APPENDIX A – AGENCY SCOPING

USDA – ARS Research and Development Center Environmental Assessment
Agency Scoping Contact List
September 2021

Agency	Position	Address	City	State	Zip
Federal Aviation Administration (FAA)	Director, Western-Pacific Region	777 S. Aviation Blvd, Ste 150	El Segundo	CA	90245
Federal Emergency Management Agency (FEMA), Region 9	Administrator	1111 Broadway, Ste 1200	Oakland	CA	94607
U.S. Army Corps of Engineers, Sacramento District	Regulatory	1325 J St	Sacramento	CA	95814
U.S. Fish and Wildlife Service, Sacramento Office, Pacific Southwest Region	Field Supervisor	2800 Cottage Way, Rm W-2606	Sacramento	CA	95825
U.S. EPA, Region 9, Pacific Southwest Office	Deputy Regional Administrator	75 Hawthorne St.	San Francisco	CA	94105
Yolo-Solano Air Quality Management District (AQMD)	Executive Director	1947 Galileo Court, Ste 103	Davis	CA	95618
Central Valley Regional Water Board, Region 5, Sacramento Office	Executive Officer	11020 Sun Center Dr., #200	Rancho Cordova	CA	95670
National Association of Conservation Districts (NACD)	Pacific Region Representative	—	Livermore	CA	—
USDA Natural Resources Conservation Service (NRCS), California	State Conservationist	430 G Street, Ste 4164	Davis	CA	95616
U.S. Dept. of the Interior, Indian Affairs, Central CA	Superintendent	Central California Agency, 650 Capitol Mall, Suite 8-500	Sacramento	CA	95814
California Department of Fish and Wildlife (CDFW), Bay Delta Region (Region 3)	Regional Manager	2825 Cordelia Rd., Suite 100	Fairfield	CA	94534
Department of Toxic Substances Control (DTSC) Regulatory Assistance Office	—	1001 I St.	Sacramento	CA	95814
California State Office of Historic Preservation	State Historic Preservation Officer (SHPO)	1725 23rd Street, Ste 100	Sacramento	CA	95816
County of Yolo	County Administrator	625 Court St., Rm 202	Woodland	CA	95695
County of Yolo, Dept. of Community Services, Planning Division	Planner	292 West Beamer St.	Woodland	CA	95695
Yolo County Farm Bureau	Executive Director	69 W. Kentucky Ave.	Woodland	CA	95695
City of Davis, Community Development and Sustainability, Planning and Zoning	Principal Planner	23 Russell Blvd, Ste 2	Davis	CA	95616
City of Davis, Public Works Engineering and Transportation	Public Works Engineering & Transportation Director	1717 Fifth Street	Davis	CA	95616
City of Davis, Public Works Utilities and Operations	Environmental Resources Manager	1717 Fifth Street	Davis	CA	95616
Davis City Council, District 4	Mayor	23 Russell Blvd.	Davis	CA	95616
UC Davis, Campus Planning and Environmental Stewardship	Associate Vice Chancellor	One Shields Ave	Davis	CA	95616
PG&E	Community Relations	—	—	—	—
Union Pacific	Environmental Programs	—	—	—	—
Colusa Indian Community Council Cachil Dehe Band of WinTun Indians	Chairperson	3730 State Highway 45 #B	Colusa	CA	95932
Cortina Indian Rancheria- Kletsel Dehe Band of Wintun Indians	Chairperson	P.O. Box 1630	Williams	CA	95987
Wilton Rancheria	Chairperson	9728 Kent Street	Elk Grove	CA	95624
Yocha Dehe Wintun Nation	Chairperson	P.O. Box 18	Brooks	CA	95606

USDA – ARS Research and Development Center Environmental Assessment
Agency Scoping Contact List
September 2021

Agency	Position	Address	City	State	Zip
Buena Vista Rancheria Me-Wuk Indians	Tribal Leader	1418 20th St, Ste 200	Sacramento	CA	95811
FMC Technologies/Schilling Robotics (neighboring business)	—	201 Cousteau Pl	Davis	CA	95618
JRP Historical Consulting LLC (neighboring business)	—	2850 Spafford St.	Davis	CA	95618
Village Bakery (neighboring food wholesaler)	Proprietor	2828 Spafford St.	Davis	CA	95618
Montessori Country Day II (neighboring day care center)	—	2802 Spafford St	Davis	CA	95618
Aleon (neighboring Luggage Wholesaler)	—	630 Pena Dr. #200	Davis	CA	95618
Fastenal (neighboring store)	—	606 Pena Dr. #900	Davis	CA	95618
Davis Furniture & Appliance Outlet (neighboring furniture wholesaler)	—	606 Pena Dr. #200	Davis	CA	95618
Tylong International (neighboring business)	—	606 Pena Dr. #100	Davis	CA	95618
Yolo County Environmental Health	Supervising EH Specialist, Hazardous Materials Unit	292 West Beamer Street	Woodland	CA	95695

Krahe, Tara

From: Baum, John@Waterboards <John.Baum@Waterboards.ca.gov>
Sent: Monday, October 25, 2021 6:18 PM
To: Krahe, Tara
Cc: Pulupa, Patrick@Waterboards; Flower, Chris@Waterboards
Subject: RE: Request for Comments and Information - USDA ARS New Facility Construction

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Tara,

I hope your afternoon is going well. Our site cleanup group reviewed the proposed location of the USDA-ARS Research and Development Center facility in Davis, CA and compared those details against our records. Our nearest site of concern is greater than 2,000 feet away and has groundwater cross gradient from the proposed project site. Based on our review, we don't have any objecting comments to the project as presented.

While we didn't identify any concerns, we do recommend reaching out to the California Department of Toxic Substances Control (DTSC) and Yolo County Health due to them possibly having information on the proposed (or adjacent) parcel absent from our records.

Thanks for your patience. Please feel free to reach out if you have any questions or concerns.

Have a good evening,

J.J. Baum PE
Assistant Executive Officer
Central Valley Regional Water Quality Control Board
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670
Office Phone: (916) 464-4656
Email: john.baum@waterboards.ca.gov

Krahe, Tara

From: Victoria Delgado <VDelgado@yochadehe-nsn.gov>
Sent: Friday, October 1, 2021 2:52 PM
To: Krahe, Tara
Cc: Rebekah Canavesio
Subject: USDA ARS Laboratory and Office 2nd St Davis Project YD-08182021-04
Attachments: USDA ARS Laboratory and Office 2nd St Davis Project YD-08182021-04 - CST CoA.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Hello Ms. Krahe;

Attached is our response to your project notification we received dated, September 16, 2021.

The response is in regards to the project listed above.

You will also receive a copy of our response via Mail.

Kind Regards,
Victoria Delgado
CRD Administrative Assistant

Yocha Dehe Wintun Nation
PO Box 18 | Brooks, CA 95606
p 530.796.0118 | c 530.419.9152 | f 530.796.2143
vdelgado@yochadehe-nsn.gov
www.yochadehe.org

YOCHA DEHE
CULTURAL RESOURCES

September 29, 2021

United States Department of Agriculture
Attn: Tara Krahe, Environmental Engineer
617 W. 7th Street, Suite 202
Los Angeles, CA 90017

RE: USDA ARS Laboratory and Office 2nd St Davis Project YD-08182021-04

Dear Mr. Krahe:

Thank you for your project notification dated, September 16, 2021, regarding cultural information on or near the proposed USDA ARS Laboratory and Office 2nd St Davis Project, Davis, Yolo County. We appreciate your effort to contact us and wish to respond.

The Cultural Resources Department has reviewed the project and concluded that it is within the aboriginal territories of the Yocha Dehe Wintun Nation. Therefore, we have a cultural interest and authority in the proposed project area.

Based on the information provided, Yocha Dehe Wintun Nation is not aware of any known cultural resources near this project site. However, we recommend cultural sensitivity training for any pre-project personnel to be added to the permit as a condition of approval. In addition, please send us detailed project information, including any plans for ground disturbance

To schedule cultural sensitivity training, prior to the start of the project, please contact:

Laverne Bill, Director of Cultural Resources
Yocha Dehe Wintun Nation
Phone: (530) 723-3891
Email: lbill@yochadehe-nsn.gov

Please refer to identification number YD – 08182021-04 in correspondence concerning this project.

Thank you for providing us the opportunity to comment.

Sincerely,

DocuSigned by:
5ED632FDB9C34EA...

Tribal Historic Preservation Officer

Krahe, Tara

From: Mat Ehrhardt <MEhrhardt@ysaqmd.org>
Sent: Monday, September 20, 2021 11:50 AM
To: Krahe, Tara
Cc: Paul Hensleigh
Subject: RE: Request for Comments and Information - USDA ARS New Facility Construction

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Tara,

The Yolo-Solano Air Quality Management District (District) has received your letter regarding the proposed USDA ARS center at 3031 2nd Street in Davis, CA. The District does not have information regarding resources in the project area, other than we have records for the emergency engine located at the existing facility, permitted under University of California Agriculture & Natural Resources. If you would like to get copies of those records, you may complete the District's Public Records Act (PRA) form located at http://www.ysaqmd.org/wp-content/uploads/Forms/PRA-Request-Form-2013.pdf

Thanks,

Mat

Mat Ehrhardt, P.E.
Executive Director/Air Pollution Control Officer
Yolo-Solano Air Quality Management District
1947 Galileo Court, Suite 103
Davis, CA 95618
www.ysaqmd.org

Krahe, Tara

From: Vega, Jacqueline - NRCS, Red Bluff, CA <jacqueline.vega@usda.gov>
Sent: Thursday, October 7, 2021 7:41 AM
To: Franz, Saundie B; Hogan, Phil - NRCS, Woodland, CA
Cc: Samuelson, Kathryn A (Kate); Thornhill, Steve
Subject: RE: [External Email]Farmland Conversion Form- Davis EA

Greetings,

Thank you for your email.

The proposed ARS research and development facility location in Davis is within the Census Bureau "Urbanized Area" boundary for Davis (2010 Census Urban Area Reference Maps).

Lands identified as "urbanized area" (UA) on Census Bureau maps, are not subject to Provision of FPPA (refer to the Part 523.10 of the Farmland Protection Policy Act Manual). Therefore, it is not necessary to complete and AD-1006 form.

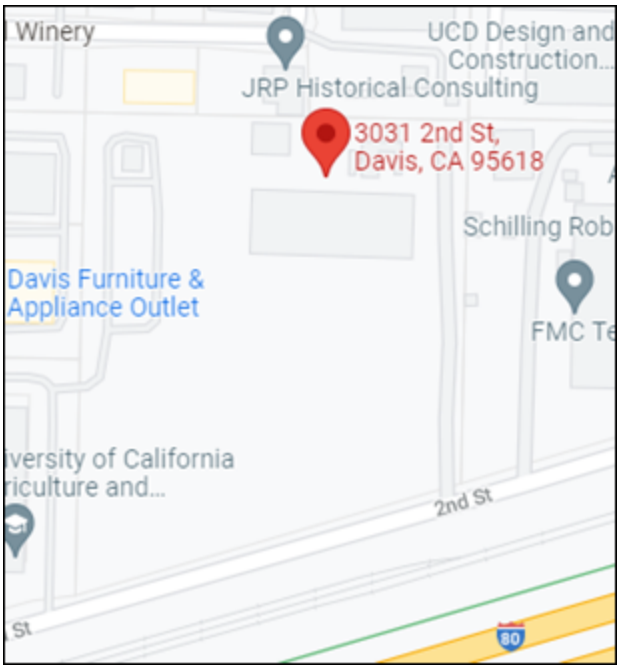

Figure 1. Area of Interest (TIGERweb - census.gov)

Please let me know if you need more information.

Thank you,
Jacqueline Vega

Jacqueline Vega-Pérez

Area 1 Resource Soil Scientist
USDA/NRCS Service Center
500 Riverside Way, Suite D

Red Bluff, CA 96080-2347
Office: 530-737-5219
Email: jacqueline.vega@usda.gov

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From: Franz, Saundie B <sbfranz@burnsmcd.com>
Sent: Tuesday, October 5, 2021 7:39 AM
To: Hogan, Phil - NRCS, Woodland, CA <phil.hogan@usda.gov>; Vega, Jacqueline - NRCS, Red Bluff, CA <jacqueline.vega@usda.gov>
Cc: Samuelson, Kathryn A (Kate) <kasamuelson@burnsmcd.com>; Thornhill, Steve <sthornh@burnsmcd.com>
Subject: [External Email]Farmland Conversion Form- Davis EA

Good morning,

The USDA Agricultural Research Service (ARS), is in the process of performing an Environmental Assessment (EA) pursuant to the National Environmental Policy Act (NEPA) to assess the environmental impacts of constructing a Research and Development Center facility in Davis, CA. The proposed project will provide a state-of-the-art laboratory with office and storage space, greenhouses, and other ancillary buildings to support various USDA ARS research unit operations and the Administrative Office Support Staff.

Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) has been retained to conduct the environmental review and prepare the EA for the proposed action. As part of the EA, Burns & McDonnell needs your help to determine if it is necessary to complete the AD-1006 form for Farmland Conversion. The parcel is undeveloped and is zoned for Planned Development by the City of Davis. The exact location of the project is 3031 2nd Street in Davis, CA- a map of the site is attached to this email.

Please let us know if the AD-1006 form should be completed for the project or if you need any additional information to make the determination.

Thanks,

Saundie Franz \ Burns & McDonnell

Assistant Environmental Scientist \ Environmental Services
Pronouns: she, her, hers
O+1 (816) 488-7329 \ M (979) 240-1880
sbfranz@burnsmcd.com \ burnsmcd.com
9450 Ward Parkway \ Kansas City, MO 64114

Please consider the environment before printing this email.

APPENDIX B – WETLAND DELINEATION

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO, CA 95814-2922

09 November 2021

CESPK-PDR-A

MEMORANDUM FOR RECORD

Subject: Negative Determination of Jurisdictional Waters for the United States Department of Agriculture (USDA) - Agricultural Research Services (ARS), Research and Development (R&D) Center Facility, Davis, California.

1. Purpose: To provide rationale on the determination of the absence of jurisdictional waters or "Waters of the United States" regulated by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA) (33 USC §1344) present on the USDA-ARS R&D Center Facility.

2. References:
    a. City of Davis. 2021. Davis Municipal Code, Davis, California. Article 30.03, Stormwater Requirements and Regulations. Accessed November 3, 2021: http://qcode.us/codes/davis/
    b. Environmental Protection Agency (EPA). 2021. Current Implementation of the Waters of the United States. Accessed November 3, 2021: https://www.epa.gov/wotus/current-implementation-waters-united-states
    c. USACE. 1987. Corps of Engineers Wetlands Delineation Manual (Technical Report Y-87-1). Environmental Laboratory, Vicksburg, MS.
    d. USACE. 2005. Regulatory Guidance Letter No. 05-02. Expiration of Geographic Jurisdictional Determinations of Waters of the United States.
    e. USACE. 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region – Version 2.0 (ERDC/EL TR-08-28). Environmental Laboratory, U.S. Army Engineer Research and Development Center (ERDC), Vicksburg, MS.
    f. USACE. 2021. Jurisdictional Information – 16 September 2021: Current Implementation of Waters of the United States. Accessed November 4, 2021:https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/juris_info/

3. Current Implementation of Waters of the United States: Consistent with the U.S. District Court for the District of Arizona's August 30, 2021 (*Pascua Yaqui Tribe v. U.S. Environmental Protection Agency*), the EPA and USACE have halted implementation of the Navigable Waters Protection Rule and are interpreting "waters of the United States" (WOTUS) consistent with pre-2015 regulatory regime (EPA, 2021; USACE 2021).

4. Background: A wetland delineation was completed on September 14, 2021, by Burns & McDonnell Engineering Company, Inc. (Burns and McDonnell) retained by USACE, for the proposed USDA-ARS R&D Center Facility located at 3031 2nd Street, Davis, California (CA), 95618 (Site). A summary of the aquatic resources delineation methods, baseline conditions of vegetation, soils, and hydrology, photographs, figures, Arid West data sheets, and survey results are discussed in Enclosure 1, the 2021 Burns and McDonnell Wetland Delineation Report.

5. Summary of Mapped Aquatic Features: No wetlands were identified at the Site. One ephemeral drainage was identified within a man-made drainage ditch. The drainage was mapped at 199-feet in length. A streambed is located above the water table year-round, and averages 1.5-feet wide and 0.25-feet deep at the ordinary high-water mark (OHWM), with banks averaging 1-foot high. No hydric soils or hydrophytic plants are present within the ephemeral drainage.

6. Site History: The ephemeral drainage is fully contained within a drainage ditch that was excavated in the mid-to-late 1990's for the purposes of complying with the City of Davis stormwater ordinance: *Drainage of stormwater runoff from all residential, nonresidential, and public project development shall be collected and conveyed by a city-approved storm drain system* (30.03.030(b); City of Davis, 2021) and the State of California, National Pollutant Discharge Elimination System Phase II Small Municipal Separate Storm Sewer System General Permit. Prior to drainage ditch construction, a detention pond existed at the north-western extent of the Site, which was refilled naturally by precipitation, and artificially from greenhouse operations and associated stormwater runoff from paved surfaces. The detention pond has since been filled by the landowner and there is no longer a detectable aquatic feature associated with the former pond. The drainage ditch occasionally redirected emergency water releases related to the operation of the nine greenhouses and headhouse on the Site. With the greenhouses now vacant, and with the drought years of 2012-2016 and recent below-average precipitation years (2018, 2020), the landowner (University of California, Davis) reported seeing the drainage ditch completely dry during and after rain events over the last five water-years (personal communication, September 14, 2021).

7. Potential for Jurisdiction: The drainage ditch was dug in uplands (non-hydric soils) for the purposes of collecting stormwater runoff and redirecting it to the city storm drain system at the road (2nd Street). The ephemeral drainage was created by the collection of overland flow and precipitation events over several decades. Flows from the drainage travel southeast through a culvert under a man-made berm before exiting the Site through a municipal stormwater culvert.

8. Summary: The ephemeral drainage at the Site is a non-jurisdictional waters defined under 33 CFR 328.3(b)(10) and 40 CFR 120.2(2)(x) as "Stormwater control features constructed or excavated in upland or in non-jurisdictional waters

to convey, treat, infiltrate, or store stormwater runoff", and is not consistent with the current interpretation of pre-2015 WOTUS (*Rapanos v. United States*). The proposed construction of the R&D Facility at Davis, CA, is not considered a discharge of dredged or fill material and therefore, a CWA Section 404 Alternatives Analysis or permit is not needed (33 CFR 323).

9. Questions or comments regarding this Memorandum for Record can be directed to Ms. Keleigh Duey, Environmental Manager at Keleigh.L.Duey@usace.army.mil, or (916) 557-5131.

MARTIN.NATHANIEL.JOEL.1594575462 Digitally signed by MARTIN.NATHANIEL.JOEL.1594575462 Date: 2021.11.09 14:43:54 -08'00'

Andrea Meier
Chief, Environmental Analysis Section

Enclosure

Burns and McDonnell. 2021. Wetland Delineation Report for the United States Department of Agriculture (USDA)-Agricultural Research Services (ARS) – Research and Development Center Facility, Davis, California – Contract No. W912DQ21D4009. Prepared for USACE, Sacramento District, Sacramento, CA.

November 15, 2021

Ms. Sophie Ngu
Project Manager
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, CA 95814-2922

Re: Wetland Delineation Report for the United States Department of Agriculture (USDA)-Agricultural Research Services (ARS) – Research and Development Center Facility Davis, California – Contract No. W912DQ21D4009
Burns & McDonnell Project Number 136017

Dear Ms. Ngu:

Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) was retained by the U.S. Army Corps of Engineers (USACE) to provide wetland delineation services for the proposed Research and Development Center Facility Project (Project) in Davis, California (Figure A-1, Appendix A). The following sections provide information on the proposed Project and summarize the completed wetland delineation.

INTRODUCTION

The USDA-ARS plans to construct the Research and Development Center Facility within a 6.56-acre site (Project Area) in Davis, California. The proposed Project would include construction of an approximate 66,000 square feet (sq ft) of laboratory and office facilities, 18,000 sq ft of storage facilities, and renovation and/or replacement of 1,200 sq ft of existing greenhouse facility space to support various USDA-ARS research unit operations and staff in Davis, CA. The 6.56-acre Project Area was evaluated for this wetland delineation (Figure A-1). The proposed Project is located in Sections 11 and 12, Township T08N, Range R02E (38.55117° N, -121.71346° W).

Burns & McDonnell conducted a wetland delineation within the Project Area to evaluate for the presence of wetlands and other water bodies, including streams, drainages, and ponds.

Brief of Description of Project Area

In the northeast corner of the Project Area there is an approximately 1.75-acre former agricultural research greenhouse operations facility. There is a concrete swale running east/west through the paved facilities area. At the terminus of the concrete swale is a man-made earthen ditch approximately 5 feet (wide) by 4 ft (deep) by 600 feet (long) traversing the center of the Project Area in a northwest to southeast direction, draining to the southeast corner of the property into the municipal storm drain system (University of California, 2015[1]). Based on

[11] University of California Office of the President – Risk Services, *Phase 1 Preliminary Site Assessment Due Diligence Report for the Acquisition of Campus-Related Property*, July 2015.

historic aerial imagery, the ditch was installed sometime between 1993 and 2003. A berm and culvert were constructed in the earthen ditch to allow the Project Area to be more easily traversed. The concrete swale and the earthen ditch were constructed to direct the flow of stormwater into the municipal storm system from the paved facilities area in the northeast corner of the Project Area. Per publicly available City of Davis GIS, this portion of the storm system never appears to cross Second Street and Interstate-80, therefore, there is no hydrologic connection to Putah Creek, a major stream and tributary of the Yolo Bypass and Sacramento River.

METHODS

The following discussions summarize the methods used for the review of existing data and the wetland delineation.

Existing Data Review

Burns & McDonnell reviewed available background information for the proposed Project prior to conducting the site visit. This available background information included the 1981 U.S. Geological Survey (USGS), National Hydrography Dataset (NHD) Data, U.S. Fish & Wildlife Service (USFWS) National Wetland Inventory (NWI) maps, National Agriculture Imagery Program (NAIP) aerial photography (2018), Federal Emergency Management Agency (FEMA) floodplain data (2018), and USDA Natural Resources Conservation Service (NRCS) 2017 Soil Survey Geographic (SSURGO) digital data for Davis, California. Maps generated from this data are included as Figures A-2 and A-3 in Appendix A. The USACE Antecedent Precipitation Tool (APT) was also reviewed to compare recent rainfall conditions in the area to normal conditions (Appendix D).

Wetland presence based only on NWI maps or other background data cannot be assumed to be an accurate assessment of potentially occurring jurisdictional wetlands. Wetland identification criteria differ between the USFWS and the USACE. As a result, wetlands shown on an NWI map may not be under the jurisdiction of the USACE, and all USACE-jurisdictional wetlands are not always included on NWI maps. Therefore, a field visit was conducted to identify any wetlands or other water bodies that may be present.

Wetland Delineation Field Survey

A wetland delineation was completed on September 14, 2021, in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual* and the 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region – Version 2.0* (Regional Supplement). Sample plots were established at multiple locations and Wetland Determination Data Forms from the Regional Supplement were completed to characterize the Project Area (Appendix B). The vegetation, soil conditions, and hydrologic indicators were recorded at each

of these sample plots. Locations of sample plots and other identified features were surveyed using a sub-meter accurate global positioning system (GPS) unit. Indicators used to identify aquatic features and ordinary high-water mark (OHWM) included soil type, stream bed presence, bank slope, hydrology, and changes in vegetation cover/communities. This information is further documented in OHWM Data Forms (Appendix B). Natural color photographs were taken onsite and are included in Appendix C (Photographs C-1 through C-10).

RESULTS

The following sections describe the results of the existing data review and the completed wetland delineation.

Existing Data Review

The existing USGS topographic maps were reviewed to familiarize Burns & McDonnell wetland personnel with the topography and potential locations of wetlands and other water bodies (Figure A-2). The USGS topographic map indicates the Project Area consists of open grassland and developed urban space. The USGS topographic map and the NHD dataset indicate no streams within the Project Area. The NWI data indicate no wetlands within the Project Area. The FEMA data indicates no portion of the Project Area is located within the 100-Year Floodplain.

The 2018 NAIP aerial photography indicates industrial space in the east and northeast portions and open grassland for the remainder of the Project Area. Figures A-3 and A-4).

The SSURGO digital data indicate one soil map unit is located in the Project Area (Figure A-3): 459283 – Sycamore silt loam, drained, 0 percent slopes. This soil map unit has a hydric rating on the USDA NRCS hydric soils list.

The USACE APT facilitates the comparison of antecedent or recent rainfall conditions for a given location to the range of normal rainfall conditions that occurred during the preceding 30 years. The APT indicates the area was experiencing wetter than normal conditions for the three months prior to September 14, 2021

Wetland Delineation Field Survey

Craig Adams, a wetland scientist with Burns & McDonnell, conducted a wetland delineation of the Project Area on September 14, 2021. Tara Krahe, a GPS specialist with Burns & McDonnell, recorded the location and extent of features identified within the Project Area. The land cover and delineated wetlands from the field survey effort are discussed in detail below.

Vegetation. The Project Area was largely composed of maintained annual grassland and industrial space. Typical vegetation in the upland portions of the Project Area included ribwort

plantain (*Plantago lanceolata*), common oat (*Avena sativa*), medusahead wildrye (*Taeniatherum caput-medusae*), and broadleaved pepperweed (*Lepidium latifolium*).

Soils. Typical soils ranged from brown (10YR 5/3) to light yellowish brown (10YR 6/4) and ranged in texture from silt loam to silty clay. Redoximorphic features were uncommon in soils.

Hydrology. Hydrology in the Project Area primarily occurs from precipitation. Precipitation likely drains into a man-made ditch that crosses through the Project Area. The precipitation in the ditch drains out of the Project Area through a municipal stormwater culvert located on the southeastern corner. Several smaller topographic swales in the northeastern portion of the Project Area connect to the ditch and may also direct precipitation during rain events.

Delineated Areas

During the wetland delineation effort, no wetlands or streams were identified within the Project Area. Any wetland or stream by definition must have the following three indicators – hydric soils, hydrophytic vegetation, and hydrology. Upland confirmation sample plots were located in the ditch and adjacent uplands. Data forms and photographs for these sample plots are included in Appendix B and Appendix C, respectively.

Mapped Aquatic Features

One ephemeral drainage (D-1) totaling 199 linear feet was identified within the Project Area, based on the following indicators – stream bed presence, bank slope, and changes in vegetation cover/communities (Figure A-4; Photographs C-1, 2, 6, and 7). The ephemeral drainage starts within a man-made drainage ditch in the central portion of the Project Area. It flows southeast through a culvert under a man-made berm before exiting the Project Area through a municipal stormwater culvert. The drainage likely only flows during, and for a short duration after precipitation events in a typical year and has a stream bed located above the water table year-round. The starting point of the drainage was identified based on the origination of a stream bed and presence of steepened bank slopes. D-1 averaged 1.5 feet wide and 0.25 foot deep at the OHWM, with banks averaging 1 foot high. Vegetation along D-1 included ribwort plantain, common oat, and medusahead wildrye. The substrate of D-1 consisted of silt. Additional characteristics associated with the drainage were documented in Wetland Determination and OHWM Data Forms (Appendix B). Precipitation events may result in surface water flow within the drainage, but this condition has not resulted in the formation of hydric soils or the ability to support hydrophytic plants associated with wetlands. The drainage location is shown on Figure A-4 in Appendix A.

SUMMARY

Burns & McDonnell conducted a wetland delineation within the Project Area to evaluate for the presence of wetlands and other water bodies, including streams, drainages, and ponds. No

wetlands or streams were identified within the Project Area. One ephemeral drainage totaling 199 linear feet was identified within the Project Area.

The Environmental Protection Agency (EPA) and USACE have halted implementation of the Navigable Waters Protection Rule and are currently interpreting waters of the U.S. consistent with the pre-2015 regulatory regime until further notice. The identified ephemeral drainage is located within a man-made drainage ditch that drains only surrounding uplands and is a non-relatively permanent water, per the pre-2015 regulatory guidance on determining jurisdiction and definitions of waters of the U.S. this would generally not be classified as waters of the U.S.

Furthermore, the ditch is constructed for stormwater runoff and empties directly into a municipal stormwater culvert. It does not display an obvious hydrologic connection to Traditional Navigable Waters (TNW). Because the ephemeral drainage drains directly into a municipal stormwater culvert, it is unlikely that it provides habitat for wildlife or aquatic organisms. Therefore, this ephemeral drainage is not likely under USACE jurisdiction. Jurisdictional recommendations are the professional opinion of Burns & McDonnell and not official. In a letter dated November 9, 2021 the USACE confirmed the Negative Determination of Jurisdictional Waters for the Project Area, therefore, a Section 404 Alternatives Analysis or permit is not needed.

The State Water Resources Control Board (State Water Board) and the Regional Water Quality Control Boards (Regional Water Boards) (collectively Water Boards) have the authority to regulate discharges of dredged or fill material to waters of the state under section 401 of the Clean Water Act (CWA). The Water Boards define waters of the state as natural wetlands, wetlands created by modification of a surface water of the state, artificial wetlands that meet certain criteria, and all waters of the U.S. The identified ephemeral drainage is an artificial water resulting from human activity (i.e., the man-made drainage ditch constructed for stormwater runoff). The ephemeral drainage is less than one acre in size and subject to ongoing operation and maintenance; it does not appear to meet any additional criteria used to define waters of the state.

Under Section 1600 et. seq. of the California Department of Fish and Game Code, the California Department of Fish and Wildlife (CDFW) regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any stream supporting fish or wildlife. Based on the observed ephemeral drainage's characteristics, it is unlikely to provide habitat for wildlife or aquatic organisms.

Under Section 1602 et. seq., the CDFW requires a Streambed Alteration Agreement permit for any activity that may substantially divert or obstruct the natural flow of a stream; substantially

change or use material from the bed, channel, or bank of any stream; and/or deposit debris, waste, or other materials. The CDFW (Region 2) confirmed via email that the ephemeral drainage would not be subject to Section 1602 et. seq., indicating that based on the artificial construction of the channel, its lack of wetland/riparian habitat features, and its lack of connectivity with the surrounding streams, they do not believe a Notification of Lake or Streambed Alteration is necessary for the Project.

If you have any questions or require additional information, please feel free to contact Craig Adams by telephone at (402) 408-3011 or by e-mail at cjadams@burnsmcd.com.

Sincerely,

Craig Adams
Wetland Scientist

Attachments:

- Appendix A - Figures
- Appendix B - Routine Wetland Determination Data Forms, Arid West Region
- Appendix C - Ground Photographs
- Appendix D - USACE Antecedent Precipitation Tool data

cc: Brent Legreid, Burns & McDonnell
Sarah Soard, Burns & McDonnell
Tara Krahe, Burns & McDonnell

APPENDIX A - FIGURES

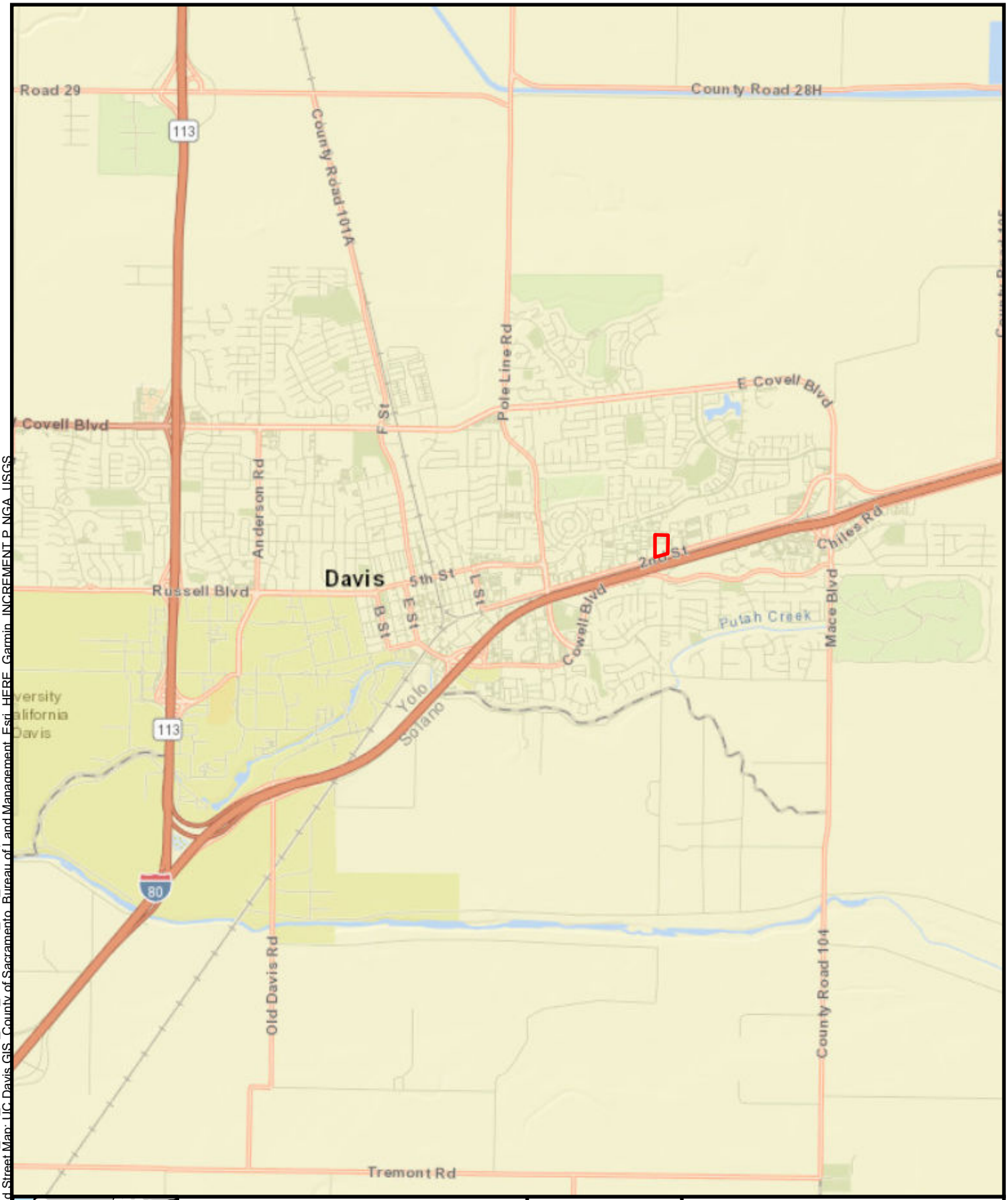
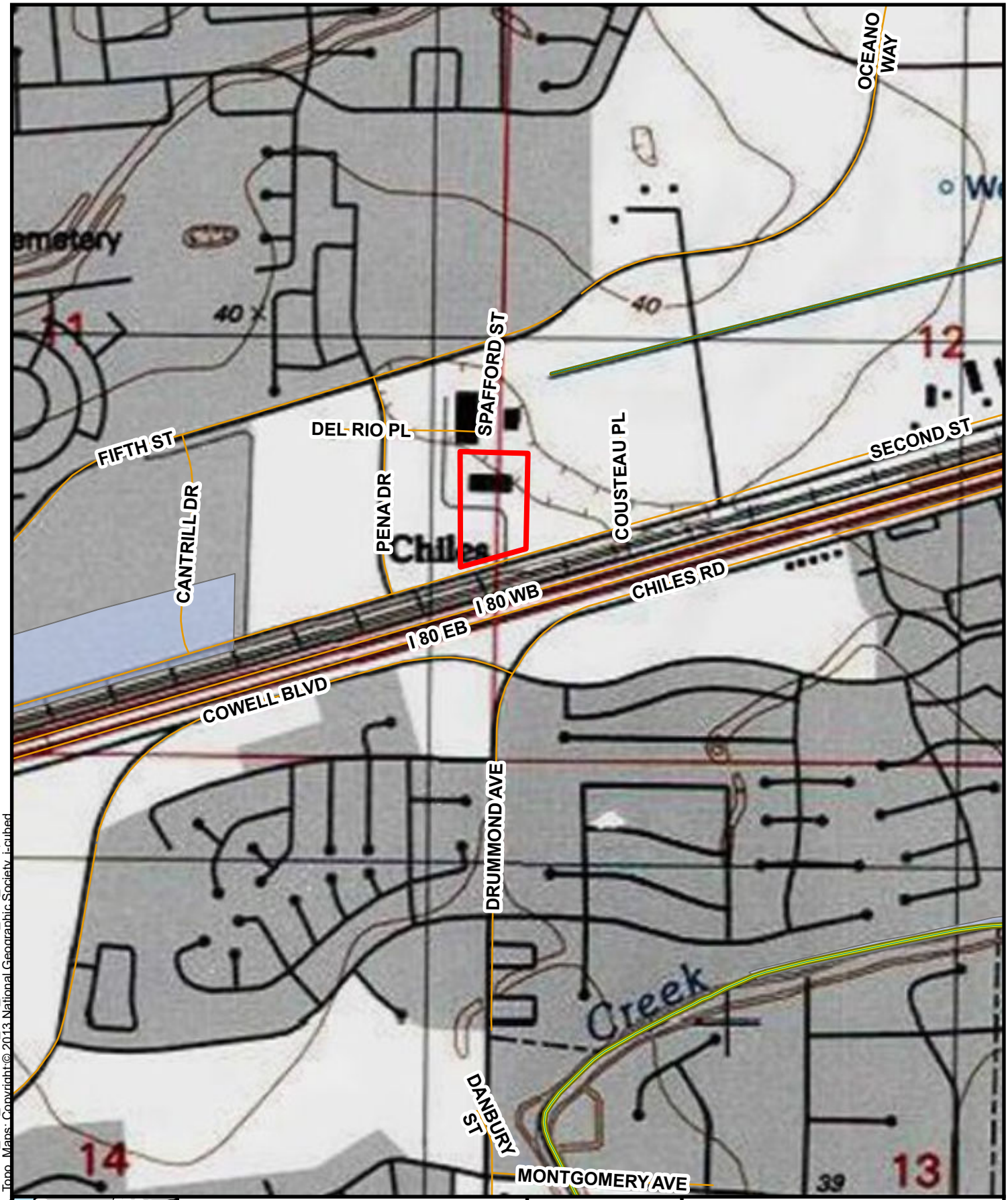


Figure A-1
General Location Map
Research and Development Center Facility Project
USDA-ARS
Davis, California

Path: C:\Users\rewilliams\GIS\USDA_ARS_Davis\USDA_ARS_Davis\USDA_ARS_Davis.aprx rewilliams 9/15/2021
Service Layer Credits: World Street Map: UC Davis GIS, County of Sacramento, Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, NGA, USGS

Source: Esri and Burns & McDonnell

Issued: 9/15/2021



Project Area
100-Year Floodplain
NWI Riverine Wetland
NHD Stream
Street

NORTH

0 400 800
Feet

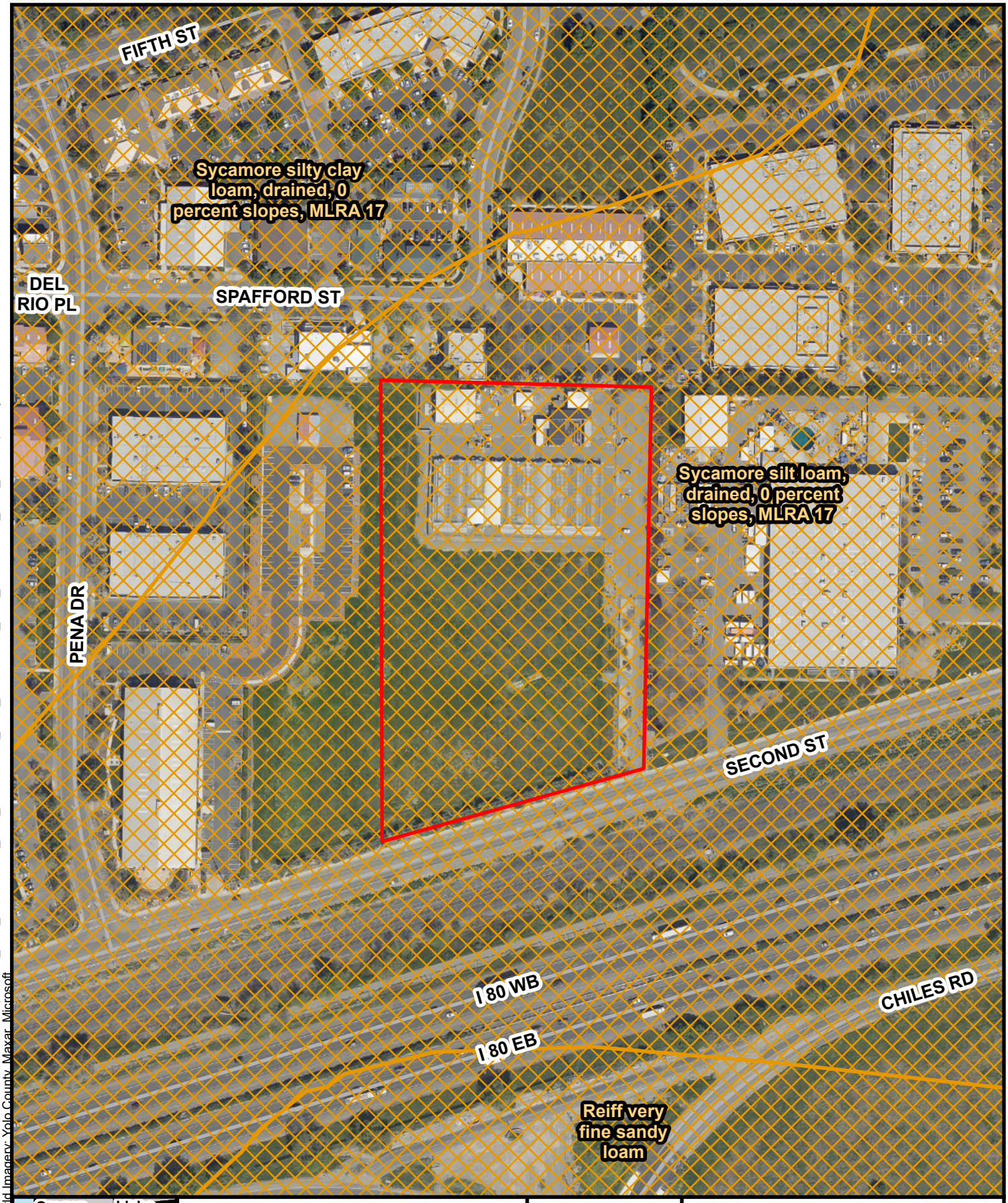
BURNS McDONNELL

Figure A-2
NWI and Topographic Map
Research and Development Center Facility Project
USDA-ARS
Davis, California

Path: C:\Users\rewilliams\GIS\USDA_ARS_Davis\USDA_ARS_Davis\USDA_ARS_Davis.aprx rewilliams 9/15/2021
Service Layer Credits: USA Topo Maps: Copyright© 2013 National Geographic Society, i-cubed

Source: Esri, FEMA, NHD, NWI, and Burns & McDonnell

Issued: 9/15/2021



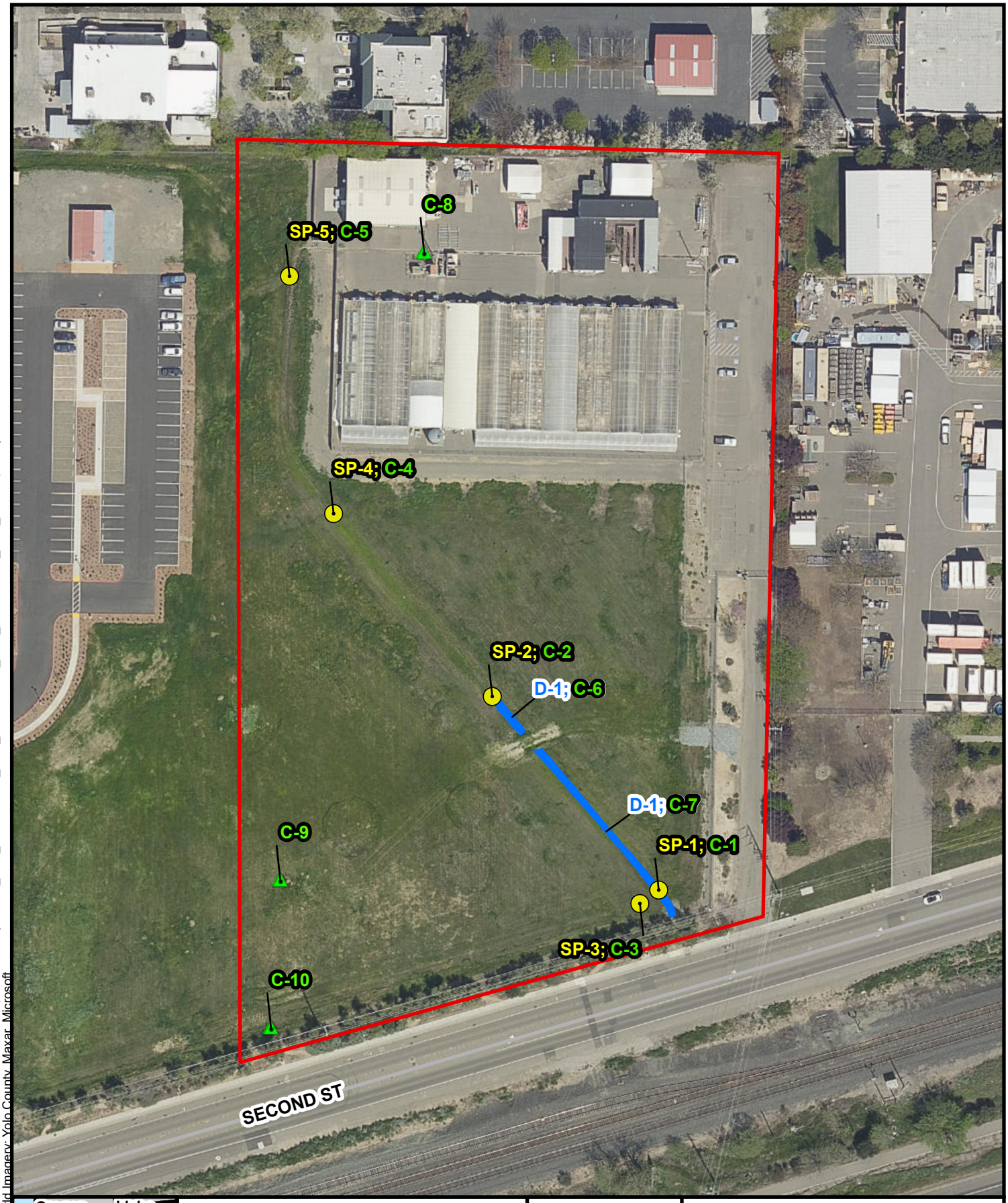
BURNS McDONNELL

Figure A-3
NRCS Soils and Aerial Map
Research and Development Center Facility Project
USDA-ARS
Davis, California

Path: C:\Users\cjadams\OneDrive - Burns & McDonnell\Desktop\USDA_ARS_Davis\USDA_ARS_Davis\USDA_ARS_Davis\USDA_ARS_Davis.aprx cjadams 10/15/2021
Service Layer Credits: World Imagery: Yolo County, Maxar, Microsoft

Source: Esri, SSURGO, and Burns & McDonnell

Issued: 10/15/2021



BURNS McDONNELL

Figure A-4
Delineated Drainages Map
Research and Development Center Facility Project
USDA-ARS
Davis, California

Path: C:\Users\cjadams\OneDrive - Burns & McDonnell\Desktop\Envr Survey\USDA_ARS_Davis\USDA_ARS_Davis\USDA_ARS_Davis\USDA_ARS_Davis.aprx cjadams 11/15/2021
Service Layer Credits: World Imagery: Yolo County, Maxar, Microsoft

Source: Esri and Burns & McDonnell

Issued: 11/15/2021

APPENDIX B - ROUTINE WETLAND DETERMINATION DATA FORMS, ARID WEST REGION

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: USDA Research and Development Center Facility City/County: Davis/Yolo County Sampling Date: 9/14/2021

Applicant/Owner: U.S. Army Corps of Engineers State: CA Sampling Point: SP-1

Investigator(s): Adams, Craig; Krahe, Tara Section, Township, Range: S12, T8N, R2E

Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): California Subtropical Fruit, Truck, Lat: 38.549773 Long: -121.712998 Datum: NAD 83

Soil Map Unit Name: Sycamore silt loam, drained, 0 percent slopes NWI classification: N/A

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 Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Upland confirmation sample plot located adjacent to ephemeral drainage D-1. OHWM form filled for this location.
The USACE Antecedent Precipitation Tool indicates the area was experiencing wetter than normal conditions for the three months prior to the sampling date.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Plantago lanceolata	40	Y	FAC
2. Taeniatherum caput-medusae	20	Y	UPL
3. Avena fatua	20	Y	UPL
4.			
5.			
6.			
7.			
8.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 30 % 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: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 34% (A/B)

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

No test is passed. Vegetation was significantly disturbed within the plot due to recent mowing.
Photograph 1.

SOIL

Sampling Point: SP-1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-15	10YR 6/4	100					silt loam	
15-20	10YR 4/4	100					silty clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [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 Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: compact

Depth (inches): 20

Hydric Soil Present? Yes _____ No ✓

Remarks:

No indicators are met. Excavation below 20 inches was prevented by compaction.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled 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): _____

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:

Indicator B10 is met. Evidence of past water flow observed.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: USDA Research and Development Center Facility City/County: Davis/Yolo County Sampling Date: 9/14/2021

Applicant/Owner: U.S. Army Corps of Engineers State: CA Sampling Point: SP-2

Investigator(s): Adams, Craig; Krahe, Tara Section, Township, Range: S11, T8N, R2E

Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 2

Subregion (LRR): California Subtropical Fruit, Truck, Lat: 38.550186 Long: -121.713448 Datum: NAD 83

Soil Map Unit Name: Sycamore silt loam, drained, 0 percent slopes NWI classification: N/A

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 Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Upland confirmation sample plot located adjacent to ephemeral drainage D-1.
The USACE Antecedent Precipitation Tool indicates the area was experiencing wetter than normal conditions for the three months prior to the sampling date.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Taeniatherum caput-medusae	60	Y	UPL
2. Plantago lanceolata	30	Y	FAC
3. Avena fatua	10	N	UPL
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 10 % 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 _____	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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

No test is passed. Vegetation was significantly disturbed within the plot due to recent mowing.
Photograph 2.

SOIL

Sampling Point: SP-2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 5/3	100					silt	
10-15	10YR 6/4	100					silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [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 Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: compact

Depth (inches): 15

Hydric Soil Present? Yes _____ No ✓

Remarks:

No indicators are met. Excavation below 15 inches was prevented by compaction. Multiple soil pits were attempted to be dug.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled 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): _____

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 indicators are met.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: USDA Research and Development Center Facility City/County: Davis/Yolo County Sampling Date: 9/14/2021

Applicant/Owner: U.S. Army Corps of Engineers State: CA Sampling Point: SP-3

Investigator(s): Adams, Craig; Krahe, Tara Section, Township, Range: S12, T8N, R2E

Landform (hillslope, terrace, etc.): stream bank Local relief (concave, convex, none): convex Slope (%): 1

Subregion (LRR): California Subtropical Fruit, Truck, Lat: 38.549744 Long: -121.713049 Datum: NAD 83

Soil Map Unit Name: Sycamore silt loam, drained, 0 percent slopes NWI classification: N/A

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 Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Upland confirmation sample plot .
The USACE Antecedent Precipitation Tool indicates the area was experiencing wetter than normal conditions for the three months prior to the sampling date.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Avena fatua	100	Y	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 5 % 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: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

No test is passed. Vegetation was significantly disturbed within the plot due to recent mowing.
Photograph 3.

SOIL

Sampling Point: SP-3

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	10YR 5/3	99	10YR 6/8	1	C	M	silt loam	
3-14	10YR 5/3	100					silt	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [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 Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: compact

Depth (inches): 14

Hydric Soil Present? Yes _____ No ✓

Remarks:

No indicators are met. Excavation below 14 inches was prevented by compaction. Multiple soil pits were attempted to be dug.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled 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): _____

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 indicators are met.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: USDA Research and Development Center Facility City/County: Davis/Yolo County Sampling Date: 9/14/2021

Applicant/Owner: U.S. Army Corps of Engineers State: CA Sampling Point: SP-4

Investigator(s): Adams, Craig; Krahe, Tara Section, Township, Range: S11, T8N, R2E

Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): California Subtropical Fruit, Truck, Lat: 38.550577 Long: -121.713877 Datum: NAD 83

Soil Map Unit Name: Sycamore silt loam, drained, 0 percent slopes NWI classification: N/A

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 Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Upland confirmation sample plot .
The USACE Antecedent Precipitation Tool indicates the area was experiencing wetter than normal conditions for the three months prior to the sampling date.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Avena fatua	60	Y	UPL
2. Plantago lanceolata	30	Y	FAC
3. Convolvulus arvensis	10	N	UPL
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 10 % 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 _____	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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

No test is passed. Vegetation was significantly disturbed within the plot due to recent mowing.
Photograph 4.

SOIL

Sampling Point: SP-4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 6/3	100					silty clay	
6-18	10YR 6/4	100					silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [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 Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: compact

Depth (inches): 18

Hydric Soil Present? Yes _____ No ✓

Remarks:

No indicators are met. Excavation below 18 inches was prevented by compaction.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled 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): _____

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:

Indicator B10 is met. Evidence of past water flow observed.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: USDA Research and Development Center Facility City/County: Davis/Yolo County Sampling Date: 9/14/2021

Applicant/Owner: U.S. Army Corps of Engineers State: CA Sampling Point: SP-5

Investigator(s): Adams, Craig; Krahe, Tara Section, Township, Range: S11, T8N, R2E

Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): California Subtropical Fruit, Truck, Lat: 38.551083 Long: -121.713994 Datum: NAD 83

Soil Map Unit Name: Sycamore silt loam, drained, 0 percent slopes NWI classification: N/A

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 Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Upland confirmation sample plot .
The USACE Antecedent Precipitation Tool indicates the area was experiencing wetter than normal conditions for the three months prior to the sampling date.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Avena fatua	60	Y	UPL
2. Lepidium latifolium	20	N	FAC
3. Epilobium ciliatum	15	N	FACW
4. Plantago lanceolata	10	N	FAC
5.			
6.			
7.			
8.			
	105 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 10 % 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: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

No test is passed. Vegetation was significantly disturbed within the plot due to recent mowing.
Photograph 5.

SOIL

Sampling Point: SP-5

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 5/3	100					silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [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 Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: compact

Depth (inches): 8

Hydric Soil Present? Yes _____ No ✓

Remarks:

No indicators are met. Excavation below 8 inches was prevented by compaction. Multiple soil pits were attempted to be dug.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled 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): _____

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:

Indicator B10 is met. Evidence of past water flow observed.

Project: USDA Research and Development Center
Project Number: 13017
Stream: S-1
Investigator(s): Adams, Craig

Date: 9/14/21
Town: Davis
Photo begin file# 6

Time: 11:00 am
State: CA
Photo end file# 7

Y ☐ / N ☒ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details: The area lies to the east of UCANR complex, bound by 2nd St. to South & Pena Ave
Projection: NAD Stateplane CA II **Datum:** NAD 83
Coordinates: 38.549773, -121.712998

Notes: The USACE Antecedent Precipitation Tool indicates the area was experiencing wetter than normal conditions for the three months prior to the sampling date. Vegetation was significantly disturbed due to recent mowing. The northern longitudinal extent of the stream was determined by the presence/absence of a stream bed, change in bank height/slope, and vegetation cover.

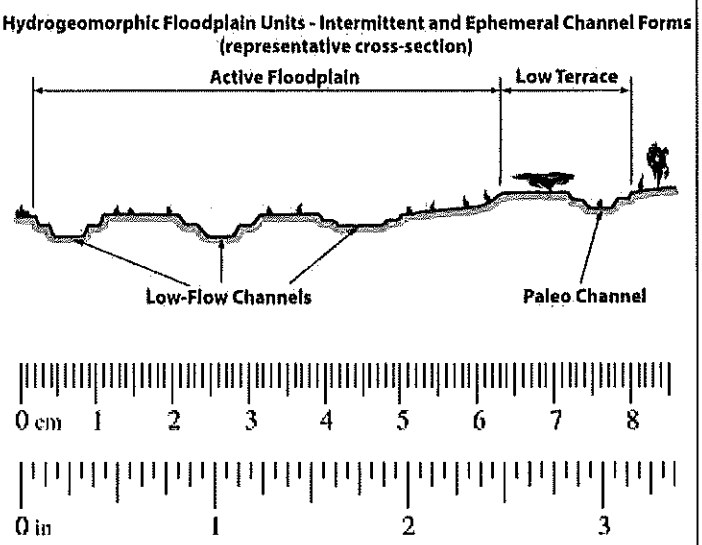
Brief site description: The site area consists primarily of maintained grasslands & developed land. A man-made ditch was present, which was used for greenhouse water & stormwater runoff. This ditch ties directly into a municipal stormwater drain, located at the southeast corner of the site.

Checklist of resources (if available):

- ☒ Aerial photography
  Dates: 2012, 2014, 2016, 2018
- ☒ Topographic maps
  Scale: 1:24 000
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ Clinometer / level
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

The dominant Wentworth size class that imparts a characteristic texture to each zone of a channel cross-section is recorded in the average sediment texture field under the characteristics section for the zone of interest.

Millimeters (mm)	Inches (in)	Wentworth size class	
10.08	256	Boulder	
2.56	64	Cobble	Gravel
0.157	4	Pebble	
		Granule	
0.079	2.00		
0.039	1.00	Very coarse sand	
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	Sand
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	
1/32 0.00061	0.0156	Medium silt	Silt
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud



☐ **Walk the channel and floodplain within the study area to get an impression of the vegetation and geomorphology present at the site. Record any potential anthropogenic influences on the channel system in "Notes" above.**

☐ **Locate the low-flow channel (lowest part of the channel). Record observations.**

Characteristics of the low-flow channel:

Average sediment texture: silt loam

Total veg cover: 50 % Tree: 0 % Shrub: 0 % Herb: 50 %

Community successional stage:

☐ NA ☐ Mid (herbaceous, shrubs, saplings)
☒ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Plantago lanceolata - Dominant
Taeniatherum caput-medusae - Non-dominant
Avena fatua - Non-dominant

Other: ☐ ☐ ☐ ☐

☐ **Walk away from the low-flow channel along cross-section. Record characteristics of the low-flow/active floodplain boundary.**

Characteristics used to delineate the low-flow/active floodplain boundary:

☒ Change in total veg cover ☐ Tree ☐ Shrub ☐ Herb
☐ Change in overall vegetation maturity
☐ Change in dominant species present
☐ Other ☒ Presence of bed and bank
☐ Drift and/or debris
☒ Other: Drainage pattern
☐ Other:

☐ **Continue walking the channel cross-section. Record observations below.**

Characteristics of the low-flow channel:

Average sediment texture: silt loam

Total veg cover: 80 % Tree: % Shrub: % Herb: 80 %

Community successional stage:

☐ NA ☐ Mid (herbaceous, shrubs, saplings)
☒ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Plantago lanceolata - Dominant
Avena fatua - Dominant
Convolvulus arvensis - Non-dominant

Other: ☐ ☐ ☐ ☐

☐ **Continue walking the channel cross-section. Record indicators of the active floodplain/low terrace boundary.**

Characteristics used to delineate the active floodplain/ low terrace boundary:

☐ Change in average sediment texture
☒ Change in total veg cover ☐ Tree ☐ Shrub ☒ Herb
☐ Change in overall vegetation maturity
☒ Change in dominant species present
☒ Other ☒ Presence of bed and bank
☐ Drift and/or debris
☒ Other: Drainage pattern
☐ Other: _____

☐ **Walk the active floodplain/low terrace boundary both upstream and downstream of the cross-section to verify that the indicators used to identify the transition are consistently associated the transition in both directions.**

Consistency of indicators used to delineate the active floodplain/low terrace boundary:

Y ☐ N ☐ Change in average sediment texture
Y ☒ N ☐ Change in total veg cover ☐ Tree ☐ Shrub ☒ Herb
Y ☐ N ☐ Change in overall vegetation maturity
Y ☒ N ☐ Change in dominant species present
Y ☒ N ☐ Other: Y ☒ N ☐ Presence of bed and bank
Y ☐ N ☐ Drift and/or debris
Y ☒ N ☐ Other: Drainage pattern
Y ☐ N ☐ Other: _____

☐ **If the characteristics used to delineate the active floodplain/low terrace boundary were NOT consistently associated with the transition in both the upstream and downstream directions, repeat all steps above.**

☐ **Continue walking the channel cross-section. Record characteristics of the low terrace.**

Characteristics of the low terrace:

Average sediment texture: silt loam

Total veg cover: 60 % Tree: ____ % Shrub: ____ % Herb: 60 %

Community successional stage:

☐ NA ☐ Mid (herbaceous, shrubs, saplings)
☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

Dominant species present: Plantago lanceolata - Dominant
Taeniatherum caput-medusa - Non-dominant
Avena fatua - Non-dominant

Other: ☐ _____
☐ _____
☐ _____
☐ _____

☐ **If characteristics used to delineate the active floodplain/low terrace boundary were deemed reliable, acquire boundary.**

Active floodplain/low terrace boundary acquired via:

☐ Mapping on aerial photograph ☒ GPS
☐ Digitized on computer ☐ Other: _____

APPENDIX C - GROUND PHOTOGRAPHS

Photograph C-1: View of upland confirmation Sample Plot (SP)-1 adjacent to ephemeral Drainage (D)-1, facing northwest.

Photograph C-2: View of upland confirmation SP-2 and start of ephemeral D-1, facing southeast.

Photograph C-3: View of upland confirmation plot SP-3, facing northwest.

Photograph C-4: View of upland confirmation plot SP-4, facing northwest.

Photograph C-5: View of upland confirmation plot SP-5, facing south.

Photograph C-6: View of ephemeral D-1, facing southeast.

Photograph C-7: View of ephemeral D-1, facing northwest.

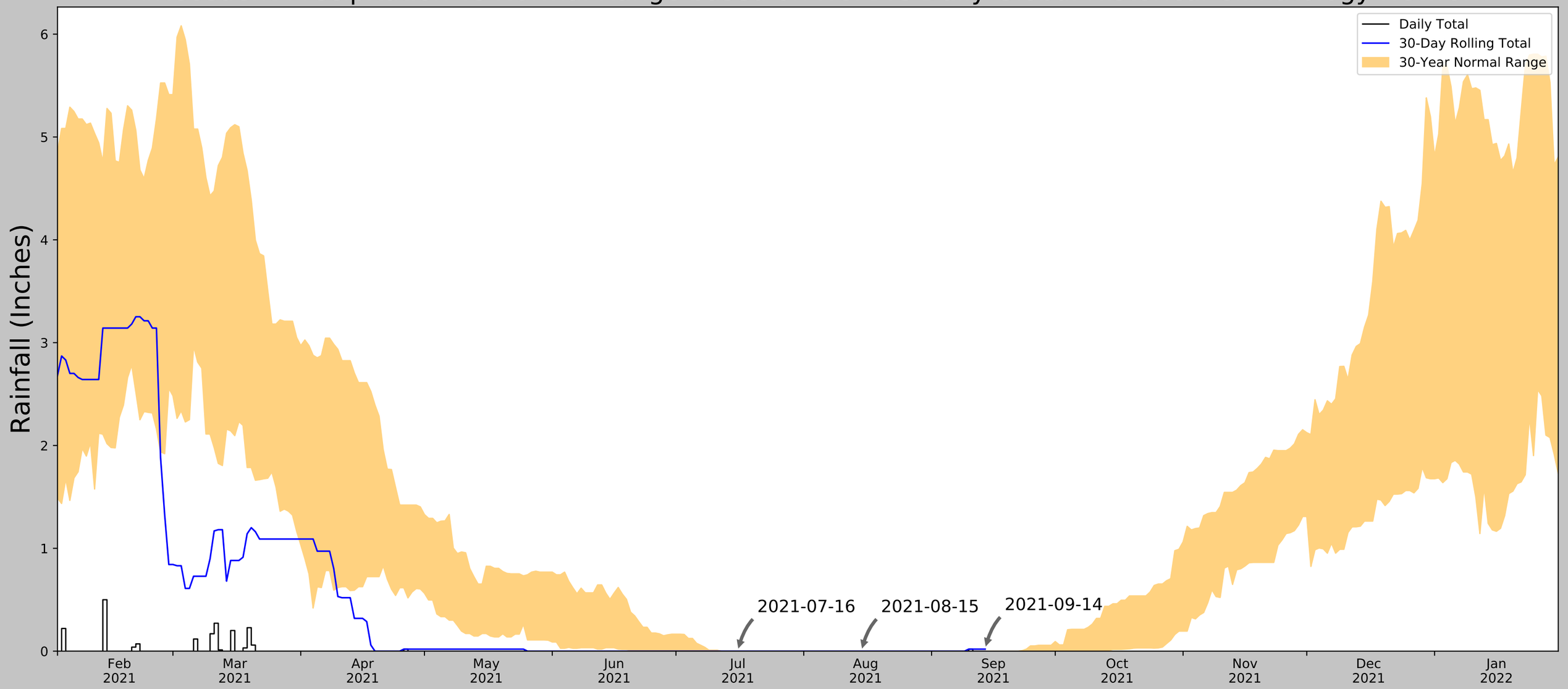
Photograph C-8: View of drainage leading into upland swale, facing west.

Photograph C-9: View of maintained upland grassland, facing northeast.

Photograph C-10: View of upland tree line, facing northeast.

APPENDIX D - USACE ANTECEDENT PRECIPITATION TOOL DATA

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	38.55117, -121.71346
Observation Date	2021-09-14
Elevation (ft)	37.65
Drought Index (PDSI)	Extreme drought (2021-08)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2021-09-14	0.0	0.0	0.019685	Wet	3	3	9
2021-08-15	0.0	0.0	0.0	Normal	2	2	4
2021-07-16	0.0	0.0	0.0	Normal	2	1	2
Result							Wetter than Normal - 15

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
DAVIS 2 WSW EXP FARM	38.535, -121.7761	60.039	3.565	22.389	1.684	11252	89
DAVIS 2.7 W	38.5523, -121.7855	57.087	1.299	2.952	0.588	35	1
DAVIS 2.3 W	38.5586, -121.778	55.118	1.634	4.921	0.743	1	0
WOODLAND 1 WNW	38.6828, -121.7939	66.929	10.257	6.89	4.686	63	0
WINTERS	38.5253, -121.9778	134.843	10.923	74.804	5.732	2	0

APPENDIX C – NO EFFECT MEMO

October 20, 2021

Ms. Sophie Ngu
Project Manager
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, CA 95814-2922

Re: Protected Species No Effect Letter for the United States Department of Agriculture (USDA)-Agricultural Research Services (ARS) – Research and Development Center Facility, Davis, California – Contract No. W912DQ21D4009
Burns & McDonnell Project Number 136017

Dear Ms. Ngu:

Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) was retained by the U.S. Army Corps of Engineers (USACE) to provide protected species habitat assessment services for the proposed Research and Development Center Facility Project (Project) in Davis, California (Figure A-1, Appendix A). The following sections provide information on the proposed Project and summarize the completed habitat assessment.

PROJECT DESCRIPTION

The USDA-ARS plans to construct the Research and Development Center Facility within a 6.56-acre site (Project Area) in Davis, California. The proposed Project would include construction of an approximate 66,000 square feet (sq ft) laboratory and office facility, 18,000 sq ft of storage facilities, and renovation and/or replacement of 1,200 sq ft of existing greenhouse facility space in order to support various USDA-ARS research unit operations and staff in Davis, CA. The 6.56-acre Project Area was evaluated for this habitat assessment (Figure A-2). The proposed Project is located in Sections 11 and 12, Township T08N, Range R02E (38.55117^{o} N, -121.71346^{o} W).

A previous habitat survey was conducted in May 2019 of the Project Area and its surroundings with particular focus on suitable habitat for burrowing owl and Swainson's hawk. No species of concern (Appendix B), suitable nest trees for Swainson's hawk, or elderberry shrubs that would indicate presence of valley elderberry longhorn beetle were observed within the Project Area.

HABITAT ASSESSMENT

Burns & McDonnell conducted a habitat assessment for the Project to evaluate for the presence of habitat for threatened and endangered species under the jurisdiction of the U.S. Fish & Wildlife Service (USFWS). The field habitat assessment was conducted by Burns & McDonnell biologist Craig Adams, concurrent with the wetland delineation on September 14, 2021. A total of 20 species listed as threatened or endangered by USFWS or federally protected by the Bald and Golden Eagle Protection Act have potential to occur in Yolo County, California (Appendix B). The federally listed bird species are also protected under the Migratory Bird Treaty Act

(MBTA). These species rely on a variety of habitats including shrublands, grasslands, woodlands, streams, and wetlands.

The Project Area consists of open annual grassland and developed land (Photographs in Appendix C). One ephemeral stream was identified. Based on the observed ephemeral streams characteristics, it is not capable of supporting the amphibian, reptile, fish, or crustacean species listed in Appendix B. Active ground squirrel burrows were observed throughout the Project Area, with the largest concentration in the southwestern region. Ground squirrel burrows can serve as suitable nesting and foraging habitat for burrowing owl. Burrows were visually examined for signs of burrowing owl activity including whitewash, pellets, tracks, and feathers. No burrowing owls or signs of occupancy were detected in or adjacent to the Project Area. The presence of two elderberry trees were confirmed adjacent to but outside of the Project Area along the western fence line. No exit holes that would indicate presence of valley elderberry longhorn beetle were detected and no elderberry trees/shrubs were identified within the Project Area. No suitable bird nest trees were identified in the Project Area and no critical habitat exists in the Project Area. Based on the habitat assessment, the Project as proposed is anticipated to have no effect on federally threatened and endangered species, their habitats, or proposed or designated critical habitat.

CONCLUSIONS

Based on the results of the habitat assessment, potential habitat for federally threatened and endangered species would not be impacted by the Project. Therefore, the Project is anticipated to have no effect on federally protected species. If you have any questions or require additional information, please feel free to contact Craig Adams by telephone at (402) 408-3011 or by e-mail at cjadams@burnsmcd.com.

Sincerely,

Craig Adams
Environmental Scientist

Attachments:

Appendix A - Figures
Appendix B - Federally Protected Species
Appendix C - Site Photographs

cc: Brent Legreid, Burns & McDonnell
Sarah Soard, Burns & McDonnell
Tara Krahe, Burns & McDonnell

APPENDIX A - FIGURES

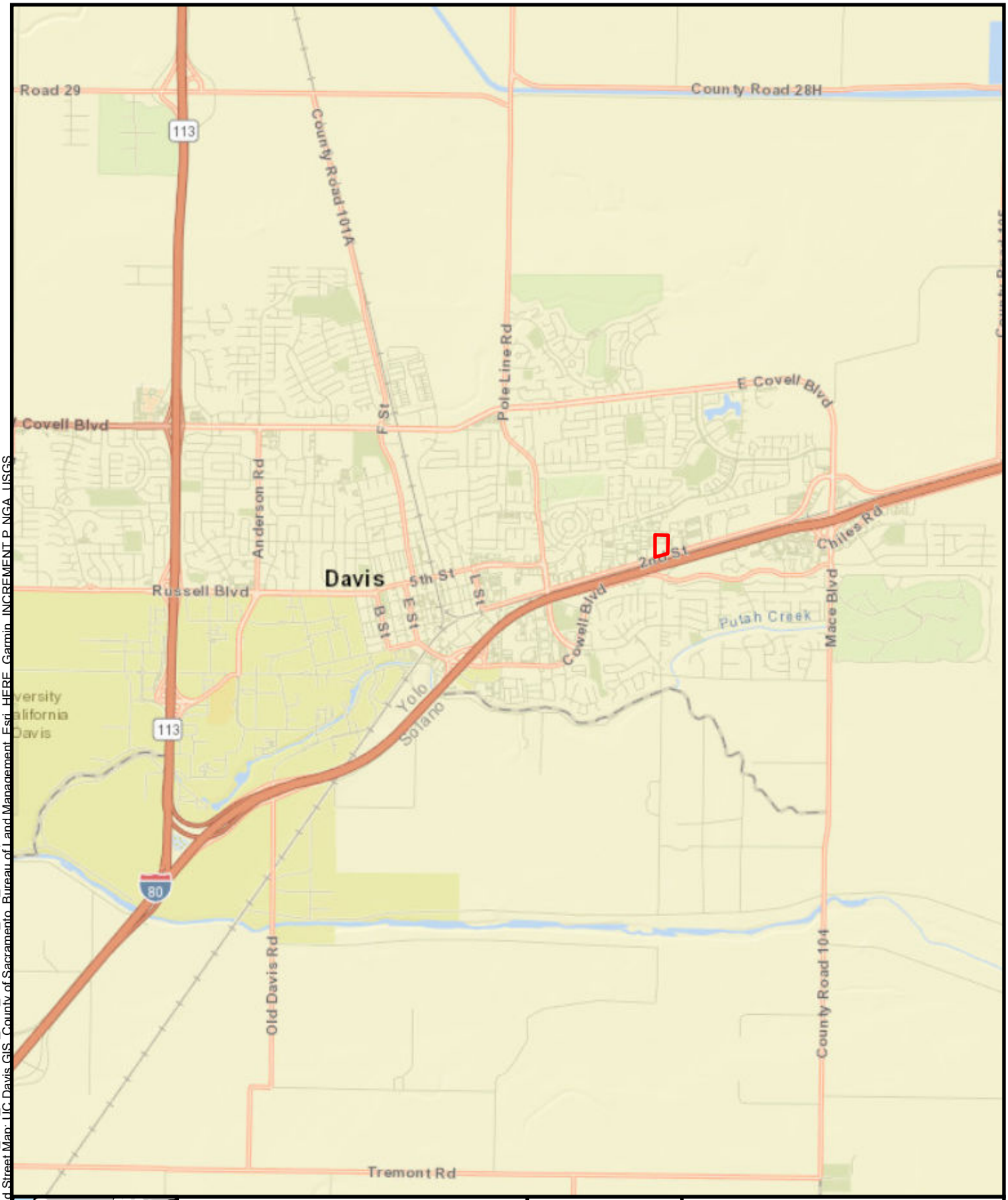


Figure A-1
General Location Map
Research and Development Center Facility Project
USDA-ARS
Davis, California

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Service Layer Credits: World Street Map: UC Davis GIS, County of Sacramento, Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, NGA, USGS

Source: Esri and Burns & McDonnell

Issued: 9/15/2021

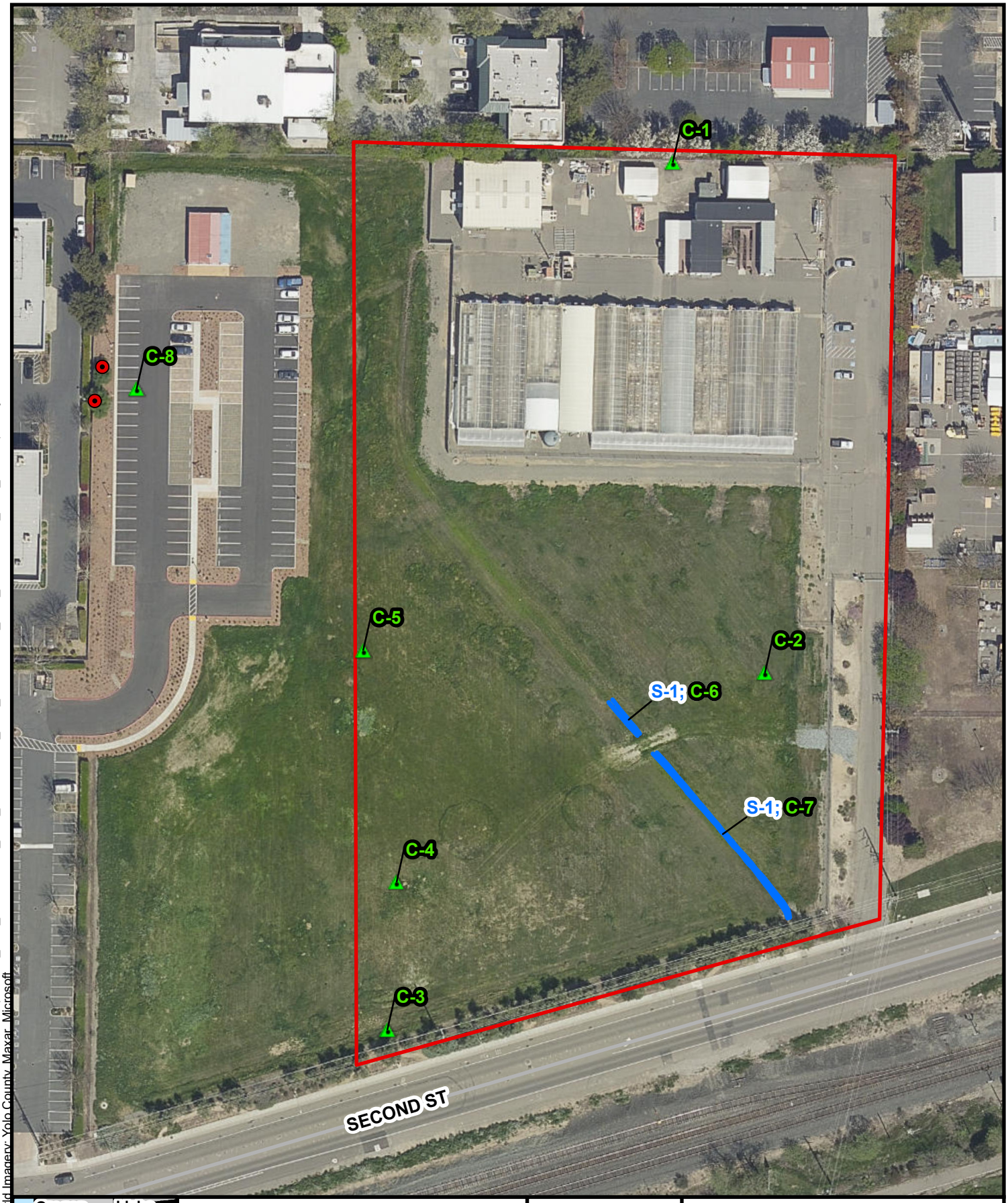

Figure A-2
Habitat Assessment Map
Research and Development Center Facility Project
USDA-ARS
Davis, California

BURNS McDONNELL

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Service Layer Credits: World Imagery: Yolo County, Maxar, Microsoft

Source: Esri and Burns & McDonnell

Issued: 10/15/2021

APPENDIX B - FEDERALLY PROTECTED SPECIES

Yolo County - Davis, CA

Common Name	Scientific Name	Federal Listing	Habitat:
Plants			
Palmate-bracted bird's beak	*Chloropyron palmatum*	E	Shrubland/chaparral, Grassland/herbaceous
Insects			
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	T	Riparian/Shrubland/chaparral, Woodland - Hardwood
Monarch butterfly	*Danaus plexippus*	C	Herbaceous wetland, Scrub-shrub wetland, Woodland - Mixed, Savanna, Cropland/hedgerow, Woodland - Conifer, Old field, Suburban/orchard, Grassland/herbaceous, Forest - Conifer, Woodland - Hardwood, Shrubland/chaparral, Sand/dune
Amphibians			
California tiger salamander	*Ambystoma californiense*	T	Temporary pool, Herbaceous wetland, Savanna, Woodland - Hardwood, Grassland/herbaceous
California red-legged frog	*Rana draytonii*	T	Riparian, Herbaceous wetland/Pool, Creek, Low gradient / Forest/Woodland, Shrubland/chaparral
Reptiles			
Giant garter snake	*Thamnophis gigas*	T	Herbaceous wetland, Riparian / Low gradient, Pool, Medium river, Creek, Cropland/hedgerow
Fish			
Delta smelt	*Hypomeses transpacificus*	T	River mouth/tidal river, Bay/sound, Medium/Large river
Crustaceans			
Conservancy fairy shrimp	*Branchinecta conservatio*	E	Large, clay-bottomed vernal pool playas with turbid water
Vernal pool fairy shrimp	*Branchinecta lynchi*	T	Herbaceous wetland, Scrub-shrub wetland, Temporary pool, Bog/fen
Vernal pool tadpole shrimp	*Lepidurus packardi*	E	Herbaceous wetland, Temporary pool, Scrub-shrub wetland
Birds			
Western snowy plover	*Charadrius nivosus*	T, MBTA	Sand/dune, Playa/salt flat/dry mud or salt flats
Swainson's hawk	*Buteo swainsoni*	MBTA	Open pine-oak woodland and cultivated lands, Desert, Grassland/herbaceous, Cropland/hedgerow, Savanna, Woodland - Mixed
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	C, MBTA	Dense stands of cottonwood and willow/Riparian, Forested wetland
Western burrowing owl	*Athene cunicularia hypugaea*	MBTA	Short vegetation and presence of fresh small mammal burrows/open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation
Least bells vireo	*Vireo bellii pusillus*	E, MBTA	Dense brush, mesquite, willow-cottonwood forest, streamside thickets, and scrub oak, in arid regions but often near water
Bank swallow	*Riparia riparia*	MBTA	Aerial, Riparian/steep sand, dirt, or gravel banks, in burrows dug near the top of the bank
Tricolored blackbird	*Agelaius tricolor*	MBTA	Cropland/hedgerow, Grassland/herbaceous / freshwater marshes of cattails, tule, bulrushes, and sedges
White tailed Kite	*Elanus Leucurus*	MBTA	Cropland/hedgerow, Savanna, Grassland/herbaceous, Woodland - Hardwood/open woodland, marshes, partially cleared lands and fields
Bald eagle	*Haliaeetus leucocephalus*	BGEPA, MBTA	Nest in forested areas adjacent to large bodies of water, staying away from heavily developed areas when possible.
Golden eagle	*Aquila chrysaetos*	BGEPA, MBTA	Open country, arctic to desert, including tundra, shrublands, grasslands, coniferous forests, farmland, and areas along rivers and streams.

Notes:

E - endangered under ESA

T - threatened under ESA

C - candidate for listing under ESA

BGEPA - federally protected under the Bald and Golden Eagle Protection Act

MBTA - federally protected under the Migratory Bird Treaty Act

APPENDIX C - SITE PHOTOGRAPHS

Photograph C-1: View of upland tree line, facing east.

Photograph C-2: View of ground squirrel borrows, facing southeast.

Photograph C-3: View of upland tree line, facing northeast.

Photograph C-4: View of maintained upland grassland, facing northeast.

Photograph C-5: View of ground squirrel borrow, facing east.

Photograph C-6: View of ephemeral S-1, facing southeast.

Photograph C-7: View of ephemeral S-1, facing northwest.

Photograph C-8: View of two elderberry tress, facing west.

APPENDIX D – PUBLIC INVOLVEMENT

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APPENDIX E – DETAILED EMISSIONS CALCULATIONS

UC Davis

Emissions Summary

Description	Total Project Emissions (tons)		
	NO_x	VOC	$PM_{2.5}$
Construction engine emissions	18.62	7.35	0.82
Construction Worker Trips	0.17	0.13	0.01
Unpaved roads - Particulates	--	--	0.53
Paved roads - Particulates	--	--	6.17E-03
Earthmoving - Particulates	--	--	0.06
Total emissions	**18.79**	**7.48**	**1.42**

UC Davis

Construction Equipment Emissions

Construction Phase Name	Construction Phase Days	Off Road Equipment Type	Off Road Equipment Unit Amount	Usage Hours/Day	Horse Power	Fuel Type	Load Factor	Emission Factor Category	Criteria Emission Factors[a,b]			Units	Criteria Emission (tpy)		
									NO_x	VOC	$PM_{2.5}$		NO_x	VOC	$PM_{2.5}$
Site Preparation	7	Backhoe	1	8	97	Diesel	0.37	D174	7.08	1.77	0.40	g/hp-hr	0.016	0.004	0.001
Site Preparation	7	Pickup Truck	3	8	330	Gasoline	0.8		0.35	0.30	0.02	g/mile	0.170	0.146	0.009
Site Preparation	7	Dump Truck	1	8	380	Diesel	0.8	D603	6.87	1.72	0.27	g/hp-hr	0.129	0.032	0.005
Site Preparation	7	Trimmers	1	8	81	Diesel	0.73	D174	7.08	1.77	0.40	g/hp-hr	0.026	0.006	0.001
Grading	14	Backhoe	1	8	97	Diesel	0.37	D174	7.08	1.77	0.40	g/hp-hr	0.031	0.008	0.002
Grading	14	Pickup Truck	3	8	330	Gasoline	0.8		0.35	0.30	0.02	g/mile	0.341	0.292	0.019
Grading	14	Dump Truck	1	8	380	Diesel	0.8	D603	6.87	1.72	0.27	g/hp-hr	0.258	0.064	0.010
Grading	14	Rubber Tired Dozer	1	8	247	Diesel	0.4	D603	6.87	1.72	0.27	g/hp-hr	0.084	0.021	0.003
Foundations	14	Backhoe	1	8	97	Diesel	0.37	D174	7.08	1.77	0.40	g/hp-hr	0.031	0.008	0.002
Foundations	14	Pickup Truck	3	8	330	Gasoline	0.8		0.35	0.30	0.02	g/mile	0.341	0.292	0.019
Foundations	14	Dump Truck	1	8	380	Diesel	0.8	D603	6.87	1.72	0.27	g/hp-hr	0.258	0.064	0.010
Foundations	14	Concrete Pumper Truck	1	8	380	Diesel	0.8	D603	6.87	1.72	0.27	g/hp-hr	0.258	0.064	0.010
Foundations	14	Crane	1	8	231	Diesel	0.29	D603	6.87	1.72	0.27	g/hp-hr	0.057	0.014	0.002
Building assembly	140	Backhoe	2	8	97	Diesel	0.37	D174	7.08	1.77	0.40	g/hp-hr	0.627	0.157	0.036
Building assembly	140	Pickup Truck	3	8	330	Gasoline	0.8		0.35	0.30	0.02	g/mile	3.410	2.923	0.186
Building assembly	140	Dump Truck	1	8	380	Diesel	0.8	D603	6.87	1.72	0.27	g/hp-hr	2.577	0.644	0.101
Building assembly	140	Crane	1	8	231	Diesel	0.29	D603	6.87	1.72	0.27	g/hp-hr	0.568	0.142	0.022
Building assembly	140	Semi Truck	3	8	430	Diesel	0.8	D603	6.87	1.72	0.27	g/hp-hr	8.748	2.187	0.342
Building assembly	140	Forklift	3	8	89	Diesel	0.2	D174	7.08	1.77	0.40	g/hp-hr	0.467	0.117	0.027
Landscaping	7	Backhoe	1	8	97	Diesel	0.37	D174	7.08	1.77	0.40	g/hp-hr	0.016	0.004	0.001
Landscaping	7	Pickup Truck	3	8	330	Gasoline	0.8		0.35	0.30	0.02	g/mile	0.170	0.146	0.009
Landscaping	7	Grader	1	8	187	Diesel	0.41	D302	7.08	1.77	0.27	g/hp-hr	0.034	0.008	0.001
												Total	**18.615**	**7.345**	**0.817**

(a) Diesel emission factors based on EPA tier 2 factors from 40 CFR 89.112. SO2 diesel emissions from AP-42, Table 3.3-1 (dated 10/96)

(b) Gasoline emission factors from MOVES2010b, average of vehicle years 1990-2020. PM_{10} and $PM_{2.5}$ emissions include exhaust emissions plus tire and brake wear emissions, assumes site speed limit of 10 mph

UC Davis

Construction Worker Trips

Number of Construction Workers	80
Percent passenger cars[a]	70%
Percent passenger trucks[a]	30%
Percent gasoline vehicles[a]	90%
Percent diesel vehicles[a]	10%
Duration of Construction (days)	365

Construction to occur March 2024 - March 2025

(a) Vehicle breakdown based on U.S. fleet trends in US EPA Report "Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 through 2014"

Vehicle Type	Fuel	Percentage	Quantity	Estimated Travel Distance (miles/vehicle/day)[a]	Criteria Emission Factors[b]			Units	Emissions (tons)		
					NO_x	VOC	$PM_{2.5}$		NO_x	VOC	$PM_{2.5}$
Passenger Car	Gasoline	63%	50	20	0.14	1.79E-01	1.17E-02	g/mile	5.58E-02	7.25E-02	4.72E-03
	Diesel	7%	6	20	0.51	6.93E-02	9.87E-03	g/mile	2.28E-02	3.12E-03	4.45E-04
Passenger Truck	Gasoline	27%	22	20	0.35	2.99E-01	1.90E-02	g/mile	6.06E-02	5.20E-02	3.31E-03
	Diesel	3%	2	20	1.78	1.52E-01	5.06E-02	g/mile	3.45E-02	2.93E-03	9.76E-04
								Total	**0.17**	**0.13**	**9.45E-03**

(a) Round trip distance

(b) Emission factors from MOVES2010b, average of vehicle years 1990-2020.

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Unpaved Road Emission Calculations

Unpaved Roads emission factor from AP-42, Section 13.2.2: *Unpaved Roads* (11/06); Equations a1 and 2

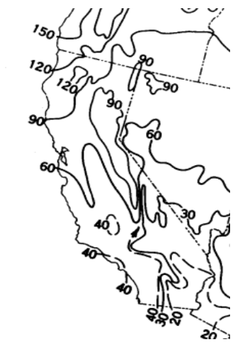
$$E = k\,(s/12)^a (W/3)^b \qquad (1a)$$

E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight

Table 13.2.2-2 - Constants for Equation 1a

Constant	PM2.5
k (lb/VMT)	0.15
a	0.9
b	0.45

Assumed miles per day per vehicle= 10.00
Assumed % of time on paved roads = 25%
Assumed % of time on unpaved roads = 75%



Surface Silt (s) content based on Table 13.2.2-1 - construction sites
s = 8.50

$$E_{ext} = E\,[(365 - P)/365] \qquad (2)$$

E_{ext} = annual size-specific emisison factor extrapolated for natural mitigation, lb/VMT
E = emisison factor from Equation 1a
P = days [Average number of days with > 0.01 inches of precipitation for Davis, California Figure 13.2.2-1
P = 90

Equipment	Construction Duration (days)	Miles per Day	Quantity	Total Vehicle Miles Traveled[a] (VMT)	W: Mean Vehicle Weight (tons)[b]	Emission Factors (lb/VMT)[c]	Emissions (tons)
						$PM_{2.5}$	$PM_{2.5}$
Hauling Trucks	365	7.5	2	5,475	20	0.195	0.533
						Total (tons)	**0.533**

(a) VMT per day are projected based on experience from previous construction projects
(b) Weighted average vehicle wt (tons), assumed average over entire fleet
(c) AP 42 Section 13.2.2 Unpaved Roads, dated November 2006, Equations 1a and 2

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Paved Road Emissions Calculations

Paved Roads emission factor from AP-42, Section 13.2.1: *Paved Roads* (01/11)

$$E = k(sL)^{0.91}(W)^{1.02}(1-P/(4*365))$$

where:

sL =	0.6	road surface silt loading silt loading (g/m2) [Table 13.2.1-2, for Ubiquitous Baseline, <500]		Assumed miles per day per vehicle= 10.00
W =	20	tons [Average vehicle weight]	Assumed	Assumed % of time on paved roads = 25%
k =	0.00054	lb/VMT [Table 13.2.1-1, for $PM_{2.5}$]		
P =	90	days [Average number of days with > 0.01 inches of precipitation for Davis, California Figure 13.2.2-1]		
$E_{(PM2.5)}$=	6.76E-03	lb/VMT		

Duration of Construction (days) 365

Equipment Type	Average Vehicle Weight (tons)[a]	Paved Roads		
		VMT per day	Quantity	VMT
Hauling Trucks	20	2.5	2	1,825

a - Weighted average vehicle wt (tons), based on research of typical vehicle weights and rated hauling capacity.

Project Totals	
PM2.5 (tons)	**0.01**

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Earthmoving Emissions

Construction Activity	Acres	Depth (ft)	Excavation Volume[a] (ft3)
Earth Moving	3.5	1	152,460

Project Construction Activity Particulate Matter Emissions

Construction Activity	Excavation[a] (tons)	Excavation PM_{10} Emission Factor[b] (lb/ton)	Excavation PM_{10} Emissions (tons)	Backfilling[a] (tons)	Backfilling PM_{10} Emission Factor[b] (lb/ton)	Backfilling PM10 Emissions (tons)	Windblown Dust (ft^2)	PM_{10} Windblown Dust Emission Factor[c,d] (lb/ft^2)	Windblown Dust PM_{10} Emissions - Controlled (tons)	Total Construction Activity PM_{10} emissions (tons)	Total Construction Activity $PM_{2.5}$ emissions[e] (tons)
Earth Moving	7,623	0.058	0.221	7,623	0.012	0.046	152,460	2.52E-05	1.92E-03	0.269	0.056
									Total	**0.27**	**0.06**

(a) Excavation and backfilling assumes 3.5 acres disturbed upto 1 foot depth. Soil density is assumed to be 100 lb/ft^3

(b) Excavation and backfilling factors from AP-42, Table 11.9-4 (dated 7/98), assuming 100% of TSP is PM_{10}

(c) Windblown dust factor from "Improvement of Specific Emission Factors" prepared for South Coast AQMD by Midwest Research Institute (1996) assuming 100% of TSP is PM_{10}.

(d) PM_{10} emissions are conservatively assumed to be 100% of TSP.

(e) $PM_{2.5}$ emissions were calculated following the SCAQMD Particulate Matter $PM_{2.5}$ Significance Thresholds and Calculation Methodology (2006). For construction and demolition fugitive dust sources, 20.8% of the PM_{10} would be $PM_{2.5}$