural resources. The training shall include a set of reporting procedures for cultural resources encountered during project activities. The project owner shall provide documentation in the Monthly Compliance Report to the CPM that the employee training and the set of procedures have been provided to all project managers, construction supervisors, and to all workers.

CULTURAL RESOURCES MONITORING

CUL-7-GP Throughout the project construction period, the project owner shall provide the designated cultural resource specialist with a current schedule of anticipated weekly project activity and a map indicating the area(s) where construction activities will occur. The designated cultural resource specialist shall consult daily with the project superintendent or construction field manager to confirm the area(s) to be worked on the next day(s).

Throughout the monitoring and mitigation phase of the project, the designated cultural resource specialist shall maintain a daily log of monitoring and mitigation activities carried out by the specialist and members of the cultural resource mitigation team. The designated cultural resource specialist shall prepare summary reports on monitoring activities, any cultural resource finds and recovery efforts, and the progress or status of the resource monitoring, mitigation, preparation, identification, and analytical work being conducted for the project. Copies of these summaries shall be included in the Monthly Compliance Reports filed with CPM by the project owner. The designated cultural resource specialist may informally discuss the cultural resource monitoring and mitigation activities with their Energy Commission technical counterpart at any time.

Verification: The project owner shall include, in the Monthly Compliance Reports to the CPM, a summary of the daily logs prepared by the designated cultural resource specialist.

CUL-8-GP The designated cultural resources specialist or his or her designee shall be present at the construction site at all times when construction-related grading, excavation, trenching, and/or augering occur in the areas that lie within the natural river levee zone (found to be generally associated with the Shanghai-Nueva-Columbia soils group). Project areas where the natural levee zones may be found include the Grimes Station site and vicinity, and the connection between the Grimes Pipeline and the existing Sutter Pipeline. Using mileposts and boundary stakes placed by the project owner, the designated cultural resource specialist or his or her designee shall monitor the Grimes Station site and vicinity, and the connection between the Grimes Pipeline and the existing Sutter Pipeline. Other sections of the Grimes pipeline route may be monitored as deemed necessary by the CPM.

Verification: The project owner shall include, in the Monthly Compliance Reports to the CPM, a summary of the daily logs prepared by the designated cultural resource specialist.

CUL-9-GP If buried human remains are encountered during project-related grading, excavation, augering, and/or trenching, the construction crew shall halt or redirect construction in the immediate vicinity of the find and immediately contact the county coroner and the designated cultural resource specialist. If the coroner determines that the find is of Native American origin, the coroner shall notify the Native American Heritage Commission (NAHC) to request a determination of "most likely descendant". The NAHC is required to notify the descendant(s) and request that they inspect the burial and make recommendations for treatment or disposal.

Verification: The designated cultural resource specialist shall notify the County Coroner, the project owner and the CPM, if any buried human remains are encountered during project construction activities.

CUL-10-GP The project owner, through the designated cultural resource specialist, shall ensure the recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all significant cultural resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files, copies of signed contracts or agreements with the designated cultural resource specialist and other qualified research specialists. These specialists will ensure the necessary recovery, preparation for analysis, analysis, identification and inventory, and preparation for curation of all significant cultural resource materials collected during monitoring, data recovery, mapping, and mitigation activities for the project. The project owner shall keep these files on-site and available for periodic audit by the CPM, for a period of at least two years after completion of the approved Final Cultural Resources Report.

CULTURAL RESOURCES REPORT

CUL-11-GP The project owner shall ensure preparation of a Preliminary Cultural Resources Report following completion of data recovery and site mitigation work. The preliminary report is to be prepared by the designated cultural resource specialist and submitted to the CPM for review and written approval

Protocol: The preliminary report shall include (but not be limited to) preliminary information on the survey report(s), methodology, and recommendations; site records and maps; determinations of significance; data recovery and other mitigation activities; discussion of possible results and findings of any analysis to be conducted on recovered cultural resource materials and data; proposed research questions that may be answered, or that may have been raised by the data from the project; related information such as maps, diagrams, charts, photographs and other appropriate materials; and an estimate of the time needed to complete the analysis of recovered cultural resource materials and prepare a final report.

If no cultural resource materials are recovered during project-related construction activities, the approved preliminary report shall also serve as the final report and shall be filed with appropriate entities, as described in conditions CUL-13 and CUL-14.

Verification: Within ninety (90) days following completion of the data recovery and site mitigation work, the project owner shall submit a copy of the Preliminary Cultural Resources Report to the CPM for review, comment, and written approval.

CUL-12-GP The project owner will ensure preparation of a Final Cultural Resources Report by the designated cultural resource specialist, if cultural resource materials are found and recovered during project-related monitoring and mitigation. This final report shall be submitted to the CPM for review and written approval.

Protocol: The final report shall include the survey report(s), methodology, and recommendations; site records and maps; description and inventory list of recovered cultural resource materials; determinations of sensitivity and significance; summary of data recovery and other mitigation activities; results and findings of any special analyses conducted on recovered cultural resource materials and data; research questions answered or raised by the data from the project; and the name and location of the public institution receiving the recovered cultural resource materials for curation.

Verification: The project owner shall submit a copy of the draft Final Cultural Resources Report to the CPM for review, comment, and written approval. The report shall be submitted to the CPM ~~a~~ within ninety (90) days following completion of the analysis of the recovered cultural materials and preparation of related information. The project owner shall submit a copy of the final cultural resources report to the CPM for review and written approval.

CUL-13-GP The project owner shall ensure that the USACE is provided with an original (or an original-quality) copy of the approved Final Cultural Resources Report, and other copies necessary to submit to the public institution receiving the recovered data and materials for curation, to the SHPO, and to the appropriate regional archaeological information center(s). A legible copy of the approved Final Cultural Resource Report shall be filed with the CPM, with a request for confidentiality, if needed to protect any sensitive resources or sites.

The report copy sent to the curating institution and to the appropriate regional information centers shall include the information required by 36 Code of Federal Regulations 79 and the regional archaeological information centers.

Verification: The project owner shall maintain in its compliance files, copies of all documentation related to the filing of the original materials and the approved final cultural resources report with the public institution receiving the recovered data and materials for curation, with the appropriate regional archaeological information repository, and the SHPO. If no cultural resource materials were recorded or recovered, then the approved Preliminary Cultural Resources Report shall serve as the final report and is to be filed with these same agencies.

CUL-14-GP Following filing of the Final Cultural Resources Report with the CPM, and the appropriate entities, the project owner, through the designated cultural resource specialist, shall deliver for curation all cultural resource materials collected during data recovery and mitigation for the project.

Verification: Within 90 days following filing of the Final Cultural Resources Report with the CPM, the materials shall be delivered for curation into a public repository which meets the U.S. Secretary of Interior requirements for the curation of cultural resource materials. The project owner shall maintain in its project history or compliance files, copies of signed contracts or agreements with the museum(s), university(ies), or other appropriate public repository(ies) by which the project owner has provided for delivery for curation of all the cultural resource materials collected during data recovery and site mitigation for the project.

4.3 Paleontological Resources

As described in Section 3.8, Paleontological Resources, the project area is considered a low sensitivity area for paleontological resources, and onsite paleontologic monitoring during earth disturbing activities is not proposed. PAL-1-GP below is based upon 1999 Decision Conditions of Certification PAL-1 (designated paleontologic resources specialist) and PAL-5 (paleontologic worker training) and will ensure that in the unlikely event that buried paleontological resources are encountered they are adequately identified, documented, and avoided. The proposed PAL-2-GP is based upon PAL-6 contained in the 1999 Commission Decision Conditions of Certification, requiring the designated paleontologic resources specialist to present the CPM-approved training program on paleonotologic resources to all construction workers. To distinguish these proposed 2011 Conditions as applicable to the Grimes Pipeline, the letters "GP" have been added to the applicable Conditions.

PAL-1-GP The project owner shall provide the California Energy Commission Compliance Project Manager (CPM) with the name and qualifications of its designated paleontologic resource specialist for CPM approval. The designated paleontologic resources specialist shall be responsible for preparing and implementing the paleonotologic worker awareness training program for construction manager and supervisor and workers.

Verification: At least 10 days prior to commencement of construction, the project owner will provide the CPM with a copy of the worker awareness training program and the name and qualifications of the person administering the program. The project owner shall state in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date.

PAL-2-GP Prior to the start of construction, and throughout the project construction as needed for all new employees, the project owner and the designated paleontologic resource specialist shall provide the CPM-approved training to all construction managers and supervisors, and workers who operate ground disturbing equipment. The project owner and construction manager shall provide the workers with the CPM-approved set of procedures for reporting any sensitive paleontologic resources or fossil-bearing sediments that maybe discovered during project-related ground disturbance.

Verification: Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated paleontologic resources specialist shall present the CPM-approved training program on paleonotologic resources. The training shall include a set of reporting procedures if paleontologic resources are encountered during project activities. The project owner shall provide documentation in the Monthly Compliance Report to the CPM that the employee training and the set of procedures have been provided to all construction managers and supervisors, and to all workers.

5. Potential Effects on the Public

Consistent with the requirements of the Commission Siting Regulations Section 1769 (a)(1)(G), this section addresses the proposed Amendment's effects on the public. Construction of the Grimes Pipeline will not have a substantial effect on the public because the Project components are located away from sensitive receptors (e.g., residences, schools, and hospitals) and will not interfere with the ongoing, daily use of public roads and other public features (e.g., irrigation canals). Operation and maintenance of the facility will not affect the public because the activities are expected to be minimal and will not require road closures or other measures that will disrupt public use of the area. The economic activity associated with the Grimes Pipeline will provide a small economic benefit in Sutter County.

6. List of Property Owners

Consistent with the Commission's Siting Regulations Section 1769(a)(1)(H), this section lists the property owners affected by the proposed modifications. As described previously, CCEC and CPN Pipeline Company has already secured easement agreements for both temporary and permanent right-of-way easements from landowners.

The entire Project area (estimated at approximately 28.8 acres) encompasses the land needed to construct the Project components, temporary construction staging areas, and temporary pipeline bore work areas.

A list of property owners potentially affected by the Grimes Pipeline is provided in Table 4.

Table 4. Property Owners in Close Proximity to the Grimes Pipeline Project

APN	Owner	Address
21-040-032	Park, Scott W.	2868 S. Meridian Rd. Meridian, CA 95957-9655
21-030-010 21-040-010 21-040-011 21-040-012	Herrod, William M.	2746 So. Meridian Rd. Meridian, CA 95957
21-020-001	Andreotti Associates, L.P.	P.O. Box 298 Colusa, CA 95932
21-020-002 21-020-003 21-020-004 21-020-005 21-020-006	Chesini, James P. (Jaydene)	434 Drexler Meridian, CA 95957
13-160-060	Giusti, Thomas A.	14943 Moroni Road Meridian, CA 95957
13-160-082 PTN	Giusti, Elva (50%)	1021 Staple Drive Yuba City, CA 95991
13-160-082 PTN	D&D Ranch (50%) Attn: Ed Atherton	99 Almaden Blvd., Suite 565 San Jose, CA 95113-1600
13-160-045 13-160-056	Angelo Giusti	14987 Moroni Road Meridian, CA 95957
13-160-046 13-160-051	Doherty 09 Trust	P.O. Box 413 Dunningan, CA 95937
21-050-001 21-050-011 21-050-036	MH Fuel Enterprises, LLC	1633 Parkway Drive Folsom, CA 95630
21-050-006	Hatfield, Robert & Bernice	25526 S. Bird Road Tracy, CA 95304

7. Potential Effects on Property Owners

Consistent with the Commission's Siting Regulations Section 1769(a)(1)(I), this section addresses potential effects of the proposed Amendment on nearby property owners, the public, and parties in the application proceeding. CPN Pipeline Company has coordinated with the landowners to identify the best location for the Grimes Pipeline and to ensure that construction of the facilities does not interfere with ongoing agricultural and recreational (i.e., hunting) activities. The property owners have provided easements for the Project components and have agreed to the proposed construction schedule. Therefore, no potential effects on property owners are expected.

Appendix A

Project Alignment Sheets

121°53'0"W
121°52'50"W
121°52'40"W
39°6'30"N
39°6'20"N

WD-01
x̄=7'
Acres=0.111

RFW-14
Acres=6.011

RFW-16
Acres=6.043

RFW-17
Acres=12.28

OWD-30
x̄=7'
Acres = 0.099

Venoco Eastside
Master Meter Site

OWD-31
x̄=8'
Acres = 0.083

MMoroniRRD

WD-02
x̄=24'
Acres = 0.303

RFW-15
Acres=3.486

OWD-33
x̄=20'
Acres = 1.77

RFW-18
Acres=32.648

OWD-32
x̄=12'
Acres=0.123

Exhibit 1
Project Alignment
Grimes Pipeline Project
January 2011
Sheet 1 of 8

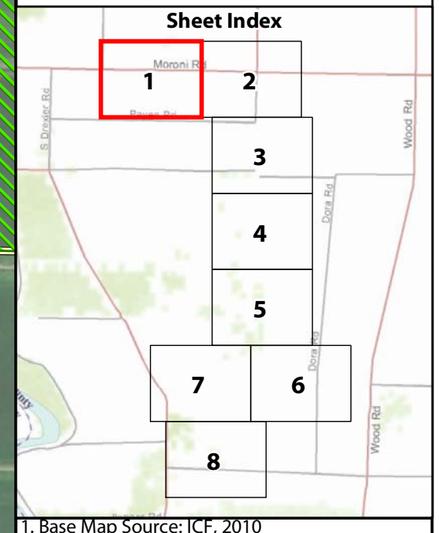
- Natural Gas Pipeline Trench (temporary sidecast fill in rice= 1.41 acres, 9230 CY)
- Bore
- Project Element
- Construction Laydown Area
- Access Road (permanent fill in drainage = 0.012 acres, 60-foot culvert)
- Pipeline Work Area
- Wetland and Biological Study Area (395.88 Acres)
- Culvert
- Other Waters Drainage
- Riparian Drainage
- Wetland Drainage
- Ricefield Wetland
- Elderberry Shrub

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Grimes
4. PLSS: T. 15 N, R. 1 E

Drawn By: Matt Ewalt	Jan 2011

ICF INTERNATIONAL

K:\PROJECTS_1-1\CALPINE\ 00778_10_GRIMES\ MAPDOC\ ALIGNMENT_FIGURES\ ALIGNMENT_20110105_W_WETLANDS.MXD SS (01-05-11)

121°52'30"W
121°52'20"W
121°52'10"W
39°6'30"N
39°6'20"N

RFW-20
Acres=0.093

OWD-34
x̄=30'
Acres = 0.561

RFW-19
Acres=13.491

RFW-17
Acres=12.28

RFW-20
Acres=7.133

WD-29
x̄=2'
Acres = 0.009

Moroni Rd

WD-04
x̄=8'
Acres = 0.121

RFW-18
Acres=32.648

RFW-21
Acres=32.415

Hageman Rd

Hageman Rd

OWD-33
x̄=20'
Acres = 1.77

Exhibit 1
Project Alignment
Grimes Pipeline Project
January 2011
Sheet 2 of 8

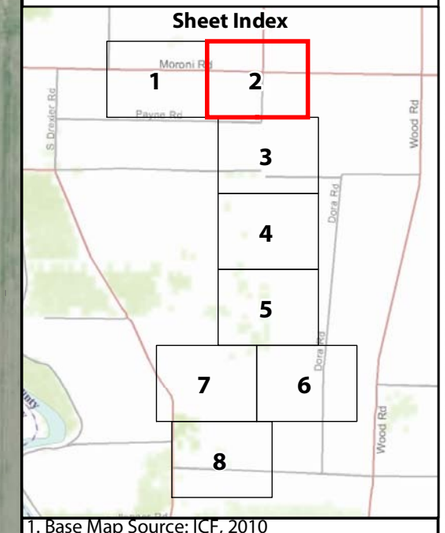
- Natural Gas Pipeline Trench (temporary sidecast fill in rice= 1.41 acres, 9230 CY)
- Bore
- Project Element
- Construction Laydown Area
- Access Road (permanent fill in drainage = 0.012 acres, 60-foot culvert)
- Pipeline Work Area
- Wetland and Biological Study Area (395.88 Acres)
- Culvert
- Other Waters Drainage
- Riparian Drainage
- Wetland Drainage
- Ricefield Wetland
- Elderberry Shrub

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Tisdale Weir
4. PLSS: T. 15 N, R. 1 E

Drawn By: Matt Ewalt	Jan 2011

ICF INTERNATIONAL

K:\PROJECTS_1-1\CALPINE\10778_10_GRIMES\MAPDOC\ALIGNMENT_FIGURES\ALIGNMENT_20110105_W_WETLANDS.MXD SS (01-05-11)

121°52'30"W
121°52'20"W
121°52'10"W
121°52'0"W
39°6'10"N
39°6'0"N

RFW-18
Acres=32.648

Venoco 32-33-3
Master Meter Site

Payne Rdne Rd

OWD-35
x̄=32'
Acres = 0.775

RFW-22
Acres=11.498

RFW-21
Acres=32.415

WD-05
x̄=33'
Acres = 1.075

OWD-36
x̄=20'
Acres = 2.254

RFW-24
Acres=30.643

RFW-23
Acres=25.01

Exhibit 1
Project Alignment
Grimes Pipeline Project
January 2011
Sheet 3 of 8

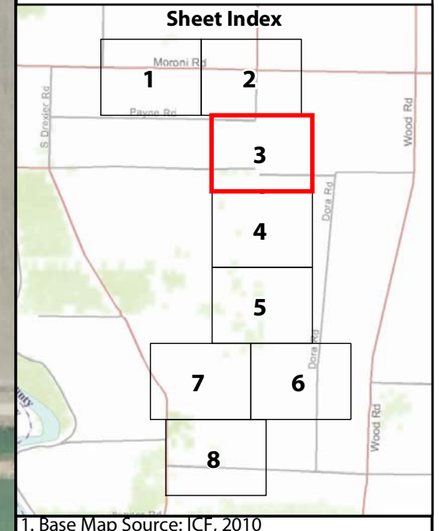
- Natural Gas Pipeline Trench (temporary sidecast fill in rice= 1.41 acres, 9230 CY)
- Bore
- Project Element
- Construction Laydown Area
- Access Road (permanent fill in drainage = 0.012 acres, 60-foot culvert)
- Pipeline Work Area
- Wetland and Biological Study Area (395.88 Acres)
- Culvert
- Other Waters Drainage
- Riparian Drainage
- Wetland Drainage
- Ricefield Wetland
- Elderberry Shrub

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Tisdale Weir
4. PLSS: T. 14, R. 1 E & T. 15, R. 1 E

Drawn By: Matt Ewalt	Jan 2011

ICF INTERNATIONAL

K:\PROJECTS_1-1\CALPINE1\00778_10_GRIMES\MAPDOC\ALIGNMENT_FIGURES\ALIGNMENT_20110105_W_WETLANDS.MXD SS (01-05-11)

121°52'30"W
121°52'20"W
121°52'10"W
121°52'0"W
39°5'50"N
39°5'40"N

OWD-36
x̄=20'
Acres = 2.254

RFW-23
Acres=25.01

RFW-24
Acres=30.643

RFW-26
Acres=37.718

WD-06
x̄=16'
Acres = 0.166

Exhibit 1
Project Alignment
Grimes Pipeline Project
January 2011
Sheet 4 of 8

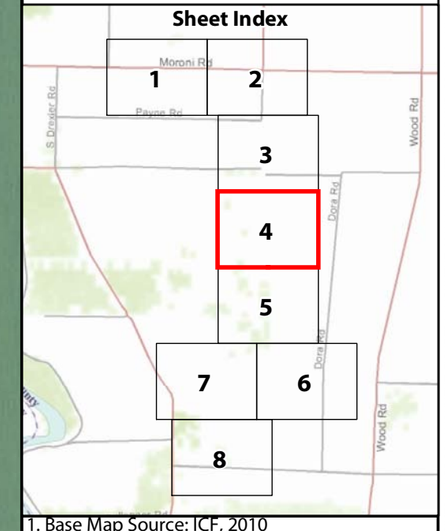
- Natural Gas Pipeline Trench (temporary sidecast fill in rice= 1.41 acres, 9230 CY)
- Bore
- Project Element
- Construction Laydown Area
- Access Road (permanent fill in drainage = 0.012 acres, 60-foot culvert)
- Pipeline Work Area
- Wetland and Biological Study Area (395.88 Acres)
- Culvert
- Other Waters Drainage
- Riparian Drainage
- Wetland Drainage
- Ricefield Wetland
- Elderberry Shrub

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Tisdale Weir
4. PLSS: T. 14, R. 1 E

Drawn By: Matt Ewalt	Jan 2011

ICF INTERNATIONAL

K:\PROJECTS_1-1\CALPINE1\0077b_10_GRIMES\MAPDOC\ALIGNMENT_FIGURES\ALIGNMENT_20110105_W_WETLANDS.MXD SS (01-05-11)

121°52'30"W
121°52'20"W
121°52'10"W
121°52'0"W
39°5'30"N
39°5'20"N

WD-07
x̄=10'
Acres = 0.123

OWD-37
x̄=8'
Acres = 0.486

RFW-26
Acres=37.718

OWD-36
x̄=20'
Acres = 2.254

RFW-25
Acres=31.487

Exhibit 1
Project Alignment
Grimes Pipeline Project
January 2011
Sheet 5 of 8

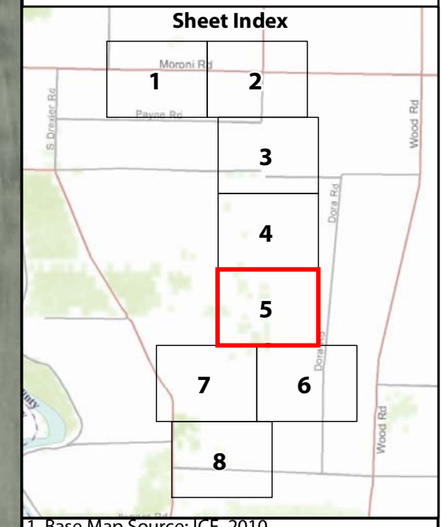
- Natural Gas Pipeline Trench (temporary sidecast fill in rice= 1.41 acres, 9230 CY)
- Bore
- Project Element
- Construction Laydown Area
- Access Road (permanent fill in drainage = 0.012 acres, 60-foot culvert)
- Pipeline Work Area
- Wetland and Biological Study Area (395.88 Acres)
- Culvert
- Other Waters Drainage
- Riparian Drainage
- Wetland Drainage
- Ricefield Wetland
- Elderberry Shrub

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Tisdale Weir
4. PLSS: T. 14, R. 1 E

Drawn By: Matt Ewalt	Jan 2011

ICF INTERNATIONAL

K:\PROJECTS_1-1\CALPINE\ 00778_10_GRIMES\ MAPDOC\ ALIGNMENT_FIGURES\ ALIGNMENT_20110105_W_WETLANDS.MXD SS (01-05-11)

Exhibit 1
Project Alignment
Grimes Pipeline Project
January 2011
Sheet 6 of 8

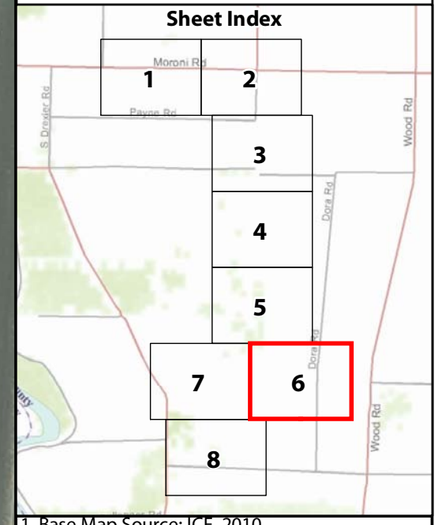
- Natural Gas Pipeline Trench (temporary sidecast fill in rice= 1.41 acres, 9230 CY)
- Bore
- Project Element
- Construction Laydown Area
- Access Road (permanent fill in drainage = 0.012 acres, 60-foot culvert)
- Pipeline Work Area
- Wetland and Biological Study Area (395.88 Acres)
- Culvert
- Other Waters Drainage
- Riparian Drainage
- Wetland Drainage
- Ricefield Wetland
- Elderberry Shrub

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Tisdale Weir
4. PLSS: T. 14, R. 1 E

Drawn By: Matt Ewalt	Jan 2011

ICF INTERNATIONAL

K:\PROJECTS_1-1\CALPINE\00778_10_GRIMES\MAPDOC\ALIGNMENT_FIGURES\ALIGNMENT_20110105_W_WETLANDS.MXD SS (01-05-11)

121°52'50"W
121°52'40"W
121°52'30"W
121°52'20"W
39°5'10"N
39°5'0"N

WD-09
x̄=14'
Acres = 0.376

RFW-26
Acres=37.718

OWD-39
x̄=14'
Acres = 0.269

RFW-28
Acres=27.793

OWD-38
x̄=14'
Acres = 1.435

S Meridian Rd

Exhibit 1
Project Alignment
Grimes Pipeline Project
January 2011
Sheet 7 of 8

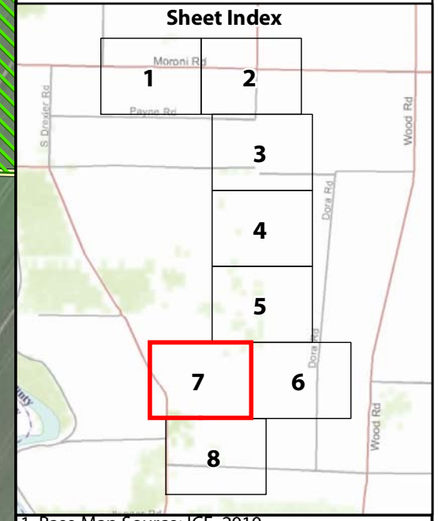
- Natural Gas Pipeline Trench (temporary sidecast fill in rice= 1.41 acres, 9230 CY)
- Bore
- Project Element
- Construction Laydown Area
- Access Road (permanent fill in drainage = 0.012 acres, 60-foot culvert)
- Pipeline Work Area
- Wetland and Biological Study Area (395.88 Acres)
- Culvert
- Other Waters Drainage
- Riparian Drainage
- Wetland Drainage
- Ricefield Wetland
- Elderberry Shrub

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



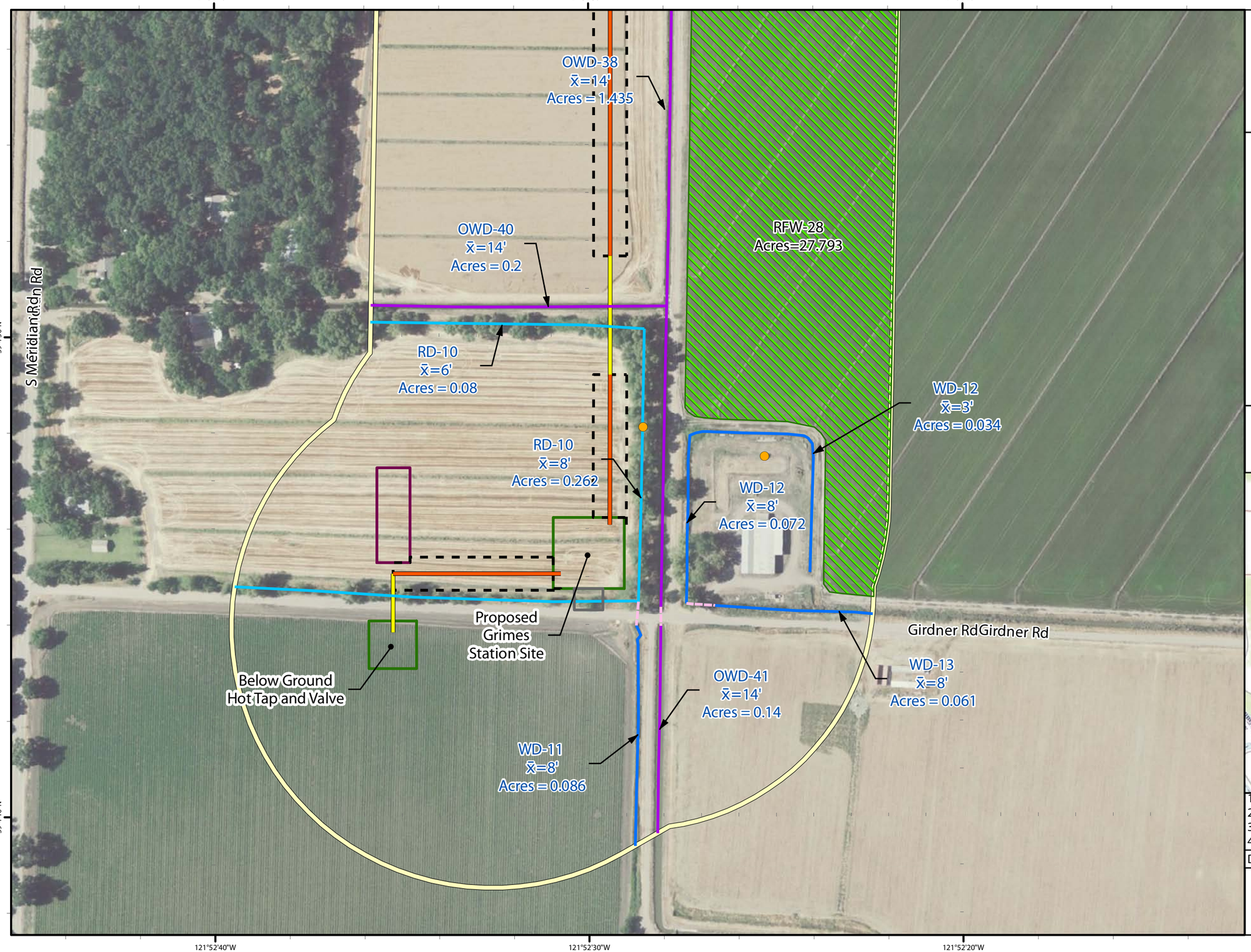
1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Grimes & Tisdale Weir
4. PLSS: T. 14, R. 1 E

Drawn By: Matt Ewalt	Jan 2011

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE\00776_10_GRIMES\MAPDOC\ALIGNMENT_FIGURES\ALIGNMENT_20110105_W_WETLANDS.MXD SS (01-05-11)

Exhibit 1
Project Alignment
Grimes Pipeline Project
January 2011
Sheet 8 of 8



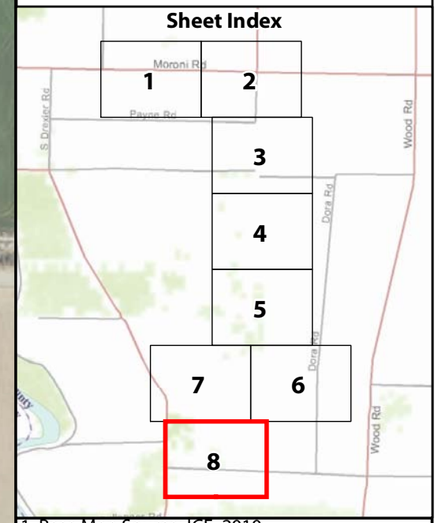
- Natural Gas Pipeline Trench (temporary sidecast fill in rice= 1.41 acres, 9230 CY)
- Bore
- Project Element
- Construction Laydown Area
- Access Road (permanent fill in drainage = 0.012 acres, 60-foot culvert)
- Pipeline Work Area
- Wetland and Biological Study Area (395.88 Acres)
- Culvert
- Other Waters Drainage
- Riparian Drainage
- Wetland Drainage
- Ricefield Wetland
- Elderberry Shrub

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Grimes & Tisdale Weir
4. PLSS: T. 14, R. 1 E

Drawn By: Matt Ewalt	Jan 2011

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE\00776_10_GRIMES\MAPDOC\ALIGNMENT_FIGURES\ALIGNMENT_20110105_W_WETLANDS.MXD SS (01-05-11)

Appendix B

Representative Photographs

Photo 1. View of natural gas pipeline alignment through agricultural lands.

Photo 2. View of other waters drainage south of Moroni Road, along natural gas pipeline alignment.

Photo 3. View of wetland drainage, and existing access roads that will be used during construction along natural gas pipeline alignment.

Photo 4. View of proposed Grimes Station Site. Photo is looking southward at disked agricultural field and riparian drainage (RD-10).

Appendix C

Biological Resources Study Report

BIOLOGICAL RESOURCES SURVEY REPORT FOR THE GRIMES PIPELINE PROJECT

PREPARED FOR:

Calpine Construction Finance Company, L.P.
4160 Dublin Boulevard
Contact: Ms. Barbara McBride, Western Regional Director, Environmental Health and Safety
Work Phone: (925) 557-2238
Cell Phone: (925) 570-0849
Email: Barbara.McBride@Calpine.com
and
CPN Pipeline Company
60 River Road
Rio Vista, CA 94571
Contact: Chris Delaney, Engineering Manager
707.374.1516

PREPARED BY:

ICF International
630 K Street, Suite 400
Sacramento, CA 95814
Contact: Susan Bushnell
Work Phone: (916) 737-3000
Cell Phone: (916) 752-0959
Email: sbushnell@icfi.com

February 2011

ICF INTERNATIONAL

ICF International. 2011. *Biological Resources Survey Report for the Grimes Pipeline Project*. February. (ICF 00776.10.) Sacramento, CA. Prepared for Construction Finance Company, L.P. and CPN Pipeline Company.

Contents

Tables and Figures

Acronyms and Abbreviations

CCFC	Calpine Construction Finance Company, L.P
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
CWA	federal Clean Water Act
ESA	Federal Endangered Species Act
ICF	ICF International
MBTA	Migratory Bird Treaty Act
NWRs	National Wildlife Refuges
OHWM	ordinary high water mark
SWANCC ruling	Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers (121 S.CT. 675,2001)
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
VELB	valley elderberry longhorn beetle

Biological Resources Survey Report

ICF International (ICF) was retained by Calpine Construction Finance Company, L.P. (CCFC) and CPN Pipeline Company, both wholly owned subsidiaries of Calpine Corporation, to conduct biological and wetland surveys, identify potential biological resource impacts, evaluate the impacts of the Grimes Pipeline Project) (Calpine Corporation 1997), identify appropriate mitigation measures (Conditions of Certification), and prepare technical documents to support acquisition of the required state and federal permits for the Grimes Pipeline Project. This technical report has been prepared to provide a description of the biological resource methods and baseline conditions in the Project area.

The project location is shown in Figures 1 and 2. Figure 3 shows the proposed Grimes Station facility located at the southern end of the Project area. The biological study area (including wetland delineation area) and Project components are shown in Appendix A of the Amendment. The draft Biological Assessment that was prepared for the proposed Project is provided in Appendix E of the Amendment. A delineation of wetlands and other water bodies was submitted to the U.S. Army Corps of Engineers (USACE) for verification and is contained in Appendix F of the Amendment along with the USACE's Preliminary Jurisdiction Determination letter.

Methods

For purpose of this biological resource report and associated analysis, the biological resources study area included the proposed Project components and a 1,000-foot-buffer around the Project components (the biological study area is shown in Appendix A of the Amendment). The survey area included the area of the proposed Project components and a 1,000-foot-buffer around the Project components (the biological study area is shown in Appendix A of the Amendment) to characterize biological resources occurring with the Grimes Pipeline project area and determine potential impacts to vegetation communities, wetlands, and species status species that could be directly or indirectly affected by Project construction and operation activities and to determine the potential indirect effects on the valley elderberry beetle and giant garter snake that are federally listed as endangered and threatened, respectively and known to occur in the Project region. In addition, the survey corridor for special-status and nesting raptors covered a 0.5-mile radius around the proposed Grimes Pipeline Project components right of way.

The methods used to identify biological resources in the study area comprised a prefield investigation, coordination with the resource agencies (discussed throughout this section), and various levels of field surveys. Each of these elements is described below.

Prefield Investigation

The sources of information listed below were reviewed to identify potential biological resources in the Project region.

- CDFG's List of California Terrestrial Natural Communities indicates which natural communities are special-status (California Department of Fish and Game 2010).

- CDFG's California Natural Diversity Database (CNDDB) records search of the Grimes, Tisdale Weir, U.S. Geological Survey (USGS) 7.5-minute quadrangles (California Natural Diversity Database 2010).
- California Native Plant Society's (CNPS's) online *Inventory of Rare and Endangered Plants of California* (2010).
- USFWS species list for Sutter County and for the Grimes and Tisdale Weir USGS quadrangles (December 1, 2010).
- *Application for Certification for the Sutter Power Plant, Colusa and Sutter Counties, California prepared for Calpine Corporation*.
- *Preliminary Delineation of Wetlands and Other Water Bodies for the Grimes Pipeline Project, Sutter County, California* (ICF 2010).
- *Draft Biological Assessment for the Grimes Pipeline Project, Sutter County, California* (ICF 2011).
- USFWS Biological Opinion (Number 1-1-98-F-100) for Calpine Corporation Sutter Power plant Project, Sutter County (April 2, 1998).
- *Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) for the Sutter Power Plant Project Sutter County, California.* CH2MHill, August 1999.
- *Soil Survey of Sutter County, California*. U.S. Department of Agriculture, Soil Conservation Service in cooperation with Regents of the University of California (Lytle 1988.).

This information was used to develop lists of special-status species and other sensitive biological resources (e.g., waters of the United States) that could be present in the Grimes Pipeline Project area. Species were included in these lists if they were known to occur in the Project region and if their habitats could be located in the Project area. Special-status plant and wildlife species identified as having potential to occur in the Project region are listed in Table 1.

Life history descriptions, potential effects, and mitigation measures for threatened or endangered species located within the Grimes Pipeline Project boundaries are discussed below. Other special status species are only discussed if there is suitable habitat available for those species within the Project area.

Field Surveys

The ICF biological team consisted of wildlife biologists, botanists, and wetlands ecologists. Biological resource surveys included driving, walking, and scanning areas within the study area. These surveys were conducted in October 2010, November 2010, and December 2010 (see Table 2 for a list of survey dates and purposes). Resumes for the botanists, wetland ecologists, and wildlife biologists that participated in the field surveys are provided in Appendix D of the Amendment.

Table 1. Special-Status Species Identified as Having the Potential to Occur in the Project Region

Common Name *Scientific Name*	Status [a] Fed/State	Geographic Distribution	Habitat Requirements	Potential for Occurrence in the Project Area
Invertebrates				
Conservancy fairy shrimp *Branchinecta conservation*	E/–	Disjunct occurrences in Solano, Merced, Tehama, Ventura, Butte, and Glenn Counties	Large, deep vernal pools in annual grasslands	None; no deep vernal pools are present in the project area.
Valley elderberry longhorn beetle* *Desmocerus californicus dimorphus*	T/–	Streamside habitats below 3,000 feet throughout the Central Valley	Riparian and oak savanna habitats with elderberry shrubs; elderberry is the host plant	High; two elderberry shrubs were located during the 2010 field surveys; one of these shrubs occurs within 100 feet of the gas pipeline alignment.
Vernal pool fairy shrimp * *Branchinecta lynchi*	T/–	Central Valley, central and south Coast Ranges from Tehama to Santa Barbara Counties; isolated populations in Riverside County	Common in vernal pools; also found in sandstone rock outcrop pools	None; no deep vernal pools or seasonal wetlands are present in the project area.
Vernal pool tadpole shrimp * *Lepidurus packardi*	E/–	Shasta County south to Merced County	Vernal pools and ephemeral stock ponds	None; no deep vernal pools or seasonal wetlands are present in the project area.
Amphibians and Reptiles				
California tiger salamander *Ambystoma californiense*	T/C	Central Valley, including Sierra Nevada foothills, up to approximately 1,000 feet, and coastal region from Butte to northeastern San Luis Obispo Counties	Small ponds, lakes, or vernal pools in grasslands and oak woodlands for larvae; rodent burrows, rock crevices, or fallen logs for cover for adults and for summer dormancy	None; no deep vernal pools or seasonal wetlands are present in the project area.
Western spadefoot (*Scaphiopus hammondii*)	–/SSC	Found in Sierra Nevada foothills, Central Valley, Coastal Ranges, coastal counties in southern California	Shallow streams with riffles and seasonal wetlands, such as vernal pools in annual grasslands and oak woodlands	None; no suitable habitat is present in the project area.
Giant garter snake *Thamnophis couchi gigas*	T/T	Central Valley from the vicinity of Burrel in Fresno County north to near Chico in Butte County; has been extirpated from areas south of Fresno	Sloughs, canals, low-gradient streams and freshwater marsh habitats where there is a prey base of small fish and amphibians; also found in irrigation ditches and rice fields; requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter	High; giant garter snake has been documented in the project region and potential aquatic and upland habitat occurs throughout the project area.
Western pond turtle *Actinemys(Emys) marmorata*	–/SSC	Oregon border of Del Norte and Siskiyou Counties south along the coast to San Francisco Bay, inland through the Sacramento Valley, and on the western slope of Sierra Nevada	Ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests	High; potential habitat is present in drainages that cross the gas pipeline corridor.

Common Name *Scientific Name*	Status [a] Fed/State	Geographic Distribution	Habitat Requirements	Potential for Occurrence in the Project Area
Birds				
Northern harrier *Circus cyaneus*	–/SSC	Occurs throughout lowland California; has been recorded in fall at high elevations	Grasslands, meadows, marshes, and seasonal and agricultural wetlands	Moderate; potential habitat occurs throughout the project area.
Osprey *Pandion haliaetus*	–/SSC	Nests along the north coast from Marin to Del Norte Counties, east through the Klamath and Cascade Ranges, and in the upper Sacramento Valley; important inland breeding populations at Shasta Lake, Eagle Lake, and Lake Almanor and small numbers elsewhere south through the Sierra Nevada; winters along the coast from San Mateo to San Diego Counties	Nests in snags, trees, or utility poles near the ocean, large lakes, or rivers with abundant fish populations	Low; potential nesting habitat along the Sacramento River.
Swainson's hawk *Buteo swainsoni*	–/T	Lower Sacramento and San Joaquin Valleys, Klamath Basin, and Butte Valley; highest nesting densities occur near Davis and Woodland, Yolo County	Nests in oaks or cottonwoods in or near riparian habitats; forages in grasslands, irrigated pastures, and grain fields	High; known to nest along the Sacramento River west and south of the project area.
Tricolored blackbird *Agelaius tricolor*	–/SSC	Permanent resident in Central Valley from Butte to Kern Counties; breeds at scattered coastal locations from Marin to San Diego Counties and at scattered locations in Lake, Sonoma, and Solano Counties; rare nester in Siskiyou, Modoc, and Lassen Counties	Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grainfields; habitat must be large enough to support 50 pairs; probably requires water at or near the nesting colony.	Moderate; known to occur in several locations near the proposed gas pipeline.
Western burrowing owl *Athene cunicularia hypugea*	–/SSC	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas; rare along south coast	Level, open, dry, heavily grazed or low-stature grassland or desert vegetation with available burrows	Low; no occurrences are known in the proejct area, canal levees and farm roads provide marginally suitable nesting habitat.
Mountain plover *Charadrius montanus*	PT/SSC	Much of the population winters in flocks in California, mostly on the west side of the Central Valley from Yolo County to Kern County; Carrizo Plain, San Luis Obispo County; and, locally, in broad valleys and coastal plains in Southern California, including Imperial Valley.	Winters in short grasslands, freshly plowed fields, newly sprouting grain fields, & sometimes sod farms	Low; potential wintering fields are uncommon in the project area, almost all wintering records are from further south.

Common Name *Scientific Name*	**Status** [a] **Fed/State**	**Geographic Distribution**	**Habitat Requirements**	**Potential for Occurrence in the Project Area**
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	C/E	Nests along upper Sacramento, lower Feather, south fork of the Kern, Amargosa, Santa Ana, and Colorado Rivers	Nests in wide, dense riparian forests with a thick understory of willows for nesting; sites with a dominant cottonwood overstory are preferred for foraging; may avoid valley-oak riparian habitats where scrub jays are abundant	Low; areas of riparian woodland in the project area may be too small to provide potential nesting habitat.
White-tailed kite *Elanus leucurus*	–/FP	Lowland areas west of Sierra Nevada from the head of the Sacramento Valley south, including coastal valleys and foothills to western San Diego County at the Mexico border	Nests in low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands for foraging	Moderate; potential nesting and foraging habitat present throughout the project region.
Greater sandhill crane *Grus canadensis tabida*	–/T	Nests in northeastern California; winters in the Central Valley and Delta	Nests near small bodies of water; uses agricultual fields in the Central Valley for foraging and stop-over during migration	Low; does not nest in project region; fallow fields in the project area may provide some marginal potential foraging habitat for migration stop-over.
Loggerhead shrike *Lanius ludovicianus*	-/SSC	Resident and winter visitor in lowlands and foothills throughout California; rare on coastal slope north of Mendocino County, occurring only in winter	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches	High; potential habitat occurs throughout the proejct area.
California black rail *Laterallus jamaicensis coturniculus*	–/T	Breeds locally in the western foothills of the northern Sierra Nevada, tidal marshes in San Pablo Bay area, Tomales Bay, Morro Bay, Tijuana Slough Estuary, the Sacramento River Delta, and the Lower Colorado River.	Found primarily in shallow freshwater and tidal marshes dominated by bulrush, sedge, or pickleweed	None; no records are known within 10 miles; no suitable habiatat is present in project area.
White-faced ibis *Plegadis chihi*	–/SSC	Both resident and winter populations on the Salton Sea and in isolated areas in Imperial, San Diego, Ventura, and Fresno Counties; breeds at Honey Lake in Lassen County, at Mendota Wildlife Management Area in Fresno County, and near Woodland in Yolo County	Nests colonially in freshwater marshes with tules, cattails, and rushes, but rarely may nest in trees; forage gregariously in flooded agricultural fields, especially flooded rice fields	Low; no suitable nesting habiat in project area, but potential foraging habiatat is present in rice fields.

Common Name *Scientific Name*	Status [a] Fed/State	Geographic Distribution	Habitat Requirements	Potential for Occurrence in the Project Area
Bank swallow *Riparia riparia*	–/T	Nests along the Sacramento River from Tehama to Sacramento Counties; along the Feather and lower American Rivers; in the Owens Valley; and in the plains east of the Cascade Range in Modoc, Lassen, and northern Siskiyou Counties; small populations near the coast from San Francisco to Monterey Counties	Nests colonially in vertical cliffs or banks with sandy or fine-textured soils near streams, rivers, lakes.	None; bank swallows occur along the Sacramento River west of the project area; however, there are no suitable bluffs or banks in the project area.
Mammals				
Marysville California kangaroo rat *Dipodomys californicus eximius*	–/SSC	Known only from the Sutter Buttes area.	Open chaparral and grassy areas in chaparral with old burrows or soil friable enough to allow them to dig their own burrows	None; suitable habitat is not present in project area.
American badger *Taxidea taxus*	–/SSC	Uncommon, permanent resident found throughout most of the state, with the exception of the northern North Coast area.	Most abundant in the drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Badgers are generally associated with treeless regions, prairies, park lands, and cold desert areas	None; suitable habitat is not present in project area.
Pallid bat *Antrozous pallidus*	–/SSC	Throughout California, primarily at lower elevations and mid-elevations	Occurs in a variety of habitats from desert to coniferous forest; most closely associated with oak, yellow pine, redwood, and giant sequoia habitats in northern California; relies heavily on trees for roosts	None; suitable habitat is not present in project area.
Western red bat *Lasiurus blossevillii*	–/SSC	Central Valley, central and southern coast	Typically a solitary bat, roosts primarily in trees with dense canopies often in edge habitats adjacent to streams or open fields, and orchards in the Central Valley; strongly associated with intact mature riparian forest	Low; no roosting habiat is present in project area, but could forage in project area.

Common Name *Scientific Name* [a]	Status[a] Fed/State/ CRPR	Geographic Distribution	Habitat Requirements	Blooming Period	Potential for Occurrence in the Project Area
Plants					
Ferris's milk-vetch *Astragalus tener* var. *ferrisiae*	–/–/1B.1	Historic range included the Central Valley from Butte to Alameda Counties; currently only occurs in Butte, Glenn, Colusa and Yolo Counties	Seasonally wet areas in meadows and seeps, subalkaline flats in valley and foothill grassland; 5–75 meters	Mar–Jun	None; no suitable habitat present in the project area.
Heartscale *Atriplex cordulata*	–/–/1B.2	Western Central Valley and valleys of adjacent foothills	Saline or alkaline soils in chenopod scrub, meadows and seeps, sandy areas in valley and foothill grassland; below 375 meters	Apr–Oct	None; no suitable habitat present in the project area.
Brittlescale *Atriplex depressa*	–/–/1B.2	Western and eastern Central Valley and adjacent foothills on west side of Central Valley	Alkaline clay soils in chenopod scrub, playas, valley and foothill grasslands, vernal pools; below 320 meters	May–Oct	None; no suitable habitat present in the project area.
San Joaquin spearscale *Atriplex joaquiniana*	–/–/1B.2	Western edge of Central Valley from Glenn to Tulare Counties	Alkaline soils in chenopod scrub, meadows and seeps, playas, valley and foothill grassland; below 835 meters	Apr–Oct	None; no suitable habitat present in the project area.
Round-leaved filaree *California macrophylla*	–/–/1B.1	Scattered occurrences in the Great Valley, southern North Coast Ranges, San Francisco Bay area, South Coast Ranges, Channel Islands, Transverse Ranges, and Peninsular Ranges	Cismontane woodland, valley and foothill grassland on clay soils; 15–1,200 meters	Mar–May	None; no suitable habitat present in the project area.
Palmate-bracted bird's-beak *Cordylanthus palmatus*	E/E/1B.1	Livermore Valley and scattered locations in the Central Valley from Colusa to Fresno Counties	Alkaline sites in chenopod scrub and valley and foothill grassland; 5–155 meters	May–Oct	None; no suitable habitat present in the project area.
Woolly rose-mallow *Hibiscus lasiocarpus* var. *occidentalis*	–/–/2.2	Scattered locations in central and southern Sacramento Valley, deltaic Central Valley from Butte to San Joaquin Counties	Freshwater marshes along rivers and sloughs; below 120 meters	Jun–Sep	Low to Moderate; occurs along Sacramento River west of the project area and along Sutter Bypass east of the project area
Coulter's goldfields *Lasthenia glabrata* ssp. *coulteri*	–/–/1B.1	Scattered locations in southern California from San Luis Obispo County to San Diego County, plus two collections in Colusa County	Coastal salt marshes and swamps, Grasslands, vernal pools, alkali sinks, playas, in alkaline soils; 1-1220 meters	Feb-Jun	None; no suitable habitat present in the project area.
Colusa layia *Layia septentrionalis*	–/–/1B.2	Inner north Coast Range: Colusa, Glenn, Lake, Mendocino, Napa, Sonoma, Sutter, Tehama, and Yolo Counties	Sandy or serpentinite soils in grasslands and openings in chaparral and foothills woodlands; 100-1095 meters	Apr-May	None; no suitable habitat present in the project area.

Common Name *Scientific Name* [a]	Status[a] Fed/State/ CRPR	Geographic Distribution	Habitat Requirements	Blooming Period	Potential for Occurrence in the Project Area
Veiny monardella *Monardella douglasii* ssp. *venosa*	–/–/1B.1	Occurrences in the northern and central Sierra Nevada Foothills; also historically known from the Sacramento Valley	Cismontane woodland, valley and foothill grassland on heavy clay soils; 60-410 meters	May-Jul	None; no suitable habitat present in the project area.
Baker's navarretia *Navarretia leucocephala* ssp. *bakeri*	–/–/1B.1	Inner North Coast Ranges, western Sacramento Valley: Colusa, Glenn, Lake, Marin, Mendocino, Napa, Solano, Sonoma, Tehama, and Yolo Counties	Vernal pools and swales in woodland, lower montane coniferous forest, mesic meadow and grassland; below 1,740 meters	May–Jul	None; no suitable habitat present in the project area.
Sanford's arrowhead *Sagittaria sanfordii*	–/1B.2	Widespread but infrequent; reported from Del Norte, Fresno, Sacramento, Santa Barbara, and Ventura Counties	Sloughs and sluggish streams with silty or muddy substrate, associated with emergent marsh vegetation	May–June	Low to Moderate; potential habitat present along drainages that cross the gas pipeline alignment
San Francisco campion *Silene verecunda* ssp. *verecunda*	–/–/1B.2	Northern Central Coast, San Francisco Bay area: San Francisco, San Mateo, Santa Cruz, and Sutter Counties	Sandy soils in coastal bluff scrub, chaparral, coastal prairie, coastal scrub, valley and foothill grassland; 30-645 meters	Mar-Jun(Aug)	None; no suitable habitat present in the project area.
Wright's trichocoronis * *Trichocoronis wrightii* var. *wrightii*	–/–/2.1	Scattered locations in the Central Valley and southern coast; Texas	On alkaline soils in floodplains, meadows and seeps, marshes and swamps, riparian forest, and vernal pools; 5–435 meters	May–Sep	None; no suitable habitat present in the project area.

[a] Status explanations:

Federal

E = listed as endangered under the federal Endangered Species Act.
T = listed as threatened under the federal Endangered Species Act.
C = candidate: species for which USFWS has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposed rule to list, but issuance of the proposed rule is precluded.
– = no listing.

State

E = listed as endangered under the California Endangered Species Act.
T = listed as threatened under the California Endangered Species Act.
FP = designated as fully protected under the California Fish and Game Code.
C = candidate for threatened or endangered status under CESA
– = no listing.
SSC = California Species of Special Concern

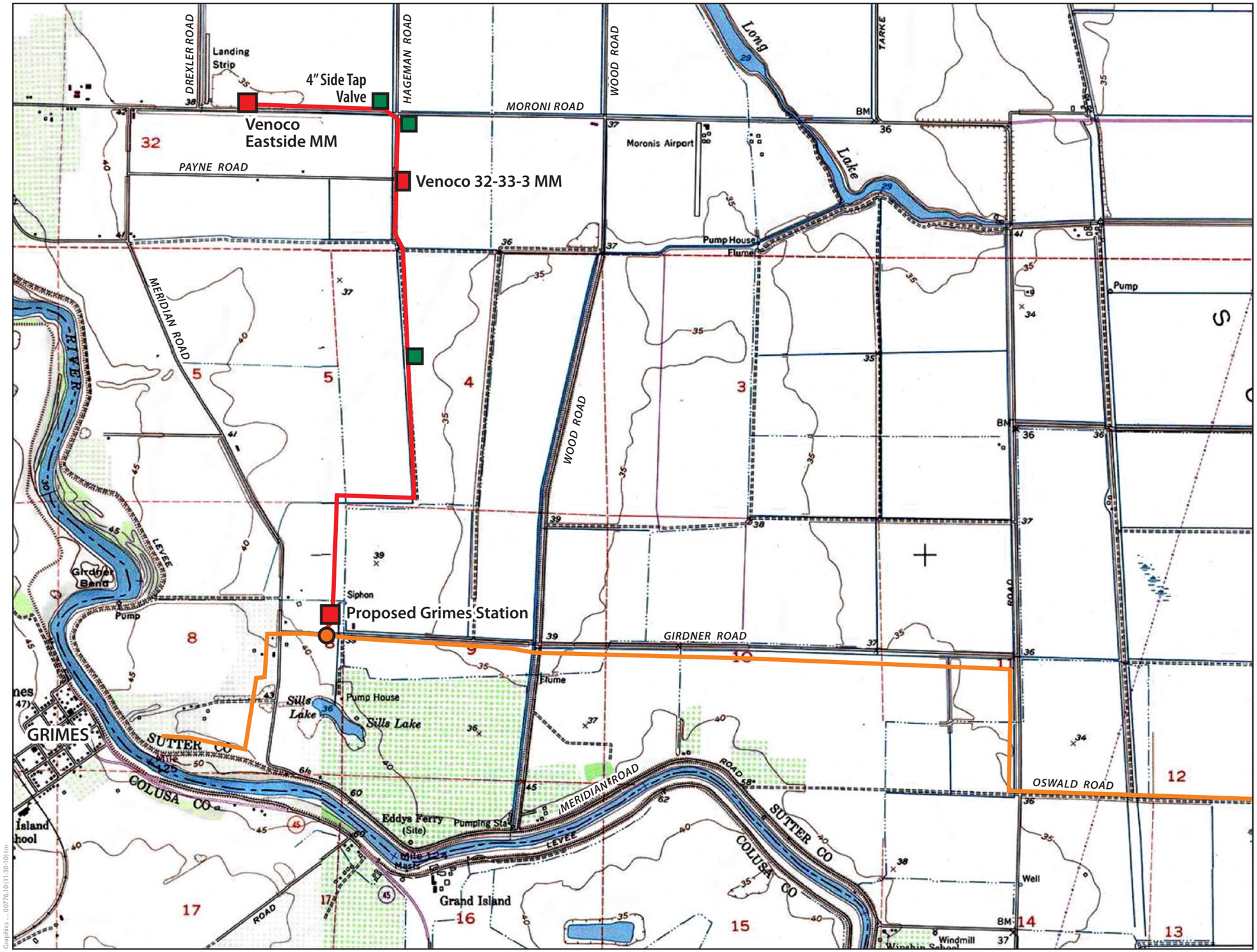
California Rare Plant Rank (Formerly California Native Plant Society [CNPS] List)

1B = List 1B species: rare, threatened, or endangered in California and elsewhere.
2 = List 2 species: rare, threatened, or endangered in California but more common elsewhere.

CRPR Code Extensions

.1 = seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat

Common Name *Scientific Name* [a]	Status[a] Fed/State/ CRPR	Geographic Distribution	Habitat Requirements	Blooming Period	Potential for Occurrence in the Project Area
.2 = fairly endangered in California (20- 80% of occurrences threatened)					
.3 = not very endangered in California (<20% of occurrences threatened or not current threats known)					



Legend

- Proposed 6-inch Natural Gas Pipeline
- Existing 20-inch Sutter Energy Center Gas Pipeline
- Below Ground Hot Tap and Valve
- Proposed Construction Laydown Area
- Venoco's Existing Master Meter Sites and Proposed Grimes Station Site

N

1,000 0 1,000 2,000 3,000 4,000

feet

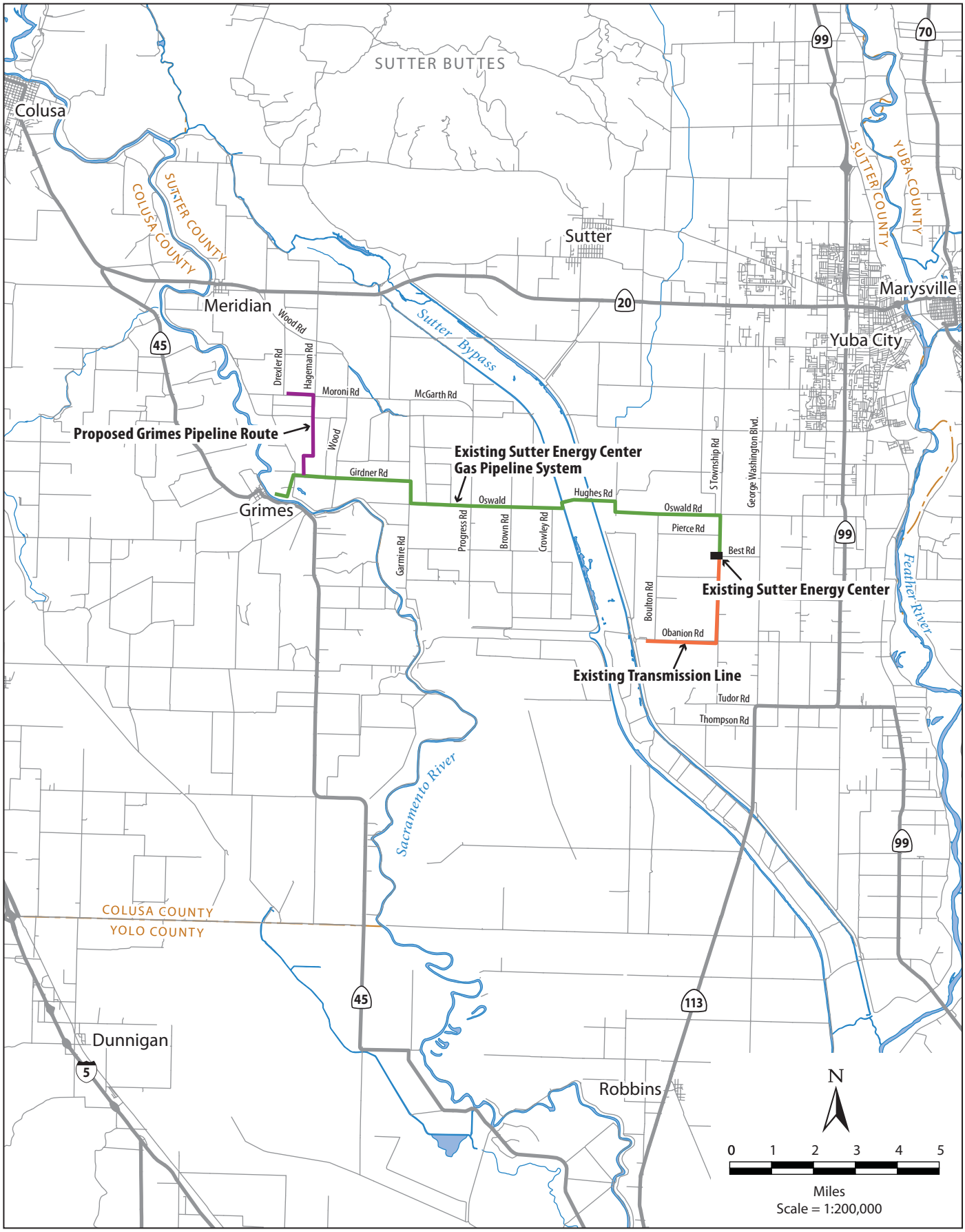
Scale = 1:24,000

Base Map:
National Geographic TOPO
Gilsizer Slough, CA (1973), Tilsdale Weir, CA (1973)

Graphics... 0077610 (11-30-10).cnm

ICF INTERNATIONAL

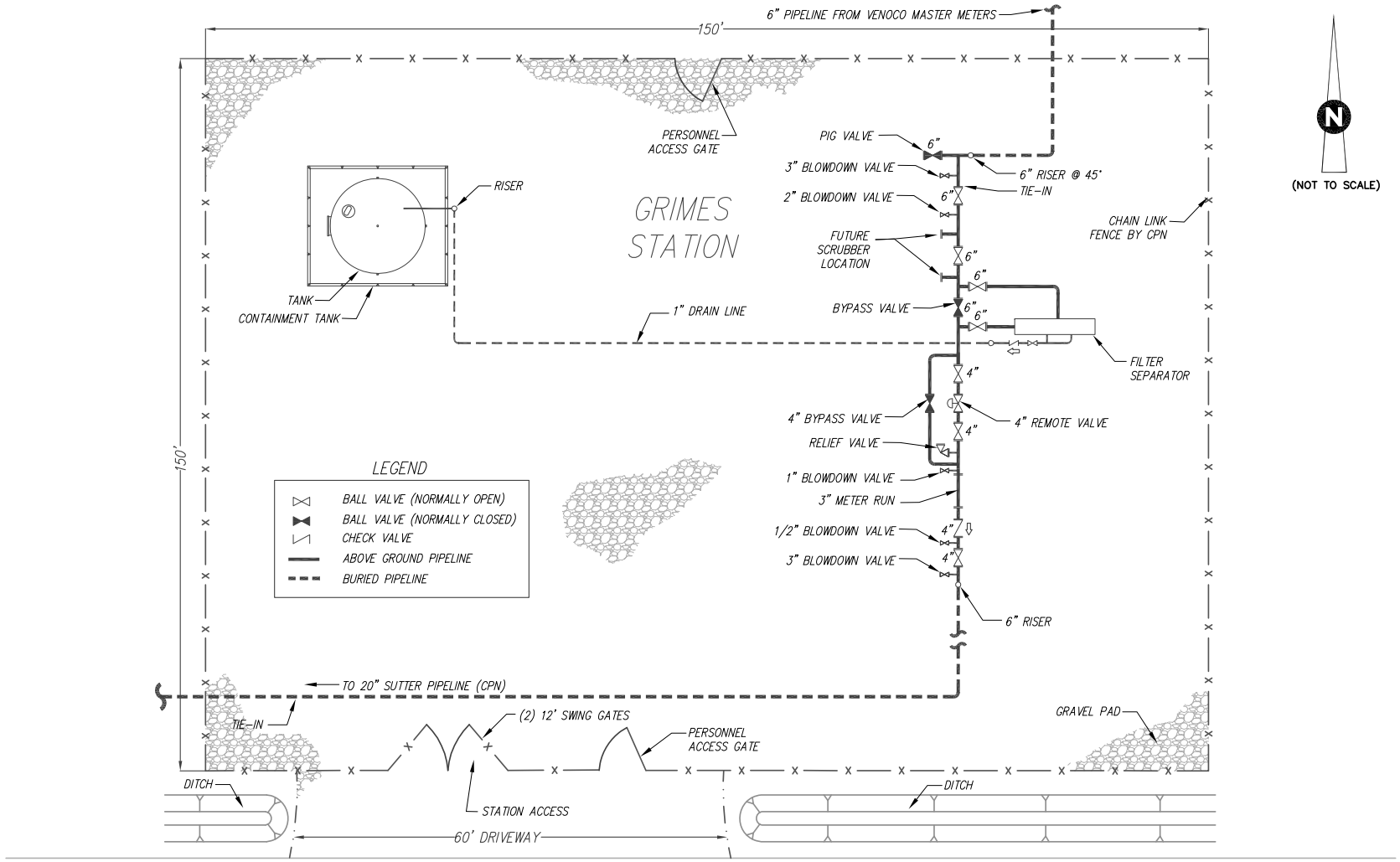
Figure 1
Grimes Pipeline Project Location



Graphics ... 00776:10 (12-9-10).tm

ICF INTERNATIONAL

Figure 2
Grimes Pipeline Project Vicinity



PREPARED BY:

GTS ENGINEERING & CONSULTING

130 Amber Grove Drive, Suite 134
Chico, Ca 95973; (530)893-6711

CPN PIPELINE

60 RIVER RD.
RIO VISTA, CA 94571

Graphics ... 00776.10 (11-30-10) tm

ICF INTERNATIONAL

Figure 3
Grimes Station Layout

Table 2. Biological Resource Survey Dates

Biological Resource Survey Purpose	Date of Fieldwork
Wetland Delineation	October 20, 2010
Wildlife and Botanical Survey and Habitat Assessment	October 20, 2010
Habitat Evaluation for Giant Garter Snake	November 24, 2010
Habitat Evaluation and Survey for Raptor Nests within 0.5-mile of the Project Components	December 23 2010

A description of the special-status and wetland surveys that have been conducted to support this biological resources section is provided below.

Special-Status Species

Special-status species refers to plant, animal, and fish species that are legally protected under the Federal Endangered Species Act (ESA), California Endangered Species Act (CESA), or other regulations, as well as species considered sufficiently rare by the scientific community to qualify for such listing. Special-status species include species, subspecies, or varieties that meet one or more of the following criteria.

- Species listed or proposed for listing as threatened or endangered under the ESA (50 CFR 17.12 [listed plants]; 50 CFR 17.11 [listed animals]; various notices in the FR [proposed species]).
- Species that are candidates for possible future listing as threatened or endangered under the ESA (74 FR 57804–57878, November 9. 2009).
- Species listed or proposed for listing by the State of California as threatened or endangered under the CESA (14 CCR 670.5).
- Species that meet the definitions of rare or endangered under the California Environmental Quality Act (CEQA) (CEQA Guidelines Section 15380).
- Plants listed as rare under the California Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.).
- Plants that meet the definitions of rare or endangered under CEQA (State CEQA Guidelines Section 15380[b], [c], and [d]), plants that may meet this definition include:
    - plants ranked as "rare, threatened, or endangered in California" (California Rare Plant Rank [CRPR] 1B and 2[1]); and
    - plants that may warrant consideration on the basis of local significance or recent biological information (State CEQA Guidelines Section 15380[d]), that may include CRPR 3 (plants about which more information is needed to determine their status) and Rank 4 (plants of limited distribution)
    - some plants included on the CNDDB *Special Plants, Bryophytes, and Lichens List* (current list available: http://www.dfg.ca.gov/biogeodata).

[1] California Department of Fish and Game recently changed *CNPS Rank* to *California Rare Plant Rank*; the name change does not change the definitions and the review and rank assignment process.

- Species that are considered locally significant, that is, a species that is not rare from a statewide perspective but is rare or unique in a local context such as within a county or region (CEQA §15125 [c]) or is so designated in local or regional plans, policies, or ordinances (CEQA Guidelines, Appendix G).
- Animal species of special concern to CDFG, as identified and defined in the CNDDB (California Natural Diversity Database 2010).
- Animals fully protected in California (California Fish and Game Code Sections 3511 [birds], 4700 [mammals], and 5050 [amphibians and reptiles]).

Wildlife Surveys

Wildlife surveys and habitat assessments were conducted by ICF wildlife biologists (Bud Widdowson and Steve Avery) during the fall months of 2010. The records search of the CNDDB and the USFWS list of threatened or endangered species provided information on sensitive species that could be affected in the Grimes Pipeline Project area and up to 10 miles around the Project right-of-way and Grimes Station site.

Field notes from the wildlife surveys were recorded on data sheets and/or in a field notebook. All wildlife species observed in the study area, as well as species flying over the Project area, were recorded during the field surveys. A list of these species observed during the field visits is provided in Table 3.

Field surveys for Swainson's hawk and other potential raptor nest sites and foraging areas were conducted within 0.5-mile of the Project area. Riparian corridors along the unmanaged ditches in the southern portion of the Project area, as well as mature trees along county roads, farm roads, canals, and ditches within 0.5 mile of the Project area, were surveyed in December 2010. Surveys were conducted by vehicle or by foot using binoculars and spotting scope. All Swainson's hawk nest locations recorded in CNDDB and additional occurrences obtained from CDFG (Paul Hoffman pers comm.) were located and evaluated.

An assessment of suitable aquatic and upland habitat for giant garter snake was conducted on November 24, 2010. The extensive network of irrigation canals and ditches in the Grimes Pipeline Project region is considered suitable habitat for the giant garter snake (DeWeese, pers. Comm. 1997, Wylie et al. 1997, Federal Register 1993). With the abundance of recorded data that indicates populations of giant garter snakes inhabit the rice fields in Sutter County, they were assumed to be present in the study area. Potential habitat and impacts associated with the proposed Project are documented in the *Draft Biological Assessment for the Grimes Pipeline Project, Sutter County, California* (ICF 2011) (Appendix D of the Amendment).

Botanical Surveys

After conducting a reconnaissance-level survey of the Project area and reviewing existing information (including the CNDDB occurrence records), ICF botanists (Margaret Widdowson and Kate Carpenter) determined that the botanical surveys should focus on natural habitats that support suitable conditions for special-status plants known to occur in the Project region. CDFG's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (California Department of Fish and Game 2009) state that it is appropriate to conduct a botanical field survey to determine if, or to the extent that, rare, threatened, or endangered plants will be affected by a proposed Project when:

Table 3. Species Observed in the Biological Study Area (in-progress)

Scientific Name	Common Name
Vascular Plants	
Ferns and Fern-allies	
Azolla filiculoides	mosquito fern
Trees	
Juglans californica var. *hindsii*	California black walnut
Populus fremontii ssp. *fremontii*	Fremont cottonwood
Quercus lobata	valley oak
Salix gooddingii	black willow
Shrubs and Woody Vines	
Baccharis pilularis	coyote bush
Rubus armeniacus [*R. discolor*] *	Himalayan blackberry
Salix lasiolepis	arroyo willow
Salix exigua	sandbar willow
Sambucus nigra ssp. caerulea [S. mexicana]	blue elderberry
Toxicodendron diversilobum	poison-oak
Vitis californica	California grape
Forbs	
Abutilon theophrasti *	velvet-leaf
Achyrachaena mollis	blow-wives
Alisma lanceolatum *	lanceleaf water plantain
Alisma plantago-aquatica	water plantain
Ambrosia psilostachya	western ragweed
Brassica nigra *	black mustard
Capsella bursa-pastoris *	shepherd's purse
Centaurea solstitialis *	yellow star-thistle
Chamaesyce maculata *	spotted spurge
Convolvulus arvensis *	field bindweed
Conyza canadensis	Canadian horseweed
Datura ferox (quercifolia) *	Chinese thornapple
Eclipta prostrata	false daisy
Epilobium ciliatum ssp. *ciliatum*	hairy willowherb
Erodium botrys *	stork's-bill
Erodium cicutarium *	redstem filaree
Galium aparine *	goosegrass
Geranium dissectum *	cut-leaved geranium
Hirschfeldia incana *	Mediterranean hoary mustard
*Kickxia spuria**	fluellin
Lactuca serriola *	prickly lettuce
Lamium sp. *	henbit
Lemna minuta	minute duckweed
Lotus corniculatus *	birdfoot trefoil

Scientific Name	Common Name
Ludwigia peploides ssp. *montevidensis* *	floating water-primrose
Malva neglecta *	common mallow
Malvella leprosa	alkali mallow
Marrubium vulgare *	horehound
Medicago sp. *	burclover
Melilotus alba *	white sweetclover
Physalis lancifolia *	narrowleaf tomatillo
Plantago lanceolata *	English plantain
Plantago major *	common plantain
Polygonum arenastrum *	common knotweed
Polygonum lapathifolium	willow smartweed
Rumex crispus *	curly dock
Senecio vulgaris *	common groundsel
Silybum marianum *	milk thistle
Sonchus asper ssp. *asper* *	prickly sowthistle
Sonchus oleraceus *	common sowthistle
Stellaria media *	common chickweed
Torilis arvensis *	hedge parsley
Torilis nodosus *	knotted hedge parsley
Verbena bonariensis *	purpletop vervain
Urtica urens *	dwarf nettle
Veronica peregrina ssp. *xalapensis*	purslane speedwell
Vicia sp.	cultivated vetch
Vicia sativa *	spring vetch
Grasses and Grass-like Plants	
Avena barbata *	slender wild oat
Bromus diandrus *	ripgut brome
Bromus hordeaceus *	soft chess
Bromus madritensis ssp. *madritensis* *	Spanish brome
Crypsis sp.	pricklegrass
Cynodon dactylon *	Bermuda grass
Cyperus esculentus	nutsedge
Cyperus eragrostis	umbrella sedge
Distichlis spicata	saltgrass
Echinochloa colona *	jungle-rice
Echinochloa crus-galli *	barnyard grass
Hordeum murinum ssp. *leporinum* *	wall barley
Leptochloa fascicularis	bearded sprangletop
Lolium multiflorum [*L. perenne*] *	Italian ryegrass
Oryza sativa *	cultivated rice
Paspalum dilatatum	dallis grass

Scientific Name	Common Name
Phalaris aquatica *	Harding grass
Poa annua *	annual bluegrass
Polypogon interruptus *	ditch rabbitsfoot grass
Polypogon monspeliensis *	rabbitsfoot grass
Scirpus acutus var. *occidentalis*	common tule
Scirpus mucronatus *	ricefield bulrush
Setaria pumila *	yellow bristle grass
Sorghum halepense *	Johnsongrass
Triticum aestivum *	cultivated wheat
Typha angustifolia	narrowleaf cattail
Typha latifolia	broadleaf cattail
Vertebrate Animals	
Birds	
Ardea herodias	Great Blue Heron
Ardea alba	Great Egret
Cygnus columbianus (fly-over)	Tundra Swan
Circus cyaneus	Northern Harrier
Accipiter cooperi	Cooper's Hawk
Buteo lineatus	Red-shouldered Hawk
Buteo jamaicensis	Red-tailed Hawk
Falco sparverius	American Kestrel
Callipepla californica	California Quail
Zenaida macroura (fresh feathers)	Mourning Dove
Tyto alba	Barn Owl
Melanerpes formicivorus	Acorn Woodpecker
Picoides pubescens	Downy Woodpecker
Picoides nuttallii	Nuttall's Woodpecker
Colaptes auratus	Northern Flicker
Sayornis nigricans	Black Phoebe
Aphelocoma californica	Western Scrub-Jay
Pica nuttalli	Yellow-billed Magpie
Corvus corax	Common Raven
Baeolophus inornatus	Oak Titmouse
Thryomanes bewickii	Bewick's Wren
Regulus calendula	Ruby-crowned Kinglet
Mimus polyglottos	Northern Mockingbird
Dendroica coronata	Yellow-rumped Warbler
Pipilo maculatus	Spotted Towhee
Pipilo crissalis	California Towhee
Passerculus sandwichensis	Savannah Sparrow
Melospiza melodia	Song Sparrow

Table 3. Continued

Scientific Name	Common Name
Melospiza lincolnii	Lincoln's Sparrow
Zonotrichia leucophrys	White-crowned Sparrow
Zonotrichia atricapilla	Golden-crowned Sparrow
Junco hyemalis	Dark-eyed Junco
Agelaius phoeniceus	Red-winged Blackbird
Sturnella neglecta	Western Meadowlark
Euphagus cyanocephalus	Brewer's Blackbird
Carpodacus mexicanus	House Finch
Mammals	
Odocoileus californicus (fresh sign)	Black-tailed deer
Sylvilagus audubonii	Audubon's cottontail
Procyon lotor (fresh sign)	Raccoon
Felis familiaris	Feral cat
Reptiles	
Hyla regia (heard)	Pacific Chorus Frog

1. Natural vegetation occurs on the site, it is unknown if rare, threatened, or endangered plants or habitats occur on the site, and the proposed Project have the potential for direct or indirect effects on vegetation; or
2. Rare plants have historically been identified on the Project site, but adequate information for impact assessment is lacking.

The Project area is primarily agricultural lands and supports very little natural habitat. Although there are several known occurrences of special-status plants and communities west of the Project area along the Sacramento River, there is little to no suitable habitat in the Project area itself. Therefore, the botanical surveys focused on areas in the Project footprint that contained natural habitats, specifically unmanaged canals and ditches supporting freshwater marsh and mature riparian vegetation. These communities were identified as having some level of potential to support two special-status plants woolly rose-mallow (*Hibiscus lasiocarpus*) and Sanford's sagittaria (*Sagittaria sanfordii),* which were identified as having potential to occur in the Project area and therefore were the focus of the late season field survey. No pedestrian surveys were conducted in developed areas or agricultural fields, which have no potential to support special-status plants. This approach is consistent with the CDFG survey guidelines referenced above. The ICF botanists determined that the fall surveys were done at an appropriate time to identify special-status plants having the potential to occur in the region. A list of plant species observed during the field surveys is provided in Table 3.

Waters of the United States, Including Wetlands Delineation

The term *waters of the United States* is an encompassing term used by USACE for areas that are subject to federal regulation under Section 404 of the federal Clean Water Act (CWA). Waters of the United States are categorized as *wetlands* or *other waters of the United States*. Each of these categories is described below.

USACE defines *wetlands* as areas that are inundated or saturated by surface water or groundwater at a frequency and duration that is sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR 328.3[b]; 40 CFR 230.3). For a wetland to qualify as a jurisdictional aquatic site, and therefore be subject to regulation under CWA Section 404, it must support a prevalence of hydrophytic vegetation, hydric soils, and wetland hydrology.

On January 9, 2001, a federal court ruling in *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers* (121 S.CT. 675,2001) (SWANCC ruling) resulted in a determination that isolated wetlands (e.g., vernal pools) are no longer regulated by USACE under CWA Section 404. Counsel for EPA and USACE published guidance on "[n]on-navigable, isolated [and] intrastate waters" on January 19, 2001, in response to the ruling. The guidance essentially resulted in a determination that USACE does not regulate non-navigable, isolated waters. Jurisdictional status would be considered as part of the wetland delineation and future permitting process for the proposed Project.

Other waters of the United States are sites that typically lack one or more of the three wetland indicators identified above. Other waters of the United States that occur in the Project area include open water portions of agricultural ditches and canals.

On October 20, 2010, a wetland team (consisting of a botanist, Kate Carpenter, and soils scientist, Joel Butterworth) conducted a wetland delineation in the study area. A detailed description of the methods used to delineate waters of the United States, including wetlands, is provided in the

wetland delineation report (ICF 2010) (Appendix F of the Amendment). The delineation report was submitted to USACE on December 20, 2010 for verification and to support acquisition of the CWA Section 404 permit compliance for the proposed Project. USACE verified the wetland delineation report and maps on January 12, 2011. USACE issued a Preliminary Determination letter on February 8, 2011. The delineation of wetlands and other water bodies was based primarily on field survey data collected in October 2010 and on interpretation of 2010 aerial photographs.

Existing Biological Conditions

As described previously, the Project area is located in northwestern Sutter County in the central part of the Sacramento Valley. It lies between the Colusa and Sutter Basins and approximately 13 miles west of Yuba City. The Sacramento River is located approximately 0.7 mile from the proposed Grimes Station location, and supports riparian communities and emergent marsh line along its banks.

The Project area has been substantially altered by agricultural activities and supports very little natural vegetation. The Project area is predominantly rice, with small areas of row crops, orchards, and other agricultural operations. Large wetland systems are present north and south of the Project area in the Sacramento and Delevan National Wildlife Refuges (NWRs). Prior to agricultural conversion, the Project area was probably dominated by grassland prairie interspersed with marshy areas, with riparian woodland along the Sacramento River and terraces. These grasslands would have been dominated by perennial native bunchgrasses such as purple needlegrass, nodding stipa, blue wildrye, and California brome. The historical bunchgrass prairie was largely replaced by annual and perennial exotics by the 1850s. The historical natural river levees that existed before flood control and reclamation efforts would have supported extensive riparian forests of valley oak, Fremont's cottonwood, and willows. These former levee areas are now largely converted to orchards.

The Project area contains an extensive network of constructed canals that convey irrigation water and provide drainage for crops. Most of the canals are maintained regularly to remove sediment and vegetation. Some of the irrigation canals support wetland vegetation that provide essential wildlife habitat, especially for the federally threatened giant garter snake. These ditches and canals appear to drain in a generally southerly direction, some of which may drain to Sills Lake, located approximately 1,200 feet south of the Project area. Other drainage water from the Project area may reach a toe drain along the east levee of the Sacramento River, where water is pumped into the river at certain times of the year.

The Project area provides habitat for breeding and foraging wildlife species. The region supports significant populations of resident and migratory wildlife species. Located in the Pacific Flyway, the Project area and vicinity provides significant winter foraging habitat for migratory waterfowl in the including Aleutian Canada goose, greater sandhill crane, tundra swan, greater white-fronted goose, and a diversity of ducks. Wintering raptors, such as bald eagle, also forage here. Rice farmers in the region manage flooded rice fields during the winter for waterfowl hunting.

The major vegetation communities and associate wildlife habitat documented in the study area are described below.

Disturbed Annual Grassland

Disturbed annual grassland is a relatively uncommon community in the study area, occurring primarily along drainages and road edges. Disturbed annual grasslands consist of sparse covers of annual grasses that often grow in association with a variety of showy annual forbs (both native and non-native). Germination occurs with the onset of the late fall rains. Growth, flowering, and seed-set occur from winter through spring. Common plant species include wild oats (*Avena* spp.), bromes (*Bromus* spp.), annual fescues (*Vulpia* spp.), barbed goatgrass (*Aegilops triuncialis*), Italian ryegrass (*Lolium multiflorum*), mustards (*Brassica* spp.), filarees (*Erodium* spp.), yellow star-thistle (*Centaurea solstitialis*), and other forbs.

Most of the grasslands in the Project area are heavily disturbed from agricultural and development activities. Such disturbance increases the number of non-native and invasive plant species present, reduces the quality of the habitat for wildlife, and decreases the number of different species expected to occur in this community. However, some grasslands (depending on the location and extent of habitat) support habitat for insects, amphibians, reptiles, and small birds and mammals, including red-tailed hawks (*Buteo jamaicensis*), golden eagles (*Aquila chrysaetos*), northern harriers (*Circus cyaneus*), American kestrels (*Falco sparverius*), great-horned owls (*Bubo virginianus*), California voles (*Microtus californicus*), deer mice (*Peromyscus* spp.), California ground squirrels (*Spermophilus beecheyi*), American badger (*Taxidea taxus*), and coyotes (*Canis latrans*).

Agricultural Land

For the purpose of this report, agricultural lands include both currently cultivated lands (rice, row crops, orchards) and fallow fields. As shown in the Project maps (Appendix A of the Amendment), rice fields are the dominant agricultural crop in the Project area and are used by a variety of wildlife, depending on the geographic area and adjacent habitats. Ground nesting birds, including waterfowl and pheasant, nest in and adjacent to agricultural fields if adequate residual vegetation is present at the beginning of the nesting season. Flood irrigation of rice fields provides feeding and roosting sites for shorebirds, wading birds, waterfowl, and raptors. Amphibians such as Pacific treefrogs (*Hyla regilla*) may breed if water is present for a sufficient amount of time; such amphibians would also provide a food source for great blue herons (*Ardea herodias*), egrets (*Egretta* spp.), and long-billed curlews (*Numenius americanus*).

Giant garter snakes (*Thamnophis gigas*) (a species listed as threatened under ESA and CESA) forage in rice fields seasonally when the rice has grown tall enough to provide shelter. When rice fields are drained prior to harvest, giant garter snakes move out of the rice fields and into the canals and ditches to feed on the prey animals that have retreated from the rice fields into the canals and ditches (Brode and Hansen 1992). Agricultural lands in the Project area provide limited habitat for terrestrial vertebrates because of the lack of cover and frequent ground disturbance. Consequently, the diversity of native species on agricultural lands is likely much lower than on less-disturbed grasslands to the north and east. Agricultural lands nonetheless support various wildlife species and seasonally attract large numbers of some bird species. Amphibians and reptiles are poorly represented in agricultural lands of the Project study area.

Croplands provide foraging habitat for several bird species common to the Central Valley, including Brewer's blackbirds (*Euphagus cyanocephalus*), mourning doves *(Zenaida macroura*), American crows (*Corvus brachyrhynchos*), and European starlings (*Sturnus vulgaris*). Winter migrants that could occur include American pipits (*Anthus rubescens*), white-crowned sparrows (*Zonotrichia*

leucophrys), and occasional mountain bluebirds (*Sialia currucoides*). Red-tailed hawks and turkey vultures (*Cathartes aura*) are commonly seen foraging over the study area at various times of the year. Swainson's hawk (*Buteo swainsoni*) (state listed as threatened), northern harrier (species of special concern), and white-tailed kite (*Elanus leucurus*) (fully protected) forage in croplands.

Several mammal species likely occur in the agricultural lands, even though the lands are heavily disturbed. House mice (*Mus musculus*), deer mice, California voles, and Botta's pocket gophers (*Thomomys bottae*) likely occur in limited numbers and attract predators such as Pacific gopher snakes (*Pituophis catenifer*) and red-tailed hawks.

Fremont Cottonwood Riparian Woodland

Fremont cottonwood riparian woodland is the only riparian community in the study area and occurs along a seasonal drainage at the southern end of the Project area. The community is dominated by Fremont cottonwood (*Populus fremontii* ssp. *fremontii*), valley oak (*Quercus lobata*), and black willow (*Salix gooddingii*). Common associate species are umbrella sedge (*Cyperus eragrostis*), Bermuda grass (*Cynodon dactylon*), Dallis grass (*Paspalum dilatatum*), and Himalayan blackberry (*Rubus armeniacus*, formerly *R. discolor*).

Despite widespread disturbances resulting from urbanization, agricultural conversion, and grazing, riparian habitats remain important wildlife resources. Scarce both regionally and statewide, riparian habitats are used by a large variety of wildlife species. This habitat supports abundant aquatic and terrestrial invertebrates that are prey for amphibians and reptiles such as common garter snakes (*Thamnophis sirtalis*), western skinks (*Eumeces sklitonianus*), and ringneck snakes (*Diadophis punctatus*), and for insectivorous birds such as warblers, northern flickers (*Colpates auratus*), downy woodpeckers (*Picoides pubescens*), and flycatchers. Small mammals found in riparian habitats include shrews, voles, bats, and mice. Raptors that prey on these small mammals and nest in large riparian trees include great-horned owls, red-tailed hawks, and American kestrels. Cavity-dependant species such as woodpeckers, bats, squirrels, and raccoons (*Procyon lotor*) require mature stands of trees. Striped skunks (*Mephitis mephitis*), red foxes (*Vulpes vulpes*), gray foxes (*Urocyon cinereoargentatus*), and badgers forage in riparian habitats and use them for cover and travel.

Valley elderberry longhorn beetle (VELB) (*Desmocerus californicus dimorphus*) (federally listed as threatened) and Swainson's hawk are both known to occur in riparian habitat along the Sacramento River, west of the Project area. Patches of Himalayan blackberry along drainages in the Project area provide suitable nesting habitat for colonies of tricolored blackbird (*Agelaius tricolor*) (species of special concern) (DeHaven et al. 1975). One elderberry shrub was located in the riparian corridor during 2010 surveys.

Emergent Wetland

Like riparian communities, emergent wetlands are primarily associated with drainages that cross through the Project area. The acreage of emergent wetlands is included in the acreage for drainages because these wetlands occur below the ordinary high water mark of these features.

In the study area, emergent wetland are dominated by cattail (*Typha* sp.) and common tule (*Scirpus acutus* var. *occidentalis*). Common associate species are umbrella sedge (*Cyperus eragrostis*), Bermuda grass (*Cynodon dactylon*), and Dallis grass (*Paspalum dilatatum*).

Emergent wetlands are among the most productive wildlife habitats in California, providing food, cover, and water for more than 160 species of birds and numerous mammals, reptiles, and amphibians occupying the open water and adjacent grassland habitats (Mayer and Laudenslayer 1988). Vegetation growing along the edges of water bodies also provides nesting habitat for several bird species (e.g., waterfowl, red-winged blackbird [*Agelaius phoenicius*], American bittern [*Botaurus lentiginosus*], marsh wren [*Cistothorus palustris*], song sparrow [*Melospiza melodia*]).

Giant garter snakes forage in emergent wetlands. Tricolored blackbirds may nest in seasonal wetlands with stands of cattail or bulrush that are large enough to support a nesting colony (typically more than 50 pairs). Preferred foraging habitats include rice, alfalfa, irrigated pasture and annual grasslands (Beedy and Hamilton 1999).

Drainage

For the purpose of this document, the term *drainage* includes natural and artificially created features with a well-defined bed and bank and flowing water at some time of the year. In the study area, these drainages include irrigation ditches and canals. Unless they are actively maintained, these drainages typically support emergent wetlands. Drainages with wetland vegetation below the ordinary high water mark (OHWM) are referred to as "wetland drainages" and are typically dominated by emergent wetland vegetation. Drainages that lack wetland vegetation below the OHWM are referred to as "other waters drainages".

The wildlife value of the drainages that occur in the Project study area ranges from high to low. Most of the drainages have high to moderate wildlife value because streamside vegetation provides cover and foraging habitat. Amphibians, including Pacific tree frog and the non-native bullfrog, were observed in drainages during field surveys, and striped skunk, raccoon, and coyote may use drainages for foraging. Giant garter snakes occur in irrigation ditches and canals and adjacent uplands. Northwestern pond turtle (*Actinemys marmorata*) may use areas where there are pools with some vegetative cover such as willows or emergent vegetation and exposed branches or rocks to use as basking sites.

Irrigation and roadside ditches that are actively maintained by the landowner and have low wildlife value because they are narrow; lack vegetative cover; and are adjacent to development, paved roads, and agricultural roads. Additionally, feral and domestic cats, automobile traffic, and agricultural practices reduce wildlife use in these areas.

The potential for drainages in the Project area to support high quality habitat for fish is relatively low. Most of the drainages have relatively poor water quality because of the heavy pesticide and herbicide use in the area.

Waters of the United States, Including Wetlands

Based on the data collected during the field surveys and verification from the USACE, the study area contains 292.125 acres of wetlands and other water bodies (Table 4).

Table 4. Acreage of Waters of the United States, Including Wetlands, Delineated in the Biological Study Area

Feature	Type	Acreage
Wetland drainage (WD)	Wetland	2.569
Riparian drainage (RD)	Wetland	0.342
Rice field wetland (RFW)	Wetland	281.017
Wetlands subtotal		283.928
Other waters drainage (OWD)	Other water body	8.197
Other water bodies subtotal		8.197
Total		292.125

A brief description of these waters of the United States is provided below. A more detailed description is provided in the wetland delineation report (ICF 2010) (contained in Appendix F of the Amendment).

Rice Field Wetland

Rice field wetlands (also referred to by the USACE as "irrigated wetlands"), totaling 281.017 acres, were mapped in the study area. The rice field wetlands consist of large, laser-leveled or contour-checked fields that are bordered by low levees or rice checks. They are fully vegetated while rice is being produced and partly vegetated by volunteer species when fallow.

Rice field wetlands consist of a near monoculture of cultivated rice (*Oryza sativa*) when rice is being produced. Common associate species, typically occurring only along the edges of the rice fields where the water depth is slightly shallower, include umbrella sedge (*Cyperus eragrostis*) and broad-leaved cattail (*Typha latifolia*).

The rice field wetlands appear to be supported by flood irrigation, incident precipitation, and possibly by a shallow water table.

Wetland Drainage

Twelve wetland drainages, totaling 2.569 acres, were mapped within the study area. These wetland drainages consist of artificial agricultural ditches and irrigation canals that overall have at least 5% vegetation cover; most have more than 50% vegetation cover.

The wetland drainages are typically dominated by cattail (*Typha* sp.) and common tule (*Scirpus acutus* var. *occidentalis*). Common associate species are umbrella sedge (*Cyperus eragrostis*), Bermuda grass (*Cynodon dactylon*), and Dallis grass (*Paspalum dilatatum*).

The wetland drainages have a well-defined bed and bank and have been excavated to depths of approximately 3–7 feet. They appear to be supported by irrigation tailwater from rice fields and high groundwater. At least some of the wetland drainages appear to be subject to periodic dredging, such that much or all of the vegetation is removed. All the wetland drainages appear to eventually flow into Sills Lake or the Sacramento River, the latter by means of pumping over the Sacramento River levee.

Riparian Drainage

One riparian drainage, totaling 0.342 acre, was mapped within the study area. Riparian drainages consist of artificial agricultural ditches that are overall more than 75% vegetated.

The riparian drainages have a well-defined bed and bank and have been excavated to depths of approximately 5–6 feet. They appear to be supported by irrigation tailwater from rice fields and high groundwater. None of the riparian drainages appear to be subject to frequent dredging. All the riparian drainages appear to flow eventually into Sills Lake or the Sacramento River, the latter by means of pumping over the Sacramento River levee.

Other Waters Drainage

Twelve other waters drainages, comprising approximately 8.197 acres, were mapped in the study area and appear to qualify as other waters. These features consist of drainage ditches and irrigation canals that are less than 5% vegetated.

The other waters drainages have been excavated to depths of approximately 4–7 feet. The other waters drainages appear to be supported by one or more of the following: irrigation water delivered directly to the feature, tailwater from rice fields, and shallow groundwater. Nearly all the other waters drainages appear to be subject to periodic dredging, such that much or all of the vegetation is removed. All the other waters drainages appear to flow eventually into Sills Lake or the Sacramento River, the latter by means of pumping over the Sacramento River levee.

Special-Status Species

Table 1 lists the special-status species that were identified during the pre-field effort as having the potential to occur in the Project region. Figure 4 shows the location of special-status species that have been documented in the Project region. No special-status plants have been documented in the Project area and none were located during the surveys conducted by ICF in fall of 2010. Therefore, special-status plants are not discussed further in this section.

Based on a review of existing information and habitat assessments conducted for the proposed Project, the Project area has the potential to support suitable habitat for several special-status wildlife species (Table 1), including giant garter snake, Swainson's hawk, valley elderberry longhorn beetle, tricolored blackbird, and western pond turtle. The Project area also supports suitable nesting habitat for a variety of special-status and common nesting raptors. Each of these species is described below.

Giant Garter Snake

The giant garter snake is a federally and state-listed threatened species (58 FR 54053–54065, October 20, 1993). The species inhabits marshes; sloughs; ponds; small lakes; and low-gradient waterways such as small streams, irrigation and drainage canals, and rice fields. Giant garter snakes feed on small fish, tadpoles, and frogs (Fitch 1940; Hansen 1988). The giant garter snake requires the habitat components listed below.

- Adequate water during the active season (early spring through mid-fall) to provide food and cover.

- Emergent wetland vegetation such as cattails (*Typha* spp.) and bulrushes (*Scirpus* spp.) to provide escape cover and foraging habitat.
- Grassy banks for basking.
- Higher elevation uplands for cover and refuge from winter floods during the dormant season (i.e., November to mid-March) (Hansen and Brode 1980; Hansen 1988; 58 FR 54053–54065, October 20, 1993).

Giant garter snakes are absent from large rivers and other water bodies that support introduced populations of large, predatory fish; wetlands with sand, gravel, and rock substrates; and natural and artificial waterways where weeds are controlled routinely, either mechanically or chemically, and where bank soils are compacted regularly (Hansen and Brode 1980; Rossman and Stewart 1987; Hansen 1988). Giant garter snakes are usually also absent from riparian woodlands because the woodlands have excessive shade and lack basking areas and prey populations (Hansen and Brode 1980).

The wetland habitats where giant garter snakes are known to occur contain permanent or seasonal water, mud bottoms, and vegetated dirt banks (Fitch 1940; Hansen and Brode 1980). In portions of the species' range where rice is grown, this species has adapted well to the vegetated artificial waterways used to flood rice fields (Hansen and Brode 1980). Prior to wetland reclamation, occupied habitats probably consisted of freshwater marshes and low-gradient streams. In the Project area, potential habitat occurs within the rice fields and drainages that occur within the proposed gas pipeline corridor. USFWS also considers adjacent uplands within 200 feet from the edge of suitable aquatic habitat as habitat for giant garter snake (U.S. Fish and Wildlife Service 1997). Rice fields and drainages provide aquatic habitat while the associated uplands provide suitable areas for basking and cover during the active season and cover for hibernation during the winter. Rice fields are important for giant garter snake because they provide a reliable prey base at the appropriate time of year when snakes are pregnant or giving birth.

Based on guidance from USFWS (Ben Watson) and CDFG (Jenny Marr) for other projects in the region, it was determined that rice fields, drainages, and other water bodies in the action area could provide potential aquatic habitat for giant garter snakes. It was also determined that the rice berms and adjacent earthen roads and fallow vegetated, agricultural fields (not unvegetated disked fields) within 200 feet of suitable aquatic habitat could provide suitable upland habitat for GGSs.

Based on the presence of known occurrences of giant garter snake in the Project region (Figure 4), it was determined that there is a high potential for this species to occur in the Project area.

Swainson's Hawk

Swainson's hawk is listed as threatened by CDFG, is a federal species of concern, and is protected under the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code Section 3503.5. The MBTA and Section 3503.5 prohibit the "take" of migratory birds, nests, and young. In the Central Valley, this hawk typically nests in oak or cottonwood trees in or near riparian habitats; in oak groves; in roadside trees; and in lone trees. Swainson's hawks prefer nesting sites that provide sweeping views of nearby foraging grounds consisting of grasslands, irrigated pasture, alfalfa, hay, and row and grain crops. Swainson's hawks are migratory, wintering from Mexico to Argentina and breeding in California and elsewhere in the western United States. The raptor generally arrives in the Central Valley in mid-March and begins courtship and nest construction immediately upon

Figure 4
CNDDB Record Search

Legend

- Project 10-Mile Buffer

CNDDB Records

- Plant
- Animal
- Terrestrial Community

Plants	Number of Occurences
Baker's navarretia	1
brittlescale	1
Colusa layia	2
Ferris' milk-vetch	1
heartscale	1
palmate-bracted bird's-beak	5
round-leaved filaree	1
San Francisco campion	1
San Joaquin spearscale	2
veiny monardella	1
woolly rose-mallow	6
Wright's trichocoronis	2

Animals	Number of Occurences
bank swallow	17
cackling (=Aleutian Canada) goose	5
California black rail	1
California linderiella	1
giant garter snake	20
greater sandhill crane	1
hoary bat	3
Marysville California kangaroo rat	2
pallid bat	1
Sacramento Valley tiger beetle	1
San Joaquin pocket mouse	1
Swainson's hawk	53
tricolored blackbird	8
valley elderberry longhorn beetle	2
vernal pool fairy shrimp	1
vernal pool tadpole shrimp	1
western pond turtle	1
western red bat	3
western yellow-billed cuckoo	1
white-faced ibis	1
Yuma myotis	1

Terrestrial Communities	Number of Occurences
Coastal and Valley Freshwater Marsh	1
Great Valley Cottonwood Riparian Forest	3
Great Valley Mixed Riparian Forest	4
Great Valley Willow Scrub	1
Northern Hardpan Vernal Pool	1

0 1 2 4 Miles

Area of Interest

ICF INTERNATIONAL

arrival at the breeding sites. The young fledge in early July, and most Swainson's hawks leave their breeding territories by late August or early September.

Swainson's hawks are known to nest and forage in the Project area. As shown in Figure 4, there are several documented nest sites along the Sacramento River corridor. Row crops provide suitable foraging habitat in the study area. Rice and fallow fields are not considered suitable foraging habitat. Based on the presence of known nest sites, there is a high potential for these hawks to nest and forage in the Project area.

Valley Elderberry Longhorn Beetle

VELB is federally listed as a threatened species (FR 45:52803) and is closely associated with blue elderberry, an obligate host for beetle larvae. During the field surveys, the locations of these two suitable elderberry shrubs were mapped and examined for evidence of VELB occupation. Suitable elderberry shrubs were considered to be all plants with stem diameters greater than or equal to 1.0 inch when measured at the base. Elderberry shrubs with diagnostic exit holes on the stems have hosted beetle larvae within recent past (typically, the last 3 to 5 years depending on stem size and growth) and are considered occupied habitat.

Two elderberry shrubs were located in the biological study area (Sheet 8 in Appendix A of the Amendment). One shrub is located in the riparian drainage within 100 feet of the gas pipeline construction corridor. The other shrub is located within the biological study area but is more than 100 feet from the construction area. No exit holes were observed in elderberry shrubs found during the field surveys. However, it was assumed that the elderberry shrubs could provide potential habitat for VELB.

Tricolored Blackbird

Tricolored blackbird is a federal species of concern and is protected under the federal Migratory Bird Treaty Act (16 U.S.C. 703B711); it is also a state species of special concern. Tricolored blackbird colonies have been documented in the Project region (Figure 4), but are not known to occur in the Project area (CNDDB 2010). There is a moderate potential for this species to nest in blackberry thickets along drainages at the southern end of the proposed gas pipeline corridor.

Western Pond Turtle

The western pond turtle (pond turtle) is a state species of special concern. Pond turtles inhabit aquatic habitats such as ponds, marshes, or streams with rocky or muddy bottoms and vegetative cover. They will occasionally leave the water to bask, and females leave the water from May through July to lay eggs as far as 0.25 mile from water.

Perennial irrigation ditches and drainages in the Project area provide potential breeding and movement corridors for pond turtles. Although suitable habitat is present, it is regularly disturbed for agricultural operations. Therefore, there is a low potential for pond turtles to occur in the Project area based on the disturbed habitat conditions and lack of pond turtle records in the Project region.

Other Special-Status and Non-Special-Status Migratory Birds and Raptors

Several non-special-status migratory birds (including waterfowl) and raptors could nest in and adjacent to the study area, based on the presence of suitable nesting habitat (wetlands and annual

grasslands). The breeding season for most birds is generally from February 16 to August 15. The occupied nests and eggs of these birds are protected by federal and state laws, including the MBTA and California Fish and Game Code Sections 3503 and 3503.5. CDFG is responsible for overseeing compliance with the codes and makes recommendations on nesting bird and raptor protection.

Several special-status migratory birds and raptors have either been documented in the Project region or habitat the potential to occur in the region (Table 1). Other non-special-status birds that were observed during the reconnaissance field surveys include red-tailed hawk, American kestrel, killdeer, western meadowlark (*Sturnella neglecta*), northern mockingbird (*Mimus polyglottos*), red-winged blackbird, western kingbird (*Tyrannus verticalis*), and mourning dove. These generally common species are locally and regionally abundant.

The Project region also provides habitat for resident and wintering waterfowl (including mallard, northern pintail [*Anas acuta*], cinnamon teal [*Anas cyanoptera*], ruddy duck [*Oxyura jamaicensis*], American wigeon [*Anas americana*], and northern shoveler [*Anas clypeata*]). These species are most abundant during winter (October through January) and are actively hunted by the numerous duck clubs located in the Project region.

Laws, Ordinances, Regulations and Standards

Table 5 describes the applicable LORS pertaining to biological resources for the Grimes Pipeline. The construction and operation of the Grimes Pipeline will conform with all applicable LORS related to biological resources.

Environmental Consequences

Potential impacts to biological resources were evaluated to determine direct and indirect effects associated with construction, operation, and maintenance of the proposed Grimes Pipeline Project, which includes the Grimes Station, the 2.8 mile long natural gas pipeline, and two existing master metering sites

Grimes Station

Construction

Construction of the access road to the Grimes Station Site would result in the placement of permanent fill material into an 8-foot-wide, artificially constructed drainage ditch, and the removal of one willow tree and two small willow shrubs. A culvert will be placed in this drainage during construction of the facility and water would continue to flow under the access road. This drainage ditch carries seasonal flows and was delineated as a waters of the United States based on the presence of a defined bed and bank and prevalence of wetland vegetation (ICF 2010). The drainage was not considered suitable aquatic habitat for giant garter snake or western pond turtle because it carries seasonal winter and irrigation runoff and does not contain water during the summer and early fall months when such species as giant garter snake inhabit aquatic areas. This impact would not be considered a substantial adverse effect on federally protected wetlands, as defined by CWA Section 404 because of the disturbed condition of the drainage, minimal habitat functions provided by the drainage, and the acreage of impact is so small (0.01 acre). However, Calpine will mitigate for

Table 5. Applicable Laws, Ordinances, Regulations and Standards Pertaining to Biological Resources

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance
Federal					
Endangered Species Act of 1973 and implementing regulations, Title 16 United States Code (USC) §1531 et seq. (16 USC 1531 et seq.), Title 50 Code of Federal Regulations (CFR) §17.1 et seq. (50 CFR 17.1 et seq.).	Designates and protects USFWS federally threatened and endangered plants and animals and their critical habitat.	USFWS	Issues BO with Conditions after review of BA	BA delivered to USACE on January 5, 2011, to provide to USFWS. BO to be obtained before construction	Yes
Section 7 of Fish and Wildlife Coordinating Act, 16 USC 742 et seq., 16 USC 1531 et seq., and 50 CFR 17.	Requires consultation if any project facilities could jeopardize the continued existence of an endangered species. Applicability depends on federal jurisdiction over some aspect of the project	USFWS	Issues BO with Conditions after review of BA	BA delivered to USACE on January 5, 2011, to provide to USFWS. BO to be obtained before construction	Yes
Section 404 of Clean Water Act of 1977 (33 USC 1251 et seq., 33 CFR §§320 and 323).	Gives the USACE authority to regulate discharges of dredge or fill material into waters of the United States, including wetlands.	USACE	Nationwide Permit No. 12	Preconstruction notification package delivered to USACE on January 5, 2011	Yes
Section 401 of Clean Water Act of 1977	Requires the applicant to conduct water quality impact analysis for the project when using 404 permits and for discharges to waterways.	Central Valley RWQCB	Water quality certification	Water quality certification package submitted to the Central Valley RWQCB on January 14, 2011	Yes
Migratory Bird Treaty Act 16 USC §§703-711	Prohibits the nonpermitted take of migratory birds.	USFWS and CDFG	Issues BO with Conditions after review of BA	BA with mitigation measures being prepared for review by agencies. BO to be obtained before construction	Yes
State					
California Endangered Species Act of 1984, Fish and Game Code, §2050 through §2098.	Protects California's endangered and threatened species.	CDFG	Issues consistency determination for giant garter snake	After USFWS issues BO, a request for a consistency determination will be sent to CDFG	Yes
Title 14, California Code of	Lists plants and animals of	CDFG	Issues BO with	BA with mitigation	Yes

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance
Regulations (CCR) §§670.2 and 670.5.	California declared to be threatened or endangered.		Conditions after review of BA.	measures being prepared for review by agencies. BO to be obtained before construction	
Fish and Game Code§1602, Streambed Alteration Agreement	Reviews projects for impacts on waterways, including impacts to vegetation and wildlife from sediment, diversions, and other disturbances.	CDFG	Issues conditions of the Streambed Alteration Agreement that reduces and minimizes effects on vegetation and wildlife	Streambed Alteration Agreement application submitted to CDFG on January 14, 2011	Yes
County					
Policies set forth in the County of Sutter General Plan	Encourages preservation and management of biotic resources, including Swainson's hawk, giant garter snake, and migratory waterfowl. Puts planning constraints in sensitive habitat areas but does not supersede CDFG and USFWS requirements	USFWS/ CDFG	Projects affecting sensitive habitat areas and special status species are subject to state or federal permitting and consultation requirements. BO with Conditions to be issued by CDFG and USFWS after review of BA	BO to be obtained before construction.	Yes

this impact by implementing the USACE permit conditions, biological resources Conditions of Certification in Section 4.0 and any additional monitoring requirements outlined in the BRMIMP. As described in Section 4.0 of the Amendment, Calpine will implement the appropriate Conditions of Certification to reduce impacts to a less-than-significant level.

Construction of the Grimes Station could result in the disturbance of nest sites for Swainson's hawk. Swainson's hawks are known to nest west and south of the Project area along the Sacramento River. A preliminary nest survey conducted by ICF in December 2010 did not identify any nests within 0.5 mile of the Project area. In addition, there are no known records of Swainson's hawks nesting within 0.5 mile of the Project area (California Natural Diversity Database 2010, CDFG, P. Hoffman pers comm.). The nearest known records are along the Sacramento River riparian corridor approximately 0.65 mile from the Grimes Station site. Riparian habitats immediately adjacent to the station site support potential nest trees for Swainson's hawks, although there are no nesting records from this location, and construction will not affect any riparian trees.

Noise associated with construction activities could result in the disturbance of nesting Swainson's hawk if these activities occur during the breeding season (generally between March 15 and September 15 or until the young are fledged and are no longer dependent on the adults) and nests are present within or adjacent to the construction area. These disturbances could cause nest abandonment and death of young or loss of reproductive potential at active nests located in or near the Project area. The potential effects on Swainson's hawks occur mainly from February through August if nest sites are within 0.5 mile of construction activities. Surveys will be conducted during the 2011 nesting season to confirm that no Swainson's hawks are nesting within 0.5 mile of the Project area. If surveys locate a nest within the 0.5 mile area, Calpine will mitigate for this impact by implementing the biological resources Conditions of Certification (Section 4.0) and any additional monitoring requirements outlined in the BRMIMP. As described in Section 4.0 of the Amendment, Calpine will implement the appropriate Conditions of Certification to reduce impacts to a less-than-significant level.

In addition to Swainson's hawk, there are several special-status raptors that could occur in the Project area. Construction of the Grimes Station could result in the disturbance of trees and shrubs that provide potential nesting habitat for common and special-status birds and raptors. Trees and shrubs near the Grimes Station site can also provide nesting habitat for a variety of migratory birds and raptors, including American goldfinch, violet-green swallow, acorn woodpecker, Nuttall's woodpecker, American kestrel, red-shouldered hawk, red-tailed hawk, and great-horned owl. Causing the abandonment or removing active nests (with eggs or young) of white-tailed kite, northern harrier, loggerhead shrike, and many other non-special-status migratory birds and raptors violates the California Fish and Game Code and the MBTA.

Grimes Station construction activities during the breeding season (generally between February 15 and August 15) could disturb or remove occupied nests of white-tailed kite, northern harrier, loggerhead shrike, and other non-special-status migratory birds and raptors. This disturbance could cause nest abandonment and subsequent loss of eggs or developing young at active nests in or near the Grimes Station. This impact would be considered significant because construction activities could result in a substantial adverse effect (through loss of eggs or young) on species (migratory birds and raptors) protected by the MBTA and California Fish and Game Code Sections 3503 and 3503.5. However, Calpine will mitigate for this impact by implementing the biological resources Conditions of Certification (Section 4.0) and any additional monitoring requirements outlined in the

BRMIMP. As described in Section 4.0 of the Amendment, Calpine will implement the appropriate Conditions of Certification to reduce impacts to a less-than-significant level.

The 0.5-acre Grimes Station site is within and adjacent to habitats that provides foraging and localized migratory habitat for a variety of species, including a local black-tailed deer herd. These species would likely move out of the construction area and into nearby habitat to avoid construction disturbance as they likely do during ongoing agricultural activities (such as plowing, disking, and other ground-disturbing practices). Because construction is short-term and will move quickly out of the area into nearby habitats, it is expected that localized species movements will not be disrupted for any length of time and there will be no significant barriers to future localized wildlife movement (including deer movement and access to the area around the Grimes Station site).

The impact on wildlife connectivity and migration corridors is considered less than significant because the there will be no substantial loss of connectivity and species will be able to move freely during construction. In addition, the 0.5-acre of row crop that will be removed to construct the Grimes Station is considered small compared to the adjacent and surrounding habitat available to wildlife species that live and migrate through the area (including the black-tailed deer that are known to occur in the area). It is expected that wildlife will continue to move through the area and that the Grimes Station will not provide an impediment to wildlife (including black-tailed deer). The implementation of the biological resources Conditions of Certification (Section 4.0) and any additional monitoring requirements outlined in the BRMIMP would provide protection to common wildlife species in the Project area. Implementation of these Conditions of Certification will reduce potential impacts to a less than significant level.

Operation and Maintenance

Future operation and maintenance activities at the Grimes Station facility will be confined to the graveled and fenced area. Maintenance activities are expected to be minimal. Therefore, no adverse effects on biological resources are anticipated. Decommissioning activities would also be confined to the graveled area and adverse effects on biological resources are not anticipated.

Natural Gas Pipeline

Construction

Construction of the natural gas pipeline is expected to result in temporary impacts on 1.41 acres of rice field wetlands. As described previously, the wetland delineation conducted for the Project has been verified by the USACE.

No permanent impacts on waters of the United States are anticipated as part of the pipeline component because the pipeline will be buried and the construction corridor will be restored to preconstruction condition.

The impacts associated with trenching through rice field wetlands and use of staging areas within rice field wetlands are considered temporary for the reasons listed below.

- Construction activities would be relatively short in duration (May 1 to October 1).
- Construction activities would not substantially alter surface or subsurface wetland hydrologic functions.

- Topsoil would be replaced immediately after construction to allow wetlands to re-establish after construction activities are complete.
- Natural landscape or agricultural field contours will be restored to pre-Project conditions.

Calpine will mitigate for this impact by implementing the USACE permit conditions, biological resources Conditions of Certification (Section 4.0) and any additional monitoring requirements outlined in the BRMIMP. As described in Section 4.0 of the Amendment, Calpine will implement the appropriate Conditions of Certification to reduce impacts to a less-than-significant level.

As described previously, perennial drainages (drainages that have water during the active season) and rice fields in the Project area provide suitable aquatic habitat for giant garter. Because disturbance to all drainages in the action area will be avoided by boring, the proposed Project will have no direct effects on suitable drainage aquatic habitat. Upland habitat within the Project area comprises ruderal grassland and earthen berms within 200 feet of suitable aquatic habitat (rice fields and drainages) which provide suitable habitat.

Activities associated with the proposed action that have the potential to result in potential direct and indirect effects to giant garter snake are listed below.

- Excavating a 30- to 36-inch-wide by 72- to 84-inch-deep trench for installation of the 6-inch-diameter underground natural gas pipeline.
- Use of construction work areas in rice fields.
- Movement of construction equipment and temporary increase in traffic on agricultural roads in suitable habitat areas.

If giant garter snakes are present in suitable aquatic or upland habitats in the construction area, these activities could result in direct loss of individuals and disruption of movement during the breeding season. Additionally, ground disturbance (e.g., staging, grading, excavation) could result in temporary disturbance or removal of suitable aquatic and upland habitat.

Table 6 provides a summary of temporary effects of associated with construction of the natural gas pipeline activities by habitat type (rice field and upland). No permanent effects associated with the buried natural gas pipeline are anticipated.

Table 6. Potential Temporary Effects on Suitable Habitat for Giant Garter Snake

	Potential Habitat (acres)	
Effect	Rice Fields Aquatic	Upland[a]
Installation of underground pipeline system	14.0	0.37
Equipment and materials staging areas	1.9	0.00
Total	15.9	0.37

[a] Upland habitat for giant garter snake consists of annual grasslands along road shoulders and drainage banks and rice field earthen berms within 200 feet of suitable aquatic habitat. Existing gravel pads and paved and unpaved roads were not considered suitable upland habitat.

Potential impacts on giant garter snake are considered significant. Calpine has submitted a Draft Biological Assessment to USACE and they initiated consultation with USFWS on February 8, 2011(Appendix E). However, Calpine will mitigate for potential impacts to giant garter snake by

implementing the USFWS Biological Opinion, biological resources Conditions of Certification (Section 4.0) and any additional monitoring requirements outlined in the BRMIMP. As described in Section 4.0 of the Amendment, Calpine will implement the appropriate Conditions of Certification to reduce impacts to a less-than-significant level.

Two elderberry shrubs (VELB habitat) were documented in the biological study area. One of these shrubs is within 100 feet of the natural gas pipeline system. The shrub occurs along a riparian drainage and will be protected and avoided during construction of the pipeline. The other shrub is more than 100 feet from the construction area and will not be directly or indirectly affected by construction or operation of the natural gas pipeline system.

Because all elderberry shrubs will be identified prior to construction, protected, and avoided, the proposed Project will not directly affect VELB habitat. The proposed Project are also not anticipated to indirectly affected VELB habitat because: (1) no ground disturbance will occur within 20 feet of the elderberry shrub, (2) ground disturbance proposed within the 100-foot buffer will occur within an agricultural field and will not remove or disturb associated riparian vegetation and will not affect existing hydrology around the shrub; and (3) avoidance and minimization measures described in the Draft Biological Assessment (ICF 2011) will be implemented to ensure that the shrub is protected throughout construction.

In addition, Calpine will mitigate for this impact by implementing the USFWS Biological Opinion, biological resources Conditions of Certification (Section 4.0) and any additional monitoring requirements outlined in the BRMIMP. As described in Section 4.0 of the Amendment, Calpine will implement the appropriate Conditions of Certification to reduce impacts to a less-than-significant level.

As discussed previously for the construction of the Grimes Station, construction of the natural gas pipeline system (including the Sutter Pipeline tap) could result in the disturbance of nest sites for Swainson's hawk. As described previously, surveys will be conducted during the 2011 nesting season to confirm that no Swainson's hawks are nesting within 0.5 mile of the natural gas pipeline construction corridor. If surveys locate a nest within the 0.5 mile area, Calpine will mitigate for this impact by implementing the biological resources Conditions of Certification (Section 4.0) and any additional monitoring requirements outlined in the BRMIMP. As described in Section 4.0 of the Amendment, Calpine will implement the appropriate Conditions of Certification to reduce impacts to a less-than-significant level.

As discussed under construction of the Grimes Station, there are several special-status raptors that could occur in the Project area. Construction of the natural gas pipeline could result in the same types of impacts as discussed for construction of the Grimes Station. Calpine will mitigate for this impact by implementing the biological resources Conditions of Certification (Section 4.0) and any additional monitoring requirements outlined in the BRMIMP. As described in Section 4.0 of the Amendment, Calpine will implement the appropriate Conditions of Certification to reduce impacts to a less-than-significant level.

Western pond turtles could be crushed and killed during pipeline construction activities near drainages that provide suitable habitat for this species. To ensure that the proposed Project do not result in a substantial reduction in local population size, lowered reproductive success, or habitat fragmentation, Calpine will implement biological resources Conditions of Certification (Section 4.0) and any additional monitoring requirements outlined in the BRMIMP. As described in Section 4.0 of

the Amendment, Calpine will implement the appropriate Conditions of Certification to reduce impacts to a less-than-significant level.

Construction activities associated with the natural gas pipeline system could temporarily disturb habitat for common wildlife species. However, many species would move out of the construction area and into nearby areas as they currently move to avoid ongoing agricultural activities (such as plowing, disking, and other ground-disturbing practices). This impact is considered less than significant because the amount of habitat that would be disturbed is small relative to the amount of habitat available to these common species in the Project region. In addition, the implementation of the biological resources Conditions of Certification (Section 4.0) and any additional monitoring requirements outlined in the BRMIMP would provide protection to common wildlife species in the Project area. Implementation of these Conditions of Certification will reduce potential impacts to a less than significant level.

Operation and Maintenance

Future operation and maintenance activities associated with the Grimes pipeline and Grimes Station are expected to be minimal. Under normal operations, the gas pipeline will not cause impacts to special-status plants, animals, or wetlands.

Maintenance of the Grimes pipeline may remove ruderal vegetation from along the pipeline right-of-way adjacent to agricultural fields and along irrigation canals and at the Griems Station site. Effects on giant garter snake in areas of giant garter snake habitat could occur if irrigation canals are cleared as part of the maintenance procedures during winter hibernation in underground burrows (October 1 through May 1).

Decommissioning of the Grimes Pipeline could involve digging the pipeline out of the ground. These activities would cause similar impacts as the construction impacts discussed above.

Meter Sites

Construction activities associated with the two existing Veneco meter sites will be conducted on existing gravel pads. There are no biological resources associated with these gravel pad sites. Consequently installation, operation, maintenance, and decommissioning activities associated with the meter sites will not result in adverse effects on biological resources.

Cumulative Effects

According to Sutter County, there is no planned or proposed project for the Project area that would generate cumulative impacts. However, the proposed Project will convert approximately 0.5 acre of row crop to industrial development. This is the general trend in the Central Valley of California and it incrementally reduces the value of habitat available to native wildlife species throughout the state. The incremental loss associated with the Project is very small, as the row crop are is subject to annual cultivation that removes native vegetation and provides low habitat value for most species in the area.

The short-term increase in construction traffic will be very small and is not expected to increase the number of wildlife that will be killed on roadways leading to and from the site.

The Grimes Pipeline Project will not result in significant effects on special status plants, natural plant communities, wetlands, and associated habitat values for wildlife. The proposed Project would mitigate potential adverse effects on wildlife through avoidance, or through reduction of impacts to a level of less-than-significant for key wildlife resources such as agricultural wetlands, giant garter snake, VELB, Swainson's hawk and other raptors, and migratory birds. The proposed Project is not expected to cause any significant cumulative effects on biological resources.

Future operation and maintenance of the Grimes Pipeline Project will not have a significant adverse effect on biological resources.

References

Printed References

Beedy, E.C., and W.J. Hamilton, III. 1999. Tricolored blackbird (*Agelaius tricolor*). No. 423 in A. Poole and F. Gill (eds.), *The Birds of North America*. Philadelphia, PA: The Academy of Natural Sciences; Washington, DC: The American Ornithologists' Union.

Brode, J. M., and G. E. Hansen. 1992. *Status and Future Management of the Giant Garter Snake (*Thamnophis gigas*) within the Southern American Basin, Sacramento and Sutter Counties, California*. California Department of Fish and Game, Inland Fisheries Division.

California Department of Fish and Game (CDFG). 2009. *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities.* State of California, California Natural Resources Agency (November 24, 2009).

California Department of Fish and Game (CDFG). 2010. List of California Terrestrial Natural Communities indicates which natural communities are special-status.

California Energy Commission. 1999. *Energy Commission Decision: Application for Certification for the Sutter Power Plant Project, Docket #97-AFC-2.* April. Sacramento, CA.

California Native Plant Society. 2010. Inventory of Rare and Endangered Plants (online edition, v7-10c 8-24-10). Available: < http://www.cnps.org/inventory >. Accessed: June –July 2010. California Native Plant Society. Sacramento, CA.

California Natural Diversity Database (CNDDB). 2010. RareFind 3, Version 3.1.0 (September 05, 2010, update). Records search of the U.S. Geological Survey 7.5-minute Grimes and Tisdale Weir and surrounding quadrangles. Sacramento, CA: California Department of Fish and Game.

Calpine Corporation. 1997. *Application for Certification for Sutter Power Plant Project.* December. San Jose, CA. Prepared for California Energy Commission, Sacramento, CA.

CH2MHill. 1999. *Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) for the Sutter Power Plant Project Sutter County, California*. August.

DeHaven, R.W., F.T. Crase, and P.D. Woronecki. 1975. Movements of tricolored blackbirds banded in the Central Valley of California. *Bird Banding* 46:220–229.

Federal Register. 1993. 50 CFR Part 17_ Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Giant Garter Snake. Vol 58, No. 201. Wednesday, October 20, 1993.

Fitch, H. S. 1940. A Biogeographical Study of the Ordinoides Artenkreis of Garter Snakes (Genus *Thamnophis*). *Univ. Calif. Publ. Zool.* 44:1–150.

Hansen, G. E. 1988. *Review of the Status of the Giant Garter Snake (*Thamnophis couchii gigas*) and Its Supporting Habitat during 1986–87.* Final report to California Department of Fish and Game (Contract C-2060).

Hansen, G. E., and J. M. Brode. 1980. *Status of the giant garter snake,* Thamnophis couchi gigas *(Fitch).* Special Publication 80-5. Sacramento, CA: California Department of Fish and Game, Inland Fishery Endangered Species Program.

ICF. 2010. *Preliminary Delineation of Wetlands and Other Water Bodies for the Grimes Pipeline Project, Sutter County, California.*

ICF. 2011. *Draft Biological Assessment for the Grimes Pipeline Project, Sutter County, California*

Lytle, D. J. 1988. *Soil Survey of Sutter County, California*. U.S. Department of Agriculture, Soil Conservation Service in cooperation with Regents of the University of California (Agricultural Experiment Station). Washington, DC: U.S. Government Printing Office.

Mayer, K. E., and W. F. Laudenslayer, Jr. 1988. *A Guide to Wildlife Habitats of California*. October. Sacramento, CA: California Department of Forestry and Fire Protection.

Rossman, D. A., and G. R. Stewart. 1987. *Taxonomic reevaluation of* Thamnophis couchii*.* Occasional Papers of the Museum of Zoology #63. Baton Rouge: Louisiana State University.

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*. (I-1-F-97-149.) Sacramento, CA.

U.S. Fish and Wildlife Service (USFWS). 1998. Biological Opinion (Number 1-1-98-F-100) for Calpine Corporation Sutter Power plant Project, Sutter County. April.

Wylie, G. et al. 1997. 1996 Progress Report for the Giant Garter Snake Study. May 1.

Personal Communications

DeWeese, June. 1997. Personal Communication, J. DeWeese, Biologist, USFWS. February 19, 1997.

Hoffman, Paul. Associate Wildlife Biologist, California Department of Fish and Game. December 1, 2010—email to William Widdowson of ICF International regarding Swainson's hawk nest locations in western Sutter County.

Marr, Jenny. Environmental Scientist, California Department of Fish and Game. Various emails and telephone conversations with Sue Bushnell regarding giant garter snake and process for obtaining a consistency determination under California Fish and Game Code 2080.1.

Watson, Ben. Biologist, U.S. Fish and Wildlife Service. Various emails and telephone conversations with Sue Bushnell regarding giant garter snake conservation measures and the Biological Assessment.

Appendix D

Resumes

Steven Avery

Project Director and Senior Wildlife Biologist

Steve Avery has over 23 years of experience managing biology projects, designing field studies, and conducting special-status species surveys in California. His expertise includes BAs and impacts analyses, wildlife census techniques, CEQA compliance as it relates to biology, and environmental compliance monitoring for large linear projects. Steve has successfully managed the survey efforts, environmental document preparation, and environmental compliance monitoring for several large transmission line and gas line projects in California. He evaluates impacts of projects on wildlife populations and provides mitigation planning for a variety of threatened and endangered species. Specifically, Steve has conducted surveys and managed technical studies in northern California, Oregon, and Nevada for federally listed species including California red-legged frog, California tiger salamander, giant garter snake, blunt-nosed leopard lizard, desert tortoise, northern spotted owl, marbled murrelet, and San Joaquin kit fox. .

Education

MA, Biology, University of Northern Colorado, Greeley, 1990

BS, Zoology/Wildlife Biology, Ohio University, Athens, 1985

Professional Memberships

The Wildlife Society

Licenses

California State Scientific Collecting Permit 801244-01
USFWS 10(a)(1)(A) permit to conduct surveys for Mexican spotted owl and California gnatcatcher surveys

Special Training

Fiber-Optic Safety Training (Union Pacific) Water Quality Chlorine Safety Training (Sacramento Regional County Sanitation District Department)

Project Experience

On-Call Master Services Agreement—PG&E, California

Program manager for ICF's on-call master services agreement with PG&E) since 1999. Responsible for negotiating contracts, writing scopes of work and cost estimates, delegating work assignments, conducting technical studies, and managing projects for PG&E's maintenance and operations throughout their service territory. For several large projects, acted as lead biologist or project manager for field investigations, impact assessment, development of mitigation measures and environmental compliance monitoring for special-status wildlife—including VELB, California red-legged frog, California tiger salamander, blunt-nosed leopard lizard, northwestern pond turtle, desert tortoise, Western burrowing owl, Swainson's hawk, and San Joaquin kit fox. As part of master services agreement, served as project manager or lead wildlife biologist for the projects below.

C3EPT 500kV Transmission Line Project—Pacific Gas and Electric Company, California

Served as project director, including overall quality assurance to PG&E. Provided management direction and senior-level oversight on

scoping document preparation, costing, and availability of company resource to ensure project success.

Managed biological resource studies including protocol-level blunt-nosed leopard lizard surveys and botanical, wetland, and general wildlife surveys for more than 300 miles of project alternative alignments. Provided senior-level input on study design and methodology for appropriate biological resource data collection. Provided peer review of biological resource sections prepared for the project.

Metcalf-Hicks-Vasona and Metcalf El Patio 230 kV Tower Construction and Reconductor Projects—PG&E, California

Managed biological resource surveys and environmental compliance monitoring during reconductor and tower work on the two projects that occurred together. These projects were within Santa Teresa County Park, where several special-status endemic plants and wildlife were identified adjacent to tower construction sites. Conducted preconstruction botanical surveys and mapped rare plant populations near construction sites. The close proximity of rare plant and wildlife resources within the park required diligent biological monitoring and close communication with PG&E construction contractors to ensure protection of these resources.

Hollister 115kV Power Line Reconductoring Project Proponents Environment Assessment—Pacific Gas and Electric Company, California

Project Director for the 20-mile reconductoring project in the community of Hollister. Ensured overall client satisfaction, provided peer review of technical sections, prepared scopes of work and contract augmentations. Acted as technical lead for biology and the permitting lead for all of the federal and state permits obtained for the project.

Tri-Valley 230kV Transmission Line Installation—PG&E, Alameda County, California

Conducted biological surveys and managed biological studies for nesting birds, listed fairy shrimp, and San Joaquin kit fox; prepared a BA for the USFWS for San Joaquin kit fox and California red-legged frog for the new 10-mile construction project. Provided testimony before the CPUC on biological issues related to the project. Directed staff in the design of on-site mitigation for aquatic and upland breeding habitat creation for California red-legged frog and California

tiger salamander. Managed cultural resources surveys for the project. Provided environmental compliance monitoring during construction of Phase I and Phase II of the project.

Tesla Substation Expansion Project—PG&E, Alameda, California

Managed preparation of a site assessment for California red-legged frog, managed protocol-level surveys for California red-legged frog in Patterson Run Creek, conducted surveys for burrowing owls, prepared a BA for USFWS, managed pre-construction clearance surveys for San Joaquin kit fox and burrowing owls, and managed daily construction monitoring during the one-year project.

HCP for San Joaquin Valley Operations and Maintenance (O&M) Service Area—PG&E, San Joaquin Valley, California

Served as lead wildlife biologist in preparation of the San Joaquin Valley HCP that included nine counties and 24 covered wildlife species, including San Joaquin kit fox. Developed innovative approaches to assessing impacts and providing mitigation to meet PG&E's O&M needs.

Various PG&E Biological Surveys and Monitoring

Managed the following surveys and construction monitoring as part of the PG&E on-call master services agreement:

- Crane Valley focused biological surveys and permitting,
- Gas Line 300A anode flex installation and San Joaquin kit fox surveys,
- Gas Line 300 valve replacement and recoating biological surveys and monitoring, and
- Palermo 115-kV transmission line 65-mile reconductoring project.

On-Call Environmental Support Services—Caltrans Districts 1, 2, and 3, Contract No. 03A1317, California

Sr. Wildlife Biologist or Task Order Manager for 8 Task Orders under this contract. Task Orders have included preparing interdisciplinary NEPA/CEQA documents for water quality improvement, highway widening project, noise and vibration studies, air quality studies, special-status wildlife surveys and habitat assessments, paleontology studies and mitigation plans, wetlands delineations, wetland/ riparian mitigation plans, bald eagle nest monitoring and reporting program, installation of bird exclusion netting on bridges, community impact assessments, biological assessment, general

biological and fisheries monitoring, fish snorkel surveys, and permit applications.

Habitat Assessments for U.S. 50/Missouri Flat Road Interchange Improvement Project-El Dorado County, California

Senior biologist on interchange improvement project and addition of auxiliary lanes over Weber Creek, habitat for listed California red-legged frog. Conducted extensive coordination with USFWS , Corps, California Department of Fish and Game, and prepared biological assessment and Natural Environment Study.

Forest Highway 120 (Quincy–LaPorte) Biological & Environmental Assessment/Evaluation—Plumas County, California

Federal Highway Administration. Conducted biological surveys and prepared biological resources evaluation report as part of road resurfacing and improvement project. Field investigations included surveys for foothill yellow-legged frogs, mountain yellow-legged frogs, and California Spotted Owls. Report discussed survey results, identified potential impacts, and recommended mitigation measures for impacts on foothill yellow-legged frogs and California Northern Spotted Owls.

Lake Mead National Recreation Area Desert Tortoise Construction Monitoring—National Park Service, Nevada

Managed the biological compliance monitoring for this 26-mile road improvement project within the Lake Mead National Recreation Area. Services included preconstruction surveys for desert tortoise and construction compliance monitoring for the 12-month project. Monitors were approved by the USFWS to handle and move desert tortoise out of danger during construction. Managed a crew of three full-time biological monitors.

Biological Surveys for the Path 15 Transmission Line Project—Western Area Power Administration, Fresno and Merced Counties, California

As project manager, supervised the wildlife, botanical, and wetland surveys for the 84-mile project and prepared the technical reports to support NEPA documents previously prepared for the project. Prepared a BA for the USFWS to address project effects on federally listed species. Supervised three biologists, two cultural resource specialist, and four paleontologists conducting field studies, preparing documents, and monitoring construction of sensitive resources along the project route during the three-year project.

Prior Experience

USDA Forest Service

Wildlife biologist. Researched home range and habitat requirements of the spotted owl; captured, banded, and outfitted spotted owls with radio transmitters; monitored spotted owls nightly; conducted vegetation sampling of nest site areas; collected pellets for food habits analysis; and conducted spotted owl habitat inventory.

Colorado Division of Wildlife

Wildlife research technician. Surveyed streams and lakes throughout southwestern Colorado; determined fish species composition, size, and weight; assessed habitat quality in streams and lakes; and performed computer data entry and analysis.

Valley Environmental Consulting, LLC

JOEL BUTTERWORTH

Mr. Butterworth, Senior Soil and Wetland Scientist at Valley Environmental Consulting, has more than 20 years of experience as a technical lead and project manager for a range of environmental projects. His areas of expertise include preparing Clean Water Act Section 404 wetland delineations and NEPA and CEQA documentation with respect to geologic, soil, hydrologic, and paleontological issues.

Representative Project Experience

- **Wetland Delineation for NICOR Central Valley Gas Storage Project— ICF International**. Conducted field surveys and prepared a wetland delineation report for approximately 14 miles of a proposed natural gas pipeline and a compressor station in Colusa County.

- **Wetland Delineation of the Bay Division Pipelines No. 3 and 4 Project— DSE Environmental**. Conducted field surveys and prepared wetland delineation report for San Francisco Public Utilities Commission water pipeline retrofit project in Alameda County.

- **EIR/EIS for Interstate 5/Cosumnes River Boulevard Interchange Project— Jones & Stokes**. Peer-reviewed the geology, seismicity, and soils; agriculture; and paleontology sections of the EIR/EIS for this project in Sacramento County.

- **Wetland Delineation for the Sacramento Area Voltage Support Project— Aspen Environmental Group**. Conducted field surveys and prepared a delineation report for approximately 21 miles of a proposed Western Area Power Administration transmission line in Sutter, Placer, and Sacramento counties.

- **Initial Study/MND Document for Calpine Grizzly Island Station Project— ICF International**. Prepared the geology and paleontology sections of the initial study/negative declaration for a small natural gas pipeline project in Solano County.

- **Wetland Delineation of Sutter Basin Mitigation Bank— Westervelt Ecological Services**. Conducted wetland delineation field surveys and prepared delineation report on 500-acre site in Sutter County.

- **EIR/EIS for San Luis Reservoir Low Point Project— Jones & Stokes**. Co-authored the geology, seismicity, and soils section of the EIR/EIS for a water quality project proposed by the Santa Clara Valley Water District.

956 First Street West • Sonoma, CA 95476-7417 • 707-938-8954 • wetsoils@comcast.net

Employment

- Valley Environmental Consulting, LLC. Senior Soil and Wetland Scientist
- Jones & Stokes. Senior Environmental Scientist
- Western Ecological Services Company, Inc. (WESCO). Soil and Watershed Specialist
- Questa Engineering Corporation. Soil Scientist
- The Bionetics Corporation. Geographer

Education

M.S. Geography (minor in Soil Science), Oregon State University, Corvallis, 1987
B.A. Geography, University of California, Santa Barbara, 1985

Memberships

International Erosion Control Association
Professional Soil Scientists Association of California (associate member)
Society for Ecological Restoration
Soil and Water Conservation Society

Kate Carpenter

Botanist, Wetland Ecologist, and Certified Arborist

Kate Carpenter specializes in special-status plant surveys, plant community characterization and mapping, wetland delineations, arborist surveys, floristic inventories, noxious weed surveys, and collection and preparation of botanical voucher specimens. She has worked on projects that include CEQA and NEPA compliance, preconstruction surveys, biological assessment preparation, permit acquisitions from state and federal agencies, HCPs, and multi-agency coordination. Kate conducts extensive arborist, botanical, and wetland field surveys, prepares environmental compliance documents, coordinates with engineers to incorporate botanical and wetland resources into project design, and obtains agency concurrence under constrained schedules.

Start Year of Professional Service

2002

Education

BA, Plant Biology (minor in Soil Science), University of California, Davis, 2002

Certifications

Certified Arborist

International Society of Arboriculture

Certificate No. WE-6595A

Professional Memberships

California Native Plant Society

Davis Botanical Society

International Society of Arboriculture

Project Experience

Biological Effectiveness Monitoring—The Natomas Basin Conservancy, Sacramento and Sutter Counties, California

Conducted several types of vegetation mapping surveys in the Natomas Basin, an agricultural basin just north of Sacramento. This includes mapping land cover types and noxious weed populations, as well as assessing the change in land cover types during the last few years.

Silicon Valley Rapid Transit Corridor Project Line Segment Biological Surveys—Santa Clara Valley Transportation Authority, San Jose, California

Conducted rare plant surveys to establish baseline conditions for future monitoring efforts along portions of the Silicon Valley Rapid Transit Corridor.

Lower Walnut Creek Channel Restoration Botanical and Wildlife Surveys—Contra Costa County Flood Control and Water Conservation District, Walnut Creek, California

Conducted rare plant surveys and wetland delineation using DFG and CWA Section 404 guidelines along Lower Walnut Creek to the Suisun Bay. Mapped rare plant populations, streams, other drainage ways, and seasonal wetlands using aerial photographs. Produced accompanying documents to assist with regulatory compliance.

Palermo-to-East Nicolaus Reconstruction Transmission Line Project Proponent's Environmental Assessment Preparation—Pacific Gas and Electric Company, California

Performed rare plant surveys and wetland delineations along a 42-mile-long transmission corridor. Mapped streams and drainageways, and other seasonal wetlands and sensitive plant locations using global positioning systems. Prepared documents to assist with regulatory compliance and coordination with federal and local agencies.

Clovis Sewer Treatment Water Reuse Facility EIR—City of Clovis, Fresno, California

Conducted rare plant surveys and wetland delineation using DFG and CWA Section 404 guidelines. Mapped rare plant populations, streams, other drainage ways, seasonal wetlands, and vernal pools using GIS-based maps and GPS units. Produced accompanying documents to assist with regulatory compliance.

Edwards Air Force Base Inventory of Plant Species—U.S. Army Corps of Engineers, San Bernardino, California

Conducted rare plant and annual plant population surveys using quadrats to quantify rare plant populations within Edwards Air Force Base.

Wawona and Chapel Area Sites Wetland Delineations—National Park Service, Yosemite National Park, California

Conducted wetland delineation using the Cowardin classification system and Section 404 guidelines in the valley of Yosemite National Park. Mapped streams, other drainage ways, and seasonal wetlands and the river protection overlay of the Merced River using GIS-based maps and pin flagging for survey. Prepared documents to assist with regulatory compliance and coordination with federal and local agencies.

Battle Creek Salmon and Steelhead Restoration Project —Bureau of Reclamation, California

Conducted rare plant surveys and wetland delineation using DFG and CWA Section 404 guidelines. Mapped rare plant populations, streams, other drainage ways, seasonal wetlands, and vernal pools using GIS-based maps and GPS units. Produced accompanying documents to assist with regulatory compliance.

Freeport EIR/EIS—Freeport Regional Water Authority, Sacramento, California

Conducted rare plant surveys and wetland delineation using DFG and CWA Section 404 guidelines for a 33-mile pipeline project area in the Sacramento Valley. Mapped rare plant populations, streams, other drainage ways, seasonal wetlands, and vernal pools using GIS-based maps and GPS units. Prepared documents to assist with regulatory compliance and coordination with federal and local agencies.

Levee Improvements Project—Three Rivers Levee Authority, California

Conducted rare plant surveys and wetland delineation using DFG and CWA Section 404 guidelines for an approximately 1,000-acre plan area in the Sacramento Valley. Rare plant populations, streams, other drainage ways, seasonal wetlands, and vernal pools were mapped using GIS-based maps and GPS units.

Foothill Raw Water Pipeline—Placer County Water Agency, California

Conducted an arborist survey including more than 1,000 native trees to comply with the Placer County tree ordinance using GPS units and a data dictionary. Conducted wetland delineation using CWA Section 404 guidelines for a 60-acre plan area in Newcastle. Mapped waters of the United States, including wetlands, using GPS units and GIS-based maps. Prepared documents to assist with regulatory compliance and coordination with federal and local agencies.

Miners Ravine Off-Channel Detention Basin Project —Placer County Flood Control and Water Conservation District, California

Conducted an arborist survey including more than 75 native trees to comply with the Placer County and City of Roseville tree ordinance using GPS units. Conducted wetland delineation using CWA Section 404 guidelines for a 26-acre plan area in Roseville. Mapped waters of the United States, including wetlands, using GPS units and GIS-based maps. Prepared documents to assist with regulatory compliance and coordination with federal and local agencies.

Wetland Delineations in Yosemite Valley—Yosemite National Park, Mariposa County, California

Conducted wetland delineation using the Cowardin classification system and CWA Section 404 guidelines for a 600-acre plan area in the valley of Yosemite Park. Mapped streams, other drainage ways, and seasonal wetlands and the river protection overlay of the Merced River using GIS-based maps and pin flagging for survey. Prepared

documents to assist with regulatory compliance and coordination with federal and local agencies.

High Winds Project—FPL Energy, Solano County, California

Conducted a rare plant survey and wetland delineation for a 6,000-acre plan area in the Montezuma Hills. Mapped streams, other drainage ways, and seasonal wetlands and sensitive plant locations using GPS units. Prepared documents to assist with regulatory compliance and coordination with federal and local agencies.

San Joaquin Valley Operations and Maintenance HCP—Pacific Gas and Electric Company, California

Prepared species accounts for sensitive plant species within the San Joaquin Valley HCP area. Compiled species information for avoidance, minimization, and compensation measures.

48-Mile-Long Gas Line 57C Project—Pacific Gas and Electric Company, San Joaquin County, California

Performed rare plant surveys and habitat assessments on four proposed gas lines in the San Joaquin Delta. Prepared a constraints analysis report with species list and maps of rare plant locations and potential waters of the United States.

Diablo-Midway Project— Pacific Gas and Electric Company, San Luis Obispo County, California

Performed rare plant surveys along a two-mile long pair of transmission lines in southern San Luis Obispo County.

Path 15 Transmission Line Project—Western Area Power Administration, Fresno and Merced Counties, California

Performed rare plant surveys and wetland delineations along an 84-mile-long Path 15 transmission corridor. Mapped streams and drainageways, and other seasonal wetlands and sensitive plant locations using GPS units. Prepared documents to assist with regulatory compliance and coordination with federal and local agencies.

Auburn-Folsom Road Widening Project—Placer County Public Works Department, California

Performed rare plant surveys and wetland delineation along the four-mile road-widening project. Mapped streams, other drainageways, and other seasonal wetlands using aerial photographs.

Vernal Pool Study—Placer County Planning Department, California

Performed rare plant surveys and species composition in vernal pools.

Kaweah South Project—Kaweah River Rock Company, Tulare County, California.

Conducted a constraints analysis for rare plant habitat on seven different five-acre sites.

Survey—Monterey County Water Agency, California

Conducted a reconnaissance-level survey to determine possible constraints along a 10-mile proposed pipeline alignment.

Prior Experience

University of California, Davis, Herbarium

Curator. Assisted patrons of the Herbarium with identification of plant specimens. Collected, identified, pressed, mounted and accessioned plant specimens into the Herbarium collection.

Andrea Nardin

Bioarchaeologist

Andrea Nardin is an archaeologist with more than ten years of experience in archaeology with an emphasis in bioarchaeology. She has participated in archaeological surveys and excavations in California, Utah, Great Basin, Ohio, Belize and the Middle East. Andrea has extensive laboratory analysis and supervisory experience and has special training in human osteology, paleopathology, and dental analysis. She also has an extensive background in preparing, curating, and managing archaeological collections. She has also conducted archaeological surveys, excavation and monitoring for a number of large, long and short-term projects. She meets the Secretary of the Interior's guidelines for a professional archaeologist.

Education

MA, Anthropology, Ohio State University, 2004

BA, Anthropology, University of California, Davis, 2001

Special Training

Bioarchaeology, paleopathology (Ohio State University)

Museum collections preparation, curation and management (University of California, Davis)

Project Experience

Biological and Cultural Surveys—Big Sandy Rancheria, Fresno, California

Managed field excavations and laboratory analysis of human remains for the proposed Big Sandy Rancheria casino site near Fresno, California. The excavation was conducted to evaluate the site for California Register of Historical Resources and NRHP eligibility. Worked in conjunction with the Bureau of Indian Affairs preparing NAGPRA documents and publications for the findings and repatriation of human remains.

North Connector Cultural Resources Monitoring—Solano Transportation Authority, Solano County, California

Field team leader for recovery of inadvertent discovery of human remains during monitoring of construction activities. The North Connector project is a Caltrans project for expansion of I-80 and I-680 access.

Podesta School Construction Site Archaeological Review of Bone Discovery—Lodi Unified School District, Lodi, California

Responsible for the field excavation of inadvertent discovery of human remains for the Lodi Unified School District. Managed and analyzed osteological collections in accordance with NAGPRA protocols for repatriation.

Gryphon Gold Corporation Borealis Mine Western Pediment Project—Knight Piesold, Mineral County, Nevada

Field Archaeologist. Conducted a Class III cultural resources inventory of 160 acres along the western slopes of the Wassuk Range within the jurisdiction of the BLM Carson City field office, in compliance with Section 106 of the NHPA.

Owens Lake Dust Mitigation Program Archaeological Testing, Evaluation, Data Recovery, and Monitoring— Los Angeles Department of Water and Power, Inyo County, California

Field archaeologist and laboratory supervisor for testing, evaluation and data recovery for multiple sites on the Owens dry lake bed for CH2M Hill and the Los Angeles Department of Water and Power in support of the 2003 Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan, implemented EIR/EIS mitigation for Section 106 (BLM lands) and CEQA (California State Lands Commission lands) compliance. Prepares and manages all archaeological collections from multiple studies associated with this project. Provides ongoing archaeological monitoring during construction phases of the program.

Cypress Bridge Replacement—Caltrans District 2, Shasta County, California

Field archaeologist and human osteologist for Section 106-related testing and evaluation of known archaeological site and project area footprint for the Cypress Avenue Bridge Replacement Project.

Bear River and UP Interceptor Canal Levees Improvement Project—HDR Engineering, Yuba County, California

Field archaeologist and human osteologist for Section 106-related testing and evaluation of known archaeological site and project area footprint for the Three Rivers Levee Improvement Authority. Conducted laboratory analysis of human remains prior to repatriation.

Lower Northwest Interceptor Mitigation Monitoring—Montgomery Watson Harza Americas Inc., Sacramento County, California

Provided full time archaeological compliance monitoring for the excavation and installation of a sewer main in Sacramento County. Responsible for archaeological presence-absence testing by obtaining soil samples at regular intervals during construction. Maintained detailed monitoring logs.

UDOT I-15 Corridor Study—Parsons Brinckerhoff, Inc., Salt Lake and Utah Counties, Utah

Field archaeologist on Class III Inventory for compliance with Section 106 of the NHPA for Parsons Brinckerhoff and UDOT. Inventory totals 120 linear miles including the length of I-15 in Utah county and proposed commuter rail and light rail lines (in progress).

Kyle Canyon Study—Forest Service, Humboldt-Toiyabe National Forest, Nevada

Field archaeologist on multiple inventories totaling over 2,000 acres within the Spring Mountains National Recreation area for the Forest Service. Archaeological mitigation monitor for the drilling and installation of fiber optic cable near National Register-eligible archaeological sites.

Prior Experience

Far Western Anthropological Research Group—Davis, California

- Gold Butte Land Transfer—BLM, Las Vegas Field Office, Clark County, Nevada. Crew member, completed 30 days of survey, testing and evaluation.
- Vidler Water Pipeline Project—Vidler Water, Washoe County, Nevada. Crew member, 45 days of survey, testing and evaluation.
- Reservoir Inventories—Southern California Edison, Fresno, Inyo and Mono Counties, California. Crew member, 20 days of survey, testing and evaluation.
- Ely Power Station Project—Nevada Power, White Pine County, Nevada. Crew member, 14 days of testing and evaluation.
- Ivanpah Airport Study—AECOM, Clark County, Nevada. Crew Member, 10 days of survey and site testing.

Assistant Bioarchaeologist and Laboratory Manager—Jabal Hamrat Fidan Archaeology Project, Southern Jordan

Responsibilities included supervision and teaching a group of 45 students during excavation, identification, reconstruction, aging, sexing, and analysis of pathological conditions of an Iron Age cemetery population. Responsible for managing osteological collections excavated during the project.

Laboratory Assistant, Research Assistant—Ohio State University, Columbus, Ohio

Identified and reconstructed human remains for various archaeological projects performed by Ohio State University.

Developed and maintained two bioarchaeological dental databases for research use.

Field Archaeologist—Peter's Site Bioarchaeology Project, the Ohio State University

Excavated Peter's Site, a prehistoric cemetery site in Pickaway County, Ohio. Reconstructed, analyzed, and catalogued human remains recovered during the project.

Laboratory Assistant—University of California, Santa Cruz

Conducted carbon and nitrogen isotope analysis of human remains from archaeological collections.

Research Assistant—Museum of Anthropology, University of California, Davis

Prepared archaeological collections containing human remains in accordance with the Curation of Federally-Owned and Administered Archeological Collections (36 CFR Part 79), under a NAGPRA grant. Organized archaeological and ethnographic museum collections for research purposes.

Field, Laboratory, and Mapping Technician—Bodega Bay Archaeology Project, University of California, Davis

Collected survey data using a Topcon GTS-802 total station and generated maps using Foresight software. Catalogued and prepared artifacts from coastal hunter-gatherer site in Northern California.

Assistant Researcher—Center for Advanced Information Technology, University of California, Davis

Researched and recommended software to UC Davis faculty and staff. Prepared instructional presentations and publications on new software.

Gabriel Roark

Archaeologist

Gabriel Roark is an archaeologist who directs and conducts cultural resource investigations for projects involving CEQA and Section 106 of NHPA. With extensive professional experience in prehistoric archaeology, historical archaeology, and regulatory compliance, Gabriel serves as the manager and technical lead on several projects. He provides exceptional design and implementation of archaeological monitoring programs, archaeological surveys and excavations, archival research, and impact analyses. His Section 106 experience includes drafting memoranda of agreement, programmatic agreements, and historic properties treatment plans.

Project Experience

Sacramento Intermodal Transit Facility Track Relocation Project Environmental Documents for CEQA/NEPA—City of Sacramento, Sacramento County, California

Advised Caltrans and the City of Sacramento as to Section 106 and NEPA compliance concerning cultural resources. Due to the shortened compliance schedule entailed with American Recovery and Reinvestment Act funding, recommended a tiered approach that secured funding and protected cultural resources. Directed identification of surface archaeological resources, archival and geoarchaeological research to isolate potential buried archaeological resources, and preparation of an archaeological resources treatment plan. Exploratory and evaluative test excavations, components of the treatment plan, are underway.

Sacramento River Bank Protection Project EIS/EIR—Corps, Sacramento County, California

Primary author of the programmatic agreement and historic properties treatment plan (HPTP) for this state/federal levee repair program. The programmatic agreement will guide the Corps' cultural resources program for the life of the project particularly in the areas of consultation and documentation of cultural resource activities. The HPTP is a multidisciplinary document that stipulates appropriate identification efforts and treatment of a variety of property types: prehistoric and historic archaeology, non-archaeological properties of

Start Year of Professional Service

1999

Education

MA, Anthropology, California State University, Sacramento, 2009

BA, Anthropology, California State University, Sacramento, 1999

Special Training

Cascade Range Archaeological Project, crew chief, 1999 (California State University, Sacramento)

Archaeological Field School, Mammoth Lakes, California, 1999 (California State University, Sacramento, Dr. Mark E. Basgall, Director)

Anthropology 199: Introduction to Analysis of California Gold Rush Chinese Ceramics, Independent Study, 1999 (California State University, Sacramento, Dr. Jerald J. Johnson, Instructor)

Anthropology 195A and 192: Fieldwork and Laboratory Work in Archaeology, Coloma, California, 1997 (California State University, Sacramento, Dr. Jerald J. Johnson and Dr. Tom Strasser, Instructors)

Professional Memberships

Society for Archaeological Sciences

Society for California Archaeology

concern to Native Americans, historic built environment properties, cultural landscapes, and submerged resources.

Carrizo-Midway 230kV Transmission Line Reconductoring Project—PG&E, Kern and San Luis Obispo Counties, California

Lead cultural resource specialist responsible for CEQA and Section 106 compliance. Directed all aspects of the cultural resources work: research, geoarchaeological assessment, Indian consultation, survey, and reporting. Advised PG&E on feasible avoidance measures to protect archaeological sites.

Palermo to East Nicolaus Transmission Line Reconstruction Project Proponent's EA Preparation—PG&E, Northern California

Managed Section 106 and CEQA compliance tasks, including research, consultation with Indians and historical societies, archaeological and historic structures surveys, evaluation of identified resources, report preparation (cultural resources report and section of proponent's EA), and agency coordination. Designed the survey parameters such that PG&E did not have to authorize additional survey during construction.

Big Sandy Casino and Resort Project EIS—Big Sandy Rancheria Band of Western Mono Indians, Fresno County, California

Assisted Big Sandy Rancheria and the Bureau of Indian Affairs (BIA) with cultural resources compliance under NEPA and Section 106. Directed records searches and archival research, supported BIA's consultation with Indian tribes, corresponded with historical societies and non-federally recognized tribes, met with the state historic preservation officer to discuss compliance effort, conducted archaeological surveys and directed two evaluative test excavations. In addition, worked with BIA, Big Sandy, and Table Mountain Rancheria to devise a plan of action, pursuant to the NAGPRA, for the treatment of Indian human remains discovered during excavations. Also assisted with reburial of Indian remains. Preparation of the cultural resources report and EIS sections is underway.

Central California Clean Energy Transmission Project Proponent's EA—PG&E, Fresno, Kern, Kings, Madera, and Tulare Counties, California

Advised PG&E regarding cultural resources regulatory compliance strategy and responsibilities from the project design phase through late-stage project planning. Ranked alternative transmission line

routes via a GIS-based model of cultural resources distribution and sensitivity. Conducted records searches and research, consulted with Indian groups, directed archaeological and built-environment surveys, and prepared iterative cultural resource reports.

Cultural Resources Compliance Support for the Railyards Initial Phase Project—Kimley-Horn Associates, Sacramento, California

Coauthored the archaeological testing plan for prehistoric and historic archaeological sites, using geotechnical data and historic maps to identify archaeologically sensitive areas. Also prepared the project inadvertent archaeological discovery plan. Crew chief for mechanical archaeological testing; identified the historic 6th Street Levee.

Suisun Marsh Management Plan EIS/EIR—DFG, Solano County, California

Prepared a geoarchaeological assessment of Suisun Marsh to estimate the potential for buried and surface-manifested cultural resources for three project alternatives. Together with records search data and historic map research, the geoarchaeological assessment formed the crux of the analysis presented in the cultural resources section of the EIS/EIR.

Sacramento Railyards Soil Remediation—ERM West, Sacramento, California

Lead Archaeological Monitor. Responsibilities included construction monitoring, staff scheduling, evaluating inadvertent archaeological discoveries and coordinating such evaluations with staff from the California State Railroad Museum, reporting, and training construction staff in the proper procedures for archaeological discoveries.

Port of Los Angeles Promenade Report of Archaeological Monitoring—Port of Los Angeles, San Pedro and Los Angeles County, California

Contributing author to the archaeological monitoring report for numerous inadvertent archaeological discoveries in the historic neighborhood known as Mexican Hollywood. Contributions included archaeological feature descriptions, tabulated artifact (functional group) analysis, and interpretation of materials.

Vantage Wind Energy Project Cultural Resources Inventory—Kittitas County, Washington

Contributing author responsible for reporting survey methods and findings, as well as recommendations for the treatment of archaeological resources. Also prepared environmental and cultural contexts for the report.

Central Valley Gas Storage Project Section 106 Consultation—Central Valley Gas Storage, LLC, Colusa County, California

Completed a cultural resources inventory for compliance with Section 106. Tasks included records searches, correspondence with Indians, a geoachaeological assessment of the project area, and preparation of an inventory report.

Buena Vista Rancheria Gaming and Entertainment Facility Tribal EIR—Stevens & O'Connell, Amador County, California

Lead cultural resources manager responsible for coordinating archaeological and built-environment inventories and assessments of off-reservation road improvements. Responsibilities included conducting records searches, archival research, ethnographic literature review, archaeological survey, and contributions to the Tribal EIR. Additionally, prepared a cultural resources management plan for the Buena Vista Band of Me-Wuk Indians' property to guide heritage preservation on the casino property. Also led the Section 106 compliance effort by meeting with agency personnel, Indian groups, and other concerned groups to arrive at reasonable terms for a memorandum of agreement.

Yuba-Feather Supplemental Flood Control Project—Yuba County Water Agency, California

Lead archaeologist for a CEQA compliance project that proposed periodic inundation of large agricultural holdings adjacent to the Feather River. Led a comprehensive archaeological survey and architectural survey of a 1,900-acre project area. One potentially significant archaeological site was identified in the project area. Worked with the agency and project engineers to devise appropriate mitigation for the site.

Madera Water Bank—Azurix Corporation, Madera County, California

Lead investigator for a cultural resources inventory and evaluation for a proposed water bank to comply with NEPA and CEQA. Responsible for designing appropriate research domains as a framework to evaluate the 20 historic resources identified through

research and survey, developing a two-prong survey strategy designed to record all historic sites in the project area, providing a representative sample of the 14,000 acres encompassed by the project, conducting site evaluations, and preparing a report.

Jensen River Ranch Restoration Project—San Joaquin River Parkway and Conservation Trust, Fresno County, California

Cultural resources team lead for a multi-disciplinary restoration project. Performed background research, Native American consultation, survey of the 167-acre restoration site, and NRHP evaluation of cultural resources; prepared a technical report for CEQA/NHPA compliance. Evaluated two historic structures and a historic refuse scatter on the restoration site, including historic property research at repositories in Fresno and Sacramento.

Seaview Vineyard Development—Peter Michael Winery, Sonoma County, California

Cultural resources team leader on an archaeological test excavation of prehistoric site CA-Son-2306 that would be affected by development of a vineyard in coastal Sonoma County. The excavation was conducted to evaluate the site for California Register of Historical Resources and NRHP eligibility. Responsible for research, development of a test excavation program, excavation, ground stone analysis, report preparation, and overall project management.

El Dorado Hills Data Recovery—Serrano Associates, LLC, El Dorado County, California

Crew member for archaeological excavations at 19th century mining camps and homestead sites located near the historic town of Clarksville. Member of the artifact analysis team and contributed to report preparation.

Archaeological Survey Report—Mendocino Coast Recreation and Park District, Mendocino County, California

Survey crew member and the chief researcher for an archaeological survey in heavily wooded terrain east of Fort Bragg.

Sacramento Region Fiber Optic Projects—XO California, Inc., Placer, Sacramento, and Yolo Counties, California

Managed cultural resources task, which consisted of providing sensitivity assessments, conducting inventories, and monitoring recommendations for more than 20 proposed fiber optic builds.

Because the majority of the proposed builds were located in urban settings not surveyed for archaeological sites before development, designed inventory and assessment methods to identify areas that likely contained buried archaeological deposits. According to the results of each assessment, assigned archaeological or Native American monitors to sensitive project areas.

Cellular Tower Builds—Sprint PCS, Northern California

Lead cultural resources manager for 31 cellular tower builds, including antenna-to-building collocations and new tower projects in Alameda, Contra Costa, El Dorado, Napa, Placer, Sacramento, Solano, Sonoma, and Yolo Counties. Responsible for conducting traditional cultural resource inventories (records search and research, Native American consultation, and field survey), sensitivity assessments, viewshed analysis, and monitoring recommendations under stringent time constraints.

Lower Northwest Interceptor Project—Sacramento Regional County Sanitation District, Sacramento and Yolo Counties, California

Coordinated efforts to identify potential cultural resources issues for the pre-design and design phase of a 19-mile sewer alignment. The proposed alignment was routed through portions of the greater Sacramento region that are highly sensitive for the presence of buried archaeological sites. Led a research program consisting of archival research, modeling of historic environments, extensive cooperation with Native Americans and local archaeologists, and architectural and archaeological surveys to recommend appropriate mitigation measures for known and potential cultural resources. Prepared the cultural resources section of an EIR and the cultural resources inventory report for the project.

Lower Northwest Interceptor Project—Sacramento Regional County Sanitation District, Sacramento and Yolo Counties, California

Devised an archaeological monitoring program designed to comply with complex federal regulatory requirements, determined whether construction was likely to disturb buried archaeological deposits, trained monitors and construction staff in their roles as resource stewards during construction, and oversaw staff archaeologists' fieldwork and reporting. Monitoring program included excavation of 298 auger tests to determine whether archaeological deposits were present in the project area and monitoring by qualified archaeologists to verify the results of the auger tests.

High Winds, LLC Wind Turbine Project—FPL Energy, Inc., Solano County, California

Conducted a cultural resources inventory for a proposed wind turbine project in the Montezuma Hills that included pre-field research, Native American consultation, historic research, and a field survey of a large wind turbine generator farm for compliance with CEQA. Identified cultural resources within the boundaries of the project and recommended mitigation and avoidance measures to protect identified resources.

I-5/Cosumnes River Boulevard Interchange Project—City of Sacramento, California

Lead archaeologist for analysis of an 880-acre study area (slated for the extension of Cosumnes River Boulevard to I-5) to comply with Section 106 of the NHPA and CEQA. In addition to using standard inventory methods, led a five-person crew in presence/absence excavations designed to explore geophysical anomalies detected through remote-sensing applications.

Tri-Valley 2002 Capacity Increase Project—PG&E, Alameda and Contra Costa Counties, California

Designed a program of cultural resource compliance to satisfy the MMP previously prepared for the project. The cultural resources compliance program included archival research, consultation with Native Americans, cultural resource inventories and evaluations, and preparation of a comprehensive cultural resources treatment plan (CRTP). The CRTP set the procedures and standards for archaeological monitoring during construction, procedures for dealing with accidental discoveries, and reporting methods. Also monitored construction in sensitive areas and assisted with an inadvertent discovery of archaeological materials.

Los Banos-Gates 500-kV Transmission Line Project (Path 15)—Infrasource, Inc., Merced and Fresno Counties, California

Lead archaeologist for the Path 15 archaeological monitoring program designed by the Western Area Power Administration (Western). Evaluated cultural resources identified by resource monitors, including Native American monitors, over an 84-mile project corridor. Responded to over 70 inadvertent discoveries—recording, test excavating, and researching a total of 26 archaeological sites. Also surveyed newly added project elements and assisted Western and Infrasource with Section 106 compliance.

Battle Creek Salmon and Steelhead Restoration Project—Reclamation and State Water Board, Shasta and Tehama Counties, California

Prepared a research design and guided archaeological test excavations of five prehistoric archaeological sites in the Cascade Range foothills near Red Bluff. Worked closely with Reclamation archaeologists to devise a suitable research design and a schedule and approach to completing Section 106 consultation under a stringent timeline.

South Delta Improvements Program EIR/EIS—DWR and Reclamation, Contra Costa and San Joaquin Counties, California

Led the cultural resources inventory and evaluation effort conducted in support of Section 106, CEQA, and NEPA compliance. Also the primary author of the cultural resources section for the project EIR/EIS. The technical team recorded and evaluated five historic-period cultural resources.

Freeport Regional Water Project—Freeport Regional Water Authority, Sacramento and San Joaquin Counties, California

Prior to construction of the FRWP, led ICF's cultural resources inventory of the 30-mile-long project and drafted a memorandum of agreement (MOA), to direct compliance with Section 106 of the NHPA. The MOA established procedures for the inventory of changes to the FRWP area, treatment of a historic property, and inadvertent archaeological discoveries during construction. Construction resulted in one inadvertent discovery of cultural resources. Worked with Reclamation and construction staff to comply with the project MOA while allowing the contractor to continue work on the project. The construction contractors identified the need for additional work areas after the MOA was executed. These areas needed to be surveyed and reported to the lead federal agency, Reclamation, and SHPO, which began to cause construction delays. Negotiated an amended MOA with Reclamation and the SHPO that streamlined the review process for newly identified project components.

Margaret Widdowson, PhD

Botanist and Wetland Ecologist

Margaret Widdowson conducts special-status plant surveys, floristic inventories, vegetation mapping, plant community mapping and interpretation of aerial photographs, and wetland delineations. She has extensively worked on projects throughout California and has also served on projects in Nevada, Oregon, Arizona, and Utah. Margaret prepares technical reports, including CEQA and NEPA documentation and analyses of biological resources and impacts.

Project Experience

State Route 199-State Route 197 EIR/EA for Surface Transportation Assistance Act Improvement Projects—California Department of Transportation, Task Order 41, Contract #03A1317, Del Norte County, California

Conducted sensitive plant surveys and wetland delineations for road improvement project, documenting several populations of sensitive plants.

U.S. 101 Klamath Grade Raise Wetland Delineation—California Department of Transportation, Task Order 48, Contract #03A1317, Del Norte County, California

Project manager for delineation of wetlands under Corps and Coastal Zone jurisdiction. Conducted delineation fieldwork, mapped wetlands, and wrote final delineation reports.

Ukonom Culverts Rehabilitation Project Biological Studies—California Department of Transportation, Task Order 34, Contract #03A1317, Siskiyou County, California

Conducted rare plant surveys and wetland delineation for road improvement project.

Point Arena State Route 1 Roadway Repair Project Permits, Wetland Delineation, and Mitigation Plan—California Department of Transportation, Task Order 25, Contract #03A1317, Mendocino County, California

Project manager for road improvement project. Conducted wetland delineation and rare plant survey and oversaw production of environmental permits and mitigation plan.

Clark County Desert Conservation Program MSHCP—PBS&J, Clark County, Nevada

Contributed to document species accounts for covered plants, ecosystem accounts, and impact analysis for HCP amendment.

Start Year of Professional Service

1996

Education

PhD, Forest Ecology, University of Stirling, United Kingdom, 1992

BS, Botany, University of Aberdeen, United Kingdom, 1983

Special Training

Jepson Herbarium Workshop: Trinity National Recreation Area: Shrubs and Endemics, Shasta-Trinity National Forest, California, 2008

Jepson Herbarium Workshop: Flora of the Great Basin, Great Basin National Park, Nevada, 2007

Basic Wetland Delineation, Seattle, Washington, 2002 (Wetland Training Institute)

Clean Water Act Section 404: Nationwide and Other Specialized Permits, Davis, California, 2002 (University of California Extension)

Southwestern Willow Flycatcher Workshop at Southern Sierra Research Station, Kern County, 2002

Jurisdictional Delineation of Wetlands, Berkeley, California, 1997 (Dr. Terrence Huffman, University of California Extension)

Professional Memberships

California Botanical Society

California Native Plant Society

Northern California Botanists

Board of Directors, Klamath Bird Observatory

Certifications

Permitted to conduct surveys of the federally listed Southwestern willow flycatcher

Clark County Rare Plant Inventory—Clark County, Nevada

Served as a lead botanist on surveys for rare plant species across the Mojave Desert in Clark County. The project involved navigating cross-country to predetermined plots; conducting systematic surveys for 10 target rare plant species; and collecting presence/absence information, habitat characteristics, and voucher specimens.

Gas Line 177A Botanical Survey—Pacific Gas and Electric Company, Trinity County, California

Project manager and lead botanist on surveys of 32-mile alignment on Shasta-Trinity National Forest for Forest Service sensitive plant species. Led field crew, documented populations of Forest Service sensitive species, and wrote biological evaluation for sensitive plants.

Natural Environment Study/Wetlands Delineation for U.S. 395 Johnstonville Rehabilitation—California Department of Transportation, Task Order 18, Contract #03A1573, Lassen County, California

Conducted rare plant surveys and wetland delineation for road improvement project.

Willits Bypass Restoration Feasibility Study—California Department of Transportation, Task Order 1, Contract # 03A1573, Mendocino County, California

Conducted wetland delineations and surveys for North Coast semaphore grass on proposed mitigation parcels.

District 1 Biological Services—California Department of Transportation, Task Order 11, Contract # 03A1573, Del Norte County, California

Conducted rare plant surveys and wetland delineations, including Coastal Zone wetlands.

Burney Gardens Timber Harvest Plan Botanical Surveys—Pacific Gas and Electric Company, Shasta County, California

Project manager and lead botanist for rare plant surveys of proposed timber harvest plan, documenting new populations of two rare plants species.

Middle Kyle Canyon Complex EIS—USDA Forest Service, Clark County, Nevada

Lead botanist on surveys for Forest Service sensitive plant species and butterfly host plants on more than 3,000 acres in the Spring Mountains National Recreation Area. Developed data dictionaries for field data recording on GPS units and led field crews for three years; documented many new populations of Forest Service sensitive plant

species, recording data on GPS units and TES data forms to construct GIS database, and wrote final report.

Lake Isabella Riparian Vegetation Assessment and Mapping—U.S. Army Corps of Engineers, Kern County, California

Project manager on a study that assessed riparian tree and seedling survival and mortality in the inundation zone of Lake Isabella.

Tejon Mountain Village Biological Surveys—Dudek & Associates, Kern County, California

Team leader for botanical surveys on more than 28,000 acres in the Tehachapi Mountains; located and mapped populations of special-status plants. The purpose of the surveys was to assist the project proponent to carry out environmental commitments to avoid and minimize impacts on threatened and endangered plant species. Mapped riparian vegetation along the south fork of the Kern River.

Placer Legacy Land Cover Mapping and Botanical Inventory—Placer County, California

As project manager, coordinated team of botanists and GIS specialists conducting land cover mapping of the 959,416-acre county from aerial photographs and compiling data from intensive ground-truthing and field surveys of western Placer County. Also managed a team compiling a vascular plant list of the study area and habitat matrices for special-status plants.

HCP/NCCP Planning Agreement—Santa Clara County, California

Assisted with development of natural community and land cover type classification and serving as vegetation ecologist conducting mapping using on-screen aerial photograph interpretation for the HCP/NCCP covering approximately 425,000 acres.

Vegetation Monitoring at Camp Roberts—U.S. Army Corps of Engineers, Sacramento District; San Luis Obispo and Monterey Counties, California

Conducted annual vegetation monitoring of sample transects in vernal pool fairy shrimp habitat using the land condition trend analysis protocol, summarizing data, and writing annual reports. Study is ongoing and has been conducted since 1999.

Southwestern Willow Flycatcher and Least Bell's Vireo Habitat Suitability Evaluation—USDA Forest Service, Los Padres National Forest, California

Served as vegetation ecologist in a study to evaluate habitat suitability for the federally listed Southwestern willow flycatcher and least Bell's vireo at selected sites on the Los Padres National Forest.

I-15 South Corridor Study EIS—Utah Department of Transportation, Salt Lake County, Utah

Assisted with evaluation of wetlands for development of the I-15 study corridor EIS.

Swainson's Hawk Mitigation Program in South Sacramento County—Reynen & Bardis, Sacramento, California

As lead vegetation ecologist, assisted with development of habitat classification and mapped all habitats and other land cover types in south Sacramento County (a 370,000–acre study area), using on-screen aerial photograph interpretation, and conducted field verification surveys. The habitat map, together with nest distribution data, was used to design and implement a GIS-based Swainson's hawk habitat suitability model.

Yuba-Sutter HCP/NCCP—Yuba and Sutter Counties, California

Conducted natural community and land cover type mapping for the 57,000-acre HCP/NCCP, using on-screen aerial photograph interpretation, and conducted field verification surveys to determine the accuracy of on-screen mapping.

Alameda Watershed HCP Baseline Data Collection—San Francisco Public Utilities Commission, Alameda County, California

Botanist for baseline data collection in support of the Alameda watershed HCP, including special-status plant surveys throughout the watershed. Focused on serpentine grasslands and large habitat/vegetation mapping project and used on-screen aerial photograph interpretation.

Shiloh Wind Farm Project—enXco, Solano County, California

Conducted surveys for special-status plants, jurisdictional wetlands, and habitat surveys for various special-status wildlife species for a large-scale wind farm project in the Montezuma Hills.

Placer County Vernal Pool Surveys—Placer County, California

Team botanist for floristic surveys of vernal pools in western Placer County to gather information on the distribution and abundance of special-status species in Placer County vernal pools. The information

will ultimately be used in support of an HCP/NCCP for Placer County.

Prescribed Burn Monitoring Program Evaluation—U.S. Fish and Wildlife Service, California, Washington, and Nevada

Served as vegetation ecologist assisting USFWS in developing a fire effects monitoring program to document basic information, detect trends, and ensure that fire and resource management objectives are met during fuel reduction operations. On selected national wildlife refuges in California, Washington, and Nevada, assisted staff in establishing a monitoring program and training staff.

Special-Status Species Surveys—Lawrence Livermore National Laboratory, San Joaquin County, California

Served as team botanist for botanical surveys of Site 300, the 7,000-acre Lawrence Livermore National Laboratory (LLNL) experimental testing facility in western San Joaquin County, to provide LLNL with baseline information for use in siting future projects and to evaluate the impacts of current and future operations. Conducted site-wide surveys for special-status plant species.

Delineation of Wetlands and Other Deepwater Habitats and Waters of the United States in the Lower Yosemite Falls Area—National Park Service, Yosemite National Park, Mariposa County, California

Conducted a delineation of waters of the United States, including wetlands and Cowardin wetlands for a proposed bridge and hiking trail improvement project in the lower Yosemite Falls area.

Delineation of Wetlands and Other Waters of the United States for the California Forest Highway 113 Rehabilitation and Reconstruction Project—Federal Highway Administration, Siskiyou and Del Norte Counties, California

Conducted a delineation of waters of the United States, including wetlands, for a 21-mile long road improvement project.

Delineation of Wetlands and Other Waters of the United States for the Lower Northwest Interceptor Project—Sacramento Regional County Sanitation District, California

Conducted a wetlands delineation and special-status plant surveys along a 21-mile project route.

Delineation of Wetlands and Other Waters of the United States for Harkins Slough Road—Monterey County, California

Conducted a delineation of waters of the United States, including wetlands, for a bridge improvement project.

Biological Studies in Support of ESA Compliance for Routine Operation of Isabella Dam and Reservoir—U.S. Army Corps of Engineers, Kern County, California

Conducted annual protocol-level surveys and habitat measurements for Southwestern willow flycatcher as part of ongoing studies of the federally and state-listed Southwestern willow Flycatcher in the Kern River Valley.

Wetland and Floristic Surveys for Path 15 Transmission Line Project—Pacific Gas and Electric Company/Western Area Power Administration, Merced and Fresno Counties, California

Served as team botanist and wetland ecologist for floristic surveys and wetland delineation of the 83-mile long proposed Path 15 transmission line project; located and mapped sensitive plant locations using GPS data recorders.

HCP for Operations and Maintenance Projects—Pacific Gas and Electric Company, San Joaquin Valley, California

Researched and prepared biological information on selected special-status plant species for inclusion in the HCP.

Southern Province Forest Plan Revision—USDA Forest Service, Southern California

Author of numerous special-status plant (and some bird) species accounts prepared to support a species viability assessment for the revised forest plan. Writing each species account involved reviewing the species distribution, habitat requirements, and conservation and management issues, and then summarizing the information.

Vegetation Surveys for Diablo Midway Transmission Line—Pacific Gas and Electric Company, San Luis Obispo County, California

Conducted special-status plant surveys for vegetation management activities within the transmission line right-of-way.

William Widdowson

Biologist

William Widdowson conducts biological studies, special-status species impact analyses, and protocol-level field surveys for a wide range of special-status animals in California and Arizona. He is a project manager and field coordinator for a variety of projects and biological studies. William's expertise includes surveying for threatened and endangered avian species, including burrowing owl, northern spotted owl, western snowy plover, marbled murrelet, clapper rail, golden eagle, willow flycatcher, and Bendire's thrasher; expertise in Monitoring Avian Production and Survival (MAPS) banding stations; all-species bird point counts and area searches; and training technicians in wildlife survey techniques. He has been an avid birder since 1976, with birding experience throughout California, as well as Mexico, Nicaragua, Costa Rica, Ecuador, Peru, Bolivia, Chile, Senegal, the Gambia, Kenya, Uganda, Ghana, South Africa, Australia, Malaysia, Indonesia, Philippines, Thailand, Taiwan, Arunachal Pradesh, and the United Kingdom. William has extensive knowledge of bird identification by visual cues and vocalization and bird distribution and ecology in California, as well as extensive experience with all forms of census techniques and behavioral study methods.

In addition to avian surveys, William conducts mammal and herpetofaunal surveys for species that include blunt-nosed leopard lizard, tailed frog, western pond turtle, San Joaquin kit fox, and kangaroo rat. His experience includes small mammal trapping and census, and extensive bat handling and operation of harp traps and mist net arrays for bat capture and processing.

Project Experience

Battle Creek Environmental Implementation Plan—Bureau of Land Management

Lead biologist for design and implementation of biological surveys and construction monitoring plans. Conducted extensive multi-year and protocol-level surveys for listed wildlife species associated with the project. Established site-specific environmental monitoring plans, Migratory Bird Treaty Act compliance program, and special-status species monitoring plans. Created and presented a worker

Start Year of Professional Service

1982

Education

BS, Wildlife Biology, Humboldt State University, Arcata, California, 1990

Special Training

Wildlife Hazard Management Workshop (Embry-Riddle Aeronautical University, 2010)

Bird Banding Certification session, 1999 (Humboldt Bay Bird Observatory)

Quadrunner training certified, 2000

Conversational Spanish

CPR Red Cross Certified

Professional Memberships

Point Reyes Bird Observatory

American Ornithologists Union

Association of Field Ornithology

Cooper Ornithological Society

Western Field Ornithologists

American Birding Association

Neotropical Bird Club

The Wildlife Society

Bird Conservation International

Licenses

Federal Master Bird Banding permit, # 23172

USFWS permit for Southwestern Willow Flycatcher, California Gnatcatcher, Mexican Spotted Owl, and Ferruginous Pygmy Owl, #TE 795934 10

DFG Scientific Collecting Permit, #SC 006773

environmental education program. Project coordinator for on-site environmental monitors and client interface. Conducted protocol-level surveys for listed wildlife species including VELB, California spotted owl, bald eagle, Vaux's swift, California black rail, yellow-breasted chat, and bats. Assisted with analysis of potential impacts and recommended mitigation measures as part of the wildlife sections for NEPA and CEQA documents and the ESA.

Ten-Mile River Bridge Biological Monitoring—California Department of Transportation, Caltrans, Task Order 39, Contract #03A1317, Mendocino County, California

Served as project manager and field coordinator. Assisted with design and implementation of environmental monitoring for multi-year bridge improvement project. Project coordinator for on-site environmental monitors, subcontractors, and client interface, prepared annual report summarizing environmental monitoring tasks.

Knights Landing Bridge Migratory Bird Nest Prevention—California Department of Transportation, Task Order 47, Contract #03A1317, Yolo County, California

Served as lead biologist and project manager. Conducted project management and administrative functions including staff coordination, progress reporting, and project forecasting. Coordinated efforts to prevent migratory birds from nesting on bridge project areas.

Feather River Bridge Migratory Bird Nest Prevention Project—California Department of Transportation, Task Order 53, Contract #03A1317, Oroville, California

Served as lead biologist and project manager. Conducted project management and administrative functions, including staff coordination, progress reporting, and project forecasting. Coordinated efforts to prevent migratory birds from nesting on bridge project areas.

Eastbound Acid Flat Deck Replacement Migratory Bird Nest Prevention and Migratory Bird Nest Prevention at Placer I-80 HOV Phase 2—California Department of Transportation, Task Orders 36 and 38, Placer County, California

Served as lead biologist and project manager. Conducted project management and administrative functions, including staff coordination, progress reporting, and project forecasting. Coordinated efforts to prevent migratory birds from nesting on bridge project areas.

I-5 Thomes Creek Bridge Installation of Migratory Bird Exclusion Netting—California Department of Transportation, Task Order 23, Contract No. 03A1317, Corning, California

Served as lead biologist and project manager. Conducted project management and administrative functions, including staff coordination, progress reporting, and project forecasting. Coordinated efforts to prevent migratory birds from nesting on bridge project areas.

I-5 Dana-to-Downtown Bald Eagle Nest—California Department of Transportation, Task Order 22, Contract No. 03A1317, Redding, California

Lead biologist for implementation of USFWS (BO) and DFG (fully protected) requirements for bald eagle mitigation monitoring (ongoing). Duties include study design, developing eagle exclusion device, construction of alternate nest, eagle monitoring, installation and set up of nest camera, developing monitoring and rescue protocols, and establishment of egg/eaglet rescue procedures.

Biological Consulting Services for Tehachapi Renewable Transmission Project—Southern California Edison

Conducted protocol-level surveys for California gnatcatcher, southwestern willow flycatcher and least Bell's vireo, and habitat analysis along the Tehachapi renewable transmission project corridor. Mapped observations in the field using handheld electronic data loggers and portable GPS receivers. Wrote and submitted report summarizing survey results.

South Discovery Timber Harvest Plan Preconstruction Surveys—Pacific Gas and Electric Company, California

Served as project manager. Conducted protocol-level surveys for California spotted owl, great grey owl and northern goshawk. Coordinated field surveys and crew for completion of field tasks including botanical and herpetofaunal surveys in remote forested habitat. Prepared annual report summarizing survey results.

Biological Resource Survey and Monitoring—University of California, Davis

Served as project manager. Conducted protocol-level surveys for burrowing owl. Provided multi-year monitoring of California ground squirrel populations. Acted as environmental monitor and liaison to the University of California, Davis, Planning Department.

Construction Monitoring and Restoration Services—Freeport Regional Water Authority, California

Served as lead biologist for the design and implementation of biological surveys and coordination of biological compliance training and construction monitoring. Conducted protocol-level surveys for listed wildlife species associated with this project. Established site-specific monitoring protocols and implemented a standardized progress reporting system.

Environmental Services in Support of EIR/EIS for DesertXpress LLC—Circle Point, California and Nevada

Conducted protocol-level surveys for southwestern willow flycatcher and least Bell's vireo and habitat analysis along the DesertXpress project corridor. Mapped observations in the field using handheld electronic data loggers and portable GPS receivers. Wrote and submitted report summarizing survey results.

HCP Biological Effectiveness Monitoring—The Natomas Basin Conservancy, Sacramento County, California

Served as field coordinator. Assisted with design and implementation of biological surveys for wildlife species covered under the HCP. Designed and implemented survey protocols, and wildlife habitat performance monitoring programs.

Forest Highway 171 Environmental Permitting—Butte County Association of Governments, California

Served as lead biologist for design and implementation of biological surveys for California spotted owl, northern goshawk, bald eagle and other nesting raptors and listed bat species. Conducted protocol-level surveys for above species.

Environmental Support Services—University of California, Merced

As field coordinator, assisted with design and implementation of biological surveys, construction monitoring, environmental awareness training, and preparations for the monitoring and training required for campus construction. Designed and provided environmental training and monitored construction activity for compliance with construction mitigation and protection measures. In addition:

- Assisted with development and implementation of California tiger salamander avoidance and minimization measures

- Monitored vernal pools within 250 feet of the construction area and reference pools to assess any potential adverse effects on pools resulting from construction (as required by the BO)
- Conducted California tiger salamander surveys on accessible sites within 0.6 miles of the Phase 1 site
- Conducted regular surveys for potential kit fox dens near the Phase 1 site
- Conducted surveys for burrowing owls in the vicinity of construction activity
- Conducted surveys for nesting Swainson's hawks in the vicinity of construction activity

Bird Airstrike Hazard Study—Teichert Aggregates, Yuba County, California

Served as project manager. Designed and implemented study of bird use of different habitats near Beale AFB to evaluate bird airstrike hazard potential from a change in land use. Mapped bird sightings, vegetation, and other habitat variables into an integrated GIS database. Produced quarterly and annual reports for client and the U.S. Air Force.

San Joaquin Kit Fox and Western Burrowing Owl Surveys—FPL Energy, Alameda County, California

Conducted protocol-level surveys for western burrowing owl and federally listed San Joaquin kit fox in support of the Altamont repowering project. Surveys were conducted as outlined in Alameda County's biological resources management plan, which was implemented as a condition of approval for the project.

Riparian Ecosystem Assessment—County of Placer, California

Conducted and assisted with design of study of wildlife use for assessing the integrity and functions of riparian ecosystems associated with perennial and seasonal streams in western Placer County. Conducted wildlife field surveys and vegetation sampling throughout western Placer County.

Southwestern Willow Flycatcher and Least Bell's Vireo Surveys—City of Lompoc, California

Conducted protocol-level surveys for southwestern willow flycatcher and least Bell's vireo, and habitat analysis along the Santa Ynez River. Mapped observations in the field using handheld electronic

data loggers and portable GPS receivers. Wrote and submitted report summarizing survey results.

Southwestern Willow Flycatcher and Least Bell's Vireo Surveys—Bureau of Land Management, Mojave Desert, California

Conducted protocol-level surveys for southwestern willow flycatcher and least Bell's vireo, and habitat analysis at isolated desert springs. Mapped observations and habitat polygons in the field using handheld electronic data loggers and portable GPS receivers.

Bird Studies in West Mojave, Bendire's and LaConte's Thrasher—Bureau of Land Management, West Mojave Desert, California

Conducted bird surveys, focusing on Bendire's thrasher (among other thrashers) and northern mockingbird. Assisted with preparation of report summarizing survey results that was used to develop the West Mojave HCP.

Habitat Suitability Analysis, Biological Studies in Support of ESA Compliance for Routine Operation of Isabella Dam and Reservoir—U.S. Army Corps of Engineers, Kern River Valley, California

Conducted bird and vegetation surveys to determine cowbird population trends and conducted willow flycatcher and least Bell's vireo surveys for analytical studies examining population status and distribution of the federally and state-listed southwestern willow flycatcher. Assisted with data preparation and writing of project reports delivered to the Corps.

Crystal Adams Northern Goshawk Surveys—USDA Forest Service, Crystal Adams Defensible Fuels Profile Zone, Plumas National Forest, California

Conducted protocol-level broadcast acoustical surveys for northern goshawk. Coordinated field surveys and crew for completion of surveys in remote forested habitat.

California Gnatcatcher, Southwestern Willow Flycatcher, Cactus Wren, and Least Bell's Vireo Surveys, PA-17 and Shady Canyon Project Area—Irvine Community Development Company, Irvine, California

Conducted protocol-level surveys for California gnatcatcher, southwestern willow flycatcher, and least Bell's vireo; conducted surveys for nesting raptors and all-species bird surveys. Wrote and submitted report summarizing survey results.

Prior Experience

LBJ Enterprises

Staff ornithologist, biologist, and primary bander. Duties included conducting surveys for threatened and endangered species in northwestern California, including northern spotted owl (NSO), western snowy plover, marbled murrelet, clapper rail, golden eagle, and willow flycatcher; conducting follow-up visits to establish breeding status (mousing) of NSO; and preparing NSO consultations for timber harvesting plans. Managed and operated two MAPS banding stations; conducted all-species bird point counts and area searches; supervised and trained interns and technicians in wildlife survey techniques. Assisted with oil spill response, conducting oiled bird surveys for the Stuyvesant oil spill in 1999. Prepared and submitted year-end summary reports of field work. Taught ornithology-based classes at beginner to advanced level at Humboldt State University Center Activities Program (topics include birding by ear, advanced warblers, gull identification, and tropical birding). Lectured and led field trips at birding festivals throughout California.

Smithsonian Migratory Bird Center (contract), National Zoo, Washington, D.C.

Ornithologist. Conducted all-bird point counts and vegetation surveys in two coffee-growing areas in central Peru. Collected foraging data, operated mist nets, and recorded bird vocalizations.

USDA Forest Service/Partners in Flight, Tortuguero, Costa Rica

Primary bander. Operated five mist-netting stations, banding resident and migrant birds. Conducted area searches and migration counts. Coordinated staffing and updated monitoring protocols.

Ecolodge San Luis and Biological Station, Monteverde, Costa Rica

Station manager. Managed biological station and tourist ecolodge. Coordinated resident naturalist program, conducted surveys of pre-montane resident and migrant bird species. Initiated a resident and migratory bird capture project.

Pasoh Forest Reserve, Simpang Pertang, Malaysia, and Danum Valley Field Center, Borneo

Crew leader, bird banding study. Studied population and ecology of birds and bats in Malaysian rain forest. Primary bander and crew leader of ongoing study at Pasoh. Banded and monitored edible-nest swiftlets at Gomantong caves. Primary bander of rainforest birds at

Danum. Trained park service employees in mist-netting techniques on island of Palau Sipadon, Sabah, and Borneo.

Tambopata Reserve Society, London Wildlife Trust, London, United Kingdom

Expedition member. Acted as field ornithologist for Tambopata-Candamo Reserve Zone 1992 expedition in southeast Peru. Conducted intensive surveys of avifauna. Censused bird communities in study areas by sight and sound. Operated mist nets and assisted with vegetation surveys and ground-truthing from Landsat images.

Wyoming State University/U.S. Fish and Wildlife Service

Biotechnician and crew leader. Studied bird use and nest success in conservation reserve program fields in the northeastern Great Plains. Conducted daily nest searches for ground-nesting passerines in western Minnesota. Collected and analyzed data on nest success. Performed vegetation assessment.

Explorer's Inn, Tambopata—Candamo Reserve Zone, Southeast Peru

Resident naturalist. Led tours describing rain forest ecology and natural history. Duties included trail maintenance, design of interpretive displays, and compiling the first bird checklist for the area.

Redwood Sciences Laboratory, USDA Forest Service, Humboldt and Del Norte Counties, California

Biotechnician. Surveyed marbled murrelets in northern California. Conducted dawn marbled murrelet and passerine censuses. Established new study sites and transects. Monitored old-growth cut and performed vegetation analysis.

McCloud Ranger District, USDA Forest Service, Shasta County, California

Biotechnician. Studied prey base and habitat use by the northern goshawk in northern California. Established large transects in northern coniferous forests at the base of Mt. Shasta. Conducted early-morning censuses of all bird and mammal species related to the goshawk prey base. Sampled vegetation and groundcover, and estimated cover types and percentages.

Humboldt Bay Bird Observatory and Klamath Demographic Network, Humboldt County, California

Master bird bander. Conducted bird banding operations, taught at bird banding and monitoring workshops, and provided individual training in mist netting and bird census techniques.

Publications

Widdowson, W.P. Olive-sided Flycatcher *in* Shuford, W. D., and Gardali, T., editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Widdowson, W. P. In press. Surveys for Bendire's Thrasher and Other Mimids in the Western Mojave Desert. ICF. Sacramento, CA.

Widdowson, W. P. and M. J. Widdowson. 2000. Checklist to the Birds of Costa Rica. December. Humboldt Bay Bird Observatory. Arcata, CA.

Appendix E

Biological Assessment

BIOLOGICAL ASSESSMENT FOR THE GRIMES PIPELINE PROJECT, SUTTER COUNTY

PREPARED FOR:

CPN Pipeline Company
60 River Road
Rio Vista, CA 94571
Contact: Chris Delaney, Engineering Manager
707.374.1516

PREPARED BY:

ICF International
630 K Street, Suite 400
Sacramento, CA 95814
Contact: Sue Bushnell
916/737-3000

December 2010

ICF INTERNATIONAL

ICF International. 2010. *Biological Assessment for the Grimes Pipeline Project, Sutter County, California*. December. (ICF 00776.10) Sacramento, CA. Prepared for CPN Pipeline Company.

Contents

Tables

On Page

Figures

Follows Page

Acronyms and Abbreviations

API	American Petroleum Institute
BA	biological assessment
BMPs	best management practices
Central Valley	Central Valley Gas Storage
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Corps	U.S. Army Corps of Engineers
ESA	Endangered Species Act
HDD	horizontal directional drilling
ICF	ICF International
NMFS	National Marine Fisheries Service
NWRs	National Wildlife Refuges
OHWM	ordinary high water mark
ROW	right-of-way
SWPPP	stormwater pollution prevention plan
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VELB	Valley Elderberry Longhorn Beetle

Chapter 1
Introduction

1.1 Project Background

CPN Pipeline Company,(Calpine) is proposing to construct and operate the Grimes Pipeline Project to provide a connection between Venoco, Inc. (Venoco) and other gas producers in the Grimes natural gas field and Calpine's existing Sutter Energy Center pipeline system (Figure 1).

The proposed action includes installation of a 2.8-mile gas pipeline, two meters at two Venoco's existing meter stations owned and operated by Venoco, a tap on the existing Sutter Energy Center pipeline system, and a 0.5-acre gas metering facility (referred to in this document as the *Grimes Station*). Once constructed, the proposed pipeline will transport approximately 10 million standard cubic feet per day of natural gas from Venoco's and other gas producers' existing gas wells through the Sutter Energy Center pipeline system to Calpine's Sutter Energy Center, southeast of the project area (Figure 2). The quantity of natural gas delivered to the Sutter Energy Center will not be increased over existing deliveries.

1.2 Legal and Regulatory Background

Calpine has submitted a permit application to the U.S. Army Corps of Engineers (Corps) pursuant to Section 404 of the Clean Water Act for the discharge of fill into waters of the United States associated with the proposed action. In accordance with Section 7 of the federal Endangered Species Act (ESA), the Corps is required to consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that issuance of a 404 permit for the proposed project would not jeopardize the continued existence of any federally listed species or result in adverse modification of designated critical habitat.

The Section 7 implementing regulations (50 Code of Federal Regulations [CFR] §402.14[a]) require that each federal agency review its actions to determine whether an action "may affect" listed species or critical habitat. If a project "may affect," but is "not likely to adversely affect" a listed species or critical habitat, formal consultation with USFWS is not necessary (50 CFR §402.14[a]). Formal consultation between the Corps and USFWS is only necessary for a Corps action that is "likely to adversely affect" a federally listed species or critical habitat (50 CFR §402.14[a]).

The Section 7 implementing regulations (50 CFR §402.14[c]) require a federal agency to provide the following information to USFWS with any written request to initiate formal consultation.

- A description of the action to be considered.
- A description of the specific area that may be affected by the action.
- A description of any federally listed species or designated critical habitat that may be affected by the action.
- A description of the manner in which the action may affect any federally listed species or designated critical habitat and an analysis of any cumulative effects.

- Relevant reports, including any environmental impact statement, environmental assessment, or biological assessment prepared.
- Any other relevant available information on the action, the affected species, or designated critical habitat.

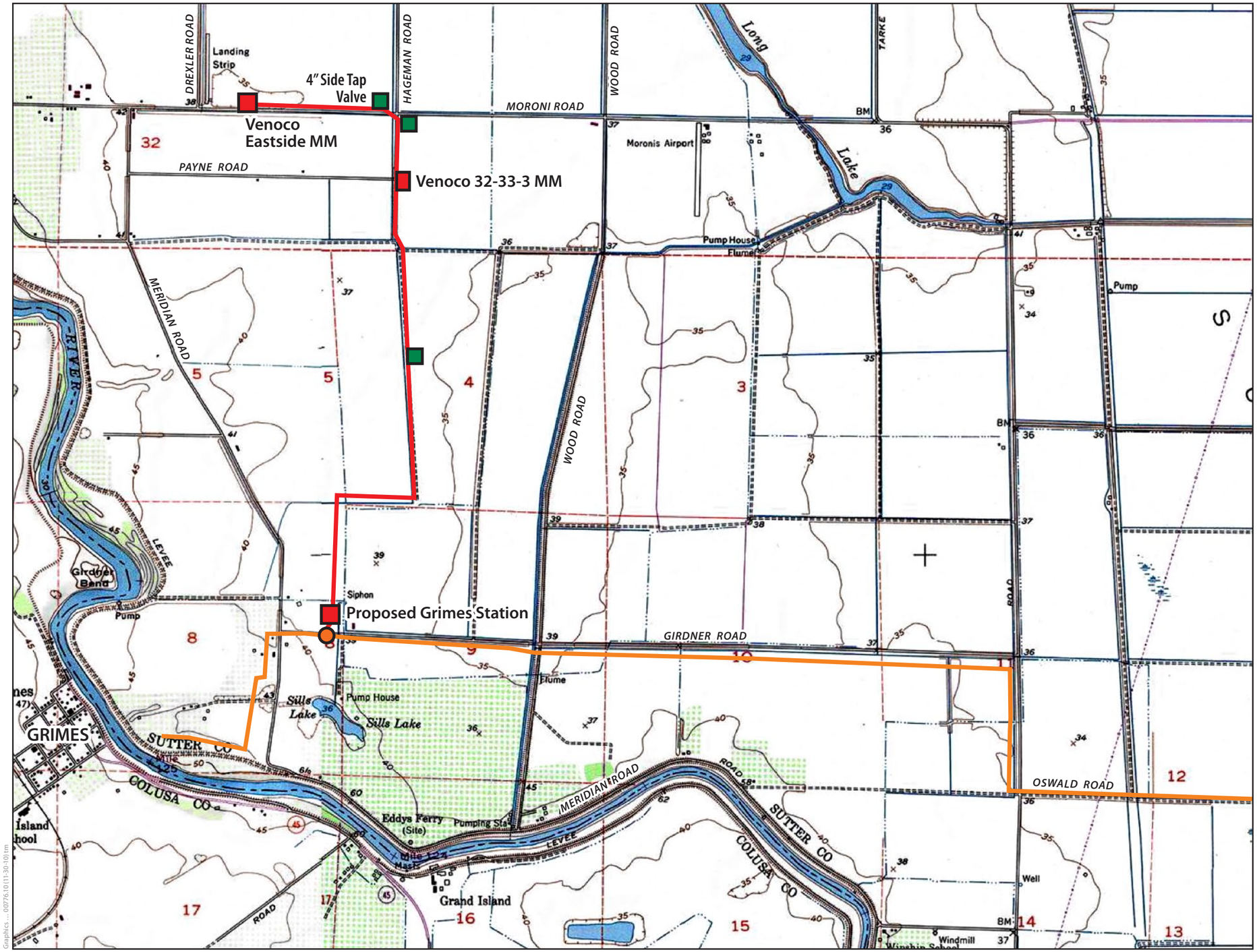
For the federally listed giant garter snake (*Thanmophis gigas*), Calpine is requesting that the proposed action be covered under the *Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California.* (I-1-F-97-149.) Sacramento, CA (herein referred to as the Corps' Programmatic Biological Opinion). The proposed action will not result in permanent losses of giant garter snake habitat and would result in the temporary disturbance of less than 20.00 acres of giant garter snake habitat; therefore meets the criteria outlined in the Corps' Programmatic Biological Opinion consultation guidelines for giant garter snake. The proposed project would result in Level 1 impacts which include 1) no permanent loss of GGS habitat; 2) less than 20.00 acres of temporary disturbances; and 3) temporary impacts restored to preproject conditions within the same season or, at most, the same calendar year.

For the federally-listed valley elderberry longhorn beetle *(Desmocerus californicus dimorphus)*, Calpine is requesting that the proposed action be covered under the Corps Programmatic Formal Consultation Permitting Projects with Relatively Small Effects on Valley Elderberry Longhorn Beetle Within the Jurisdiction of the Sacramento Field Office, California (Corps File # 199600065). The proposed action will not affect more than 25 elderberry plants with at least one stem measuring 1.0 inch or greater in diameter at ground level or more than 200 elderberry measuring 1.0 inch or greater in diameter at ground level, and less than 250 linear feet of non-developed watercourse is present in the action area. Therefore, the proposed action meets the criteria outlined in the Corps' Programmatic Biological Opinion consultation guidelines for valley elderberry longhorn beetle.

1.3 Purpose of Biological Assessment

The purpose of this biological assessment (BA) is to provide the information necessary for formal consultation between the Corps and USFWS as required pursuant to ESA Section 7(a)(2). This BA provides all the required information (as listed above) for the proposed action. Chapter 1 of this BA describes the action area, the federally listed species that may be affected by the proposed action, and informal consultation conducted with the USFWS to date. Chapter 2 describes the environmental baseline against which project-related effects are determined. Chapter 3 describes the proposed action including conservation measures incorporated into the project to be considered. Chapter 4 describes the manner in which the proposed action may affect federally listed species and critical habitat.

As stated in the *Endangered Species Consultation Handbook* (Handbook), one of the purposes of a Section 7 BA is to help make the determination of whether the proposed action is "likely to adversely affect" federally listed species and critical habitat, and thus whether formal consultation is necessary (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998). These determinations are provided in Chapter 5 of this BA, along with summaries of project-related effects on the federally listed species addressed.



Legend

- Proposed 6-inch Natural Gas Pipeline
- Existing 20-inch Sutter Energy Center Gas Pipeline
- Below Ground Hot Tap and Valve
- Proposed Construction Laydown Area
- Venoco's Existing Master Meter Sites and Proposed Grimes Station Site

N

1,000 0 1,000 2,000 3,000 4,000

feet

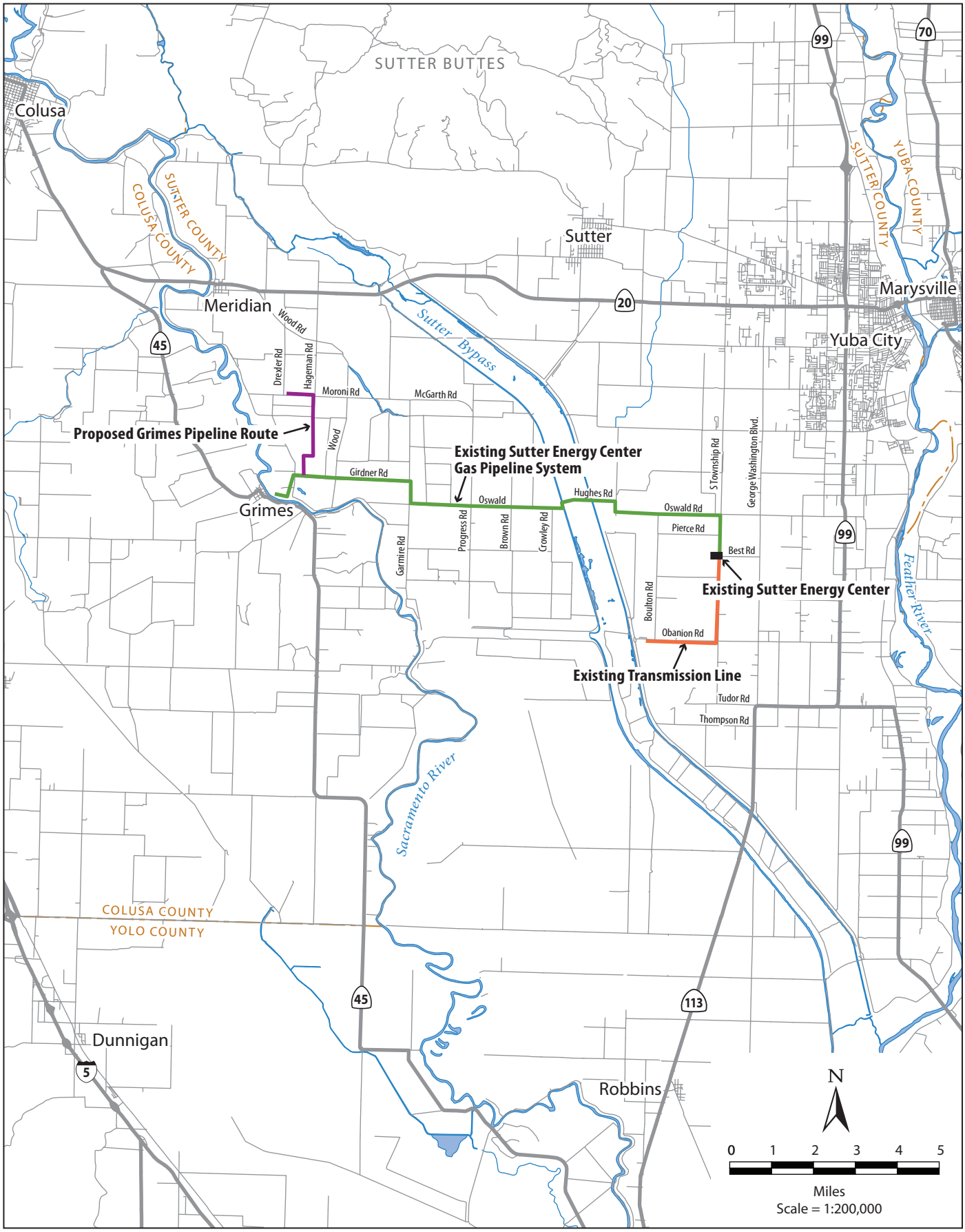
Scale = 1:24,000

Base Map:
National Geographic TOPO
Gilsizer Slough, CA (1973), Tilsdale Weir, CA (1973)

Graphics... 0077610 (11-30-10).cnm

ICF INTERNATIONAL

Figure 1
Grimes Pipeline Project Location



ICF INTERNATIONAL

Figure 2
Grimes Pipeline Project Vicinity

1.4 Action Area

The *action area* encompasses approximately 29 acres and is located in northwestern Sutter County, immediately east of the Sacramento River and approximately 1 mile east of the town of Grimes. The action area includes all areas in which federally listed species could be directly and indirectly impacted by the proposed action. It lies between the Colusa and Sutter Basins and is approximately 13 miles west of Yuba City in northwestern Sutter County (Figure 1). The proposed action would extend approximately 2.8 miles from the Venoco's Eastside master meter station south to the existing Sutter Energy Center 20-inch pipeline (Figure 2).

1.5 Species Addressed

This document only addresses potential effects on species that are federally listed as threatened or endangered, proposed for listing under ESA and that are therefore under the regulatory authority of USFWS, pursuant to Section 7. California state-listed species and other special-status species that are not federally listed or proposed for listing are not addressed in this document.

Consistent with Section 7 implementing regulations (50 CFR §402.12[b][2]), lists of endangered, threatened, and proposed species were generated from USFWS's website for the Tisdale Weir U.S. Geological Survey (USGS) 7.5-minute quadrangle and for Sutter County (Appendix A). Biologists reviewed the list of species obtained from the USFWS, California Natural Diversity Database (CNDDB) and the California Native Plant Society (CNPS) *On-Line Electronic Inventory of Rare and Endangered Vascular Plants of California* for records of occurrences of federally listed species within and near the action area. Previously recorded occurrences of federally listed wildlife and plant species are shown in Appendix A. Appendix A also contains the USFWS' species list. Each of the federally listed species identified as having the potential to occur in the action area is addressed in Table 1-1.

On behalf of Calpine, ICF International (ICF) has made a preliminary determination of whether the proposed action "may affect" each of the species on the USFWS list, based on species range and habitat preferences and on the types of impacts that would result from the proposed action. "May affect" is defined in the Handbook (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998) as the appropriate conclusion when a proposed action may pose *any* effects on listed species or designated critical habitat. The appropriate conclusion when a proposed action will not affect a listed species or designated critical habitat, as stated in the Handbook, is "no effect." When the federal agency proposing the action determines that a "may affect" situation exists, then it must either initiate formal consultation or seek written concurrence from USFWS that the action is "not likely to adversely affect" the listed species.

Species for which a "no effect" determination was made are described briefly below (Section 1.5.1, *"No Effect" Species*), but are not addressed further in this BA. Species for which a "may affect" determination was made are indicated in Section 1.5.2, *"May Affect" Species*, and are fully addressed in the remainder of the BA.

1.5.1 "No Effect" Species

Six federally listed species (Table 1-1)—one fish, two invertebrates, two amphibians, and one plant—were considered for inclusion in this BA because they appeared on the USFWS species lists

(U.S. Fish and Wildlife Service 2010) or have been previously recorded in the project region (California Natural Diversity Database 2010 and California Native Plant Society 2010), but were not addressed further because it was determined that the proposed action would not affect them. There is no formally designated critical habitat for any of these species in the action area. The rationale for this determination follows.

One federally listed fish species under the jurisdiction of USFWS, Delta smelt (*Hypomesus transpacificus*), was included on the USFWS species lists. The species is known to occur in the Sacramento River but is restricted to the Delta region and would not occur in the vicinity of the proposed action. The USFWS species lists also include four federally listed fish species under the jurisdiction of the National Marine Fisheries Service (NMFS): green sturgeon (*Acipenser medirostris*), Central Valley steelhead (*Oncorhynchus mykiss*), Central Valley spring-run Chinook salmon (*O. tshawytscha*), and winter-run Chinook salmon. The proposed action crosses several artificially created drainage and irrigation ditches. These drainages convey surface water and drainage water from irrigated lands before draining to Sills Lake or being pumped into the Sacramento River. Low flows combined with the presence of drainage from irrigated lands means that water temperatures likely are too warm to support salmonids, especially during summer and early fall when construction will occur. Furthermore, these drainages appear to have no direct connection to the Sacramento River, where green sturgeon, Central Valley steelhead, and Chinook salmon may occur. The proposed action will avoid affecting all drainages in the action area. The gas pipeline will either avoid the drainage completely or will be installed under the drainage by bore method. Consequently, the proposed action would not affect steelhead, green sturgeon, or winter- and spring-run Chinook salmon; therefore, these species are not addressed further in the BA.

The federally listed invertebrate species that were considered but dismissed from further discussion are vernal pool fairy shrimp (*Branchinecta lynchi*) and vernal pool tadpole shrimp (*Lepidurus packardi*). There are no vernal pools or other seasonally ponded areas that would provide suitable habitat conditions for vernal pool fairy shrimp and vernal pool tadpole shrimp within 250 feet of the proposed action. Based on the lack of suitable habitat, it was determined that vernal pool fairy shrimp and vernal pool tadpole shrimp are not present in the action area and would not be affected by the proposed action.

The two federally listed amphibian species that were considered but dismissed from further discussion are California tiger salamander (*Ambystoma californiense*) and California red-legged frog (*Rana draytonii*). The action area is within the historic range of both species; however, the current range of these species has been significantly reduced. California red-legged frog is believed to have been extirpated from the low elevations of the Central Valley by nonnative predators and loss of habitat (URS 2007). The closest known occurrence of California red-legged frog is more than 10 miles from the action area (California Natural Diversity Database 2010). There are no vernal pools or other seasonally ponded areas that would provide suitable habitat conditions for California tiger salamander in the action area or within 1.3 miles of the action area. The action area is in a large, actively cultivated agricultural area. Based on the lack of reported sightings of California red-legged frog and California tiger salamander in Sutter County (CNDDB 2010) and the lack of suitable habitat for California tiger salamander, California red-legged frog and California tiger salamander are not expected to occur within the action area and would not be affected by the proposed action.

The single federally listed plant species considered but dismissed from further discussion is palmate-bracted bird's-beak (*Cordylanthus palmatus*). This species occurs in alkaline grassland habitats, which are not present in the action area. Based on the lack of suitable habitat, it was

Table 1-1. Federally Listed Species Potentially Occurring in the Action Area

Common Name *Scientific Name*	Federal Status	Geographic Distribution	Habitat Requirements	Potential for Effect
Plants				
Palmate-bracted bird's-beak *Cordylanthus palmatus*	E	Livermore Valley and scattered locations in the Central Valley from Colusa to Fresno Counties.	Alkaline sites in chenopod scrub and valley and foothill grassland. Blooms May–Oct.	No effect. No suitable habitat (alkali grassland) present in the action area.
Wildlife				
Vernal pool fairy shrimp *Branchinecta lynchi*	T	Central Valley and central and south Coast Ranges from Tehama to Santa Barbara Counties. Isolated populations in Riverside County.	Common in vernal pools and other ephemeral wetlands in annual grassland; also found in sandstone rock outcrop pools.	No effect. No suitable habitat (vernal pools or other ephemeral wetlands) present within 250 feet of the proposed action.
Vernal pool tadpole shrimp *Lepidurus packardi*	E	Shasta County south to Merced County.	Vernal pools, seasonal wetlands, and ephemeral stock ponds in annual grassland. Also occurs locally in railroad right-of-way pools and roadside ditches.	No effect. No suitable habitat (vernal pools or other ephemeral wetlands) present within 250 feet of the proposed action.
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	T	Streamside habitats below 3,000 feet throughout the Central Valley. Largest known populations are associated with the Sacramento River, American River, San Joaquin River, and Putah Creek watersheds.	Riparian and oak savanna habitats with elderberry shrubs; elderberries are the host plant for larvae and primary food source for adults.	Not likely to adversely affect. One elderberry shrub is located within the action area; however, the shrub will not be directly or indirectly affected by the proposed action.
Delta smelt *Hypomesus transpacificus*	T	Sacramento River–San Joaquin River Delta.	Euryhaline (fresh and brackish water) estuary channels. Spawning habitats consist of side channels and sloughs in the middle reaches of the Delta.	No effect. Drainages in the action area do not provide suitable habitat for Delta smelt and are not within species' range.
California tiger salamander *Ambystoma californiense (=A. tigrinum c.)*	T	Central Valley, including Sierra Nevada foothills, up to approximately 1,000 feet, and coastal region from Butte County south to northeastern San Luis Obispo County.	Small ponds, lakes, or vernal pools in grasslands and oak woodlands for larvae; rodent burrows, rock crevices, or fallen logs for cover for adults and for summer dormancy.	No effect. No suitable habitat (seasonal ponds, lakes, or vernal pools) present within 1.3 miles of the proposed action.
California red-legged frog *Rana draytonii*	T	Along the coast and coastal mountain ranges of California from Marin to San Diego Counties and in the Sierra Nevada from Tehama to Fresno Counties.	Permanent and semipermanent aquatic habitats, such as creeks and cold-water ponds, with emergent and submergent vegetation. May aestivate in rodent burrows or cracks during dry periods.	No effect. Potential habitat is present in riparian drainage in the action area; however, no known occurrences within 10 miles of action area and possibly extirpated from Central Valley floor.

Common Name *Scientific Name*	Federal Status	Geographic Distribution	Habitat Requirements	Potential for Effect
Giant garter snake *Thamnophis gigas*	T	Central Valley from the vicinity of Burrel in Fresno County north to near Chico in Butte County; has been extirpated from areas south of Fresno.	Sloughs, canals, low-gradient streams, and freshwater marsh habitats where there is a prey base of small fish and amphibians; also found in irrigation ditches and rice fields; requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter.	Likely to adversely affect. Several known occurrences within 5 miles of the action area. Suitable aquatic habitat is present in cultivated rice fields and several drainages in the action area.

Status explanations:
E = listed as endangered under the federal Endangered Species Act.
T = listed as threatened under the federal Endangered Species Act.

determined that palmate-bracted bird's-beak is not present in the action area and would not be affected by the proposed action.

1.5.2 "May Affect" Species

Giant garter snake and valley elderberry longhorn beetle are the only federally listed species that may be affected by the proposed action and are addressed in this BA. Giant garter snake (GGS) and valley elderberry longhorn beetle (VELB) are federally listed as threatened are under the jurisdiction of USFWS.

1.6 Critical Habitat

No critical habitat has been designated by USFWS within the action area.

1.7 Consultation to Date

To date, no formal consultation has been initiated with USFWS for the proposed action. Ben Watson, USFWS biologist, was contacted by telephone on December 6 and 22, 2010, to discuss the proposed action and schedule; species to be addressed in the BA; potential effects and the appropriate conservation measures for federally listed species; and the applicability of the Corps' Programmatic Biological Opinions for GGS and VELB for this proposed action. In addition, coordination between the USFWS and California Department of Fish and Game on the appropriate GGS conservation measures that would be required by both agencies was also discussed.

Chapter 2
Environmental Baseline

To assess the effects of an action on listed species, the Section 7 implementing regulations require an analysis of how the proposed action would affect the environmental baseline (50 CFR §402.02). The environmental baseline is a current measurement of the status of the listed species or their critical habitat, as well as the status of the present environment in which the species or critical habitat exist (Sullins 2001). The environmental baseline includes the past and present impacts of all federal, state, or private actions and any other human activities, as well as the anticipated future effects of proposed projects that have already undergone Section 7 consultation in the action area (50 CFR §402.02).

This chapter characterizes the environmental baseline of the action area. Section 2.1 describes the methods used to assess the present environment and known or potential occurrence of federally listed species. Section 2.2 describes the vegetation communities found in the action area. Section 2.3 describes the status, habitat requirements, and known or potential presence of each listed species in the action area.

Potential habitat is identified here based on vegetation communities and habitat types occurring in the action area; the description of suitable habitat is based on the results of habitat assessment and survey efforts, as well as on previous determinations made by USFWS for other projects in the region.

2.1 Assessment Methodology

2.1.1 Vegetation and Habitat Mapping

ICF's biological team consisted of wildlife biologists Steve Avery and Bud Widdowson, botanists Kate Carpenter and Margaret Widdowson, and wetland ecologists. Biological resource surveys entailed driving and walking lands within the action area. Various types of habitat assessments and field surveys were conducted in October and December 2010. During the various surveys, biological communities and areas that could provide suitable habitat for special-status species were mapped on 1 inch = 200 feet aerial photographs.

ICF biologists used aerial photograph interpretation and field verifications to describe and map vegetation and land cover types occurring in the action area. The purpose of the mapping effort was to identify the locations of sensitive biological resources.

2.1.2 Habitat Assessments and Focused Surveys

2.1.2.1 Federally Listed Plant Species

After conducting a reconnaissance-level survey of the action area and reviewing existing species lists and databases for the geographic region (USFWS lists, CNDDB, CNPS *Inventory of Rare and Endangered Vascular Plants of California*), only one federally listed plant species, palmate-bracted bird's-beak, was identified as potentially occurring in the region. However, ICF botanists

determined that the action area consists primarily of agricultural lands and supports very little natural habitat that could support palmate-bracted bird's-beak. There are no known occurrences of palmate-bracted bird's beak within 5 miles of the action area and no suitable habitat (alkaline grasslands) for this species is present in or adjacent to the action area. Based on the lack of suitable habitat, it was determined that this species has no potential to occur in the action area.

2.1.2.2 Giant Garter Snake

Based on guidance from USFWS (Ben Watson) and the California Department of Fish and Game (DFG) (Jenny Marr) for other projects in the region, it was determined that rice fields, drainages, and other water bodies in the action area could provide suitable aquatic habitat for GGSs. It was also determined that the rice berms and adjacent earthen roads and fallow vegetated, agricultural fields (not unvegetated disked fields) within 200 feet of suitable aquatic habitat could provide suitable upland habitat for GGSs.

The identification of wetland and upland habitat features that could be used by GGSs were based on the results of the vegetation mapping and wetland delineations of the action area. These potential habitat features were checked in the field to determine specific habitat conditions, typical hydro-period, land use, and presence of upland habitat and hibernacula.

2.1.2.3 Valley Elderberry Longhorn Beetle

During the field surveys, the locations of suitable elderberry shrubs (*Sambucus* sp.) within or adjacent to the proposed action were mapped and examined for evidence of valley elderberry longhorn beetle (VELB) occupation. Suitable elderberry shrubs were considered to be all plants with stem diameters greater than or equal to 1.0 inch when measured at the base. Elderberry shrubs with diagnostic exit holes on the stems have hosted beetle larvae within recent past (typically, the last 3 to 5 years depending on stem size and growth) and are considered occupied habitat. Although no exit holes were observed in elderberry shrubs found during these field surveys, for the purpose of this BA and project design, it was assumed that the elderberry shrubs could provide habitat for VELB.

2.2 Vegetation Communities

The action area is in the Sacramento Valley subregion of the Central Valley. This area was historically an open grassland community with interspersed vernal pools, seasonal wetlands, emergent wetlands, and intermittent and perennial creeks with riparian habitat and valley oak woodlands. Currently, the action area supports very little natural habitat and has been substantially altered by agricultural activities. The action area is predominantly rice, row crops, and other agricultural operations. The Sacramento River is a short distance south and east of the action area. Representative photographs of seasonal baseline conditions in the action area are provided in Appendix B.

Biological communities were classified using a combination of DFG's List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database (California Department of Fish and Game, Biogeographic Data Branch, Vegetation Classification and Mapping Program, September 2003 edition) and professional judgment for habitat types that occur in the

action area but are not described in DFG classification system (e.g., seasonal wetland, agricultural lands, and drainages).

A brief description of the vegetation communities and associated habitat types found within the action area is provided below. Table 2-1 lists the vegetation communities found at each of the major project components (project components are described in Chapter 3).

Table 2-1. Vegetation Communities Associated with Each Major Project Component

Component	Vegetation Community
0.5-acre gas metering facility (Grimes Station)	Row crop
2.8-mile 6-inch natural gas pipeline (70-foot wide right of way)	Rice field, row crop, ruderal grassland
Two metering sites	Existing gravel pad
400-feet of 6-inch pipe and Tap site	Row crop
Temporary material and equipment staging areas	Row crop, gravel pad, rice field

2.2.1 Ruderal Grassland

Ruderal grassland is a relatively uncommon community in the action area, occurring primarily along roadside edges and drainage banks. Ruderal grassland consists of a sparse cover of annual grasses that often grow in association with a variety of showy annual forbs (both native and nonnative). Germination occurs with the onset of the late fall rains. Growth, flowering, and seed-set occur from winter through spring. Plants are typically senescent through the summer and fall dry season (Holland 1986). Common plant species are wild oats (*Avena* spp.), bromes (*Bromus* spp.), annual fescues (*Vulpia* spp.), Italian ryegrass (*Lolium multiflorum*), mustards (*Brassica* spp.), filarees (*Erodium* spp.), yellow star-thistle (*Centaurea solstitialis*), and other forbs.

The only federally listed species that could occur in ruderal grasslands in the action area is GGS, which may use grasslands within 200 feet of aquatic habitat for basking or as winter hibernacula (where such areas are protected from flooding).

2.2.2 Agricultural Land

For the purpose of this BA, agricultural lands include both currently cultivated lands (rice fields, row crops) and fallow fields. Agricultural lands in the action area provide variable wildlife habitat value and uses depending on the cover type and irrigation.

The only federally listed species potentially present in agricultural lands in the action area is GGS, which may use uplands (including rice berms) within 200 feet of aquatic habitat for basking or as winter hibernacula (where such areas are protected from flooding). A description of each agricultural cover type and its suitability for GGS is provided below.

2.2.2.1 Rice Fields

Rice fields are the dominant agricultural crop in the action area and are used by a variety of wildlife, depending on the geographic area and adjacent habitats. GGS forage seasonally in rice fields when the rice has grown tall enough to provide shelter. When rice fields are drained prior to harvest, GGS

move out of the rice fields and into the canals and ditches to feed on the prey animals that have retreated from the rice fields into the canals and ditches (Brode and Hansen 1992).

2.2.2.2 Row Crops

Row crops are present primarily in the southern end of the action area. Most of the row crops in the action area do not provide suitable upland habitat for GGS; however, earth berms around the perimeter of these fields could be used as winter hibernacula by GGS if they are within 200 feet of aquatic habitat.

2.2.3 Drainage

For the purpose of this BA, the term *drainage* refers to any feature with a well-defined bed and bank and flowing water at some time of the year. Within the action area, the gas pipeline alignment parallels 14 irrigation canals and drainage ditches and crosses 11 irrigation canals and drainage ditches. Drainages with wetland vegetation below the ordinary high water mark (OHWM) are referred to as *wetland drainages* and are typically dominated by freshwater marsh vegetation and seasonal wetland vegetation (drainages are shown in the Exhibit 1 project alignment maps). Drainages that lack wetland vegetation below the OHWM are referred to as *other waters drainages*. One drainage in the action area is dominated by riparian vegetation and is referred to as a *riparian drainage*. Wetland and riparian drainages would generally be considered jurisdictional wetlands under Section 404 of the Clean Water Act; non-wetland drainages would be considered other waters drainages.

The wildlife value of the drainages in the action area ranges from high to low. Most of the drainages have high to moderate wildlife value because streamside vegetation provides cover and foraging habitat. Amphibians—Pacific tree frog (*Pseudacris regilla*) and the nonnative bullfrog (*Rana catesbeiana*)—were observed in drainages during field surveys, and striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), and coyote (*Canis latrans*) may use drainages for foraging. Western pond turtle (*Actinemys marmorata*) may use areas where there are pools with some vegetative cover, such as willows or emergent vegetation, and exposed branches or rocks to use as basking sites.

Irrigation ditches that are actively maintained by the landowner have low wildlife value because they are narrow; lack vegetative cover; and are adjacent to development, paved roads, and agricultural roads. Additionally, feral and domestic cats, automobile traffic, and agricultural practices reduce wildlife use in these areas.

The potential for drainages in the action area to support high quality habitat for fish is relatively low. Most of the drainages have relatively poor water quality because of the heavy pesticide and herbicide use in the area. GGS is the only federally listed species potentially present in drainages in the action area; individuals may forage in irrigation ditches and canals and use adjacent uplands for basking and overwintering.

2.3 Federally Listed Species

2.3.1 Giant Garter Snake

2.3.1.1 Species Status

GGS was federally listed as threatened on October 20, 1993, and a draft recovery plan was published in 1999 (U.S. Fish and Wildlife Service 1999). A final recovery plan has not been completed, and critical habitat has not been designated for this species.

GGS occurs in the Central Valley of California from Fresno County in the south to Butte County in the north. Although GGS historically ranged throughout the Central Valley, recent sightings in the San Joaquin valley are rare and the species has likely been extirpated from habitats south of Fresno County.

USFWS determined in a 2006 status review that the abundance and distribution of GGS had not changed significantly since the time of listing (U.S. Fish and Wildlife Service 2006a). This report indicates that the most serious threat to the species is loss and fragmentation of habitat from urban and agricultural development and loss of habitat associated with changes in rice production.

2.3.1.2 Habitat Characteristics

GGSs inhabit marshes; ponds; sloughs; small lakes; low-gradient streams and other waterways; and agricultural wetlands, including irrigation and drainage canals, rice fields, and adjacent uplands. Their habitat requirements include: (1) adequate water during the snake's active season (early spring through mid-fall) to provide food and cover, (2) emergent herbaceous wetland vegetation for escape cover and foraging habitat during the active season, (3) basking habitat of grassy banks and openings in waterside vegetation, and (4) higher elevation uplands for cover and refuge from floodwaters during the snake's dormant season (U.S. Fish and Wildlife Service 2006a).

2.3.1.3 Presence in the Action Area

GGSs are known to occur along the Sutter Bypass and have been previously reported near the town of Grimes in the vicinity of the action area (California Natural Diversity Database 2010). In the action area, drainages and rice fields provide suitable aquatic habitat for GGS foraging, cover, and dispersal. Suitable upland habitat in the action area comprises ruderal grasslands along drainages and earthen berms that are within 200 feet of aquatic habitat and provide burrows or other refugia adequate for GGS hibernation. The Exhibit 1 project alignment maps show the locations of drainages and rice fields in the action area. Representative photographs of areas that are considered suitable habitat for GGS in the action area are provided in Appendix B.

2.3.2 Valley Elderberry Longhorn Beetle

2.3.2.1 Status of the Species

Valley elderberry longhorn beetle was federally listed as threatened and critical habitat for this species was formally designated, on August 8, 1980 (45 FR 52803). A recovery plan for this species was published on June 28, 1984 (U.S. Fish and Wildlife Service 1984).

The beetle primarily occurs in the Greater Sacramento Valley and Northern San Joaquin Valley. Barr (1991) reports the range of VELB to include all of the Central Valley extending to Shasta County in the north and to Kern County in the south. The range of the threatened subspecies as described by Fisher may overlap with that of *Desmocerus californicus californicus*, as described by Horn, along the eastern edge of the Coastal Range and in the southern San Joaquin Valley (Halstead and Oldham 1990).

On October 2, 2006, USFWS announced their recommendation to remove VELB from the endangered species list (U.S. Fish and Wildlife Service 2006b). This report indicated that riparian habitat loss had slowed, 50,000 acres of riparian habitat had been protected, and over 5,100 acres of beetle habitat had been restored since the species was federally listed.

2.3.2.2 Habitat Characteristics

VELB is dependent on the host plant, red or blue elderberry (*Sambucus* spp.), throughout its life cycle. Adult VELB and the characteristic exit holes formed when the adult emerges have been observed in both riparian habitats and savanna habitats adjacent to riparian vegetation (Collinge et al. 2001). VELB utilize both red, or Mexican, elderberry (*Sambucus mexicana*) and blue elderberry (S. *racemosa* var. *microbtrys*) and does not seem to prefer one over the other (Barr 1991). Elderberry co-occurs with other riparian woody plants, including Fremont cottonwood (*Populus fremontii*), California sycamore (*Platanus racemosa*), various willows (*Salix* spp.), wild grape (*Vitis californica*), blackberry (*Rubus* spp.), and poison oak (*Toxicodendron diversilobum*) (U.S. Fish and Wildlife Service 1984; Collinge et al. 2001).

2.3.2.3 Presence in the Action Area

During field surveys conducted for the proposed action, two elderberry shrubs were found within and adjacent to the action area. Although no evidence of VELB occupation (exit holes, chewing pattern, or adult beetles) was observed during field surveys, the elderberry shrubs that were documented in and adjacent to the Action Area provide suitable habitat for VELB. The one elderberry shrub within the action area is located within riparian vegetation along a riparian drainage north of Girdner Road and approximately 75 feet east of the proposed gas pipeline (Sheet 8 in Exhibit 1), outside the construction area. A second shrub, approximately 260 feet from the first shrub, is located within a developed area associated with farm equipment staging and storage, and is located north of Girdner Road approximately 325 feet east of the proposed Grimes Station site and pipeline (Sheet 8 in Exhibit 1). There is no formally designated critical habitat for VELB in the Action Area.

Chapter 3
Proposed Action Description

3.1 Overview of Proposed Action

Calpine is proposing to construct the Grimes Pipeline Project to provide a connection between gas wells owned and operated by Venoco and other gas producers in the Grimes natural gas field and Calpine's existing Sutter Energy Center natural gas pipeline system (Figure 1). The proposed action includes installation of a 2.8-mile gas pipeline, two meters at two existing Venoco meter stations, a 400- foot pipe connection to and tap on the existing Sutter Energy Center pipeline system, and a 0.5-acre gas metering facility (referred to in this document as the *Grimes Station*). Once constructed, the proposed pipeline will transport approximately 10 million standard cubic feet per day[1] from Venoco's and other gas producers' existing gas wells through the Sutter Energy Center pipeline system to Calpine's Sutter Energy Center, southeast of the Action Area (Figure 2). The quantity of natural gas delivered to the Sutter Energy Center will not be increased over existing deliveries.

The action area is in agricultural lands consisting predominantly of rice fields with agricultural and natural gas operations. The action area has been farmed for many decades and now supports very little undisturbed natural habitat. The action area and surrounding agricultural lands are used for recreational waterfowl and deer hunting during the fall and winter months.

The northern end of the pipeline alignment is at Venoco's existing Eastside master meter station on Moroni Road; from there it extends east for approximately 2,500 feet to Hageman Road. At this intersection, the alignment runs south for approximately 1,500 feet and connects to Venoco's existing 32-33-3 master meter station, then continues south to the proposed Grimes Station, adjacent to Girdner Road. From the Grimes Station, a 400-foot-long pipeline will be installed to connect the 2.8-mile pipeline to the existing Sutter Energy Center 20-inch pipeline.

3.2 Proposed Action Components

The proposed action comprises the components listed below and shown on Exhibit 1.

- A 0.5-acre gas metering facility (Grimes Station).
- A 2.8-mile, 6-inch natural gas pipeline.
- Natural gas meters at Venoco's existing Eastside and 32-33-3 master meter sites.
- Belowground hot tap and valve at the existing Sutter Energy Center 20-inch natural gas pipeline connection.

[1] A standard cubic foot is a measure of quantity of gas, sometimes but not always defined as a cubic foot of volume at 60°F and 14.7 pounds per square inch of pressure.

3.2.1 Natural Gas Pipeline

Calpine will construct a 2.8-mile, 6-inch pipeline to transfer gas from Venoco's and other gas producers' existing gas wells to the proposed Grimes Station. The proposed pipeline crosses through agricultural fields (primarily cultivated rice fields) and under two Sutter County public roads (Wilbur and Hageman Roads near their intersection). It also crosses 11 drainages that are proposed for avoidance (see Exhibit 1). In addition to this pipeline, a 400-foot-long, 6-inch gas pipeline will be constructed between the Grimes Station and the Sutter pipeline tap.

The proposed pipeline alignment (as shown in Figures 1 and 2) was chosen because it meets the project objectives: determining the most direct route between the existing Venoco metering sites and the Sutter pipeline, meeting landowners' needs and restrictions, and minimizing impacts on sensitive resources. The proposed alignment avoids or substantially lessens any of the significant impacts of the project by avoiding natural habitats and following the most direct route between Venoco's metering sites and the Sutter pipeline while meeting landowners' needs and restrictions.

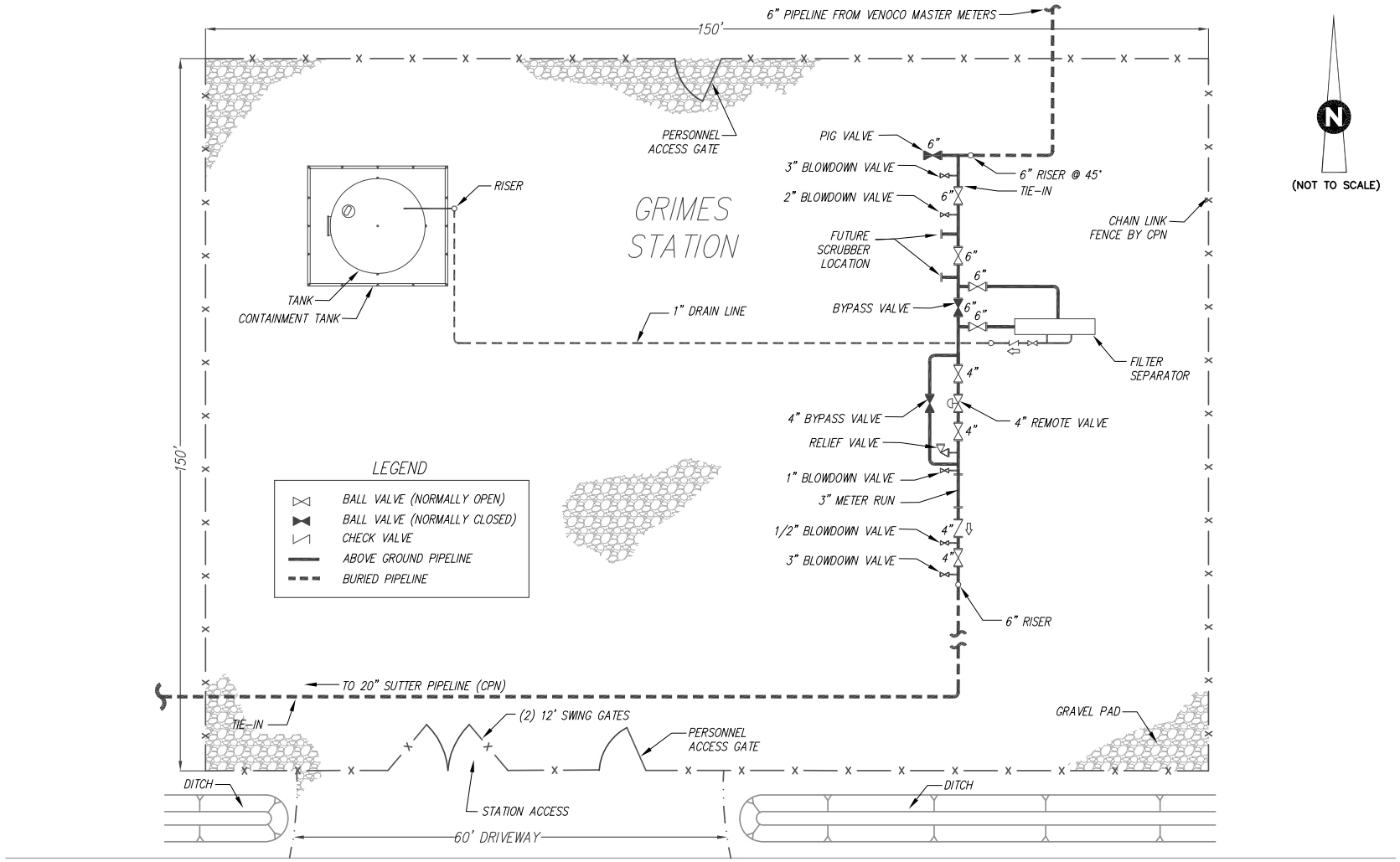
3.2.2 Grimes Station

The Grimes Station is on Girdner Road just west of Hageman Road. The site is currently an agricultural field planted with row crops and does not occur within 200 feet of suitable aquatic habitat for GGS.

The final Grimes Station facility will be a 150- by 150-foot (0.5 acre), 3-foot-thick gravel pad. The facility layout is shown in Figure 3 and comprises the following components.

- A natural gas master meter to measure the flow into the Sutter Pipeline.
- A horizontal filter-separator to ensure that high-quality gas is received. The filter will be approximately 9 feet long, 2 feet in diameter, and 5 feet above ground level.
- A pig receiver to conduct in-line inspections and perform maintenance activities on the gas pipeline.
- A flow control valve to control flow through the pipeline and shut down if necessary during an emergency or other conditions.
- An aboveground 100-barrel drain tank to collect any liquids that might be present in the natural gas and are removed in the filter-separator. This tank will be an atmospheric tank with a vent on top. The tank will be fully contained within a secondary steel tank to prevent uncontrolled runoff. The tank will be 8 feet tall and 10 feet in diameter.
- Communication equipment (powered by solar panels) for Calpine to remotely monitor conditions at the site and operate control valves, if necessary.
- Provisions for a future gas scrubber to assist in liquid removal if necessary. The scrubber will be 10 feet long, 3 feet in diameter, and 5 feet above ground level.

The approximately 0.5-acre gravel pad will accommodate the facilities as well as equipment and vehicle access and turnouts. The site will be protected by a 6-foot-tall chain-link fence with three barbed wire arms and will be graveled for operations and maintenance purposes. Two personnel gates and a vehicle gate will be installed at the site entrance from Girdner Road (Figure 3). Overhead lighting or other utilities are not necessary and therefore will not be installed as part of the



PREPARED BY:

GTS ENGINEERING & CONSULTING

130 Amber Grove Drive, Suite 134
Chico, Ca 95973; (530)893-6711

CPN PIPELINE

60 RIVER RD.
RIO VISTA, CA 94571

Graphics ... 00776.10 (11-30-10) tm

ICF INTERNATIONAL

Figure 3
Grimes Station Layout

proposed action. In addition, no generators or pumps (i.e., gasoline- or diesel-powered stationary equipment) are necessary and none will be installed as part of the proposed action.

The aboveground facilities will be painted with non-glare, earth-tone colors (wheat or olive green) to blend with the surrounding vegetation/landscape.

3.2.3 Meter Sites

Calpine will install two meters: one at Venoco's existing Eastside master meter site and the other at the 32-33-3 master meter site. These meters will serve as the custody transfer points for the natural gas. Calpine will install the meters on the existing Venoco meter site pads and has determined that no pad extensions will be required.

Work associated with these meter sites will occur within existing disturbed areas (gravel pads) and will not affect any aquatic resources.

3.3 Surface Land Disturbance Requirements

The proposed action will entail disturbance of approximately 29.3 acres of land. Disturbance acreages associated with each of the components and associated work areas are shown in Table 3-1.

Table 3-1. Temporary and Permanent Land Disturbance Acreages Required to Construct and Operate the Project

Component	Permanent	Temporary	Total
Grimes Station	0.5	0.3	0.8
Gas pipeline system (includes bore work areas)	0.0	27.3	27.3
Meter sites	0.0[a]	0.0	0.0
Tap site	0.0	0.2	0.2
Temporary material and equipment staging areas	0.0	1.0	1.0
Total project land disturbance requirements	0.5	28.8	29.3

[a] The meters will be installed within Venoco's existing meter sites and will not require any additional land or result in any additional disturbances to previously undisturbed lands.

3.4 Construction Approach

3.4.1 Proposed Equipment and Material Staging Areas

The locations of potential material and equipment staging areas (laydown areas) are shown on the project alignment maps on Exhibit 1. Equipment and materials will also be staged for short periods within the 70-foot-wide pipeline construction corridor and within the designated work areas.

The staging areas will contain laydown areas for equipment, pipes, and other construction-related supplies as well as providing vehicle parking (Figure 1). The contractors may install a temporary

trailer for use as a field office. The main equipment and material staging areas will be secured with a chain-link fence around the perimeter.

No new access roads will be necessary to construct the proposed action.

3.4.2 Construction Equipment

Tables 3-2 and 3-3 identify the equipment that may be used during construction of the pipeline system and Grimes Station components, respectively. Some of the equipment identified in these tables may be used to construct multiple components of the proposed action.

Table 3-2. Estimated Pipeline Construction Equipment

Equipment	Number of Units
Pickup truck	8
Flatbed truck	2
Winch truck	1
Crane	1
Fuel truck	1
Water truck	1
Truck and lowboy	1
Truck and pole trailer	2
Skid truck	1
Excavator (trackhoe)	2
Ditching machine	1
Bulldozer	2
Pipelayer (sideboom)	4
Wheel loader	1
Motor grader	1
Tractor mounted tack rig	1
Welding rig	3
X-ray rig	2
Air compressor	1
Pump	2
Bending machine	1
Parts van	1
Boring machine	1
Directional drilling machine	1

Table 3-3. Estimated Grimes Station Pad Construction Equipment

Activity	Equipment
Site clearing/improvements	1 Dozer 1 Backhoe 1 Skiploader 1 Roller
Fence	1 Crew truck 1 Auger machine
Cleanup/Restoration	1 Crew truck

3.4.3 Construction Schedule

Calpine will retain construction contractors to install all components of the project. Construction is planned for summer and fall 2011 with completion in late fall 2011. The majority of the pipeline route is in farmland currently used for growing rice. The pipeline installation will be planned to start right after the rice harvest (June 2011) and be completed by the end of September 2011. The project is anticipated to be ready to deliver natural gas in late 2011.

Construction activities associated with project components will generally take place Monday–Saturday between 7 a.m. and 7 p.m.

3.4.4 Construction Methods

Brief descriptions of the relevant methods that will be used to construct the pipeline system and Grimes Station are provided below. Installation of the two meters is not described below because they will be installed on Venoco's existing master meter site gravel pads.

3.4.4.1 Pipeline Construction

This section describes the methods that Calpine will use to install the 2.8-mile, 6-inch gas pipeline and 400-foot-long, 6-inch interconnection line and associated hot tap. Calpine will use several types of construction methods for street/road, cross-country, and drainage crossing segments, including open cuts, borings, and horizontal directional drilling (HDD). Typically, a 20-foot-wide permanent easement will be obtained from the landowner plus an additional 50-foot-wide temporary easement for use during construction (i.e., a 70-foot-wide construction corridor). For boring under irrigation ditches and roads, additional work space is usually required as shown on Exhibit 1. Access during the construction period is on established paved and agricultural roads and the pipeline right-of-way (ROW) through agricultural fields. Any damage to roads from construction will be repaired to original or as near original condition as possible. For example, small sections of damaged pavement may be patched instead of replaced.

Permission will be obtained from owners for the use of roads that cross their property. Calpine will regulate traffic as necessary to protect the public, wildlife, and any livestock from hazards associated with pipeline construction. Equipment and vehicles will not be operated during wet periods when the surface soil is unable to support the equipment and vehicles without causing excessive damage to the soil and vegetation.

Construction of the pipeline will consist of the steps discussed below.

Right of Way Preparation

The pipeline ROW will be cleared of any obstacles or debris. Clearing, cutting, and trimming of vegetation will be minimized whenever possible. Vegetation removal is expected to be minimal because most of the pipeline ROW consists of agricultural lands that are harvested at the time of construction and that lack woody vegetation.

If necessary, the landowners will prepare the right of way for construction activities as part of their farming activities (i.e. leveling of rice fields, flooding and maintenance of levees and rice checks) to prepare and plant their yearly crops. This will be done prior to final right of way preparation and pipeline construction starting in June.

Trenching

Trenching entails digging a 30- to 36-inch-wide by 72- to 84-inch-deep trench using a bucket wheel ditcher or a backhoe. The excavated subsoil will be piled at one side of the 70-foot-wide construction ROW and used for backfilling the trench after the pipe is installed. All soil removed from the trench will be used onsite and no material will be hauled offsite.

Trench Dewatering

Dewatering will be necessary in rice fields and other areas where the groundwater intercepts the trench or where stormwater runoff flows into the trench. The water will be pumped into nearby agricultural ditches. The water will be filtered for sediment if necessary.

Stringing

Pipe will be trucked onsite and laid along the construction ROW. The pipe lengths will be unloaded from the truck using a crane or tractor with a sideboom attachment.

Installation

The pipe installation will involve bending the pipe lengths if necessary, welding them together, and coating them with an epoxy-based coating. The pipe will then be lowered into the trench using a sideboom. Welding will meet applicable American Petroleum Institute (API) standards and be performed by qualified welders. Welds will be inspected in accordance with API standard 1104. All welds will undergo radiograph inspection by an independent, qualified radiographic contractor. The ditch will be cleared of loose rocks, hard dirt clods, roots, and debris before the pipe is placed.

Backfilling

The subsoil and topsoil will be replaced on the pipe in the trench, ensuring that the surface is returned to its original grade or level. In agricultural fields (most of the pipeline alignment), the compaction density will be the same as the surrounding undisturbed soil.

Hydrostatic Pipeline Testing

Before the pipeline system is placed in service, it will be hydrostatically tested. Hydrostatic testing will be conducted in accordance with the requirements of U.S. Department of Transportation

(USDOT) pipeline safety regulations (49 CFR Part 192), Calpine testing specifications, and applicable permits. This step entails filling the pipeline with water, increasing the pressure to 150% of the maximum operating pressure, and holding for a period of time. A maximum of 23,000 gallons of water will be used for hydrostatic testing. This water will be obtained from existing public or private water supplies (local purveyors, local groundwater, or municipal sources), which have not yet been identified. The test water will be discharged at one time from each hydrotest segment. The water will be either reused in the next segment or released into an onsite filtering system (composed of hay bales) and discharged into existing drainage ditches in agricultural areas.

Cleanup

The surface of the ROW will be restored by removing any construction debris, grading to original grade and contour, and revegetating in nonagricultural areas and where determined necessary. A slight crown may be retained over the top of the trench to allow for settling. The rice fields will be completely restored to original grade prior to replanting in the following season.

Commissioning

This step entails drying the inside of the pipeline, purging air from the pipeline, and filling the pipeline with natural gas.

Boring

Auger boring or HDD will be used to cross public roads and large irrigation canals and ditches. The auger boring method involves the excavation of bore pits on each side of the crossing to a depth below the invert elevation of the pipe. Then, an auguring machine is lowered into the bore pit, a hole is augured along the alignment, and a pilot pipe is jacked forward behind the auger head. When the auger reaches the bore pit on the opposite side, the carrier pipe is pulled or jacked through as the pilot pipe is removed.

The HDD method may be used for longer and deeper crossings or if significant groundwater makes the auger method impractical. This method requires a pilot hole that may be wet-bored by hydraulic cutting action using a jet nozzle, then reamed to the appropriate diameter with a reaming bit. These types of guided bores typically use bentonite, a fine, nontoxic clay that, when mixed with water, provides the necessary lubricant and operating fluid for the drilling process. The mixture is injected into the drill under pressure and recirculated back to the surface, where it is filtered and reused.

Spill prevention measures specified in the stormwater pollution prevention plan (SWPPP) will be implemented to minimize the risk of bentonite entering waterways during boring. Although bentonite contamination rarely occurs, bentonite can reach the ground surface and enter surface waters if the bore encounters a rock fracture during high-pressure boring operations. The risk of bentonite reaching the surface or surface waters will be minimal because boring will occur during summer, when many of the drainages may be dry or contain minimal flowing water.

3.4.4.2 Grimes Station Construction

Approximately 0.8 acre (comprising temporary [0.3 acre] and permanent easements [0.5 acre]) will be required to construct the Grimes Station. Construction activities will entail clearing and grading the site so that drainage and runoff will be routed to a collection point, if necessary, to control stormwater drainage as specified in the project's SWPPP. Completion of site preparation will be

followed by constructing the gravel driveway and culvert; constructing the gravel pad foundation; installing the perimeter fencing; installing aboveground equipment and piping; and cleaning up and restoring the site.

Construction activities and storage of construction material and equipment will be confined to the 0.8-acre site. After the site has been leveled, the contractor may install a stabilization fabric and then import approximately 3,000 cubic yards of fill material to create the pad. Any excess native soils will be used onsite or disposed of in an approved offsite area. After the gravel pad has been constructed, the station facilities (described in Section 3.2.1) will be installed.

Cleanup and restoration of the 0.3-acre temporary work area around the site will be completed as work on the area is finished. The access roads and parking areas will be graded and graveled, or other aggregate will be spread on the surfaces.

3.5 Conservation Measures

3.5.1 General Measures

As part of Calpine's standard construction practices, the following conservation measures will be incorporated into the project design and will be implemented to avoid or minimize impacts on biological resources. These conservation measures include the Corps' programmatic consultation mitigation for Level 1 impacts to giant garter snake.

3.5.1.1 Training and Monitoring

- Before any work, including grading, is performed in the action area, Calpine will conduct mandatory contractor/worker environmental awareness training for construction, monitoring, supervisory, and engineering/inspection personnel. The awareness training will be provided to all construction personnel to discuss sensitive environmental resources known or having the potential to occur in the project region, discuss best management practices (BMPs), and discuss permit conditions. The awareness training will include distribution of an informational handout illustrating sensitive species (including giant garter snake and valley elderberry longhorn bettle) and habitats to be avoided; the life history of the giant garter snake; the importance of irrigation canals, marshes/wetlands, and seasonally flooded areas, such as rice fields, to the giant garter snake; the project conservation measures; and terms and conditions of the USFWS's biological opinion and other permits. If new construction personnel are added to the project, Calpine will ensure that the personnel receive the mandatory training before starting work. Proof of this instruction will be submitted to USFWS's Sacramento field office.
- A biological monitor will be onsite during any construction activity near sensitive habitat to ensure implementation of and compliance with conservation measures. The monitor will have authority to stop construction activities and identify alternative work practices, in consultation with construction personnel and resources agencies, if construction activities are likely to affect special-status species, wetlands, or other sensitive biological resources.
- If special-status species are observed prior to or during construction activities, construction personnel will contact the biological monitor. If the biological monitor determines that mitigation measures are not adequate to protect special-status species, the monitor will notify

the Calpine project representative; Calpine will notify and consult with USFWS regarding appropriate avoidance and mitigation measures.

- A postconstruction compliance report prepared by a qualified biologist will be forwarded to the chief of the Endangered Species Division of USFWS's Sacramento field office within 60 calendar days after completion of the proposed action. This report will include dates that construction occurred, pertinent information about the applicant's success in implementing project mitigation measures, an explanation of any failures to implement mitigation measures, any known project-related affects on federally listed species, any occurrences of incidental take of federally listed species, and any other pertinent information.

3.5.1.2 Restricted Access

- The construction specifications will require that a qualified biologist identify sensitive habitats onsite and identify areas to avoid during construction. Sensitive communities in the area that would otherwise be disturbed by construction activities, including staging and access, will be staked and flagged to avoid disturbance in these areas. Environmentally sensitive areas to be avoided by all construction personnel will be staked and flagged.
- Before construction, the contractor will work with the project engineer and a resource specialist to identify the locations that require avoidance and will place stakes and flagging around the sensitive resource sites to indicate these locations. The protected area will be designated an environmentally sensitive area and clearly identified on the construction specifications. The sensitive areas will be staked and flagged before construction activities are initiated and will be maintained throughout the construction period.

3.5.1.3 Use Restrictions

- Construction personnel will not bring firearms or pets to the project site and will not leave trash on the project site during construction.
- Vehicles will be restricted to established roadways and approved access routes and staging areas.
- All fueling of vehicles will be conducted at least 50 feet from water bodies.

3.5.1.4 Erosion and Sediment Control

- A SWPPP has been prepared and will be implemented to prevent construction-related erosion and sediments from entering nearby waterways. The SWPPP includes a list of BMPs to be implemented in areas with potential to drain to any water body. These BMPs will be selected to achieve maximum sediment removal and will represent the best available technology that is economically achievable.

3.5.1.5 Other Water Quality Measures

- Any dewatering activities, if localized dewatering is required, will be conducted according to the provisions of the SWPPP. No dewatering materials will be placed in local water bodies without implementation of proper construction water quality control measures.
- To reduce potential contamination by spills, no refueling, storage, servicing, or maintenance of equipment will be performed within 50 feet of sensitive environmental resources. No refueling

or servicing will be conducted without absorbent material or drip pans underneath to contain spilled fuel. Any fluids drained from machinery during servicing will 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 will be assessed and disposed of properly. Under no circumstances will contaminated soils be added to a spoils pile or trench backfill.

- All maintenance materials (e.g., oils, grease, lubricants, antifreeze) will be stored at offsite staging areas. If these materials are required during field operations, they will be placed in a designated area away from site activities and sensitive resources.

3.5.1.6 Restoration

- Calpine will restore temporarily affected areas (e.g., pipeline trenches) to preconstruction conditions and or as directed by the landowner. Calpine will remove construction materials, save and replace topsoil and regrade where necessary to preconstruction topographic contours, and revegetate with appropriate seed mix or crop.

3.5.2 Giant Garter Snake

3.5.2.1 Avoidance and Minimization Measures

In addition to the general construction measures discussed above, Calpine will implement the following measures to avoid and minimize direct effects on GGS during project construction and implementation. These measures are consistent with the "Reasonable and Prudent Measures" described in the Corps' programmatic consultation BO.

- All construction activity in aquatic and upland habitat for GGS in and around agricultural ditches will be conducted during the active period for GGS. This timing will reduce direct impacts on the species by allowing snakes to move out of the way of construction activities. The active period is generally between May 1 and October 1. Depending on weather conditions and consultation with USFWS, it may be possible to extend the construction period.
- Construction activities within 200 feet from the banks of giant garter snake aquatic habitat will be avoided to the extent feasible. Heavy equipment movement will be confined to existing roadways and the right of way to minimize habitat disturbance.
- Prior to any trenching within suitable GGS aquatic habitat (drainages and rice fields), the habitat must remain dry (either through dewatering or, in the case of rice fields, not irrigating the area of effect) for at least 15 consecutive days after April 15 and prior to excavating or filling of trenches.
- A biologist will conduct a preconstruction survey in suitable habitat no more than 24 hours before construction and will be onsite during construction activity in potential aquatic and upland habitat. The biologist will provide the Service with a field report form documenting the monitoring efforts within 24-hours of commencement of construction activities. The construction area will be resurveyed whenever there is a lapse in construction activity of 2 weeks or more. Any sightings or incidental take will be immediately reported to the USFWS.
- Open trenches will be inspected before commencing daily activities.

- If a GGS is encountered within the construction work area, construction activities must cease until the snake moves out of the work area unassisted. Capture and relocation of trapped or injured individuals can only be attempted by USFWS-permitted personnel. Any sightings and any incidental take will be immediately reported (within one working day) by Calpine or its designated representative to the USFWS Chief, Endangered Species Division by email and telephone at (916) 979-2725. A follow-up report will be sent to USFWS, including dates, locations, habitat description, and any corrective measures taken to protect snakes encountered.
- Construction speed limits of 15 miles per hour will be enforced within the construction area to minimize the potential for increased traffic volumes to result in increased incidence of road-kill of GGS during project construction. Speed limits will be posted on project-controlled roads leading to the construction area. These signs will alert drivers to the potential presence of snakes. Additionally, the worker awareness training will inform all workers of the need to watch for and avoid snakes that may be present along roadways.

3.5.2.2 Compensation Measures

The proposed action will not result in permanent loss of aquatic habitat for GGS; therefore, no compensation for permanent effects is proposed.

To compensate for the temporary effects on GGS upland and aquatic habitat related to pipeline construction, Calpine proposes to restore any GGS habitat temporarily affected by project-related activities (primarily trenching associated with pipeline installation) to pre-project conditions within the same season or, at most, the same calendar year.

3.5.3 Valley Elderberry Longhorn Beetle

3.5.3.1 Avoidance and Minimization

In addition to general construction measures discussed above, Calpine will implement the following measure to avoid any direct or indirect effects to elderberry shrubs that provide habitat for valley elderberry longhorn beetle.

- Central Valley will ensure that a minimum 4 foot-tall temporary, plastic mesh–type construction fence is installed at least 20 feet from the driplines of elderberry shrubs that are within 100 feet of the construction area. The fencing will be installed in a way that prevents equipment from enlarging the work area beyond the delineated work area. The fencing will be checked and maintained weekly until all construction is completed. No construction activity, including grading, will be allowed until this condition is satisfied. No grading, clearing, storage of equipment or machinery, or other disturbance or activity may occur until the biological monitor has inspected and approved all temporary construction fencing. The fencing and a note reflecting this condition will be shown on the construction plans.

3.5.3.2 Compensation

No direct effects to valley elderberry longhorn beetle are anticipated from the proposed action because the two elderberry shrubs that occur in the vicinity of proposed project facilities occur more than 20 feet from the designated construction area. Implementation of the conservation measures identified in this section will ensure that the proposed action will also not indirectly affect

valley elderberry longhorn beetle. Therefore, no compensatory mitigation for Valley Elderberry Longhorn Beetle is required.

Chapter 4
Analysis of Effects

4.1 Potential Adverse Effects

4.1.1 Giant Garter Snake

Drainages and rice fields in the action area provide suitable aquatic habitat for GGS. Because disturbance to all drainages in the action area will be avoided by boring or using HDD, the proposed action will have no direct effects on drainage habitat. Upland habitat within the action area comprises ruderal grassland and earthen berms within 200 feet of suitable aquatic habitat (rice fields and drainages) which provide suitable habitat.

Activities associated with the proposed action that have the potential to result in potential direct and indirect effects to GGS are listed below.

- Excavating a 30- to 36-inch-wide by 72- to 84-inch-deep trench for installation of the 6-inch-diameter underground natural gas pipeline.
- Use of construction work areas in rice fields.
- Movement of construction equipment and temporary increase in traffic on agricultural roads in suitable habitat areas.

If GGSs are present in suitable aquatic or upland habitats in the construction area, these activities could result in direct loss of individuals and disruption of movement during the breeding season. Additionally, ground disturbance (e.g., staging, grading, excavation) could result in temporary disturbance or removal of suitable GGS aquatic and upland habitat.

Several project components are outside suitable habitat and therefore are not expected to adversely affect GGS. These components are installation of two meters at Venoco's existing meter site pads, construction of the 0.5-acre Grimes Station, and installation of the Sutter Pipeline tap. Construction activities associated with the two meter sites will be conducted on existing gravel pads, and construction activities associated with the Grimes Station and Sutter Pipeline tap will be conducted in row crops that are not within 200 feet of suitable aquatic habitat.

Table 4-1 provides a summary of temporary effects of project activities by habitat type (rice field and upland). Because permanent project facilities will not be constructed in suitable GGS habitat, no permanent effects are anticipated. The proposed action is expected to take 4 months to construct.

Table 4-1. Potential Temporary Effects on Suitable Habitat for Giant Garter Snake

	Potential Habitat (acres)	
Effect	Rice Fields Aquatic	Upland[a]
Installation of underground pipeline system	14.0	0.37
Equipment and materials staging areas	1.9	0.00
Total	15.9	0.37

[a] Upland habitat for GGS consists of annual grasslands along road shoulders and drainage banks and rice field earthen berms within 200 feet of suitable aquatic habitat. Existing gravel pads and paved and unpaved roads were not considered suitable upland habitat.

4.1.1.1 Preparation of Gas Pipeline ROW

To prepare the pipeline ROW, the ground will be cleared and leveled to support construction equipment and other pipeline installation activities. As described in Chapter 3, all areas temporarily disturbed during ROW preparation will be restored to preconstruction site conditions after installation of the gas pipeline. Because preparation of the gas pipeline ROW will occur when the rice fields are not flooded, there will be no effects on suitable aquatic habitat. Temporary removal of aquatic rice habitat within the gas pipeline ROW is discussed below in Section 4.1.2, *Installation of Gas Pipeline System*.

4.1.1.2 Installation of Gas Pipeline System

Installation of the underground pipeline system (the 2.8-mile, 6-inch gas pipeline and the 400-foot-long, 6-inch interconnection line) will be accomplished using one of three construction methods (trenching, auger bores, and HDD bores).Installation of the pipeline system will occur during GGS active period (May 1–October 1) when snakes are able to escape and avoid danger. Dewatering will be conducted by the farmer prior to any construction activities in aquatic habitat to minimize disturbance of GGS. However, if GGSs are present in aquatic habitat adjacent to the construction area, they could bask on nearby roads or use uplands to move between aquatic sites and could be killed (run over) by construction equipment. Conservation measures identified in Chapter 3 will be implemented to minimize potential take of GGS. These measures include restricting work in GGS habitat to between May 1 and October 1, conducting preconstruction surveys within 24 hours prior to construction in GGS habitat, onsite monitoring by a biologist, and restoration of disturbed areas following installation of the pipeline system.

For purposes of calculating temporary effects from installation of the underground pipelines, it is assumed that, wherever the 6-inch gas pipeline crosses through potential aquatic or suitable upland habitat for GGS, it would result in temporary habitat loss or disturbance. Based on an approximately 70-foot-wide temporary construction corridor, installation of underground pipelines will result in the temporary disturbance of 580 linear feet (0.37 acre) of potential upland habitat (nonnative annual grassland along roads and drainages and agricultural berms within 200 feet of suitable aquatic habitat) and 8,700 linear feet (14 acres) of rice field aquatic habitat (

Table 4-1). An additional 2.0 acres of rice field aquatic habitat will be disturbed as part of the staging areas. As described in Chapter 3, all areas temporarily disturbed during construction will be restored to preconstruction site conditions.

4.1.1.3 Construction Access and Increased Vehicle Traffic

Construction access to the project right of way, staging areas and existing metering sites and Grimes Station will be primarily on existing, unpaved agricultural roads. The action area is in a mostly agricultural setting with relatively low traffic volumes. Construction associated with the proposed action will result in an increase in traffic consisting of construction equipment and work crews entering and leaving the work area. Because construction will occur during the GGS active period, an increase in vehicle trips could result in GGS vehicle strikes while snakes are moving between aquatic sites or basking on roadways adjacent to aquatic habitat. To minimize potential vehicle strikes during construction associated with the proposed action, conservation measures identified in Chapter 3 (e.g., preconstruction surveys, worker awareness training, the presence of a biologist, posted speed limits) will be implemented during construction in and adjacent to suitable habitat areas.

4.1.1.4 Future Maintenance

After the facility is constructed in summer/fall 2011, it would be maintained on a regular basis with a local operator onsite at least once a week. Normal operations and maintenance activities would be very minor, entailing checks on valve operation, control logic, and site upkeep as necessary. All future maintenance activities would be conducted in full compliance with USDOT 49 CFR Part 192 federal regulations.

4.1.2 Valley Elderberry Longhorn Beetle

One elderberry shrub that provides habitat for VELB is present within the Action Area. This shrub is located just north of Girdner Road within riparian vegetation associated with a riparian drainage. In the vicinity of this elderberry shrub, proposed project features and construction activities include excavation of a 30- to 36-inch-wide by 72- to 84-inch-deep trench for installation of the 6-inch-diameter underground natural gas pipeline approximately 75 feet to the west (Sheet 8 in Attachment 1). Because all elderberry shrubs will be identified prior to construction, protected, and avoided, the Proposed Action will not directly affect VELB habitat. The Proposed Action is also not anticipated to indirectly affected VELB habitat because: (1) no ground disturbance will occur within 20 feet of the elderberry shrub, (2) ground disturbance proposed within the 100-foot buffer will occur within an agricultural field and will not remove or disturb associated riparian vegetation and will not affect existing hydrology around the shrub; and (3) avoidance and minimization measures described in Chapter 3 (*Section 3.5 Conservation Measures*) will be implemented to ensure that the shrub is protected throughout construction.

With the implementation of the proposed avoidance and minimization measures, there will be no direct or indirect effects to VELB resulting from the Proposed Action.

4.2 Cumulative Effects

Cumulative effects, as defined in the Section 7 implementing regulations, include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in the biological opinion. Effects of future federal actions that are unrelated to the proposed action are not considered cumulative effects in the Section 7 consultation process.

Projects that may take place in the action area in the future and that could result in take of listed wildlife species would require take authorization from USFWS, and are therefore not considered the analysis of cumulative effects. However, a number of ongoing activities in the action area could adversely affect listed species and could possibly proceed without federal approval, such as ongoing and new agriculture, levee maintenance, and herbicide use. Although these activities could result in loss or degradation of habitat where listed species occur, the magnitude and extent of these effects cannot be quantified at this time. Moreover, these activities are not associated with the proposed action.

Chapter 5
Findings

The proposed action is *likely to adversely affect* the federally listed giant garter snake through activities that would modify habitat for this species and potentially harm individual snakes. However, conservation measures have been incorporated into the project description to avoid and minimize impacts on GGS and to compensate for temporary effects on habitat.

The Proposed Action is *not likely to adversely affect* the federally listed valley elderberry longhorn beetle or result in adverse modification of habitat for this species. Conservation measures have been incorporated into the project description to ensure the proposed action will not affect habitat where VELB could occur.

The proposed action would not adversely modify formally designated or proposed critical habitat for any federally listed species.

With implementation of conservation measures prior to, during, and following project construction, the proposed action will not appreciably reduce the reproduction, numbers, or distribution of any federally listed species.

Chapter 6
References

Barr, C. B. 1991. *The Distribution, Habitat, and Status of the Valley Elderberry Longhorn Beetle Desmocerus californicus dimorphus*. U.S. Fish and Wildlife Service. Sacramento, CA.

Brode, J. M., and G. E. Hansen. 1992. *Status and Future Management of the Giant Garter Snake (*Thamnophis gigas*) within the Southern American Basin, Sacramento and Sutter Counties, California*. California Department of Fish and Game, Inland Fisheries Division.

California Native Plant Society. 2008. *Inventory of Rare and Endangered Plants of California*. v7-10dec 12-02-10. Available: <http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi>. Accessed: December 2010.

California Natural Diversity Database. 2010. RareFind 3, Version 3.1 (March 2010 update). Records search of 7.5-minute quadrangle(s) of the project site and surrounding area. Sacramento, California: California Department of Fish and Game.

Collinge, S. K., M. Holyoak, C. B. Barr, and J. T. Marty. 2001. Riparian habitat fragmentation and population persistence of the threatened valley elderberry longhorn beetle in Central California. Biological Conservation. 100: 103–113.

Halstead, J.A., and J.A. Oldham. 1990. Revision of the Neartic Desmocerus Audinet-Serville with Emphasis on the federally threatened valley elderberry longhorn beetle (Coleoptera: Cerambycidae). Environmental Section Staff Report, Kings River Conservation District. Fresno, CA.

Holland, R. F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Sacramento, CA: State of California, The Resources Agency, Nongame Heritage Program, California Department of Fish and Game.

Sullins, T. A. 2001. *ESA Endangered Species Act: Basic Practice Series*. Chicago, IL: American Bar Association.

U.S. Fish and Wildlife Service. 1984. Valley elderberry longhorn beetle recovery plan. Portland, OR.

———. 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.* (I-1-F-97-149.) Sacramento, CA.

———. 1999. *Draft Recovery Plan for the Giant Garter Snake (*Thamnopsis gigas*).* Portland, OR.

———. 2006a. *Giant Garter Snake (*Thamnophis gigas*) 5-Year Review: Summary and Evaluation*. September. Sacramento, CA.

———. 2006b. Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus) 5-Year Review: Summary and Evaluation. September. Sacramento, CA.

U.S. Fish and Wildlife Service and National Marine Fisheries Service. 1998. *Endangered Species Consultation Handbook*. Final. March.

Appendix A

Species Information

Calpine Grimes Pipeline Project
CNDDB Record Search

Legend

- Project 10-Mile Buffer

CNDDB Records

- Plant
- Animal
- Terrestrial Community

[illegible]	[illegible]
[illegible]	1
[illegible]	1
[illegible]	2
[illegible]	1
[illegible]	1
[illegible]	5
[illegible]	1
[illegible]	1
[illegible]	2
[illegible]	1
[illegible]	6
[illegible]	2

[illegible]	[illegible]
[illegible]	17
[illegible]	5
[illegible]	1
[illegible]	1
[illegible]	20
[illegible]	1
[illegible]	3
[illegible]	2
[illegible]	1
[illegible]	1
[illegible]	1
[illegible]	53
[illegible]	8
[illegible]	2
[illegible]	1
[illegible]	1
[illegible]	1
[illegible]	3
[illegible]	1
[illegible]	1
[illegible]	1

[illegible]	[illegible]
[illegible]	1
[illegible]	3
[illegible]	4
[illegible]	1
[illegible]	1

0 1 2 4 Miles

Area of Interest

ICF INTERNATIONAL

Inventory of Rare and Endangered Plants

v7-10dec 12-02-10

Status: search results - Tue, Dec. 14, 2010 12:34 c

{QUADS_123} =~ m/545D|530A|530B|544B|544C|529B|545A|545B|54! Search

Tip: +DNT Jun Jul returns Del Norte taxa with those blooming both months listed first.[all tips and help.][search history]

Your Quad Selection: Tisdale Weir (545D) 3912117, Kirkville (530A) 3812187, Dunnigan (530B) 3812188, Sutter (544B) 3912126, Gilsizer Slough (544C) 3912116, Sutter Causeway (529B) 3812186, Sutter Buttes (545A) 3912127, Meridian (545B) 3912128, Grimes (545C) 3912118

Hits 1 to 8 of 8

Requests that specify topo quads will return only Lists 1-3.

To save selected records for later study, click the ADD button.

ADD checked items to Plant Press | check all | check none

Selections will appear in a new window.

open	save	hits	scientific	common	family	CNPS
		1	**Astragalus tener var. ferrisiae**	Ferris' milk-vetch	Fabaceae	List 1B.1
		1	**Atriplex cordulata**	heartscale	Chenopodiaceae	List 1B.2
		1	**Atriplex joaquiniana**	San Joaquin spearscale	Chenopodiaceae	List 1B.2
		1	**Cordylanthus palmatus**	palmate-bracted bird's-beak	Scrophulariaceae	List 1B.1
		1	**Hibiscus lasiocarpos var. occidentalis**	woolly rose-mallow	Malvaceae	List 1B.2
		1	**Layia septentrionalis**	Colusa layia	Asteraceae	List 1B.2
		1	**Silene verecunda ssp. verecunda**	San Francisco campion	Caryophyllaceae	List 1B.2
		1	**Trichocoronis wrightii var. wrightii**	Wright's trichocoronis	Asteraceae	List 2.1

No more hits.

Selected Elements by Scientific Name

California Department of Fish and Game

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFG SSC or FP
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	None	G2G3	S2	SSC
Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	SSC
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Ardea alba great egret	ABNGA04040	None	None	G5	S4	
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Astragalus tener var. ferrisiae Ferris' milk-vetch	PDFAB0F8R3	None	None	G1T1	S1.1	1B.1
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S2	SSC
Atriplex cordulata heartscale	PDCHE040B0	None	None	G2?	S2.2?	1B.2
Atriplex depressa brittlescale	PDCHE042L0	None	None	G2Q	S2.2	1B.2
Atriplex joaquiniana San Joaquin spearscale	PDCHE041F3	None	None	G2	S2	1B.2
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S2S3	
Branta hutchinsii leucopareia cackling (=Aleutian Canada) goose	ABNJB05035	Delisted	None	G5T4	S2	
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S2	
California macrophylla round-leaved filaree	PDGER01070	None	None	G2	S2	1B.1
Charadrius montanus mountain plover	ABNNB03100	Proposed Threatened	None	G2	S2?	SSC
Cicindela hirticollis abrupta Sacramento Valley tiger beetle	IICOL02106	None	None	G5TH	SH	
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Candidate	Endangered	G5T3Q	S1	
Cordylanthus palmatus palmate-bracted bird's-beak	PDSCR0J0J0	Endangered	Endangered	G1	S1.1	1B.1
Desmocerus californicus dimorphus valley elderberry longhorn beetle	IICOL48011	Threatened	None	G3T2	S2	
Dipodomys californicus eximius Marysville California kangaroo rat	AMAFD03071	None	None	G4T1	S1	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFG SSC or FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Great Valley Cottonwood Riparian Forest Great Valley Cottonwood Riparian Forest	CTT61410CA	None	None	G2	S2.1	
Great Valley Mixed Riparian Forest Great Valley Mixed Riparian Forest	CTT61420CA	None	None	G2	S2.2	
Great Valley Willow Scrub Great Valley Willow Scrub	CTT63410CA	None	None	G3	S3.2	
Grus canadensis tabida greater sandhill crane	ABNMK01014	None	Threatened	G5T4	S2	FP
Hibiscus lasiocarpos var. occidentalis woolly rose-mallow	PDMAL0H0R3	None	None	G4	S2.2	2.2
Lasiurus blossevillii western red bat	AMACC05060	None	None	G5	S3?	SSC
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4?	
Lasthenia glabrata ssp. coulteri Coulter's goldfields	PDAST5L0A1	None	None	G4T3	S2.1	1B.1
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G4T1	S1	FP
Layia septentrionalis Colusa layia	PDAST5N0F0	None	None	G2	S2.2	1B.2
Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered	None	G3	S2S3	
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G3	S2S3	
Monardella douglasii ssp. venosa veiny monardella	PDLAM18082	None	None	G5T1	S1.1	1B.1
Myotis ciliolabrum western small-footed myotis	AMACC01140	None	None	G5	S2S3	
Myotis yumanensis Yuma myotis	AMACC01020	None	None	G5	S4?	
Navarretia leucocephala ssp. bakeri Baker's navarretia	PDPLM0C0E1	None	None	G4T2	S2.1	1B.1
Northern Hardpan Vernal Pool Northern Hardpan Vernal Pool	CTT44110CA	None	None	G3	S3.1	
Perognathus inornatus inornatus San Joaquin pocket mouse	AMAFD01061	None	None	G4T2T3	S2S3	
Plegadis chihi white-faced ibis	ABNGE02020	None	None	G5	S1	WL
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2S3	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFG SSC or FP
Silene verecunda ssp. verecunda	PDCAR0U213	None	None	G5T2	S2.2	1B.2
San Francisco campion						
Spea hammondii	AAABF02020	None	None	G3	S3	SSC
western spadefoot						
Spinus lawrencei	ABPBY06100	None	None	G3G4	S3	
Lawrence's goldfinch						
Thamnophis gigas	ARADB36150	Threatened	Threatened	G2G3	S2S3	
giant garter snake						
Trichocoronis wrightii var. wrightii	PDAST9F031	None	None	G4T3	S1.1	2.1
Wright's trichocoronis						

Record Count: 47

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office

2800 Cottage Way, Room W-2605

Sacramento, California 95825

December 1, 2010

Document Number: 101201040650

Margaret Widdowson

ICF

2895 Churn Creek Rd

Redding, CA 96002

Subject: Not specified

Dear: Ms. Widdowson

We are sending this official species list in response to your December 1, 2010 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through

an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be March 01, 2011.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found at www.fws.gov/sacramento/es/branches.htm.

Endangered Species Division

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 101201041152

Database Last Updated: April 29, 2010

Quad Lists

Listed Species

Invertebrates

Branchinecta lynchi
- vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
- valley elderberry longhorn beetle (T)

Lepidurus packardi
- vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris
- green sturgeon (T) (NMFS)

Hypomesus transpacificus
- delta smelt (T)

Oncorhynchus mykiss
- Central Valley steelhead (T) (NMFS)
- Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
- Central Valley spring-run chinook salmon (T) (NMFS)
- Critical Habitat, Central Valley spring-run chinook (X) (NMFS)
- Critical habitat, winter-run chinook salmon (X) (NMFS)
- winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
- California tiger salamander, central population (T)

Rana draytonii
- California red-legged frog (T)

Reptiles

Thamnophis gigas
- giant garter snake (T)

Plants

Cordylanthus palmatus
- palmate-bracted bird's-beak (E)

Candidate Species

Birds

Coccyzus americanus occidentalis
Western yellow-billed cuckoo (C)

Quads Containing Listed, Proposed or Candidate Species:

GRIMES (545C)

TISDALE WEIR (545D)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We

recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals

on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be March 01, 2011.

U.S. Fish & Wildlife Service
Sacramento Fish & Wildlife Office
Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 101201040930

Database Last Updated: April 29, 2010

No quad species lists requested.

County Lists

Sutter County

Listed Species

Invertebrates

Branchinecta conservatio
Conservancy fairy shrimp (E)

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Lepidurus packardi
vernal pool tadpole shrimp (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Oncorhynchus mykiss
Central Valley steelhead (T) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
Critical Habitat, Central Valley spring-run chinook (X) (NMFS)
Critical habitat, winter-run chinook salmon (X) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana draytonii
California red-legged frog (T)

Reptiles

Thamnophis gigas
giant garter snake (T)

Candidate Species

Birds

Coccyzus americanus occidentalis
Western yellow-billed cuckoo (C)

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be

found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

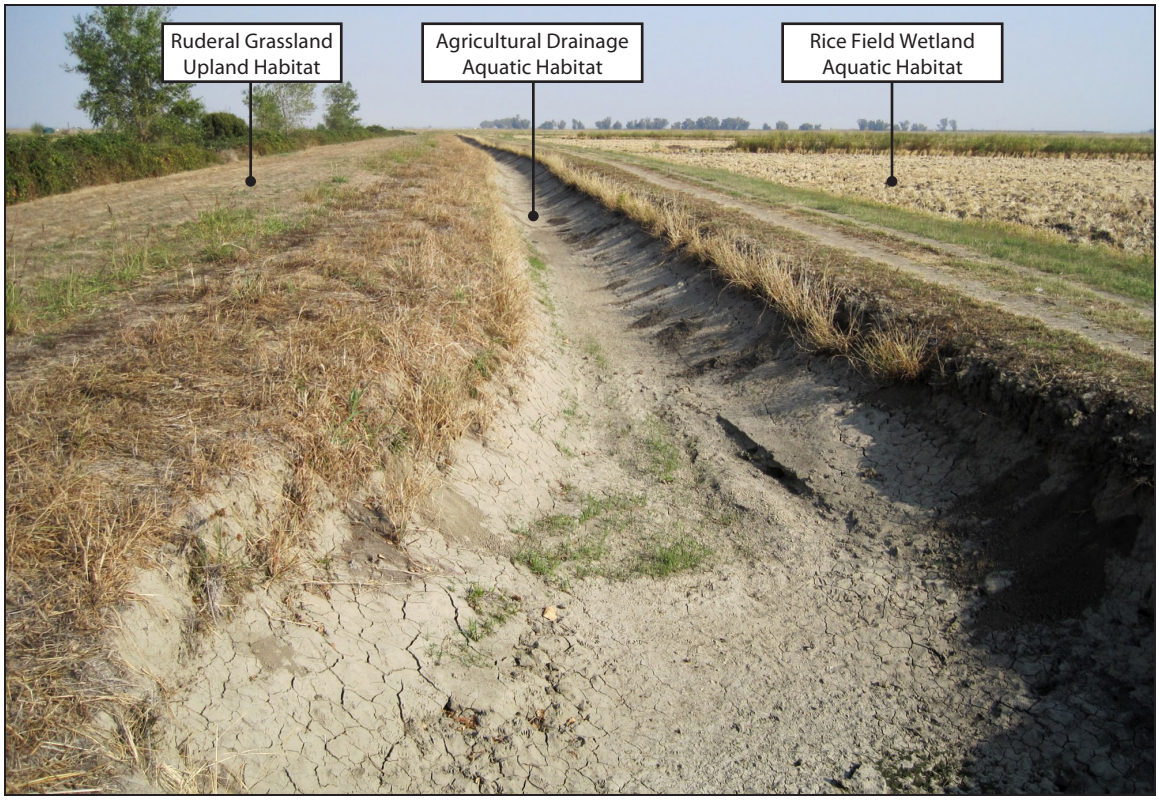
If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be March 01, 2011.

Appendix B

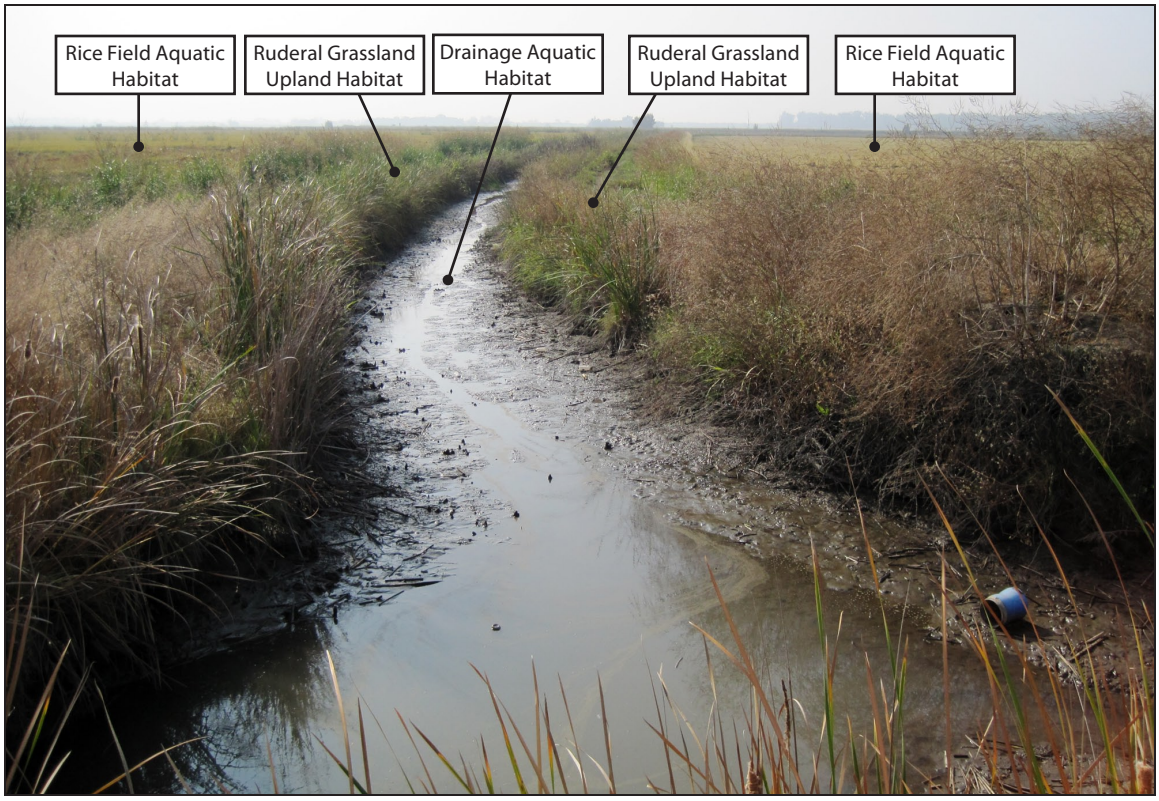
Representative Photos



Graphics ...00776.10 (12-10)

ICF INTERNATIONAL

Appendix B
Representative Photographs of Suitable Upland and Aquatic Habitat for Giant Garter Snake in the Action Area



Graphics ... 00776.10 (12-10)

ICF INTERNATIONAL

Appendix B
Representative Photographs of Suitable Upland and Aquatic Habitat for Giant Garter Snake in the Action Area

Exhibit 1

Project Alignment

121°53'0"W
121°52'50"W
121°52'40"W
39°6'30"N
39°6'20"N

WD-01
x̄=7'
Acres=0.111

RFW-14
Acres=6.011

RFW-16
Acres=6.043

RFW-17
Acres=12.28

OWD-30
x̄=7'
Acres = 0.099

Venoco Eastside
Master Meter Site

OWD-31
x̄=8'
Acres = 0.083

MMoroniRRD

WD-02
x̄=24'
Acres = 0.303

RFW-15
Acres=3.486

OWD-33
x̄=20'
Acres = 1.77

RFW-18
Acres=32.648

OWD-32
x̄=12'
Acres=0.123

Exhibit 1
Project Alignment
Grimes Pipeline Project
January 2011
Sheet 1 of 8

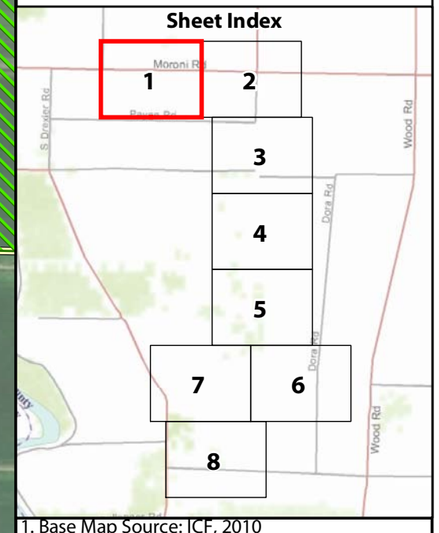
- Natural Gas Pipeline Trench (temporary sidecast fill in rice= 1.41 acres, 9230 CY)
- Bore
- Project Element
- Construction Laydown Area
- Access Road (permanent fill in drainage = 0.012 acres, 60-foot culvert)
- Pipeline Work Area
- Wetland and Biological Study Area (395.88 Acres)
- Culvert
- Other Waters Drainage
- Riparian Drainage
- Wetland Drainage
- Ricefield Wetland
- Elderberry Shrub

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Grimes
4. PLSS: T. 15 N, R. 1 E

Drawn By: Matt Ewalt	Jan 2011

ICF INTERNATIONAL

K:\PROJECTS_1-1\CALPINE\ 00778_10_GRIMES\ MAPDOC\ ALIGNMENT_FIGURES\ ALIGNMENT_20110105_W_WETLANDS.MXD SS (01-05-11)

121°52'30"W
121°52'20"W
121°52'10"W
39°6'30"N
39°6'20"N

RFW-20
Acres=0.093

OWD-34
x̄=30'
Acres = 0.561

RFW-19
Acres=13.491

RFW-17
Acres=12.28

RFW-20
Acres=7.133

WD-29
x̄=2'
Acres = 0.009

Moroni Rd

WD-04
x̄=8'
Acres = 0.121

RFW-18
Acres=32.648

RFW-21
Acres=32.415

Hageman Rd

Hageman Rd

OWD-33
x̄=20'
Acres = 1.77

Exhibit 1
Project Alignment
Grimes Pipeline Project
January 2011
Sheet 2 of 8

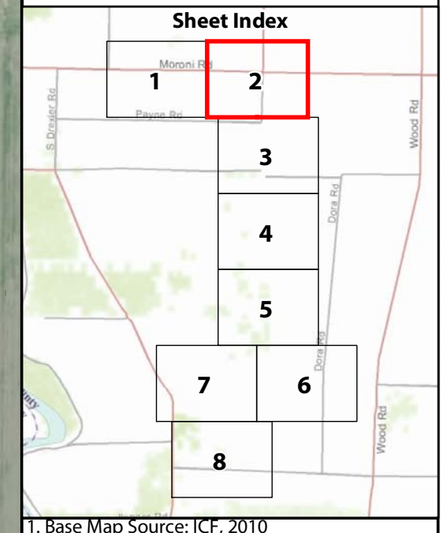
- Natural Gas Pipeline Trench (temporary sidecast fill in rice= 1.41 acres, 9230 CY)
- Bore
- Project Element
- Construction Laydown Area
- Access Road (permanent fill in drainage = 0.012 acres, 60-foot culvert)
- Pipeline Work Area
- Wetland and Biological Study Area (395.88 Acres)
- Culvert
- Other Waters Drainage
- Riparian Drainage
- Wetland Drainage
- Ricefield Wetland
- Elderberry Shrub

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Tisdale Weir
4. PLSS: T. 15 N, R. 1 E

Drawn By: Matt Ewalt	Jan 2011

ICF INTERNATIONAL

K:\PROJECTS_1-1\CALPINE\10778_10_GRIMES\MAPDOC\ALIGNMENT_FIGURES\ALIGNMENT_20110105_W_WETLANDS.MXD SS (01-05-11)

121°52'30"W
121°52'20"W
121°52'10"W
121°52'0"W
39°6'10"N
39°6'0"N

RFW-18
Acres=32.648

Venoco 32-33-3
Master Meter Site

Payne Rdne Rd

OWD-35
x̄=32'
Acres = 0.775

RFW-22
Acres=11.498

RFW-21
Acres=32.415

WD-05
x̄=33'
Acres = 1.075

OWD-36
x̄=20'
Acres = 2.254

RFW-24
Acres=30.643

RFW-23
Acres=25.01

Exhibit 1
Project Alignment
Grimes Pipeline Project
January 2011
Sheet 3 of 8

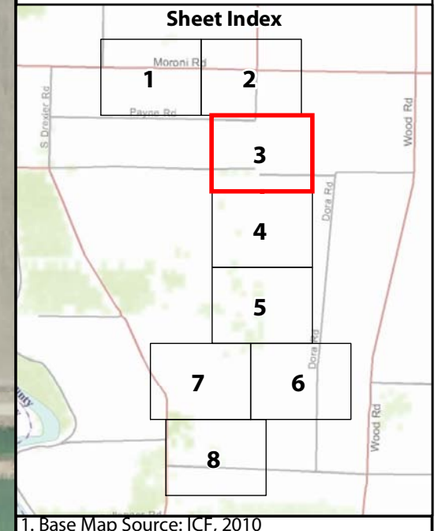
- Natural Gas Pipeline Trench (temporary sidecast fill in rice= 1.41 acres, 9230 CY)
- Bore
- Project Element
- Construction Laydown Area
- Access Road (permanent fill in drainage = 0.012 acres, 60-foot culvert)
- Pipeline Work Area
- Wetland and Biological Study Area (395.88 Acres)
- Culvert
- Other Waters Drainage
- Riparian Drainage
- Wetland Drainage
- Ricefield Wetland
- Elderberry Shrub

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Tisdale Weir
4. PLSS: T. 14, R. 1 E & T. 15, R. 1 E

Drawn By: Matt Ewalt	Jan 2011

ICF INTERNATIONAL

K:\PROJECTS_1-1\CALPINE1\00778_10_GRIMES\MAPDOC\ALIGNMENT_FIGURES\ALIGNMENT_20110105_W_WETLANDS.MXD SS (01-05-11)

121°52'30"W
121°52'20"W
121°52'10"W
121°52'0"W
39°5'50"N
39°5'40"N

OWD-36
x̄=20'
Acres = 2.254

RFW-23
Acres=25.01

RFW-24
Acres=30.643

RFW-26
Acres=37.718

WD-06
x̄=16'
Acres = 0.166

Exhibit 1
Project Alignment
Grimes Pipeline Project
January 2011
Sheet 4 of 8

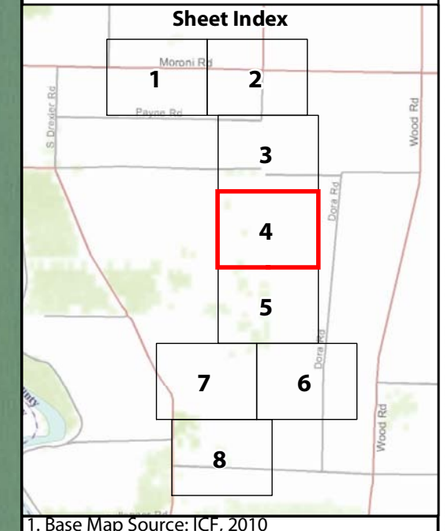
- Natural Gas Pipeline Trench (temporary sidecast fill in rice= 1.41 acres, 9230 CY)
- Bore
- Project Element
- Construction Laydown Area
- Access Road (permanent fill in drainage = 0.012 acres, 60-foot culvert)
- Pipeline Work Area
- Wetland and Biological Study Area (395.88 Acres)
- Culvert
- Other Waters Drainage
- Riparian Drainage
- Wetland Drainage
- Ricefield Wetland
- Elderberry Shrub

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Tisdale Weir
4. PLSS: T. 14, R. 1 E

Drawn By: Matt Ewalt	Jan 2011

ICF INTERNATIONAL

K:\PROJECTS_1-1\CALPINE1\0077b_10_GRIMES\MAPDOC\ALIGNMENT_FIGURES\ALIGNMENT_20110105_W_WETLANDS.MXD SS (01-05-11)

121°52'30"W
121°52'20"W
121°52'10"W
121°52'0"W
39°5'30"N
39°5'20"N

WD-07
x̄=10'
Acres = 0.123

OWD-37
x̄=8'
Acres = 0.486

RFW-26
Acres=37.718

OWD-36
x̄=20'
Acres = 2.254

RFW-25
Acres=31.487

Exhibit 1
Project Alignment
Grimes Pipeline Project
January 2011
Sheet 5 of 8

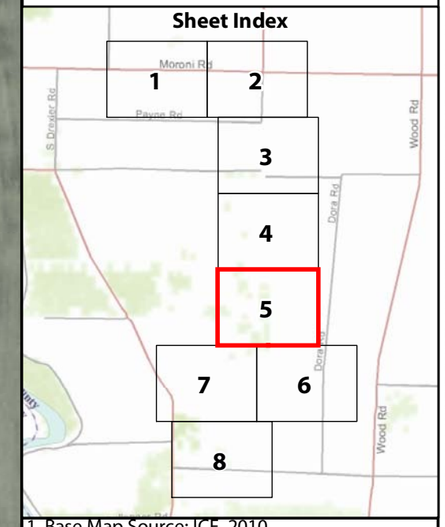
- Natural Gas Pipeline Trench (temporary sidecast fill in rice= 1.41 acres, 9230 CY)
- Bore
- Project Element
- Construction Laydown Area
- Access Road (permanent fill in drainage = 0.012 acres, 60-foot culvert)
- Pipeline Work Area
- Wetland and Biological Study Area (395.88 Acres)
- Culvert
- Other Waters Drainage
- Riparian Drainage
- Wetland Drainage
- Ricefield Wetland
- Elderberry Shrub

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Tisdale Weir
4. PLSS: T. 14, R. 1 E

Drawn By: Matt Ewalt	Jan 2011

ICF INTERNATIONAL

K:\PROJECTS_1-1\CALPINE\ 00778_10_GRIMES\ MAPDOC\ ALIGNMENT_FIGURES\ ALIGNMENT_20110105_W_WETLANDS.MXD SS (01-05-11)

Exhibit 1
Project Alignment
Grimes Pipeline Project
January 2011
Sheet 6 of 8

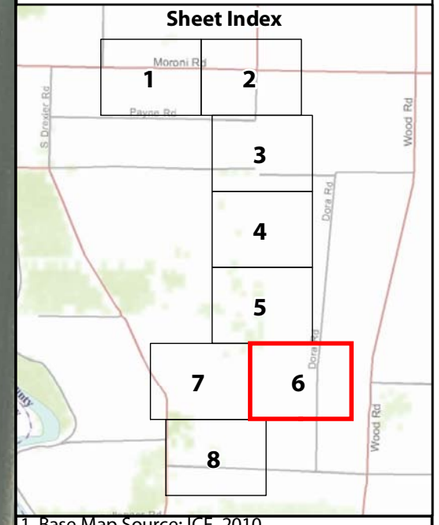
- Natural Gas Pipeline Trench (temporary sidecast fill in rice= 1.41 acres, 9230 CY)
- Bore
- Project Element
- Construction Laydown Area
- Access Road (permanent fill in drainage = 0.012 acres, 60-foot culvert)
- Pipeline Work Area
- Wetland and Biological Study Area (395.88 Acres)
- Culvert
- Other Waters Drainage
- Riparian Drainage
- Wetland Drainage
- Ricefield Wetland
- Elderberry Shrub

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Tisdale Weir
4. PLSS: T. 14, R. 1 E

Drawn By: Matt Ewalt	Jan 2011

ICF INTERNATIONAL

K:\PROJECTS_1-1\CALPINE\00778_10_GRIMES\MAPDOC\ALIGNMENT_FIGURES\ALIGNMENT_20110105_W_WETLANDS.MXD SS (01-05-11)

121°52'50"W
121°52'40"W
121°52'30"W
121°52'20"W
39°5'10"N
39°5'0"N

WD-09
x̄=14'
Acres = 0.376

RFW-26
Acres=37.718

OWD-39
x̄=14'
Acres = 0.269

RFW-28
Acres=27.793

OWD-38
x̄=14'
Acres = 1.435

S Meridian Rd

Exhibit 1
Project Alignment
Grimes Pipeline Project
January 2011
Sheet 7 of 8

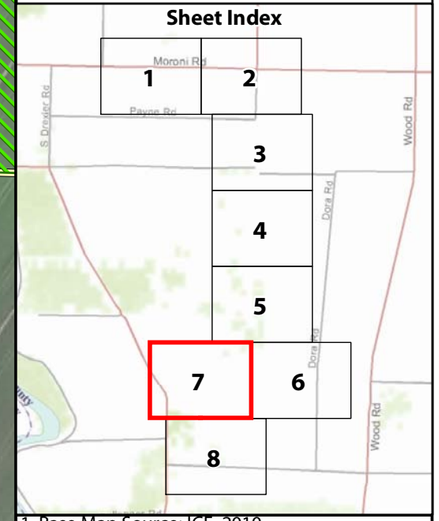
- Natural Gas Pipeline Trench (temporary sidecast fill in rice= 1.41 acres, 9230 CY)
- Bore
- Project Element
- Construction Laydown Area
- Access Road (permanent fill in drainage = 0.012 acres, 60-foot culvert)
- Pipeline Work Area
- Wetland and Biological Study Area (395.88 Acres)
- Culvert
- Other Waters Drainage
- Riparian Drainage
- Wetland Drainage
- Ricefield Wetland
- Elderberry Shrub

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



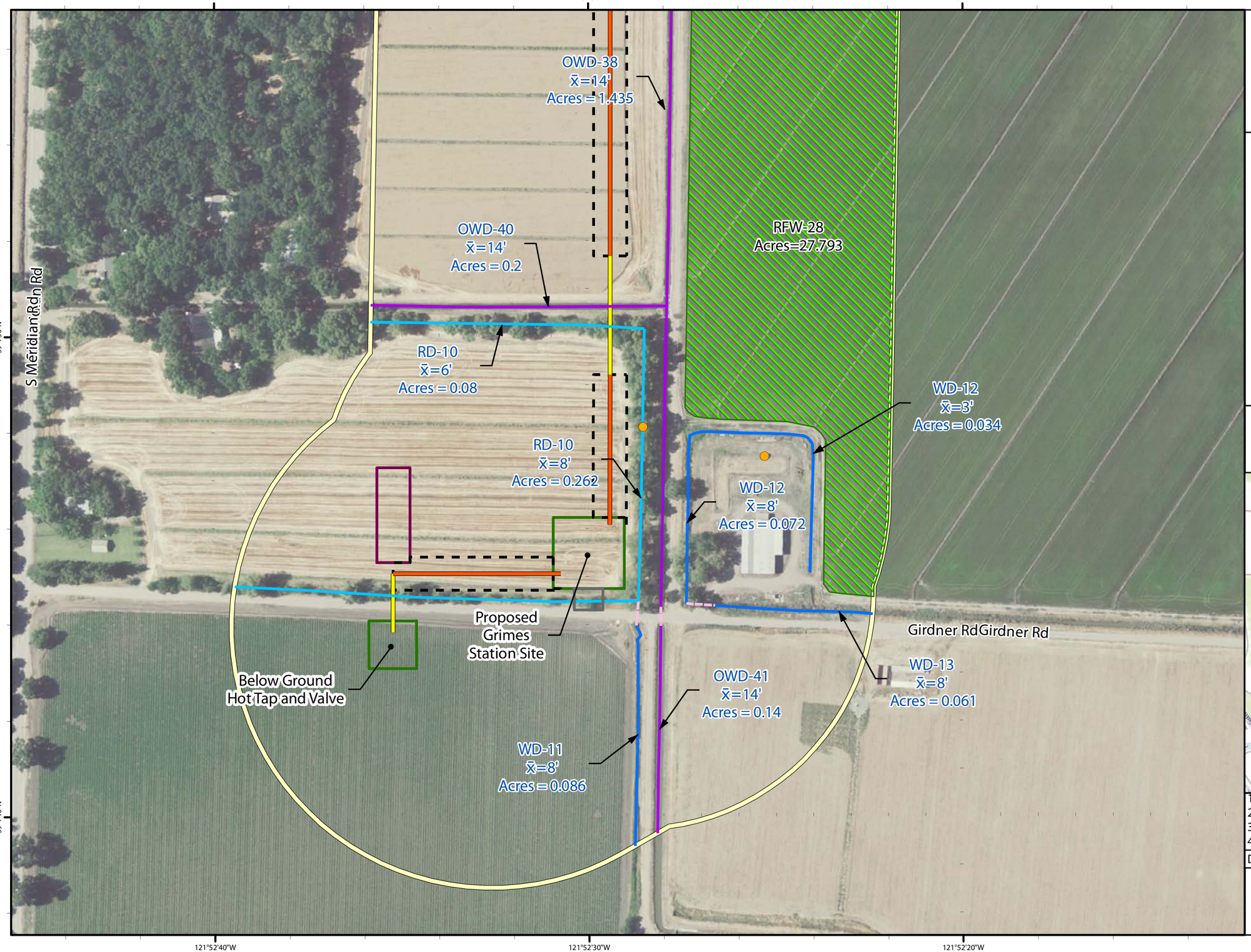
1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Grimes & Tisdale Weir
4. PLSS: T. 14, R. 1 E

Drawn By: Matt Ewalt	Jan 2011

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE\00776_10_GRIMES\MAPDOC\ALIGNMENT_FIGURES\ALIGNMENT_20110105_W_WETLANDS.MXD SS (01-05-11)

Exhibit 1
Project Alignment
Grimes Pipeline Project
January 2011
Sheet 8 of 8



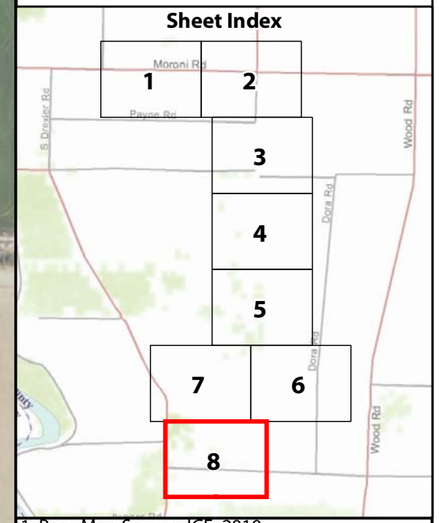
- Natural Gas Pipeline Trench (temporary sidecast fill in rice= 1.41 acres, 9230 CY)
- Bore
- Project Element
- Construction Laydown Area
- Access Road (permanent fill in drainage = 0.012 acres, 60-foot culvert)
- Pipeline Work Area
- Wetland and Biological Study Area (395.88 Acres)
- Culvert
- Other Waters Drainage
- Riparian Drainage
- Wetland Drainage
- Ricefield Wetland
- Elderberry Shrub

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Grimes & Tisdale Weir
4. PLSS: T. 14, R. 1 E

Drawn By: Matt Ewalt	Jan 2011

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE\00776_10_GRIMES\MAPDOC\ALIGNMENT_FIGURES\ALIGNMENT_20110105_W_WETLANDS.MXD SS (01-05-11)

Appendix F

Delineation of Wetlands and Other Water Bodies

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

January 12, 2011

Regulatory Division SPK-2010-01485

Chris Delaney
CPN Pipeline Company, LLC
60 River Road
Rio Vista, California 94571

Dear Mr. Delaney:

We are responding to a letter from ICF on your behalf dated December 20, 2010, and received December 22, 2010, for the Grimes Pipeline Project. This preliminary jurisdictional determination (JD) is in accordance with our Regulatory Guidance Letter (RGL) 08-02. The approximately 292.13-acre site is located in Section 32, Township 15 North, Range 1 East, Mount Diablo Baseline Meridian, Latitude 39.0947708721938°, Longitude -121.874167077057°, in Sutter County, California.

Based on available information, we concur with the estimate of potential waters of the United States, as depicted on the December 2010, *Preliminary Delineation of Wetlands and Other Water Bodies* drawing prepared by *ICF International*. The approximately 292.13 acres of wetlands or other water bodies present within the survey area may be jurisdictional waters of the United States. These waters may be regulated under Section 404 of the Clean Water Act.

A copy of our RGL 08-02 Preliminary Jurisdictional Determination Form for this site is enclosed. Please sign and return a copy of the completed form to this office. Once we receive a copy of the form with your signature we can accept and process a Pre-Construction Notification or permit application for your proposed project.

You should not start any work in potentially jurisdictional waters of the United States unless you have Department of the Army permit authorization. You may request an approved JD for this site at any time prior to starting work within waters. In certain circumstances, as described in RGL 08-02, an approved JD may later be necessary.

You should provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

This preliminary determination has been conducted to identify the potential limits of wetlands and other water bodies which may be subject to Corps of Engineers' jurisdiction for the particular site identified in this request. A Notification of Appeal Process and Request for Appeal (RFA) form is enclosed to notify you of your options with this determination.

This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

We appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website under *Customer Service Survey*.

Please refer to identification number SPK-2010-01485 in any correspondence concerning this project. If you have any questions, please contact Chandra Jenkins at the letterhead address above, or email *chandra.l.jenkins@usace.army.mil*, or telephone 916-557-6652. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/regulatory.html*.

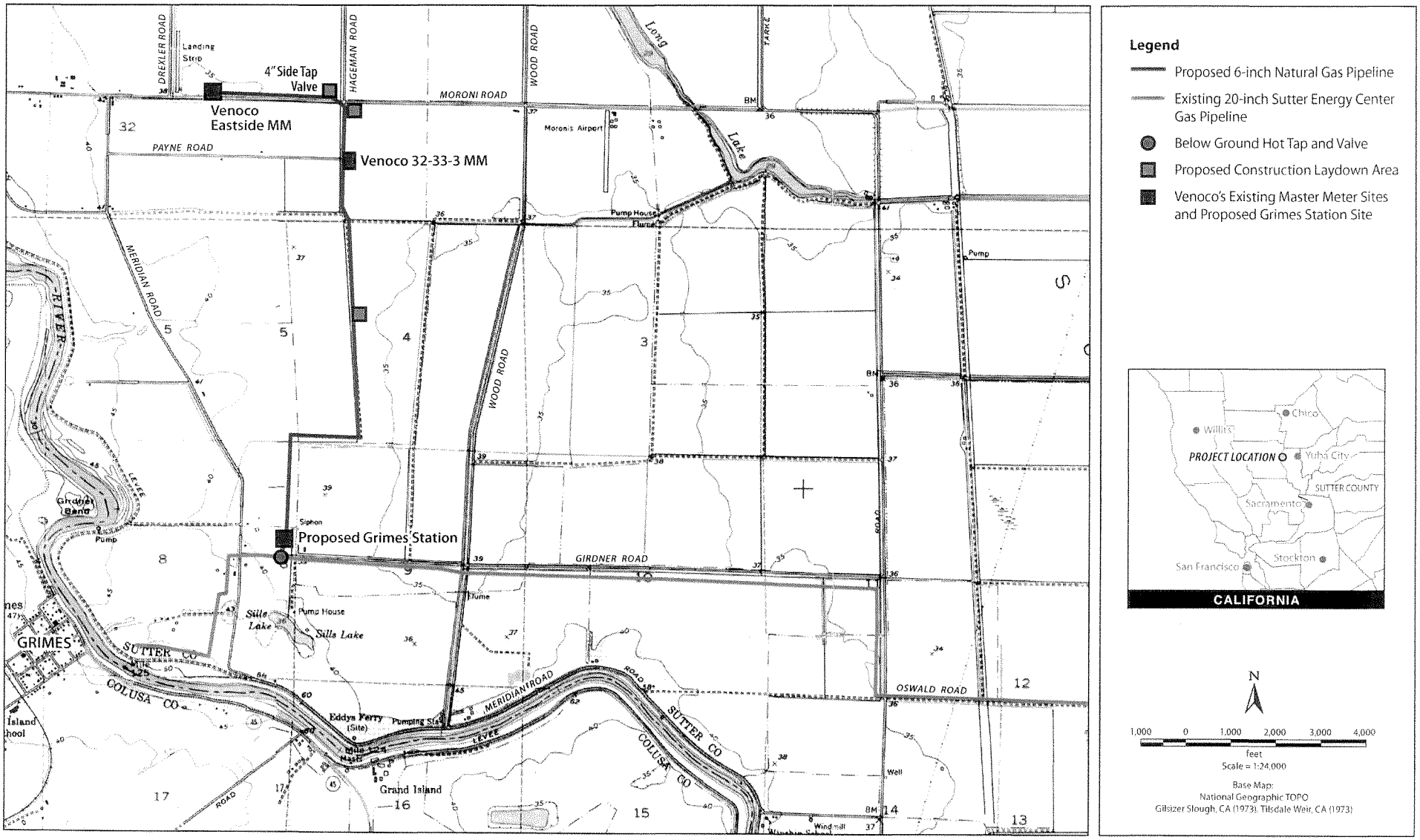
Sincerely,

Original Signed

Nancy A. Haley
Chief, California North Branch

Copy furnished:

Sue Bushnell, ICF International, 630 K Street, Suite 400, Sacramento, California 95814
U.S. Fish and Wildlife Service, Endangered Species Division, 2800 Cottage Way, Suite W2605, Sacramento, California 95825-3901
Jason Brush, U.S. Environmental Protection Agency, Region IX, Wetlands Regulatory Office (WTR-8), 75 Hawthorne Street, San Francisco, California 94105-3901
Scott Zaitz, RWQCB, 415 Knollcrest Drive, Suite 100, Redding, California 96002



ICF

Figure 1
Grimes Pipeline Project Location

PRELIMINARY DELINEATION OF WETLANDS AND OTHER WATER BODIES

FOR THE

GRIMES PIPELINE PROJECT, SUTTER COUNTY, CALIFORNIA

PREPARED FOR:

CPN Pipeline Company, LLC
60 River Road
Rio Vista, CA 94571
Contact: Chris Delaney, Engineering Manager
707.374.1516

PREPARED BY:

ICF International
630 K Street, Suite 400
Sacramento, CA 95814
Contact: Sue Bushnell
916.752.0959

December 2010

ICF INTERNATIONAL

ICF International. 2010. *Preliminary Delineation of Wetlands and Other Water Bodies for the Grimes Pipeline Project, Sutter County, California*. December. (ICF 00776.10) Sacramento, CA. Prepared for CPN Pipeline Company, LLC.

Contents

Tables and Figures

Table

Figure **Follows Page**

Acronyms and Abbreviations

Arid West Supplement	*Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* Version 2.0
Calpine	CPN Pipeline Company, LLC
CFR	Code of Federal Regulations
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
GIS	geographic information system
GPS	global positioning system
JD	jurisdictional determination
OHWM	ordinary high water mark
OWD	other waters drainage
PG&E	Pacific Gas & Electric Company
RD	riparian drainage
RFW	rice field wetland
SR	State Route
USGS	U.S. Geological Survey
WD	wetland drainage

Preliminary Delineation of Wetlands and Other Water Bodies for the Grimes Pipeline Project, Sutter County

Summary

This report presents the results of a delineation of wetlands and other water bodies conducted for the Grimes Pipeline Project in Sutter County, California. The delineation was conducted to assist the CPN Pipeline Company, LLC (Calpine) in determining the type and extent of wetlands and other water bodies in the delineation area that may be waters of the United States and subject to regulation by the U.S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act (CWA).

Wetlands and other water bodies were delineated using the routine onsite determination method described in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and, where applicable, the criteria specified in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0* (Arid West Supplement) (U.S. Army Corps of Engineers 2008). Additionally, in evaluating the potential jurisdictional status of cultivated rice fields, the guidance presented in Sacramento District Regulatory Branch memorandum 2007-01 (Irrigated Wetlands) and verbal guidance from the Corps Sacramento District on delineations for previous rice land projects was considered. The verbal guidance from Brian Vierria of the Corps pertained to projects in which the applicant was requesting a "preliminary" jurisdictional determination (JD) from the Corps, rather than an "approved" JD. For the previous project delineations, Mr. Vierria directed ICF International staff to assume that the rice fields would revert to wetland conditions in the absence of irrigation water and therefore should be mapped as wetlands rather than non-wetlands.

The delineation of wetlands and other water bodies was based primarily on field survey data collected in October 2010 and on interpretation of recent 2010 aerial photographs.

The delineation area encompasses 396 acres and includes the project components and a 1,000-foot buffer around the project components. The project facilities will be constructed within a 29-acre area and will include a 2.8-mile-long pipeline alignment, 0.5-acre gas metering facility, hot tap to the existing Sutter Energy Center pipeline system, two meters at two existing metering sites, and temporary staging and work areas.

Based on the data collected during the field surveys and from aerial photograph interpretation, the delineation area contains 292.125 acres of wetlands and other water bodies (Table 1).

Table 1. Acreage Summary of Wetlands and Other Water Bodies

Feature	Type	Acreage
Wetland drainage (WD)	Wetland	2.569
Riparian drainage (RD)	Wetland	0.342
Rice field wetland (RFW)	Wetland	281.017
Wetlands subtotal		283.928
Other waters drainage (OWD)	Other water body	8.197
Other water bodies subtotal		8.197
Total		292.125

A description of the wetlands and other water body features mapped in the delineation area is provided in *Results*, and their locations are depicted on the 1 inch = 200 feet aerial photographs in Exhibit A. All jurisdictional boundaries shown in Exhibit A are preliminary and subject to verification by the Corps Sacramento District.

Introduction

This report presents the results of a delineation of wetlands and other water bodies conducted by ICF International for the proposed Grimes Pipeline Project in Sutter County, California.

The project applicant is Calpine. Information for the project applicant's contact person is provided below.

Mr. Chris Delaney
CPN Pipeline Company, LLC
60 River Road
Rio Vista, CA 94571
Direct: 707.374.1516
Cell: 916.996.0156

The delineation area encompasses 396 acres and is defined by a 1,000-foot buffer around all areas that could be directly or indirectly disturbed during construction and maintenance of the project. The project area includes a 2.8-mile-long pipeline alignment, 0.5-acre gas metering facility, hot tap to the existing Sutter Energy Center pipeline system, two meters at two existing metering sites, and temporary staging and work areas.

The delineation area is owned by multiple property owners; Calpine has obtained easements for construction and operation of the project facilities.

Project Description

Overview

Calpine is proposing to construct and operate the Grimes Pipeline Project to provide a connection between Venoco and other gas producers in the Grimes natural gas field and Calpine's existing Sutter Energy Center pipeline system (Figure 1).

The proposed project includes installation of a 2.8-mile gas pipeline, two meters at two existing Venoco meter stations, a tap on the existing Sutter Energy Center pipeline system, and a 0.5-acre gas metering facility (referred to in this document as the *Grimes Station*). Once constructed, the proposed pipeline will transport approximately 10 million standard cubic feet per day[1] from Venoco's and other gas producers existing gas wells through the Sutter Energy Center pipeline system to Calpine's Sutter Energy Center, southeast of the project area (Figure 2).

Site Location and Driving Directions

Figure 2 shows the project area and its relationship to the Sutter Energy Center, nearby towns, roads, and the Sacramento River.

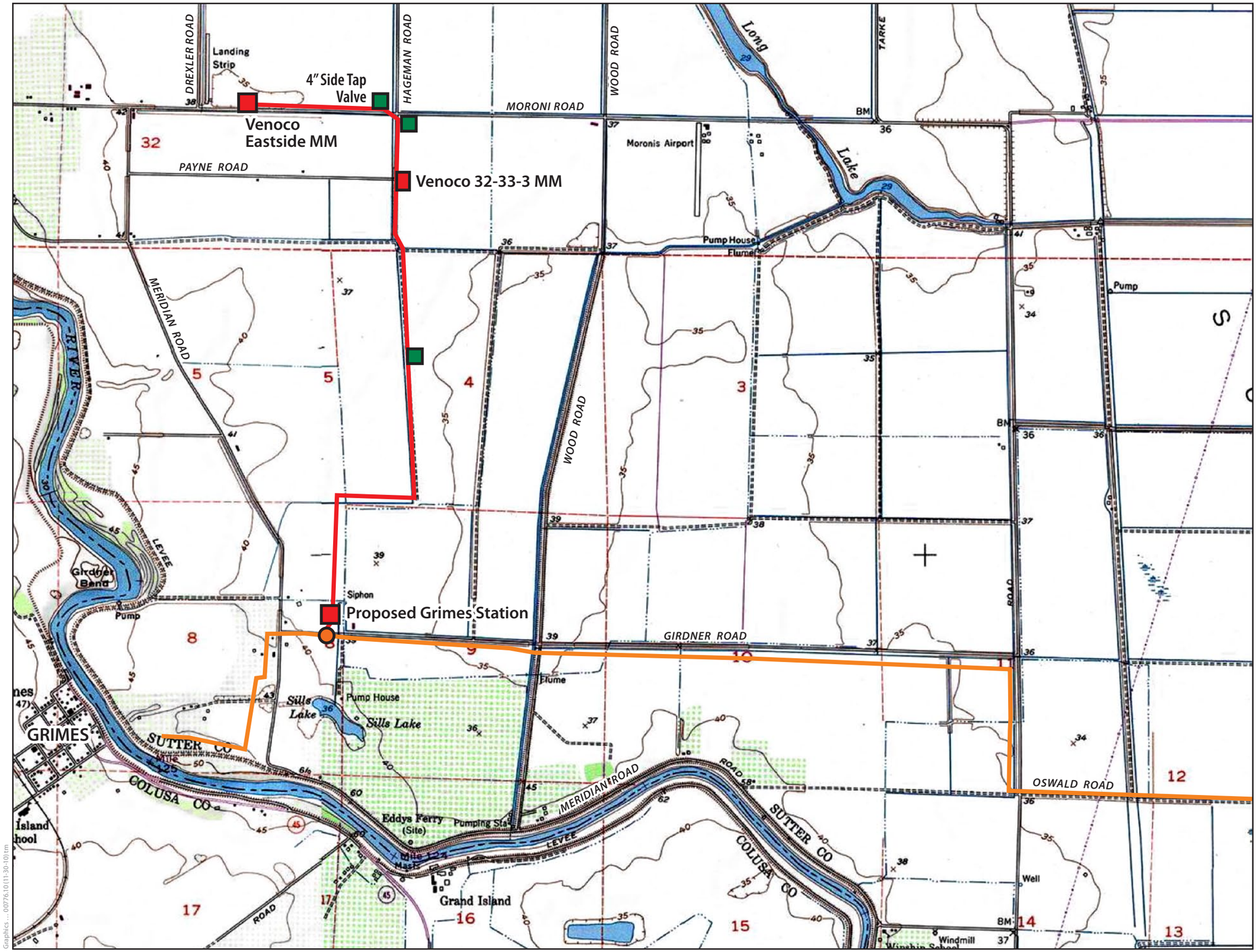
The project area is located in northwestern Sutter County, east of the Sacramento River and approximately 1 mile east of the town of Grimes. It lies between the Colusa and Sutter Basins and is approximately 13 miles west of Yuba City in northwestern Sutter County (Figure 1).

The northern end of the pipeline alignment is at Venoco's Eastside master meter station on Moroni Road; from there it extends east for approximately 2,500 feet to Hageman Road. At this intersection, the alignment runs south for approximately 1,500 feet and connects to Venoco's 32-33-3 master meter station, then continues south to the proposed Grimes Station, adjacent to Girdner Road. From the Grimes Station, a 400-foot-long pipeline will be installed to connect the 2.8-mile pipeline to the existing Sutter Energy Center 20-inch pipeline.

The delineation area is located on the Tisdale Weir U.S. Geological Survey (USGS) 7.5-minute quadrangle. The southern end of the delineation area is at 39.07896° north latitude and 121.87453° west longitude; the northern end is at 39.09986° north latitude and 121.87595° west longitude.

The northern end of the delineation area can be reached from downtown Sacramento by driving north on Interstate 5 for 6 miles to the State Route (SR) 99/70 north exit. After 14 miles, take the left fork for SR 99, then continue north on SR 99 for approximately 16 miles to Yuba City and turn left (west) onto SR 20. Continue approximately 10 miles on SR 20 (crossing over the Sutter Bypass), then turn left (south) onto Drexler Road. Continue approximately 1.5 miles and turn left onto Moroni Road. Continue approximately 0.1 mile to the Eastside master meter component of the project.

[1] A standard cubic foot is a measure of quantity of gas, sometimes but not always defined as a cubic foot of volume at 60°F and 14.7 pounds per square inch of pressure.



Legend

- Proposed 6-inch Natural Gas Pipeline
- Existing 20-inch Sutter Energy Center Gas Pipeline
- Below Ground Hot Tap and Valve
- Proposed Construction Laydown Area
- Venoco's Existing Master Meter Sites and Proposed Grimes Station Site

N

1,000 0 1,000 2,000 3,000 4,000

feet

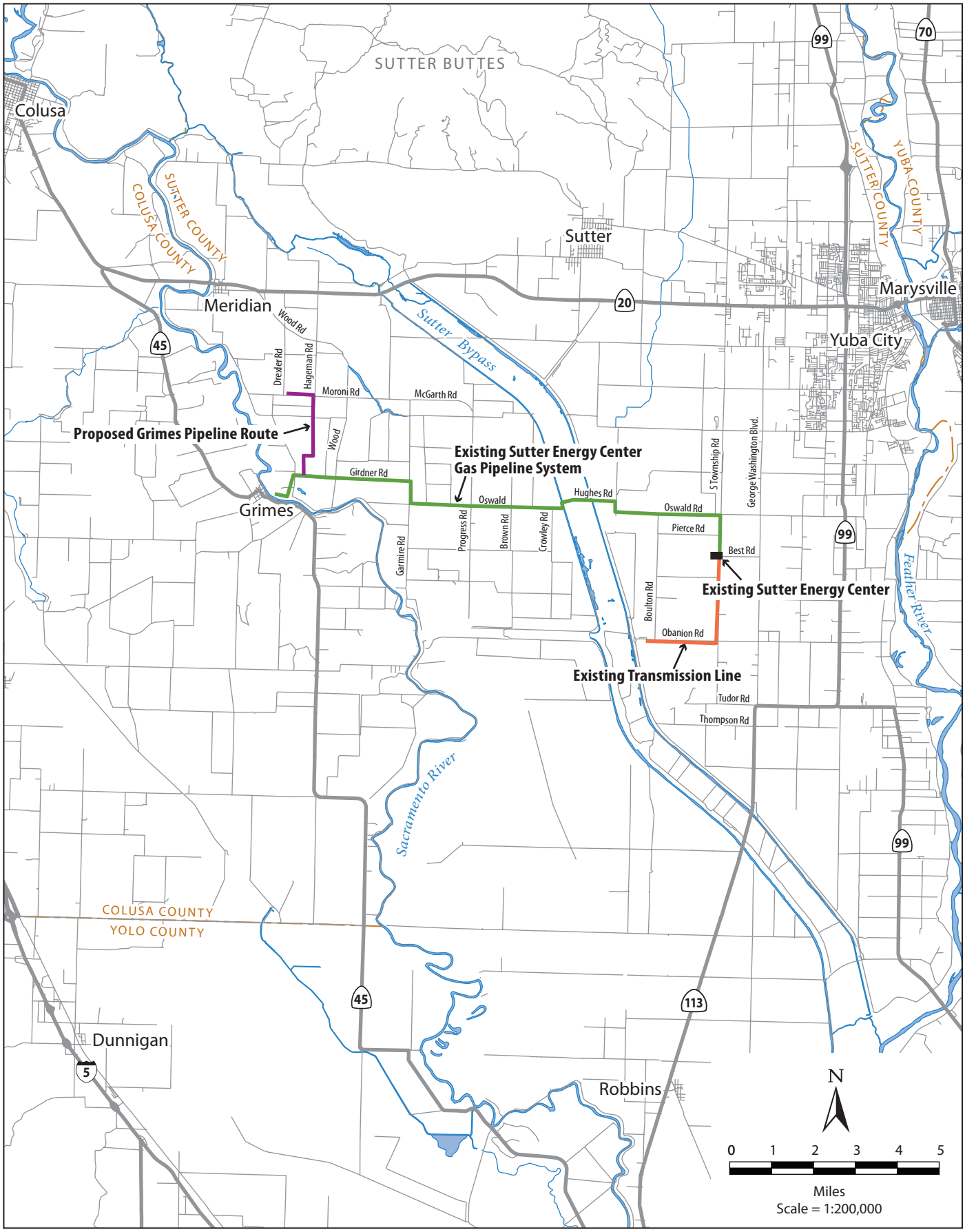
Scale = 1:24,000

Base Map:
National Geographic TOPO
Gilsizer Slough, CA (1973), Tilsdale Weir, CA (1973)

Graphics... 0077610 (11-30-10).cnm

ICF INTERNATIONAL

Figure 1
Grimes Pipeline Project Location



ICF INTERNATIONAL

Figure 2
Grimes Pipeline Project Vicinity

Site Description

Land Use

The delineation area is in an agricultural area consisting predominantly of rice fields with widely scattered rural residences and agricultural operations. The southwestern part of the delineation area was used in 2010 for corn and beans, and there is a small fig orchard in the southeastern corner. The delineation area has been farmed for many decades and now supports very little undisturbed natural habitat. The area is used for recreational waterfowl and deer hunting during the fall and winter months.

Topography

Elevations in the delineation area are approximately 37 feet at the northern end and 39 feet at the southern end. With the exception of canal and ditch banks, slopes are generally level to 1%. Some of the rice fields appear to have been laser-leveled; the remainder have contour checks and therefore have probably not been leveled significantly.

Hydrology

The delineation area is located in the Sacramento–Stone Corral hydrologic unit (HUC 18020104) (U.S. Geological Survey 2010).

The Sacramento River, approximately two-thirds of a mile south of the southern end of the delineation area, is a navigable water of the United States (U.S. Army Corps of Engineers 2010).

The pipeline alignment parallels or crosses a number of irrigation canals and drainage ditches (some of which support wetland vegetation). The ditches and canals appear to drain generally to the south; some may drain to Sills Lake, approximately 1,200 feet south of the delineation area. Other drainage water from the delineation area may reach a toe drain along the east levee of the Sacramento River, where drainage water is pumped into the river at certain times of the year.

Irrigation water is applied to the rice fields in the delineation area using a conventional flow-through irrigation system, in which water is delivered from a canal into the top paddy of the overall field then flows through several paddies to the bottom paddy. Weir boxes placed along each check control water flow rates and water depth in the individual paddies.

The rice fields are flooded up to a depth of approximately 6 inches in April and then usually aerially seeded. Until harvest time in September or October, the fields are maintained in a flooded condition. After being harvested in the fall, some of the rice fields are flooded again in the winter months to attract waterfowl and promote decay of rice stubble.

Soils

A map of the soils in the delineation area and associated hydric soil information are provided in Appendix A. The landform and hydrologic characteristics of the soils are summarized in Table 2. Morphologically, the soils that formed on a basin (i.e., Capay and Cropley series) are very deep and have a fine-loamy texture. The soils that formed on a floodplain (i.e., Shanghai and Nueva series) are deep and have a fine-loamy texture.

Table 2. Summary of Hydrologic Characteristics of the Soils in the Delineation Area

Soil Map Symbol	Soil Map Unit Name	Geomorphic Surface	Drainage Class	Permeability (slowest layer)	Existing Flooding Frequency*	Existing Seasonal High Water Table* (feet)/Type of Water Table	Hydric Status of Primary Component of Map Unit**
104	Capay silty clay, 0 to 2 percent slopes	basins and basin rims	moderately well	slow	rare	>6.0 n/a	Hydric
108	Capay silty clay, wet, 0 to 2 percent slopes	basins and basin rims	moderately well	slow	rare	4.0-5.0 apparent	Hydric
146	Nueva loam, wet, 0 to 1 percent slopes	floodplains	somewhat poor	moderately slow	rare	4.0-5.0 apparent	Non-hydric
163	Shanghai silt loam, clay substratum, 0 to 2 percent slopes	floodplains	somewhat poor	slow	rare	4.0-5.0 apparent	Hydric
167	Shanghai silty clay loam, 0 to 2 percent slopes	floodplains	somewhat poor	moderately slow	rare	3.0-5.0 apparent	Hydric

Sources: Lytle 1980; Soil Survey Staff 2010.

* *Water table* refers to a saturated zone in the soil. The figures represent the depth to the top (upper limit) of the seasonal saturated zone in most years. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence (i.e., redoximorphic features) of a saturated zone in the soil.

** *Primary Component* refers to the soil that makes up approximately 85% or more of the map unit. The remaining soils in the map unit (i.e., inclusions) are not indicated here. The inclusions may or may not be hydric.

Precipitation and Growing Season

The climate in the delineation area is characterized by hot, dry summers and cool, moist winters. National Weather Service cooperative weather station number CA6194 (Nicolas 2) is the closest weather station to the delineation area, about 8 miles to the southwest. Mean annual precipitation at the Nicolas 2 station is 19.57 inches. Most of the precipitation falls as rain between October and April (U.S. Department of Agriculture, Natural Resources Conservation Service 2007).

No significant rain had fallen between the end of the 2009–2010 rainy season and the time of the delineation field surveys.

The average length of the growing season in the central part of Sutter County is inferred to be approximately 275 days (Lytle 1988).

Vegetation

The delineation area is within the Sacramento Valley geographic subdivision of the Great Central Valley in the California Floristic Province (Hickman 1993). The area was historically a grassland community with interspersed vernal pools, seasonal wetlands, emergent wetlands, and intermittent and perennial creeks with riparian habitat and valley oak woodlands. Currently, the area supports very little natural habitat and has been substantially altered by agricultural activities.

Most of the delineation area is used for rice farming. The southwestern part of the delineation area appears to be used for corn and beans. There is a small fig orchard in the southeastern corner.

Irrigation canals and drainage ditches are present throughout the delineation area. Some appear to have been recently dredged, such that little vegetation occurs on their beds or banks. Others support a patchy to continuous herbaceous wetland plant cover, including common tule and broad-leaf cattail. A few canals/ditches in the southern part of the delineation area support a riparian overstory of willows, black walnut, and valley oak.

A list of the plant species that were observed while conducting the delineation field surveys and their wetland indicator status is provided in Appendix B. The wetland plant communities found in the delineation area are described in the *Results* section of this report.

Delineation Methods

The delineation area encompasses 396 acres and is defined by a 1,000-foot buffer beyond the 29 acres of project area lands that will be directly or indirectly disturbed during construction of the project.

The fieldwork for the delineation was conducted by a soil scientist and a botanist on October 20, 2010. The delineation team used the routine onsite determination method described in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and, where applicable, the criteria specified in the Arid West Supplement (U.S. Army Corps of Engineers 2008).

As detailed in the Arid West Supplement, data on vegetation, soil, and hydrology characteristics used as the basis for wetland boundary determinations were collected and recorded on Arid West Supplement data forms (version 2.0) (Appendix C). Data forms were completed at nine sample plots (data points).

The wetland indicator status of each plant species was based on the *National List of Plant Species that Occur in Wetlands: California* (Reed 1988). Common and scientific plant names are taken from the *Jepson Manual of Higher Plants of California* (Hickman 1993), supplemented by the Jepson Online Interchange for California Floristics (University of California 2007). In this report, classification of wetland and other water body habitats are based on the nomenclature developed by Cowardin et al. and presented in *Classification of Wetland and Deepwater Habitats of the United States* (1979).

The boundaries of non-wetland water bodies (i.e., drainages that lack wetland vegetation) were delineated at the ordinary high water mark (OHWM) as defined in Title 33, Section 328.3 of the Code of Federal Regulations (CFR). The OHWM represents the limit of potential Corps jurisdiction over nontidal waters (e.g., irrigation ditches, canals, natural streams) in the absence of adjacent wetlands (33 CFR 328.04). The features were mapped and delineated in the field in accordance with Corps Regulatory Guidance Letter No. 05-05 (U.S. Army Corps of Engineers 2005).

A Trimble GeoXT global positioning system (GPS) unit, typically accurate to less than 1 horizontal meter, was used to record the location of the data points and potential jurisdictional feature boundaries. However, where the boundaries of the wetland or water bodies (e.g., rice field wetlands) were clearly evident on the 1 inch = 200 feet aerial photograph base map, the features were mapped directly onto the aerial photograph. The aerial photo mapping was then digitized into a geographic information system (GIS) data layer. The GPS data were downloaded, differentially corrected, and incorporated into the GIS data layer to generate the delineation maps.

The resulting delineation map and this report were prepared in accordance with U.S. Army Corps of Engineers Sacramento District guidelines (U.S. Army Corps of Engineers 2001).

Results

Table 1 provides the total acreage of wetlands and other water bodies mapped in the delineation area.

Photographs of representative wetlands, other water bodies, and the delineation area in general are provided in Appendix D. A list of drainages (wetland and other water body) that occur in the delineation area is provided in Appendix E.

Wetlands

Wetland Drainage

Twelve wetland drainages (Riverine Lower Perennial Emergent Wetland), totaling 2.569 acres, were mapped within the delineation area (Exhibit A). Wetland drainages consist of artificial agricultural ditches and irrigation canals that overall have at least 5% vegetation cover; most have more than 50% vegetation cover. Paired data points were established at representative wetland drainages to confirm the presence of all three wetland indicators (hydrophytic vegetation, hydric soil, and wetland hydrology) used by the Corps to identify wetlands.

The wetland drainages are typically dominated by cattail (*Typha* sp.) (OBL) and common tule (*Scirpus acutus* var. *occidentalis*) (OBL). Common associate species are umbrella sedge (*Cyperus eragrostis*) (FACW), Bermuda grass (*Cynodon dactylon*) (FAC), and Dallis grass (*Paspalum dilatatum*) (FAC). Hydric soil was identified by the presence of the indicators Redox Dark Surface (F6) and Hydrogen Sulfide (A4). Wetland hydrology was identified by the presence of Surface Water (A1), High Water Table (A2), Saturation (A3), and Hydrogen Sulfide Odor (C1).

The wetland drainages have a well-defined bed and bank and have been excavated to depths of approximately 3–7 feet. They appear to be supported by irrigation tailwater from rice fields and high groundwater. At least some of the wetland drainages appear to be subject to periodic dredging, such that much or all of the vegetation is removed. All the wetland drainages appear to eventually flow into Sills Lake or the Sacramento River, the latter by means of pumping over the Sacramento River levee.

Riparian Drainage

One riparian drainage (Riverine Lower Perennial Emergent Wetland), totaling 0.342 acre, was mapped within the delineation area (Exhibit A). Riparian drainages consist of artificial agricultural ditches that are overall more than 75% vegetated. No data points were established in the riparian drainages because they are essentially wetland drainages with a riparian overstory.

The riparian drainages are typically dominated by Fremont cottonwood (*Populus fremontii* ssp. *fremontii*) (FACW), valley oak (*Quercus lobata*) (FAC), and black willow (*Salix gooddingii*) (OBL). Common associate species are umbrella sedge (*Cyperus eragrostis*) (FACW), Bermuda grass (*Cynodon dactylon*) (FAC), and Dallis grass (*Paspalum dilatatum*) (FAC). Wetland hydrology was identified by the presence of Water Marks (B1) and Water Stained Leaves (B2).

The riparian drainages have a well-defined bed and bank and have been excavated to depths of approximately 5–6 feet. They appear to be supported by irrigation tailwater from rice fields and high groundwater. None of the riparian drainages appear to be subject to frequent dredging. All the riparian drainages appear to flow eventually into Sills Lake or the Sacramento River, the latter by means of pumping over the Sacramento River levee.

Rice Field Wetland

Rice field wetlands (Palustrine Emergent Wetland) totaling 281.017 acres were mapped in the delineation area.

The rice field wetlands consist of large, laser-leveled or contour-checked fields that are bordered by low levees or rice checks. They are fully vegetated while rice is being produced and partly vegetated by volunteer species when fallow. Paired data points were established in two of the rice field wetlands (which were accessible at the time of the field surveys) to confirm the presence of all three wetland indicators (hydrophytic vegetation, hydric soil, and wetland hydrology) used by the Corps to identify wetlands.

Rice field wetlands consist of a near monoculture of cultivated rice (*Oryza sativa*) (OBL) when rice is being produced. Common associate species, typically occurring only along the edges of the rice fields where the water depth is slightly shallower, include umbrella sedge (*Cyperus eragrostis*) (FACW) and broad-leaved cattail (*Typha latifolia*) (OBL). Hydric soil was identified by the presence of the indicator Redox Dark Surface (F6). Wetland hydrology was usually identified by the presence of Oxidized Rhizospheres (C3). In other rice fields (in which no data points were established), the presence of a Biotic Crust (B12) was observed.

The rice field wetlands appear to be supported by flood irrigation, incident precipitation, and possibly by a shallow water table.

Other Water Bodies

Other Waters Drainage

Twelve other waters drainages (Riverine Intermittent Streambed), comprising approximately 8.197 acres, were mapped in the delineation area and appear to qualify as other waters (Exhibit A). These features consist of drainage ditches and irrigation canals that are less than 5% vegetated.

The other waters drainages have been excavated to depths of approximately 4–7 feet. The other waters drainages appear to be supported by one or more of the following: irrigation water delivered directly to the feature, tailwater from rice fields, and shallow groundwater. Nearly all the other waters drainages appear to be subject to periodic dredging, such that much or all of the vegetation is removed. All the other waters drainages appear to flow eventually into Sills Lake or the Sacramento River, the latter by means of pumping over the Sacramento River levee.

References Cited

Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1975. *Classification of Wetlands and Deepwater Habitats of the United States*. FWS/OBS-79/31. December. U.S. Department of the Interior Fish and Wildlife Service. Washington, DC: U.S. Government Printing Office.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual.* Technical Report Y-87-1. Vicksburg, MS: U.S. Army Waterways Experiment Station.

Hickman, J. C. 1993. *The Jepson Manual of Higher Plants of California.* Berkeley and Los Angeles: University of California Press.

Reed, P. B. 1988. *National List of Plant Species that Occur in Wetlands: California (Region 0).* Biological Report 88 (26.10). May. Prepared for National Wetlands Inventory. Washington, DC: U.S. Fish and Wildlife Service, Research and Development.

Lytle, D. J. 1988. *Soil Survey of Sutter County, California*. U.S. Department of Agriculture, Soil Conservation Service in cooperation with Regents of the University of California (Agricultural Experiment Station). Washington, DC: U.S. Government Printing Office.

Soil Survey Staff. 2010. *Web Soil Survey*. Natural Resources Conservation Service, United States Department of Agriculture. Available: <http://websoilsurvey.nrcs.usda.gov/>. Accessed: October 17, 2010.

University of California. 2007. *Jepson Online Interchange for California Floristics*. Last updated: January 26, 2007. Available: <http://ucjeps.berkeley.edu/interchange.html>. Accessed: October 25, 2010.

U.S. Geological Survey. 2010. *Boundary Descriptions and Names of Regions, Subregions, Accounting Units and Cataloging Units*. Last revised: April 23, 2010. Available: <http://water.usgs.gov/lookup/getwatershed?18020104/www/cgi-bin/lookup/getwatershed>. Accessed: October 21, 2010.

U.S. Army Corps of Engineers. 2001. *Minimum Standards for Acceptance of Preliminary Wetlands Delineations*. Sacramento, CA. Last updated: November 30. Available: <http://www.spk.usace.army.mil//organizations/cespk-co/regulatory/pdf/min_standards.pdf>. Accessed: October 17, 2010.

———. 2005. *Ordinary High Water Mark Identification.* (Regulatory Guidance Letter No. 05-05). December 7, 2005.

———. 2007. *Irrigated Wetlands*. Sacramento District Regulatory Branch Memorandum 2007-01. March 13.

———. 2008. *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Arid West Region (Version 2.0)*. J. S. Wakeley, R. W. Lichvar, and C.V. Noble (eds.). (ERDC/EL TR-08-28.) Vicksburg, MS: U.S. Army Engineer Research and Development Center.

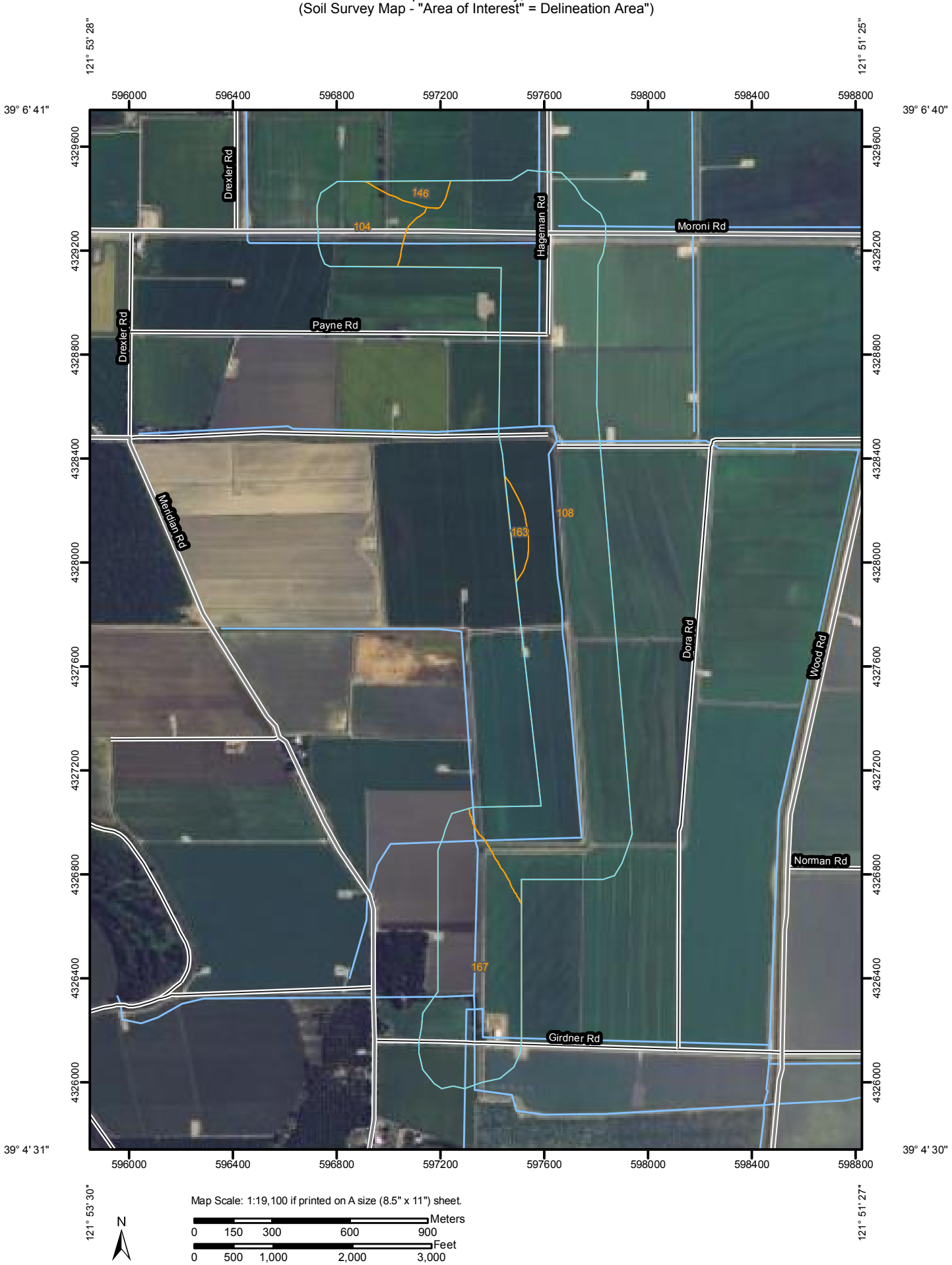
———. 2010. *Navigable Waterways in the Sacramento District*. Available: <http://www.spk.usace.army.mil//organizations/cespk-co/regulatory/waterways.html>. Accessed: October 17, 2010.

U.S. Department of Agriculture, Natural Resources Conservation Service. 2007. WETS table documentation for the Colusa 2 SSW cooperative weather station (station CA 1948), California. Available: <ftp://ftp.wcc.nrcs.usda.gov/support/climate/wetlands/ca/06011.txt>. Accessed: October 22, 2010. Last updated: August 29, 2002.

Appendix A

Soil Survey Information

Soil Map—Sutter County, California
(Soil Survey Map - "Area of Interest" = Delineation Area")



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:19,100 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sutter County, California
Survey Area Data: Version 7, Aug 31, 2009

Date(s) aerial images were photographed: 6/29/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Sutter County, California (CA101)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
104	Capay silty clay, 0 to 2 percent slopes	25.5	6.5%
108	Capay silty clay, wet 0 to 2 percent	278.9	71.3%
146	Nueva loam, wet, 0 to 1 percent slopes	5.3	1.4%
163	Shanghai silt loam, clay substratum, 0 to 2 percent slopes	4.6	1.2%
167	Shanghai silty clay loam, 0 to 2 percent slopes	76.6	19.6%
Totals for Area of Interest		**391.0**	**100.0%**

Hydric Soils (CA)

This table lists the map unit components and their hydric status in the survey area. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 2002).

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The criteria for hydric soils are represented by codes in the table (for example, 2B3). Definitions for the codes are as follows:

1. All Histels except for Folistels, and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
   A. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
   B. are poorly drained or very poorly drained and have either:
      i. a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
      ii. a water table at a depth of 0.5 foot or less during the growing season if saturated hydraulic conductivity (Ksat) is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
      iii. a water table at a depth of 1.0 foot or less during the growing season if saturated hydraulic conductivity (Ksat) is less than 6.0 in/hr in any layer within a depth of 20 inches.
3. Soils that are frequently ponded for long or very long duration during the growing season.
4. Soils that are frequently flooded for long or very long duration during the growing season.

Hydric Condition: Food Security Act information regarding the ability to grow a commodity crop without removing woody vegetation or manipulating hydrology.

References:
Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
Federal Register. September 18, 2002. Hydric soils of the United States.
Federal Register. July 13, 1994. Changes in hydric soils of the United States.
Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
National Research Council. 1995. Wetlands: Characteristics and boundaries.
Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.
Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.
Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.
Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

Report—Hydric Soils (CA)

Hydric Soils (CA)– CA101 - Sutter County, California							
Map symbol and map unit name	**Component/ Local Phase**	**Hydric status**	**Landform**	**Hydric criteria met (code)**	**Farmable condition**	**Comp. pct.**	**Altered hydrology notes**
104: Capay silty clay, 0 to 2 percent slopes	(C) - Capay-silty clay	Yes	Basin floors	4	Farmable under natural conditions	70	—
	(I) - Clear Lake-	Yes	Basin floors	2B3,4	Neither wooded nor farmable under natural conditions	0-10	—
	(I) - Oswald-	Yes	Basin floors	2B3,4	Neither wooded nor farmable under natural conditions	0-10	—
	(I) - Gridley-	No	—	—	—	0-10	—
108: Capay silty clay, wet 0 to 2 percent	(C) - Capay-silty clay, wet	Yes	Basin floors	4	Neither wooded nor farmable under natural conditions	80	—
	(I) - Clear Lake-	Yes	Basin floors	2B3,4	Neither wooded nor farmable under natural conditions	0-5	—
	(I) - Oswald-	Yes	Basin floors	2B3,4	Neither wooded nor farmable under natural conditions	0-5	—
	(I) - Gridley-	No	—	—	—	0-5	—
	(I) - Liveoak-	No	—	—	—	0-5	—
146: Nueva loam, wet, 0 to 1 percent slopes	(C) - Nueva-loam, wet	No	Flood plains	—	—	85	—
	(I) - Columbia-	Yes	Flood plains	4	Farmable under natural conditions	0-8	—
	(I) - Shanghai-	Yes	Flood plains	4	Farmable under natural conditions	0-7	—
163: Shanghai silt loam, clay substratum, 0 to 2 percent slopes	(C) - Shanghai-silt loam, clay substratum	Yes	Flood plains	4	Farmable under natural conditions	90	—
	(I) - Columbia-	Yes	Flood plains	4	Farmable under natural conditions	0-4	—
	(I) - Holillipah-	Yes	Flood plains	4	Farmable under natural conditions	0-3	—
	(I) - Conejo-	No	—	—	—	0-3	—

Hydric Soils (CA)– CA101 - Sutter County, California							
Map symbol and map unit name	**Component/ Local Phase**	**Hydric status**	**Landform**	**Hydric criteria met (code)**	**Farmable condition**	**Comp. pct.**	**Altered hydrology notes**
167: Shanghai silty clay loam, 0 to 2 percent slopes	(C) - Shanghai-silty clay loam	Yes	Flood plains	4	Farmable under natural conditions	90	—
	(I) - Columbia-	Yes	Flood plains	4	Farmable under natural conditions	0-4	—
	(I) - Holillipah-	Yes	Flood plains	4	Farmable under natural conditions	0-3	—
	(I) - Unnamed-	Yes	Flood plains	4	Farmable under natural conditions	0-3	—

Data Source Information

Soil Survey Area: Sutter County, California
Survey Area Data: Version 7, Aug 31, 2009

Appendix B

Plant Species Observed in the Delineation Area

Appendix B. Plant Species Observed in the Delineation Area

Scientific Name	Common Name	Wetland Indicator Status‡
Ferns and Fern-allies		
Azolla filiculoides	mosquito fern	OBL
Trees		
Juglans californica var. *hindsii*	California black walnut	UPL
Populus fremontii ssp. *fremontii*	Fremont cottonwood	FACW
Quercus lobata	valley oak	FAC*
Salix gooddingii	black willow	OBL
Shrubs and Woody Vines		
Rubus armeniacus [*R. discolor*] *	Himalayan blackberry	FACW*
Salix lasiolepis	arroyo willow	FACW
Salix exigua	sandbar willow	OBL
Vitis californica	California grape	FACW
Forbs		
Abutilon theophrasti *	velvet-leaf	NI
Achyrachaena mollis	blow-wives	FAC*
Alisma lanceolatum *	lanceleaf water plantain	OBL
Alisma plantago-aquatica	water plantain	OBL
Brassica nigra *	black mustard	UPL
Centaurea solstitialis *	yellow star-thistle	UPL
Chamaesyce maculata *	spotted spurge	UPL
Convolvulus arvensis *	field bindweed	UPL
Eclipta prostrata	false daisy	UPL
Epilobium ciliatum ssp. *ciliatum*	hairy willowherb	FACW
Hirschfeldia incana *	Mediterranean hoary mustard	UPL
Lactuca serriola *	prickly lettuce	FAC
Lemna minuta	minute duckweed	OBL
Lotus corniculatus *	birdfoot trefoil	FAC
Ludwigia peploides ssp. *montevidensis**	floating water-primrose	OBL
Malva neglecta *	common mallow	UPL
Malvella leprosa	alkali mallow	FAC*
Melilotus alba *	white sweetclover	FACU+
Physalis lancifolia *	narrowleaf tomatillo	UPL
Plantago lanceolata *	English plantain	FAC-
Polygonum arenastrum [*P. aviculare*] *	common knotweed	FAC
Polygonum lapathifolium	willow smartweed	OBL
Rumex crispus *	curly dock	FACW-
Senecio vulgaris *	common groundsel	NI*
Silybum marianum *	milk thistle	UPL
Sonchus asper ssp. *asper* *	prickly sowthistle	FAC
Torilis arvensis *	hedge parsley	UPL
Torilis nodosus *	knotted hedge parsley	UPL
Verbena bonariensis *	purpletop vervain	FACW

Scientific Name	Common Name	Wetland Indicator Status‡
Veronica peregrina ssp. *xalapensis*	purslane speedwell	OBL
Grasses and Grass-like Plants		
Avena barbata *	slender wild oat	UPL
Bromus diandrus *	ripgut brome	UPL
Bromus hordeaceus [*B. mollis*] *	soft chess	FACU-
Bromus madritensis ssp. *madritensis* *	Spanish brome	UPL
Crypsis sp.	pricklegrass	OBL
Cynodon dactylon *	Bermuda grass	FAC
Cyperus cf. *esculentus*	nutsedge	UPL
Cyperus eragrostis	umbrella sedge	FACW
Distichlis spicata	saltgrass	FACW
Echinochloa colona *	jungle-rice	FACW
Echinochloa crus-galli *	barnyard grass	FACW
Hordeum murinum ssp. *leporinum* *	wall barley	NI
Leptochloa fascicularis	bearded sprangletop	OBL
Lolium multiflorum [*L. perenne*] *	Italian ryegrass	FAC*
Oryza sativa *	cultivated rice	OBL
Paspalum dilatatum	dallis grass	FAC
Phalaris aquatica *	bulbous canarygrass, Harding grass	FAC+
Poa annua *	annual bluegrass	FACW-
Polypogon interruptus *	ditch rabbitsfoot grass	OBL
Polypogon monspeliensis *	rabbitsfoot grass	FACW+
Scirpus acutus var. *occidentalis*	common tule	UPL
Scirpus mucronatus *	ricefield bulrush	OBL
Setaria pumila *	yellow bristle grass	UPL
Sorghum halepense *	Johnsongrass	FACU
Typha latifolia	broadleaf cattail	OBL

Notes: The * following a scientific name indicates that the species is not native. Wetland indicator status follows Reed (1988); nomenclature follows Reed (1988) and *The Jepson Manual* (Hickman 1993) and online updates.

‡ Wetland Indicator Status for Region 0, California:
OBL (obligate)—almost always occurs in wetlands (99% probability of occurrence in wetlands).
FAC (facultative)—equally likely to occur in wetlands or nonwetlands (34–66% probability).
FACU (facultative upland)—usually occurs in nonwetlands but occasionally occurs in wetlands (1–33% probability).
FACW (facultative wetland)—usually occurs in wetlands (67–99% probability).
UPL (obligate upland)—almost never occurs in wetlands (1% probability); in general, species that are not listed on the wetland plant list are assumed to be obligate upland species.
NI (no indicator)—no indicator status assigned because regional status information is lacking; the indicator status assigned to the species in the nearest adjacent region is applied, in this case, Region 9 (Northwest).
Undetermined—cannot be assigned an indicator status because plant could not be identified to species.

A plus (+) modifier indicates more frequently found in wetlands, a minus (-) modifier indicates less frequently found in wetlands; however, although these modifiers are used in Reed (1988), **they are not used in the Regional Supplements.** For example, FAC–, FAC, and FAC+ plants are all considered to be FAC. An asterisk (*) was assigned if the indicator status was derived from limited ecological information

Appendix C

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Grimes Pipeline City/County: Sutter County Sampling Date: 20-Oct-10
Applicant/Owner: Calpine State: CA Sampling Point: DP-1
Investigator(s): Joel Butterworth and Kate Carpenter Section, Township, Range: Tisdale Weir Sections 4,5,8,9 T14N/R1E
Landform (hillslope, terrace, etc.): basin floor Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): Mediterranean California (LRR C) Lat: Long: Datum:
Soil Map Unit Name: Capay silty clay, wet, 0 to 2 percent slopes (#108) NWI Classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes x No
Are Vegetation x , Soil x , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No **x**	**Is the Sampled Area within a Wetland?** **Yes** **No x**
Hydric Soil Present?	Yes	No **x**	
Wetland Hydrology Present?	Yes	No **x**	

Remarks: Data point located on top of levee road between wetland drainage and rice field.

VEGETATION

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status?
1.			
2.			
3.			
4.			
Total Cover:			
Shrub Stratum (Plot size: 30 ft radius)			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (Plot size: 5 ft radius)			
1. *Convolvulus arvensis*	15%	Y	NL
2. *Conyza canadensis*	10%	Y	FAC
3. *Hordeum murinum ssp. leporinum*	10%	Y	FACU
4. *Sorghum halepense*	5	N	FACU
5. *Rumex crispus*	3	N	FACW-
6. *Avena fatua*	2	N	NL
7.			
8.			
Total Cover:	45%		
Woody Vine Stratum (Plot size: 5 ft radius)			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 55 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)
Total Number of Dominant Species Across All Strata: **3** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **33%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1 =	
FACW species		x2 =	
FAC species	**10**	x3 =	**30**
FACU species		x4 =	
UPL species		x5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
x Dominance Test is >50%
Prevalence Index is ≤3.0[1]
Morphological Adaptation[1] (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** **No x**

Remarks:

SOIL

Sampling Point: DP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR3/2	100%					c	fill material

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** x

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	___	No	x	Depth (inches): n/a
Water table Present?	Yes	___	No	x	Depth (inches): none to 20
Saturation Present? (includes capillary fringe)	Yes	___	No	x	Depth (inches): none to 20

Wetland Hydrology Present? **Yes** _____ **No** x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Grimes Pipeline City/County: Sutter County Sampling Date: 20-Oct-10
Applicant/Owner: Calpine State: CA Sampling Point: DP-2
Investigator(s): Joel Butterworth and Kate Carpenter Section, Township, Range: Tisdale Weir Sections 4,5,8,9 T14N/R1E
Landform (hillslope, terrace, etc.): basin floor Local relief (concave, convex, none): concave Slope (%): 1
Subregion (LRR): Mediterranean California (LRR C) Lat: Long: Datum:
Soil Map Unit Name: Capay silty clay, wet, 0 to 2 percent slopes (#108) NWI Classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes x No
Are Vegetation , Soil x , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x No	**Is the Sampled Area within a Wetland?**	**Yes x No**
Hydric Soil Present?	Yes x No		
Wetland Hydrology Present?	Yes x No		

Remarks: Data point located on lower bank of wetland drainage.

VEGETATION

	Absolute % Cover	Dominant Species?	Indicator Status?
Tree Stratum (Plot size: 30 ft radius)			
1.			
2.			
3.			
4.			
Total Cover:			
Shrub Stratum (Plot size: 30 ft radius)			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (Plot size: 5 ft radius)			
1. *Scirpus acutus*	60%	Y	OBL
2. *Typha latifolia*	40%	Y	OBL
3. *Sorghum halepense*	5%	N	FACU
4. *Avena fatua*	5%	N	NL
5.			
6.			
7.			
8.			
Total Cover:	110%		
Woody Vine Stratum (Plot size: 5 ft radius)			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **2** (A)
Total Number of Dominant Species Across All Strata: **2** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
x Dominance Test is >50%
Prevalence Index is ≤3.0[1]
Morphological Adaptation[1] (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes x No**

Remarks:

SOIL

Sampling Point: DP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR3/1	92%	10YR4/1	8	d	M	sic	C horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- x* Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** x **No** ___

Remarks: Native profile has been truncated, leaving C horizon exposed. * Soil also problematic because ditch is routinely dredged, which precludes the formation of redox features. Soil assumed to be hydric based on saturation within 12 inches of surface (aquic moisture regime).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No x Depth (inches): ___

Water table Present? Yes x No ___ Depth (inches): 12

Saturation Present? (includes capillary fringe) Yes x No ___ Depth (inches): 10

Wetland Hydrology Present? **Yes** x **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Grimes Pipeline City/County: Sutter County Sampling Date: 20-Oct-10
Applicant/Owner: Calpine State: CA Sampling Point: DP-3
Investigator(s): Joel Butterworth and Kate Carpenter Section, Township, Range: Tisdale Weir Sections 4,5,8,9 T14N/R1E
Landform (hillslope, terrace, etc.): basin floor Local relief (concave, convex, none): none Slope (%): 0-1
Subregion (LRR): Mediterranean California (LRR C) Lat: Long: Datum:
Soil Map Unit Name: Capay silty clay, wet, 0 to 2 percent slopes (#108) NWI Classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes x No
Are Vegetation x , Soil , or Hydrology x naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x No	**Is the Sampled Area within a Wetland?** **Yes x No**
Hydric Soil Present?	Yes x No	
Wetland Hydrology Present?	Yes x No	

Remarks: Data point located in rice field, at edge.

VEGETATION

	Absolute % Cover	Dominant Species?	Indicator Status?
Tree Stratum (Plot size: 30 ft radius)			
1.			
2.			
3.			
4.			
Total Cover:			
Shrub Stratum (Plot size: 30 ft radius)			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (Plot size: 5 ft radius)			
1. *Oryza sativa*	102%	Y	OBL
2. *Cyperus eragrostis*	1%	N	FACW
3. *Typha latifolia*	2%	N	OBL
4.			
5.			
6.			
7.			
8.			
Total Cover:	105%		
Woody Vine Stratum (Plot size: 5 ft radius)			
1.			
2.			
Total Cover:			
% Bare Ground in Herb Stratum 0	% Cover of Biotic Crust 0		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)
Total Number of Dominant Species Across All Strata: **1** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
x Dominance Test is >50%
Prevalence Index is ≤3.0[1]
Morphological Adaptation[1] (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes x No**

Remarks: Rice has been recently harvested.

SOIL

Sampling Point: DP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR3/1	96%	5YR4/4	4	c	RC	c	A1 horizon
6-20	10YR4/1	100%					c	A2 horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- x Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** x **No** ___

Remarks: Native profile.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- x Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No x	Depth (inches):	n/a	
Water table Present?	Yes ___	No x	Depth (inches):	none to 20	
Saturation Present? (includes capillary fringe)	Yes ___	No x	Depth (inches):	none to 20	

Wetland Hydrology Present? **Yes** x **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Rice field has recently been drained.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Grimes Pipeline City/County: Sutter County Sampling Date: 20-Oct-10
Applicant/Owner: Calpine State: CA Sampling Point: DP-4
Investigator(s): Joel Butterworth and Kate Carpenter Section, Township, Range: Tisdale Weir Sections 4,5,8,9 T14N/R1E
Landform (hillslope, terrace, etc.): basin floor Local relief (concave, convex, none): none Slope (%): 20
Subregion (LRR): Mediterranean California (LRR C) Lat: Long: Datum:
Soil Map Unit Name: Capay silty clay, wet, 0 to 2 percent slopes (#108) NWI Classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes x No
Are Vegetation , Soil x , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No x	**Is the Sampled Area within a Wetland?** **Yes** **No x**
Hydric Soil Present?	Yes	No x	
Wetland Hydrology Present?	Yes	No x	

Remarks: Data point located on hingepoint of levee adjacent to wetland drainage.

VEGETATION

	Absolute % Cover	Dominant Species?	Indicator Status?
Tree Stratum (Plot size: 30 ft radius)			
1.			
2.			
3.			
4.			
Total Cover:			
Shrub Stratum (Plot size: 30 ft radius)			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (Plot size: 5 ft radius)			
1. *Convolvulus arvensis*	10%	Y	NL
2. *Lolium multiflorum*	30%	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	40%		
Woody Vine Stratum (Plot size: 5 ft radius)			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 60 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)
Total Number of Dominant Species Across All Strata: **2** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **50%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
Dominance Test is >50%
Prevalence Index is ≤3.0[1]
Morphological Adaptation[1] (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** **No x**

Remarks: Lolium is dead at this time of the year.

SOIL

Sampling Point: DP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-17	10YR3/1	100%					sicl	fill material

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** x

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	___	No	x	Depth (inches): n/a
Water table Present?	Yes	___	No	x	Depth (inches): none to 17
Saturation Present? (includes capillary fringe)	Yes	___	No	x	Depth (inches): none to 17

Wetland Hydrology Present? **Yes** _____ **No** x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Grimes Pipeline City/County: Sutter County Sampling Date: 20-Oct-10
Applicant/Owner: Calpine State: CA Sampling Point: DP-5
Investigator(s): Joel Butterworth and Kate Carpenter Section, Township, Range: Tisdale Weir Sections 4,5,8,9 T14N/R1E
Landform (hillslope, terrace, etc.): basin floor Local relief (concave, convex, none): concave Slope (%): 50
Subregion (LRR): Mediterranean California (LRR C) Lat: Long: Datum:
Soil Map Unit Name: Capay silty clay, wet, 0 to 2 percent slopes (#108) NWI Classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes x No
Are Vegetation x , Soil , or Hydrology x naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x No	**Is the Sampled Area within a Wetland?**	**Yes x No**
Hydric Soil Present?	Yes x No		
Wetland Hydrology Present?	Yes x No		

Remarks: Data point located within OHWM of wetland drainage (WD-6).

VEGETATION

	Absolute % Cover	Dominant Species?	Indicator Status?
Tree Stratum (Plot size: 30 ft radius)			
1.			
2.			
3.			
4.			
Total Cover:			
Shrub Stratum (Plot size: 30 ft radius)			
1.	50	Y	OBL
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (Plot size: 5 ft radius)			
1. *Typha latifolia*	65%	Y	OBL
2. *Conyza canadensis*	5%	N	FAC
3. *Polypogon monspeliensus*	15%	Y	FACW
4. *Azola filiculoides*	20%	Y	OBL
5. *Polygonum amphibium*	15	Y	OBL
6.			
7.			
8.			
Total Cover:	120%		
Woody Vine Stratum (Plot size: 5 ft radius)			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **4** (A)
Total Number of Dominant Species Across All Strata: **4** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
x Dominance Test is >50%
Prevalence Index is ≤3.0[1]
Morphological Adaptation[1] (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes x No**

Remarks:

SOIL

Sampling Point: DP-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR4/1	100%					sicl	C horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- x Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** x **No** ___

Remarks: Profile has been truncated, leaving C horizon exposed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- x Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	___	No	x	Depth (inches): n/a
Water table Present?	Yes	x	No	___	Depth (inches): 12
Saturation Present? (includes capillary fringe)	Yes	x	No	___	Depth (inches): 9

Wetland Hydrology Present? **Yes** x **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Grimes Pipeline City/County: Sutter County Sampling Date: 20-Oct-10
Applicant/Owner: Calpine State: CA Sampling Point: DP-6
Investigator(s): Joel Butterworth and Kate Carpenter Section, Township, Range: Tisdale Weir Sections 4,5,8,9 T14N/R1E
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): Mediterranean California (LRR C) Lat: Long: Datum:
Soil Map Unit Name: Shanghai silty clay loam, 0 to 2 percent slopes (#167) NWI Classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes x No
Are Vegetation x , Soil x , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No **x**	**Is the Sampled Area within a Wetland?** **Yes** **No x**
Hydric Soil Present?	Yes	No **x**	
Wetland Hydrology Present?	Yes	No **x**	

Remarks: Data point located on top of levee between WD-9 and corn field.

VEGETATION

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status?
1.			
2.			
3.			
4.			
Total Cover:			
Shrub Stratum (Plot size: 30 ft radius)			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (Plot size: 5 ft radius)			
1. *Avena fatua*	15%	Y	NL
2. *Phalaris paradoxa*	70%	Y	NL
3. *Hordeum marinum ssp. gussoneanum*	5%	N	FAC
4. *Sorghum halepense*	5	N	FACU
5.			
6.			
7.			
8.			
Total Cover:	95%		
Woody Vine Stratum (Plot size: 5 ft radius)			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)
Total Number of Dominant Species Across All Strata: **2** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **0%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
Dominance Test is >50%
Prevalence Index is ≤3.0[1]
Morphological Adaptation[1] (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** **No x**

Remarks:

SOIL

Sampling Point: DP-6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-17	10YR3/2	100%					sicl	fill material

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** x

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	___	No	x	Depth (inches): n/a
Water table Present?	Yes	___	No	x	Depth (inches): none to 17
Saturation Present? (includes capillary fringe)	Yes	___	No	x	Depth (inches): none to 17

Wetland Hydrology Present? **Yes** _____ **No** x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Grimes Pipeline City/County: Sutter County Sampling Date: 20-Oct-10
Applicant/Owner: Calpine State: CA Sampling Point: DP-7
Investigator(s): Joel Butterworth and Kate Carpenter Section, Township, Range: Tisdale Weir Sections 4,5,8,9 T14N/R1E
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-1
Subregion (LRR): Mediterranean California (LRR C) Lat: Long: Datum:
Soil Map Unit Name: Shanghai silty clay, 0 to 2 percent slopes (#167) NWI Classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes x No
Are Vegetation x , Soil , or Hydrology x naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x No	**Is the Sampled Area within a Wetland?**	**Yes x No**
Hydric Soil Present?	Yes x No		
Wetland Hydrology Present?	Yes x No		

Remarks: Data point located within OHWM of wetland drainage (WD-9) between levee and falow corn field.

VEGETATION

	Absolute % Cover	Dominant Species?	Indicator Status?
Tree Stratum (Plot size: 30 ft radius)			
1.			
2.			
3.			
4.			
Total Cover:			
Shrub Stratum (Plot size: 30 ft radius)			
1. *Salix exigua*	50	Y	OBL
2.			
3.			
4.			
5.			
Total Cover:	50		
Herb Stratum (Plot size: 5 ft radius)			
1. *Typha latifolia*	60%	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	60%		
Woody Vine Stratum (Plot size: 5 ft radius)			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **2** (A)
Total Number of Dominant Species Across All Strata: **2** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
x Dominance Test is >50%
Prevalence Index is ≤3.0[1]
Morphological Adaptation[1] (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes x No**

Remarks:

SOIL

Sampling Point: DP-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-21	10YR4/1	100%					sic	C horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- x Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** x **No** ___

Remarks: Profile has been truncated, leaving C horizon exposed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- x Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No x	Depth (inches):	n/a	
Water table Present?	Yes x	No ___	Depth (inches):	11	
Saturation Present? (includes capillary fringe)	Yes x	No ___	Depth (inches):	9	

Wetland Hydrology Present? **Yes** x **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Grimes Pipeline City/County: Sutter County Sampling Date: 20-Oct-10
Applicant/Owner: Calpine State: CA Sampling Point: DP-8
Investigator(s): Joel Butterworth and Kate Carpenter Section, Township, Range: Tisdale Weir Sections 4,5,8,9 T14N/R1E
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0-1
Subregion (LRR): Mediterranean California (LRR C) Lat: Long: Datum:
Soil Map Unit Name: Shanghai silty clay, 0 to 2 percent slopes (#167) NWI Classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes x No
Are Vegetation x , Soil , or Hydrology x naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x No	**Is the Sampled Area within a Wetland?**	**Yes x No**
Hydric Soil Present?	Yes x No		
Wetland Hydrology Present?	Yes x No		

Remarks: Data point located in rice field, which has been harvested. Straw has been cut and harvested. Field then tilled.

VEGETATION

	Absolute % Cover	Dominant Species?	Indicator Status?
Tree Stratum (Plot size: 30 ft radius)			
1.			
2.			
3.			
4.			
Total Cover:			
Shrub Stratum (Plot size: 30 ft radius)			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (Plot size: 5 ft radius)			
1. *Oryza sativa*	40%	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	40%		
Woody Vine Stratum (Plot size: 5 ft radius)			
1.			
2.			
Total Cover:			
% Bare Ground in Herb Stratum 60	% Cover of Biotic Crust 0		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)
Total Number of Dominant Species Across All Strata: **1** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)
Prevalence Index = B/A =	

Hydrophytic Vegetation Indicators:
x Dominance Test is >50%
Prevalence Index is ≤3.0[1]
Morphological Adaptation[1] (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes x No**

Remarks: Rice stubble and detritus.

SOIL

Sampling Point: DP-8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR3/2	94%	7.5YR4/4	6	c	RC	c	A1 horizon
5-20	10YR3/1	100%					c	A2 horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- x Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** x **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- x Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	___	No	x	Depth (inches): n/a
Water table Present?	Yes	___	No	x	Depth (inches): none to 19
Saturation Present? (includes capillary fringe)	Yes	___	No	x	Depth (inches): none to 19

Wetland Hydrology Present? **Yes** x **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Grimes Pipeline City/County: Sutter County Sampling Date: 20-Oct-10
Applicant/Owner: Calpine State: CA Sampling Point: DP-9
Investigator(s): Joel Butterworth and Kate Carpenter Section, Township, Range: Tisdale Weir Sections 4,5,8,9 T14N/R1E
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 40
Subregion (LRR): Mediterranean California (LRR C) Lat: Long: Datum:
Soil Map Unit Name: Shanghai silty clay loam, 0 to 2 percent slopes (#167) NWI Classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes x No
Are Vegetation x , Soil x , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No **x**	**Is the Sampled Area within a Wetland?** **Yes** **No x**
Hydric Soil Present?	Yes	No **x**	
Wetland Hydrology Present?	Yes	No **x**	

Remarks: Data point located on sideslope of levee adjacent to rice field.

VEGETATION

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status?
1.			
2.			
3.			
4.			
Total Cover:			
Shrub Stratum (Plot size: 30 ft radius)			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (Plot size: 5 ft radius)			
1. *Sorghum halepense*	40%	Y	NL
2. *Convolvulus arvensis*	15%	Y	FACU
3. *Conyza candensis*	3%	N	FAC
4. *Cynodon dactylon*	2	N	FAC
5.			
6.			
7.			
8.			
Total Cover:	60%		
Woody Vine Stratum (Plot size: 5 ft radius)			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: **0** (A)
Total Number of Dominant Species Across All Strata: **2** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **0%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
Dominance Test is >50%
Prevalence Index is ≤3.0[1]
Morphological Adaptation[1] (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** **No x**

Remarks:

SOIL

Sampling Point: DP-9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-13	10YR3/2	100%					sic	fill material
13-16	10YR4/2	100%					sicl	fill material

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **x**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Plowed Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No x Depth (inches): n/a
Water table Present? Yes _____ No x Depth (inches): none to 16
Saturation Present? (includes capillary fringe) Yes _____ No x Depth (inches): none to 16

Wetland Hydrology Present? **Yes** _____ **No** **x**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix D

Representative Photographs of the Delineation Area

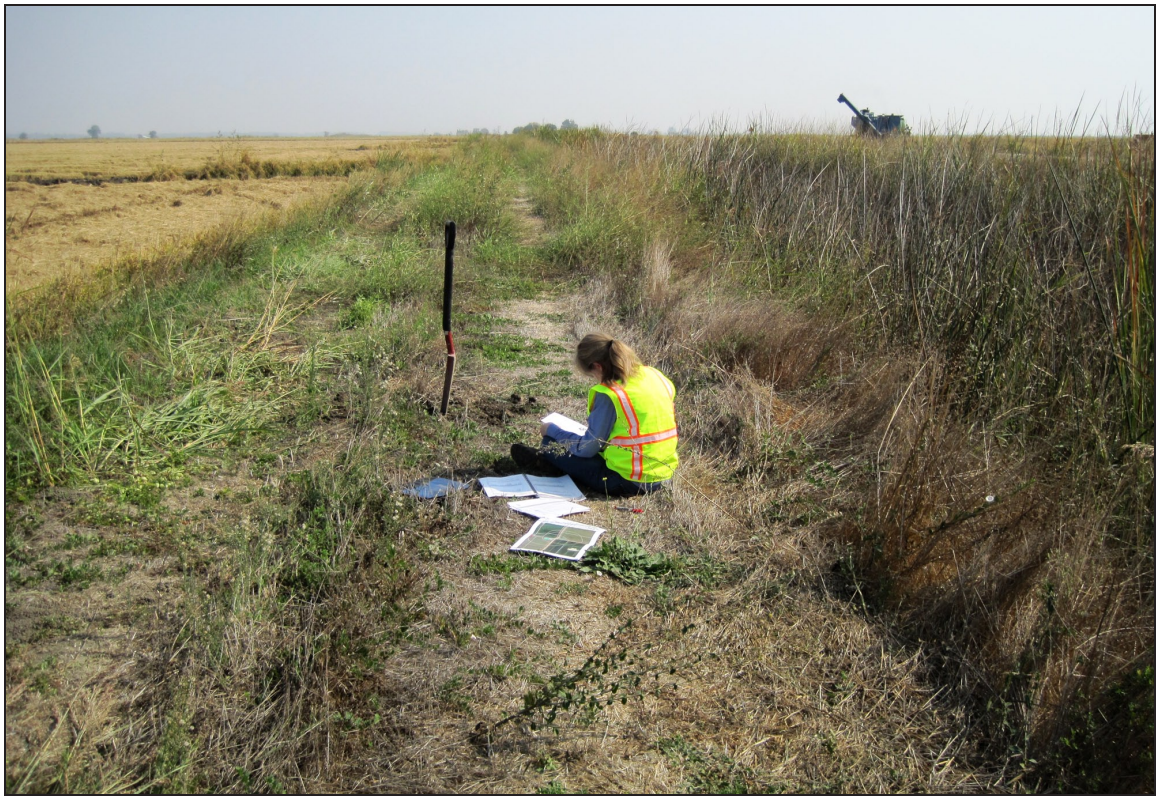


Photo 1. View of wetland drainage (at right) along Moroni Road, looking east. Sharpshooter is at Data Point 1. Rice field wetland is to left.

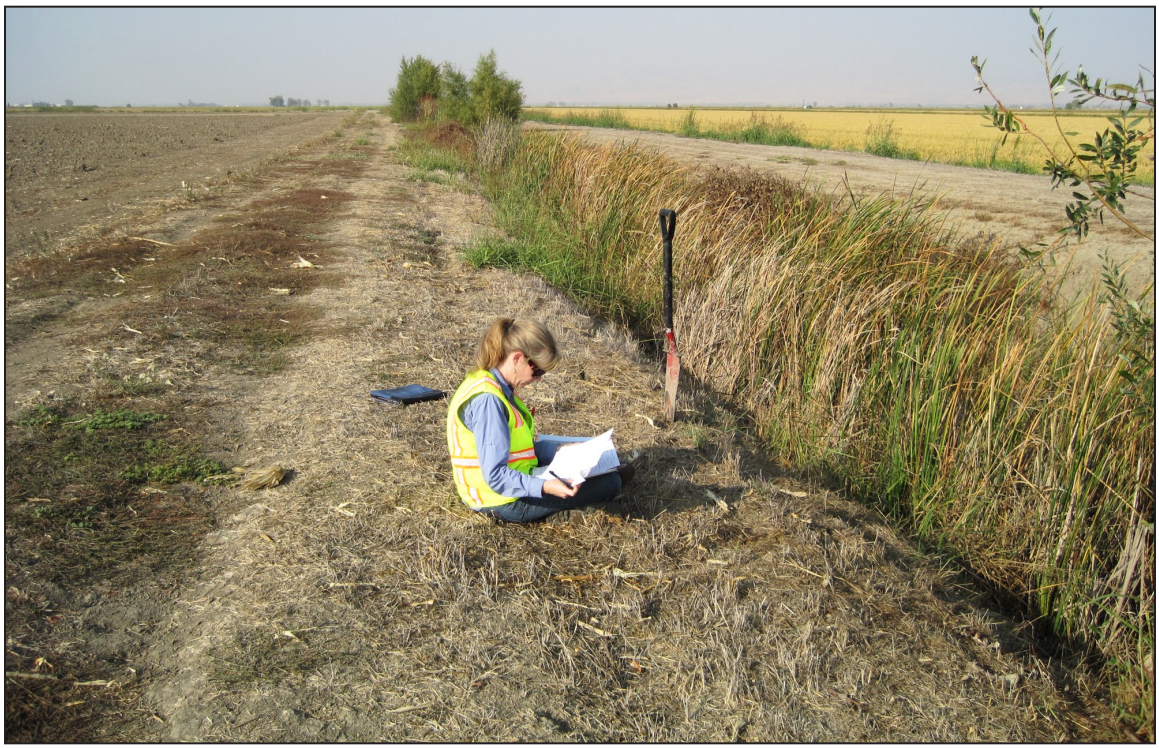


Photo 2. View of wetland drainage (at right), looking north. Sharpshooter is at Data Point 6, on low levee. Fallow corn field is to left.

Photo 3. View of other waters drainage (irrigation canal), looking east.

Photo 4. View of other waters drainage (drainage ditch) along Moroni Road, looking west.

Photo 5. View of other waters drainage south of Moroni Road, looking south.

Photo 6. View of wetland drainage, looking west, at site of Data Point 5.

Photo 7. View of Proposed Grimes Station Site. Photo is looking southward at disked agricultural field and riparian drainage (RD-10).

Exhibit A

Preliminary Delineation of Wetlands and Other Waters of the US, Including Wetlands

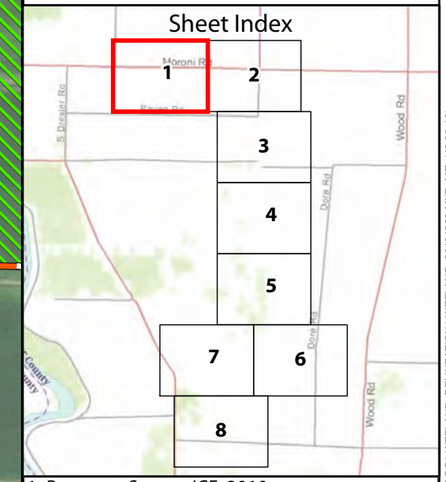
Exhibit A
Preliminary Delineation of Waters of the US, Including Wetlands
Grimes Pipeline Project
December 2010
Sheet 1 of 8

Project Totals	Acres
Other Waters Drainage	8.197
Riparian Drainage	0.342
Wetland Drainage	2.569
Rice Field Wetland	281.017
Total	292.125

Legend
- Delineation Area (395.88 Acres)
- Data Point
- Culvert

Key
OWD = Other Water Drainage
RD = Riparian Drainage
WD = Wetland Drainage
RFW = Rice Field Wetland

Sheet Index



1. Base map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Grimes
4. PLSS: T. 15 N, R. 1 E

Delineated By:	Nov 2010
K. Carpenter, J. Butterworth	
Drawn By: Matt Ewalt	Dec 2010

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE\60776_10_GRIMES\MAPDOC\WETLAND_DELINEATION\WETLAND_20101202.MXD ME (12-03-10)

Exhibit A
Preliminary Delineation of Waters of the US, Including Wetlands
Grimes Pipeline Project
December 2010
Sheet 1 of 8

Project Totals	Acres
Other Waters Drainage	8.197
Riparian Drainage	0.342
Wetland Drainage	2.569
Rice Field Wetland	281.017
Total	292.125

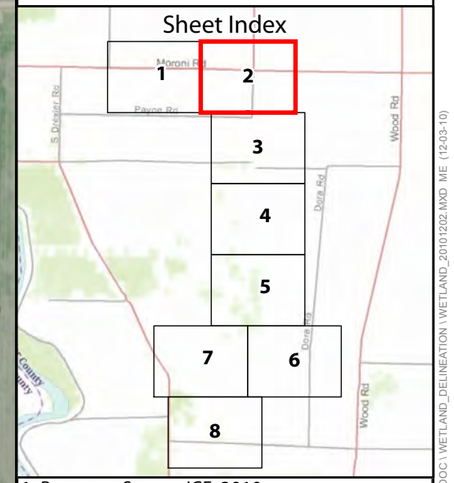
Legend

- Delineation Area (395.88 Acres)
- Data Point
- Culvert

Key

OWD = Other Water Drainage
RD = Riparian Drainage
WD = Wetland Drainage
RFW = Rice Field Wetland

Sheet Index



1. Base map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Grimes
4. PLSS: T. 15 N, R. 1 E

Delineated By: K. Carpenter, J. Butterworth	Nov 2010
Drawn By: Matt Ewalt	Dec 2010

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE\100776_10_GRIMES\MAPDOC\WETLAND_DELINEATION\WETLAND_20101202.MXD ME (12-03-10)

121°52'30"W
121°52'20"W
121°52'10"W
39°6'30"N
39°6'20"N

RFW-17
Acres=12.28

RFW-19
Acres=13.491

RFW-20
Acres=0.093

OWD-34
x̄=30'
Acres = 0.561

See Appendix C for Wetland Delineation Data forms for each data point

RFW-20
Acres=7.133

WD-29
x̄=2'
Acres = 0.009

DP3
DP 1
DP 2

Moroni Rd

WD-04
x̄=8'
Acres = 0.121

RFW-18
Acres=32.648

RFW-21
Acres=32.415

Hageman Rd

OWD-33
x̄=20'
Acres = 1.77

N

0 50 100 200
Feet

1 inch = 200 feet

121°52'30"W 121°52'20"W 121°52'10"W 121°52'0"W

39°6'10"N

39°6'0"N

Payne Rd

RFW-18
Acres=32.648

OWD-35
x̄=32'
Acres = 0.775

RFW-22
Acres=11.498

RFW-21
Acres=32.415

WD-05
x̄=33'
Acres = 1.075

OWD-36
x̄=20'
Acres = 2.254

RFW-24
Acres=28.082

RFW-23
Acres=25.01

N

0 50 100 200
Feet

1 inch = 200 feet

Exhibit A
Preliminary Delineation of Waters of the US, Including Wetlands
Grimes Pipeline Project
December 2010
Sheet 3 of 8

Project Totals	Acres
Other Waters Drainage	8.197
Riparian Drainage	0.342
Wetland Drainage	2.569
Rice Field Wetland	281.017
Total	292.125

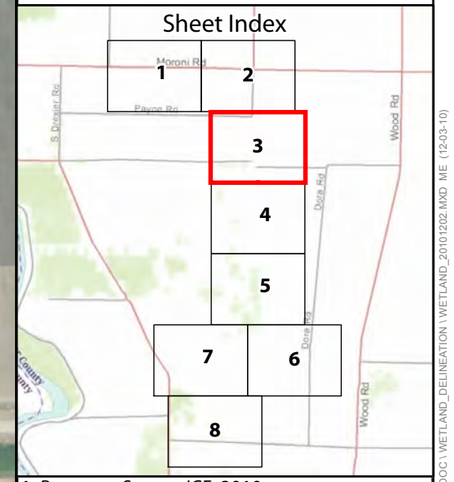
Legend

- Delineation Area (395.88 Acres)
- Data Point
- Culvert

Key

OWD = Other Water Drainage
RD = Riparian Drainage
WD = Wetland Drainage
RFW = Rice Field Wetland

Sheet Index



1. Base map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Tisdale Weir
4. PLSS: T. 14, R. 1 E & T. 15, R. 1 E

Delineated By:	Nov 2010
K. Carpenter, J. Butterworth	
Drawn By: Matt Ewalt	Dec 2010

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE\100776_10_GRIMES\MAPDOC\WETLAND_DELINEATION\WETLAND_20101202.MXD ME (12-03-10)

121°52'30"W
121°52'20"W
121°52'10"W
121°52'0"W
39°5'50"N
39°5'40"N

OWD-36
x̄=20'
Acres = 2.254

RFW-23
Acres=25.01

RFW-24
Acres=28.082

See Appendix C for Wetland Delineation Data forms for each data point

RFW-26
Acres=37.718

WD-06
x̄=16'
Acres = 0.166

DP 4

DP 5

N

0 50 100 200
Feet

1 inch = 200 feet

Exhibit A
Preliminary Delineation of Waters of the US, Including Wetlands
Grimes Pipeline Project
December 2010
Sheet 4 of 8

Project Totals	Acres
Other Waters Drainage	8.197
Riparian Drainage	0.342
Wetland Drainage	2.569
Rice Field Wetland	281.017
Total	292.125

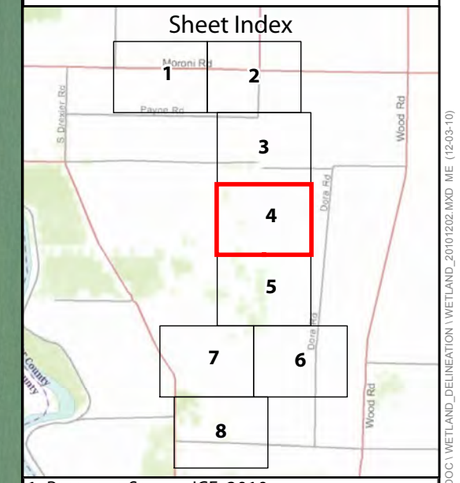
Legend

Delineation Area (395.88 Acres)
Data Point
Culvert

Key

OWD = Other Water Drainage
RD = Riparian Drainage
WD = Wetland Drainage
RFW = Rice Field Wetland

Sheet Index



1. Base map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Tisdale Weir
4. PLSS: T. 14, R. 1 E

Delineated By:	Nov 2010
K. Carpenter, J. Butterworth	
Drawn By: Matt Ewalt	Dec 2010

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE\100776_10_GRIMES\MAPDOC\WETLAND_DELINEATION\WETLAND_20101202.MXD ME (12-03-10)

121°52'30"W
121°52'20"W
121°52'10"W
121°52'0"W
39°5'30"N
39°5'20"N

WD-07
x̄=10'
Acres = 0.123

OWD-37
x̄=8'
Acres = 0.486

RFW-26
Acres=37.718

OWD-36
x̄=20'
Acres = 2.254

RFW-25
Acres=31.487

N

0 50 100 200
Feet
1 inch = 200 feet

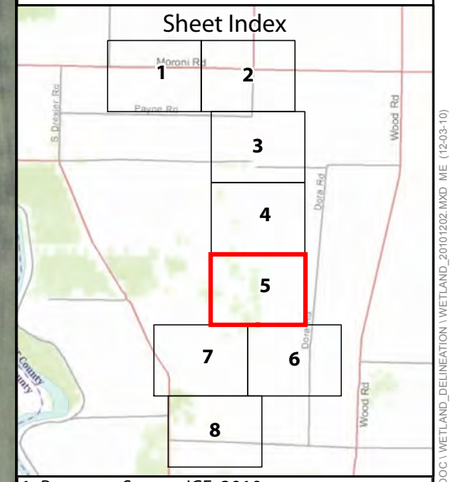
Exhibit A
Preliminary Delineation of Waters of the US, Including Wetlands
Grimes Pipeline Project
December 2010
Sheet 5 of 8

Project Totals	Acres
Other Waters Drainage	8.197
Riparian Drainage	0.342
Wetland Drainage	2.569
Rice Field Wetland	281.017
Total	292.125

Legend
- Delineation Area (395.88 Acres)
- Data Point
- Culvert

Key
OWD = Other Water Drainage
RD = Riparian Drainage
WD = Wetland Drainage
RFW = Rice Field Wetland

Sheet Index



1. Base map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Tisdale Weir
4. PLSS: T. 14, R. 1 E

Delineated By:	Nov 2010
K. Carpenter, J. Butterworth	
Drawn By: Matt Ewalt	Dec 2010

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE\100776_10_GRIMES\MAPDOC\WETLAND_DELINEATION\WETLAND_20101202.MXD ME (12-03-10)

Exhibit A
Preliminary Delineation of Waters of the US, Including Wetlands
Grimes Pipeline Project
December 2010
Sheet 6 of 8

Project Totals	Acres
Other Waters Drainage	8.197
Riparian Drainage	0.342
Wetland Drainage	2.569
Rice Field Wetland	281.017
Total	292.125

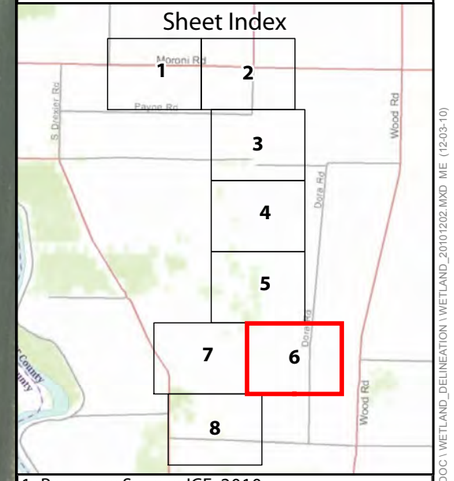
Legend

- Delineation Area (395.88 Acres)
- Data Point
- Culvert

Key

OWD = Other Water Drainage
RD = Riparian Drainage
WD = Wetland Drainage
RFW = Rice Field Wetland

Sheet Index



1. Base map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Tisdale Weir
4. PLSS: T. 14, R. 1 E

Delineated By: K. Carpenter, J. Butterworth	Nov 2010
Drawn By: Matt Ewalt	Dec 2010

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE\100776_10_GRIMES\MAPDOC\WETLAND_DELINEATION\WETLAND_20101202.MXD ME (12-03-10)

121°52'50"W
121°52'40"W
121°52'30"W
121°52'20"W
39°5'10"N
39°5'0"N

WD-09
x̄=14'
Acres = 0.376

RFW-26
Acres=37.718

See Appendix C for Wetland Delineation Data forms for each data point

DP 7
DP 6

OWD-39
x̄=14'
Acres = 0.269

S. Meridian Rd

RFW-28
Acres=27.793

OWD-38
x̄=14'
Acres = 1.435

N
0 50 100 200
Feet
1 inch = 200 feet

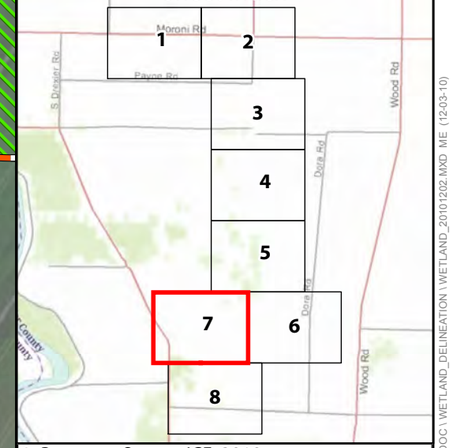
Exhibit A
Preliminary Delineation of Waters of the US, Including Wetlands
Grimes Pipeline Project
December 2010
Sheet 7 of 8

Project Totals	Acres
Other Waters Drainage	8.197
Riparian Drainage	0.342
Wetland Drainage	2.569
Rice Field Wetland	281.017
Total	292.125

Legend
- Delineation Area (395.88 Acres)
- Data Point
- Culvert

Key
OWD = Other Water Drainage
RD = Riparian Drainage
WD = Wetland Drainage
RFW = Rice Field Wetland

Sheet Index



1. Base map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Grimes & Tisdale Weir
4. PLSS: T. 14, R. 1 E

Delineated By:	Nov 2010
K. Carpenter, J. Butterworth	
Drawn By: Matt Ewalt	Dec 2010

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE\100776_10_GRIMES\MAPDOC\WETLAND_DELINEATION\WETLAND_20101202.MXD ME (12-03-10)

121°52'40"W 121°52'30"W 121°52'20"W

39°4'50"N

39°4'40"N

S. Meridian Rd

OWD-38
x̄=14'
Acres = 1.435

OWD-40
x̄=14'
Acres = 0.2

RD-10
x̄=6'
Acres = 0.08

RD-10
x̄=8'
Acres = 0.262

RFW-28
Acres=27.793

See Appendix C for Wetland Delineation Data forms for each data point

DP 8

DP 9

WD-12
x̄=3'
Acres = 0.034

WD-12
x̄=8'
Acres = 0.072

Girdner Rd

WD-13
x̄=8'
Acres = 0.061

OWD-41
x̄=14'
Acres = 0.14

WD-11
x̄=8'
Acres = 0.086

N

0 50 100 200
Feet

1 inch = 200 feet

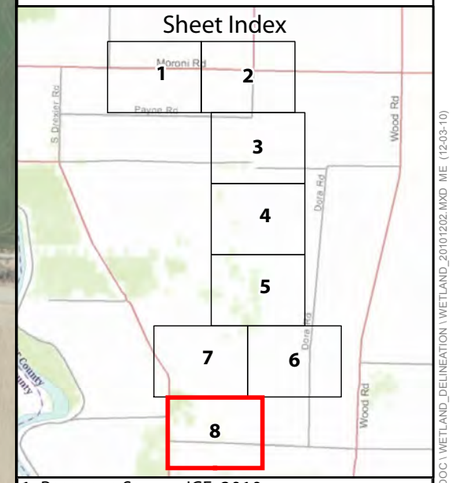
Exhibit A
Preliminary Delineation of Waters of the US, Including Wetlands
Grimes Pipeline Project
December 2010
Sheet 8 of 8

Project Totals	Acres
Other Waters Drainage	8.197
Riparian Drainage	0.342
Wetland Drainage	2.569
Rice Field Wetland	281.017
Total	292.125

Legend
- Delineation Area (395.88 Acres)
- Data Point
- Culvert

Key
OWD = Other Water Drainage
RD = Riparian Drainage
WD = Wetland Drainage
RFW = Rice Field Wetland

Sheet Index



1. Base map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Grimes & Tisdale Weir
4. PLSS: T. 14, R. 1 E

Delineated By:	Nov 2010
K. Carpenter, J. Butterworth	
Drawn By: Matt Ewalt	Dec 2010

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE\100776_10_GRIMES\MAPDOC\WETLAND_DELINEATION\WETLAND_20101202.MXD ME (12-03-10)

Appendix G

Cultural Resources Inventory Report

CULTURAL RESOURCES INVENTORY REPORT FOR THE GRIMES PIPELINE PROJECT, SUTTER COUNTY, CALIFORNIA

PREPARED FOR:

Calpine Construction Finance Company, L.P.
4160 Dublin Boulevard
Contact: Ms. Barbara McBride, Western Regional Director, Environmental Health and Safety
Work Phone: 925.557.2238
Cell Phone: 925.570.0849
Email: Barbara.McBride@Calpine.com
and
CPN Pipeline Company
60 River Road
Rio Vista, CA 94571
Contact: Chris Delaney, Engineering Manager
707.374.1516

PREPARED BY:

ICF International
630 K Street, Suite 400
Sacramento, CA 95814
Contact: Gabriel Roark
916.737.3000

February 2011

ICF INTERNATIONAL

ICF International. 2011. *Cultural Resources Inventory Report for the Grimes Pipeline Project, Sutter County, California*. February. (ICF 00776.10.) Sacramento, CA. Prepared for Calpine Construction Finance Company, L.P. and CPN Pipeline Company.

Contents

Figures

Acronyms and Abbreviations

ac	acre
APE	area of potential effects
B.P.	
CCFC	Calpine Construction Finance Company, L.P.
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHRIS	California Historical Resources Information System
cm	centimeters
USACE	U.S. Army Corps of Engineers
ha	hectare
HDD	horizontal directional drilling
ICF	ICF International
km	kilometers
m	meters
MOA	memorandum of agreement
NAHC	Native American Heritage Commission
NEIC	Northeast Information Center
NRHP	National Register of Historic Places
ROW	right-of-way
Section 106	Section 106 of the National Historic Preservation Act
SHPO	State Historic Preservation Officer

Chapter 1
Introduction

ICF International (ICF) was retained by Calpine Construction Finance Company, L.P. (CCFC) and CPN Pipeline Company, both wholly owned subsidiaries of Calpine Corporation, to conduct cultural resource surveys and prepare a technical report to support the Grimes Pipeline Project. This report documents the status of cultural resource studies and known cultural resources located in Grimes Pipeline Project area of potential effects (APE) in Sutter County (Figure 1). The purpose of this report is to provide the U.S. Army Corps of Engineers (USACE) with information necessary to consult with the California State Historic Preservation Officer (SHPO) under Section 106 of the National Historic Preservation Act (Section 106) and its implementing regulations, 36 Code of Federal Regulations (CFR) 800. The report is also prepared to support the California Energy Commission's (CEC's) preparation of the California Environmental Quality Act (CEQA) compliance document; therefore, cultural resources are evaluated according to the significance criteria of CEQA in addition to those of the National Register of Historic Places (NRHP).

The cultural resources inventory documented in this report consisted of a records search and literature review, correspondence with the Native American Heritage Commission (NAHC) and historical societies, and a pedestrian survey of the APE.

No cultural resources were identified in the APE as a result of these efforts.

Regulatory Context

Section 106 of the National Historic Preservation Act

Because the proposed project requires a permit from the USACE, the proposed project is considered a federal undertaking and the USACE is the lead federal agency. Pursuant to federal regulations, prior to the approval of any federal undertaking, federal agencies must comply with Section 106 of the National Historic Preservation Act of 1966 (16 United States Code 470), as amended, and its implementing regulations, 36 CFR 800. Section 106 requires that before beginning any undertaking, a federal agency must take into account the effects of the undertaking on historic properties and afford the Advisory Council on Historic Preservation an opportunity to comment on proposed actions. The Section 106 process has five basic steps.

1. Initiate the Section 106 process.
2. Identify and evaluate historic properties.
3. Assess effects of the project on historic properties within the APE.
4. If historic properties are subject to adverse effects, the USACE, SHPO, and any other consulting parties (including Indian tribes) continue consultation to seek ways to avoid, minimize, or mitigate the adverse effect. A memorandum of agreement (MOA) is usually developed to document the measures agreed upon to resolve the adverse effects.
5. Proceed in accordance with the terms of the MOA.

Specific regulations regarding compliance with Section 106 state that although the tasks necessary to comply with Section 106 may be delegated to others, the federal agency (in this case, the USACE) is ultimately responsible for ensuring that the Section 106 process is completed according to statute (36 CFR 800.2[a]).

California Environmental Quality Act

CEQA requires that public agencies (in this case, the CEC) that finance or approve public or private projects must assess the impacts of the project on cultural resources. CEQA requires that alternative plans or mitigation measures be considered if a project would result in significant impacts on important cultural resources. CEQA requires that significant impacts on cultural resources be addressed. The steps that normally are taken in a cultural resources investigation for CEQA compliance are listed below.

1. Identify cultural resources.
2. Evaluate the significance of resources.
3. Evaluate the potential impacts of a project on these resources.
4. Develop and implement measures as and if necessary to mitigate the impacts of the project only on significant resources, namely historical resources and unique archaeological resources.

Description of the Undertaking

Project Location and Setting

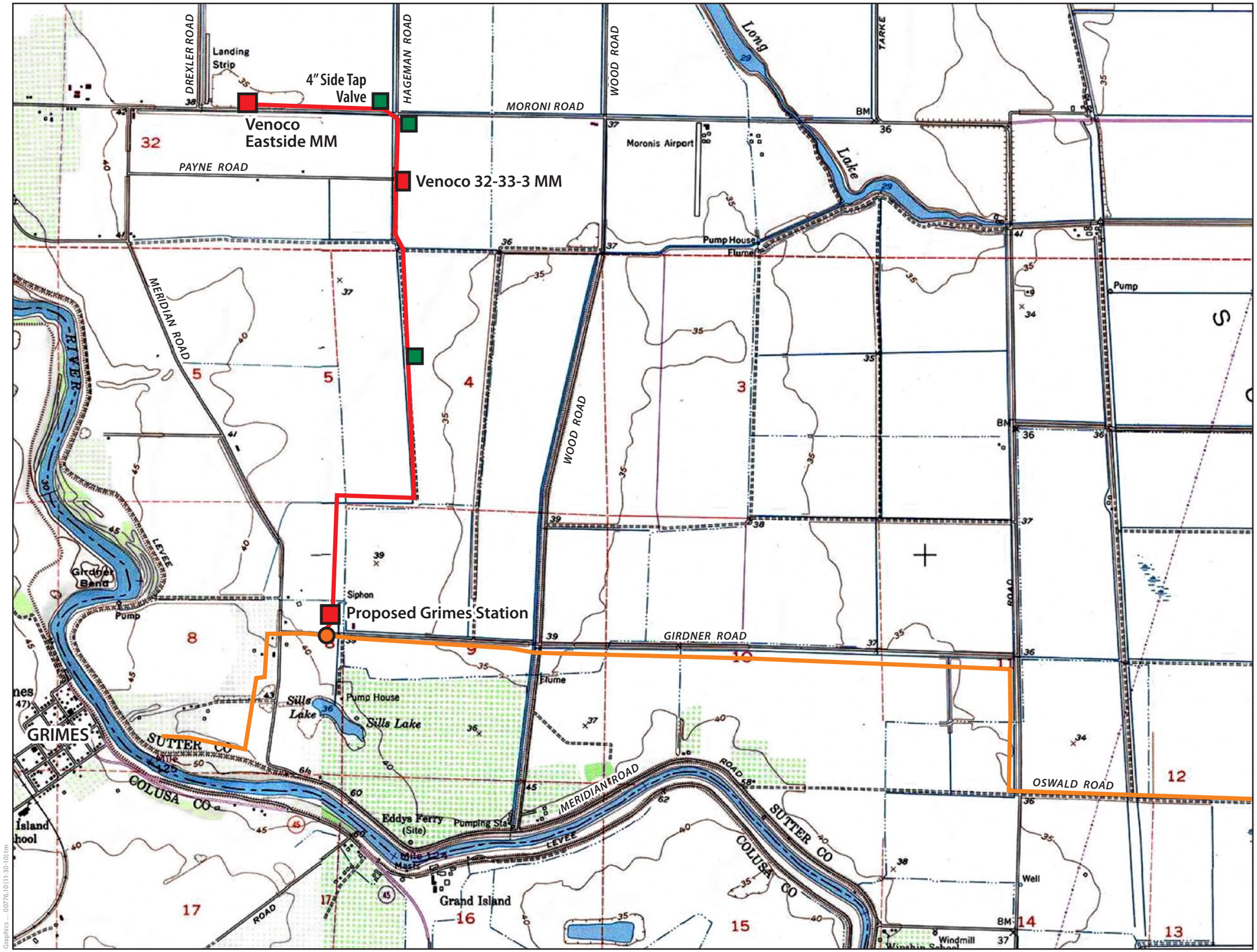
Sited on agricultural land in Sutter County, California, the proposed undertaking would be located east of the Sacramento River, approximately 1.6 kilometers (km) (1 mile) east of Grimes, and just north of Sills Lake. The proposed natural gas pipeline alignment would extend approximately 3.2 km (2 miles) north of Sills Lake and approximately 1.2 km (0.75 miles) west on Moroni Road, terminating west of the intersection of Moroni and Drexler Roads. The legal location is Township 14 North, Range 1 East, sections 4, 5, 8 and 9; Township 1 North Range 1 East, sections 32 and 33, Mt. Diablo Baseline and Meridian (Figures 1 and 2).

The APE is in agricultural lands consisting predominantly of rice fields with widely scattered rural residences and agricultural operations. The southwestern part of the APE area was used in 2010 for corn and beans, and a small fig orchard occupies the southeastern corner. The APE has been farmed for many decades and is used for recreational waterfowl and deer hunting during the fall and winter months.

The proposed gas pipeline alignment parallels or crosses 25 irrigation ditches. The ditches appear to drain generally to the south.

Project Description

CCFC and CPN Pipeline Company are proposing to construct the Grimes Pipeline Project to provide a connection between gas wells owned and operated by Venoco and other gas producers in the Grimes natural gas field and CCFC's existing Sutter Energy Center natural gas pipeline system (Figure 1). The proposed project includes the following components.



Legend

- Proposed 6-inch Natural Gas Pipeline
- Existing 20-inch Sutter Energy Center Gas Pipeline
- Below Ground Hot Tap and Valve
- Proposed Construction Laydown Area
- Venoco's Existing Master Meter Sites and Proposed Grimes Station Site

N

1,000 0 1,000 2,000 3,000 4,000

feet

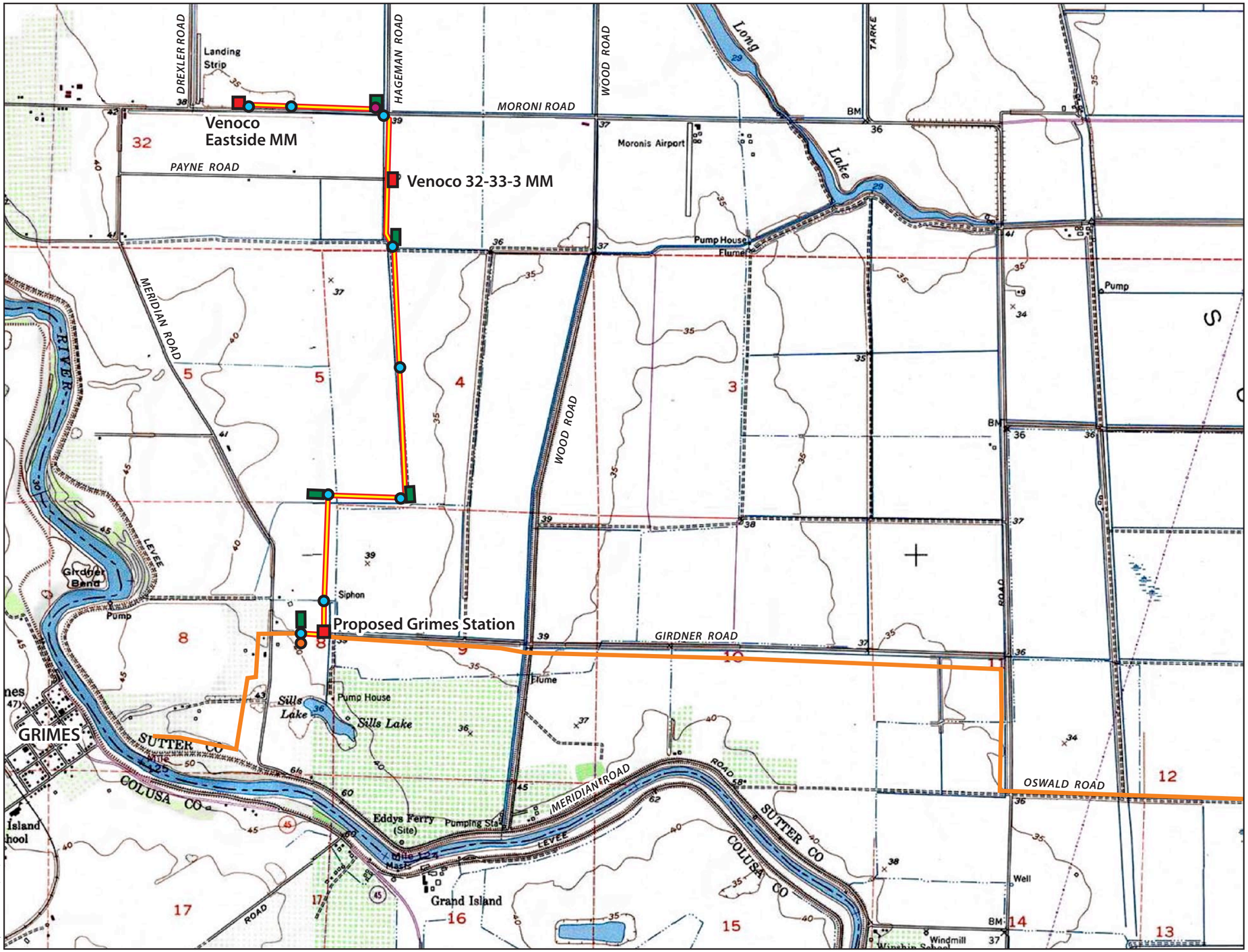
Scale = 1:24,000

Base Map:
National Geographic TOPO
Gilsizer Slough, CA (1973), Tilsdale Weir, CA (1973)

Graphics... 0077610 (11-30-10).cnm

ICF INTERNATIONAL

Figure 1
Grimes Pipeline Project Location



Legend

- Area Surveyed
- Existing 20-inch Sutter Energy Center Gas Pipeline
- Natural Gas Pipeline Alignmen t
- Below Ground Hot Tap and Valve
- Proposed Construction Laydown Area
- Venoco's Existing Master Meter Sites and Proposed Grimes Station Site
- 4" Side Tap Valve
- Bore

N

1,000 0 1,000 2,000 3,000 4,000

feet

Scale = 1:24,000

Base Map:
National Geographic TOPO
Gilsizer Slough, CA (1973), Tilsdale Weir, CA (1973)

Graphics... 0076.10 (12-10).ai

ICF INTERNATIONAL

Figure 2
Survey Coverage Map

- A 4.5-km (2.8-mile) gas pipeline and a 122-m (400-ft) gas pipeline, each 15 centimeters (cm) (6 inches) in diameter.
- A 0.2-hectare (ha) (0.5-acre [ac]) gas metering facility (referred to in this report as *Grimes Station*), as shown in Figure 3.
- Two new gas meters, one at Venoco's existing Eastside master meter site and another at its 32-33-3 master meter site.
- A below ground connection between the Grimes Pipeline and the existing Sutter Pipeline.

Once constructed, the proposed pipeline would transport approximately 10 million standard cubic feet per day[1] of natural gas from Venoco's and other producers' existing wells through the Sutter Energy Center pipeline system to the Sutter Energy Center.

The 4.5-km (2.8-mile) pipeline and 122-m (400-ft) pipeline and Grimes Station will be owned and operated by CPN Pipeline Company. Venoco will continue to operate its existing Eastside master meter and 32-33-3 master meter sites. The lands occupied by the project facilities are under lease from the property owners through lease agreements. The leases would remain in effect until CPN Pipeline Company chooses to surrender them to the landowners.

Project Components

Natural Gas Pipelines

CCFC and CPN Pipeline Company would construct a 4.5-km (2.8-mile), 15-cm (6-inch)-diameter pipeline to transfer gas from Venoco's and other gas producers' existing gas wells to the proposed Grimes Station (Figures 1 and 2; Appendix A, Sheets 1–8). The proposed pipeline crosses through agricultural fields (primarily cultivated rice fields) and under two Sutter County public roads (near the intersection of Wilbur and Hageman Roads). In addition to this pipeline, a 122-m (400-ft), 15-cm (6-inch) -diameter gas pipeline would be constructed between the Grimes Station and the Sutter Pipeline tap.

Grimes Station

The Grimes Station would be located on Girdner Road just west of Hageman Road (Figures 1 and 2; Appendix A, Sheet 8). The site is currently an agricultural field planted with row crops; the final facility would be a 46 m (150 ft) by 46 m (151 ft) (0.2-ha [0.5-ac]) structure atop a 1-m (3.3-ft) -thick gravel pad. The facility layout is shown in Figure 3 and comprises the following components.

- A natural gas master meter to measure gas flow into the Sutter Pipeline.
- A horizontal filter-separator to ensure that high-quality gas is received. The filter will be approximately 2.7 m (9 ft) long, 0.6 m (2 ft) in diameter, and 1.5 m (5 ft) above ground level.
- A pig receiver to conduct in-line inspections and perform maintenance activities on the gas pipeline.
- A flow control valve to control flow through the pipeline and shut down if necessary during an emergency or other conditions.

[1] A standard cubic foot is a measure of quantity of gas often defined as a cubic foot of volume at 60°F and 14.7 pounds per square inch (PSI) of pressure.

- An aboveground 100-barrel drain tank to collect any liquids that might be present in the natural gas and are removed in the filter-separator. This tank will be an atmospheric tank with a vent on top. The tank will be fully contained within a secondary steel tank to prevent uncontrolled runoff. The tank will be 8 feet tall and 10 feet in diameter.
- Communication equipment (powered by solar panels) for CPN Pipeline Company to remotely monitor conditions at the site and operate control valves, if necessary.
- Provisions for a future gas scrubber to assist in liquid removal, if necessary; the scrubber would be 3 m (10 ft) long, 1 m (3 ft) in diameter, and 1.5 m (5 ft) above ground level.

The gravel pad would accommodate the facilities described above as well as equipment and vehicle access and turnouts. The station would be protected by a 1.8-m (6-ft)-tall chain-link fence with three barbed wire arms.

Meter Sites

CCFC and CPN Pipeline Company will install two meters, one at Venoco's existing Eastside master meter site and the other at the 32-33-3 master meter site (Figures 1 and 2; Appendix A, Sheets 1 and 3). These meters will serve as the custody transfer points for the natural gas. CCFC and CPN Pipeline Company will install the meters on the existing Venoco meter pads and has determined that no pad extensions will be required.

Construction Approach

Proposed Equipment and Material Staging Areas

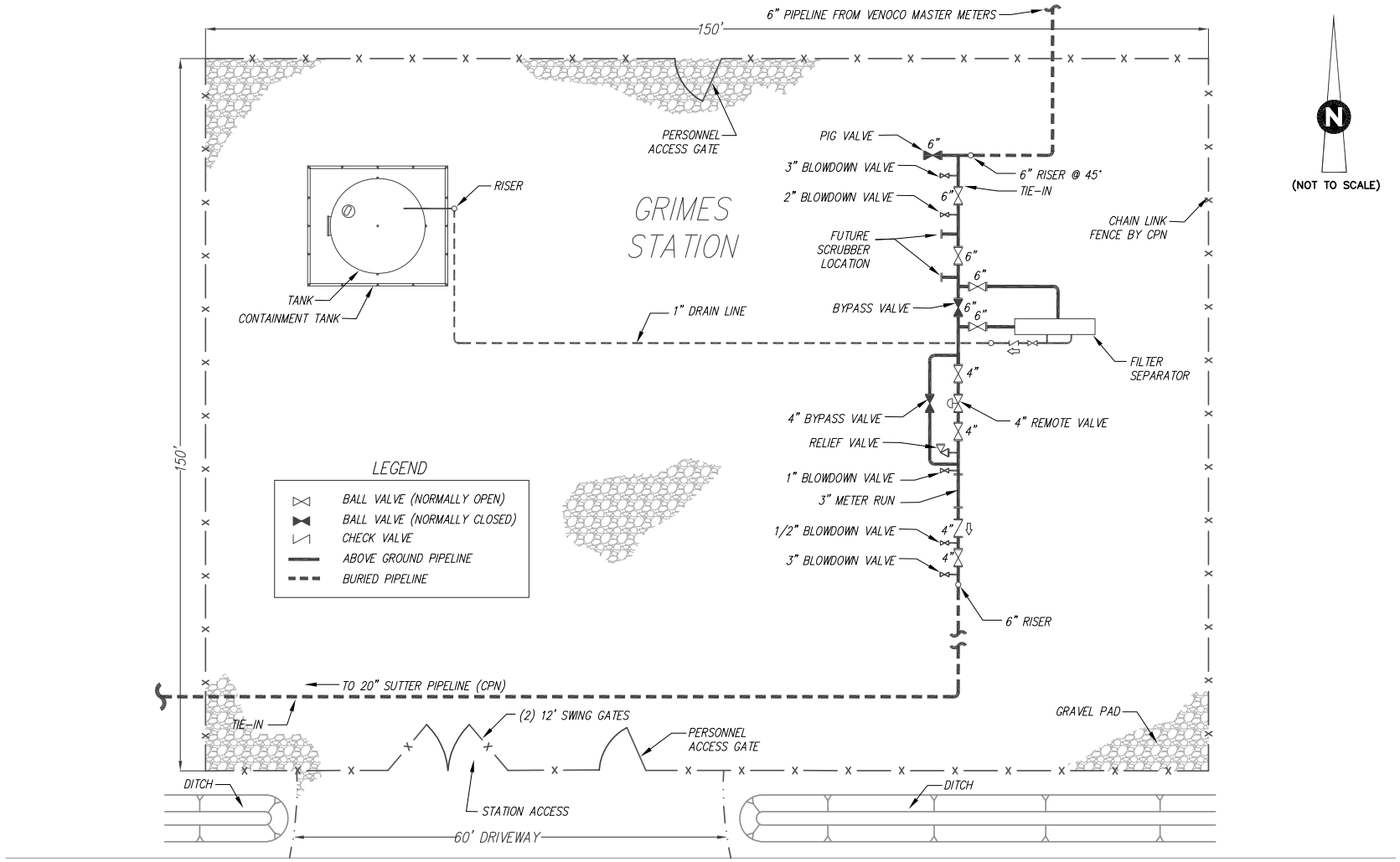
The locations of potential material and equipment staging areas are shown on the project alignment in Figure 1. Equipment and materials also would be staged for short periods within the 21-m (70-ft) -wide pipeline construction corridor and within the designated work areas (Figure 1 and 2; Appendix A, Sheets 2 and 6). The main equipment and material staging areas would be secured with a chain-link fence around their perimeter.

The staging areas would contain laydown areas for equipment, pipes, and other construction-related supplies as well as providing vehicle parking. The contractor may install a temporary trailer for use as a field office.

No new access roads will be necessary to construct for the proposed project.

Area of Potential Effects

The entire APE (estimated at approximately 12 ha [29 ac]) encompasses the land needed to construct the project components, set up temporary construction staging areas, and establish temporary pipeline bore work areas. The APE is depicted in Figure 2 and is described based on the underground disturbances associated with the project elements described above; the two new meters at the existing Venoco metering sites do not necessitate underground disturbance and thus are not discussed in this section.



PREPARED BY:

GTS ENGINEERING & CONSULTING

130 Amber Grove Drive, Suite 134
Chico, Ca 95973; (530)893-6711

CPN PIPELINE

60 RIVER RD.
RIO VISTA, CA 94571

Graphics ... 00776.10 (11-30-10) tm

ICF INTERNATIONAL

Figure 3
Grimes Station Layout

Installation of Pipeline and Interconnection to the Sutter Pipeline

CCFC and CPN Pipeline Company would use several types of construction methods, for street/road, cross country, and drainage crossings, including open cuts, borings, and horizontal directional drilling (HDD). Typically, a 6-m (20-ft) -wide permanent easement would be obtained from the landowner plus an additional 15-m (50-ft) -wide temporary easement for use during construction, together forming a 21-m (70-ft) -wide construction corridor. Because unanticipated circumstances often arise during construction, and because biologists might identify constraints within the 21-m (70-ft) construction corridor, the APE includes a 9-m (30-ft) buffer, for a total APE width of 30 m (100 ft) for the project's pipeline component.

Preparation for the pipeline system includes removal of the top 0.3 m (1 ft) of native topsoil from the rice field that would be used to construct a berm on both sides of the trench. Where the pipeline crosses non-rice fields, the topsoil excavated during trenching would be stockpiled adjacent to the trench and segregated from the subsoil.

Right-of-Way Preparation

The pipeline ROW will be cleared of any obstacles or debris. Clearing, cutting, and trimming of vegetation will be minimized whenever possible. Vegetation removal is expected to be minimal because most of the pipeline ROW consists of agricultural lands that are harvested at the time of construction and that lack woody vegetation.

If necessary, the landowners will prepare the right of way for construction activities as part of their farming activities (i.e. leveling of rice fields, flooding and maintenance of levees and rice checks) to prepare and plant their yearly crops. This will be done prior to final right of way preparation and pipeline construction starting in June.

Trenching

Trenching entails using a bucket wheel ditcher or tracked backhoe to dig a trench 0.8–1.0 m (30–36 inches) wide and 1.8–2.1 m (6–7 ft) deep. The excavated subsoil will be piled at one side of the construction ROW and used for backfilling the trench after the pipe is installed. All soil removed from the trench will be used onsite.

Trench Dewatering

Dewatering will be necessary in rice fields and other areas where groundwater intercepts the trench or stormwater runoff flows into the trench. Such water will be pumped into nearby agricultural ditches.

Stringing

Pipe will be trucked onsite and laid along the construction ROW. The pipe lengths will be unloaded from the truck using a crane or tractor with a sideboom attachment.

Installation

The pipe installation will involve bending the pipe lengths, welding them together, and coating them with an epoxy-based coating. The pipe will then be lowered into the trench using a sideboom. The

excavated subsoil and topsoil will be returned to the trench and the surface returned to its original grade or level. A slight crown will be retained over the top of the trench to allow for settling.

Backfilling

The subsoil and topsoil will be replaced on the pipe in the trench, ensuring that the surface is returned to its original grade or level. In agricultural fields (most of the pipeline alignment), the compaction density will be the same as the surrounding undisturbed soil.

Boring

Auger boring or horizontal directional drilling (HDD) will be used to cross public roads and large irrigation canals and ditches. The auger boring method involves excavating bore pits on each side of the crossing to a depth below the invert elevation of the pipe (about 2.1 m [7 ft] below ground surface). An auguring machine is then lowered into the bore pit, a hole is augured along the alignment, and a pilot pipe is jacked forward behind the auger head. When the auger reaches the bore pit on the opposite side, the carrier pipe is pulled or jacked through as the pilot pipe is removed.

The HDD method would be used for longer (more than 100 m [328 ft]) and deeper (more than 6 m [20 ft] below grade) crossings. This method requires a pilot hole that may be wet-bored by hydraulic cutting action using a jet nozzle, then reamed to the appropriate diameter with a reaming bit.

Cleanup

The surface ROW will be restored by removing any construction debris, grading to original grade and contour, and revegetating in nonagricultural areas and wherever else determined necessary.

Grimes Station Construction

The Grimes Station will be located on approximately 0.2 ha (0.5 ac) of land. The temporary work area for construction activities will affect another 0.1 ha (0.3 ac). Construction activities for the Grimes Station will entail clearing and grading the site with drainage and runoff to a collection point, if necessary, to control stormwater drainage as specified in the project's SWPPP. Completion of site preparation will be followed by constructing the gravel driveway and culvert; constructing the gravel pad foundation; installing the perimeter fencing; installing aboveground equipment and piping; and cleaning up and restoring the site.

Construction activities and storage of construction material and equipment will be confined to the 0.3-ha (0.8-ac) work and site area. After the site has been leveled, the contractor may install a stabilization fabric and then import approximately 2,294 cubic meters (3,000 cubic yards) of fill material to create the pad. Any excess native soils will be used onsite or disposed of in an approved offsite area. After the gravel pad has been constructed, the project facilities (described above) will be installed.

Cleanup and restoration of the 0.1-ha (0.3-ac) temporary work area around the site will be completed as work on the area is finished. The access roads and parking areas will be graded and graveled, or other aggregate will be spread on the surfaces.

Chapter 2
Environmental and Cultural Context

Environmental Context

The APE is situated in the northern Sacramento Valley east and north of the Sacramento River, southwest of the Sutter Bypass and northwest of the Tisdale Bypass in agricultural land. The Holocene environment of this region was characterized by a general warming trend that subsumed episodes of relatively cool climates. Most paleoclimatic reconstructions for the Central Valley are based on Antev's (1948, 1953, 1955) three-part global climatic sequence. The sequence spans the Holocene, consisting of the moderately cool/moist Anathermal (ca. 10,000–7500 B.P.[2]), the warm and dry Altithermal (ca. 7500–4000 B.P.) and the Medithermal (ca. 4000 B.P. to present).

The surface geology of the APE is dominated by Holocene and latest Pleistocene deposits. The most common deposits in the APE are stream channel, basin, and alluvial deposits, and the Modesto and Riverbank formations. The surface geology of most of the area can be characterized in terms of the lateral distribution of geological formations with respect to major streams like the Sacramento River. Quaternary Period (predominantly Holocene) stream channel deposits mark existing and former stream channels, flanked by Holocene alluvial deposits. Fine alluvial sediments (clay and silt) accumulate in basins as a result of overbank deposition beyond the alluvial fan deposits. With increasing distance from stream channels, the mantle of Holocene sediments becomes thinner, exposing the Pleistocene sediments of the Modesto and Riverbank formations. Basin deposits occur in level areas of the Central Valley floor and generally consist of fine-grained, unconsolidated Holocene alluvium. Basin deposits are generally 1.0–1.8 m (3–6 ft) thick near the valley perimeter and can be as thick as 60 m (200 ft) in the valley center.

Before Euroamerican settlement, the mainstem Sacramento River and its tributaries along the valley floor would naturally overtop their banks at regular cycles and flood the adjacent lands, replenishing wetlands and depositing sediments. Despite overbank deposition, these flood basins have maintained a low topographic profile, which suggests that they are subsiding at a rate equal to or greater than overbank deposition (Gilbert 1917; Water Engineering and Technology 1989, cited in North State Resources and Stillwater Sciences 2009). These floodplains have historically provided crucial fluvial geomorphic roles for the Sacramento River and other rivers and creeks in the area because the flow loss to the flood basins causes the Sacramento River to downsize in the downstream direction in its lower reaches (Water Engineering and Technology 1989, cited in North State Resources and Stillwater Sciences 2009).

The APE is situated among landforms whose surface is considered historical–modern in age (150 B.P. to present); the potential for buried archaeological resources in such settings is variable (Meyer and Rosenthal 2008: Figure 47), requiring examination of other sources of information, such as soil surveys. The northern half of the APE consists of basin deposits, characterized by Capay series soils, whereas the southern half of the APE is predominantly a floodplain marked by Shanghai series soils (Table 1). Buried soils have not been found in the soil map units shown in Table 1 (Lytle 1988:11,

[2] B.P. = Before Present, by convention A.D. 1950.

13, 31–32, 41–43, 74, 85–86, 90–91, Sheets 3 and 6), however, these soil map units were not selected for establishing typical profiles for the soils series. Buried soils are not expected to occur within the 2.1-m (7.0-ft) maximum excavation depth for the proposed undertaking in Capay soil units because they formed in basins or basin rims and were therefore less favorable locations for human habitation. Although buried soils have not been identified in the Shanghai soil units of the APE (units 163 and 167), such an occurrence is known in a Shanghai Variant series unit (unit 168) on a floodplain 4.8 km (3.0 mi) north of the APE and 1.6 km (1.0 mi) east of Meridian (Lytle 1988:91, Sheet 3). The buried A soil horizon at this location was observed from 0.7 m to 1.6 m (29 to 62 inches) below ground surface (Lytle 1988:91). Because buried soils tend to occur on a landscape level (Meyer and Rosenthal 2008) and there is no record that the APE has previously been investigated to identify buried soils, there is potential for such a buried soil occurrence among Shanghai soil units in the APE at a depth of approximately 0.7–1.6 m (29–62 inches).

Table 1. Summary of Soil Characteristics in the APE

Soil Map Symbol	Soil Map Unit Name	Geomorphic Surface	Recorded Buried Soil?
104	Capay silty clay, 0 to 2 percent slopes	basins and basin rims	No
108	Capay silty clay, wet, 0 to 2 percent slopes	basins and basin rims	No
163	Shanghai silt loam, clay substratum, 0 to 2 percent slopes	floodplains	No
167	Shanghai silty clay loam, 0 to 2 percent slopes	floodplains	No

Source: Lytle 1988: Sheets 3, 6

Prehistoric Context

This summary of the archaeology of the Central Valley follows a temporal outline using the Early, Middle, and Late horizons. The Central Valley sequence is seen as a continuous and gradual cultural response to both ecological and social constraints.

Terminal Pleistocene and Early Holocene: 13,500–7000 B.P.

Archaeological evidence for human use of the Central Valley during the late Pleistocene and early Holocene is scarce (Ann S. Peak & Associates 1981; Johnson 1967; Treganza and Heizer 1953). Johnson (1967:283–284) describes a number of lithic cores and a flakes found at three different locations associated with Pleistocene gravels, under what is now Camanche Reservoir. These archaeological remains have been grouped into what has been called the Farmington Complex, characterized by core tools and large, reworked percussion flakes (Treganza and Heizer 1953:28). The economy of the Central Valley residents during the late Pleistocene is thought to be based on the hunting of large Pleistocene mammals. Although no direct evidence of this exists in the Central

Valley, artifact assemblage association seems to support this argument. The economy of the Central Valley residents during the late Pleistocene is thought to have been based on the hunting of large Pleistocene mammals. Although no direct evidence of this exists in the Central Valley, the similarity of the artifact assemblages with those of other locations in Western North America lends some support to the notion of a large-game economic focus. Much of the Pleistocene megafauna became extinct at the Pleistocene/Holocene transition. These extinctions were caused by climatic changes that also led to the replacement of pine forest with vegetation similar to that found today. To survive without large game, people had to change their food procurement strategies to make use of a more diverse range of smaller plants and animals.

Middle to Late Holocene: 7000–1200 B.P.

A generalized subsistence strategy worked well for the inhabitants of the Central Valley for many millennia. Beginning in approximately 6000 B.P., change in the subsistence strategy begins to take place. As the population slowly increased, people's ability to move to resources was constrained. They were forced to find ways of increasing the amount of food that could be produced from smaller portions of land. The beginnings of this intensification can be seen in what Fredrickson (1973) has identified as the Windmiller Pattern. Artifacts and faunal remains at Windmiller sites indicate that a diverse range of resources was exploited, including seeds, a variety of small game, and fish. The material culture assemblage includes trident fish spears; at least two types of fishhooks; quartz crystals and numerous charm stone styles; and a baked clay assemblage that included net sinkers, pecan-shaped fish line sinkers, and cooking balls. Ground stone items included mortars and pestles. The bone tool industry appears minimal but includes awls, needles, and flakers. People with a Windmiller adaptation buried their dead in formal cemeteries, both within and apart from their villages, in a ritual context that included the use of red ochre, often rich grave offerings, and ventral extended bodies oriented predominantly west (although other burial positions and cremations also are known) (Moratto 1984).

Late Horizon: 1200 B.P. to Historic Period

The trends toward specialization, exchange, and spatial circumscription that characterized prior periods continued in the Late Horizon. Population continued to increase and group territories continued to become smaller and more defined. Patterns in the activities, social relationships, belief systems, and material cultural continued to develop during this period and took forms similar to those described by the first Europeans that entered the area.

The predominant generalized subsistence pattern during this period is called the Augustine Pattern (Fredrickson 1973). Archaeological sites representing the Augustine Pattern show a high degree of technological specialization. Technological achievements in this period include artifacts of composite materials; developed reductive technologies, such as stone and shell work; and highly specialized adaptive technologies, including basketwork and ceramic production. Other notable elements of the material culture assemblage include flanged tubular smoking pipes; harpoons; ceramic figurines and vessels (Cosumnes Brownware); clam shell disk beads; and small projectile point types, such as those classified within the Gunther Barbed series. These small projectile points may indicate the use of the bow and arrow. Complex social and economic institutions also are represented by different access to wealth, the implementation of a shell money system, and the maintenance of extensive exchange networks.

Ethnographic Context

The APE is located at the interface of two Native American groups: the Patwin (or Wintun) and the Valley Nisenan. The banks of the Sacramento River and associated riparian and tule marshland habitats were inhabited by the River or Valley Patwin. The Nisenan (also called Southern Maidu), while primarily occupying territory east of the Sacramento River, used land west of the river as well (Johnson 1978; Levy 1978; Wilson and Towne 1978).

Patwin

The APE is located within the historic territory of the Patwin (Johnson 1978:350; Kroeber 1976:Plate 34). *Patwin* is a collective Euroamerican referent for the speakers of one of the three languages in the Wintuan group, a part of the Penutian language family. One translation for the word is *people*. Several politically autonomous tribelets in the southwestern part of the Sacramento Valley are known to have used the word in reference to their respective individual groups (Powers 1877). The approximate maximum extent of Patwin territory in the late eighteenth and early nineteenth centuries was from Princeton in Colusa County south to Suisun Bay, and from the Sacramento River west across the eastern slope of the Coast Ranges (Johnson 1978; McCarthy 1985a:37, Map 9).

The evidence for the chronology of the initial establishment and subsequent development of Patwin territory is equivocal. Glottochronological estimates for the internal divergence of Wintuan languages suggests a California entry for Wintuan speakers ca. 2000–2500 B.P. (McCarthy 1985b:31), although Moratto (1984) argues from archaeological data that the Wintuan entry into California occurred approximately between 1950 and 1450 B.P. Glottochronological and other linguistic evidence suggests that the Patwin were in the lower Sacramento Valley by approximately 1250 B.P. (Bennyhoff 1977; Whistler 1977, 1988), and that they began to move onto the eastern slope of the Coast Ranges after approximately 950 B.P. (Moratto 1984:571).

The character of the culture that developed in the Patwin region is known from ethnographic and historic sources that date from the late eighteenth century to early twentieth century. Most of these sources date to the latter end of this range, because the intense proselytization of the Patwin by the Missions San Francisco de Asís, San José de Guadalupe, and San Francisco Solano in the late eighteenth and early nineteenth centuries, in combination with the malaria epidemic of 1833 and smallpox epidemic of 1837, led to an apparent rapid decline in Patwin population and the abandonment, particularly in the south, of significant portions of former Patwin territory (Johnson 1978:351–352). Most of the actual ethnographic data from native Patwin informants dates to the late nineteenth and early twentieth centuries and postdates the cultural upheaval of the earlier period. It is unclear how well the available data represents Patwin culture before European contact.

The tribelet was the broadest apparent unit of political organization among the Patwin. Kroeber (1932:258–259) developed the term to describe what appears to have been the prevailing form of Native American political organization in central California from approximately the late eighteenth century through the late nineteenth century. A tribelet is small in size, on the order of 100–300 people, with a discrete territory. The territory typically includes a permanent principal settlement or village and a number of subordinate villages that may or may not have been permanently occupied. Principal Patwin villages with dance houses appear to have been the residences of tribelet head chiefs (Kroeber 1932:259). Each village in a Patwin tribelet also had a chief (Johnson 1978:354). The position appears to have been hereditary, but in the absence of an heir, village elders could choose a chief. The chief was the primary trustee of the village's natural resources. The chief

appears to have been responsible for the reification of the village's ownership of particular resources and for decisions about resource utilization. Despite the apparent weight of a village chief's authority, the foundation for that authority was always the consensus of the households in the village.

The Patwin economy was principally based on the utilization of natural resources from the riverine corridor, wetlands, and grasslands of the lower Sacramento Valley, and from the open woodlands on the eastern foothills of the Coast Ranges (Johnson 1978; Kroeber 1932, 1976). The family was the basic subsistence unit within the tribelet engaged in the exploitation of this resource mosaic (Johnson 1978:354). Tribelets with territory primarily on the floor of the Sacramento Valley were more reliant on riverine and wetland resources. Fish, shellfish, and waterfowl were important sources of protein in the diet of these groups (Johnson 1978:355; Kroeber 1932:277–280). Salmon, sturgeon, perch, chub, sucker, pike, trout, and steelhead were variously caught with nets, weirs, lines and fishhooks, and harpoons. Mussels were taken from the gravels along the Sacramento River stream channel. Geese, ducks, and mudhens were taken with the use of decoys and various types of nets. Tribelets with territory on the western margin of the Sacramento Valley were less reliant on riverine and wetland animal resources and more reliant on terrestrial game (Kroeber 1932:294–295). Deer, tule elk, antelope, bear, mountain lion, fox, and wolf were variously driven, caught with nets, or shot.

Most of the plant resources that were important factors in the Patwin diet came from the grasslands of the lower Sacramento Valley and woodlands of the Coast Range foothills (Johnson 1978:355; Kroeber 1932:275–276, 295–296). Acorns were a staple among all the Patwin tribelets. Two types of valley oaks and a variety of hill and mountain oaks were the primary sources of this foodstuff. As in many other native California cultures, the acorns were pulverized into meal and leached with water in a sand basin. The processed meal was then used to make a gruel or bread. A number of seed plants were important secondary food sources, including sunflower, wild oat, alfilaria, clover, and bunchgrass (Johnson 1978:355). The seeds from these plants were typically parched or dried, and then ground into meal for consumption. Manzanita and juniper berries were also typically dried and ground. Blackberries, elderberries, and wild grapes could be eaten raw, dried and ground into meal, or boiled. On the western margin of the Patwin culture area, sugar pine and foothill pine nuts were roasted and eaten whole (Kroeber 1932:296).

Nisenan

The APE is also located within the lands occupied and used by the Nisenan, or Southern Maidu. The language of the Nisenan, which includes several dialects, is classified within the Maiduan family of the Penutian linguistic stock (Kroeber 1976:392; Shipley 1978:89). The western boundary of Nisenan territory was the western bank of the Sacramento River. The eastern boundary was "the line in the Sierra Nevada mountains where the snow lay on the ground all winter" (Littlejohn 1928:13).

Nisenan settlement locations depended primarily on elevation, exposure, and proximity to water and other resources. Permanent villages were usually located on low rises along major watercourses. Villages ranged in size from three houses to 40 or 50. Houses were domed structures covered with earth and tule or grass, and they measured 3.0–4.6 m (10–15 ft) in diameter. Brush shelters were used in summer and at temporary camps during food-gathering rounds. Larger villages often had semisubterranean dance houses that were covered in earth and tule or brush,

with a central smoke hole at the top and an east-facing entrance. Another common village structure was a granary, which was used for storing acorns. (Wilson and Towne 1978:388.)

The Nisenan occupied permanent settlements from which specific task groups set out to harvest the seasonal bounty of flora and fauna that the rich valley environment provided. The Valley Nisenan economy involved riparian resources, in contrast to the Hill Nisenan, whose resource base consisted primarily of acorn and game procurement. The only domestic plant was native tobacco (*Nicotiana* sp.), but many wild species were closely husbanded. The acorn crop from the blue oak (*Quercus douglasii*) and black oak (*Q. kelloggii*) was so carefully managed that its management served as the equivalent of agriculture. Acorns could be stored in anticipation of winter shortfalls in resource abundance. Deer, rabbit, and salmon were the chief sources of animal protein in the aboriginal diet, but many other insect and animal species were taken when available. (Wilson and Towne 1978:389–390.)

Religion played an important role in Nisenan life. The Nisenan believed that all natural objects were endowed with supernatural powers. Two kinds of shamans existed: curing shamans and religious shamans. Curing shamans had limited contact with the spirit world and diagnosed and healed illnesses. Religious shamans gained control over the spirits through dreams and esoteric experiences. (Wilson and Towne 1978:393, 395.) The usual mode of burial was cremation (Faye 1923:37).

Historic Context

The area that now encompasses Sutter County was first explored by Gabriel Moraga in 1808 during his second expedition into the inland valley of California. Subsequent visitors include Luis Argüello, who came to the area in 1817 in search of possible mission sites, and the American frontiersman and trapper Jedediah Strong Smith, who passed through the region in 1828. Hudson's Bay Company trappers also traversed the land that forms Sutter County on their expeditions south during the 1830s and 1840s. (Gordon 1988; Hoover et al. 1990.)

The first permanent settlement in Sutter County was Hock Farm, established in 1841 by John A. Sutter. Located approximately 12.8 km (8 miles) south of Yuba City, Hock Farm was one of Sutter's several ranchos and became the principal stock ranch for his sprawling New Helvetia settlement. Under the management of Sutter's employee, John Bidwell, Hock Farm eventually included a home, orchards, gardens, and more than 5,000 head of cattle, which grazed freely on Sutter's lands between the Sacramento and Feather rivers. The Gold Rush (1848–1852) and the resultant pillaging of his fort at Sacramento prompted Sutter to make Hock Farm his primary residence between 1850 and 1868. Sutter continued the agricultural diversification of his lands by importing cuttings and seeds from abroad, which served as the nucleus for the extensive orchards, gardens, and grain fields that support Sutter County's economy today. The agricultural opportunities generated by Sutter's land improvements soon attracted hundreds of new settlers to the region. In 1850, Sutter County was officially incorporated. (Gordon 1988; Hart 1978; Hoover et al. 1990.)

With the decline of the Gold Rush, farming and ranching became the predominant economic activities in Sutter County. By the mid-1850s, farmers were producing large quantities of wheat and other grains for local markets and for export. Land improvement projects in the Sutter Basin during the 1860s opened up new lands for the cultivation of barley, corn, rice, prunes, and the Thompson seedless grape, which was first introduced to the region in 1870. The success of fruit orchards led to

the development of canning and packing operations that continue to support the economy of Sutter County today. (Gordon 1988; Hart 1978.)

The growth of commercial agriculture in Sutter County necessitated more effective means of transport to various markets in the Sacramento Valley and other parts of the state. Steam navigation between Yuba City and Sacramento via the Feather and Sacramento rivers began in the 1850s, but was continually hampered by awkward bridge transport and debris from hydraulic mining operations that filled the rivers. Rail transport effectively replaced water bound commerce with the coming of the California Northern Railroad in 1864, the California Central Railroad in 1869, the San Francisco-Marysville Railroad in 1871, and the Western Pacific Railroad in 1910. (Gordon 1988; Hart 1978.)

Sutter County experienced 15 major flood events during the twentieth century. There are more than 322 km (200 miles) of levees countywide, 113 km (70 miles) of which protect Yuba City and Live Oak alone. The last time levee breaks occurred during a flood event was in 1955 at Yuba City and Nicolaus. However, the most recent major flood event occurred on the Feather River in 1997 in Yuba City and also affected nearby municipalities in Yuba County. Approximately 24,000 residents were evacuated. (Sutter County 2010.)

Chapter 3
Methods and Results

Efforts to identify cultural resources in the APE consist of a records search and review of pertinent archaeological, ethnographic, and historical sources; correspondence with Native Americans and historical societies; and a pedestrian survey of the APE.

Records Search and Literature Review

ICF requested a records search from the Northeast Information Center (NEIC) of the California Historical Resources Information System (CHRIS) on October 13, 2010. ICF requested records search results for the APE and a 0.4-km (0.25-mile) radius surrounding the APE. The NEIC provided the records search results to ICF on October 13, 2010 (Records Search No. D10-83). The records search included a review of the NEIC's maps of previous cultural resource studies and recorded cultural resources.

In addition, the following sources were consulted during the records search: National Register of Historic Places (2010), the California Register of Historic Resources (2010), *California Points of Historical Interest* (2010), *California Inventory of Historic Resources* (2010), *California Historical Landmarks* (2010), Directory of Properties in the Historic Property Data Files for Sutter County (2010), *Handbook of North American Indians, Vol. 8, California* (1978); Historic Spots in California (1990).

The records search indicates that only the proposed tap to the existing Sutter pipeline has been surveyed for the presence of cultural resources (Davy and Nachmanoff 1999); the remainder of the APE has not been surveyed prior to the present investigation.

No previously recorded cultural resources were identified in the APE or within a 0.4-km (0.25-mile) radius of the APE. The records search and related correspondence are contained in Appendix B.

In addition to obtaining the records search, ICF reviewed environmental, archaeological, ethnographic, and historical sources pertinent to the project vicinity, filed at ICF's Sacramento office cultural resources library. Relevant sources are cited in Chapter 2 of this report.

Correspondence with Native Americans

As required by the U.S Army Corps of Engineers, documentation of contacts with Native Americans is required as part of compliance with Section 106. This documentation is included in Appendix C. The following is a summary of the contacts. On November 3, 2010, ICF initiated correspondence with Native Americans by contacting the NAHC. ICF faxed a request to the NAHC for a search of the Sacred Lands File and a list of contacts with knowledge of cultural resources in the project vicinity. A second attempt to contact the NAHC was made on December 12, 2010. The NAHC responded to this second request via facsimile on December 22, 2010. The NAHC response indicated that the Sacred Lands File does not contain record of Native American resources. The NAHC also provided contact information for six Native American individuals among three Indian tribes (Enterprise Rancheria of

Maidu Indians, Mechoopda Indian Tribe of the Chico Rancheria, and Strawberry Valley Rancheria). ICF mailed project notification letters to the contacts on December 28, 2010 and transmitted PDF versions via email.

Michael DeSpain, Director of the Mechoopda Indian Tribe's Department of Environmental Planning & Protection, responded to ICF's project notification letter via email on December 29, 2010:

> For this project, Mechoopda Indian Tribe would request that your firm contact Colusa, Enterprise, Mooretown, Berry Creek, Rumsey, Cortina and Grindstone Rancherias for any knowledge they may have too. MIT would like to make sure that when your firm does the onsite portion of the study that a funded Tribal Monitor is present to verify any artifacts or remains that may be found. You may contact me by phone if you have any questions.

ICF informed Mr. DeSpain via email on January 5, 2011, that the pedestrian survey was conducted in October 2010 to take advantage of the short interval during which rice was harvested but the fields in the APE still not inundated. Mr. DeSpain responded in an email dated January 7, 2011.

At Mr. DeSpain's request, ICF provided a detailed timeline of historic properties identification efforts between October 2010 and January 2011 to Mechoopda Indian Tribe, Colusa, Enterprise, Mooretown, Berry Creek, Rumsey, Cortina, Grindstone, and Shingle Springs Rancherias (email dated January 7, 2011). Also at Mr. DeSpain's request, ICF and CCFC organized a field meeting with tribal representatives.

Tribal representatives from the Cortina Indian Rancheria, Mechoopda Indian Tribe, and Shingle Springs Rancheria met with ICF cultural resources manager, Gabriel Roark, and representatives from CCFCon January 20, 2011. The purpose of the meeting was to facilitate further consultation concerning cultural resources in the APE, communicate a clear and detailed description of the undertaking, discuss cultural resources identification efforts to date, examine the APE together, and discuss findings and next steps. Regarding cultural resources of concern to Indian tribes, Mechoopda Indian Tribe and Shingle Springs Rancheria agreed at the meeting and in written communications afterward, see Appendix C, that a tribal representative should monitor construction related ground-disturbing activities at the proposed Grimes Station and connection between the Grimes Pipeline and the existing Sutter Pipeline, and the vicinity of Grimes Station within the U-shaped tree line that surrounds this project element.

Mechoopda Indian Tribe and Shingle Springs Rancheria further agreed that Cortina Indian Rancheria would be the best tribe to provide a monitor during construction, owing to their proximity to and historical association with the project vicinity. CCFC and CPN Pipeline Company has agreed to tribal monitoring as described above and has included tribal monitoring in the Conditions for Certification in Amendment to the CEC (ICF International 2011:Chapter 4).

Correspondence with Historical Societies

On December 7, 2010, ICF initiated correspondence with local historical societies, including the Colusa County Historical Records Commission and the Sacramento Valley Museum. Outgoing correspondence included a letter describing the project and a map depicting the project area. At time this report was written, ICF has received no return correspondence. Copies of the above mentioned correspondence are located in Appendix D.

Pedestrian Survey

Two ICF archaeologists surveyed the APE for the presence of cultural resources on October 20 and 27, 2010. The survey was conducted over 2 days and after the rice fields had been harvested, ensuring the best surface visibility given the ground cover. The APE was surveyed by walking parallel transects spaced 15 m (50 ft) between surveyors. The width of the APE required two passes from end to end, such that four transects were walked. Where visibility was good (50 percent or more), the archaeologists maintained parallel transects, making surface observations and examining rodent burrows and ditch sidewalls along survey transects. Where vegetation reduced ground surface visibility to less than 50 percent, the archaeologists used garden hoes to make 1-m^2 (3.2 by 3.2 ft) surface scrapes every 30 m (100 ft) along transects. The observations afforded by the surface scrapes were augmented by examining rodent burrows and ditch sidewalls. Gravel pads themselves were not surveyed, although the archaeologists surveyed the pad margins. Additionally, one transect was walked in a dry earthen ditch for a distance of 0.8 km (0.5 mi) to look for indications of buried soils and archaeological materials. The ditch was selected in part because it parallels the proposed pipeline route at a distance of 30 m (100 ft) and traversed the Shanghai soils units within the APE. The soil profile presented by the ditch was homogenous throughout and exhibited no archaeological materials.

ICF archaeologists returned to the project area on January 7, 2010. The purpose of this visit was to survey several sections of the APE that were not surveyed during the previous two days of survey in October 2010. The APE was surveyed by the two crew members walking transects spaced 15 m (50 ft) apart. The areas requiring survey were sufficiently small enough to allow for the areas to be covered in a single pass. Ground visibility at this time was excellent (75 percent or better). A section of this portion of the APE, measuring approximately 15 m by 100 m (50 ft by 300 ft) was not surveyed due to excessive standing water on the plowed field.

No archaeological materials were identified as a result of the survey. Survey coverage is depicted in Figure 2 and in Appendix A.

Chapter 4
Summary and Management Recommendations

The present cultural resources study for the proposed undertaking consisted of a review of existing literature, a records search at the CHRIS, correspondence with interested parties, and a pedestrian survey of the APE. No cultural resources were identified.

However, in the event possible cultural resources materials or human remains are encountered during project construction, two recommendations are proposed, as discussed below.

Recommendation 1. Stop work if cultural materials are encountered

While the potential is relatively low, it is possible that buried archaeological sites, which are unobservable on the ground surface, may exist in the APE. If buried cultural resources such as chipped or ground stone, historic debris, or building foundations are discovered during ground-disturbing activities, work will be temporarily halted in the area and within 30 m (100 ft) of the discovery until a qualified archaeologist can assess the significance of the discovery and, if necessary, develop appropriate treatment measures in consultation with the USACE and other appropriate agencies, per 36 CFR 800.13.

Recommendation 2. Contact authorities if human remains are encountered

No human remains are known to be located in the APE. However, there is always the possibility that unmarked burials may be unearthed during construction. Section 7050.5 of the California Health and Safety Code requires that construction or excavation be stopped in the vicinity of discovered human remains until the Sutter County Coroner can determine whether the remains are those of a prehistoric Native American. If the remains are determined to be Native American, the coroner must contact the NAHC.

Chapter 5
References Cited

Ann S. Peak & Associates

1981 *Archaeological Investigation of CA-Sac-370 and CA-Sac-379, the Rancho Murieta Early Man Sites in Eastern Sacramento County*. Sacramento, California.

Antev, Ernst

1948 Climatic Changes and Pre-White Man. *University of Utah Bulletin* 38:168–191.

1953 The Postpluvial or Neothermal. *University of California Archaeological Survey Reports* 22:9–23.

1955 Geologic-Climatic Dating in the West. *American Antiquity* 20:317–335.

Bennyhoff, James A.

1977 *Ethnogeography of the Plains Miwok*. Publication 5. Center for Archaeological Research at Davis, Davis, California.

Davy, Douglas M. and Jennifer K. B. Nachmanoff

1999 *Cultural Resources Inventory of the Sutter Power Project Sutter County, California. Foster Wheeler Environmental Corporation, Sacramento*. Prepared for Calpine Corporation, San Jose, California. On file, North Central Information Center, California Historical Resources Information System, Sacramento .S-3147.

Faye, Paul-Louis

1923 Notes on the Southern Maidu. *University of California Publications in American Archaeology and Ethnology* 20:35–53.

Fredrickson, David A.

1973 *Early Cultures of the North Coast Ranges, California.* Unpublished Ph.D. dissertation, Department of Anthropology, University of California, Davis.

Gilbert, G. K.

1917 *Hydraulic Mining Debris in the Sierra Nevada*. USGS Professional Paper 105. Government Printing Office, Washington, D.C.

Gordon, Marjorie

1988 *Changes in Harmony: An Illustrated History of Yuba and Sutter Counties*. Windsor Publications, Northridge, California.

Hart, James D.

1978 *A Companion to California*. Oxford University Press, New York.

Hoover, Mildred B., Hero E. Rensch, Ethel G. Rensch, and William N. Abeloe

1990 *Historic Spots in California*. 4th edition. Revised by Douglas E. Kyle. Stanford University Press, Palo Alto, California.

ICF International
2011 *Amendment to the Application for Certification for the Sutter Energy Center Project (97-AFC-02)*. Draft. January. ICF International, Sacramento, California. ICF 00776.10. Prepared for Calpine Construction Finance Company, Middletown, California.

Johnson, Jerald J.
1967 *The Archaeology of the Camanche Reservoir Locality, California*. Paper 6. Sacramento Anthropological Society, Sacramento, California.

Johnson, Patti J.
1978 Patwin. In *California*, edited by Robert F. Heizer, pp. 350–360. Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Kroeber, A. L.
1932 The Patwin and their Neighbors. *University of California Publications in American Archaeology and Ethnography* 29:253–423.
1976 *Handbook of the Indians of California*. Reprinted. Dover Publications, New York. Originally published in 1925, Bulletin No. 78, Bureau of American Ethnology, Smithsonian Institution, Washington, D.C.

Levy, Richard
1978 Eastern Miwok. In *California*, edited by Robert F. Heizer, pp. 398–413. Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Littlejohn, Hugh W.
1928 Nisenan Geography. On file, University of California Archives, Department of Anthropology, University of California, Berkeley. Document 18.

Lytle, Dennis J.
1988 *Soil Survey of Sutter County, California*. July. Soil Conservation Service, United States Department of Agriculture, Washington, D.C.

McCarthy, Helen
1985a Ethnography. Chapter III in *Ethnography and Prehistory of the North Coast Range, California*, by Helen McCarthy, William R. Hildebrandt, and Laureen K. Swenson, pp. 36–86. Publication 8. Center for Archaeological Research at Davis, Davis, California.
1985b Linguistics and Its Implications for California Ethnography and Culture History. Chapter II in *Ethnography and Prehistory of the North Coast Range, California*, by Helen McCarthy, William R. Hildebrandt, and Laureen K. Swenson, pp. 20–34. Publication 8. Center for Archaeological Research at Davis, Davis, California.

Meyer, Jack, and Jeffrey S. Rosenthal
2008 *A Geoarchaeological Overview and Assessment of Caltrans District 3, Cultural Resources Inventory of Caltrans District 3 Rural Conventional Highways*. April. Far Western Anthropological Research Group, Davis, California. Prepared for District 3, California Department of Transportation, Marysville.

Moratto, Michael J.
1984 *California Archaeology*. Academic Press, San Diego, California.

North State Resources and Stillwater Sciences
2009 *Draft Environmental Assessment/Initial Study for Levee Repair of 25 Erosion Sites: Sacramento River Bank Protection Project*. April. Redding and Berkeley, California. Prepared for Sacramento District, U.S. Army Corps of Engineers, Sacramento, California, and Central Valley Flood Protection Board. Contract W91238-07-D-0022.

Powers, Stephen
1877 *Tribes of California*. Contributions to North American Ethnology III. U.S. Geographical and Geological Survey of the Rocky Mountain Region, Washington, D.C.

Shipley, William F.
1978 Native Languages of California. In *California*, edited by Robert F. Heizer, pp. 80–90. Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Sutter County
2010 *Flood Protection Fact Sheet*. Public Works Department, Sutter County, Yuba City, California. Electronic document, http://www.co.sutter.ca.us/doc/government/depts/pw/wr/fp/fpfacts, accessed August 16, 2010.

Treganza, Adan E., and Robert F. Heizer
1953 Additional Data on the Farmington Complex: A Stone Implement Assemblage of Probably Early Post-Glacial Date from Central California. *University of California Survey Reports* 22:28–38.

Whistler, Kenneth A.
1977 Wintun Prehistory: An Interpretation Based on Plant and Animal Nomenclature. In *Proceedings of the Third Annual Meeting of the Berkeley Linguistics Society*, pp. 157–174.
1988 Pomo Prehistory: A Case for Archaeological Linguistics. In *Archaeology and Linguistics*, edited by Ann M. Mester and Colin McEwan. *Journal of the Steward Anthropological Society* 15:64–98.

Wilson, Norman L., and Arlean H. Towne
1978 Nisenan. In *California*, edited by Robert F. Heizer, pp. 387–397. Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Appendix A

Area of Potential Effects and Cultural Resources Survey Coverage

121°53'0"W
121°52'50"W
121°52'40"W
39°6'30"N
39°6'20"N
Moroni RD
90% Visibility
80% Visibility
80% Visibility
30% Visibility
Venoco Eastside
Master Meter Site
0-10% Visibility

Appendix A
Area of Potential Effects
Grimes Pipeline Project
December 2010
Sheet 1 of 8

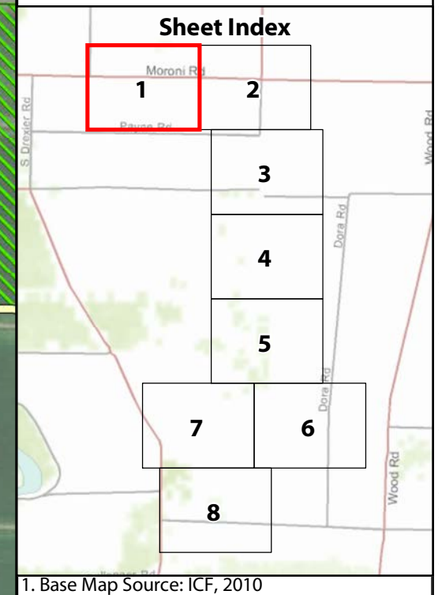
- Area of Potential Effects and Survey Coverage
- Natural Gas Pipeline Alignment
- Bore
- Project Element
- Construction Laydown Area
- Pipeline Work Area
- Visibillity Area
- Unsurveyed Area
- Culvert
- Riparian Drainage
- Wetland Drainage
- Other Waters Drainage
- Surveyed Earthen Ditch
- Ricefield Wetland

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



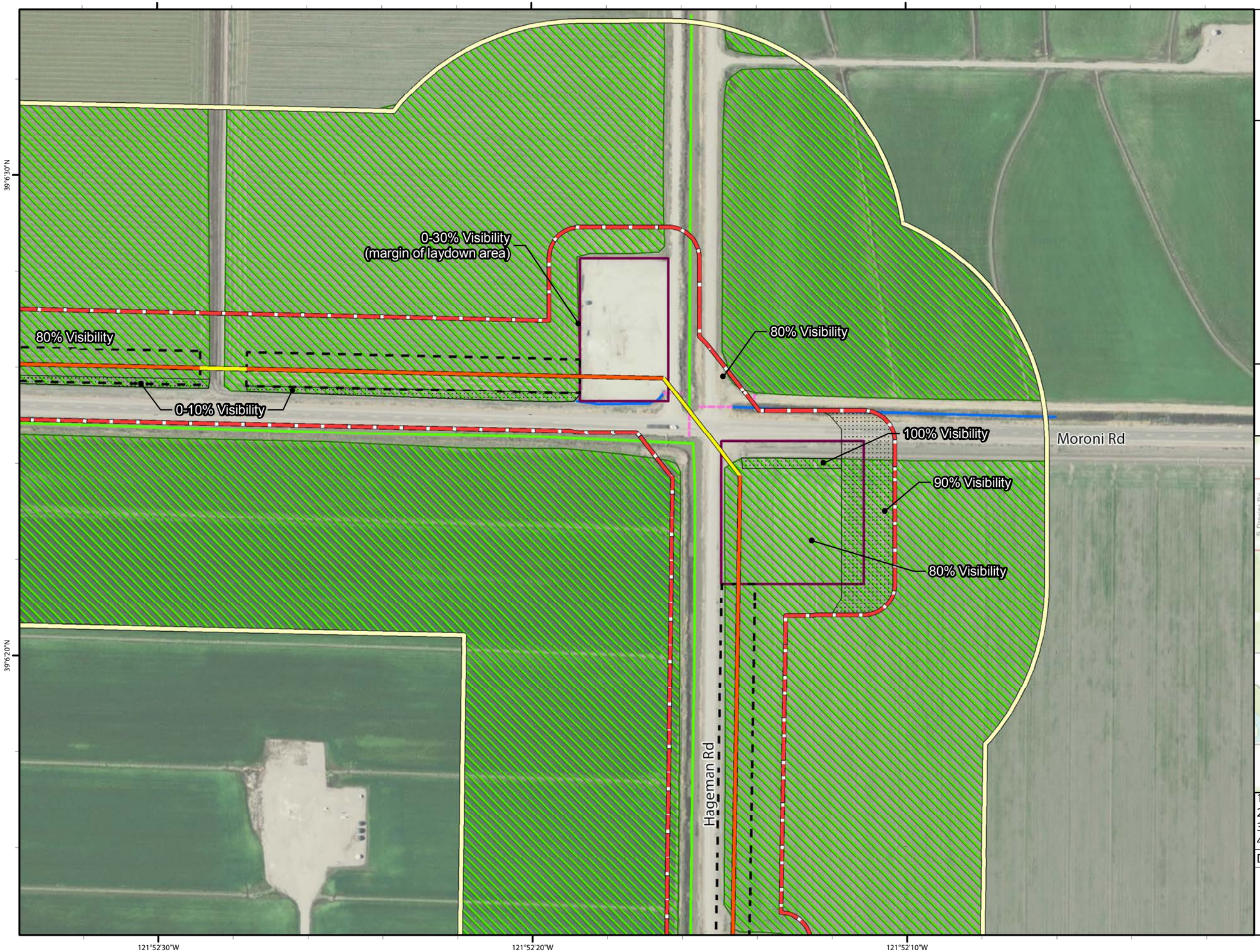
1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Grimes
4. PLSS: T. 15 N, R. 1 E

Drawn By: Sacha Selim	Dec 2010

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE\00778_10_GRIMES\MAPDOC\CULTURAL\CULTURAL_APE_VISIBILITY\CULTURAL_APE_VISIBITLY_REPORT_20110124.MXD SS (01-25-11)

Appendix A
Area of Potential Effects
Grimes Pipeline Project
December 2010
Sheet 2 of 8



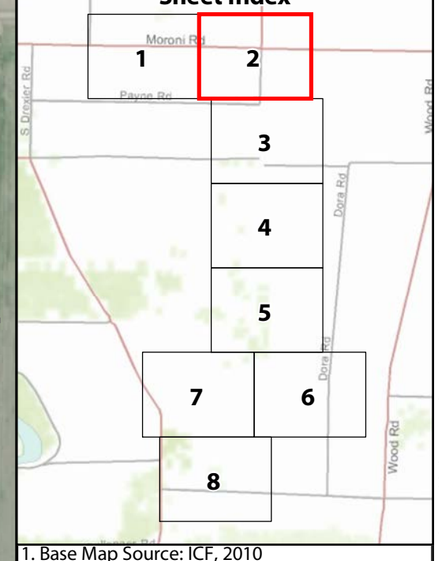
- Area of Potential Effects and Survey Coverage
- Natural Gas Pipeline Alignment
- Bore
- Project Element
- Construction Laydown Area
- Pipeline Work Area
- Visibillity Area
- Unsurveyed Area
- Culvert
- Riparian Drainage
- Wetland Drainage
- Other Waters Drainage
- Surveyed Earthen Ditch
- Ricefield Wetland

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Tisdale Weir
4. PLSS: T. 15 N, R. 1 E

Drawn By: Sacha Selim	Dec 2010

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE_00778_10_GRIMES\MAPDOC\CULTURAL\CULTURAL_APE_VISIBILITY\CULTURAL_APE_VISIBITLY_REPORT_20110124.MXD SS (01-25-11)

121°52'30"W
121°52'20"W
121°52'10"W
121°52'0"W
39°6'10"N
39°6'0"N

Payne Rd

80% Visibility

Area Not Surveyed Due To Standing Water

0% Visibility Surface Scrapes at 30 - Meter Intervals

Appendix A
Area of Potential Effects
Grimes Pipeline Project
December 2010
Sheet 3 of 8

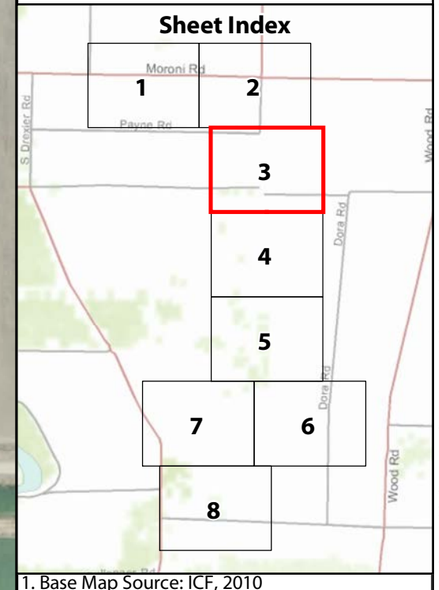
- Area of Potential Effects and Survey Coverage
- Natural Gas Pipeline Alignment
- Bore
- Project Element
- Construction Laydown Area
- Pipeline Work Area
- Visibillity Area
- Unsurveyed Area
- Culvert
- Riparian Drainage
- Wetland Drainage
- Other Waters Drainage
- Surveyed Earthen Ditch
- Ricefield Wetland

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Tisdale Weir
4. PLSS: T. 14, R. 1 E & T. 15, R. 1 E

Drawn By: Sacha Selim	Dec 2010

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE\00778_10_GRIMES\MAPDOC\CULTURAL\CULTURAL_APE_VISIBILITY\CULTURAL_APE_VISIBITLY_REPORT_20110124.MXD SS (01-25-11)

Appendix A
Area of Potential Effects
Grimes Pipeline Project
December 2010
Sheet 4 of 8

121°52'30"W
121°52'20"W
121°52'10"W
121°52'0"W
39°5'50"N
39°5'40"N

0% Visibility
Surface Scrapes at
30 - Meter Intervals

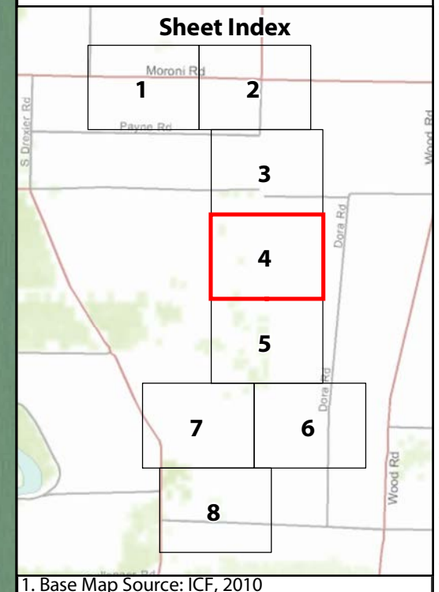
- Area of Potential Effects and Survey Coverage
- Natural Gas Pipeline Alignment
- Bore
- Project Element
- Construction Laydown Area
- Pipeline Work Area
- Visibillity Area
- Unsurveyed Area
- Culvert
- Riparian Drainage
- Wetland Drainage
- Other Waters Drainage
- Surveyed Earthen Ditch
- Ricefield Wetland

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Tisdale Weir
4. PLSS: T. 14, R. 1 E

Drawn By: Sacha Selim	Dec 2010

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE\00778_10_GRIMES\MAPDOC\CULTURAL\CULTURAL_APE_VISIBILITY\CULTURAL_APE_VISIBITLY_REPORT_20110124.MXD SS (01-25-11)

121°52'30"W
121°52'20"W
121°52'10"W
121°52'0"W
39°5'30"N
39°5'20"N

0% Visibility
Surface Scrapes at
30 - Meter Intervals

Appendix A
Area of Potential Effects
Grimes Pipeline Project
December 2010
Sheet 5 of 8

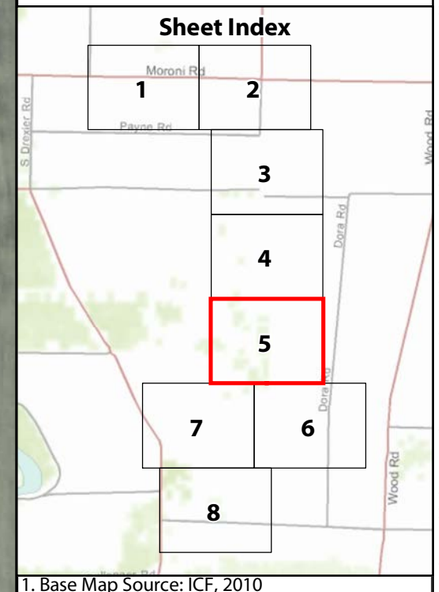
- Area of Potential Effects and Survey Coverage
- Natural Gas Pipeline Alignment
- Bore
- Project Element
- Construction Laydown Area
- Pipeline Work Area
- Visibillity Area
- Unsurveyed Area
- Culvert
- Riparian Drainage
- Wetland Drainage
- Other Waters Drainage
- Surveyed Earthen Ditch
- Ricefield Wetland

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Tisdale Weir
4. PLSS: T. 14, R. 1 E

Drawn By: Sacha Selim	Dec 2010

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE\00778_10_GRIMES\MAPDOC\CULTURAL\CULTURAL_APE_VISIBILITY\CULTURAL_APE_VISIBITLY_REPORT_20110124.MXD SS (01-25-11)

Appendix A
Area of Potential Effects
Grimes Pipeline Project
December 2010
Sheet 6 of 8

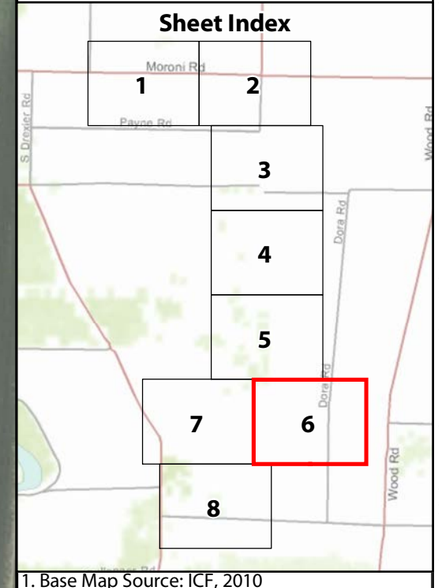
- Area of Potential Effects and Survey Coverage
- Natural Gas Pipeline Alignment
- Bore
- Project Element
- Construction Laydown Area
- Pipeline Work Area
- Visibillity Area
- Unsurveyed Area
- Culvert
- Riparian Drainage
- Wetland Drainage
- Other Waters Drainage
- Surveyed Earthen Ditch
- Ricefield Wetland

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Tisdale Weir
4. PLSS: T. 14, R. 1 E

Drawn By: Sacha Selim	Dec 2010

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE\00778_10_GRIMES\MAPDOC\CULTURAL\CULTURAL_APE_VISIBILITY\CULTURAL_APE_VISIBITLY_REPORT_20110124.MXD SS (01-25-11)

Appendix A
Area of Potential Effects
Grimes Pipeline Project
December 2010
Sheet 7 of 8

121°52'50"W
121°52'40"W
121°52'30"W
121°52'20"W
39°5'10"N
39°5'0"N

0% Visibility
0-10% Visibility
75% Visibility
Surveyed Earthen Ditch 100% Visibility
100% Visibility
S Meridian Rd

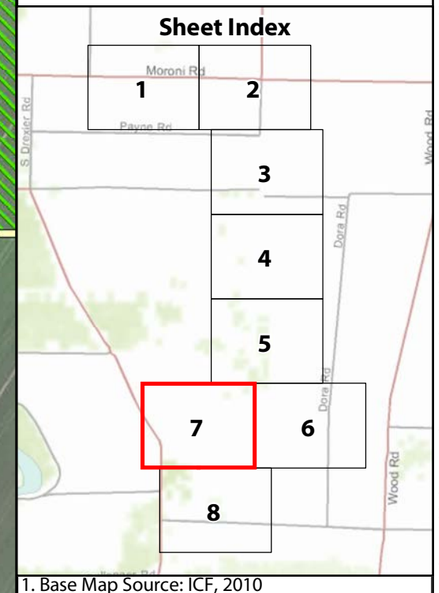
- Area of Potential Effects and Survey Coverage
- Natural Gas Pipeline Alignment
- Bore
- Project Element
- Construction Laydown Area
- Pipeline Work Area
- Visibillity Area
- Unsurveyed Area
- Culvert
- Riparian Drainage
- Wetland Drainage
- Other Waters Drainage
- Surveyed Earthen Ditch
- Ricefield Wetland

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



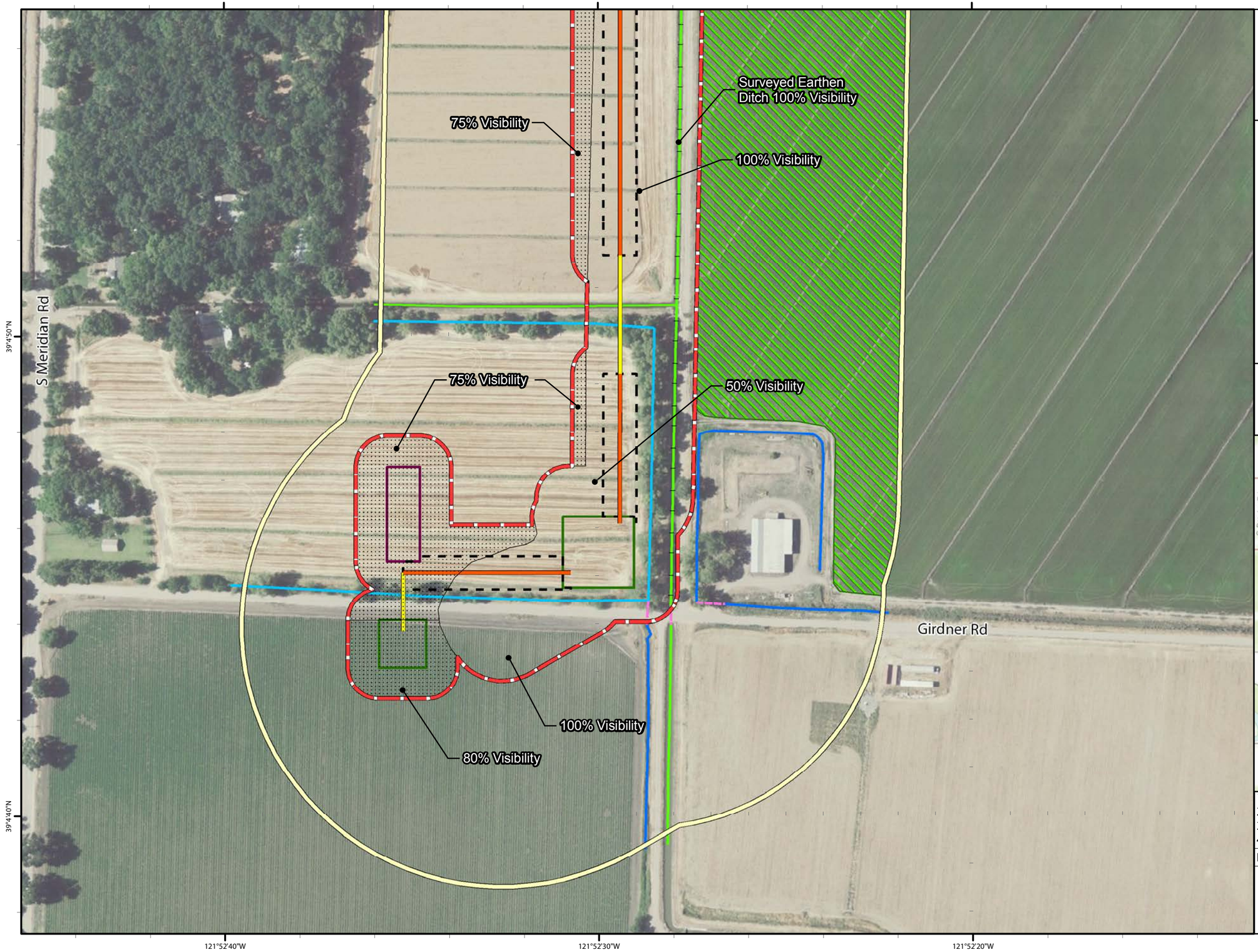
1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Grimes & Tisdale Weir
4. PLSS: T. 14, R. 1 E

Drawn By: Sacha Selim	Dec 2010

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE_00776_10_GRIMES\MAPDOC\CULTURAL\CULTURAL_APE_VISIBILITY\CULTURAL_APE_VISIBILITY_REPORT_20110124.MXD SS (01-25-11)

Appendix A
Area of Potential Effects
Grimes Pipeline Project
December 2010
Sheet 8 of 8



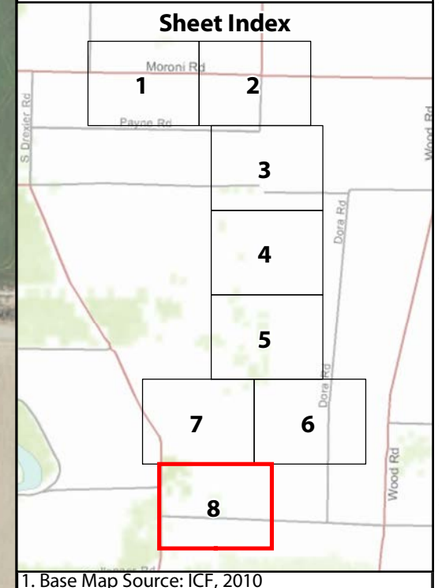
- Area of Potential Effects and Survey Coverage
- Natural Gas Pipeline Alignment
- Bore
- Project Element
- Construction Laydown Area
- Pipeline Work Area
- Visibillity Area
- Unsurveyed Area
- Culvert
- Riparian Drainage
- Wetland Drainage
- Other Waters Drainage
- Surveyed Earthen Ditch
- Ricefield Wetland

N

0 50 100 200 Feet

1 inch = 200 feet

Sheet Index



1. Base Map Source: ICF, 2010
2. Aerial Source: ESRI / Aerial Express 2007
3. USGS Topo Quad: Grimes & Tisdale Weir
4. PLSS: T. 14, R. 1 E

Drawn By: Sacha Selim	Dec 2010

ICF INTERNATIONAL

K:\PROJECTS_1\CALPINE\00778_10_GRIMES\MAPDOC\CULTURAL\CULTURAL_APE_VISIBILITY\CULTURAL_APE_VISIBITLY_REPORT_20110124.MXD SS (01-25-11)

Appendix B

Records Search and Related Correspondence

California Historical Resources Information System

CONFIDENTIAL RECORDS SEARCH REQUEST FORM

Date: 10/13/2010 Access Agreement Number: _____

TO: Northeast Information Center

Name: Gabriel Roark, M.A.

Affiliation: ICF International

Address: 630 K Street, Suite 400

City: Sacramento State: CA Zip: 95814

Email: groark@icfi.com

Phone: 916/231-9538 Cell Phone: 916/752-0983 Fax: 916/737-3030

Project Name / Reference: Sutter Linears and Grimes Pipelines

Project Street Address: N/A

Project Description: Installation of natural gas pipeline, electrical transmission line tie-ins, and substations.

County: Sutter

USGS 7.5' Quad: Gilsizer Slough and Tisdale Weir 7.5-minute

Township/Range/Section or UTMs: _____

PRIORITY RESPONSE (Additional Fee): ◉yes /○no

EMERGENCY RESPONSE (Additional Fee): ○yes /◉no

TOTAL FEE NOT TO EXCEED: $ 1,000

Special Instructions: Fed-Ex Number 104658440

California Historical Resources Information System

CONFIDENTIAL RECORDS SEARCH REQUEST FORM (continued)

Include the following information (check as necessary) for the records search area shown on the attached map. Any selection left unmarked will be considered a "0" or a "no. "

Map of Resource Locations:	within search area	[x] yes	[ ] no
	within 0.25 mi radius	[x] yes	[ ] no
Resource Database Printout:	within search area	[ ] yes	[x] no
	within _____ mi radius	[ ] yes	[x] no
Copy of Resource Records:	within search area	[x] yes	[ ] no
	within 0.25 mi radius	[x] yes	[ ] no
Map of Report Locations:	within search area	[x] yes	[ ] no
	within 0.25 mi radius	[x] yes	[ ] no
Report Database Printout:	within search area	[ ] yes	[x] no
	within _____ mi radius	[ ] yes	[x] no
Copy of Entire Report:	within search area	[ ] yes	[x] no
	within _____ mi radius	[ ] yes	[x] no
Copy of Title Page Only:	within search area	[x] yes	[ ] no
	within 0.25 mi radius	[x] yes	[ ] no

		REVIEW	PROVIDE DOCUMENTATION
OHP Historic Properties Directory*:	within search area	[x] yes [ ] no	[x] yes [ ] no
	within 0.25 mi radius	[x] yes [ ] no	[ ] yes [x] no
OHP Archaeological Determinations of Eligibility:	within search area	[x] yes [ ] no	[x] yes [ ] no
	within 0.25 mi radius	[ ] yes [x] no	[ ] yes [x] no
California Inventory of Historical Resources (1976):	within search area	[x] yes [ ] no	[x] yes [ ] no
	within 0.25 mi radius	[x] yes [ ] no	[ ] yes [x] no

*Includes, but not limited to, information regarding National Register of Historic Places, California Register of Historical Resources, California State Historical Landmarks, California State Points of Historical Interest, and historic building surveys.

Listed below are sources of additional information that may be available at the Information Center. Indicate if a review and documentation of any of the following types of information is requested.

Caltrans Bridge Survey	[x] yes	[ ] no
Ethnographic Information	[ ] yes	[x] no
Historical Literature	[x] yes	[ ] no
Historical Maps	[x] yes	[ ] no
Local Inventories	[x] yes	[ ] no
Plat Maps	[x] yes	[ ] no
Shipwreck Inventory	[ ] yes	[x] no
Soil Survey Maps	[ ] yes	[x] no

Appendix C

Native American Correspondence

California Historical Resources Information System

CONFIDENTIAL RECORDS SEARCH REQUEST FORM (continued)

Include the following information (check as necessary) for the records search area shown on the attached map. Any selection left unmarked will be considered a "0" or a "no. "

Map of Resource Locations:	within search area	[x] yes	[ ] no
	within 0.25 mi radius	[x] yes	[ ] no
Resource Database Printout:	within search area	[ ] yes	[x] no
	within _____ mi radius	[ ] yes	[x] no
Copy of Resource Records:	within search area	[x] yes	[ ] no
	within 0.25 mi radius	[x] yes	[ ] no
Map of Report Locations:	within search area	[x] yes	[ ] no
	within 0.25 mi radius	[x] yes	[ ] no
Report Database Printout:	within search area	[ ] yes	[x] no
	within _____ mi radius	[ ] yes	[x] no
Copy of Entire Report:	within search area	[ ] yes	[x] no
	within _____ mi radius	[ ] yes	[x] no
Copy of Title Page Only:	within search area	[x] yes	[ ] no
	within 0.25 mi radius	[x] yes	[ ] no

		REVIEW	PROVIDE DOCUMENTATION
OHP Historic Properties Directory*:	within search area	[x] yes [ ] no	[x] yes [ ] no
	within 0.25 mi radius	[x] yes [ ] no	[ ] yes [x] no
OHP Archaeological Determinations of Eligibility:	within search area	[x] yes [ ] no	[x] yes [ ] no
	within 0.25 mi radius	[ ] yes [x] no	[ ] yes [x] no
California Inventory of Historical Resources (1976):	within search area	[x] yes [ ] no	[x] yes [ ] no
	within 0.25 mi radius	[x] yes [ ] no	[ ] yes [x] no

*Includes, but not limited to, information regarding National Register of Historic Places, California Register of Historical Resources, California State Historical Landmarks, California State Points of Historical Interest, and historic building surveys.

Listed below are sources of additional information that may be available at the Information Center. Indicate if a review and documentation of any of the following types of information is requested.

Caltrans Bridge Survey	[x] yes	[ ] no
Ethnographic Information	[ ] yes	[x] no
Historical Literature	[x] yes	[ ] no
Historical Maps	[x] yes	[ ] no
Local Inventories	[x] yes	[ ] no
Plat Maps	[x] yes	[ ] no
Shipwreck Inventory	[ ] yes	[x] no
Soil Survey Maps	[ ] yes	[x] no

STATE OF CALIFORNIA Arnold Schwarzenegger, *Governor*

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
Fax (916) 657-5390

December 22, 2010

Andrea Nardin, Archaeologist
ICF International
630 K Street, Suite 400
Sacramento, CA 95814

Sent by Fax: 916-737-3030
Number of Pages: 2

RE: Grimes Pipeline, Sutter County

Dear Ms. Nardin:

A record search of the sacred lands file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 653-4040.

Sincerely,

Katy Sanchez

Katy Sanchez
Program Analyst

Native American Contact List
Sutter County
December 22, 2010

Mechoopda Indian Tribe of Chico Rancheria
Dennis E. Ramirez, Chairperson
125 Mission Ranch Blvd
Chico , CA 95926
dramirez@mechoopda-nsn.gov
(530) 899-8922 ext 215
(530) 899-8517 - Fax
Mechoopda Maidu
Concow

Enterprise Rancheria of Maidu Indians
Glenda Nelson, Chairperson
3690 Olive Hwy
Oroville , CA 95966
eranch@cncnet.com
(530) 532-9214
(530) 532-1768 FAX
Maidu

Mechoopda Indian Tribe of Chico Rancheria
Paula Cuddeford, Tribal Administrator
125 Mission Ranch Blvd
Chico , CA 95926
pcuddeford@mechoopda-nsn.
(530) 899-8922 ext-209
Fax: (530) 899-8517
Mechoopda Maidu
Concow

Mechoopda Indian Tribe of Chico Rancheria
Mike DeSpain, Director - OEPP
125 Mission Ranch Blvd
Chico , CA 95926
mdespain@mechoopda-nsn.gov
(530) 899-8922 ext 219
(530) 899-8517 - Fax
Mechoopda Maidu
Concow

Strawberry Valley Rancheria
Cathy Bishop, Chairperson
PO Box 667
Marysville , CA 95901
catfrmsac2@yahoo.com
916-501-2482
Maidu
Miwok

Enterprise Rancheria of Maidu Indians
Art Angle, Vice Chairperson
3690 Olive Hwy
Oroville , CA 95966
eranch@cncnet.com
(530) 532-9214
(530) 532-1768 FAX
Maidu

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Grimes Pipeline; Sutter County.

December 28, 2010

Mechoopda Indian Tribe of Chico Rancheria
Paula Cuddeford, Tribal Administrator
125 Mission Ranch Blvd.
Chico, CA 95926

Subject: Venoco Grimes Connection Natural Gas Project, Sutter County

Dear Ms. Cuddeford:

Calpine is proposing to purchase approximately 10 MMCFD of pipeline quality natural gas from the Venoco Grimes natural gas field. It will be routed through the Calpine Pipeline system to the Sutter Energy Center and possibly other Calpine power plants. Calpine will design and install approximately 4.5 kilometers of 15-centimeter pipeline in order to connect two of Venoco's delivery points to the Sutter lateral segment of the CPN pipeline system.

As part of the environmental compliance review for the project, ICF International is conducting a cultural resource study in this project area. As part of this effort, we are requesting information and views concerning cultural resources from Native American organizations and individuals near the project area. Your contact information was provided to us by the Native American Heritage Commission on December 22, 2010. Your efforts in this process provide invaluable information for the proper identification and treatment of cultural resources that may be affected by the proposed project. To date, no cultural resources have been identified in the project area.

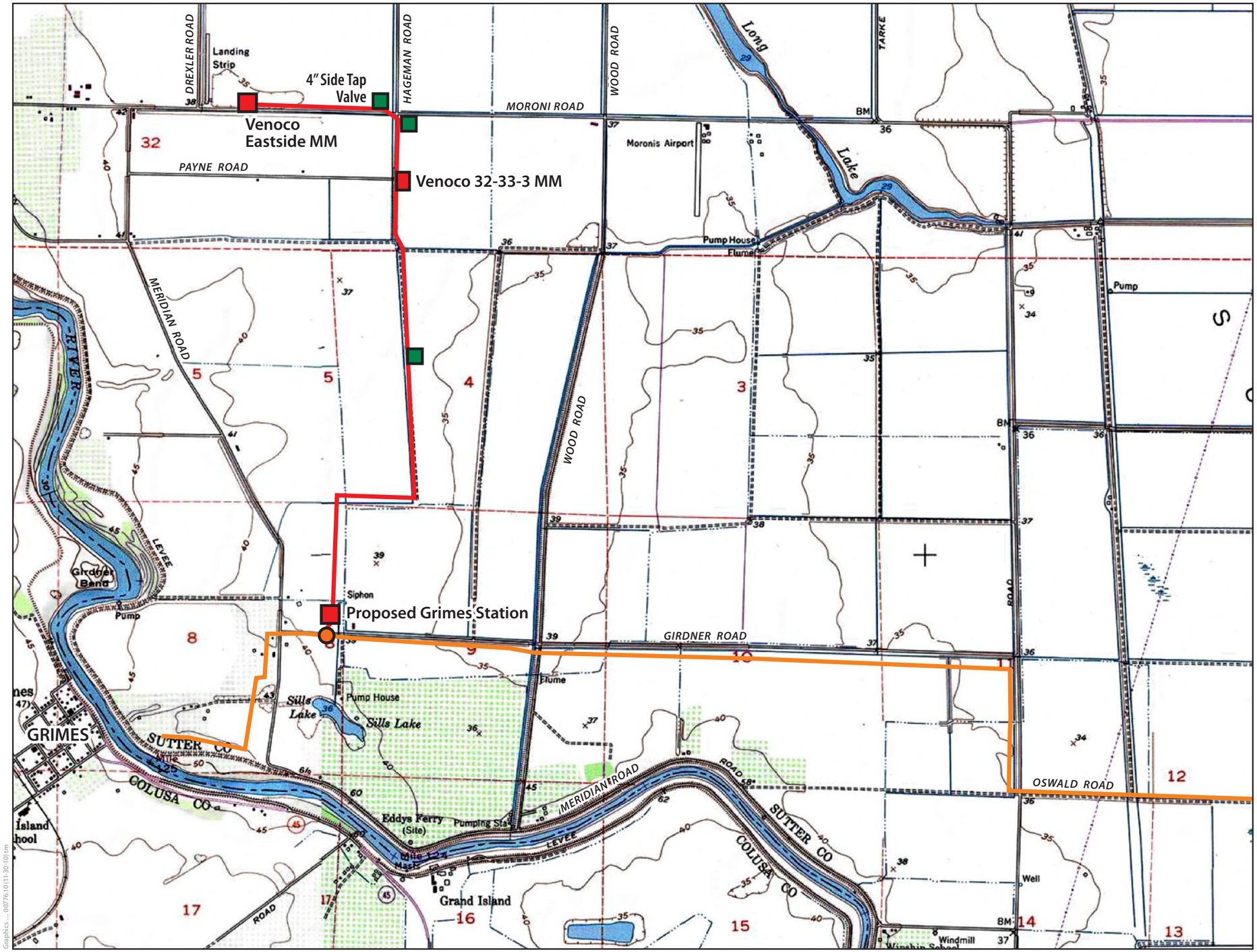
If you have any questions or comments regarding resources in the proposed project area, please call Gabriel Roark (916-737-3000). All comments and letters received will be included in the reports generated by this study. Thank you for your time and attention to this matter.

Sincerely,

Gabriel Roark

Attachment: Figure 1—Grimes Pipeline Project Location

630 K Street, Suite 400 — Sacramento, CA 95814 — 916.737.3000 — 916.737.3030 fax — icfi.com



Legend

- Proposed 6-inch Natural Gas Pipeline
- Existing 20-inch Sutter Energy Center Gas Pipeline
- Below Ground Hot Tap and Valve
- Proposed Construction Laydown Area
- Venoco's Existing Master Meter Sites and Proposed Grimes Station Site

N

1,000 0 1,000 2,000 3,000 4,000

feet

Scale = 1:24,000

Base Map:
National Geographic TOPO
Gilsizer Slough, CA (1973), Tilsdale Weir, CA (1973)

Graphics... 0077s.10 (11-30-10) rm

ICF INTERNATIONAL

Figure 1
Grimes Pipeline Project Location

December 28, 2010

Mechoopda Indian Tribe of Chico Rancheria
Mike DeSpain, Director—OEPP
125 Mission Ranch Blvd.
Chico, CA 95926

Subject: Venoco Grimes Connection Natural Gas Project, Sutter County

Dear Mr. DeSpain:

Calpine is proposing to purchase approximately 10 MMCFD of pipeline quality natural gas from the Venoco Grimes natural gas field. It will be routed through the Calpine Pipeline system to the Sutter Energy Center and possibly other Calpine power plants. Calpine will design and install approximately 4.5 kilometers of 15-centimeter pipeline in order to connect two of Venoco's delivery points to the Sutter lateral segment of the CPN pipeline system.

As part of the environmental compliance review for the project, ICF International is conducting a cultural resource study in this project area. As part of this effort, we are requesting information and views concerning cultural resources from Native American organizations and individuals near the project area. Your contact information was provided to us by the Native American Heritage Commission on December 22, 2010. Your efforts in this process provide invaluable information for the proper identification and treatment of cultural resources that may be affected by the proposed project. To date, no cultural resources have been identified in the project area.

If you have any questions or comments regarding resources in the proposed project area, please call Gabriel Roark (916-737-3000). All comments and letters received will be included in the reports generated by this study. Thank you for your time and attention to this matter.

Sincerely,

Gabriel Roark

Attachment: Figure 1—Grimes Pipeline Project Location

630 K Street, Suite 400 — Sacramento, CA 95814 — 916.737.3000 — 916.737.3030 fax — icfi.com

December 28, 2010

Mechoopda Indian Tribe of Chico Rancheria
Dennis E. Ramirez, Chairperson
125 Mission Ranch Blvd.
Chico, CA 95926

Subject: Venoco Grimes Connection Natural Gas Project, Sutter County

Dear Mr. Chairperson:

Calpine is proposing to purchase approximately 10 MMCFD of pipeline quality natural gas from the Venoco Grimes natural gas field. It will be routed through the Calpine Pipeline system to the Sutter Energy Center and possibly other Calpine power plants. Calpine will design and install approximately 4.5 kilometers of 15-centimeter pipeline in order to connect two of Venoco's delivery points to the Sutter lateral segment of the CPN pipeline system.

As part of the environmental compliance review for the project, ICF International is conducting a cultural resource study in this project area. As part of this effort, we are requesting information and views concerning cultural resources from Native American organizations and individuals near the project area. Your contact information was provided to us by the Native American Heritage Commission on December 22, 2010. Your efforts in this process provide invaluable information for the proper identification and treatment of cultural resources that may be affected by the proposed project. To date, no cultural resources have been identified in the project area.

If you have any questions or comments regarding resources in the proposed project area, please call Gabriel Roark (916-737-3000). All comments and letters received will be included in the reports generated by this study. Thank you for your time and attention to this matter.

Sincerely,

Gabriel Roark

Attachment: Figure 1—Grimes Pipeline Project Location

630 K Street, Suite 400 — Sacramento, CA 95814 — 916.737.3000 — 916.737.3030 fax — icfi.com

December 28, 2010

Enterprise Rancheria of Maidu Indians
Art Angle, Vice Chairperson
2133 Monte Vista Ave.
Oroville, California 95966

Subject: Venoco Grimes Connection Natural Gas Project, Sutter County

Dear Mr. Vice Chairperson:

Calpine is proposing to purchase approximately 10 MMCFD of pipeline quality natural gas from the Venoco Grimes natural gas field. It will be routed through the Calpine Pipeline system to the Sutter Energy Center and possibly other Calpine power plants. Calpine will design and install approximately 4.5 kilometers of 15-centimeter pipeline in order to connect two of Venoco's delivery points to the Sutter lateral segment of the CPN pipeline system.

As part of the environmental compliance review for the project, ICF International is conducting a cultural resource study in this project area. As part of this effort, we are requesting information and views concerning cultural resources from Native American organizations and individuals near the project area. Your contact information was provided to us by the Native American Heritage Commission on December 22, 2010. Your efforts in this process provide invaluable information for the proper identification and treatment of cultural resources that may be affected by the proposed project. To date, no cultural resources have been identified in the project area.

If you have any questions or comments regarding resources in the proposed project area, please call Gabriel Roark (916-737-3000). All comments and letters received will be included in the reports generated by this study. Thank you for your time and attention to this matter.

Sincerely,

Gabriel Roark

Attachment: Figure 1—Grimes Pipeline Project Location

630 K Street, Suite 400 — Sacramento, CA 95814 — 916.737.3000 — 916.737.3030 fax — icfi.com

December 28, 2010

Enterprise Rancheria of Maidu Indians
Art Angle, Vice Chairperson
3690 Olive Hwy
Oroville, CA 95966

Subject: Venoco Grimes Connection Natural Gas Project, Sutter County

Dear Mr. Vice Chairperson:

Calpine is proposing to purchase approximately 10 MMCFD of pipeline quality natural gas from the Venoco Grimes natural gas field. It will be routed through the Calpine Pipeline system to the Sutter Energy Center and possibly other Calpine power plants. Calpine will design and install approximately 4.5 kilometers of 15-centimeter pipeline in order to connect two of Venoco's delivery points to the Sutter lateral segment of the CPN pipeline system.

As part of the environmental compliance review for the project, ICF International is conducting a cultural resource study in this project area. As part of this effort, we are requesting information and views concerning cultural resources from Native American organizations and individuals near the project area. Your contact information was provided to us by the Native American Heritage Commission on December 22, 2010. Your efforts in this process provide invaluable information for the proper identification and treatment of cultural resources that may be affected by the proposed project. To date, no cultural resources have been identified in the project area.

If you have any questions or comments regarding resources in the proposed project area, please call Gabriel Roark (916-737-3000). All comments and letters received will be included in the reports generated by this study. Thank you for your time and attention to this matter.

Sincerely,

Gabriel Roark

Attachment: Figure 1—Grimes Pipeline Project Location

630 K Street, Suite 400 — Sacramento, CA 95814 — 916.737.3000 — 916.737.3030 fax — icfi.com

Enterprise Rancheria of Maidu Indians
Glenda Nelson, Chairperson
2133 Monte Vista Ave.
Oroville, California 95966

Subject: Venoco Grimes Connection Natural Gas Project, Sutter County

Dear Ms. Chairperson:

Calpine is proposing to purchase approximately 10 MMCFD of pipeline quality natural gas from the Venoco Grimes natural gas field. It will be routed through the Calpine Pipeline system to the Sutter Energy Center and possibly other Calpine power plants. Calpine will design and install approximately 4.5 kilometers of 15-centimeter pipeline in order to connect two of Venoco's delivery points to the Sutter lateral segment of the CPN pipeline system.

As part of the environmental compliance review for the project, ICF International is conducting a cultural resource study in this project area. As part of this effort, we are requesting information and views concerning cultural resources from Native American organizations and individuals near the project area. Your contact information was provided to us by the Native American Heritage Commission on December 22, 2010. Your efforts in this process provide invaluable information for the proper identification and treatment of cultural resources that may be affected by the proposed project. To date, no cultural resources have been identified in the project area.

If you have any questions or comments regarding resources in the proposed project area, please call Gabriel Roark (916-737-3000). All comments and letters received will be included in the reports generated by this study. Thank you for your time and attention to this matter.

Sincerely,

Gabriel Roark

Attachment: Figure 1—Grimes Pipeline Project Location

December 28, 2010

Enterprise Rancheria of Maidu Indians
Glenda Nelson, Chairperson
3690 Olive Hwy
Oroville, CA 95966

Subject: Venoco Grimes Connection Natural Gas Project, Sutter County

Dear Ms. Chairperson:

Calpine is proposing to purchase approximately 10 MMCFD of pipeline quality natural gas from the Venoco Grimes natural gas field. It will be routed through the Calpine Pipeline system to the Sutter Energy Center and possibly other Calpine power plants. Calpine will design and install approximately 4.5 kilometers of 15-centimeter pipeline in order to connect two of Venoco's delivery points to the Sutter lateral segment of the CPN pipeline system.

As part of the environmental compliance review for the project, ICF International is conducting a cultural resource study in this project area. As part of this effort, we are requesting information and views concerning cultural resources from Native American organizations and individuals near the project area. Your contact information was provided to us by the Native American Heritage Commission on December 22, 2010. Your efforts in this process provide invaluable information for the proper identification and treatment of cultural resources that may be affected by the proposed project. To date, no cultural resources have been identified in the project area.

If you have any questions or comments regarding resources in the proposed project area, please call Gabriel Roark (916-737-3000). All comments and letters received will be included in the reports generated by this study. Thank you for your time and attention to this matter.

Sincerely,

Gabriel Roark

Attachment: Figure 1—Grimes Pipeline Project Location

630 K Street, Suite 400 — Sacramento, CA 95814 — 916.737.3000 — 916.737.3030 fax — icfi.com

December 28, 2010

Strawberry Valley Rancheria
Cathy Bishop, Chairperson
PO Box 667
Marysville, CA 95901

Subject: Venoco Grimes Connection Natural Gas Project, Sutter County

Dear Ms. Chairperson:

Calpine is proposing to purchase approximately 10 MMCFD of pipeline quality natural gas from the Venoco Grimes natural gas field. It will be routed through the Calpine Pipeline system to the Sutter Energy Center and possibly other Calpine power plants. Calpine will design and install approximately 4.5 kilometers of 15-centimeter pipeline in order to connect two of Venoco's delivery points to the Sutter lateral segment of the CPN pipeline system.

As part of the environmental compliance review for the project, ICF International is conducting a cultural resource study in this project area. As part of this effort, we are requesting information and views concerning cultural resources from Native American organizations and individuals near the project area. Your contact information was provided to us by the Native American Heritage Commission on December 22, 2010. Your efforts in this process provide invaluable information for the proper identification and treatment of cultural resources that may be affected by the proposed project. To date, no cultural resources have been identified in the project area.

If you have any questions or comments regarding resources in the proposed project area, please call Gabriel Roark (916-737-3000). All comments and letters received will be included in the reports generated by this study. Thank you for your time and attention to this matter.

Sincerely,

Gabriel Roark

Attachment: Figure 1—Grimes Pipeline Project Location

630 K Street, Suite 400 — Sacramento, CA 95814 — 916.737.3000 — 916.737.3030 fax — icfi.com

From: M DeSpain [mdespain@mechoopda-nsn.gov]
Sent: Friday, January 07, 2011 9:14 AM
To: Roark, Gabriel
Cc: Dennis Ramirez; Dave Singleton; Ren Reynolds; Robert Columbro; Rhonda Dickerson; Julie McIntosh; Glenda Nelson; S Knight
Subject: RE: Venoco Grimes Pipeline Project

Importance: High

Good morning Gabriel; Thank you for the notice, understanding the process, I would have thought that your firm or the lead agency would have gave notice prior to any field work or the request of Tribes from NAHC. Though this notification via electronic e-mail was in my opinion a good idea and then followed up with the correct procedure via a written document still does not address the requirement of Section 106, NEPA or CEQA! The process of contacting the Tribes should have started prior to any field work that was conducted by your firm. The Mechoopda Indian Tribe would like to request the notification date of the proposed project starting date when your firm was awarded the contract, this is where as part of the process agencies like the SHPO and USFWS are notified and have 30 days to respond. The Tribe is very concerned of the cultural resources in the area! Being agricultural land and regardless of weather should not have precluded the notification process at the earliest possible time frame within the project scope of work for comments. Mechoopda Indian Tribe currently invoices field monitoring work at $55.00 an hour, this includes mileage but does not per-diem if the study is longer that eight (8) hours. (Please forward to Berry Creek and Colusa also). Thank you for your time

From: Roark, Gabriel [mailto:GRoark@icfi.com]
Sent: Wednesday, January 05, 2011 12:12 PM
To: M DeSpain
Subject: Venoco Grimes Pipeline Project

Good afternoon, Mike,

Thank you for responding to the email that my associate, Teresa Giffen, sent to you last week. It is not normally my way to have another colleague send correspondence on my behalf, but I was out ill and wanted to make sure that you received notification concerning the project as soon as possible. Your suggestions regarding further contacts (additional tribes) were helpful; the Commission provided me with a surprisingly attenuated list this time round (included only Mechoopda, Enterprise, and Strawberry).

The project is situated almost completely in rice fields, which severely constrain survey access, being wet or covered in vegetation most of the year. We were able to get crop schedules from the landowners for this project and found that most of the fields would have been harvested at intervals in October. This was the best time to survey, so we surveyed the majority of the project area in that month. So far, we have found no cultural resources of any kind.

About 1.5 weeks ago, I found that the client, CPN Pipeline Company, added new project elements outside of our survey area. I am planning to survey these areas tomorrow or Friday. You or your staff are welcome to meet us in the field, accompany us on the survey, and review the entire project area (not just the new additions) if you can make those dates. I realize that this is poor notice and apologize. The Commission only responded to our information request on December 22 and I did not receive the notice till near close of business on the 23rd.

I also have to let you know that CPN Pipeline is not compensating additional consultants for their time on the project. May I ask what Mechoopda's rate or fee is for this sort of in-field consultation? I would like to plan for incorporating such a fee as a contingency in future projects. The project site is probably 2 hours from your office. I expect that we will be in the field for 4 hours to conduct the survey and review the alignment. Probably a full day for you.

Best Regards,

Gabriel

GABRIEL ROARK, M.A. | Senior Archaeologist | 916.737.3000 | groark@icfi.com | icfi.com
ICF INTERNATIONAL | 630 K Street, Suite 400, Sacramento, CA 95814 | 916.737.3030 (f) | 916.752.0983 (m)
In January, ICF Jones & Stokes became ICF International.
? Please consider the environment before printing this e-mail.

From: Dave Singleton [ds_nahc@pacbell.net]
Sent: Monday, January 10, 2011 4:00 PM
To: M DeSpain
Cc: Roark, Gabriel; Dennis Ramirez; Ren Reynolds; Robert Columbro; Rhonda Dickerson; Julie McIntosh; Glenda Nelson; S Knight
Subject: Re: Venoco Grimes Pipeline Project
Attachments: Larry's letter to BLM Sc. 106 10-25-10.pdf; ATT00001.htm; Larry's Letter to BLM Sec. 106.pdf; ATT00002.htm

Importance: High

STATE OF CALIFORNIA Edmund G. Brown, Jr.,, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
e-mail: ds_nahc@pacbell.net

January 10, 2011\

Mr. Mike DeSpain, EPA/ Cultural Resources Dierector
MECHOOPDA INDIAN TRIBE
Chico, CA 95926

Dear Mike, Gabriel and e-mail Correspondents on This Project:

RE: Venoco Grimes Pipeline Project

The Native American Heritage Commission (NAHC) while not fully versed on the proposed, the project, the issues raised in the e-mails, particularly from Robert Columbro of Shingle Springs Rancheria touch on issues and concerns that have tribes, and tribal advacates and the NAHC very angry about the current tribal consultation process. In fact, increasingly with the renewable energy and other major infrastructure projects, including all Caltrans projects which are NEPA/CEQA per 23 CFR Sec. 329 (P.L. 109-59), the NANC and tribes feel abused by the consultation process.. The main reason is the lack of respect for the concerns by tribal representatives for their known sacred sites and for their recommendations and the unwillingness of project proponents to include tribes as development partners in any manner whatsoever. What the on-slought of ARRA (federal Economic Stimulus), renewable energy

and other federally-assisted 'fast track' projects has resulted in is a rising outcry by tribes and Native Americans about the callous way there concerns are being received. It has also brought greater divide between the Native American and the archaeological community. The following are some of those concerns and our comments:

Sacred Sties: Archaeologists come to the NAHC for a Sacred Lands File search and for a Native American Contacts list. What for: to document their due diligence on a project. The sites those folks are concerned about are Tribal Cultural Properties (TCPs); that is recorded sites that are eligible for the National Register of Historic Places, pursuant to federal Advisory Council criteria. What about sites that Native American consider sacred, many of which are recorded by 'oral tradition' or other traditional ways. NOT CONSIDERED. (Please see the attached letters for NAHC Manager, Larry Myers, to BLM on this issue.

The NAHC "Sacred Sites,' are defined by the California Legislature in California Public Resources Code §§5097.94(a) and 5097.96. Items in the NAHC Sacred Lands Inventory are confidential and exempt from the Public Records Act pursuant to California Government Code §6254.10. The absence of evidence of archaeological items does not indicate that they do not exist at the subsurface and/or when groundbreaking activity occurs; that is why the NAHC refers project Lead Agencies to the Native American on an attached list – these folks, not even the NAHC, are the real experts to identify and recommend concerning sites, sacred to Native Americans. On the federal level, confidentiality of "historic properties of religious and cultural significance" may also be protected under Section 304 of he NHA or at the Secretary of the Interior discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C., 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APE and possibility threatened by proposed project activity.

Therefore, the NAHC recommends consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries of cultural resources or burial sites once a project is underway. Culturally affiliated tribes and individuals may have knowledge of the religious and cultural significance of the historic properties in the project area (e.g. the Area of Potential Effect or APE)., to see if the proposed project might impact Native American cultural resources and to obtain their recommendations concerning the proposed project. The NAHC is now stressing that consultation with Native American communities is also a matter of environmental justice as defined by California Government Code §65040.12(e). The NAHC, further, recommends avoidance as defined by CEQA Guidelines §15370(a) to pursuing a project that would damage or destroy a Native American cultural resource.

It is fine for the project proponent to also check with the Information Center at Chico State, part of the California Historical Resources Information System (CHRIS) to see if any professional archaeologist recorded any sites in the project area (e.g. APE), But do not discount those sites that are identified or about which concerns are raised by California Indian people.

Also, consultation with tribes and interested Native American consulting parties, on the NAHC list, should be conducted in compliance with the requirements of federal NEPA (42 U.S.C 4321-43351) and Section 106 and 4(f) of federal NHPA (16 U.S.C. 470 et seq), 36 CFR Part 800.3 (f) (2) & .5, the President's Council on Environmental Quality (CSQ, 42 U.S.C 4371 et seq. and NAGPRA (25 U.S.C. 3001-3013) as appropriate. The 1992 Secretary of the Interiors Standards for the Treatment of Historic Properties were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including cultural landscapes. Also, federal Executive Orders Nos. 11593 (preservation of cultural environment), 13175 (coordination & consultation) and 13007 (Sacred Sites) are helpful, supportive guides for Section 106 consultation. Lead agencies and project proponents also 'cut corners' here and do not make sure that tribes have offered comments based on all these sections of federal law. This is particularly true that the archaeologists do not ask Native Americans to present the historical context of these projects, or how the proposed project might fit into an cultural landscape tying the project to several visual and other items, even those at some distance away, cultural features in the general area.. Both of these concepts are presented in the Secretary of the Interior's Standards document and are generally not dealt with.

Native American Burials: Project proponents tend to not have protocols that would describe procedures in the event of the discovery of human remains that would be considered by the county coroner as Native American. Public Resources Code Section 5097.98, California Government Code §27491 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery'. These should be included in any project 'mitigation plan.'

Non federally-recognized tribes and Interested Native American Individuals: This is another area addressed in the attached letters from Larry Myers. Because many or most of these projects are driven by the Section 106, National Historic Preservation Act requirements, project proponents and their archaeologists discount non federally-recognized tribes. This discounts California Indian history that was dealt with unjustly by the federal government as none of the 1852 treaties, and one signed at Camp Bidwell in the Chico area, was ratified by the United States Senate. The Senate, without debate, refused ratification and conveniently 'lost' the documents until they were discovered in January 1905. So, it wrong for the project proponents and their contractors to continue this injustice, or cultural genocide, by avoiding non federally recognized tribes. Then, what about tribal elders who particularly expertise about the cultural resources/sites in or near the project area. Lead agencies and project staff discount them as well, as they do not meet the requirements of Section 106 consultation.

Native American tribes as Development Partners: To be effective, consultation on specific projects must be the result of an ongoing relationship between Native American tribes and lead agencies/developers and, project proponents and their contractors, in the opinion of the NAHC. Regarding tribal consultation, a relationship built around regular meetings and informal

involvement with local tribes will lead to more qualitative consultation tribal input on specific projects. This is totally avoided by most project Lead Agencies; tribal consultation for them is a perfunctorily task, a check activity.

In sum, California Indian Country is increasingly angry at the disrespect of their opinions, of their concerns for sacred sites, of disrespect for the their tribal sovereignty, and the abuse of their time and culture brought about by much of the Section 106 consultation process. Hopefully, the anger will result in changes to federal policy, as the NAHC proposes, and tougher regulatory and enforcement at the California state level now that the state has a new Governor, one who established the Native American Heritage Commission in 1977. The NAHC, the California Indian Assistance Project (CIAP, now abolished by State HCD), protection of Indian burial sites by the the state, beginning in the early 1970s, came about because California tribal leaders demeanded it. People like Mickey Gimmel, David Risling, Joe Carrillo, Vincent Havier, Henry Rodriguez, Walt Lara, Ralph DeGarmo, Florence Curl Jones, Marie Potts, Audrey Taylor, Vivan Hilstone, Mary Norton, Tilly Harwick, Doris Jackson Renick, Dorothy Stanley, Dorothy Joseph, Katherine Saubel, and many others. California Native American cultural survival is at a crossroads once again. So, I support the expressions made in these e-mails on this project. The NAHC knows this area along and near the Sacramento River to very culturally sensitive. You all keep up the good work in trying to protect those resources.

Sincerely,

Dave Singleton
Program Analyst

Enclosures

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
e-mail: ds_nahc@pacbell.net

October 25, 2010

Mr. Richard C. Hanes, Chief
Division of Cultural, Paleontological Resources and Tribal Consultation
United States Department of the Interior
BUREAU OF LAND MANAGEMENT
1849 "C" Street, N.W., Mail Stop 406-LS
Washington, D.C. 20240

Dear Mr. Hanes:

Re: Draft Programmatic Agreement (Revised) Among the Advisory Council on Historic Preservation, and, the National Conference of State Historic Preservation Officers regarding the Mann in which the BLM will meet its Responsibilities under the National Historic Preservation Act.

The Native American Heritage Commission (NAHC) of the State of California appreciates the opportunity to comment on the above referenced revised Agreement to require the Bureau of Land Management (BLM) to follow certain protocols in executing its responsibilities under Section 106, 110 (f) and 111 (a) of the National Historic Preservation Act (16 U.S.C. 470). The California NAHC is the 'trustee agency' for the protection and preservation of Native American cultural resources pursuant to California Public Resources Code §21070. The NAHC concerns regarding the revised draft Programmatic Agreement between BLM and responsible and cooperating agencies are two-fold:

1. Scope of Tribal Consultation: In the State of California, as a result of the failure of the United States Senate to ratify treaties with California tribes in 1852, many areas of the state have no federally recognized tribal governments with which to consult regarding proposed *federal actions.* Yet, California is known to have a large and dense population of indigenous American Indian tribes. California non-federally-recognized tribes have expertise in their respective cultural areas that is unique and not shared with federally recognized tribes. Therefore, the California NAHC recommends that BLM include them, as well as their Tribal Elders, as 'consulting parties' in the Section 106 consultation process.

2. Traditional Cultural Properties and California Sacred Sites: Many American Indian cultural resources are not listed nor have been evaluated as 'eligible for listing' in the National Register of Historic Places. In many cases, many sites that are considered by tribes as of religious or cultural significance by California tribes are *confidential* and known only to those tribes and/or its members. Thus, those sacred sites that may also include burial sites are not evaluated for eligibility for listing in the National Register. Also, the State of California has established a Sacred Lands File Inventory pursuant to California Public Resources Code §§ 5097.94 (a) and 5097.96 in order to have a

repository of sacred sites, identified and submitted by California Native Americans and housed at the Native American Heritage Commission. This repository is also exempt from the California Public Records Act pursuant to California Government Code 6254.10.

Therefore, because of the unique configuration and history of California Native American communities, with approximately 50 non federally-recognized tribes and the establishment of a California Sacred Lands File Inventory, to catalogue sites that are considered culturally significant to California tribes, we urge that the Bureau of Land Management contact non federally recognized tribes and their elders in the Section 106 consultation process.

If you have any questions about this response to your request for input on the revised Historic Preservation Agreement, please do not hesitate to contact me at (916) 653-4082.

Sincerely,

Larry Myers
Manager

Cc: Advisory Council on Historic Preservation

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
Fax (916) 657-5390
Web Site www.nahc.ca.gov

May 27, 2999

Mr. Mike Pool, Director
U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management, California Office
2800 Cottage Way
Sacramento, CA 95825

Dear Mr. Pool:

The California Native American Heritage Commission (NAHC) is the state's 'Trustee Agency' for the protection and preservation of Native American Cultural resources pursuant to CA Public Resources Code §21070. The NAHC also maintains a Sacred Lands Inventory (SLF), established by the California Legislature and codified in Public Resources Code §5097.94 (a); this inventory is exempt from the California Public Records Act (CA Government Code §6254.10.

Recently, our staff heard a presentation on the Bureau of Land Management's Solar Generation Projects to be located in the Mojave and Colorado deserts in Southern California; Ashley Conrad-Saydah, BLM renewable Energy Project Manager, presented the report. During the report Ms. Conrad-Saydah indicated that only published data with proper protocols would be accepted by BLM as comments on the proposed BLM-permitted solar projects. We are concerned that Tribal elders' concerns that the proposed projects might conflict with their Indian religious ceremonies, gathering places, hallowed village sites and burial grounds, normally unmarked, and sacred power places. Such expressions from the California Native American community are normally not written or recorded in a manner that a registered archaeologist might employ. The NAHC accepts into it Sacred Lands Inventory identified sacred sites, based on oral and ancient Native American traditions.

Furthermore, we feel that requiring recorded, written documentation on Native American sacred sites may not be consistent with requirements of the National Historic Preservation Act, as amended (NHPA, Section 106) 1(6 U.S.C. 470). Most, if not all, of the proposed renewable energy project in California come under the jurisdiction of both federal and state law. The NHPA requires Federal agencies to consider the effects of their undertakings on historic and cultural properties and provides an opportunity for Native American tribes and interested Native American individuals, to comment on such undertakings. Section 106 mandates consideration of Native American concerns of the project's effect on historic and sacred resources as the method by which a cultural

resource's significance is determined for a federal project under Section 4(f) of the NHPA.

Therefore, it would appear, based on Ms. Conrad-Saydah's presentation May 15, 2009, that that BLM standards for published documentation submitted by the public would preclude the form of comments and concerns normally used by the Native American community in California. BLM has a legal responsibility to consult with federally recognized Native American tribes and interested and interested Native American individuals, in order to allow them the opportunity to express, in whatever form they choose, the potential impact of proposed projects on cultural resources. And this agency is of the opinion that such input, based on the oral traditions of tribal cultures is ever bit as authentic as that which is recorded in federal or state agency archaeological files. The NAHC as well as BLM is a member of the RETI Stake-holders Steering Committee and is committed to working with BLM, cooperatively to facilitate the tribal and Native American individual consultation with regard to the proposed renewable energy projects.

If you have any other questions concerning the concerns outlined above, please do not hesitate to contact me at (916) 653-4082.

Sincerely,

Larry Myers
Executive Secretary

Cc: Milford Wayne Donaldson
State Historic Preservation Officer
State of California

James Fletcher, Superintendent (RETI SSC Member)
Bureau of Indian Affairs

Robert Doyel (RETI SSC Member)
BLM, California Office

Dave Olsen, Co-Coordinator
Renewable Energy Transmission Initiative (RETI)

Dave Singleton (RETI SSC Member)
Program Analyst
NAHC

From: M DeSpain [mdespain@mechoopda-nsn.gov]
Sent: Friday, January 21, 2011 1:07 PM
To: Roark, Gabriel; Dennis Ramirez; Dave Singleton; Ren Reynolds; Robert Columbro; Rhonda Dickerson; Julie McIntosh; Glenda Nelson; S Knight; Kathleen Campbell; Gilfillan, Mark A SPK; Dennis Ramirez; Dramirez48@comcast.net
Cc: Andrew Godsey
Subject: RE: Venoco Grimes Natural Gas Pipeline

Good day all; Thank you all for the site visit. I discussed the project with Mechoopda Indian Tribes Chairman this morning and he is in agreement of the request I made yesterday. They are as follows. 1) A funded Tribal Monitor be on site during all ground breaking activities, 2) the written report for the cultural survey that was done your company in October 2010 be sent to all the Tribes that attended the site visit and the other Tribes that have shown interest, 3) the biological report (mitigation measures) for the Black tail deer herd that is in the area that will be displaced by the project, 4) the notification process of Consultation be documented that the Tribes were not invited or attended the ground survey in October 2010. In my opinion, I believe the Cortina Rancheria should be the lead Tribe when the project moves forward with the ground work. Thank you all again, Mike

From: Roark, Gabriel
Sent: Tuesday, January 25, 2011 2:37 PM
To: 'Kathleen Campbell'; Dave Singleton; Dennis Ramirez; 'M DeSpain'; 'Crystal Dilworth'; Robert Columbro; Rhonda Dickerson; Ren Reynolds; Glenda Nelson; S Knight; Gilfillan, Mark A SPK; Dramirez48@comcast.net; 'Andrew Godsey'; Julie McIntosh
Cc: Bushnell-Bergfalk, Susan
Subject: Calpine Venoco-Grimes Field Review
Attachments: Grimes Field Notes Memo.docx

Good afternoon, all:

Attached please find my memorandum documenting the field meeting on January 20, 2011. Please review the memo and indicate any information that I may have missed or errors on my part. I will forward the memo to David Jones and Cortina Indian Rancheria under separate cover, as I only have a mailing address for him.

Thank you all for your participation in the field meeting, input up that point, and continued consultation.

Best regards,

Gabriel

GABRIEL ROARK, M.A. | Senior Archaeologist | 916.737.3000 | groark@icfi.com | icfi.com
ICF INTERNATIONAL | 630 K Street, Suite 400, Sacramento, CA 95814 | 916.737.3030 (f) | 916.752.0983 (m)
In January, ICF Jones & Stokes became ICF International.
? Please consider the environment before printing this e-mail.

Memorandum

Date:	January 25, 2011
To:	Kathleen Campbell, Environmental Permitting Manager Calpine Corporation 4160 Dublin Boulevard, Suite 100 Dublin, CA 94568-7755
Cc:	Sue Bushnell-Bergfalk (ICF), Crystal Dilworth (Shingle Springs), Akisha Marshall (Shingle Springs), Robert Columbro (Shingle Springs), Mike DeSpain (Mechoopda Indian Tribe), David Jones (Cortina Rancheria), Jeff Little (GTS), Dave Singleton (Native American Heritage Commission)
From:	Gabriel Roark Archaeologist
Subject:	**Venoco–Grimes Natural Gas Pipeline Field Meeting, January 20, 2011**

Dear Ms. Campbell:

The following is a summary of the field meeting and tribal consultation for the Venoco–Grimes Natural Gas Pipeline Project, held January 20, 2011. Attendees consisted of

- Crystal Dilworth (Shingle Springs Band of Miwok Indians, hereafter "Shingle Springs Band")
- Akisha Marshall (Shingle Springs Band)
- Robert Columbro (Shingle Springs Band)
- Mike DeSpain (Mechoopda Indian Tribe of Chico Rancheria, hereafter "Mechoopda Indian Tribe")
- David Jones (Cortina Indian Rancheria)
- Jeff Little (GTS)
- Kathleen Campbell (Calpine Environmental Permitting Manager)
- Gabriel Roark (ICF)

The above listed individuals met at the California Highway Patrol (CHP) office in Williams at 8:30 a.m. (excepting Ms. Dilworth and Ms. Marshall) to make introductions, discuss the project, and review project maps. The purpose of the meeting was also to exchange views and information regarding cultural resources in the project's area of potential effects (APE) to assist the U.S. Army Corps of Engineers with its compliance responsibilities under Section 106 of the National Historic Preservation Act (Section 106). Mr. DeSpain emphasized the need for project applicants and their

consultants to contact the federal lead agency and tribes at the earliest possible time in project development. Mr. Jones of the Cortina Indian Rancheria could not attend the field review portion of the meeting due to scheduling conflicts, but wanted to meet with the group at CHP to receive a first-hand overview, since he, Mr. DeSpain, and the Shingle Springs Band agree that the Cortina Indian Rancheria is the most appropriate tribe for any monitoring that may be required and response to any human remains discoveries that might result during construction.

The group met Ms. Dilworth and Ms. Marshall at the Eastern Master Meter (MM) (northern terminus of the project) at 10:00 a.m. Mr. De Spain and Mr. Columbro surveyed rice checks, berms, ditch sidewalls, and other exposed soil surfaces between the Eastside MM and Hageman Road while the rest of the group reviewed project maps. I handed a survey map set to Mr. Columbro for his and Mr. DeSpain's use during survey.

Mr. Dilworth asked about monitoring and recommended tribal monitoring during trenching. Mr. Columbro and Mr. DeSpain found no cultural resources between Eastside MM and Hageman Road. Mr. Columbro and Mr. DeSpain deemed northern part of project non-sensitive for the presence of cultural resources.

I gave the group an overview of ICF's cultural resources inventory methods: records search and literature review, consultation with tribes and other Native American groups, and survey methods. Mr. DeSpain asked whether ICF conducted a geoarchaeological study for this project. I said that we did not conduct a formal study that included excavation, but did consult geologic map sheets for the area and the Sutter County Soil Survey. I indicated that the soil survey maps suggest low sensitivity for buried archaeological resources, as known occurrences of buried soils in the project vicinity are located on a landform different from that characterizing the project area. I also emphasized that for the southern half of the APE, we were able to survey a 1.8-meter-deep earthen ditch that paralleled the proposed pipeline and look for indications of buried archaeological materials or buried soils; none were found.

We commenced driving the APE, with the group stopping at intervals for Mr. Little to point out how trenchless crossings of ditches and roads would be accomplished and other engineering and construction details important to assessing potential effects on cultural resources. Other stops were made at the request of tribal representatives so that questions about project features could be broached and potentially sensitive areas examined.

The group spent approximately one hour in the southern extremity of the APE, around the proposed Grimes Station and the proposed interconnect with the existing Sutter Energy gas pipeline. Mr. DeSpain expressed concern at the disruption and potential displacement of Columbia black-tailed deer herd from the riparian corridor and requested a copy of the biological report that deals with this issue. I informed Mr. DeSpain that the Columbia black-tailed would not be covered by the biological report and is outside of the purview of Section 106. Mr. DeSpain stated that the deer disruption is a CEQA/National Environmental Policy Act issue and requested mitigation for the deer disruption. I stated that I thought it unlikely that this subspecies of deer had any standing under CEQA and asked Ms. Campbell what Calpine would do about the issue. She said that she needed to consult with ICF's biologists, which all agreed was prudent.

Mr. DeSpain took us to the deer trail that he saw in the tree line that surrounds the proposed Grimes Station to the north and east. Fresh sign, including tracks and 15 resting places were evident and Mr. DeSpain suspects that both male and female deer passed through the tree line. These signs were what raised the deer herd concern for Mr. DeSpain.

Mr. DeSpain indicated he would like to see a monitor for boring, grading and trenching in the proposed Grimes Station vicinity and said he will coordinate finding a monitor, probably from Cortina Indian Rancheria. Ms. Dilworth and Mr. Columbo both concurred with Mr. De Spain's request.

In light of Mr. DeSpain's request for monitoring in this area and his and Mr. Columbro's low concern about the project north of Grimes Station, I asked Ms. Dilworth what her criteria were for recommending monitoring during construction. She generally recommends monitoring whenever there is deep ground disturbance. Ms. Dilworth said that in the present case she will defer to the Cortina Indian Rancheria and the Mechoopda Indian Tribe on the issue of monitoring because the proposed project is a little west of the Shingle Springs Band's aboriginal territory.

Mr. DeSpain said that he would bring all of these matters up to the Mechoopda Indian Tribe's tribal council and seek their support for the agreements made in the field. Ms. Campbell asked about the schedule and Mr. DeSpain said he will contact tribal council to get a letter singed as early as possible the week of January 24, 2011, subject to the schedule and commitments of the tribal council.

We adjourned the field review and drove back to Williams. From Williams we all headed to our respective offices.

I invite clarifications, additions, and corrections to this recollection of our field meeting from you and the individuals copied on this memorandum.

From: Roark, Gabriel
Sent: Wednesday, January 26, 2011 1:46 PM
To: 'davidj@cortinawepa.org'
Cc: 'M DeSpain'
Subject: Grimes Field Notes Memo
Attachments: Grimes Field Notes Memo.docx

Dear David:

Attached is ICF's notes on the field visit on January 20, 2011. You already have Mike's notes via email. Thank you for stopping by to talk with us in Williams – it was good to meet you.

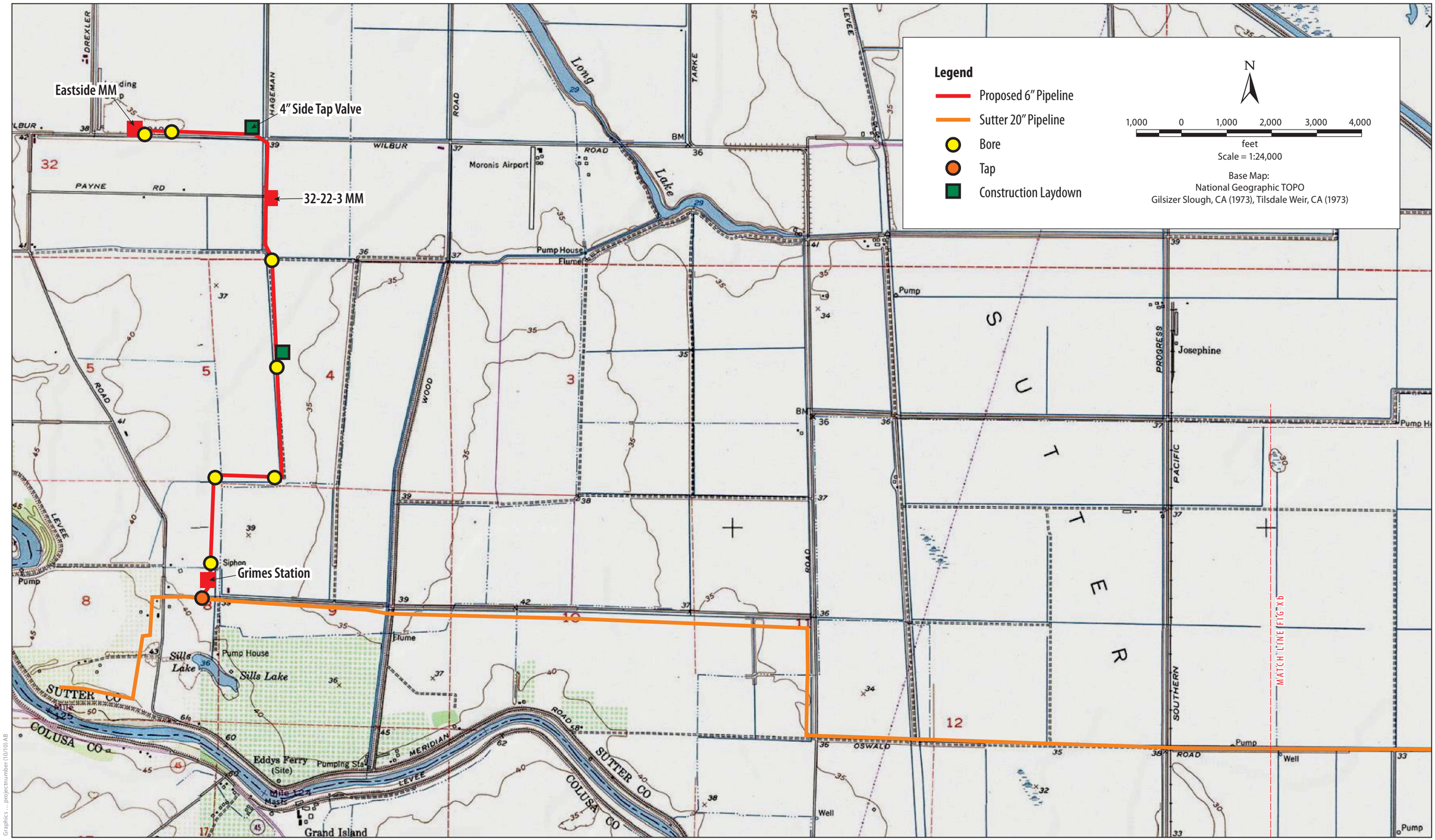
If Cortina Indian Rancheria wishes to have a monitor present during project-related ground disturbance, please let me know. Other comments and questions are welcome also.

Thanks again,

Gabriel
GABRIEL ROARK, M.A. | Senior Archaeologist | 916.737.3000 | groark@icfi.com | icfi.com
ICF INTERNATIONAL | 630 K Street, Suite 400, Sacramento, CA 95814 | 916.737.3030 (f) | 916.752.0983 (m)
In January, ICF Jones & Stokes became ICF International.

Appendix D

Historical Society Correspondence



Graphics\... projectnumber(10/10) AB

ICF INTERNATIONAL

Figure _a
Grimes Pipeline Project, Sutter County