APPENDIX E

BIOLOGICAL CONSTRAINTS REPORT

Biological Resources Assessment for the Vanden Meadows Project Site in Vacaville

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INTRODUCTION

The Vanden Meadows property consists of rural agricultural land located on the southwestern edge of the city of Vacaville in Solano County, California (Figure 1). The approximate 277.5-acre property is located in central Solano County, approximately 5 miles southeast of downtown Vacaville. The site is located on the USGS Elmira 7.5-minute topographic quadrangle. The center of the site is at approximate Latitude 38.31269 degrees north and Longitude 121.94903 degrees west.

Study Objectives

The primary objectives of this study were to locate and map special-status species habitat and potentially jurisdictional wetlands on the Vanden Meadows property. Additionally, the study focused on identifying other significant biological resources regulated by state and federal environmental policies. In general, the objectives of the study were to:

- Document biological resources reported from or identified on the site;
- Determine the presence of potential habitat for special-status plants and wildlife;
- Identify biological resource regulations governing project development; and
- Delineate the extent of wetlands and other waters of the United States subject to state and federal regulatory jurisdiction.

Definitions

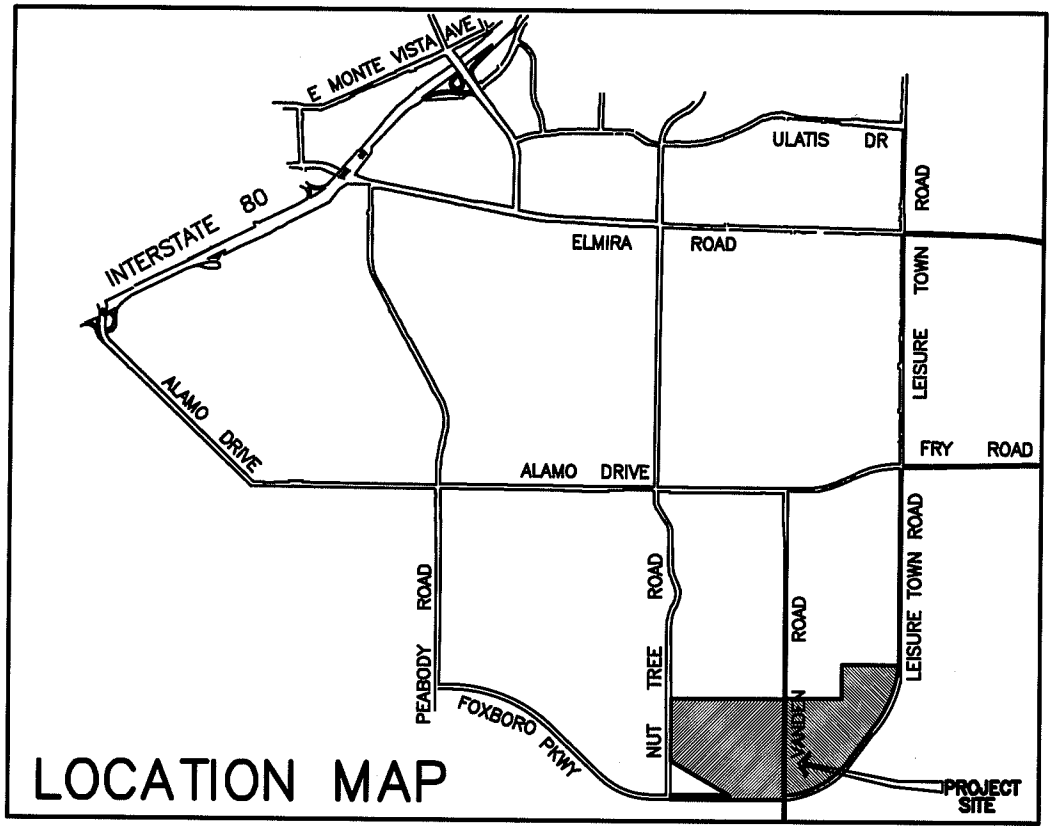
Special-Status Species

Special-status species are plants and animals that are legally protected under state and federal Endangered Species Acts or other regulations, and species that are considered sufficiently rare by the scientific community to qualify for such listing.

Jurisdictional Wetlands and Other Waters of the United States

Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers regulates the disposal of dredged or fill material into waters of the United States, including wetlands. Waters of the United States include, but are not limited to: coastal and inland waters and lakes, rivers and streams, and wetlands. Wetlands are defined by the federal regulations as those areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR 328) . In streams, the extent of waters of the U.S. is determined by the ordinary high water mark.

In California, the Department of Fish and Game (DFG) also has jurisdictional authority over wetland resources associated with rivers, streams, and lakes under California Fish and Game Code. DFG has the authority to regulate all work that will substantially divert, obstruct, or change the natural flow of a river, stream, or lake; substantially change the bed, channel, or bank of a river, stream, or lake; or use material from a streambed.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INTERSTATE 80
ULATIS DR
ROAD
ELMIRA ROAD
LEISURE TOWN
ALAMO DRIVE
FRY ROAD
ALAMO DRIVE
PEABODY ROAD
NUT TREE ROAD
ROAD
LEISURE TOWN ROAD
FOXBORO PKWY
WARREN
PROJECT SITE
LOCATION MAP

REGULATORY CONSIDERATIONS

Clean Water Act Section 404

Activities that result in discharge of fill material into waters of the United States are regulated by the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act (CWA). The CWA is primarily intended to authorize the EPA to regulate water quality through restriction of pollution discharges. Discharges of fill material, including placement of structures, into waters of the U.S., including wetlands, generally require a permit from the Corps. The Corps may issue either general permits, or nationwide permits, on a programmatic basis or individual permits on a case-by-case basis. Compensatory mitigation will normally be required to offset the losses of waters of the United States, including wetlands.

Clean Water Act Section 401

Section 401 of the Clean Water Act requires that the discharge of material into waters of the U.S. does not violate effluent limitations or water quality standards established by the state. The Corps may not authorize a project under a general permit, or issue and individual permit under Section 404 until the permit applicant has obtained certification or waiver of water quality standards from the regional water quality control board. The state uses its Section 401 certification authority to ensure Section 404 permits protect state water quality standards.

The State Board and the Regional Water Quality Control Boards regulate discharges to surface waters including wetlands under Section 401 of the federal Clean Water Act (CWA) as well as the California Porter-Cologne Water Quality Control Act (Water Code Sections 13020-13983).

California Fish and Game Code

The California Department of Fish and Game (DFG) has jurisdictional authority over wetland resources associated with rivers, streams, and lakes under California Fish and Game Code 1600-1607(Streambed Alteration Agreement). DFG has the authority to regulate all work that will substantially divert, obstruct, or change the natural flow of a river, stream, or lake; substantially change the bed, channel, or bank of a river, stream, or lake: or use material from a streambed.

In practice DFG defines its jurisdictional limit to the top of the stream or lake bank, at the outer edge of the riparian vegetation or to the 100-year floodplain. Compensation is often required to offset adverse impacts on waters of the state and associated riparian habitat.

California Endangered Species Act

DFG is responsible for protection and conservation of fish and wildlife resources in California. Under the California Endangered Species Act of 1984 (CESA), DFG is responsible

for ensuring that projects do not adversely affect a species listed as endangered or threatened under CESA (Section 2090 of the Fish and Game Code). CESA prohibits the take of species designated by the California Fish and Game Commission as endangered or threatened. The code defines "take" as "to hunt, pursue, catch, capture, or kill, or attempt to engage in any such conduct."

The California Fish and Game Code also provides protection from take for a variety of species, referred to as fully protected species. Section 5050 lists protected amphibians and reptiles. Section 3515 prohibits take of fully protected fish species. Eggs and nests of all birds are protected under Section 3503, nesting birds (including raptors and passerines) under Sections 3503.5 and 3513, birds of prey under Section 3503.5, and fully protected birds under Section 3511. Migratory nongame birds are protected under Section 3800. Mammals are protected under Section 4700. Except for take related to scientific research, all take of fully protected species is prohibited.

Federal Endangered Species Act

The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over species listed as threatened or endangered under Section 9 of the ESA. The ESA protects listed species from harm, or take. For any project involving a federal agency in which a listed species could be affected, the federal agency must consult with the USFWS in accordance with Section 7 of ESA. The USFWS issues a Biological Opinion (BO) and, if the project does not jeopardize the continued existence of the listed species, issues an incidental take permit. When no federal context is present, proponents of a project affecting a listed species must consult with the USFWS and apply for an incidental take permit under Section 10 of the ESA.

California Environmental Quality Act (CEQA)

CEQA is the regulatory framework by which California public agencies identify and mitigate significant environmental impacts. A project normally will have a significant environmental effect if it substantially affects a rare or endangered species or the habitat of that species; substantially interferes with the movement of resident or migratory fish or wildlife; or substantially diminishes habitat for fish, wildlife, or plants.

METHODS

Pre-field Investigation

Prior to conducting the field assessment, Davis Environmental biologists identified wildlife and plant species that have been reported in the vicinity of the project site. The pre-field investigation involved conducting a search of the California Natural Diversity Database (NDDB) for the U.S. Geological Survey 7.5 minute quadrangle and reviewing the draft multi-species habitat conservation plan for Solano County (Solano County Water Agency, February 2007), as well as habitat requirements for rare plants and animals known to occur in Solano County.

Literature pertinent to identifying potential wetlands and other waters on the site was reviewed, including the USGS 7.5 minute topographic quadrangle map for the area, recent color aerial photographs, the soil survey report, and the County-level hydric soils list.

Field Surveys

Biologists conducted field surveys of the Vanden Meadows property on July 29 and 30, 2009 to assess the biological communities on the proposed project site based on the results of the NDDB search and knowledge of the area. The biologists walked meandering transects across the project site, focusing on potential habitat for special-status species, potential jurisdictional wetlands, and other sensitive habitats.

Wetland Delineation

Potential jurisdictional wetlands were identified during the field survey. Wetland boundaries were identified according to the 1987 Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (U.S. Army Corps of Engineers 2006) applying the routine onsite determination method and according to U.S. Army Corps of Engineers guidelines. The resulting wetland delineation should be considered preliminary until the U.S. Army Corps of Engineers, Sacramento District, issues a jurisdictional determination of the extent of jurisdictional waters on the site.

Estimates of vegetative composition and cover were made at seven sampling points. The indicator status of each species was determined using the Revision of the National List of Plant Species that Occur in Wetlands (Reed 1988) to distinguish between upland and wetland vegetation. The indicator status of each species was recorded on the data sheets included in Appendix A of this report.

Seven delineation sample plots were established throughout the site to document the presence of areas meeting the three wetland parameters and to establish the wetland-nonwetland boundary. A wetland and a nonwetl and data point "pair" were established to document the wetland boundary. In addition to the formal data points, numerous other observations of the three parameters were made to correlate the signature of an aerial photograph of the site to observed wetland conditions.

Soil pits were excavated to a depth ranging from 4 to 20 inches, depending on soil density and the depth required to document the presence or absence of hydric soil morphology. A global positioning system receiver (GPS) was used to accurately map the location of wetlands. The wetland polygons were then scanned to convert them into a vector format geographic information system (GIS) data layer. The acreages of the mapped features were then calculated using ArcView GIS software.

The ordinary high water mark of non-wetland waters of the United States ("other waters") (i.e. Brazeltine Drain) potentially subject to federal jurisdiction were evaluated and mapped according to CFR 328.3 and various regulatory guidance letters issued by the Corps.

DESCRIPTION OF SITE CHARACTERISTICS

The Vanden Meadows property is generally undeveloped agricultural land. Rural residential homes and outbuildings exist in the northern portion of the property, off Vanden Road. It appears that the site has been used for livestock grazing and dryland hay production (Figure 2).

Leisure Town Road and Vanden Road cross the property. A storm water detention basin is located in the southeastern corner, south of Leisure Town Road. Southern Pacific Railroad tracks form the eastern site boundary. To the west is a residential subdivision. To the north are lots prepared for residential development. To the south is rangeland.

Topography and Hydrology

Elevations of the property range between approximately 85 and 125 feet above sea level.

The property occurs within an area of low hill, terrace, and basin landforms. A low, northwest-southeast trending ridge of sedimentary rocks exists in the southwestern corner. The southwestern part of the site generally slopes downward to the northeast. The remainder of the site slopes downward to the east. Most of the site is characterized by planar to gently sloping topography. The large agricultural field in the central part of the property, west of Vanden Road, appears to have been leveled, as evidenced by a uniform slope break of approximately 2 to 3 feet between two fields. The field to the east of Vanden road has been used to stockpile excess soil material.

A small segment of a wetland drainage swale crosses the southwestern corner of the property. A concrete-lined irrigation canal also traverses the southwestern portion of the property. It appears that this canal receives water from the Putah South Canal to the west.

A segment of the Brazeltine drain flows easterly through the northeastern part of the site (Figure 2). This segment of the Brazeltine drain has been cut off from historic upstream flows from previous development projects; the watershed now is limited to roadside runoff and local surface drainage. The nearest traditional navigable water to which the site flows is the Sacramento River.

Soils

The USDA soil survey of Solano County (Bates 1977 and USDA Natural Resources Conservation Service 2009) (see Appendix B for soil map and hydric soil list) indicates that the site is underlain by five soil map units, as shown in Table 1. As indicated in the table, none of the primary components of the map units, nor their inclusions, formed under hydric conditions.

WATERS OF THE U.S. INCLUDING WETLANDS	
SW-1	0.25
SW-2	0.06
WDS-1	0.03
WDS-2	0.02
BRAZELTON DRAIN	0.43
CANAL	0.33
DETENTION BASIN WETLAND	5.09
TOTAL	6.21

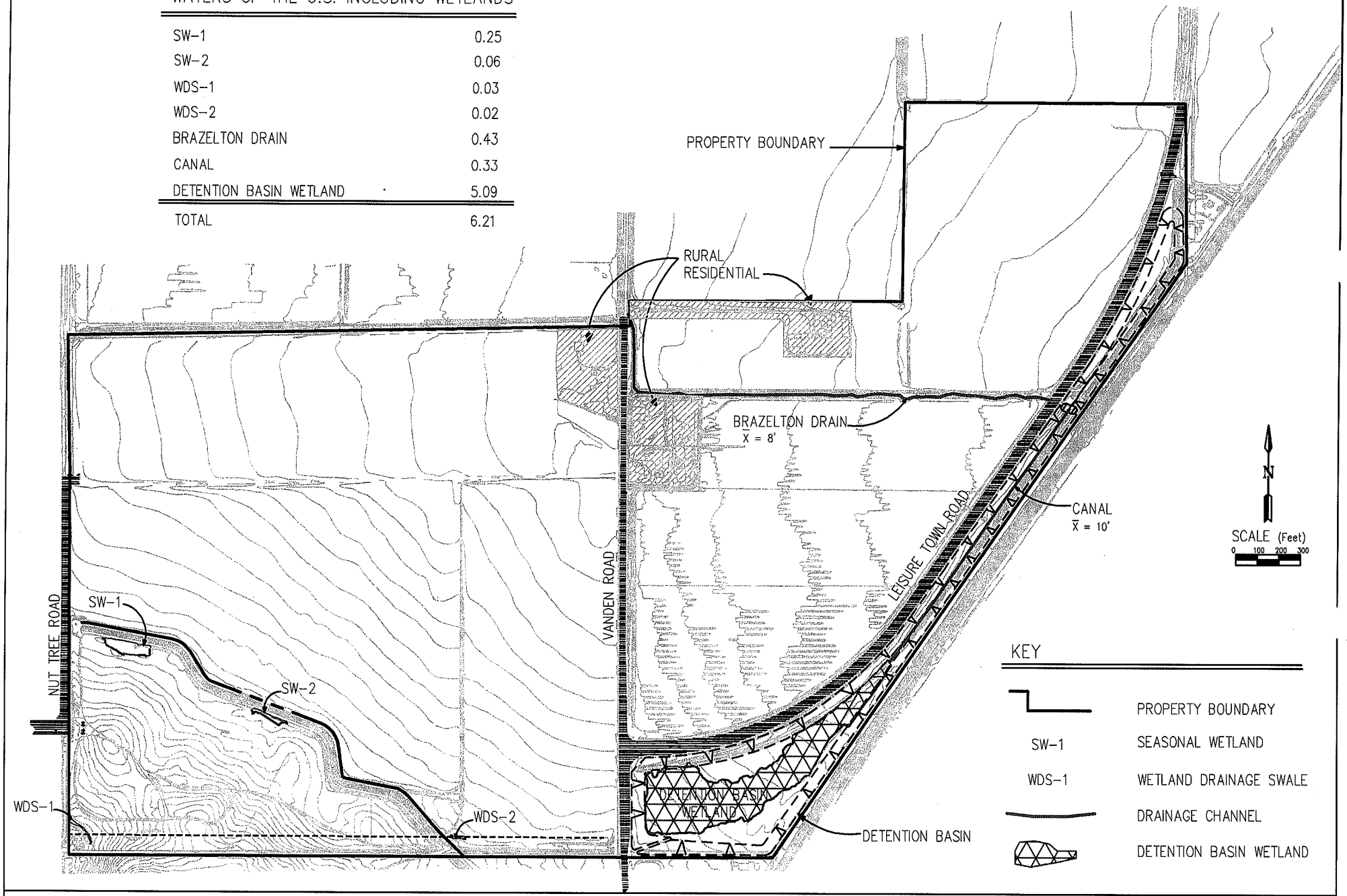

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Figure 2. Vanden Meadows
Biological Resources Map
Vacaville, California

Table 1. Summary of Soil Map Units that Occur at the Site

Soil Map Unit Symbol	Soil Map Unit Name	Landform	Profile of Primary Component of Map Unit (upper 60 inches)	Natural Drainage Class	Permeability	Hydric Status of Map Unit*
Ca	Capay silty clay loam	rims on basin floors	silty clay loam	moderately well	slow	component: non-hydric inclusions: non-hydric
DbC	Dibble-Los Osos loams, 2 to 9 percent slopes	mountains	loam over clay loam and clay over sandstone	well	slow	component: non-hydric inclusions: non-hydric
MkA	Millsap sandy loam, o to 2 percent slopes	hills	sandy loam over clay over sandstone	moderately well	very slow	component: non-hydric inclusions: non-hydric
SeA	San Ysidro loam, 0 to 2 percent slopes	terraces	loam over clay loam	moderately well	very slow	component: non-hydric inclusions: non-hydric
SfA	San Ysidro sandy loam, thick surface, 0 to 2 percent slopes	terraces	sandy loam over clay loam	moderately well	very slow	component: non-hydric inclusions: non-hydric

Sources: Bates (1977), USDA Natural Resources Conservation Service (2009)

Climate

The average annual precipitation in Vacaville, located approximately 5 miles northwest of the site, is 25.2 inches. Most falls between October and April. The growing season is approximately 270 days (Bates 1977).

Rainfall for the July 1, 2008 – June 31, 2009 rainy season was roughly 80% of the average in the region. This condition was considered in interpreting the presence/absence of

indicators of wetland hydrology and in plant species composition while the field survey was being conducted.

RESULTS

Based on the field assessment, the Vanden Meadows property supports six general habitat associations: agricultural land, drainage swale, emergent wetland habitat, open water habitat in a concrete-lined irrigation canal, seasonal wetland habitat, and Eucalyptus trees with other ornamental vegetation. A brief description of these habitat associations is provided below.

Agricultural Land

The majority of the site is characterized as agricultural land and rural residential development, with active farming of hay observed on the northeastern parcel. The remaining parcels were fallow at the time of the field surveys. Fallow fields support a mixture of non-native and naturalized annual grasses and forbs.

Drainage Swale

A segment of the Brazeltine drain flows from west to east from Vanden Road to Leisure Town Road, bisecting the eastern half of the property. Drainage channel habitat in the segment of the Brazeltine drain channel on the property is limited to pockets of herbaceous seasonal wetland vegetation. Small segments of two additional wetland drainage swales are located in the southeastern corner of the property (Figure 2).

Emergent Marsh

The Brazeltine drain flows under Leisure Town Road, draining into a detention basin and canal that was constructed as part of the Southtown development project. At the time of the survey, emergent marsh vegetation and standing water was present throughout the constructed detention basin and canal.

Open Water

A concrete-lined irrigation canal diagonally crosses the southwestern corner of the Vanden Meadows project site. At the time of the field survey, the canal sustained open water habitat, presumably transporting water for irrigation uses at off-site locations.

Seasonal Wetland

Seasonal wetland habitat is present adjacent to the irrigation canal in the fallow agricultural field in the southwestern portion of the property. Two, well–defined seasonal wetlands support native and non-native wetland vegetation. The seasonal wetlands appear to have developed as a result of surface water accumulating on the north side of the concrete-lined irrigation canal (Figure 2).

Eucalyptus Trees and Ornamental Vegetation

Three rural residences and associated outbuildings are present on the west and east side of Vanden Road; these developed areas support associated ornamental vegetation, including stands of mature Eucalyptus trees.

SPECIAL-STATUS SPECIES

Botanical Resources

The California Natural Diversity Data Base (NDDB) documents the locations of seventeen (17) special-status plant species and two special plant communities in the project vicinity (Table 2).

Table 2. Special-Status Plant and Animal Species Reported from the Vanden Meadows Project Vicinity (CNDDB 2009)

Plant Species:	**Status (federal/state)**	**Habitat**	**Suitable Habitat within the Project Site**
Alkali milk vetch (*Astragalus tener* var. *tener*)	None/None	Alkali flats any playas, vernal pools and playas	No
San Joaquin spearscale (*Atriplex joaquiniana*)	None/None	Alkali wetlands or alkali sink habitat	No
Pappose Tarplant (*Centromadia parryi* ssp. *Parryi*)	None/None	Seasonal alkaline wetlands, coastal salt marsh	No
Adobe Lily (*Fritillaria pluriflora*)	None/None	Woodland and Foothill Grassland, usually on clay soils or serpentine	No
Contra Costa Goldfields (*Lasthenia conjugens*)	Endangered/None	Grasslands with vernal pools and swales	Potential habitat is present in seasonal wetlands
Legenere (*Legenere limosa*)	None/None	Vernal Pools	No
Baker's Navarretia (*Navarretia leucocephala* ssp. *Bakeri*)	None/None	Vernal pools and swales on adobe or alkaline soils	No

Two-Fork Clover (*Trifolium amoenum*)	Endangered/None	Valley and foothill grassland on serpentine soil or swales	No
Saline Clover (*Trifolium depauperatum* var. *hydrophilum*)	None/None	Marshes and vernal pools on alkaline soils	No
San Joaquin Valley Orcutt Grass (*Orcuttia inaequalis*)	Threatened/Endangered	Vernal Pools and Swales and Alkali Playa Pools	No
Bearded Popcorn Flower (*Plagiobothrys hystriculus*)	None/None	Vernal Pools in valley foothill grasslands	No
Heartscale (*Atriplex cordulata*)	None/None	Alkali flats and scalds	No
Brittlescale (*Atriplex depressa*)	None/None	Alkali scalds or alkali clay in annual grassland	No
Hispid birds beak (*Cordylanthus mollis* ssp. *hispidus*)	None/None	Alkali meadows	No
Recurved larkspur (*Delphinium recurvatum*)	None/None	Alkaline Soils and Saltbush or Chenopod Scrub	No
Dwarf Downingia (*Downingia pusila*)	None/None	Vernal Pools and mesic grasslands	No
Golden bush (*Isocoma arguta*)	None/None	Alkali grasslands and swales	No
Animal Species:			
California linderiella (*Linderiella occidentalis*)	None/None	Seasonal pools in unplowed grasslands with low alkalinity	Potential habitat in seasonal wetlands
California tiger salamander (*Ambystoma californense*)	Threatened/None	Shallow open water ponds and vernal pools	Potential habitat in seasonal wetland and seasonal swale habitat
Delta green ground beetle (*Elaphrus viridis*)	Threatened/None	Vernal pools	No
Conservancy fairy shrimp (*Brachinecta conservatio*)	Endangered/None	Large, Turbid Vernal pools	No

Mid-Valley fairy shrimp (*Brachinecta mesovallensis*)	None/None	Shallow vernal pools	No
Vernal pool tadpole shrimp (*Lepidurus packardi*)	Endangered/None	Vernal Pools and Swales	No
Vernal Pool Fairy Shrimp (*Brachinecta lynchi*)	Threatened/None	Vernal Pools and Swales	Potential habitat is present in seasonal wetlands
Ricksecker's water scavenger beetle (*Hydrochara rickseckeri*)	None/None	Aquatic Habitat	No
Swainson's hawk (*Buteo swainsonii)*	None/Threatened	Grasslands with scattered trees, agricultural land, riparian areas	Yes, potential nesting and foraging habitat on project site. Reported nest tree on Vanden Road in project area (CNDDB 2005).
Burrowing Owl (*Athene cunicularia*)	None/None	Open dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation	Yes, Potential habitat is present; small mammal burrows
Northwestern Pond Turtle (*Actinemys marmorata marmorata*)	None/None	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation, basking sites, and sandy banks	Marginal habitat is present in the drainage basin area

The two special communities reported by the CNDDB in the project vicinity are northern claypan vernal pool and valley needlegrass grassland. Neither is present on the Vanden Meadows property.

The only special-status plant species that could be supported in the seasonal wetlands on the property is Contra Costa goldfields. Although a number of other special-status plant species were identified in the CNDDB, most species only occur in saline or alkaline soils or in vernal pools, and are not likely to be found on the project site. No alkali or adobe soils, no saline soils and no vernal pool habitat or coastal brackish marsh habitat suitable to support other rare plants were identified on the property.

Wildlife Resources

The NDDB search revealed the locations of eleven (11) special-status wildlife species that have been identified in the project vicinity. Based on the site survey, there is potentially suitable habitat on the property for five of these special-status species (Table 2): Swainson's hawk, northwestern pond turtle, burrowing owl, California tiger salamander, vernal pool fairy shrimp, and California linderiella.

Swainson's Hawk

The Eucalyptus stand and ornamental vegetation on the Vanden Meadows property provides potential nesting and perching habitat for raptors, such as red-tailed hawk, white-shouldered kite, and the state-listed Swainson's hawk (*Buteo swainsonii*). The California Natural Diversity Data Base has records of a Swainson's hawk nest on the property in 2005. Active nest sites are protected by state law (Fish and Game Code Section 3503.5).

During field surveys a pair of Swainson's hawks were observed near the Eucalyptus trees east of Vanden Road on the project site. If an active nest is located within the construction zone, disturbance protection measures may include establishing setbacks, construction windows, nest avoidance until young birds have left the nest, and regular inspection and reporting.

Northwestern Pond Turtle

Northwestern pond turtle is a special-status species that could be present in the detention basin. Although not protected by federal or state Endangered Species Acts, it is considered a special-status species and impacts on northwestern pond turtle should be avoided during project construction. Because the detention basin and canal are not included in the proposed construction area, it is not likely that the project would impact any turtles.

California Tiger Salamander

California tiger salamander is a federally listed threatened species that is present in the project vicinity. The closest reported breeding area is approximately 1.4 miles to the west. California tiger salamander is known to migrate through upland habitats. The seasonal wetlands and wetland drainage swales in the southwestern portion of the project site provide potentially

suitable habitat for California tiger salamander and should be evaluated during the winter and spring months for the presence of this species.

Vernal Pool Fairy Shrimp and California Linderiella

The two seasonal wetlands adjacent to the concrete-lined irrigation canal on the property are potentially suitable, but very unlikely habitat for the vernal pool fairy shrimp and California linderiella. The vernal pool fairy shrimp is federally-listed as threatened under the federal Endangered Species Act.

Burrowing owl

The burrowing owl is a state species of special concern. It is primarily a grassland species that uses ground burrows for nesting and prefers short vegetation with sparse shrubs for foraging habitat. Burrowing owl habitat was observed south of the irrigation canal in the southwestern portion of the Vanden Meadows project site.

WETLANDS AND OTHER WATERS OF THE UNITED STATES

Seasonal Wetlands

Two seasonal wetlands were mapped at the project site (Figure 2). Seasonal wetlands SW-1 and SW-2 are dominated by hydrophytic plants including perennial ryegrass (*Lolium perenne*), mediterranean barley (*Hordeum marianum*), spike rush (*Eleocharis macrostachya*), curly dock (*Rumex crispus*) and rabbitsfootgrass (*Polypogon monspeliensis*).

Wetland Drainage Swales

Two small segments of seasonally-inundated drainage swales are present on the Vanden Meadows project site. These drainage swales support a mixture of common wetland species adapted to seasonal inundation. Dominant species include swamp grass (*Crypsis schoenoides*), cocklebur (*Xanthium strumarium*), and umbrella sedge (*Cyperus eragrostis*).

Emergent Marsh

The detention basin and canal on the project site support emergent marsh habitat dominated by cattail (*Typha latifolia*). The basin and canal were sustaining standing water and saturated soils at the time of the survey, indicating that these areas have perennial water.

Other Waters of the United States

A remnant segment of the Brazelton Drain flows across the eastern half of the Vanden Meadows property, eventually draining into the detention basin in the southern portion of the site (Figure 2). The landward extent of the drain channel was mapped by the ordinary high water mark, which was identified based on the cross-section of the bed and bank and scoured bed.

Riparian habitat along the channel is very sparse, and includes a few willow trees (*Salix* spp.) adjacent to Vanden Road.

Preliminary Jurisdictional Acreages

Table 3 provides a breakdown of the acreage of each of the jurisdictional habitat types. These acreages should be considered preliminary, subject to verification by the Corps.

Table 3. Summary of Waters of the United States, Including Wetlands, at the Vanden Meadows Property

Habitat Type	**Acreage**
Wetlands	
Seasonal Wetlands	
SW-1	0.25 acre
SW-2	0.06 acre
Wetland Drainage Swales	
WDS - 1	0.03 acre
WDS - 2	0.02 acre
Waters of the United States	
Brazeltine Drainage Channel	0.43 acre
Detention Basin and Canal	5.42 acres
Total Area	6.21 acres

DISCUSSION AND RECOMMENDATIONS

Based on the results of the biological resources surveys on the Vanden Meadows property, the following measures are recommended:

Focused Special-Status Species Surveys

Because there is potentially suitable habitat on the site for one rare plant and five special-status animals, focused special-status surveys are recommended. The seasonal wetland habitats

on the site are potentially suitable habitat for Contra Costa goldfields; consequently a focused botanical survey should be conducted during the spring flowering period (March-May).

Although only marginally suitable habitat, the seasonal wetlands and seasonal swales in the southwestern portion of the site should be surveyed by a qualified biologist during winter months to determine the status of the California tiger salamander, vernal pool fairy shrimp, and California linderiella on the site.

Pre-Construction Raptor Survey

Because active raptor nests are protected by the California Fish and Game Code, and Swainson's hawks are protected under the state Endangered Species Act, the project proponent should have a qualified biologist conduct a pre-construction survey prior to initiating construction. If active Swainson's hawk or burrowing owl nests are found on or near the proposed construction zone, a no-disturbance buffer area will be established in coordination with the California Department of Fish and Game. Active construction must be avoided in the no-disturbance zone until it has been determined that the birds will not be disturbed or that the young have left the nest, at which time, construction can commence.

California Department of Fish and Game generally recommends mitigation for the loss of Swainson's hawk nesting and foraging habitat and any loss of burrowing owl nests. Mitigation for the loss of agricultural land may also be required by the City of Vacaville and in compliance with the proposed Solano County Multi-Species Habitat Conservation Plan.

Section 404 Permit

Discharges of fill material, including placement of structures, into waters of the U.S., including wetlands on the site will require a Section 404 permit from the Corps of Engineers. The proposed Vanden Meadows development project may meet the conditions for authorization under nationwide permit number 29 (NWP-29). NWP-29 authorizes the construction of residential developments provided that no more than 0.5 acre non-tidal waters of the United States are filled, including the loss of no more than 300 linear feet of streambed (for intermittent and ephemeral streams, this 300 linear foot limit can be waived by the Corps).

For the construction of the proposed Vanden Meadows project, the project proponent must submit a pre-construction notification to the Corps for authorization under NWP-29.

Streambed Alteration Agreement

Because the proposed project will impact the Brazelton Drain, the project will be required to obtain a Streambed Alteration Agreement with the California Department of Fish and Game. The agreement will require compliance with the California Environmental Quality Act (CEQA) prior to approval.

Cultural Resources

Compliance with the National Historic Preservation Act is required for all federal actions, including a Corps of Engineers' Section 404 permit. A cultural resources survey should be completed to determine if there are any features on the site that are eligible for listing under the National Historic Preservation Act.

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APPENDIX A:

Wetland Delineation Data Sheets

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site:	Vaudin Meadows	City/County:	Solano	Sampling Point:	SW-1a
Applicant/Owner:		State:	CA	Sampling Date:	7/29/09
Investigator(s):	Butterworth / Davis	Section, Township, Range:		Photo No:	#1
Landform (hillslope, terrace, etc.):		Land Surface Shape (concave, convex, planar):	Concave	Slope (%):	
Subregion (LRR):	Lat:	Long:		Datum:	
Soil Map Unit Name:				NWI classification:	

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

Are Vegetation	☐,	Soil	☐,	Or Hydrology	☐,	significantly disturbed?	Are "Normal Circumstances" present?	Yes	☑	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	☑	No	☐	Is the Sampling Area within a Wetland?	Yes	☑	No ☐
Hydric Soil Present?	Yes	☑	No	☐				
Wetland Hydrology Present?	Yes	☑	No	☐				

Remarks:

VEGETATION

Tree Stratum (Plot size r = 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	

Sapling/Shrub Stratum (Plot size r = 5 ft.)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Herb Stratum (Plot size r = 5 ft.)			
1. Lolium perenne	90	x	FAC
2. Eleocharis macrostachya	20	x	OBL
3. Plagiobothrys mucronatus	5		FACW
4. Taeniatherum caput	2		UPL
5. Convolvulus arvense	1		UPL
6. Rumex crispus	1		FACW
7.			
8.			
	120	= Total Cover	

Woody Vine Stratum (Plot size r = 30 ft.)			
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	20	x1 =	20
FACW species	6	x2 =	12
FAC species	90	x3 =	270
FACU species	0	x4 =	
UPL species	4	x5 =	20
Column Totals:	120 (A)		322 (B)

Prevalence Index = B/A = 2.68

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: perimeter of low spot / seasonal wetland

Project Site: Vantin Meadows

SOIL

Sampling Point: SW-1a

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

Depth	Matrix		Redox Features						
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Horizon	Remarks
0-8	10YR3/2	95	7.5YR3/4	15	C	PL	SL	A1	A1 horizon
8-17	10YR5/2	100					SL	A2	A2

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, LRC=Living Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

☐	Surface Water (A1)	☐	Salt Crust (B11)
☐	High Water Table (A2)	☐	Biotic Crust (B12)
☐	Saturation (A3)	☐	Aquatic Invertebrates (B13)
☐	Water Marks (B1) **(Nonriverine)**	☐	Hydrogen Sulfide Odor (C1)
☐	Sediment Deposits (B2) **(Nonriverine)**	☒	Oxidized Rhizospheres along Living Roots (C3)
☐	Drift Deposits (B3) **(Nonriverine)**	☐	Presence of Reduced Iron (C4)
☐	Surface Soil Cracks (B6)	☐	Recent Iron Reduction in Tilled Soils (C6)
☐	Inundation Visible on Aerial Imagery (B7)	☐	Thin Muck Surface (C7)
☐	Water-Stained Leaves (B9)	☐	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):	
Water Table Present?	Yes	☐	No	☐	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	☐	No	☐	Depth (inches):	

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Data Point 2

Project Site:	Vandenberg	City/County:		Sampling Point:	SW-16
Applicant/Owner:		State:	CA	Sampling Date:	
Investigator(s):	Butterworth / Davis	Section, Township, Range:		Photo No:	
Landform (hillslope, terrace, etc.):		Land Surface Shape (concave, convex, planar):		Slope (%):	
Subregion (LRR):	Lat:	Long:		Datum:	
Soil Map Unit Name:				NWI classification:	

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

Are Vegetation	☐,	Soil	☐,	Or Hydrology	☐,	significantly disturbed?	Are "Normal Circumstances" present?	Yes	☐	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	☐	No	☑	Is the Sampling Area within a Wetland?	Yes	☐	No	☑
Hydric Soil Present?	Yes	☐	No	☑					
Wetland Hydrology Present?	Yes	☐	No	☑					

Remarks:

VEGETATION

Tree Stratum (Plot size r = 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	

Sapling/Shrub Stratum (Plot size r = 5 ft.)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Herb Stratum (Plot size r = 5 ft.)			
1. Taeniatherum caput-medusae	90	X	UPL
2. Convolvulus arvensis	2		UPL
3. Avena fatua	10	X	UPL
4. Raphanus sativus	<1		UPL
5. Vicia americana	<1		UPL
6.			
7.			
8.			
	105	= Total Cover	

Woody Vine Stratum (Plot size r = 30 ft.)			
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:	0	(A)
Total Number of Dominant Species Across All Strata:	0	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0	(A/B)

Prevalence Index Worksheet:			
Total % Cover of:		Multiply by:	
OBL species		x1 =	
FACW species		x2 =	
FAC species		x3 =	
FACU species		x4 =	
UPL species	105	x5 =	525
Column Totals:		(A)	(B)

Prevalence Index = B/A = 5

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:

Project Site:	Verdun Meadows

SOIL

Sampling Point: SW-16

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

Depth	Matrix		Redox Features						
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Horizon	Remarks
0-14	10YR 3/2	100					SL	A	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, LRC=Living Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type:	
Depth (Inches):	

Hydric Soils Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

☐	Surface Water (A1)	☐	Salt Crust (B11)
☐	High Water Table (A2)	☐	Biotic Crust (B12)
☐	Saturation (A3)	☐	Aquatic Invertebrates (B13)
☐	Water Marks (B1) **(Nonriverine)**	☐	Hydrogen Sulfide Odor (C1)
☐	Sediment Deposits (B2) **(Nonriverine)**	☐	Oxidized Rhizospheres along Living Roots (C3)
☐	Drift Deposits (B3) **(Nonriverine)**	☐	Presence of Reduced Iron (C4)
☐	Surface Soil Cracks (B6)	☐	Recent Iron Reduction in Tilled Soils (C6)
☐	Inundation Visible on Aerial Imagery (B7)	☐	Thin Muck Surface (C7)
☐	Water-Stained Leaves (B9)	☐	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):	
Water Table Present?	Yes	☐	No	☐	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	☐	No	☐	Depth (inches):	

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: Adjacent Upland Area near edge of Seasonal Wetland depression

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site:	Vandalia Meadows	City/County:		Sampling Point:	SW-2a
Applicant/Owner:		State: CA		Sampling Date:	7/29/09
Investigator(s):	Butterworth	Section, Township, Range:		Photo No:	#2
Landform (hillslope, terrace, etc.):		Land Surface Shape (concave, convex, planar):		Slope (%):	
Subregion (LRR):		Lat:	Long:	Datum:	
Soil Map Unit Name:			NWI classification:		

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

Are Vegetation	☐,	Soil	☐,	Or Hydrology	☐,	significantly disturbed?	Are "Normal Circumstances" present?	Yes	☐	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	☑	No	☐	Is the Sampling Area within a Wetland?	Yes	☑	No ☐
Hydric Soil Present?	Yes	☑	No	☐				
Wetland Hydrology Present?	Yes	☑	No	☐				

Remarks:

VEGETATION

Tree Stratum (Plot size r = 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size r = 5 ft.)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size r = 5 ft.)			
1. Polygonum monspeliensis	50	X	FACW
2. Rumex crispus	20	X	FACW
3. Convolvulus arvensis	<10		UPL
4. Hordeum hystrix	<50	X	FACW
5. Capsella bursa-pastoris	<1		FAC
6.			
7.			
8.			
	131	= Total Cover	
Woody Vine Stratum (Plot size r = 30 ft.)			
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:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	—	x1 =	
FACW species	120	x2 =	240
FAC species	1	x3 =	3
FACU species	—	x4 =	
UPL species	10	x5 =	50
Column Totals:	131 (A)		293 (B)

Prevalence Index = B/A = 2.23

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

Project Site: Vandin Meadows

SOIL

Sampling Point: SW2a

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

Depth	Matrix		Redox Features						
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Horizon	Remarks
0-2	10YR 3/2	100					L	A1	
2-7	10YR 3/2	80	7.5YR 3/4	20	C	M	L	A2	
7-13	10YR 3/2	100					L	A3	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, LRC=Living Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)				Secondary Indicators (2 or more required)	
☐	Surface Water (A1)	☐	Salt Crust (B11)	☐	Water Marks (B1) **(Riverine)**
☐	High Water Table (A2)	☒	Biotic Crust (B12)	☐	Sediment Deposits (B2) **(Riverine)**
☐	Saturation (A3)	☐	Aquatic Invertebrates (B13)	☐	Drift Deposits (B3) **(Riverine)**
☐	Water Marks (B1) **(Nonriverine)**	☐	Hydrogen Sulfide Odor (C1)	☐	Drainage Patterns (B10)
☐	Sediment Deposits (B2) **(Nonriverine)**	☐	Oxidized Rhizospheres along Living Roots (C3)	☐	Dry-Season Water Table (C2)
☐	Drift Deposits (B3) **(Nonriverine)**	☐	Presence of Reduced Iron (C4)	☐	Crayfish Burrows (C8)
☐	Surface Soil Cracks (B6)	☐	Recent Iron Reduction in Tilled Soils (C6)	☐	Saturation Visible on Aerial Imagery (C9)
☐	Inundation Visible on Aerial Imagery (B7)	☐	Thin Muck Surface (C7)	☐	Shallow Aquitard (D3)
☐	Water-Stained Leaves (B9)	☐	Other (Explain in Remarks)	☐	FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☐	Depth (inches):	
Water Table Present?	Yes	☐	No	☐	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	☐	No	☐	Depth (inches):	

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks: Biotic Crust is evident

WETLAND DETERMINATION DATA FORM – Arid West Region

Data Point 3

Project Site:	Vaudin Meadows	City/County:		Sampling Point:	SW-2b
Applicant/Owner:		State:	CA	Sampling Date:	7/29/09
Investigator(s):	Butterworth	Section, Township, Range:		Photo No:	1
Landform (hillslope, terrace, etc.):		Land Surface Shape (concave, convex, planar):		Slope (%):	
Subregion (LRR):	Lat:	Long:		Datum:	
Soil Map Unit Name:				NWI classification:	

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

Are Vegetation	☐,	Soil	☐,	Or Hydrology	☐,	significantly disturbed?	Are "Normal Circumstances" present?	Yes	☑	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 ☐	No ☑				
Hydric Soil Present?	Yes ☐	No ☑	Is the Sampling Area within a Wetland?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑				

Remarks:

VEGETATION

Tree Stratum (Plot size r = 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	

Sapling/Shrub Stratum (Plot size r = 5 ft.)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Herb Stratum (Plot size r = 5 ft.)			
1. Taeniatherum caput-medusae	50	X	UPL
2. Lolium perenne	50	X	FAC
3. Hordeum hystrix	10	X	FACW
4. Convolvulus arvensis	<1		UPL
5. Rumex crispus	<2		FACW
6.			
7.			
8.			
	113	= Total Cover	

Woody Vine Stratum (Plot size r = 30 ft.)			
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:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	66	(A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	—	x1 =	
FACW species	12	x2 =	24
FAC species	50	x3 =	150
FACU species	[illegible]	x4 =	
UPL species	51	x5 =	255
Column Totals:	113 (A)		429 (B)

Prevalence Index = B/A = 3.79

Hydrophytic Vegetation Indicators:

- ☑ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1] No
- ☐ 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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks: On upper edge of seasonal wetland depressional area

Project Site: Vaudlin Meadows

SOIL

Sampling Point: SW-2b

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

Depth	Matrix		Redox Features						
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Horizon	Remarks
0-2	10YR 3/1	97	7.5YR 4/6	3	C	PL	L	A1	
2-16	10YR 3/1	100					L	A2	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, LRC=Living Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type:	
Depth (Inches):	

Hydric Soils Present? Yes ☐ No ☒

Remarks: Absence of biotic crust; Redox crust @ A1 is too thin to be F6

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

☐	Surface Water (A1)	☐	Salt Crust (B11)
☐	High Water Table (A2)	☐	Biotic Crust (B12)
☐	Saturation (A3)	☐	Aquatic Invertebrates (B13)
☐	Water Marks (B1) **(Nonriverine)**	☐	Hydrogen Sulfide Odor (C1)
☐	Sediment Deposits (B2) **(Nonriverine)**	☐	Oxidized Rhizospheres along Living Roots (C3)
☐	Drift Deposits (B3) **(Nonriverine)**	☐	Presence of Reduced Iron (C4)
☐	Surface Soil Cracks (B6)	☐	Recent Iron Reduction in Tilled Soils (C6)
☐	Inundation Visible on Aerial Imagery (B7)	☐	Thin Muck Surface (C7)
☐	Water-Stained Leaves (B9)	☐	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):	
Water Table Present?	Yes	☐	No	☐	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	☐	No	☐	Depth (inches):	

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks: No hydrology

WETLAND DETERMINATION DATA FORM – Arid West Region

Data Point 5

Project Site:	Vanden Meadows	City/County:	Solano	Sampling Point:	WDS-1
Applicant/Owner:		State:	CA	Sampling Date:	7/29/09
Investigator(s):	Butterworth	Section, Township, Range:		Photo No:	3
Landform (hillslope, terrace, etc.):		Land Surface Shape (concave, convex, planar):		Slope (%):	
Subregion (LRR):	Lat:	Long:		Datum:	
Soil Map Unit Name:				NWI classification:	

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

Are Vegetation	☐,	Soil	☐,	Or Hydrology	☐,	significantly disturbed?	Are "Normal Circumstances" present?	Yes	☐	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	☑	No	☐				
Hydric Soil Present?	Yes	☑	No	☐	**Is the Sampling Area within a Wetland?**	Yes	☑	No ☐
Wetland Hydrology Present?	Yes	☑	No	☐				

Remarks:

VEGETATION

Tree Stratum (Plot size r = 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size r = 5 ft.)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size r = 5 ft.)			
1. Xanthium strumarium	80	X	OBL
2. Crypsis schoenoides	5		OBL
3.			
4.			
5.			
6.			
7.			
8.			
	85	= Total Cover	
Woody Vine Stratum (Plot size r = 30 ft.)			
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	85	x1 =	85
FACW species		x2 =	
FAC species		x3 =	
FACU species		x4 =	
UPL species		x5 =	
Column Totals:	85 (A)		85 (B)

Prevalence Index = B/A = 1

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: Wetland drainage swale crosses corner of site Culverted on either side

Project Site:	

SOIL

Sampling Point: WDS-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (data point 5)

Depth	Matrix		Redox Features						
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Horizon	Remarks
0-5	10YR3/1	95	7.5YR4/6	5	C	PL	L	A1	
5-9	10YR3/1	100					L	A2	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, LRC=Living Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type:	
Depth (Inches):	

Hydric Soils Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)				Secondary Indicators (2 or more required)	
☐	Surface Water (A1)	☐	Salt Crust (B11)	☐	Water Marks (B1) **(Riverine)**
☐	High Water Table (A2)	☒	Biotic Crust (B12)	☐	Sediment Deposits (B2) **(Riverine)**
☐	Saturation (A3)	☐	Aquatic Invertebrates (B13)	☐	Drift Deposits (B3) **(Riverine)**
☐	Water Marks (B1) **(Nonriverine)**	☐	Hydrogen Sulfide Odor (C1)	☐	Drainage Patterns (B10)
☐	Sediment Deposits (B2) **(Nonriverine)**	☒	Oxidized Rhizospheres along Living Roots (C3)	☐	Dry-Season Water Table (C2)
☐	Drift Deposits (B3) **(Nonriverine)**	☐	Presence of Reduced Iron (C4)	☐	Crayfish Burrows (C8)
☐	Surface Soil Cracks (B6)	☐	Recent Iron Reduction in Tilled Soils (C6)	☐	Saturation Visible on Aerial Imagery (C9)
☐	Inundation Visible on Aerial Imagery (B7)	☐	Thin Muck Surface (C7)	☐	Shallow Aquitard (D3)
☐	Water-Stained Leaves (B9)	☐	Other (Explain in Remarks)	☐	FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☐	Depth (inches):	
Water Table Present?	Yes	☐	No	☐	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	☐	No	☐	Depth (inches):	

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks: Drainage swale

WETLAND DETERMINATION DATA FORM – Arid West Region

Data Point 6

Project Site:	Vandin Meadows	City/County:	Solano	Sampling Point:	DB-1
Applicant/Owner:		State:	CA	Sampling Date:	
Investigator(s):	Butterworth / Davis	Section, Township, Range:		Photo No:	
Landform (hillslope, terrace, etc.):		Land Surface Shape (concave, convex, planar):		Slope (%):	
Subregion (LRR):		Lat:		Long:	Datum:
Soil Map Unit Name:				NWI classification:	

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

Are Vegetation	☐,	Soil	☐,	Or Hydrology	☐,	significantly disturbed?	Are "Normal Circumstances" present?	Yes ☐	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	☐	No	☑				
Hydric Soil Present?	Yes	☐	No	☑	**Is the Sampling Area within a Wetland?**	Yes	☐	No ☑
Wetland Hydrology Present?	Yes	☐	No	☑				

Remarks:

VEGETATION

Tree Stratum (Plot size r = 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size r = 5 ft.)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size r = 5 ft.)			
1. Lolium perenne	70	X	FAC
2. Raphanus sativus	5		UPL
3. Avena barbata	5		FAC
4. Trifolium spp.	2		FACU
5. Avena fatua	15	X	UPL
6. Bromus carinatus	2		UPL
7.			
8.			
		= Total Cover	
Woody Vine Stratum (Plot size r = 30 ft.)			
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:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50	(A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	—	x1 =	
FACW species	—	x2 =	
FAC species	75	x3 =	225
FACU species	2	x4 =	8
UPL species	20	x5 =	100
Column Totals:	97 (A)		333 (B)

Prevalence Index = B/A = 3.43

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks: side edge of excavated drainage basin

Project Site:	Vandin Meadows

SOIL

Sampling Point: DP-1

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

Depth	Matrix		Redox Features						
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Horizon	Remarks
0-9	10YR 4/6	100					GRCL	C	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, LRC=Living Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)				**Indicators for Problematic Hydric Soils[3]:**	
☐	Histosol (A1)	☐	Sandy Redox (S5)	☐	1 cm Muck (A9) **(LRR C)**
☐	Histic Epipedon (A2)	☐	Stripped Matrix (S6)	☐	2 cm Muck (A10) **(LRR B)**
☐	Black Histic (A3)	☐	Loamy Mucky Mineral (F1)	☐	Reduced Vertic (F18)
☐	Hydrogen Sulfide (A4)	☐	Loamy Gleyed Matrix (F2)	☐	Red Parent Material (TF2)
☐	Stratified Layers (A5) **(LRR C)**	☐	Depleted Matrix (F3)	☐	Other (Explain in Remarks)
☐	1 cm Muck (A9) **(LRR D)**	☐	Redox Dark Surface (F6)		
☐	Depleted Below Dark Surface (A11)	☐	Depleted Dark Surface (F7)		
☐	Thick Dark Surface (A12)	☐	Redox Depressions (F8)		
☐	Sandy Mucky Mineral (S1)	☐	Vernal Pools (F9)	[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.	
☐	Sandy Gleyed Matrix (S4)				

Restrictive Layer (if present):							
Type:		**Hydric Soils Present?**	**Yes**	☐	**No**	☐
Depth (Inches):						

Remarks: Natural profile truncated due to excavation of basin

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)				Secondary Indicators (2 or more required)	
☐	Surface Water (A1)	☐	Salt Crust (B11)	☐	Water Marks (B1) **(Riverine)**
☐	High Water Table (A2)	☐	Biotic Crust (B12)	☐	Sediment Deposits (B2) **(Riverine)**
☐	Saturation (A3)	☐	Aquatic Invertebrates (B13)	☐	Drift Deposits (B3) **(Riverine)**
☐	Water Marks (B1) **(Nonriverine)**	☐	Hydrogen Sulfide Odor (C1)	☐	Drainage Patterns (B10)
☐	Sediment Deposits (B2) **(Nonriverine)**	☐	Oxidized Rhizospheres along Living Roots (C3)	☐	Dry-Season Water Table (C2)
☐	Drift Deposits (B3) **(Nonriverine)**	☐	Presence of Reduced Iron (C4)	☐	Crayfish Burrows (C8)
☐	Surface Soil Cracks (B6)	☐	Recent Iron Reduction in Tilled Soils (C6)	☐	Saturation Visible on Aerial Imagery (C9)
☐	Inundation Visible on Aerial Imagery (B7)	☐	Thin Muck Surface (C7)	☐	Shallow Aquitard (D3)
☐	Water-Stained Leaves (B9)	☐	Other (Explain in Remarks)	☐	FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☐	Depth (inches):					
Water Table Present?	Yes	☐	No	☐	Depth (inches):					
Saturation Present? (includes capillary fringe)	Yes	☐	No	☐	Depth (inches):		**Wetland Hydrology Present?**	**Yes**	☐	**No** ☐

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site:	Dundee Meadows	City/County:	Solano	Sampling Point:	DP-2
Applicant/Owner:		State:	CA	Sampling Date:	
Investigator(s):	Butterworth / Davis	Section, Township, Range:		Photo No:	
Landform (hillslope, terrace, etc.):		Land Surface Shape (concave, convex, planar):		Slope (%):	
Subregion (LRR):	Lat:	Long:		Datum:	
Soil Map Unit Name:				NWI classification:	

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

Are Vegetation	☐,	Soil	☐,	Or Hydrology	☐,	significantly disturbed?	Are "Normal Circumstances" present?	Yes	☐	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	☑	No	☐	**Is the Sampling Area within a Wetland?**	Yes ☑	No ☐
Hydric Soil Present?	Yes	☑	No	☐			
Wetland Hydrology Present?	Yes	☑	No	☐			

Remarks: In Drainage Basin

VEGETATION

Tree Stratum (Plot size r = 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size r = 5 ft.)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size r = 5 ft.)			
1. Typha latifolia	95	X	OBL
2. Polypogon monspeliensis	10	X	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	105	= Total Cover	
Woody Vine Stratum (Plot size r = 30 ft.)			
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	95	x1 =	95
FACW species	10	x2 =	20
FAC species		x3 =	
FACU species		x4 =	
UPL species		x5 =	
Column Totals:	105 (A)		125 (B)

Prevalence Index = B/A = 1.19

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

Project Site: Vinton Meadows

SOIL

Sampling Point: DP-2

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

Depth	Matrix		Redox Features						
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Horizon	Remarks
0-6	10YR 4/6	100						C	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, LRC=Living Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type:	
Depth (Inches):	

Hydric Soils Present? Yes ☐ No ☐

Remarks: * Recently excavated soil; assume hydric due to visible hydrology + inundation

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

				Secondary Indicators (2 or more required)	
☑	Surface Water (A1)	☐	Salt Crust (B11)	☐	Water Marks (B1) **(Riverine)**
☐	High Water Table (A2)	☐	Biotic Crust (B12)	☐	Sediment Deposits (B2) **(Riverine)**
☐	Saturation (A3)	☐	Aquatic Invertebrates (B13)	☐	Drift Deposits (B3) **(Riverine)**
☐	Water Marks (B1) **(Nonriverine)**	☑	Hydrogen Sulfide Odor (C1)	☐	Drainage Patterns (B10)
☐	Sediment Deposits (B2) **(Nonriverine)**	☐	Oxidized Rhizospheres along Living Roots (C3)	☐	Dry-Season Water Table (C2)
☐	Drift Deposits (B3) **(Nonriverine)**	☐	Presence of Reduced Iron (C4)	☐	Crayfish Burrows (C8)
☐	Surface Soil Cracks (B6)	☐	Recent Iron Reduction in Tilled Soils (C6)	☐	Saturation Visible on Aerial Imagery (C9)
☐	Inundation Visible on Aerial Imagery (B7)	☐	Thin Muck Surface (C7)	☐	Shallow Aquitard (D3)
☐	Water-Stained Leaves (B9)	☐	Other (Explain in Remarks)	☐	FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☐	Depth (inches):	0.5
Water Table Present?	Yes	☐	No	☐	Depth (inches):	—
Saturation Present? (includes capillary fringe)	Yes	☐	No	☐	Depth (inches):	—

Wetland Hydrology Present? Yes ☑ No ☐

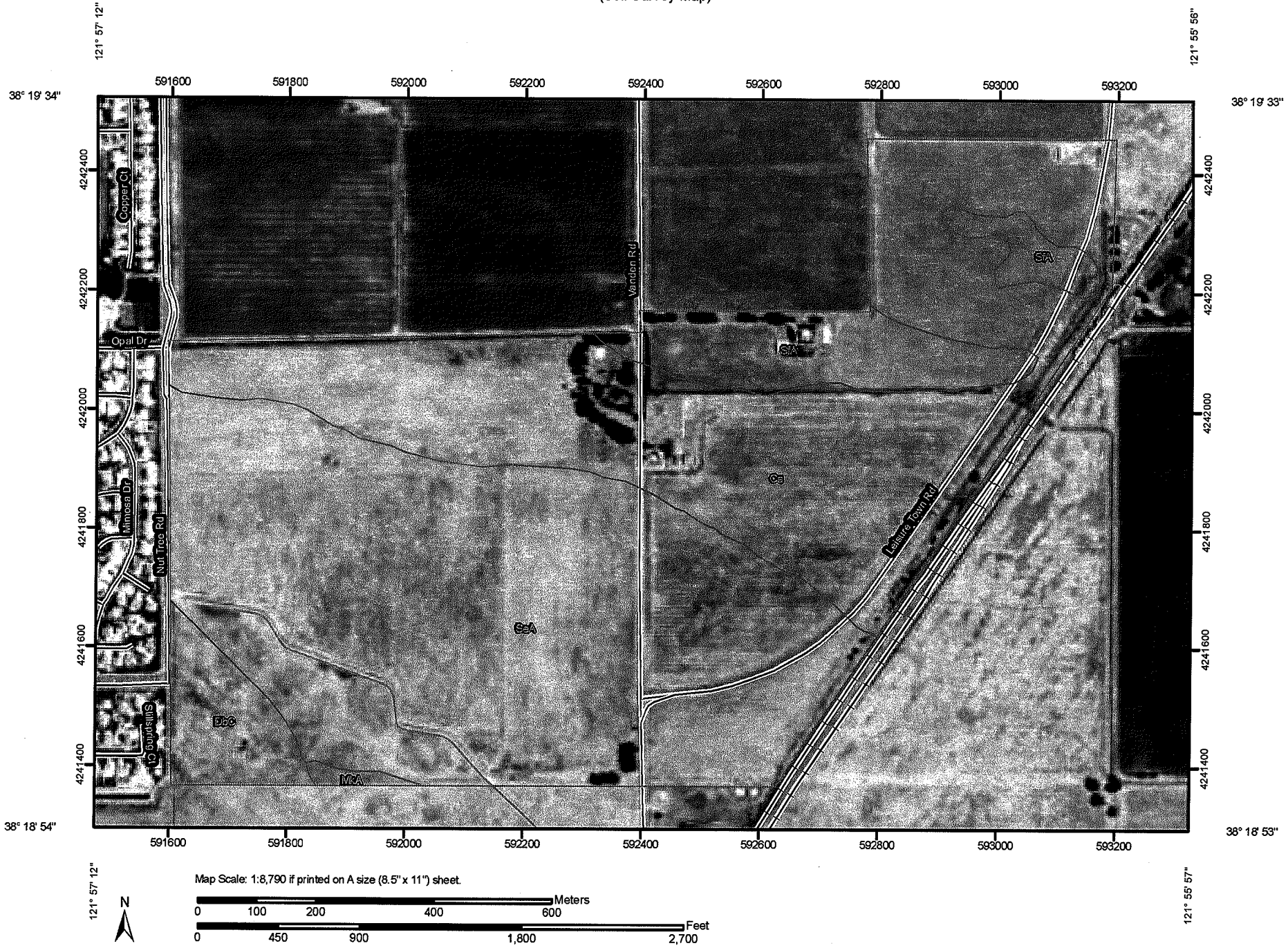
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX B:

Soils Map

Soil Map—Solano County, California
(Soil Survey Map)



Map Scale: 1:8,790 if printed on A size (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 450 900 1,800 2,700

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: 1:8,790 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: Solano County, California
Survey Area Data: Version 5, Dec 12, 2007

Date(s) aerial images were photographed: 6/30/2005

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

Solano County, California (CA095)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ca	Capay silty clay loam	107.6	38.8%
DbC	Dibble-Los Osos loams, 2 to 9 percent slopes	10.9	3.9%
MkA	Millsap sandy loam, 0 to 2 percent slopes	1.0	0.4%
SeA	San Ysidro sandy loam, 0 to 2 percent slopes	135.1	48.7%
SfA	San Ysidro sandy loam, thick surface , 0 to 2 percent slopes	22.9	8.2%
Totals for Area of Interest		**277.5**	**100.0%**