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Docket Number:	06-AFC-09C
Project Title:	Colusa Generating Station - Compliance
TN #:	202385
Document Title:	Petition to Install a Water Line
Description:	Petition for Project Modification for the Colusa Generating Station
Filer:	Jerry Salamy
Organization:	CH2M HILL
Submitter Role:	Applicant Consultant
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May 27, 2014

476176.02.AM

Mr. Eric Veerkamp, CPM
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Subject: Petition for Project Modification Colusa Generating Station (06-AFC-09C)

Dear Mr. Veerkamp:

On behalf of Pacific Gas and Electric Company (PG&E), CH2M HILL hereby submits this Petition for Project Modification for the Colusa Generating Station (06-AFC-09C). The modification is for the construction of a 0.86-mile back-up water supply pipeline from the Glenn Colusa Canal to the project site. The back-up water supply pipeline would transport Glenn Colusa Irrigation District water allocated to the Colusa Generating Station when there is insufficient water in the Tehama Colusa Canal for use by the Colusa Generating Station. The back-up water supply pipeline, once constructed, would eliminate the need for trucking the water to the site, as approved under the March 14, 2014, emergency amendment petition.

I certify under penalty of perjury that the foregoing is true, correct, and complete to the best of my knowledge. I also certify that I am authorized to submit PG&E's Petition for Project Modification on behalf of PG&E.

Sincerely,

CH2M HILL

Jerry Salamy
Principal Project Manager

Colusa Generating Station

(06-AFC-09C)

Project Modification
Back-up Water Supply Pipeline

Submitted to the

California Energy Commission

Submitted by

Pacific Gas and Electric Company

May 2014

With Assistance from

CH2MHILL

2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

Contents

Acronyms and Abbreviations

CEC	California Energy Commission
CGS	Colusa Generating Station
CRS	Cultural Resources Specialist
GCC	Glen Colusa Canal
GCID	Glenn Colusa Irrigation District
I-5	Interstate 5
LORS	laws, ordinances, regulations, and standards
PG&E	Pacific Gas and Electric Company
PRS	Paleontological Resources Specialist
TCC	Tehama Colusa Canal
TCCA	Tehama Colusa Canal Authority

SECTION 1

Introduction

1.1 Background

On April 23, 2008, the California Energy Commission (CEC) granted a license to Pacific Gas and Electric Company (PG&E) to construct and operate the Colusa Generating Station (CGS). The Final Decision was docketed on April 25, 2008, Docket Number 06-AFC-09C. On July 29, 2008, PG&E began construction of the CGS. CGS commenced commercial operation on December 22, 2010.

The Final Decision authorizes the use of up to 180 acre-feet per year of water supplied by the Glenn Colusa Irrigation District (GCID) and approved by the County of Colusa. The agreement allows the transfer of water rights and the use of water from the nearby Tehama Colusa Canal (TCC) supplied to the site via an underground pipeline. The TCC is owned by the U.S. Bureau of Reclamation and operated by the Tehama Colusa Canal Authority (TCCA). GCID transfers water into the TCC at the Sacramento River diversion facility located at Red Bluff. Currently the CGS removes water from the TCC, which lies west of the CGS, using a pumping station owned and operated by PG&E. While the water is physically taken out of the TCC, it is legally part of GCID's allotment.

In February 2014, GCID notified CGS that the Bureau of Reclamation may be reducing its usual water allotment to GCID for the year due to the current California drought conditions. In addition, there was concern that TCCA would suspend all water removal from the TCC beginning in April 2014 because it had not yet received an allotment for 2014. If this occurred, it would have affected GCID's ability to convey water through the TCC for CGS.

GCID assured PG&E that it would be able to continue to meet its contractual obligations by allowing the CGS to remove water directly from GCID's Glen Colusa Canal (GCC), which lies to the east of the CGS. Given this, on March 14, 2014, PG&E submitted an emergency petition to the CEC to enable GCID water allocated to CGS to be pumped from the GCC and temporarily trucked to the CGS. The CEC approved the emergency petition on April 22, 2014.

GCID recently informed PG&E that it could supply CGS its full allotment from the TCC through November 1, 2014. However, to ensure CGS will continue to have a reliable water supply, PG&E proposes to construct an approximately 0.86-mile back-up water supply pipeline from the GCC to the CGS. PG&E is pursuing the additional flexibility of piping water from the GCC due to the high likelihood of water restrictions in future drought years. The back-up water supply pipeline would transport GCID water allocated to the CGS when there is insufficient water in the TCC for use by CGS. The back-up water supply pipeline, once constructed, would eliminate the need for trucking the water to the site, as approved under the March 14 emergency amendment petition.

1.2 Description of Proposed Project Modification

PG&E proposes to construct an approximately 0.86-mile pipeline to transport GCID water from the GCC to the CGS. The pipeline would be used when there is insufficient water in the TCC to supply the CGS. PG&E would access the water from an existing pump station, located immediately north of Dirks Road, which is owned and operated by the farmer whose field borders the canal. A new pump and electrical panel would be installed in a disturbed area immediately adjacent to the existing pump station to draw water from the pump station's intake basin to the new back-up water supply pipeline.

The pipeline would be 6 inches in diameter and would be located on the south side (eastbound lane) of Dirks Road (a private road) until it reaches the CGS site. Two 2-inch conduit lines (one housing an electrical line, the other a spare) would be located within the trench with the water pipeline to serve as an alternative electric supply for the new water pump. A complete project description is included in Section 2.

1.3 Necessity of Proposed Modification

Sections 1769 (a)(1)(A), (B), and (C) of the CEC Siting Regulations require a discussion of the necessity for the proposed modification to the CGS project and whether the modification is based on information known by the petitioner during the certification proceeding. The back-up water supply pipeline is necessary to ensure a water supply to the CGS when there is insufficient water in the TCC to supply the CGS. Section 2.2 provides additional information regarding the necessity of the proposed modification.

1.4 Summary of Environmental Impacts

Section 1769 (a)(1)(E) of the CEC Siting Regulations requires that an analysis be conducted to address impacts the proposed modification may have on the environment and proposed measures to mitigate any significant adverse impacts. Section 1769 (a)(1)(F) requires a discussion on whether the proposed modification affects the facility's ability to comply with applicable laws, ordinances, regulations, and standards (LORS). The proposed back-up water supply pipeline would not result in any environmental impacts and is consistent with LORS. Section 3 provides an environmental analysis of the proposed modification and its consistency with LORS.

1.5 Consistency of Modifications with License

Section 1769 (a)(1)(D) of the CEC Siting Regulations requires a discussion of the consistency of the proposed project modification with the assumptions, rationale, findings, or other bases of the Final Decision and whether the modification is based on new information that changes or undermines the bases of the final decision. Also required is an explanation of why the modification should be permitted. The proposed modification does not undermine the assumptions, rationale, findings, or other basis of the Final Decision for the CGS project. In addition, the proposed modification should be permitted because it would ensure a water supply to the CGS when there is insufficient water in the TCC to supply the CGS.

SECTION 2

Description of Project Modification

Consistent with the CEC Siting Regulations Section 1769(a)(1)(A), this section includes a description of the requested project modification, as well as the necessity for the modification.

2.1 Proposed Modification

PG&E proposes to construct an approximately 0.86-mile pipeline to transport GCID water from the GCC to the CGS. The pipeline would be used when there is insufficient water in the TCC to supply the CGS. PG&E would access the water from an existing pump station, located immediately north of Dirks Road, which is owned and operated by the farmer whose field borders the canal. A new pump and electrical panel would be installed in a disturbed area adjacent to the existing pump station to draw water from the existing pump station's intake basin to the new water pipeline (see Figure 1). The pump would be located on a 3-foot by 6-foot pad. The specific location of the new pump and electrical panel adjacent to the existing pump station would be determined during final design.

The back-up water supply pipeline would extend from the interconnection point adjacent to the existing pump station and continue approximately 0.86 mile to the CGS (see Figure 1). Specifically, the pipeline route would exit the pump station area and head west on Dirks Road until it reaches the CGS. The pipeline would be located on the south side (eastbound lane) of Dirks Road for the entire route. As the route reaches the CGS property, it would continue west along the south side of the CGS fence line. Within this area, the pipeline route would either be located immediately adjacent to the fence line, on the north side of the landscaping and leach field, or as an alternative it would be located south of the landscaping and leach field. The specific location would be determined during final design. The pipeline would then enter the CGS site west of the leach field and continue north within the power plant until it interconnects at the water treatment building.

The pipeline would consist of 6-inch-diameter, high-density polyethylene pipe. Two 2-inch conduit lines (one housing an electrical line, the other a spare) would be located in the trench with the water pipeline to serve as an alternative electric supply for the new water pump. An electrical panel would also be installed at the CGS to support this alternative electric supply. The specific electric supply for the water pump would be determined during detailed design.

The pipeline trench would be 18 inches wide and 24 inches deep. The construction corridor would be approximately 10 feet wide (2-feet construction disturbance and 8 feet for construction equipment) and would be located primarily within the eastbound lane (south side) of Dirks Road. Dirks Road is a private road used by PG&E, West Coast Gas, and the neighboring farmer. Construction of the pipeline would require closure of the eastbound lane in the area where construction is occurring. However, one lane of the road would remain open at all times and traffic flow would be maintained through the use of traffic

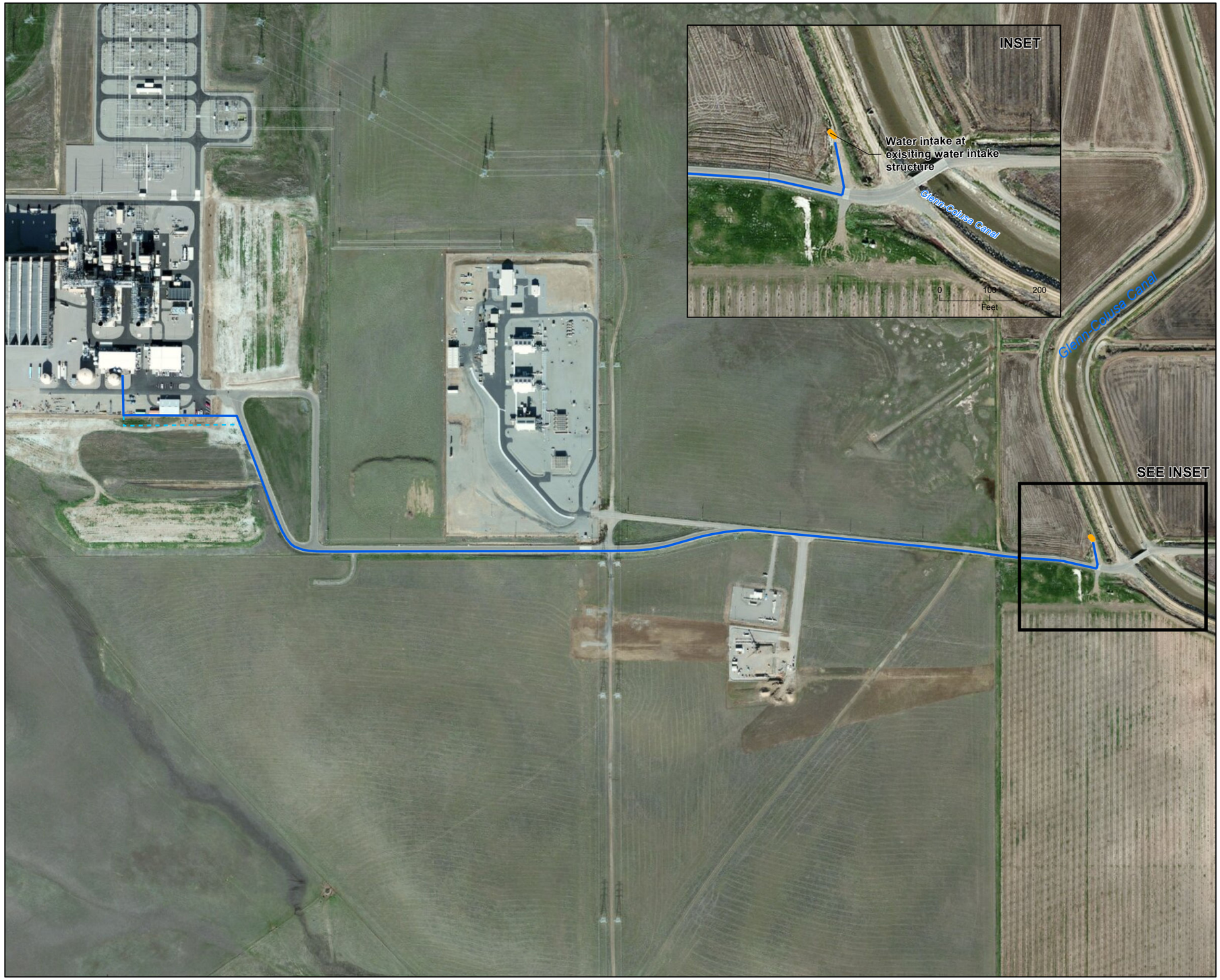
controls and flagmen. For safety, steel plates would be placed over any open trench at the end of the day. Construction at the east and west ends of the pipeline would be located within previously disturbed areas with a 30-foot-wide construction corridor. A laydown area at the CGS site would be used. The laydown area would be either an existing paved or graveled area. Service water from CGS would be used for dust control during construction and hydrostatic testing of the line once construction is complete.

Construction of the pipeline is estimated to take approximately 4 weeks. Installation of the pump and electrical panel at the existing pump station would take an additional approximately 6 weeks. An estimated seven construction workers would be needed during the approximately 10-week construction period. Construction would occur Monday through Friday from 7:00 a.m. to 3:30 p.m.

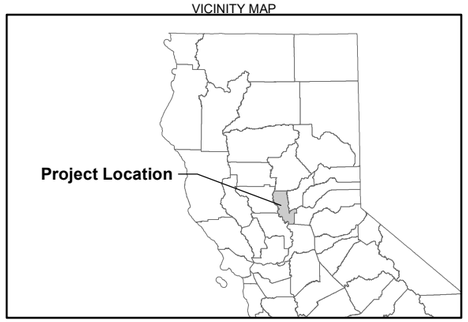
2.2 Necessity of Proposed Modification

Sections 1769 (a)(1)(B) and 1769(a)(1)(C) of the CEC Siting Regulations require a discussion of the necessity for the proposed modification to the project and whether this modification is based on information that was known by the petitioner during the certification proceeding. The back-up water supply pipeline is necessary to ensure the CGS has a water supply when there is insufficient water in the TCC to supply the CGS, by allowing water to be withdrawn from the GCC and piped to the CGS.

The proposed project modification is based on information that was not known during the certification preceding. During the certification proceeding, water restrictions to the TCC affecting the water supply to the CGS were not envisioned. The proposed modification would provide a back-up water supply pipeline to transport the water to the CGS, thus ensuring its continued operation.



VICINITY MAP



LEGEND

- 6-inch waterline route
- Alternate waterline route
- Water intake at exisiting water intake structure

N

0 400 800
Feet

Figure 1
Colusa Generating Station
Water Line Route

Colusa Generation Station
Pacific Gas And Electric Company
Proposed Water Intake Structure and 6-inch Waterline
Colusa County, CA

CH2MHILL

SECTION 3

Environmental Analysis of the Project Modification

PG&E has reviewed the modification proposed herein to determine if the modification would result in any environmental impacts that were not originally analyzed by the CEC when it approved the project in April 2008. The only disciplines that could be affected by the modification described in this petition are Air Quality, Biological Resources, Cultural Resources, Paleontological Resources, Traffic and Transportation, and Water Resources. The proposed modification discussed in this petition would not alter the operational impacts that were used as the basis to license the project during the original proceeding. Therefore, operational impacts are expected to be equal to those analyzed in the Final Decision and are not addressed in this petition.

3.1 Air Quality

The construction of the back-up water supply pipeline, pump, and electrical panel would take approximately 10 weeks, with 4 weeks for pipeline installation and the remaining 6 weeks for installation of the pump and electrical panel at the existing pump station. A maximum of seven construction workers would be required over the estimated 10-week period. A total of 20 delivery trucks would deliver materials to the CGS site for use in pipeline construction and installation of the pump and electrical panel.

Table 1 presents the expected construction equipment and worker vehicles. The laydown area at the CGS site would be either an existing paved or graveled area. The potential air quality impacts associated with the proposed project would be related to construction air emissions in the form of tailpipe exhaust and fugitive dust. Air emissions were estimated assuming all construction equipment are diesel fueled, per Section 4.2 of Appendix A of the CalEEMod User's Guide (ENVIRON, 2013). Although some equipment would be expected to be powered by gasoline fuel, CalEEMod emission factors were used in this evaluation as a conservative emissions estimate. Construction equipment fuel consumption estimates were based on the OFFROAD2007 model for the Sacramento Valley Air Basin in the year 2014.

TABLE 1
Construction Equipment
Colusa Generating Station Project Modification Back-up Water Supply Pipeline

Equipment / Vehicle List	Equipment / Vehicle Type	Quantity per Day
Off-Highway Truck	Construction Equipment	1
Forklift	Construction Equipment	1
Roller	Construction Equipment	1
Rubber Tired Loader	Construction Equipment	1

TABLE 1
Construction Equipment
Colusa Generating Station Project Modification Back-up Water Supply Pipeline

Equipment / Vehicle List	Equipment / Vehicle Type	Quantity per Day
Trencher	Construction Equipment	1
Paving Equipment	Construction Equipment	1
Offsite Delivery Trucks	Heavy-duty Diesel	1
Construction Worker Commute	Light-duty Auto/Truck	7
Onsite Dump Truck	Heavy-duty Diesel	1

The estimate maximum daily and project total emissions are presented in Table 2, which shows that the project's expected construction air emissions are negligible. The estimated maximum daily and project total emissions are presented in Table 3. Appendix A presents the detailed calculations for the construction emission estimates.

TABLE 2
Estimated Criteria Pollutant Air Emissions
Colusa Generating Station Project Modification Back-up Water Supply Pipeline

	Criteria Pollutant Emissions					
Construction Year 2014	**VOC**	**CO**	**NOx**	**SOx**	**PM_{10}**	**$PM_{2.5}$**
Daily Emissions (lbs/day)	3.4	18.4	37.5	0.04	9.1	3.25
Project Emissions (tons/project)	0.09	0.46	0.94	0.001	0.14	0.06

TABLE 3
Estimated Greenhouse Gas Air Emissions
Colusa Generating Station Project Modification Back-up Water Supply Pipeline

Construction Year 2014	CO_2	N_2O	CH_4	CO_2e
Project Emissions (metric tons/project)	139.6	0.003	0.008	140.8

The already less-than-significant construction air emissions would be further reduced by implementing the existing Air Quality Construction Mitigation Plan (Condition AQ-SC2) and Conditions of Certification AQ-SC2 through AQ-SC5.

The short duration of the water pipeline construction and pump and electrical panel installation is not expected to result in cumulative air quality impacts nor alter the basis of the Final Decision. In addition, the proposed project modification would comply with applicable LORS.

3.2 Biological Resources

Because all construction activities associated with the water pipeline would occur within paved road surfaces, graveled pads, or other previously disturbed areas, no temporary or permanent construction impacts or ongoing operations impacts are anticipated to sensitive habitats or biological resources along the proposed waterline alignment or water intake location. Appendix B contains a technical memorandum, which provides information on the habitats in the project area and the results of the project biological survey.

Areas within 250 feet on either side of the proposed construction corridor were surveyed and environmental conditions were mapped. Mapped features from previous delineations and biological assessments conducted during CGS licensing were verified in the field against current conditions. Previously identified vernal pools and habitat types were consistent and appeared be unchanged from historical survey documentation. Because no proposed construction is planned to occur outside of previously disturbed or paved road areas, no vernal pools will be disturbed. Impacts to special-status plants would also be unlikely. No suitable nesting trees occur within the California Department of Fish and Wildlife recommended 0.5-mile buffer for protection of Swainson's hawk. In addition, no burrowing owls or evidence of burrowing owl occupancy (feathers, pellets, or white wash) were observed within 500 feet of the project site (where access was allowed).

Potential aquatic habitat for giant garter snake occurs within a drainage ditch and the GCC to the east of the proposed water intake structure. All work and staging would occur in heavily disturbed areas, which provide marginally suitable upland habitat for CGS. No other special-status species or suitable habitats were noted or observed during the survey effort.

Although construction associated with the water pipeline would occur within a paved roadway, graveled pad, or previously disturbed area, Appendix B contains proposed avoidance and minimization measures for biological resources.

3.3 Cultural Resources

The project is not anticipated to affect historical or cultural resources. The GCC is considered a historic resource under the California Environmental Quality Act. However, it would not be affected by the proposed project modification because the pump, electrical panel, and pipeline interconnection would be located at an existing intake basin located approximately 100 feet east of the GCC.

During CGS construction, only one diagnostic artifact was discovered. However, the location in which the artifact was found is approximately 1.5 miles from the proposed water pipeline. In addition, no subsurface cultural resources were found during construction of the CGS. Therefore, the proposed modification is not expected to affect cultural resources.

All construction workers would be given Worker Environmental Awareness Training so they would be familiar with cultural resources and know what to do in the event a potential resource is discovered during construction. In addition, prior to construction, the name and resume of a Cultural Resources Specialist (CRS) would be provided to the CEC for approval. The CRS would be on-call in the event of a find.

3.4 Paleontological Resources

Based on the paleontological monitoring conducted during CGS construction, it is not anticipated that paleontological resources would be discovered during construction of the pipeline or installation of the pump and electrical panel. The pipeline, pump, and electrical panel would be located in previously disturbed areas.

All construction workers would be given Worker Environmental Awareness Training so they would be familiar with paleontological resources and know what to do in the event a potential resource is discovered during construction. In addition, prior to construction, the name and resume of a Paleontological Resources Specialist (PRS) would be provided to the CEC for approval. The PRS would be on-call in the event of a find.

3.5 Traffic and Transportation

The proposed project modification is located in a rural agricultural area of Colusa County. The site is served by local two-lane roads and Interstate 5 (I-5). Access to the site from I-5 would be via Delevan Road (at the Delevan Road off-ramp) to McDermott Road, north to Dirks Road, then west to the project site. Dirks Road becomes a private road west of McDermott Road to the project site. Because of the agricultural nature of the project area and the lack of recent development in the project area, the local roadways are free flowing with relatively low daily traffic volumes. This assumption was also shared by CEC Staff in its analysis of the proposal to temporarily truck water to the CGS project site (TN 201985).

Direct or indirect traffic and transportation impacts associated with the water pipeline are expected only during the construction phase of the project. No operational traffic and transportation impacts are expected. Therefore, the remainder of this section will focus on the construction-related traffic and transportation impacts. Construction of the pipeline is estimated to take approximately 4 weeks. Installation of the pump and electrical panel at the existing pump station would take an additional approximately 6 weeks. A maximum of seven construction workers and an estimated total of 20 material delivery trucks would be required over the approximately 10-week construction period, for a maximum of 27 daily vehicle trips to the project site. Construction of the water pipeline would require excavation within the eastbound lane of Dirks Road, with the westbound lane remaining open for traffic.

Assuming the material delivery trucks occur during a single day, combined with the construction workforce this would result in 27 trips on roadways in the project area. This is the same number of water truck trips analyzed by the CEC Staff in its analysis of the proposal to temporarily truck water to the CGS project site (TN 201985). The CEC Staff concluded that this number of trips would not result in significant traffic or transportation impacts. Therefore, the construction of the water pipeline and pump and electrical panel are not expected to result in any traffic or transportation impacts. Furthermore, the pump and electrical panel installation activities would occur north of Dirks Road and traffic impacts during the approximate 10-week construction period would be related to worker commute trips and materials deliveries.

Because of the short construction period, the rural nature of the project area, and the lack of traffic congestion, no cumulative impacts are expected. In addition, the proposed project modification would comply with applicable LORS

To ensure traffic safety during construction of the water pipeline, PG&E would require its contractor to prepare a Construction Traffic Control Plan to identify the traffic control measures to be implemented while sections of the eastbound lane of Dirks Road are closed.

3.6 Water Resources

The proposed project modification is not expected to result in impacts to water supplies (surface or groundwater) resulting from the use of GCID water from the GCC. The water being extracted from the GCID is the same water supply whether it is delivered via the TCC or the GCC. Additionally, PG&E is not requesting an increase in water use. Therefore, potential water resource impacts would be limited to impacts to surface water resources during the estimated 10-week construction period. The water pipeline is approximately 0.86 mile long. Assuming a 2-foot-wide area of disturbance for the segment of the pipeline located within the paved road and a 30-foot-wide area of disturbance for the segments located in unpaved areas, the total area of disturbance is 0.93 acre. Table 4 presents a breakdown of the area of disturbance. The project does not disturb a sufficiently large area to require the development of a Construction Activity Stormwater Pollution Prevention Plan.

PG&E expects to begin construction of the back-up water supply pipeline as soon as possible; therefore, construction would likely occur during the warmer summer months. As noted in Appendix B, Biological Resources Technical Memorandum, PG&E will implement sedimentation control measures to protect alkali habitats adjacent to the pipeline route. Furthermore, PG&E will implement standard housekeeping, erosion, sedimentation, and dust control best management practices to reduce water resource impacts. These measures would result in water resource impacts below significant impact levels.

TABLE 4
Water Pipeline Area of Disturbance
Colusa Generating Station Project Modification Back-up Water Supply Pipeline

Feature	Acres
Pipeline: 0.86 miles	0.42
Eastern Unpaved Area: 30 feet	0.09
Western Unpaved Area, Preferred Route: 30 feet	0.36
Western Unpaved Area, Alternate Route: 30 feet	0.35
Laydown Area: 50 feet by 50 feet	0.06
Maximum Disturbance	**0.93**

Because of the short duration of construction and the minimal area of disturbance, no cumulative impacts are expected. In addition, the proposed project modification would comply with applicable LORS.

SECTION 4

Proposed Modifications to the Conditions of Certification

Consistent with the requirements of the CEC Siting Regulations Section 1769 (a)(1)(A), this section addresses any proposed modifications to the project's Conditions of Certification. Condition of Certification Soil & Water-8 as modified on April 22, 2014, enables water to be drawn from the GCC as a backup water interconnection location in cases of emergency.

The CGS is a customer of the GCID. As such, the CGS has no control over the availability of water in the TCC or the TCCA's operation of the canal. As recently experienced, water restrictions could occur due to drought conditions. However, they could also be the result of canal maintenance activities conducted by the TCCA. For example, in 2011 the TCCA conducted maintenance on the TCC, which had the potential to reduce the water level in the TCC below the CGS pump intakes. To ensure the CGS had an adequate water supply, PG&E was forced to obtain a diesel pump to draw water from the canal. Furthermore, PG&E recently learned that the TCCA plans to conduct maintenance on the TCC within the next year or two, which will require the TCC to be dry in the location of the CGS pump intakes. In this event, CGS will have no water for its operations unless GCID water from the GCC is used.

Assuming that an emergency constitutes any situation under which there is insufficient water in the TCC affecting the CGS operations, the Soil & Water-8 language as revised on April 22, 2014, is sufficient and no further language modifications are necessary for this project modification.

SECTION 5

Potential Effects on the Public and Property Owners

The CEC Siting Regulations Section 1769(a)(1)(I), requires the project owner address any potential effects the proposed project modification may have on nearby property owners, the public, and parties to the proceeding.

The proposed modification would have minimal impact on nearby property owners, the public, and parties to the proceeding. The pipeline would be located within the eastbound lane of Dirks Road, a private road, which is used by PG&E, West Coast Gas, and the neighboring farmer. During construction of the pipeline, one lane of traffic would remain open at all times. During the approximate 10-week construction period, traffic flow would be maintained through the use of traffic control measures and flagmen. Given the limited use of Dirks Road, impacts to property owners during construction would be minimal. The proposed modification would have no effect on the public and parties to the proceeding because pipeline construction would occur on a private road.

SECTION 6

List of Property Owners

Consistent with the CEC Siting Regulations Section 1769(a)(1)(H), this section lists the property owners affected by the proposed modifications. Property owners within 1,000 feet of the proposed project modification are listed in Table 5.

TABLE 5
Property Owners within 1,000 Feet
Colusa Generating Station Project Modification Back-up Water Supply Pipeline

Assessor Parcel Number	Owner	Mailing Address
011-040-029-000	Allan and Mary Anne Azevedo	P.O. Box 629 Maxwell, CA 95955
011-140-021-000	Allan and Mary Anne Azevedo	
011-040-033-000	Jeffrey Holthouse and Cerena Lee	25039 Hwy 395 S Canyon City, OR 97820-8709
011-040-032-000	Jeffrey Holthouse and Cerena Lee	
011-140-014-000	Jeffrey Holthouse and Cerena Lee	
011-140-004-000	Jeffrey Holthouse and Cerena Lee	
011-040-011-000	Dirks & William Jr. and Dora	P.O. Box 9 Maxwell, CA 95955
011-140-019-000	Jack L. Barrett Jr.	P.O. Box 99 Maxwell, CA 95955

SECTION 7

References

California Energy Commission (CEC). 2008. *Final Commission Decision for the Colusa Generating Station (06-AFC-9C)*. April.

California Energy Commission (CEC). 2013. *Colusa Generating Station (06-AFC-9C) Staff Analysis of Proposal to Temporarily Truck Water to the Project Site*. April.

California Energy Commission (CEC). 2007. *Colusa Generating Station (06-AFC-9C) Final Staff Assessment (CEC-700-2007-003-FSA)*. November.

ENVIRON. 2013. *CalEEMod User's Guide*. October.

Pacific Gas & Electric Company (PG&E). 2008a. *Cultural Resources Monitoring & Mitigation Plan for the Colusa Generating Station*. June.

Pacific Gas & Electric Company (PG&E). 2008b. *Paleontological Resources Monitoring & Mitigation Plan for the Colusa Generating Station*. April.

Pacific Gas & Electric Company (PG&E). 2014. *Emergency Petition to Amend the Colusa Generating Station (06-AFC-9C)*. March.

Appendix A
Construction Emissions Summary

Construction Emissions Summary

Colusa Generating Station - Pipeline Construction

Construction Emissions

Construction Year 2014	Criteria Pollutant Emissions					
	VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
Daily Emissions (lbs/day) [a]	3.441	18.401	37.536	0.036	9.101	3.247
Project Emissions (tons/project) [a]	0.086	0.459	0.935	0.001	0.138	0.062
Construction Year 2014	**GHG Emissions**					
	CO_2	N_2O	CH_4	CO_2e [b]		
Project Emissions (metric tons/project) [a]	139.605	0.003	0.008	140.828		

Notes:

[a] It was conservatively assumed that all construction equipment and vehicles could operate simultaneously on the worst-case day during the construction period.

[b] CO_2e emissions were computed using the following global warming potentials from 40 CFR Part 98:

CO_2: 1

N_2O: 298

CH_4: 25

Mitigated Annual Construction Emissions

Construction Year 2014	Criteria Pollutant Emissions					
	VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]
Daily Emissions (lbs/day) [a]	3.441	18.401	37.536	0.036	5.254	2.446
Project Emissions (tons/project) [a]	0.086	0.459	0.935	0.001	0.091	0.053
Construction Year 2014	**GHG Emissions**					
	CO_2	N_2O	CH_4	CO_2e [c]		
Project Emissions (metric tons/project) [a]	139.605	0.003	0.008	140.828		

Notes:

[a] It was conservatively assumed that all construction equipment and vehicles could operate simultaneously on the worst-case day during the construction period.

[b] Implementation of mitigation measures is assumed to reduce fugitive dust emissions associated with earthmoving activities, including onsite cut/fill and disturbed surfaces.

[c] CO_2e emissions were computed using the following global warming potentials from 40 CFR Part 98:

CO_2: 1

N_2O: 298

CH_4: 25

Construction Emissions - Mitigated [a]

Colusa Generating Station - Pipeline Construction

Equipment / Vehicle List	Equipment / Vehicle Type	Quantity	Number of Days Used	Hours per Day	Miles per Day	Emissions (lbs/day)						Emissions (tons/project)						Emissions (metric tons/project)		
						VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]	VOC	CO	NOx	SOx	PM_{10} [b]	$PM_{2.5}$ [b]	CO_2	N_2O	CH_4
Off-Highway Truck	Construction Equipment	1	50	8.5	--	1.12E+00	5.91E+00	1.33E+01	1.40E-02	5.11E-01	4.71E-01	2.80E-02	1.48E-01	3.34E-01	3.49E-04	1.28E-02	1.18E-02	5.35E+01	1.36E-03	3.04E-03
Forklift	Construction Equipment	1	50	8.5	--	2.65E-01	1.36E+00	2.28E+00	1.63E-03	1.91E-01	1.76E-01	6.63E-03	3.40E-02	5.71E-02	4.09E-05	4.78E-03	4.40E-03	6.19E+00	1.58E-04	3.52E-04
Roller	Construction Equipment	1	50	8.5	--	4.01E-01	2.20E+00	3.69E+00	2.83E-03	2.74E-01	2.53E-01	1.00E-02	5.49E-02	9.21E-02	7.07E-05	6.86E-03	6.31E-03	1.17E+01	2.98E-04	6.65E-04
Rubber Tired Loader	Construction Equipment	1	50	8.5	--	5.49E-01	2.00E+00	7.41E+00	6.48E-03	2.52E-01	2.32E-01	1.37E-02	5.01E-02	1.85E-01	1.62E-04	6.30E-03	5.80E-03	2.93E+01	7.46E-04	1.66E-03
Trencher	Construction Equipment	1	50	8.5	--	6.21E-01	3.03E+00	5.48E+00	3.72E-03	4.27E-01	3.93E-01	1.55E-02	7.59E-02	1.37E-01	9.30E-05	1.07E-02	9.83E-03	1.29E+01	3.29E-04	7.33E-04
Paving Equipment	Construction Equipment	1	50	8.5	--	3.67E-01	2.74E+00	4.61E+00	4.33E-03	2.20E-01	2.02E-01	9.17E-03	6.84E-02	1.15E-01	1.08E-04	5.50E-03	5.06E-03	2.00E+01	5.10E-04	1.14E-03
Offsite Delivery Trucks	Heavy-duty Diesel	1	20	--	13.2	7.41E-03	3.71E-02	2.20E-01	4.86E-04	1.52E-02	6.53E-03	7.41E-05	3.71E-04	2.20E-03	4.86E-06	1.52E-04	6.53E-05	4.91E-01	1.27E-06	1.35E-06
Construction Worker Commute	Light-duty Auto/Truck	7	50	--	33.6	2.82E-02	1.01E+00	1.03E-01	2.01E-03	1.80E-01	4.91E-02	7.06E-04	2.52E-02	2.58E-03	5.02E-05	4.50E-03	1.23E-03	4.81E+00	4.23E-05	2.03E-04
Onsite Dump Truck	Heavy-duty Diesel	1	50	--	7.31	5.88E-02	1.09E-01	3.95E-01	2.69E-04	3.46E-02	9.66E-03	1.47E-03	2.73E-03	9.88E-03	6.72E-06	8.65E-04	2.41E-04	6.80E-01	1.75E-06	1.86E-06
Fugitive Dust [c]	Onsite Cut/Fill	1,009	20	--	--	--	--	--	--	2.68E+00	5.57E-01	--	--	--	--	2.68E-02	5.57E-03	--	--	--
Fugitive Dust [c]	Disturbed Surface	0.104	50	--	--	--	--	--	--	4.69E-01	9.75E-02	--	--	--	--	1.17E-02	2.44E-03	--	--	--
Asphalt Paving	Asphalt Paving Off-Gassing	0.275	30	--	--	2.41E-02	--	--	--	--	--	3.61E-04	--	--	--	--	--	--	--	--

Notes:

-- = Parameter not required for computing emissions.

[a] Refer to the Construction Emissions tab for details regarding data sources and assumptions.

[b] As described on the Construction Emissions tab, PM_{10} and $PM_{2.5}$ emissions include paved and unpaved road fugitive dust emissions associated with onroad and offroad travel, respectively.

[c] To reduce fugitive dust emissions, water will be applied to disturbed surfaces (including onsite cut/fill volumes) twice per day. Implementation of this mitigation measure is assumed to reduce fugitive dust emissions by the following percent: 55%

Construction Equipment Emission Factors

Colusa Generating Station - Pipeline Construction

Construction Equipment Emission Factors

Equipment [a]	Horsepower [b]	Load Factor [b]	Emission Factors (g/bhp-hr) [c, d]						Fuel Consumption (gallons/hour) [e]
			VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	
Off-Highway Truck	400	0.38	0.3934	2.07518	4.68575	0.0049	0.1795	0.1652	12.33
Forklift	89	0.20	0.7945	4.07936	6.84833	0.0049	0.5737	0.5278	1.43
Roller	81	0.38	0.695	3.80915	6.39036	0.0049	0.4759	0.4378	2.70
Rubber Tired Loader	200	0.36	0.4066	1.48551	5.49539	0.0048	0.1868	0.1719	6.75
Trencher	81	0.50	0.8181	3.99876	7.2172	0.0049	0.5629	0.5179	2.97
Paving Equipment	131	0.36	0.4151	3.09686	5.21567	0.0049	0.2488	0.2289	4.61

Notes:

[a] The Water Truck was categorized as "Off-Highway Truck", the Double Roller was categorized as a "Roller", the "Skip Loader" was categorized as a "Rubber Tired Loader", the Trench Compactor was categorized as a "Trencher", and the Asphalt Equipment was categorized as "Paving Equipment".

[b] Horesporwer and Load Factors taken as the defaults provided in Table 3.3 of Appendix D of the *CalEEMod User's Guide* (Environ, 2013).

[c] Emission Factors in grams per brake-horsepower-hour (g/bhp-hr) taken as the defaults for the year 2014 provided in Table 3.4 of Appendix D of the *CalEEMod User's Guide* (Environ, 2013).

[d] Assumed all equipment is fired with diesel fuel, per Section 4.2 of Appendix A of the *CalEEMod User's Guide* (ENVIRON, 2013). Although some equipment is expected to be powered by gasoline fuel, CalEEMod emission factors were used in this evaluation as a conservative emissions estimate.

[e] Fuel consumption based on consumption in the OFFROAD2007 model for the Sacramento Valley Air Basin in the year 2014; value estimated by dividing the reported consumption (gallons/day) by the reported activity (hours/day).

Vehicle Emission Factors

Colusa Generating Station - Pipeline Construction

Vehicle	Vehicle Class [a]	Exhaust Emission Factors (g/mile) [b]						Road Emission Factors (g/mile) [c]		Fuel Economy (mpg) [e]
		VOC	CO	NOx	SOx	PM_{10} [d]	$PM_{2.5}$ [d]	PM_{10}	$PM_{2.5}$	
Offsite Delivery Trucks	Heavy-duty Diesel	0.255	1.275	7.546	0.017	0.220	0.149	0.300	0.075	5.489
Construction Worker Commute	Light-duty Auto/Truck	0.054	1.948	0.199	0.004	0.047	0.020	0.300	0.075	21.485
Onsite Dump Truck	Heavy-duty Diesel	3.651	6.784	24.514	0.017	0.534	0.438	1.614	0.161	5.489

Notes:

[a] The vehicle classes are represented as follows:

Heavy-duty Diesel: Assumed to be 100% HHDT, DSL values, as confirmed in Section 4.5 of Appendix A of the *CalEEMod User's Guide* (ENVIRON, 2013).

Light-duty Auto/Truck: 50% LDA, GAS; 25% LDT1, GAS; and 25% LDT2, GAS values, per Section 4.5 of Appendix A of the *CalEEMod User's Guide* (ENVIRON, 2013).

[b] Exhaust emission factors from EMFAC2011-PL for the Sacramento Valley Air Basin, calendar year 2014. EMFAC2007 Vehicle Categories were used. A speed of 5 mph was assumed for onsite vehicles and a speed of 40 mph was assumed for offsite vehicles and worker commutes, which is consistent with the CalEEMod defaults.

[c] Paved and unpaved road emission factors were calculated using EPA *AP-42* methodology, as described below.

[d] The PM_{10} and $PM_{2.5}$ emission factors include tire and brake wear.

[e] Fuel economy from EMFAC2011 Web Based Emissions Database for the Sacramento Valley Air Basin, calendar year 2014, using EMFAC2007 Vehicle Categories. An aggregated speed and model year were used for onsite and offsite vehicles. Value estimated by dividing the VMT (miles/day) by the Fuel (gal/day).

Derivation of Paved Road Emission Factors

Parameter	PM_{10}	$PM_{2.5}$
Average Weight [a]	2.4	2.4
k [b]	1	0.25
sL [c]	0.1	0.1
Emission Factor (g/mile) [d]	**0.300**	**0.075**

Notes:

[a] Average Weight taken as the default value from Section 5.3 of Appendix A of the *CalEEMod User's Guide* (ENVIRON, 2013).

[b] k taken from Table 13.2.1-1 of Section 13.2.1 of *AP-42* (EPA, 2011).

[c] sL taken as the CalEEMod default for the Maxwell climate region of the Sacramento Valley Air Basin.

[d] Emission factor calculated using Equation 1 from Section 13.2.1 of *AP-42* (EPA, 2011):

Emission Factor (g/mile) = k (g/mile) x $[sL\ (g/m^2)]^{0.91}$ x $[\text{Average Weight (tons)}]^{1.02}$

Vehicle Emission Factors

Colusa Generating Station - Pipeline Construction

Derivation of Unpaved Road Emission Factors

Vehicles on Unpaved Surfaces at Industrial Sites

Parameter	PM_{10}	$PM_{2.5}$
Mean Vehicle Weight [a]	16.5	16.5
Silt Content [b]	6.9	6.9
k [c]	1.5	0.15
a [c]	0.9	0.9
b [c]	0.45	0.45
P [b]	65	65
Emission Factor (lbs/mile) [d]	1.61	0.16

Notes:

[a] Mean vehicle weight assumes that medium/heavy duty trucks weigh 16.5 tons.

[b] Silt Content and P taken as the CalEEMod default for the Maxwell climate region of the Sacramento Valley Air Basin.

[c] k, a, and b taken from Table 13.2.2-2 of Section 13.2.2 of *AP-42* (EPA, 2006) for industrial roads.

[d] Emission factor calculated using Equations 1a and 2 from Section 13.2.2 of *AP-42* (EPA, 2006):

Emission Factor (lbs/mile) = {k (lbs/mile) x [Silt Content (%) / 12]^{a} x [Mean Vehicle Weight (tons) / 3]^{b}} x [(365 - P) / 365]

Fugitive Dust Emission Factors

Colusa Generating Station - Pipeline Construction

Activity	Emission Factors		
	PM_{10} [a]	$PM_{2.5}$ [b]	Units
Onsite Cut/Fill [c]	0.059	0.012	ton/1,000 yd^3
Disturbed Surface	0.110	0.0229	ton/acre-month
	0.005	0.001	ton/acre-day [d]

Notes:

[a] Unless otherwise noted, PM_{10} emission factors taken from Table A-4 of Appendix A of the *Software User's Guide: URBEMIS2007 for Windows* (JSA, 2007).

[b] $PM_{2.5}$ emissions assumed to be 20.8% of the PM_{10} emissions for construction fugitive dust sources per the *Final - Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds* (SCAQMD, 2006).

[c] All cut/fill is assumed to occur onsite such that the excavated soil will be used as backfill.

[d] Emission factor converted to units of ton/acre-day assuming 22 construction days per month.

Asphalt Paving Emission Factors

Colusa Generating Station - Pipeline Construction

Activity	Emission Factors	
	VOC [a]	Units
Ashpalt Paving	2.620	lbs/acre

Notes:

[a] Taken as the Sacramento Metropolitan Air Quality Management District default emission factor per Section 4.8 of Appendix A of the *CalEEMod User's Guide* (ENVIRON, 2013).

Greenhouse Gas Emission Factors

Colusa Generating Station - Pipeline Construction

Fuel / Category Type	Emission Factor	Emission Factor Units	Emission Factor Source
CO_2 Emission Factors			
Gasoline	8.78	kg CO_2/gallon	The Climate Registry General Reporting Protocol, Version 2.0, Table 13.1, April 2014.
Diesel	10.21	kg CO_2/gallon	The Climate Registry General Reporting Protocol, Version 2.0, Table 13.1, April 2014.
N_2O Emission Factors			
Gasoline Passenger Car Model Year 2011 [a]	0.0036	g N_2O/mile	The Climate Registry General Reporting Protocol, Version 2.0, Table 13.5, April 2014.
Diesel Heavy-duty Truck Model Year 1960 - 2011 [a]	0.0048	g N_2O/mile	The Climate Registry General Reporting Protocol, Version 2.0, Table 13.5, April 2014.
Diesel Off-road Vehicle	0.26	g N_2O/gallon	The Climate Registry General Reporting Protocol, Version 2.0, Table 13.7, April 2014.
CH_4 Emission Factors			
Gasoline Passenger Car Model Year 2011 [a]	0.0173	g CH_4/mile	The Climate Registry General Reporting Protocol, Version 2.0, Table 13.5, April 2014.
Diesel Heavy-duty Truck Model Year 1960 - 2011 [a]	0.0051	g CH_4/mile	The Climate Registry General Reporting Protocol, Version 2.0, Table 13.5, April 2014.
Diesel Off-road Vehicle	0.58	g CH_4/gallon	The Climate Registry General Reporting Protocol, Version 2.0, Table 13.7, April 2014.

Notes:

[a] Model Year 2011 was the most recent year of emission factors available. As a result, it was assumed representative of vehicles used for this project.

Appendix B
Biological Resources Technical Memorandum

Colusa Generating Station Water Intake and Water Line Project

PREPARED FOR:	Charles Price/PG&E Compliance Manager
PREPARED BY:	Victor Leighton/CH2M HILL
COPIES:	Jerry Salamy/CH2M HILL Richard Crowe/CH2M HILL Susan Strachan/ Strachan Consulting
DATE:	April 29, 2014

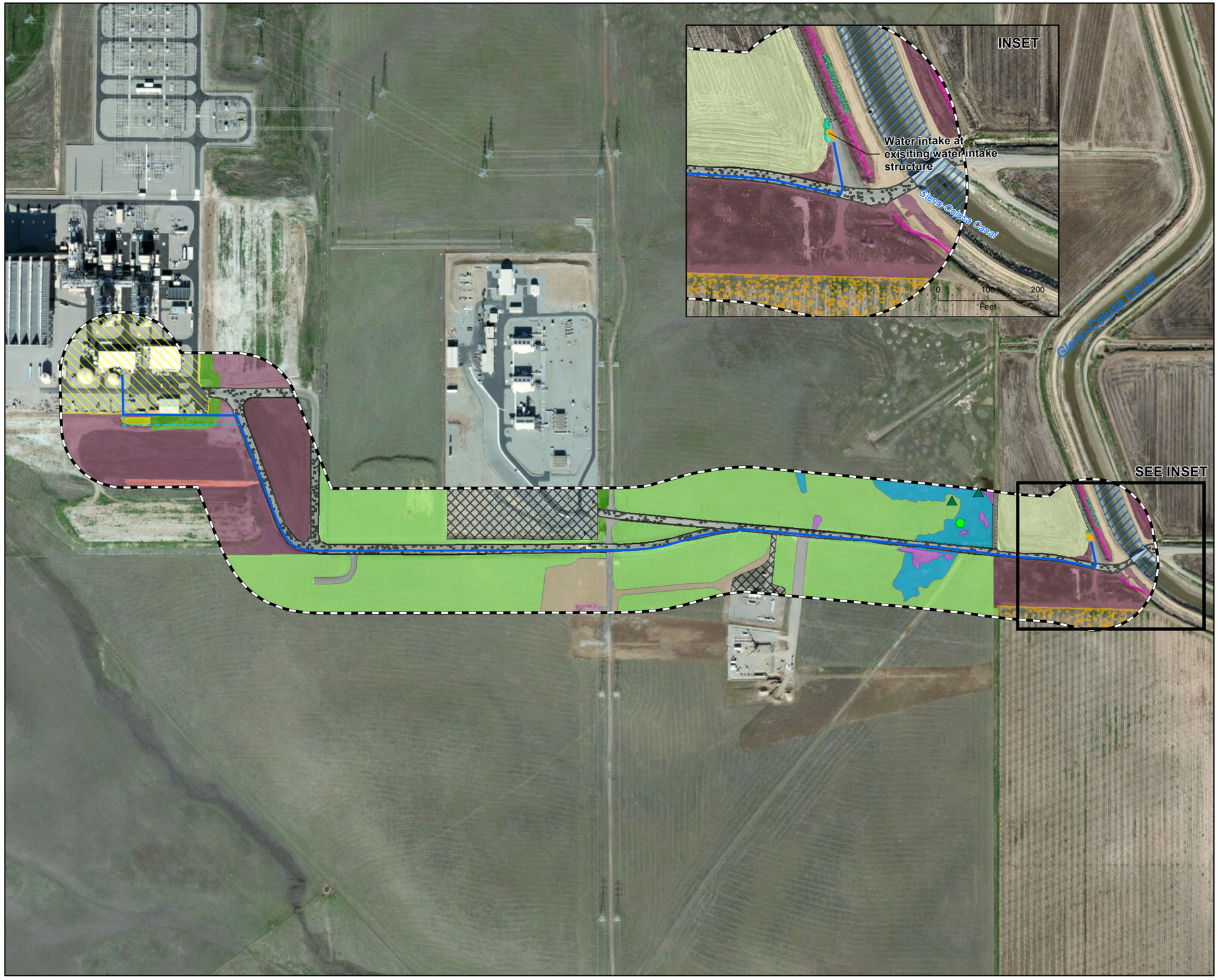
Introduction

This technical memorandum serves as a summary of biological survey results for the Colusa Generating Station (CGS) proposed water intake structure and 6-inch waterline project that runs within the private road from the CGS, east to an existing water intake structure on the west side of the Glenn-Colusa Canal (GCC). Protocol nesting bird, wetland delineations and plant surveys were not conducted during this survey. Areas within 250-feet on either side of the proposed construction corridor were surveyed and environmental conditions mapped. Mapped features from previous delineations and biological assessments conducted during licensing of CGS were verified in the field against current conditions. As all work is to occur within the paved road surfaces or graveled pads, there are no anticipated direct affects to sensitive resources (e.g., vernal pools, sensitive habitats or listed wildlife or plant species).

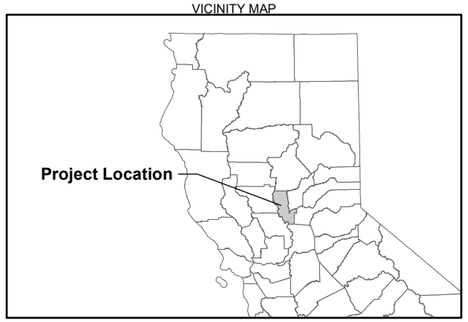
Project Description

PG&E proposes to construct an approximately 0.86-mile pipeline to transport Glenn-Colusa Irrigation District (GCID) water from the GCC to the CGS. The pipeline would be used when there is insufficient water in the Tehama-Colusa Canal (TCC) to supply the CGS. PG&E would access the water from an existing pump station, located immediately north of Dirks Road and west of the GCC, which is owned and operated by the farmer (property owner) whose field borders the canal. A new pump and electrical panel would be installed in a disturbed area adjacent to the existing pump station. The specific location of the new pump and electrical panel adjacent to the existing pump station would be determined during final design.

The water pipeline would extend from the interconnection point adjacent to the existing pump station and continue approximately 0.86-miles west to the CGS (see Figure 1). Specifically, the pipeline route would exit the pump station area and head west on Dirks Road until it reaches the CGS. The pipeline would be located on the south side (eastbound lane) of Dirks Road for the entire route. As the route reaches the CGS property, it would continue west along the south side of the CGS property line. Within this area, the pipeline route would either be located immediately adjacent to the fence line, on the north side of the landscaping and leach field, or as an alternative, it would be located south of the landscaping and leach field. The specific location would be determined during final design.



VICINITY MAP



LEGEND

- Project Study Area
- 6-inch waterline route
- Alternate waterline route
- Water intake at exisiting water intake structure

Special-Status Species (Historical)

- Brittlescale (*Atriplex depressa*)

Habitat Type

- Annual Grassland
- Freshwater marsh
- Walnut Orchard
- Winter Wheat
- Drainage Ditch Wetland
- Disturbed
- Disturbed Annual Grassland
- Disturbed Cut Bank
- Gravel Road
- Paved Road
- Dirt Road
- Landscaped
- Glenn-Colusa Canal
- Vernal Pool
- Alkali Grassland
- Leach Field
- PG&E Compressor Station
- Compressor Station
- Colusa Generation Station
- California Ground Squirrel Burrows
- California Ground Squirrel Burrows

0 400 800
Feet

N

Figure 1
Biological Resources In The Study Area
Colusa Generation Station
Pacific Gas And Electric Company
Proposed Water Intake Structure and 6-inch Waterline
Colusa County, CA

The pipeline would then enter the CGS site after the leach field and continue north within the site until it interconnects at the water treatment building.

The pipeline would consist of 6-inch diameter HDPE pipe. Two 2-inch conduit lines (one housing an electrical line, the other a spare) would be located in the trench with the water pipeline to serve as an alternative electric supply for the new water pump. An electrical panel would also be installed at the CGS to support this alternative electrical supply. The specific electric supply for the water pump would be determined during detailed design. The pipeline trench would be 18-inches wide and 24-inches deep. The construction corridor would be approximately 10-feet and would be located entirely within the eastbound lane of Dirks Road. Dirks Road is a private road utilized by PG&E, West Coast Gas, and the neighboring farmer. Construction of the pipeline would require closure of the eastbound lane in the area where construction is occurring. One lane of the road would be open at all times and traffic flow would be maintained through the use of traffic controls and flagmen.

Project Location

The Colusa Generating Station is located west of Interstate 5 and northwest of the City of Maxwell. The project is approximately 6.5 miles northwest of downtown Maxwell, in Colusa County, California (Figure 1). It is found in Sections 35 and 36 of Townships 18 North, Range 4 West and Sections 1 and 2 of Township 17N, Range 4 West (Mt. Diablo Meridian and Baseline) of the Sites 7.5-minute U.S. Geological Service Quadrangle (Latitude 39° 21′ 47.6″, Longitude 122° 15′ 21.8″). The Study area is defined as the proposed PG&E water intake structure and water line and all habitats within 250-feet of the pipeline from the Colusa Generating Station east to the west side of the Glenn-Colusa Canal . The study area is approximately 56.16 acres and encompasses the proposed water line and 250-feet on the north and south sides of the proposed waterline route (Figure 1).

Environmental Setting

The Great Central Valley is an approximately 400-mile long northwest-trending basin that extends along the center of the state from the Tehachapi Mountains in the south to the Klamath Mountains in the north. Regionally, the gently sloping alluvial terraces on the western side of the valley are characterized by agricultural and California annual grassland, punctuated by seasonal streams that are largely tributaries to the Sacramento River. At the project location, elevations range from approximately 200 feet above mean sea level (amsl) in the west to 120 feet amsl in the east.

Land Use and Terrestrial Plant Community Types

The extensive area is dominated by California annual grassland and rangeland habitats with developed industrial (gas facility) tracts, throughout the study area. The western end is dominated by annual grassland/dry rangeland habitats. The eastern end of the study area is characterized by, agricultural; upland alkali grasslands and vernal pools and disturbed habitats. PG&E developed facilities, irrigation canals, ditches including freshwater marsh habitat and the GCC dot the landscape along the alignment. Agricultural uses include non-irrigated rangeland, winter wheat, cultivated rice and English walnut orchards. Large nesting trees are limited in the area and are generally found to the east of the eastern end of the project alignment. Smaller trees/shrubs occur to the northwest along the irrigation and

drainage canals in the area. The proposed pipeline runs on a privately owned and paved roadway. The habitat types are briefly described in the following paragraphs.

California Annual Grassland/Rangeland

California annual grasslands are dominated by non-native plant species which are typical of degraded grasslands in the Central Valley and locally used as non-irrigated rangeland forage. The grasses and forbs germinate with fall rains, grow slowly in the winter months, and remain low in stature until spring, when increasing temperatures stimulate rapid growth. Characteristic species include yellow star-thistle (*Centaurea solstialis*), wild oat (*Avena fatua*, *A. barbata*), soft chess (*Bromus hordeaceus*), Medusa head (*Taeniatherum caput-medusae*), rat-tail fescue (*Vulpia myuros*), and Italian ryegrass (*Lolium multiflorum*). Common annual forbs include winter vetch (*Vicia villosa*), miniature lupine (*Lupinus bicolor*), long-beaked filaree (*Erodium botrys*), blow-wives (*Achyrachaena mollis*), and common fiddleneck (*Amsinckia menziesii* var. *intermedia*).

Developed

Developed areas include the CGS, buildings; PG&E Delevan gas compressor station, West Coast Gas compressor/storage, PG&E electrical transmission lines, roads, urban landscaped and farming disturbed areas.

Agricultural Uses

Agricultural uses in the area include rice, walnuts, winter wheat and non-irrigated rangeland grazing habitats.

Upland Alkali Grassland and Vernal Pool Complex

Alkali grasslands are habitats intermittently flooded or saturated within valley bottoms and the lower portions of alluvial slopes and are considered upland to facultative wetlands with low-growing vegetation species. The alkali grasslands within the study area are considered upland alkali grasslands. Shallow digressional areas within the alkali grassland areas support vernal pools and seasonal wetlands. Pools form after winter rains in settings of impeded water (e.g., basins) over areas with hardpans and are classified as: Palustrine non-persistent emergent wetlands and saline wetlands. Water chemistry is a mix of saline and fresh water. These pools occur on old, acidic, iron-silica cemented soils including Corning, Redding, and San Joaquin soil series. Topography is typified by hogwallows and mima mounds which occur on aggregations most commonly on old alluvial fans ringing the Central Valley (Sawyer and Keeler-Wolf, 1995). Characteristic species include barley (*Hordeum marinum; Hordeum murinum*), peppergrass (*Lepedium nitidum*), plantain (*Platago sp.*), alkali health (*Frankenia grandifolia*), brome (*Bromus hordeaceus*), filaree (*Erodium sp.*) and soft-chess brome (*Bromus hordeaceus*).

Vernal Pool Complex

Vernal pools are defined as "a natural habitat of the Mediterranean climate region of the Pacific coast covered by shallow water for extended periods during the cool season but completely dry for most of the warm season drought" (Zedler, 1987). Vernal pools are generally characterized by four distinct phases: (1) the wetting phase, which occurs during initial fall rainfall when dormant seeds germinate before the pools fill with water; (2) the aquatic phase, which occurs when the soils are completely saturated and pools are inundated; (3) the drying phase, which begins as the pool water level decreases but soil

moisture remains sufficient for plant growth and flowering; and (4) the drought phase, which is when pools are completely dry and most plant species have turned brown (Zedler, 1987). As a result of these different phases, the vegetation and or hydrology criteria are often not evident due to normal seasonal variations.

Vernal pools are typically distinguished from other seasonal wetlands based on a unique flora consisting of native plant species that are specifically adapted for the cyclical patterns of inundation and drying. The vernal pools in the study area have been classified as Northern hardpan vernal pools (Sawyer and Keeler-Wolf, 1995).

Freshwater Marsh

Freshwater marsh wetlands within the study area are located in irrigation and drainage channels and along the margins of irrigated fields including cultivated rice. Typical plant species include broad-leaf cattail (*Typha latifolia*), bulrush (*Schoenoplectus acutus*) and smartweed (*Polygonum* sp.*).*

Survey Methods

Before conducting the site survey, the California Natural Diversity Database (CNDDB, April 2014 data) was queried to identify those sensitive species and habitats recorded within 5 miles of the PG&E CGS proposed water intake structure and waterline. See Table 1 for CNDDB records from this 5-mile buffer. In addition, historical documents from the Application for Certification (AFC), U.S. Fish and Wildlife Service Biological Opinion (USFWS 2008), historic biological survey data and figures were referenced. Biological resource figures detailing species and habitat findings for the construction of the CGS were printed and used as reference and verification in the field.

The site survey was conducted by CH2M HILL biologist Victor Leighton on April 8, 2014 between 8:00 a.m. and 12:30 p.m., Air temperatures were 55 to 80 degrees Fahrenheit, clear skies with negligible wind speeds. The water intake area and water pipeline route was walked and aerial maps were used to identify and mark habitat types including vernal pools, alkali grasslands, and wetland habitats. The site and surrounding locations were systematically evaluated on foot and by windshield survey throughout the study areas. Where private lands existed along the alignment and could not be accessed, the areas were surveyed with binoculars and spotting scope to identify habitat types, including sensitive habitat for listed species. Potential nesting birds including Swainson's' hawk (*Buteo swainsoni*, SWHA) a state and federally threatened species and suitable nesting locations/activities associated with these species and locations were documented on aerial maps.

To meet the California Department of Fish and Wildlife (CDFW) recommendations for protection of SWHA nest sites, non-protocol surveys were conducted within a 0.5-mile radius around all proposed project activities (where possible) to identify potential SWHA nesting locations and 300 feet for non-listed raptors and 100 feet for non-listed passerines at all work locations. Multiple angles were utilized to assist with visual observation of all trees to aid in detecting nests and binoculars were used to distinguish stick nests locations. Driving or "windshield surveys" were also utilized for surveying the study area and the 0.5-mile buffer. Visual and aural cues were also used to detect hawks within the surrounding area.

Results

The study area and survey findings are depicted in Figure 1. The proposed water pipeline alignment occurs within an existing PG&E owned and paved road from the CGS to the east to a graveled pad and existing water intake structure. The area that the road runs through is dominated by non-native California annual grassland habitats, with a small segment running through upland alkali grasslands and vernal pool complexes towards the eastern end of the roadway alignment. Several PG&E and gas gathering facilities, and transmission facilities occur on the north and south sides of the alignment; sites are fenced and have gravel roads to the sites with considerable disturbances around their perimeter.

Vernal pools and alkali grassland communities were compared to historic biological resource maps and field verified, as these lands are privately owned and access was limited to Dirk's Road and dirt access roads that run perpendicular to the water line alignment. Previously identified vernal pools and habitat types were consistent and appeared to have not changed from historic survey documentation. The vernal pools' were dry during the survey as it was past the wet season and California is experiencing a decline in precipitation over the last few years and considered to be in a severe drought for the 2013/2014 season.

The eastern end of the proposed project where the proposed water intake structure is to be constructed (Figure 1) is within a highly disturbed graveled pad. The pad has an existing water intake structure and filtration station on a cement pad which belongs and is maintained by the property owner. Adjacent to the gravel pad to the west is a winter wheat field and an irrigation drainage ditch runs north and south to the east side of the pad. The wheat field has a small border of freshwater marsh, dominated by dead cattails, where the irrigated field intersects the slope of the gravel pad before draining through a culvert under a dirt access road before entering a drainage ditch to the east. The ditch also contains a small border of freshwater marsh species along its border. Dirt and gravel access roads occur on both the east and west side of the drainage ditch. East of the drainage ditch is the GCC. To the south of the gravel pad and south of PG&E's access road (Dirk's Road) is a newly created English walnut orchard and highly disturbed upland habitats boarder the roadway. Cultivated rice fields occur east of the GCC which is currently dry and undisturbed from last year's production season. Freshwater marsh exists on the boarders of these rice fields and is dominated by dead cattails.

Nesting cliff swallows (*Petrochelindon pyrrhonota*) were actively building nests under the GCC bridge structure. A pair of red-tailed hawks (*Buteo jamaicensis,* RTHA) was observed conducting aerial courtship displays near the CGS. No RTHA nests were identified associated with this pair within 300-feet of the alignment.

Rattle snakes are common in the area and a juvenile western diamond-back (*Cortalus atrox*) was observed to the south of the CGS site along a wattled berm. Scattered medium sized burrows were observed along the water pipeline alignment, each was checked systematically. All burrows were just starts with no below ground tunnels, with the exception of the California ground squirrel (*Spermophilus beecheyi*) burrows observed along the drainage ditch near the proposed water intake structure and within the alkali grassland as shown in Figure 1. A list of wildlife species observed is included in Attachment 1.

Special-status Plants

The CNDDB contains records for 7 special-status plant species in the general vicinity of the site (Table 1). No protocol special-status plant surveys were conducted during this survey effort. The proposed water intake and water line alignment are within heavily compacted, graveled and disturbed surfaces or a paved roadway. The only naturalized vegetation occurs on the adjacent road shoulders and disturbed areas around the water pipeline alignment. The road shoulders appear to be routinely (annually) sprayed to control weed species. The California grasslands south of the CGS site are routinely mowed and disturbed. As no proposed site work is to occur outside of previously disturbed or paved road areas, impacts to special-status plants would be considered highly unlikely. See Table 1 for species details.

Special-status Wildlife

The CNDDB contains records for 9 special-status wildlife species in the general vicinity of proposed water intake and water line alignment. California tiger salamander, CA DPS (*Ambystoma califoniense*, CTS) a federally and state threatened species was noted in the original licensing documentation but per the U.S. Fish and Wildlife Service Biological Opinion (USFWS 2007) no documented CTS occurrence north of Yolo County have been recorded in over 40 years. No CNDDB records are noted within 5-miles of the project site for this species currently. The closets pool that contains sufficient water to support the life cycle for CTS occurs to the west (approximately 0.38-miles) and south (approximately 0.36-miles) of the CGS waterline alignment.

Although suitable trees that could provide nest sites for SWHA occur in the greater area; no suitable nesting trees occur within the CDFW-recommended 0.5-mile buffer for protection of this species. No nesting habitat was noted for tri-colored blackbird (*Agelaius tricolor*) a California species of special concern. California ground squirrel and their associated burrows were present near the water intake structure along the drainage ditch and within the alkali grasslands north of the waterline alignment. No burrowing owls (*Athene cunicularia*, BUOW) a California State Species of Special Concern or evidence of burrowing owls occupancy (i.e., feathers, pellets or white wash) was observed within 500 feet of the proposed projects sites (where access was allowed). As the survey occurred during the appropriate breeding season for BUOW, and no BUOW were noted, and it is unlikely that this species will be impacted.

No vernal pools will be impacted as all work will occur within roads or highly disturbed areas during the dry season; impacts to vernal pools and listed brachiopods are considered highly unlikely. Potential aquatic habitat occurs for giant garter snake (*Thamnophis gigas*, GGS) a state and federally threatened species within the drainage ditch and the GCC to the east of the proposed water intake structure. All work and staging will occur in heavily disturbed areas and provides marginally suitable upland habitat for GGS. No other special-status species or suitable habitat were noted or observed during the survey effort. Impacts to special-status wildlife species would be less than significant.

Direct and Indirect Impacts

Direct impacts will be confined to the PG&E owned paved road from the west of the GCC to just east of the CGS and asphalt paved surfaces within the CGS. A small portion of

disturbed California annual grassland will be temporality impacted to install the waterline along the southern border of the CGS. Additional temporary impacts will occur at the proposed water intake structure within the gravel pad adjacent to the property owner's existing water intake and filtration system structure. Approximately 0.295 acres of temporary impacts to disturbed California annual grassland, landscaped and graveled areas are anticipated (assuming a 20-foot work corridor). The alternate alignment would have temporary impacts of 0.319 acres. Approximately 0.177 acres of temporary impacts to previously asphalted private roadways and CGS are anticipated.

No temporary or permanent construction impacts or ongoing operational impacts are anticipated to sensitive habitat or resources along the proposed waterline alignment or water intake location.

Avoidance and Minimization Measures

PG&E proposes to implement the existing Biological Resources Conditions of Certification BIO-1 to BIO-6, BIO-13, and BIO-14 to further reduce the already less than significant biological resource impacts due to construction of the water pipeline and pumping facility. A summary of these avoidance and minimization included.

- Designate a Biologist (DB) and Biological Monitor (BM) to oversee, as appropriate, the installation of the water pipeline and water intake pumping facility (Conditions BIO-1 to BIO-4).
- Implement the existing and approved PG&E CGS Worker Environmental Awareness Training program to all construction workers (Condition BIO-5).
- Implement the existing and approved PG&E CGS Biological Resources Monitoring and Mitigation Plan (Condition BIO-6).
- For work activities occurring between February 15 and August 31, pre-construction nesting bird surveys and ongoing nesting surveys will be conducted by a qualified biologist within 14 days of construction, covering a radius of 0.5 miles for Swainson's hawk, 250 feet for non-listed raptors, and 100 feet for non-listed passerines at all work locations. If nesting birds are found, the DB and/or BM will evaluate whether existing screening buffers (such as buildings, trees, intervening topography) are sufficient to allow work to proceed, and/or determine what level of work exclusion buffers or nest monitoring is needed.
- The DB and/or BM will monitor construction within 250-feet of vernal pools, rice fields or the GCC for sensitive species (Condition BIO-13).
- All construction will be limited to the dry season and the active season for GGS (May 1 through October 1) and when listed vernal pool species and habitat is less likely to be indirectly affected by erosion, sedimentation or species dispersal.
- Wetlands adjacent to the road (work corridor) will be marked as sensitive areas, and if deemed necessary by the DB or BM, best management practices (BMPs) would be installed (e.g., silt fence, biodegradable straw wattle). These would be installed at the top of PG&E road embankment. BMPs would be regularly inspected and maintained for the duration of the construction.

- Construction would be confined to the existing PG&E access road and graveled pads associated with the existing water intake structure and approaches on the west side of the GCC. All ground disturbing activity will be excluded from wetlands and wetland boundaries.
- Upon completion of the project, all areas that have been temporarily impacted by the project would be restored to approximate original site conditions.

References

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U.S. Fish and Wildlife Service. 2007. Biological Opinion for the Colusa Generating Station. Service file number 1-1-96-F-001, reference 81420-2008-F-0836-1. March 14, 2008.

Zedler, Paul. 1987. *The Ecology of Southern California Vernal Pools.* Biological Report No. 85 (7.11) U.S. Department of the Interior, Fish and Wildlife Service, Washington D.C.

Sawyer, J. and Todd Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society. Sacramento, California.

Photo 1, looking east within CGS. Waterline to enter into building in front of Gradall.

Photo 2, looking north where waterline will enter CGS into building in background.

Photo 3, looking south from CGS, adjacent to west side of leach field.

Photo 4, Primary waterline route along south fence line of CGS. View east.

Photo 5, Alternate waterline south of CGS fence line and leach field. View east.

Photo 6, looking west at primary waterline alignment on south side of CGS.

Photo 7, looking west from paved road at point waterline heads west to CGS plant through landscaped perimeter.

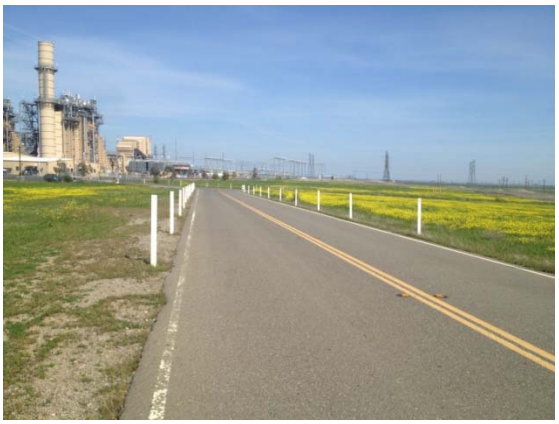

Photo 8, looking north at waterline alignment within edge of right paved road.

Photo 9, looking north at waterline route.

Photo 10, looking west toward curve in road as seen in Photo 9.

Photo 11, looking south at disturbed areas south of Delevan Compressor Station.

Photo 12, looking north at Delevan Compressor Station.

Photo 13, looking west at waterline alignment through disturbed California annual grasslands adjacent to Delevan Compressor Station.

Photo 15, looking west at waterline route through disturbed grasslands.

Photo 17, Looking northeast at alkali grassland and vernal pools on north side of road see Figure 1.

Photo 14, looking west where road splits near Delevan Compressor Station.

Photo 16, looking west, adjacent to alkali grassland and vernal pool on south side of access road, See Figure 1.

Photo 18, Looking northwest of alkali grassland on north side of access road, see Figure 1.

Photo 19, Looking north at proposed water intake pad adjacent to property owner's intake and filtration station.

Photo 21, looking north at proposed water intake location adjacent to property owner's water intake and filtration station.

Photo 23, Looking south from proposed water intake pad and structures.

Photo 20. Looking west from south side of water intake pad as seen in Photo 19.

Photo 22, looking northwest at water intake.

Photo 24, looking south at disturbed fields and walnut orchard south of water intake structure and adjacent to waterline alignment and paved road.

Photo 25. Looking southeast at disturbed habitats south of waterline alignment.

Photo 26, looking south at proposed water intake adjacent to existing structure. New intake line will be installed in cement box on right side of photo.

Photo 27, looking south at freshwater marsh along edge of irrigated winter wheat field. Note culvert box which leads to drainage canal in photo 29.

Photo 28, looking at freshwater marsh at tail-end of irrigated winter wheat field.

Photo 29, looking south at drainage canal at east side of water intake pad. Pipe is existing water intake line for property owner out of the Glenn-Colusa Canal.

Photo 30, Western diamond-backed rattler (Juvenile).

TABLE 1
CNDDB Records from a 5-Mile Buffer of the proposed work locations for Colusa Generating Station Proposed Water Intake Structure and Waterline Alignment.

Scientific Name	Common Name	Status				Habitat Requirements	Potential for Occurrence
			State	CDFW	CNPS		
Plants							
Atriplex codulata var. *cordulata*	Crownscale	-	-	-	4.2	Found in shadescale scrub, valley grasslands, freshwater wetlands, and wetland-riparian habitats, usually occurs in wetlands and vernal pools.	No suitable habitat within the project work space.
Atriplex deprressa	Brittlescale	-	-	-	1B.2	Found in shadescale scrub, valley grasslands, alkali sink, and wetland-riparian habitats, occurs in wetlands and non-wetlands in playa habitat.	No suitable habitat within the project work space.
Atriplex joaquinana	San Joaquin spearscale	-	-	-	1B.2	Shade scale scrub, valley grassland in meadows	No suitable habitat within the project work space.
Atriplex persistens	Sacramento saltbush	-	-	-	1B.2	Found in shadescale scrub, valley grasslands, freshwater wetlands, and wetland-riparian habitats, usually occurs in wetlands and vernal pools.	No suitable habitat within the project work space.
Chamaesyce hooveri	Hoover's spurge	T	-	-	1B.2	Found in valley grasslands, freshwater wetlands, and wetland-riparian habitats, usually occur in wetlands and vernal pools.	No suitable habitat within the project work space.
Chloropyron palmatum	Palmate-bracted bird's-beak	E	E	-	1B.1	Grows in saline-alkaline soils in seasonally-flooded lowland plains and basins at elevations of less than 500 feet.	No suitable habitat within the project work space.
Lepidium latipes var. *heckardii*	Hackard's peppergrass	-	-	-	1B.2	Found in valley grasslands, and wetland-riparian habitats, usually occur in wetlands and vernal pools.	No suitable habitat within the project work space.

TABLE 1
CNDDB Records from a 5-Mile Buffer of the proposed work locations for Colusa Generating Station Proposed Water Intake Structure and Waterline Alignment.

Scientific Name	Common Name	Status				Habitat Requirements	Potential for Occurrence
			State	CDFW	CNPS		
Invertebrates							
Branchinecta conservatio	Conservancy fairy shrimp	E	-	-	-	Restricted to the Central Valley except for one population in the Central Coast in Ventura County found in large and turbid vernal pools called playa pools.	No suitable habitat is present in project area.
Linderiella occidentalis	Vernal pool fairy shrimp	-	-	-	-	Endemic to the grasslands of central valley coast mountains, and south coast mountains, in rain filled pools.	No suitable habitat is present in project area.
Lepidurus packardi	Vernal pool tadpole shrimp	E	-	-	-	Marshes and swamps (freshwater). Inhabits vernal pools and swales in the Sacramento valley containing clear to highly turbid water.	No suitable habitat is present in project area.
Mammals							
Perognathus inornatus inonatus	San Joaquin pocket mouse	-	-	-	-	Found in California central valley in open grasslands, savanna and desert scrub. Generally in areas with sandy washes and finely textured soils.	Not a listed species
Amphibians/Reptiles							
Ambystomoa californiense	California tiger salamander	E	E	SSC	-	Vernal pools, grasslands and oak woodlands. Aestivates in upland habitats, utilizing small mammal burrows, breeds in seasonal to permanent ponding features.	Not likely to occur. Potential suitable ponds within 0.38-miles to the west and 0.36-miles to the south of the project. No occurrence in over 40 years for this project region.
Thamnophis gigas	Giant garter snake	T	T	-	-	California central valley, wetlands, rice, canals and marshes.	Suitable habitat is present within 200-feet of the project area at Water Intake Structure only. Work will be conducted during the active season.

TABLE 1
CNDDB Records from a 5-Mile Buffer of the proposed work locations for Colusa Generating Station Proposed Water Intake Structure and Waterline Alignment.

Scientific Name	Common Name	Status				Habitat Requirements	Potential for Occurrence
			State	CDFW	CNPS		
Birds							
Agelaius tricolor	Tri-colored blackbird	-	-	SSC	-	Highly colonial species, most numerous in Central Valley & vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of colony.	No suitable habitat is present in project area.
Buteo swainsoni	Swainson's hawk	-	T	-	-	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs and agricultural ranchlands.	No suitable nesting locations within 0.5 miles of the project area.
Athene cunicularia	Western burrowing owl	-	-	SSC	-	Valley and foothill grassland. Utilizes fossorial mammal burrows or manmade structures (e.g. pipes, culverts) to nest or take refuge.	Suitable nesting habitat present. No evidence of occupancy noted during survey.

*Status:
Federal Designations:
(E) Federally endangered, (T) Federally Threatened (C) Candidate for listing
State Designations:
(E) State Endangered, (T) State Threatened, (R) State Rare,
California Department of Fish and Wildlife (CDFW) Designations:
(SSC) Species of Special Concern, (CFP) Fully Protected Species
California Native Plant Society (CNPS) California Rare Plant Rank:
(1A) Presumed extinct in California; (1B) Rare, threatened, or endangered in California and elsewhere; (2) Rare, threatened, or endangered in California, but more common elsewhere; (3) More information is needed; (4) Limited distribution, watch list
Threat Rank:
- •0.1 Seriously threatened in California (more than 80% of occurrences threatened / high degree and immediacy of threat)
- •0.2 Fairly threatened in California (20 to 80% occurrences threatened / moderate degree and immediacy of threat)
- •0.3 Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

Attachment A
Observed Wildlife Species

Wildlife Observations in the PG&E Colusa Generating Station Project Area, Colusa County California, April 8, 2014

Common Name	*Scientific Name*	Comments
Mallard	*Anas platyrhynchos*	Fly over
Turkey vulture	*Cathartes aura*	Fly over
Red-tailed hawk	*Buteo jamaicensis*	Fly over
Ferruginous hawk	*Buteo regalis*	Perched east of Glenn-Colusa Canal
American kestrel	*Falco sparverius*	Foraging
Killdeer	*Charadrius vociferus*	Within alkali grasslands
Rock dove	*Columba livia*	Fly over, and on adjacent bridge
Mourning dove	*Zenadiada macroura*	Perched in disturbed grasslands and fly over
Anna's hummingbird	*Calypte anna*	Fly over
Western kingbird	*Tyrannus verticalis*	Perched and foraging in the area.
Black phoebe	*Sayornis nigricans*	Pair foraging in adjacent property
Cliff swallow	*Hirundo pyrrhonota*	Nesting under the Glenn-Colusa Canal and flyover
American crow	*Corvus brachyrhynchos*	Fly over
Common raven	*Corvus corax*	Fly over
Northern mocking bird	*Mimus polyglottos*	Perched and foraging in the area
Western meadowlark	*Sturnella neglecta*	Perched and foraging in the area
Red-winged blackbird	*Agelaius phoeniceus*	Fly over
White-crowned sparrow	*Zonotrichia querula*	Perched and foraging in the area
House sparrow	*Passer domestiscus*	Perched and foraging in the area
California ground squirrel	*Otospermophilus beecheyi*	Using burrows in alkali grassland and along drainage canals
Western diamond-back rattlesnake	*Cortalus atrox*	Juvenile within disturbed grassland south of CGS