APPENDIX C

DELINEATION OF WATERS

OF THE UNITED STATES

County Road R over Glenn-Colusa Canal Bridge Replacement Project

Delineation of Waters of the United States

Prepared for:
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On behalf of:
Glenn County
Public Works Agency
777 No. Colusa Street
Willows, CA 95988

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Project No 2272004900

March 13, 2018

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Executive Summary

On behalf of the Glenn County Public Works Agency (County), North State Resources, Inc., now Stantec (Stantec) conducted a delineation of waters of the United States occurring in the 5.28-acre County Road R over Glenn-Colusa Canal Bridge Replacement Project study area (study area) in Glenn County, California. The delineation was conducted in accordance with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (U.S. Army Corps of Engineers 2008). The field delineation was conducted on November 30, 2017. A total of 1.673 acres of potential waters of the United States were mapped within the study area and include rice field/managed wetland (0.634 acre), vegetated ditch (0.398 acre, 1,510 linear feet), and irrigation canal (0.641 acre, 260 linear feet).

The purpose of this delineation of waters of the United States is to document and describe waters of the United States to support a Preliminary Jurisdictional Determination from the United States Army Corps of Engineers (Corps). This delineation is subject to verification by the Corps, Sacramento District. Stantec advises all parties to treat the information contained herein as preliminary until the Corps provides written verification of the boundaries of its jurisdiction.

If the Corps wishes to conduct a field verification, the County requests that the Corps contact Matt Vader, Engineering Technician, Glenn County Public Works Agency by telephone at (530) 934-6530 or by email at engineer@countyofglenn.net to schedule a date and time to access the study area.

Abbreviations

County	Glenn County Public Works Agency
Corps	United States Army Corps of Engineers
GCID	Glenn-Colusa Irrigation District
GPS	Global Positioning System
Stantec	North State Resources, Inc., now Stantec
NWI	National Wetlands Inventory
OHWM	Ordinary High Water Mark
USGS	United States Geological Survey

1.0 PROJECT LOCATION

The study area is located in a rural area near the unincorporated community of Artois in Glenn County, California and it consists of a 1,200-foot alignment along County Road R. This location can be found on the *Glenn, California* 7.5-minute U.S. Geological Survey (USGS) quadrangle in Township 20N, Range 2W, Sections 17 and 18. The approximate center of the study area is located at latitude 39.586947°, longitude -122.116908° (North American Datum 83). The study area location is shown in Figure 1.

To access the study area from Interstate 5, travel 5 miles east on County Road 39 (Bayliss Blue Gum Road) to County Road R. Turn left and travel 0.2 mile to the study area where the County Road R Bridge crosses over the Glenn-Colusa Canal (Figure 1).

2.0 ENVIRONMENTAL SETTING

2.1 CURRENT/RECENT LAND USE

The study area is bounded by agricultural fields, with machine-harvested rice as the primary crop. There are two rural residences in the vicinity along County Road 39, located approximately 0.2 mile south of the study area.

2.2 SITE TOPOGRAPHY AND ELEVATION

The topography of the study area immediately adjacent to the Glenn-Colusa canal is nearly level. The study area generally runs perpendicular to the Glenn-Colusa canal and occurs at an elevation of approximately 130 feet.

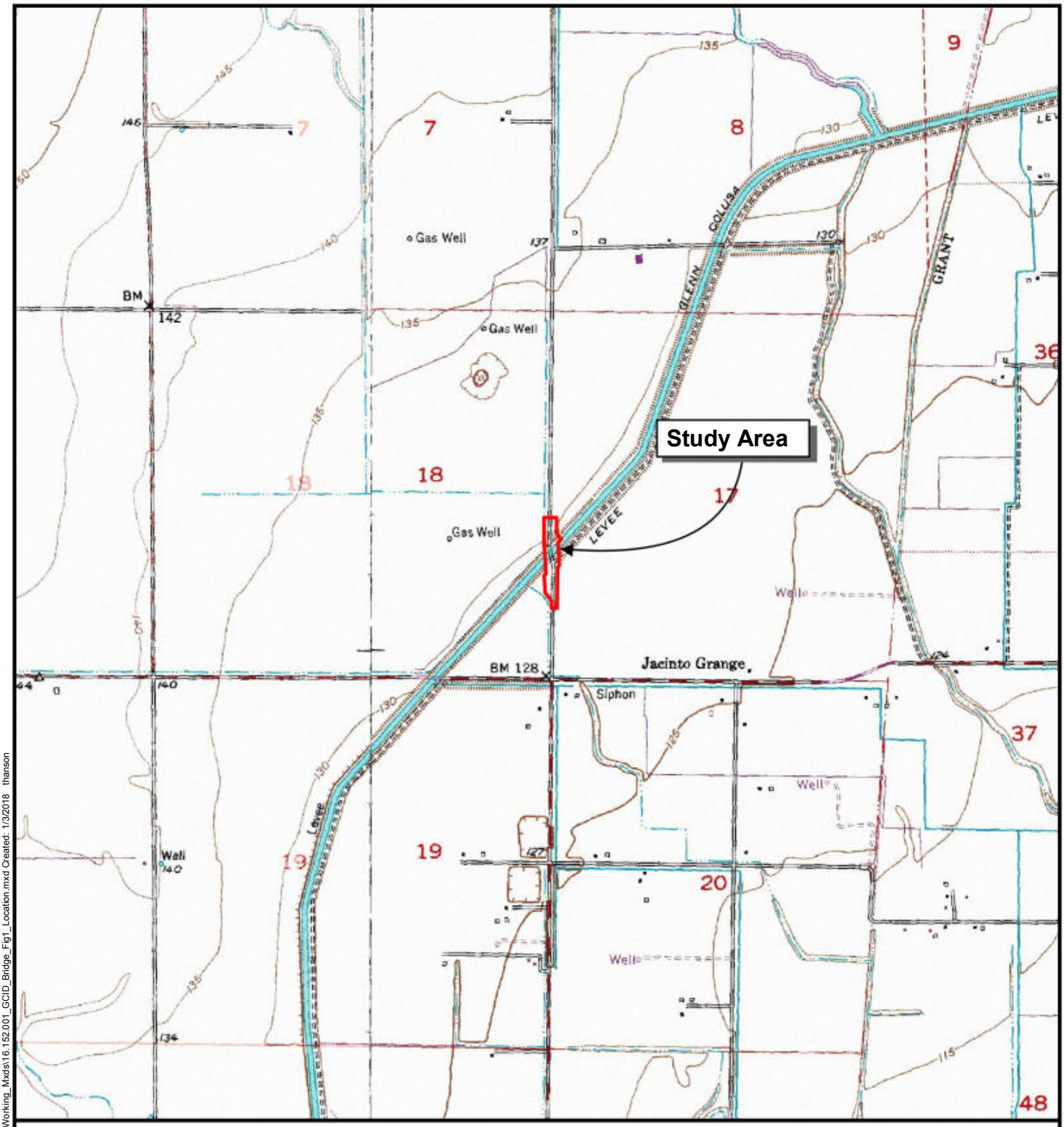
2.3 CLIMATE

Historical data used to describe the climate are collected at Willows 6 W weather station approximately 15 miles southwest of the study area (Western Regional Climate Center 2016). The climate data are described below:

Type: The climate of the area is characterized as Mediterranean with moderate winters and hot, dry summers.

Precipitation: Precipitation in the study area primarily occurs as rain. The average annual rainfall is approximately 18 inches.

Air Temperature: Air temperatures in the study area range between an average January high of 55 degrees Fahrenheit (°F), and an average July high of 95°F. The annual average high is approximately 75°F.



Study Area (5.28 acres)

Public Land Survey:
Township 20N
Range 2W
Section 17 and 18

USGS 7.5 Quad:
Glenn - 1951

N

0 500 1,000 2,000
Feet
1:24,000

Glenn County, California

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North State Resources, Inc.
now
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County Road R over Glenn-Colusa Canal Bridge Replacement Project

Figure 1
Study Area Location

Growing Season: The growing season (i.e., 50% probability of air temperature 28 °F or higher) in the study area is approximately 320 days and occurs between February and November.

2.4 HYDROLOGY/HYDROLOGIC FEATURES

The hydrologic features in the study area include rice fields/managed wetlands, vegetated ditches, and irrigation canal. The water is sourced from the Sacramento River through the Glenn-Colusa Irrigation District's (GCID) main pump station located approximately three miles north of Hamilton City. The irrigation canal that flows through the study area is the GCID's main delivery canal for agricultural water in the region. Drainage in the region is generally to the south and east towards the river, serving agricultural crops and a complex of wildlife refuges in the area.

2.5 SOIL MAP UNITS

Two soil map units occur in the study area. They are described in the *Soil Survey of Glenn County, California* (Natural Resources Conservation Service 1999). Soil map units in and around the study area are shown in Figure 2. The soil map units that occur within the study area are described below:

- **Plaza silt loam (Pf).** This is a non-hydric, moderately well to imperfectly drained soil formed in alluvium. These soils occur in rice producing areas and consequently water tables persist for longer periods than would be expected under natural conditions. The depth to a restrictive layer is 60 inches.

- **Plaza silty clay loam (Pg).** This is a non-hydric, moderately well to imperfectly drained soil formed in alluvium. These soils occur in rice producing areas and consequently water tables persist for longer periods than would be expected under natural conditions. The depth to a restrictive layer is 60 inches.

Study Area (5.28 acres)

Soil Map Units

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Pf - Plaza silt loam
Pg - Plaza silty clay loam
Sw - Sunnyvale clay
Sy - Sunnyvale silty clay loam
Tb - Tehama loam, deep to gravel, 0 to 3 percent slopes
Tm - Tehama silt loam, 0 to 3 percent slopes, MLRA 17
W - Water

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County Road R over Glenn-Colusa Canal Bridge Replacement Project

Figure 2
Soil Map Units

2.6 VEGETATION COMMUNITIES

Vegetation communities are based on descriptions provided in *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer 1988). Three vegetation communities or other habitats occur in the study area: agriculture (rice), barren/ruderal, and riverine.

Agriculture/Rice. Agriculture, in the form of machine harvested rice, surrounds the study area on all sides. This habitat is generally flooded with water in the spring when rice is planted and continues to be inundated until fall when the rice is harvested. After harvest, some fields are left fallow for the winter with no water or crops growing. The two fields to the west and the one field to the north east of the study area were fallow during the November 30, 2017 site visit. Some rice fields are re-inundated after the rice harvest and provide habitat for migrating and over-wintering water fowl during the winter months. The rice fields located south of the Glenn-Colusa canal and east of the study area were flooded for this purpose during the site visit.

Barren/Ruderal. Barren/ruderal habitat occurs as dirt and paved roads and their associated road shoulders. Vegetation is usually not present, although sparse opportunistic grasses and forbs or weedy species may occur.

Riverine. Riverine habitat consists of the Glenn-Colusa canal and associated irrigation ditches. The canal is characterized by rock and mud substrates with very little vegetation within the canal. The irrigation ditches are characterized by mud substrates; dominated by freshwater emergent vegetation which appears to be regularly maintained by farmers.

3.0 METHODS

Stantec conducted an on-site routine delineation of wetlands and "other waters" of the United States based on field observations of positive indicators for wetland vegetation, hydrology, and soils; and indicators of an ordinary high water mark (OHWM). This methodology is consistent with the approach outlined in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (U.S. Army Corps of Engineers 2008). Plant taxonomy follows *The Jepson Manual: Vascular Plants of California* (Baldwin et al. 2012). Wetland indicator status for plant species was confirmed using *The National Wetland Plant List* (Lichvar et al. 2016), and the "50/20 Rule" or "Prevalence Index" was applied to determine plant dominance (U.S. Army Corps of Engineers 2008). Presence of primary and secondary wetland hydrology indicators were documented for each wetland feature.

Soil pits were dug in representative wetland features to a depth sufficient to document the presence or confirm the absence of hydric soil or wetland hydrology indicators. Soils were examined to assess field indicators of hydric soils. Positive indicators of hydric soils were observed in the field following the criteria outlined in *Field Indicators of Hydric Soils in the United States* (Vasilas et al. 2017). Soil colors were determined using a Munsell® soil color chart. The

hydric status of each soil map unit occurring in the study area was reviewed using the *Web Soil Survey* (Natural Resources Conservation Service 1999). At least one set of data points was selected to best represent the wetland feature type and the adjacent uplands. Data points were also placed in suspect areas to confirm wetland or upland status.

Other waters are defined as traditional navigable waters and their tributaries (33 CFR 329). Delineation of other waters was based on presence of an OHWM as defined in Corps regulations (33 CFR 328.3 and 33 CFR 328.4) and whether the feature qualified as tributary to waters of the United States. Physical characteristics of an OHWM include, but are not limited to the following conditions: a natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, presence of litter and debris, leaf litter disturbed or washed away, scour, deposition, presence of bed and bank, and water staining. At least one data point was selected to best represent the OHWM of other waters for each other waters type.

Prior to conducting the on-site routine delineation, the U.S. Fish and Wildlife Service's, National Wetlands Inventory (NWI) Wetlands Mapper (U.S. Fish and Wildlife Service 2017) was reviewed to determine if any wetlands or deepwater habitats as described by Cowardin et al. (1979) were previously mapped in the study area and general vicinity. Features delineated during the on-site routine delineation were classified using Cowardin (1979) based on existing NWI mapping, or assigned a Cowardin type if not previously mapped.

Four data points were used to characterize and document each wetland or other water feature type, and the adjacent upland. Field observations were conducted on November 30, 2017.

The boundaries of delineated features and the associated data points were mapped using a Trimble Mapping Grade Global Positioning System (GPS) capable of sub-foot accuracy. Where the use of the GPS was not practicable or satellites were not available, the features were delineated by hand onto ortho-rectified color aerial photographs. The GPS and hand-drawn location data were overlaid onto an aerial photograph of the study area to develop the delineation map.

4.0 RESULTS AND DISCUSSION

Potential waters of the United States occur in the study area as wetlands and other waters. Wetlands include rice field/managed wetland and vegetated ditch and other waters include irrigation canal.

The boundaries and area of potential waters of the United States occurring in the study area are illustrated in Figure 3. A total of 1.673 acres of waters of the United States were delineated. A summary of the delineated features is presented in Table 1. Routine wetland determination data forms are presented in Appendix A. Representative photographs of the delineated features and data point locations are presented in Appendix B.

Coordinate System: NAD 1983 UTM Zone 10N
Projection: Transverse Mercator
Datum: North American 1983

Glenn-Colusa Canal

39.584908,
-122.116923

39.588485,
-122.116668

County Road R

VD-1
VD-2
VD-3
VD-4
RF-1
RF-2
RF-3
IC-1

1
2
3
4

Study Area (5.28 acres)
3-Parameter Data Point
Ordinary High Water Mark
1-Foot Contours
Map Reference Point

Potential Waters of the U.S.

Wetlands
Rice Field/Managed Wetland
Vegetated Ditch

Other Waters
Irrigation Canal

Potential Waters of the United States

Wetlands

Label	Type	Area (ac)	Length (ft)	Location (lat)	Location (long)
RF-1	Rice Field/Managed Wetland	0.476	—	39.587838	-122.117218
RF-2	Rice Field/Managed Wetland	0.065	—	39.587878	-122.116602
RF-3	Rice Field/Managed Wetland	0.093	—	39.585601	-122.116629
VD-1	Vegetated Ditch	0.019	125	39.586405	-122.117028
VD-2	Vegetated Ditch	0.245	684	39.586153	-122.116658
VD-3	Vegetated Ditch	0.103	568	39.587661	-122.117077
VD-4	Vegetated Ditch	0.031	133	39.587414	-122.116719
Total Wetlands		**1.032**	**1,510**		

Other Waters

Label	Type	Area (ac)	Length (ft)	Location (lat)	Location (long)
IC-1	Irrigation Canal	0.641	260	39.586888	-122.116904
Total Other Waters		**0.641**	**260**		
Total Waters of the United States		**1.673**	**1,770**		

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Prepared for:
Glenn County Planning & Public Works Agency
777 No. Colusa Street
Willows, CA 95988

Notes:
Delineator: Chariss Femino
Delineation Dates: November 30, 2017
Orthophotography provided by Bing Maps.

This delineation of waters of the United States is subject to verification by the U.S. Army Corps of Engineers (Corps). NSR advises all parties that the delineation is preliminary until the Corps provides a written verification.

1 inch = 150 feet

N

0 75 150

Feet

County Road R over Glenn-Colusa Canal Bridge Replacement Project

Figure 3
Potential Waters of the United States

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Table 1. Waters of the United States Summary

Waters of the United States	Total Acreage	Total Linear Feet	Cowardin Type[1]
Wetlands			
Rice Field/Managed Wetland	0.634	N/A	PUBMKf
Vegetated Ditch	0.398	1,510	PEM1Kx
Other Waters			
Irrigation Canal	0.641	260	R2UBHx
Total Waters of the United States	**1.673**	**1,770**	

4.1 CHARACTERIZATION OF DELINEATED FEATURES

4.1.1 Rice Field/Managed Wetland

The study area is bounded by rice fields/managed wetlands. Rice fields are generally flooded for the duration of the growing season, which may exceed five months. RF-1 and RF-2 are located in the northern portion of the study area and were both dry during the November 30, 2017 survey. However, inundation is visible on aerial imagery. RF-3 lies in the southeastern portion of the study area and was flooded during the November 30, 2017 survey. If irrigation ceased, RF-1, RF-2, and RF-3 might revert to uplands. Determining whether these wetlands would revert to upland in absence of irrigation would require additional investigation after cessation of irrigation for rice cultivation. For the purposes of this delineation (i.e., to support a Preliminary Jurisdictional Determination), RF-1, RF-2, and RF-3 are considered potential wetlands.

4.1.2 Vegetated Ditch

Vegetated ditches are located throughout the study area. They are excavated ditches that convey water from the irrigation canal to the adjacent rice fields. VD-1 is located to the west of County Road R, south of the Irrigation Canal. VD-1 is dominated by broad leaved cattail (*Typha latifolia*) which is an obligate wetland plant species. VD-2 is located to the south of the irrigation canal and runs parallel to the east side of County Road R. VD-2 is also dominated by cattails and water primrose (*Ludwigia* sp.) which are both obligate wetland species. During the November 30, 2017 survey, there was evidence that the vegetation in VD-3 and VD-4 had recently been excavated. Remnants of hydrophytic vegetation such as cattails and flat sedge (*Cyperus difformis*) seedlings were present in VD-3 and VD-4. Hydrology indicators include surface water and saturation. All vegetated ditches in the study area meet wetland criteria and also qualify as other waters of the United States due to the presence of an OHWM.

[1] Cowardin et al. 1979

4.1.3 Irrigation Canal (Glenn-Colusa Canal)

The Glenn-Colusa Canal is an irrigation canal (IC-1) that flows westerly through the study area. This feature is typically flooded year round to convey water to agricultural crops. IC-1 is characterized as a bed and bank feature that exhibits indicators of scour, deposition, and watermarks. Hydrology indicators include surface water and inundation visible on aerial imagery. IC-1 qualifies as other waters of the United States.

5.0 CONCLUSION

Waters of the United States delineated within the study area occupy a total of 1.673 acres (1,770 linear feet) and include rice field/managed wetland, vegetated ditch, and irrigation canal.

Determinations of waters of the United States, including wetlands, are based on current conditions (i.e., normal circumstances), and made in accordance with relevant U.S. Environmental Protection Agency and Corps guidance. Determinations are subject to verification by the Corps. Stantec advises all interested parties to treat the information contained herein as preliminary pending written verification of jurisdictional boundaries by the Corps.

6.0 REFERENCES

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APPENDIX A
ROUTINE WETLAND DETERMINATION DATA FORMS

North State Resources, Inc. now Stantec

Data Point 7
Feature Type Vegetated Ditch

Wetland Determination Data Form–Arid West Region

Project/Site: Co. Road R/GCID City/County: Glenn Co. Date: 11/30/17
Applicant/Owner: Glenn County Planning & Public Works State: CA
Investigator(s): Chariss Fenino Section, Township, Range S17+18, T20N, R2W
Landform (hillslope, terrace, etc.) Valley Local relief (concave, convex, none) concave Slope % <5%
Subregion (LRR): C Lat: 39.586454 Long: -122.116941 Datum: NAD 83
Soil Map Unit Name: Plaza silty clay loam NWI Classification: R2AB3Hx
Are climatic/hydrologic conditions on the site typical for this time of year? Y (N) *(If no, explain in Remarks.)*
Are vegetation Y / (N), soil Y / (N), or hydrology Y / (N) significantly disturbed? Are normal circumstances present? (Y) / N
Are vegetation Y / (N), soil Y / (N), or hydrology Y / (N) naturally problematic? *(If needed, explain in Remarks.)*

Summary of Findings (Attach site map showing sampling point locations, transects, important features, etc.)
Hydrophytic vegetation? (Y) / N Hydric soil? (Y) N Wetland hydrology? (Y) N Is sampled area a wetland? (Y) N Other waters? (Y) N

Evaluation of features designated "Other Waters of the United States"
Indicators: Defined bed and bank X Scour ____ Ordinary High Water Mark Mapped ____ Stream Width ≈18"
Feature Designation: Perennial ____ Intermittent ____ Ephemeral ____ Blue-line on USGS Quad ____ Substrate Mud
Natural Drainage ____ Artificial Drainage X Navigable Water ____

Remarks DP taken @ edge & thalweg of vegetated ditch used for irrigation & rice fields. Excavated + managed ditch. Rainfall has been much lower than average so far in fall/winter 2018.

Vegetation (Use Scientific Names)

Tree Stratum (Plot Size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Sapling/Shrub Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Herb Stratum (Plot Size:____)	**% Cover**	**Species?**	**Status**
1. Typha latifolia	100	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
50%=____ 20%=____ Total Cover:	100		
Woody/Vine Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
50%=____ 20%=____ Total Cover:			

% Bare Ground in Herb Stratum 0 % 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 (AB)

Prevalence Index Worksheet

Total % Cover of:		Multiply by	
OBL Species	____	x 1 =	____
FACW Species	____	x 2 =	____
FAC Species	____	x 3 =	____
FACU Species	____	x 4 =	____
UPL Species	____	x 5 =	____
Column Totals	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators
✓ Dominance Test is >50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation? (Y) N

Remarks

Data Point 1

Soils

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	2.5YR 3/3	100					SiCL	

[1]Types: C = Concentration D = Depletion RM = Reduced Matrix [2]Location: PL = Pore Lining M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) (LRR C)
- ____ 1 cm Muck (A9) (LRR D)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]

- ____ 1 cm Muck (A9) (LRR C)
- ____ 2 cm Muck (A10) (LRR B)
- ____ Reduced Vetric (F18)
- ____ Red Parent Materials (TF21)
- ____ Vegetated Sand/Gravel Bars
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if present): Type: _____ Depth (Inches) _____ Hydric Soil? (Y) / N

Remarks strong odor

Hydrology

Wetland Indicators

Primary Indicators (Any one indicator is sufficient.)

- X Surface Water (A1)
- ____ High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1) (Nonriverine)
- ____ Sediment Deposits (B2) (Nonriverine)
- ____ Drift Deposits (B3) (Nonriverine)
- X Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Salt Crust (B11)
- X Biotic Crust (B12)
- X Aquatic Invertebrates (B13)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Plowed Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) (Riverine)
- ____ Sediment Deposits (B2) (Riverine)
- ____ Drift Deposits (B3) (Riverine)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes X No ____ Depth (inches) ____ Wetland Hydrology? (Y) / N

Water Table Present? Yes ____ No ____ Depth (inches) ____

Saturation Present? Yes ____ No ____ Depth (inches) ____ *(includes capillary fringe)*

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

Remarks

Pt taken about 4" from edge of water w/in bed & bank

North State Resources, Inc. now Stantec

Data Point 2
Feature Type Upland

Wetland Determination Data Form–Arid West Region

Project/Site: Co. Road R/GCID City/County: Glenn Co. Date: 11/30/17
Applicant/Owner: Glenn County Planning & Public Works State: CA
Investigator(s): Chariss Fehrino Section, Township, Range S17+18, T20N, R2W
Landform (hillslope, terrace, etc.) Valley Local relief (concave, convex, none) none Slope % 0
Subregion (LRR): C Lat: 39.586435 Long: -122.116944 Datum: NAD83
Soil Map Unit Name: Plaza Silty Clay Loam NWI Classification: N/A
Are climatic/hydrologic conditions on the site typical for this time of year? Y (N) *(If no, explain in Remarks.)* See DPI data sheet
Are vegetation Y / (N) soil Y / (N) or hydrology Y / (N) significantly disturbed? Are normal circumstances present? (Y) / N
Are vegetation Y / (N) soil Y / (N) or hydrology Y / (N) naturally problematic? *(If needed, explain in Remarks.)*

Summary of Findings (Attach site map showing sampling point locations, transects, important features, etc.)
Hydrophytic vegetation? Y / (N) Hydric soil? Y / (N) Wetland hydrology? Y / (N) Is sampled area a wetland? Y / (N) Other waters? Y / (N)

Evaluation of features designated "Other Waters of the United States"
Indicators: Defined bed and bank _____ Scour _____ Ordinary High Water Mark Mapped _____ Stream Width _____
Feature Designation: Perennial _____ Intermittent _____ Ephemeral _____ Blue-line on USGS Quad _____ Substrate _____
Natural Drainage _____ Artificial Drainage _____ Navigable Water _____

Remarks Upland point to DP-1 for vegetated ditch-1 (VD-1)

Vegetation (Use Scientific Names)	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot Size: _____)			
1.			
2.			
3.			
4.			
50%=_____ 20%=_____ Total Cover:			
Sapling/Shrub Stratum (Plot:_____)	% Cover	Species?	Status
1.			
2.			
3.			
4.			
50%=_____ 20%=_____ Total Cover:			
Herb Stratum (Plot Size:_____)	% Cover	Species?	Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
50%=_____ 20%=_____ Total Cover:			
Woody/Vine Stratum (Plot:_____)	% Cover	Species?	Status
1.			
2.			
50%=_____ 20%=_____ Total Cover:			

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test Worksheet
Number of dominant species that are OBL, FACW, or FAC: _____ (A)
Total number of dominant species across all strata: _____ (B)
Percent of dominant species that are OBL, FACW, or FAC: _____ (AB)

Prevalence Index Worksheet

Total % Cover of:		Multiply by
OBL Species	_____	x 1 = _____
FACW Species	_____	x 2 = _____
FAC Species	_____	x 3 = _____
FACU Species	_____	x 4 = _____
UPL Species	_____	x 5 = _____
Column Totals	_____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators
_____ Dominance Test is >50%
_____ Prevalence Index is ≤ 3.0[1]
_____ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
_____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]*Indicators of hydric soil and wetland hydrology must be present.*

Hydrophytic Vegetation? Y / (N)

Remarks
Ground is barren of vegetation @ this location

Data Point 2

Soils

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	5YR 4/3	100						

[1]Types: C = Concentration D = Depletion RM = Reduced Matrix [2]Location: PL = Pore Lining M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) (LRR C)
- ____ 1 cm Muck (A9) (LRR D)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]

- ____ 1 cm Muck (A9) (LRR C)
- ____ 2 cm Muck (A10) (LRR B)
- ____ Reduced Vetric (F18)
- ____ Red Parent Materials (TF21)
- ____ Vegetated Sand/Gravel Bars
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if present): Type: _____ Depth (Inches) _____ Hydric Soil? Y / (N)

Remarks
Soil is highly compacted @ this location.

Hydrology

Wetland 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 (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Plowed Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) (Riverine)
- ____ Sediment Deposits (B2) (Riverine)
- ____ Drift Deposits (B3) (Riverine)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes ____ No ____ Depth (inches) _____ Wetland Hydrology? Y / (N)

Water Table Present? Yes ____ No ____ Depth (inches) _____

Saturation Present? Yes ____ No ____ Depth (inches) _____ *(includes capillary fringe)*

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

Remarks
Upland point to DP-1 (VD-1). No wetland hydrology present at this location

North State Resources, Inc. now Stantec

Data Point 3

Wetland Determination Data Form–Arid West Region

Feature Type Irrigation Canal

Project/Site: Co. Road R/GCID City/County: Glenn Co. Date: 11/30/17

Applicant/Owner: Glenn County Planning + Public Works State: CA

Investigator(s): Charissa Fenlino Section, Township, Range S17&18, T20N, R2W

Landform (hillslope, terrace, etc.) Valley Local relief (concave, convex, none) Concave Slope % 5

Subregion (LRR): C Lat: 39.581606 48 Long: -122.116933 Datum: NAD 83

Soil Map Unit Name: Water NWI Classification: R2UBHx

Are climatic/hydrologic conditions on the site typical for this time of year? Y / (N) *(If no, explain in Remarks.)* See DP1 data sheet

Are vegetation Y / (N), soil Y / (N), or hydrology Y / (N) significantly disturbed? Are normal circumstances present? (Y) N

Are vegetation Y / (N), soil Y / (N), or hydrology Y / (N) naturally problematic? *(If needed, explain in Remarks.)*

Summary of Findings (Attach site map showing sampling point locations, transects, important features, etc.)

Hydrophytic vegetation? Y / (N) Hydric soil? Y / (N) Wetland hydrology? (Y) N Is sampled area a wetland? Y / (N) Other waters? (Y) N

Evaluation of features designated "Other Waters of the United States"

Indicators: Defined bed and bank X Scour ____ Ordinary High Water Mark Mapped X Stream Width ≈ 30'

Feature Designation: Perennial ____ Intermittent ____ Ephemeral ____ Blue-line on USGS Quad X Substrate ____

Natural Drainage ____ Artificial Drainage X Navigable Water ____

Remarks Point taken @ edge of ditch for Irrigation Canal.

Vegetation (Use Scientific Names)

Tree Stratum (Plot Size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Sapling/Shrub Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Herb Stratum (Plot Size:____)	**% Cover**	**Species?**	**Status**
1. Unknown seedings	25	Y	?
2.			
3.			
4.			
5.			
6.			
7.			
8.			
50%=____ 20%=____ Total Cover:	25		
Woody/Vine Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
50%=____ 20%=____ Total Cover:			

% Bare Ground in Herb Stratum 75 % Cover of Biotic Crust 0

Dominance Test Worksheet

Number of dominant species that are OBL, FACW, or FAC: ____ (A)

Total number of dominant species across all strata: ____ (B)

Percent of dominant species that are OBL, FACW, or FAC: ____ (AB)

Prevalence Index Worksheet

Total % Cover of:		Multiply by	
OBL Species	____	x 1 =	____
FACW Species	____	x 2 =	____
FAC Species	____	x 3 =	____
FACU Species	____	x 4 =	____
UPL Species	____	x 5 =	____
Column Totals	____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators

____ Dominance Test is >50%

____ Prevalence Index is ≤ 3.0[1]

____ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation? Y / (N)

Remarks Unknown seedings present at DP location.

Data Point 3

Soils

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Types: C = Concentration D = Depletion RM = Reduced Matrix [2]Location: PL = Pore Lining M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) (LRR C)
- ____ 1 cm Muck (A9) (LRR D)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]

- ____ 1 cm Muck (A9) (LRR C)
- ____ 2 cm Muck (A10) (LRR B)
- ____ Reduced Vetric (F18)
- ____ Red Parent Materials (TF21)
- ____ Vegetated Sand/Gravel Bars
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if present): Type: _____ Depth (Inches) _____ Hydric Soil? Y (N)

Remarks

unable to dig soil pit due to steepness of canal slope.

Hydrology

Wetland Indicators

Primary Indicators (Any one indicator is sufficient.)

- X 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)
- X 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 (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Plowed Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water Marks (B1) (Riverine)
- ____ Sediment Deposits (B2) (Riverine)
- ____ Drift Deposits (B3) (Riverine)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes X No ____ Depth (inches) ____ Wetland Hydrology? (Y) / N

Water Table Present? Yes ____ No ____ Depth (inches) ____

Saturation Present? Yes ____ No ____ Depth (inches) ____ *(includes capillary fringe)*

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

Remarks

Water in Glenn-Colusa canal is sourced from the Sacramento River north of Hamilton City.

North State Resources, Inc. now Stantec

Data Point 4
Feature Type Rice field

Wetland Determination Data Form–Arid West Region

Project/Site: Co. Road F/GCID City/County: Glenn Co. Date: 11/30/17
Applicant/Owner: Glenn County Planning & Public Works State: CA
Investigator(s): Charissa Fenino Section, Township, Range S17+18, T20N, R2W
Landform (hillslope, terrace, etc.) valley Local relief (concave, convex, none) concave Slope % <5%
Subregion (LRR): C Lat: 39.584946 Long: -122.116653 Datum: NAD 83
Soil Map Unit Name: Plaza silty clay loam NWI Classification: none
Are climatic/hydrologic conditions on the site typical for this time of year? Y (N) *(If no, explain in Remarks.)* see DP1 data sheet
Are vegetation Y /(N), soil Y /(N), or hydrology Y /(N) significantly disturbed? Are normal circumstances present? (Y) N
Are vegetation (Y) N, soil Y /(N), or hydrology Y /(N) naturally problematic? *(If needed, explain in Remarks.)*

Summary of Findings (Attach site map showing sampling point locations, transects, important features, etc.)
Hydrophytic vegetation? (Y) / N Hydric soil? (Y) / N Wetland hydrology? (Y) N Is sampled area a wetland? (Y) N Other waters? Y /(N)

Evaluation of features designated "Other Waters of the United States"
Indicators: Defined bed and bank ____ Scour ____ Ordinary High Water Mark Mapped ____ Stream Width ____
Feature Designation: Perennial ____ Intermittent ____ Ephemeral ____ Blue-line on USGS Quad ____ Substrate ____
Natural Drainage ____ Artificial Drainage ____ Navigable Water ____

Remarks Artificial feature constructed & managed for the purpose of growing rice.

Vegetation (Use Scientific Names)

Tree Stratum (Plot Size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Sapling/Shrub Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
3.			
4.			
50%=____ 20%=____ Total Cover:			
Herb Stratum (Plot Size:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
50%=____ 20%=____ Total Cover:			
Woody/Vine Stratum (Plot:____)	**% Cover**	**Species?**	**Status**
1.			
2.			
50%=____ 20%=____ Total Cover:			

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

Dominance Test Worksheet
Number of dominant species that are OBL, FACW, or FAC: ____ (A)
Total number of dominant species across all strata: ____ (B)
Percent of dominant species that are OBL, FACW, or FAC: ____ (AB)

Prevalence Index Worksheet

Total % Cover of:		Multiply by
OBL Species	____	x 1 = ____
FACW Species	____	x 2 = ____
FAC Species	____	x 3 = ____
FACU Species	____	x 4 = ____
UPL Species	____	x 5 = ____
Column Totals	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators
____ Dominance Test is >50%
____ Prevalence Index is ≤ 3.0[1]
____ Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
X Problematic Hydrophytic Vegetation[1] (Explain)
[1]*Indicators of hydric soil and wetland hydrology must be present.*

Hydrophytic Vegetation? (Y) / N

Remarks No vegetation was present at the time of the survey. Hydrophytic vegetation (rice) would be present during the growing season.

Data Point 4

Soils

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Types: C = Concentration D = Depletion RM = Reduced Matrix [2]Location: PL = Pore Lining M = Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted)

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5) (LRR C)
- ____ 1 cm Muck (A9) (LRR D)
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1)
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Loamy Mucky Mineral (F1)
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]

- ____ 1 cm Muck (A9) (LRR C)
- ____ 2 cm Muck (A10) (LRR B)
- ____ Reduced Vetric (F18)
- ____ Red Parent Materials (TF21)
- ____ Vegetated Sand/Gravel Bars
- ____ Other (Explain in Remarks)

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

Restrictive Layer (if present): Type: _____ Depth (Inches) _____ Hydric Soil? (Y) N

Remarks Soil pit was not dug at this location due to access issues. Hydric soil is likely present considering length of time inundated - unable to verify. Assuming soils are hydric.

Hydrology

Wetland Indicators

Primary Indicators (Any one indicator is sufficient.)

- X 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)
- X 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 (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Plowed Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ____ Water Marks (B1) (Riverine)
- ____ Sediment Deposits (B2) (Riverine)
- ____ Drift Deposits (B3) (Riverine)
- ____ Drainage Patterns (B10)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Shallow Aquitard (D3)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes X No ____ Depth (inches) _____ Wetland Hydrology? (Y) N

Water Table Present? Yes ____ No ____ Depth (inches) _____

Saturation Present? Yes ____ No ____ Depth (inches) _____ *(includes capillary fringe)*

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

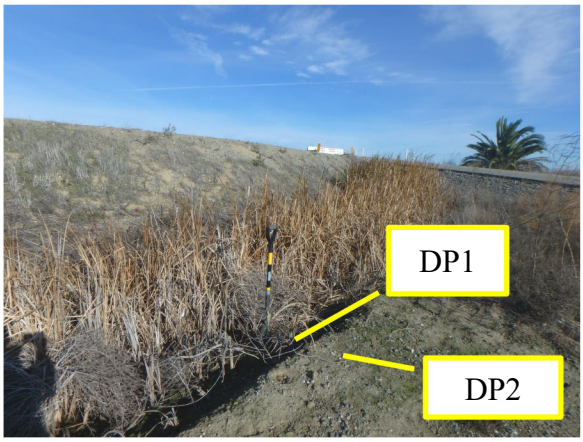
Remarks

Long periods of inundation visible on aerial imagery

APPENDIX B
REPRESENTATIVE PHOTOGRAPHS

County Road R over Glenn-Colusa Canal
Bridge Replacement Project
Delineation of Waters of the United States

Photographs Taken November 30, 2017



Photograph 1. Vegetated Ditch (VD-1). Data points (DP) 1 and 2 document the feature and the uplands, respectively. Orientation: northeast.

Photograph 2. Irrigation Canal (IC-1). DP3 documents the OHWM of the feature. Orientation: southwest.

Photograph 3. Rice Field (RF-3). DP4 documents the feature. Orientation: northeast.