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CH2MHILL

January 12, 2009

371322

Rod Jones
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: Lodi Energy Center (08-AFC-10)
Wetland Concerns - Technical Memorandum

Dear Mr. Jones:

Please find attached a Technical Memorandum addressing the wetland concerns of an area to the southwest of the proposed project site for the Lodi Energy Center project.

Attached are 13 hard copies and 1 electronic copy on CD-ROM. Additional electronic copies are available upon request.

If you have any questions about this matter, please contact me at (916) 286-0249 or Andrea Grenier at (916) 780-1171.

Sincerely,

CH2M HILL

Sarah Madams
AFC Project Manager

Attachment

cc: A. Grenier, Grenier & Associates, Inc.
E. Warner, NCPA

MEMORANDUM CH2MHILL

Lodi Energy Center - Wetland Concerns

TO: Rod Jones/CEC
Kathleen Dadey/USACE
Dale Harvey/RWQCB

COPIES: Sarah Madams/CH2M HILL
Andrea Grenier/Grenier & Associates, Inc.

FROM: Russell Huddleston/CH2M HILL

DATE: January 12, 2009

Introduction

Based on the results of a site visit conducted in September 2008, the California Energy Commission (CEC) expressed concerns that an area to the southwest of the proposed project site that was not identified on the maps provided to the CEC and the U.S. Army Corps of Engineers (USACE) is a potential wetland feature. The concern was based on their observation of wetland vegetation in a low swale adjacent to a dirt access road that parallels an irrigation canal south of the existing Combustion Turbine Project #2 (STIG plant[1]) during a CEC site review of the site in September 2008. During the biological resource surveys of this area conducted by CH2M HILL in April 2008, this low swale was not considered to be a potential wetland. Although wetland vegetation such as nettle (*Urtica dioica*) [FACW] and perennial pepperweed (*Lepidium latifolium*) [FACW[2]] were observed in this area at that time, the swale was also characterized by abundant cover of non-wetland species such as rip-gut brome (*Bromus diandrus*) and Italian thistle (*Carduus pycnocephalus*). Perennial pepperweed, while listed as a FACW species, is abundant and widespread in the southwestern part of the project area, including upland areas. This highly invasive and opportunistic species is often associated with disturbed areas and was not considered a reliable indicator of wetland conditions on the site. Additionally no evidence of wetland hydrology was noted in the low swale area at the time of the initial survey.

During the CEC site visit in September 2008, a dense patch of seaside heliotrope (*Heliotropium curassavicum*) [OBL[3]] was observed in the low swale area along with dense perennial pepperweed. The CEC was concerned that this area may be a seasonal wetland based on the abundance of FACW and OBL wetland plant species in a topographically low area. Seaside heliotrope is a summer blooming species that was not evident during the early spring surveys and no detailed wetland studies or sample points were established in the swale during the April field survey. Given the concerns of the CEC and the lack of detailed wetland sample points, it was determined that additional data from this area was necessary to determine whether or not the swale is a wetland. This memorandum documents the results of additional field data collection, including wetland sample points and site

[1] "STIG plant" refers to the Northern California Power Agency's Combustion Turbine Project, which is a steam turbine injected gas turbine (STIG) plant

[2] FAWC – Facultative wetland plant species (estimated 67-99 percent probability of occurrence in wetlands)

[3] OBL – Obligate wetland plant species (estimated 99 percent probability of occurrence in wetlands)

photographs as well as other relevant information supporting our conclusions that the swale is not a wetland.

Methods

Additional field data was collected from within the low swale on December 4, 2008 by CH2M HILL wetland ecologist Russell Huddleston. Wetland sample points were established in three locations where dense hydrophytic vegetation was present: the first was characterized by seaside heliotrope (OBL), the second by perennial pepperweed (FACW) and the third by nettle (FACW). Although the vegetation had senesced by the time of the survey, the remnant stems, leaves, fruits, seedlings and young leaves allowed for the identification of the plant species at each sample location. The percent aerial cover of each species was visually estimated and recorded on data sheets (Attachment A). The wetland indicator status of each species was based on the *National List of Plants that Occur in Wetlands (*Reed 1988). Representative photographs of each sample point are provided in Attachment B.

At each sample point a soil pit was excavated to a minimum depth of 24 inches. Information on soil color and texture was recorded on the data sheets. The soil profile was examined for evidence of hydric soil conditions based on the *Filed Indicators of Hydric Soils in the United States* developed by the Natural Resource Conservation Service [NRCS](2006) in cooperation with the National Technical Committee for Hydric Soils. Field observations were also checked against the mapped soils units for this area and official soil series descriptions (NRCS 2008a, 2008b). Soil information is provided in Attachment C.

Each sample point as well as areas throughout the swale were investigated for evidence of seasonal wetland hydrology such as water marks, sediment deposits, drift lines, water stained leaves, algal matting, aquatic invertebrates and a water table within the upper 24 inches.

Wetland Definition

The U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency (33 CFR Part 328) jointly define wetlands as:

> *Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*

Wetlands have the following general diagnostic environmental characteristics:

(1) *Vegetation.* The prevalent vegetation consists of macrophytes that are typically adapted to survive in anaerobic conditions due to prolonged ponding or saturation.
(2) *Soil.* Wetland soils typically possess characteristics (redoximorphic features) that are associated with reducing soil conditions.
(3) *Hydrology.* The area is inundated or the soil is saturated to the surface at some time during the growing season for a minimum of 14 consecutive days.

Except in certain situations defined in this manual, evidence of a minimum of one positive wetland indicator from each criterion (vegetation, soil and hydrology) must be found in order to make a positive wetland determination.

Results

The area in question is a low topographic swale along the southwestern edge of the property that runs parallel to the dirt access road along the north side of an irrigation canal (Figure 1). Within the project study area the swale is a low, weakly expressed depressional feature that becomes a more defined channel to the west of the property (see photographs in Attachment B). Vegetation within the swale includes a mixture of native and non-native hydrophytic and upland plant species such as nettle, perennial pepperweed, seaside heliotrope, prickly lettuce (*Lactuca serriola*), Italian thistle, milk thistle (*Silybum marinum*), rip-gut brome, Himalayan blackberry (*Rubus discolor*) and mustard (*Brassica* sp.). Several large cottonwoods (*Populus fremontii*), scattered black locust (*Robinia pseudoacacia*) and one black willow (*Salix gooddingii*) are present along the swale. Based on the results of the field surveys and additional data review, the low swale shows no indication that it is a seasonal wetland. While this area supports hydrophytic plant species, no evidence of hydric soils or wetland hydrology was apparent at any of the sample locations within the swale. Descriptions of the sample points are provided below.

Sample Point SP-01

This sample point was located at a low point in the swale immediately west of a 24-inch diameter corrugated metal culvert (Figure 1). Vegetation in this area is characterized by dense seaside heliotrope. Remnant stems and seedlings of Italian thistle and rip-gut brome are also present. Seaside heliotrope is listed as an obligate (OBL) plant species in California on both the Reed (1988) and Kartaz (1996) lists of plants that occur in wetlands. Obligate plants are those that have an estimated 99 percent probability of occurring in wetlands and the presence of such species would normally be considered compelling evidence that wetland conditions are present in a given area. However; the designation of OBL to seaside heliotrope is not supported by the habitats and locations in which this species is often found based on botanical literature, herbarium records, and personal observations. During the December 4, 2008 survey this species was observed in the non-wetland grassland area adjacent to the swale and along roadsides elsewhere in the project area. According to the *Jepson Manual* (Hickman 1993) this species occurs in "moist to dry saline soils". Local floras describe this species occurring in "somewhat saline places" (Beidleman and Kozloff, 2003) and "disturbed and alkaline areas, riverbanks" (Best et al. 1996). The habitat of this species as described in *Weeds of California and Other Western States* (Di Tomaso and Healy 2007) includes "open disturbed places, roadsides, fields, ditches, pastures, margins of agronomic and vegetable crops, riparian areas, seasonal wetlands (including those on serpentine soil), pond margins, forest clearings and saline or alkaline soils." Of the 412 herbarium records available through the Jepson Interchange (U.C. Berkley, 2008) 142 contained at least some specific habitat information. Over half of these 142 collections were described from what would seem to be non-wetland areas such as roadsides, trails, fields and sandy areas. Many of the "wetland" records indicated the plants were growing along the **edges** of lakes, ponds, rivers and creeks. Only 21 of the 142 records (15 percent) were described as actually

occurring **in** wetlands (UC Berkley, 2008). Based on this information the assignment of an OBL wetland indicator status to seaside heliotrope appears to significantly overestimate the probability of occurrence in wetland habitats while underestimating its frequency of occurrence in non-wetlands. Therefore the presence of this species alone was not considered to be a reliable indicator of wetland conditions despite its OBL status.

Soil in this area appears to be very similar to that described for the Devries Series which is the mapped soil unit in this location (NRCS 2008a, 2008b – Attachment C). The upper surface is a loose, very dark grayish brown (10YR 3/2) [moist] sandy loam with many fine roots. From 3 to 10 inches the soil is a very dark grayish brown (10YR 3/2) [moist] sandy clay loam with brown (10 YR 5/3) [moist] sandy mottles. Note: these are mottles in the true sense of the word and **not** redoximorphic features. Mottles are defined as areas of color that differ from the matrix color and are often attributes retained from the geologic source rather than from pedogensis (NRCS, 2002). Soil matrix color and texture are similar below (from 10 to 16 inches) but the soil is harder and much more friable. No hydric soil indicators were observed in the upper 28 inches at this sample location and there is no evidence to suggest the soil becomes anaerobic in the upper part at any time during the season.

As previously noted this sample point was established in a low part of the weakly concave low swale. A 24-inch diameter corrugated metal culvert is located just to the east of this sample point (Figure 1). The swale continues for approximately 140 feet to the west to the edge of the property at which point it becomes a more defined, excavated channel (see photographs in Attachment B). A large log is present to the west of the sample point lying within and perpendicular to the swale feature. At the time of the surveys (April and December) no evidence of flowing or standing water was noted in the swale area. Both ends of the culvert, the area around the log and fence line to the west were examined for flow lines, debris piles, sediment deposits, water marks, water stained leaves and other indicators that might suggest seasonal flooding, or other signs of flowing or ponding water in this area, and none were found. Soils in this area appear to have moderately high permeability with no restrictive layer in the upper 28 inches. According the mapped soil data the water table in this area is at a depth of approximately 5 feet and the soil is subject to only rare flooding or ponding (NRCS 2008a – Attachment C). During the December field visit there was no evidence of a seasonal water table within 28 inches of the surface in this area.

While hydrophytic vegetation is present in this area, no evidence of hydric soil or wetland hydrology was found. Therefore this sample point was considered to occur in a non-wetland area.

Sample Point SP-02

The second sample point was located within the same swale feature approximately 70 feet west of the first sample point (Figure 1). Vegetation in this area is characterized by a dense monoculture of perennial pepperweed. Perennial pepperweed is a highly invasive non-native species typically found in moist or seasonally wet habitats such as riparian areas, seasonal wetlands, floodplains, and wet meadows. However; it is also common in drier sites such as pastures, range lands, orchards, vineyards and other agricultural areas (Di Tomaso and Healy 2007; Renz 2000). Perennial pepperweed is tolerant of saline and alkaline habitats and is capable of withstanding extended periods (over 50 days) of inundation (Chen et al., 2002), but will not survive in permanently flooded areas (Renz, 2000). Perennial

pepperweed is abundant and widespread throughout the area south of the existing STIG plant and in disturbed, non-wetland areas throughout the property (see photographs in Attachment B).

Soil in this area is similar to that observed at sample point SP-01. The surface layer is a dark grayish brown (10 YR 4/2) [moist] sandy loam underlain by a dark grayish brown (10 YR 4/2) to very dark grayish brown (10 YR 3/2) [moist], with sandy inclusions (mottles) present between 6 and 16 inches. A brown (10 YR 4/3) sandy layer is present at a depth of 20 inches. No redoximorphic features or other hydric soil indicators were noted in the upper 24 inches of the soil profile.

As with the first sample location, no evidence of seasonal ponding, flowing water or shallow ground water was observed in this area. Based on the lack of hydric soil and wetland hydrology indicators this sample point was considered to be located in a non-wetland area.

Sample Point SP-03

The third sample point was established towards the east end of the swale feature (Figure 1) in an area characterized by dense nettles. Nettles occur throughout the eastern part of the swale feature, but are intermixed with upland species such as rip-gut brome, Italian thistle, mustard and wild radish (*Raphanus sativus*). The specific location of the sample point was selected based on the lack of upland plant species and abundance of nettle.

Soils were generally similar to the other two sample points within the swale feature. The surface layer is a very dark gray (10 YR 3/1) [moist] loam with many fine roots. From 3 to 24 inches the soil is a dark grayish brown (10 YR 4/2) [moist] sandy clay loam with brown (10 YR 5/3) and olive brown (2.5 Y 4/3) sandy inclusions (mottles).

As with the other sample points no evidence of wetland hydrology or hydric soil was observed at this location, therefore this point was considered a non-wetland.

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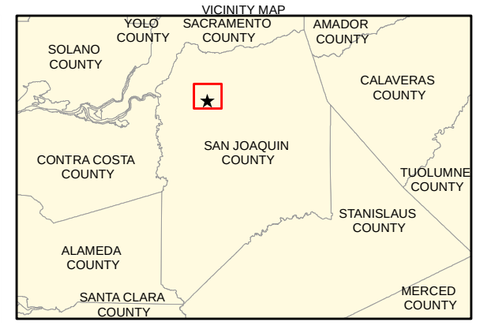


LEGEND

- Sample Point
- 24" Diameter Culvert
- Natural Gas Pipeline
- 250-foot Buffer of Sites
- Project Sites

Potential Jurisdictional Waters of the U.S/State

- Irrigation Canal

Potential Non-Jurisdictional Waters of the U.S/State

- Agricultural Drainage Ditch
- Vector Control Pond
- Water Treatment Pond

N

0 100 200
Feet

Figure 1
Water Features
Lodi Energy Center
San Joaquin County, CA

Attachment A
Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Lodi Energy Center City/County: San Joaquin Date: Dec. 4, 2008

Applicant/Owner: Northern California Power Agency State: CA Sampling Point: SP-01

Investigator(s): Russell Huddleston Section, Township, Range: Sec 24 T: 03 North R: 05 East (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 1-2 %

Subregion (LRR): C – Mediterranean California Lat: 38˚ 05' 13.726" N Long: 121˚ 23'15.835 W Datum: WGS84

Soil Map Unit Name: Devries Sandy Loam, Drained, 0-2 Percent Slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, 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** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Below average rainfall between October 1 and November 30 – total precipitation for this period in 2008 is 1.8 inches; approximately 56% of the average of 3.2 inches for this time of year. Low area is characterized by hydrophytic plants, but no evidence of ponded or flowing water or anaerobic soil conditions were observed at this sample location.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum Plot Area: 1 m^2			
1. *Heliotropium curassavicum*	80	X	OBL
2. *Carduus pycnocephalus*	15		NL
3. *Bromus diandrus*	5		NL
4. *Geranium dissectum*	<1		NL
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

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		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

X Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Plant species had senesced but were still identifiable based on remnant stems, leaves and fruits as well as emerging seedlings. *Heliotropium curassavicum* while listed as an OBL is ecologically more likely FAC and the abundance of this species may not be a reliable indicator of wet conditions. Cottonwood and black locust trees are present along the edges of the swale but were not included in the sample plot.

SOIL

Sampling Point **SP-01**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[a]	Redox Features Loc[b]	Texture	Remarks
0-3	10 YR 3/2	100					SL	No Redox Present
3-10	10 YR 3/2	90					SCL	No Redox Present
	10 YR 5/3	10					S	Sandy Inclusions (Mottles)
10-16	10 YR 3/2	85					SCL	No Redox Present
	10 YR 4/3	12					S	Sandy Inclusions (Mottles)
	2.5 Y 6/4	3					S	Sandy Inclusions (Mottles)
16-28	10 YR 3/2	40					SCL	Few 2.5 Y 6/4 Sandy Inclusions
	10 YR 3/3	60					SCL	

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: None

Depth (inches): >28

Hydric Soil Present? **Yes** ___ **No** X

Remarks: Soil is very similar to the mapped series in this area. Mottles (in the true sense of the word, not redoximorphic features) occur throughout the lower profile – these sandy inclusions, which are notably different from the matrix color and texture are common in this soil series and are likely the result of geological and depositional processes rather than chemical reactions in the soil due to anaerobic conditions. Soil texture suggests moderate to rapid permeability; no restrictive layer in the upper 28 inches and are likely well drained given the constructed drainage channel to the west of this sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ 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 ___ No X Depth (inches): >28

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >28

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sample point is located just west of a 24-inch diameter culvert within a low swale area. No drainage patterns, flow lines, water marks, water stained leaves, or other indicators of seasonal ponding or flooding were observed in the vicinity of the sample point or at either end of the culvert. No shallow ground water or indication that high water or a seasonally perched water table would be present at this location.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Lodi Energy Center City/County: San Joaquin Date: Dec. 4, 2008

Applicant/Owner: Northern California Power Agency State: CA Sampling Point: SP-02

Investigator(s): Russell Huddleston Section, Township, Range: Sec 24 T: 03 North R: 05 East (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 1-2 %

Subregion (LRR): C – Mediterranean California Lat: 38˚ 05' 13.759" N Long: 121˚ 23'16.673 W Datum: WGS84

Soil Map Unit Name: Devries Sandy Loam, Drained, 0-2 Percent Slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, 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** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Below average rainfall between October 1 and November 30 – total precipitation for this period in 2008 is 1.8 inches; approximately 56% of the average of 3.2 inches for this time of year. Low area is characterized by hydrophytic plants, but no evidence of ponded or flowing water or anaerobic soil conditions were observed at this sample location.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix gooddingii*		X	OBL
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum Plot Area: 1 m^2			
1. *Lepidium latifolium*	100	X	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

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		×1 =	
FACW species		×2 =	
FAC species		×3 =	
FACU species		×4 =	
UPL species		×5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

X Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Vegetation in this area is characterized by dense monoculture of perennial pepperweed, which is abundant and widespread especially in the southwestern part of the property, often intermixed with non-native annual grasses and other upland plant species. A single large black willow is present at the west end of the swale, but is likely tapping into the relatively shallow ground water table and not indicative of surface water hydrology in this location.

SOIL

Sampling Point **SP-02**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[a]	Redox Features Loc[b]	Texture	Remarks
0-6	10 YR 4/2	100					SL	No Redox Present, Many F-M Roots
6-16	10 YR 4/2	70					SCL	No Redox, few F-M roots, hard, friable
	10 YR 3/2	20					SCL	
	2.5 YR 5/3	8					S	Sandy Inclusions (mottles)
	10 YR 4/4	1					S	Sandy Inclusions (mottles)
	5 Y 6/2	1					S	Sandy Inclusions (mottles)
16-20	10 YR 3/2	100					SCL	No redox
20-24	10 YR 4/3	100					S	No Redox

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? **Yes** ___ **No** X

Remarks: Soil is very similar to the mapped series in this area. Mottles (in the true sense of the word, not redoximorphic features) occur throughout the lower profile – these sandy inclusions, which are notably different from the matrix color and texture are common in this soil series and are likely the result of geological and depositional processes rather than chemical reactions in the soil due to anaerobic conditions. Soil texture suggests moderate to rapid permeability; no restrictive layer in the upper 24 inches and are likely well drained given the constructed drainage channel to the west of this sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ 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 ___ No X Depth (inches): >24

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >24

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sample point is located within a low swale area. No drainage patterns, flow lines, water marks, water stained leaves, or other indicators of seasonal ponding or flooding were observed in the vicinity of the sample point or along the fence line to the west of this swale. No shallow ground water or indication that high water or a seasonally perched water table would be present at this location.

SOIL

Sampling Point **SP-03**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[a]	Redox Features Loc[b]	Texture	Remarks
0-3	10 YR 3/1	100					L	No Redox Present, Many F-M Roots
3-24	10 YR 4/2	90					SCL	No Redox, few F-M roots
	10 YR 5/3	5					S	Sandy Inclusions (mottles)
	2.5 YR 4/3	5					S	Sandy Inclusions (mottles)

[a] Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [b] 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[c]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[c] Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: None

Depth (inches): >24

Hydric Soil Present? Yes ___ **No** X

Remarks: Soil is very similar to the mapped series in this area. Mottles (in the true sense of the word, not redoximorphic features) occur throughout the lower profile – these sandy inclusions, which are notably different from the matrix color and texture are common in this soil series and are likely the result of geological and depositional processes rather than chemical reactions in the soil due to anaerobic conditions. Soil texture suggests moderate to rapid permeability; no restrictive layer in the upper 24 inches and are likely well drained given the constructed drainage channel to the west of this sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ 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)
- ___ Other (Explain in Remarks)

Secondary Indicators (two or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ 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 ___ No X Depth (inches): >24

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >24

Wetland Hydrology Present? Yes ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sample point is located within a weakly expressed swale area. No drainage patterns, flow lines, water marks, water stained leaves, or other indicators of seasonal ponding or flooding were observed in the vicinity of the sample point. No shallow ground water or indication that high water or a seasonally perched water table would be present at this location.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Lodi Energy Center City/County: San Joaquin Date: Dec. 4, 2008

Applicant/Owner: Northern California Power Agency State: CA Sampling Point: SP-03

Investigator(s): Russell Huddleston Section, Township, Range: Sec 24 T: 03 North R: 05 East (MDM)

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 1-2 %

Subregion (LRR): C – Mediterranean California Lat: 38˚ 05' 13.7459" N Long: 121˚ 23'13.025 W Datum: WGS84

Soil Map Unit Name: Devries Sandy Loam, Drained, 0-2 Percent Slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, 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** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Below average rainfall between October 1 and November 30 – total precipitation for this period in 2008 is 1.8 inches; approximately 56% of the average of 3.2 inches for this time of year. Low area is characterized by hydrophytic plants, but no evidence of ponded or flowing water or anaerobic soil conditions were observed at this sample location.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.		X	FACW
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. *Urtica dioica*	100	X	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

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		×1 =
FACW species		×2 =
FAC species		×3 =
FACU species		×4 =
UPL species		×5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is ≤3.0*

____ Morphological Adaptations* (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation* (Explain)

* Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: Sample point was located within dense patch of nettle – most of the plants had senesced by the time of the survey and cover estimates were based on remnant stems and leaves in this area as well as adjacent (still green) vegetation.

Attachment B
Representative Photographs

Looking west from culvert - low area at the west end of the swale feature; dense seaside heliotrope in the foreground with scattered Italian thistle seedlings; dense perennial pepperweed in background (behind the log)

East side of low swale area – looking east from dirt road along irrigation canal; rip-gut brome is the dominant grass throughout with scattered Italian thistle, milk thistle and nettle; dense perennial pepperweed in background on slope to the northeast, along the road

More defined drainage channel to the west of the project site – photo from dirt access road looking to the east towards low swale with large cottonwoods and a black willow tree

Fence line at west end of swale – rip-gut brome throughout this area; no evidence of flowing or standing water such as debris, drift lines sediment deposits, or scouring.

Sample point SP-01 – Dense seaside heliotrope with Italian thistle and rip-gut brome seedlings - adjacent slopes with dense rip-gut brome, prickly lettuce and Italian thistle; no evidence of surface water (flowing or ponded) was noted in this area

Surface soil from SP-01 (dry) – light yellowish brown to light olive brown mottles (not redox) are typical for the Devries Series and are not indicative of hydric soil at this location. No redoximorphic features or other hydric soil indicators were noted in the upper 28 inches

Sample Point SP-02 looking west – Dense perennial pepperweed throughout this area with black willow in the background; no evidence of ponded or flowing water was observed

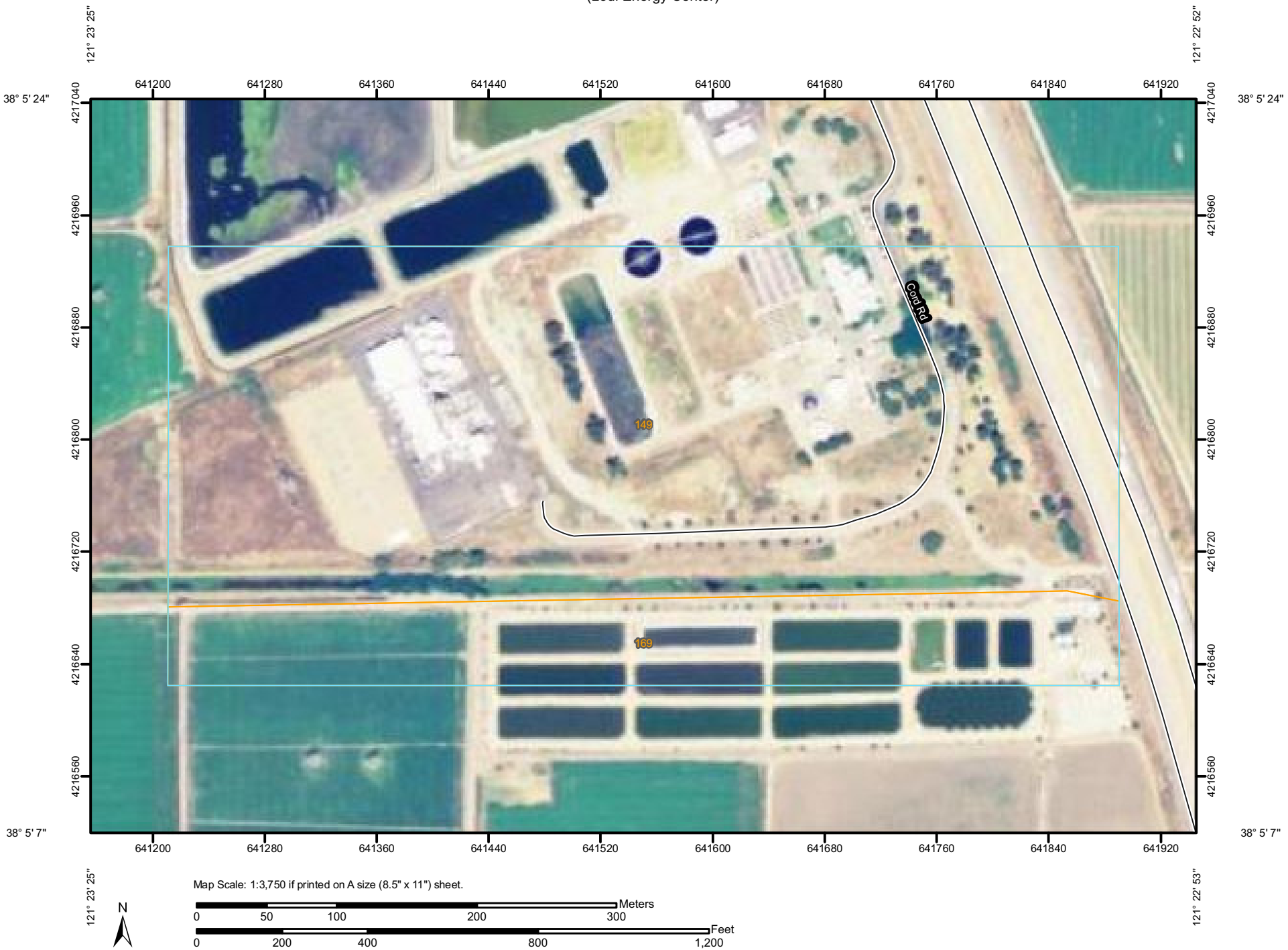
SP02 Soils – light sandy mottles are typical for the Devries Series and are not indicative of hydric soils. No redoximorphic features observed. Soils were dry to a depth of 24 inches with no indication of a seasonally shallow water table.

Sample Point SP-03 – Dense patch of nettle; no evidence of standing or flowing water was observed in this location.

SP02 Soils – light sandy mottles are typical for the Devries Series and are not indicative of hydric soils. No redoximorphic features observed. Soils were dry to a depth of 24 inches with no indication of a seasonally shallow water table.

Attachment C
Soil Information

Soil Map—San Joaquin County, California
(Lodi Energy Center)



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: 1:3,750 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: San Joaquin County, California
Survey Area Data: Version 6, Jul 25, 2008

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

San Joaquin County, California (CA077)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
149	Devries sandy loam, drained, 0 to 2 percent slopes	42.1	80.2%
169	Guard clay loam, drained, 0 to 2 percent slopes	10.4	19.8%
Totals for Area of Interest		**52.5**	**100.0%**

Flooding Frequency Class

Flooding Frequency Class— Summary by Map Unit — San Joaquin County, California				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
149	Devries sandy loam, drained, 0 to 2 percent slopes	Rare	42.1	80.2%
169	Guard clay loam, drained, 0 to 2 percent slopes	Rare	10.4	19.8%
Totals for Area of Interest			**52.5**	**100.0%**

Description

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent.

"None" means that flooding is not probable. The chance of flooding is nearly 0 percent in any year. Flooding occurs less than once in 500 years.

"Very rare" means that flooding is very unlikely but possible under extremely unusual weather conditions. The chance of flooding is less than 1 percent in any year.

"Rare" means that flooding is unlikely but possible under unusual weather conditions. The chance of flooding is 1 to 5 percent in any year.

"Occasional" means that flooding occurs infrequently under normal weather conditions. The chance of flooding is 5 to 50 percent in any year.

"Frequent" means that flooding is likely to occur often under normal weather conditions. The chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year.

"Very frequent" means that flooding is likely to occur very often under normal weather conditions. The chance of flooding is more than 50 percent in all months of any year.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: More Frequent

Ponding Frequency Class

Ponding Frequency Class— Summary by Map Unit — San Joaquin County, California				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
149	Devries sandy loam, drained, 0 to 2 percent slopes	None	42.1	80.2%
169	Guard clay loam, drained, 0 to 2 percent slopes	None	10.4	19.8%
Totals for Area of Interest			**52.5**	**100.0%**

Description

Ponding is standing water in a closed depression. The water is removed only by deep percolation, transpiration, or evaporation or by a combination of these processes. Ponding frequency classes are based on the number of times that ponding occurs over a given period. Frequency is expressed as none, rare, occasional, and frequent.

"None" means that ponding is not probable. The chance of ponding is nearly 0 percent in any year.

"Rare" means that ponding is unlikely but possible under unusual weather conditions. The chance of ponding is nearly 0 percent to 5 percent in any year.

"Occasional" means that ponding occurs, on the average, once or less in 2 years. The chance of ponding is 5 to 50 percent in any year.

"Frequent" means that ponding occurs, on the average, more than once in 2 years. The chance of ponding is more than 50 percent in any year.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: More Frequent

Beginning Month: January

Ending Month: December

Depth to Water Table

Depth to Water Table— Summary by Map Unit — San Joaquin County, California				
Map unit symbol	**Map unit name**	**Rating (centimeters)**	**Acres in AOI**	**Percent of AOI**
149	Devries sandy loam, drained, 0 to 2 percent slopes	152	42.1	80.2%
169	Guard clay loam, drained, 0 to 2 percent slopes	152	10.4	19.8%
Totals for Area of Interest			**52.5**	**100.0%**

Description

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: *None Specified*

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

LOCATION DEVRIES CA

Established Series
Rev. MAM-WBS-TDC-ET
02/2003

DEVRIES SERIES

The Devries series consists of moderately deep to hardpan, somewhat poorly drained soils that formed in alluvium from mixed rock sources. Devries soils are on basin rims of the San Joaquin Delta and have slopes of 0 to 2 percent. The mean annual precipitation is 14 inches and the mean annual temperature is 60 degrees F.

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, thermic Typic Duraquolls

TYPICAL PEDON: Devries sandy loam - on a nearly level slope of less than 1 percent under annual grasses and forbs at an elevation of 8 feet. (Colors are for dry soil unless otherwise stated. When described on November 13, 1980, the soil was dry from 0 to 4 inches and moist below.)

A1--0 to 4 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium angular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine roots; few fine and common very fine interstitial pores; neutral (pH 7.0); gradual wavy boundary. (4 to 10 inches thick)

A2--4 to 13 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; few fine distinct light olive brown (2.5Y 5/4) mottles, olive brown (2.5Y 4/4) moist; moderate medium angular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; few fine and common very fine interstitial pores; slightly alkaline (pH 7.5); gradual smooth boundary. (6 to 9 inches thick)

Bt--13 to 28 inches; light gray (10YR 7/2) sandy loam, dark grayish brown (10YR 4/2) moist; few fine distinct light yellowish brown (2.5Y 6/4) mottles, olive brown (2.5Y 4/4) moist; moderate medium angular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; few fine and very fine interstitial pores; very few thin clay films bridging sand grains and lining pores; slightly effervescent with disseminated lime; moderately alkaline (pH 8.0) abrupt wavy boundary. (10 to 21 inches thick)

Bkqm--28 to 80 inches; light gray (10YR 7/2) duripan, dark grayish brown (2.5Y 4/2) moist; common fine faint light yellowish brown (2.5Y 6/4) mottles, olive brown (2.5Y 4/4) moist; massive; indurated continuous laminar capping 3 to 4 mm thick; strongly cemented in 75 percent of the matrix and weakly cemented in the remainder; strongly effervescent with disseminated lime and segregated soft masses of gypsum in remnant pores; primary cementing agent is silica; moderately alkaline (pH 8.0).

TYPE LOCATION: San Joaquin County, California; approximately 6 miles west of Lodi near Interstate 5, 2,110 feet south of Hwy. 12, 200 feet west of Thornton Road; 38 degrees 06' 38" north Lat., 121 degrees 23' 35" west Long. (in an unsectionized area) Terminous quadrangle.

RANGE IN CHARACTERISTICS: Depth to duripan is 20 to 40 inches. The mean annual soil temperature is 62 to 63 degrees F. The soil between the depth of 8 inches to the duripan is not dry at any time unless artificially drained. The texture control section from a depth of 10 inches to the duripan is 7 to 18 percent clay. Content of gravel is 0 to 5 percent.

The A horizon has dry color of 10YR 5/2, 5/1, 4/2, 4/1; 2.5Y 5/2, or 4/2 and moist color of 10YR 3/2, 3/1, or 2.5Y 3/2. Distinct or prominent mottles are present in lower A horizons. Organic matter ranges from 1 to 3 percent. It is neutral to moderately alkaline.

The Bt horizon has dry color of 10YR 5/2, 5/3, 6/3, 7/2, 4/2; 2.5Y 5/2 or 4/2 and moist color of 10YR 4/3, 4/2, 4/4, 5/2 or 2.5Y 4/2. Mottles are distinct or prominent. It is mildly or moderately alkaline and slightly or strongly effervescent. It is sandy loam or fine sandy loam.

The Bkqm horizon has a strongly cemented to indurated continuous laminar capping over weakly to strongly cemented material. The cementation typically decreases with depth. It has dry color of 10YR 7/2, 6/2, 6/3, 6/4, 5/4; 2.5Y 6/2, 6/4, 5/2; 5Y 6/2, 5/2, 5/3 or 5/4 and moist color of 10YR 5/2, 5/3, 4/2, 4/3; 2.5Y 5/2, 4/2; 5Y 4/2 or 4/3. Mottles are faint to prominent.

COMPETING SERIES: There are no other soils in this family. Rioblancho (T) and Guard (T) series are similar soils in other families. Rioblancho soils are fine-loamy and have calcic horizons. Guard soils are weakly cemented but lack a duripan.

GEOGRAPHIC SETTING: Devries soils are on basin rims of the San Joaquin Delta. Slopes are 0 to 2 percent. The soils formed in alluvium from mixed sources. Elevations are 5 below sea level to 35 feet. The climate is subhumid with hot dry summers and cool moist winters. Dense ground fog often occurs in the winter months. Mean annual precipitation is 14 to 16 inches. The mean January temperature is 45 degrees F; mean July temperature is 77 degrees F; mean annual temperature is 60 degrees F. Frost-free period is 260 to 280 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are Egbert, Kingile and Ryde soils. Egbert, Kingile and Ryde soils do not have duripans.

DRAINAGE AND PERMEABILITY: Somewhat poorly drained; slow runoff; moderately rapid permeability. Depth to the apparent water table is presently greater than 5 feet, but the soil may be saturated above the hardpan for short periods after heavy rain in the winter months.

USE AND VEGETATION: Mostly irrigated field and row crops. Vegetation is soft chess, rye grass, salt grass, plantain and other annual grasses, forbs and scattered valley oaks.

DISTRIBUTION AND EXTENT: Devries soils occur on the eastern rim of the San Joaquin delta in Central California. The soils are not extensive in MLRA-17.

MLRA OFFICE RESPONSIBLE: Davis, California

SERIES ESTABLISHED: San Joaquin County, California 1990.

REMARKS: The activity class was added to the classification in February of 2003. Competing series were not checked at that time. - ET

Diagnostic horizons and features recognized in this pedon are:

Mollic epipedon - the zone from the surface to a depth of 13 inches (A1,A2)

Cambic horizon - the zone from 13 to 28 inches (Bt)

Duripan - the zone from 28 to 80 inches (Bkqm)

National Cooperative Soil Survey
U.S.A.

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
FOR THE *Lodi Energy Center*

DOCKET NO. 08-AFC-10

PROOF OF SERVICE
(Revised 12/1/08)

INSTRUCTIONS: All parties shall 1) send an original signed document plus 12 copies OR 2) mail one original signed copy AND e-mail the document to the web address below, AND 3) all parties shall also send a printed OR electronic copy of the documents that shall include a proof of service declaration to each of the individuals on the proof of service:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 08-AFC-03
1516 Ninth Street, MS-15
Sacramento, CA 95814-5512
docket@energy.state.ca.us

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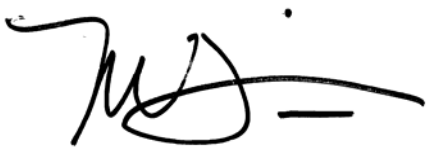
DECLARATION OF SERVICE

I, Mary Finn, declare that on December 12, 2009, I deposited copies of the attached **Wetland Concerns – Technical Memorandum** in the United States mail at Sacramento, CA with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list above.

OR

Transmission via electronic mail was consistent with the requirements of California Code of Regulations, title 20, sections 1209, 1209.5, and 1210. All electronic copies were sent to all those identified on the Proof of Service list above.

I declare under penalty of perjury that the foregoing is true and correct.



Attachments