Environmental Assessment for the USDA – ARS Research and Development Center

U.S. Department of Agriculture – Agricultural Research Service

USDA – ARS Research and Development Center Facility
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Davis, California

January 2022

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
ABA	Architectural Barriers Act
ADA	American with Disabilities Act
APE	Area of Potential Effects
ASTM	American Society for Testing and Materials
BCC	Birds of Conservation Concern
BGEPA	Bald and Golden Eagle Protection Act
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
BMPs	best management practices
CAA	Clean Air Act
CARB	California Air Resources Board
CCAA	California Clean Air Act
CGP	Construction General Permit
CNRA	California Natural Resources Agency
CO	carbon monoxide
CPGRU	Crops Pathology and Genetics Research Unit
DHS	Department of Homeland Security
EA	environmental assessment
EISA	Energy Independence and Security Act of 2007
EPA	U.S. Environmental Protection Agency
Facility	USDA-ARS Research and Development Center Facility
GHGs	greenhouse gases
HMBP	Hazardous Materials Business Plan

Abbreviation	Term/Phrase/Name
IFC	International Fire Code
IPaC	Information for Planning and Consultation
ISPHRU	Invasive Species and Pollinator Health Research Unit
LEED	Leadership in Energy and Environmental Design
LLRW	Low-Level Radioactive Waste
MAQ	Maximum Allowable Quantity
MBTA	Migratory Bird Treaty Act
NAAQS	National Ambient Air Quality Standard
NCGR	National Clonal Germplasm Repository
NFPA	National Fire Protection Association
NO_x	nitrogen oxides
NO_2	Nitrogen dioxide
NPS	National Park Service
PM	particulate matter
PM_{10}	particulate matter 10 microns in diameter or less
$PM_{2.5}$	particulate matter 2.5 microns in diameter or less
REC	Recognized Environmental Condition
RWQCB	Regional Water Quality Control Board
SAWSRU	Sustainable Agricultural Water Systems Research Unit
Section 106	Section 106 of the National Historic Preservation Act of 1966
SF	Square Foot
SHPO	State Historic Preservation Officer
SO_2	sulfur dioxide
SVAB	Sacramento Valley Air Basin

Abbreviation	Term/Phrase/Name
SWPPP	Stormwater Pollution Prevention Plan
UC Davis	University of California-Davis
USACE	United States Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USDA-ARS	U.S. Department of Agriculture – Agricultural Research Service
VCE	Valley Clean Energy
VELB	Valley elderberry longhorn beetle
VOCs	volatile organic compounds
YSAQMD	Yolo-Solano Air Quality Management District

1.0 OBJECTIVE OF PROPOSED ACTION

The U.S. Department of Agriculture – Agricultural Research Service (USDA-ARS) is in the process of performing an environmental assessment (EA) pursuant to the National Environmental Policy Act (NEPA) in order that it may assess and consider the environmental impacts of constructing an Agricultural Research and Development Center Facility at Davis, California (Project). This EA describes the alternatives evaluated, the affected environment, potential environmental consequences, a recommended alternative, and mitigation measures for the Project.

The Agricultural Research and Development Center Facility (also referred to as the Proposed Action or Project) will consist of an approximately 66,000 square foot (SF) Laboratory and Office Facility (the Facility). The Project would support various USDA-ARS research unit operations and the Location Administrative Office Support Staff. The Project would be located at 3031 Second Street in Davis, California (see Figure 1-1) and be located adjacent to the existing greenhouses facilities.

The U.S. Army Corps of Engineers, Sacramento District (USACE) under Interagency Agreement No. 6001019745-15, with USDA-ARS, is assisting with the environmental compliance (NEPA), design and construction of the Facility. The Project is subject to NEPA, as amended (42 U.S. Code [U.S.C.] § 4321 et seq.), the Council on Environmental Quality's NEPA implementing regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508), and USDA-ARS' NEPA implementing regulations, Environmental Policies and Procedures (7 CFR 1b; 7 CFR 520).

1.1 Project Background

USDA-ARS currently conducts a variety of valuable research activities on University of California-Davis (UC Davis) leased land and/or in UC Davis buildings. USDA-ARS has determined the existing facilities are inadequate to meet USDA-ARS' research needs due to existing facility conditions. Existing facilities do not include adequate space for essential green houses, growth chambers, constant temperature and cold rooms, storage, and shop space. Additional office, administration, and support space are also required to continue ongoing critical research of the various research units when staffed at optimal capacity. UC Davis has indicated its desire to reacquire their laboratory and office space currently occupied by USDA-ARS research units co-located on campus. The USDA-ARS research units that are included in this Project are: Crops Pathology and Genetics Research Unit (CPGRU), the National Clonal Germplasm Repository (NCGR), the Sustainable Agricultural Water Systems Research Unit (SAWSRU), and the Davis-based portion of the Invasive Species and Pollinator Health Research Unit (ISPHRU).

Currently, the CPGRU and the NCGR research units are imbedded in seven different university buildings represented by six different academic departments (USACE, 2021a). The SAWSRU is currently located on 1.5 acres of leased land. ISPHRU scientists currently occupy two offices in Robbins Hall and two cubicles in Briggs Hall, which are provided by the university to accommodate four scientists. The Aquatic Weed worksite is approximately eight acres of leased land on the UC Davis' Agricultural Experiment Station to the west of the campus. The field facility has three offices for technicians, two separate laboratories with wet and general lab spaces, weighing room, analytical room and general laboratory space, and separate areas for equipment and herbicide storage, and two greenhouses/outdoor spaces for culture of aquatic and riparian plants. The Pollinator Health worksite is also on leased land, occupying approximately one-third of an acre near the Aquatic Weed worksite. The Pollinator Health worksite consists of four 52'x 8' x 8' mobile buildings that serve as the laboratory and office space for the scientific staff.

USDA-ARS plans to acquire a partially developed parcel adjacent to the UC Davis campus and facilities. The parcel is approximately 6.56 acres and was previously owned by Calgene/Monsanto, who built and maintained agriculture/biotech facilities, including greenhouses and related research and development support buildings from 1980 to summer 2018. The northeastern corner of the parcel contains these existing facilities on 25,000 SF. These facilities include nine greenhouses, headhouse, growth chamber, and support buildings (see Figure 1-2). However, the existing buildings do not provide the modernized facilities required to support the anticipated USDA-ARS research unit operations. The remainder of the parcel is undeveloped grass field, approximately 3.5 acres of which would be used for the construction of the Project. The existing driveway on Second Street for the existing facilities would be used for the Project. The average slope of the site is approximately two percent from east to west. The Facility would be directly served by new connections to the existing water and sewer lines in the area.

The new proposed Facility would be constructed on the currently undeveloped area of the parcel. The Project would provide a building with various state-of-the-art laboratories, including supporting equipment, cold and instrument rooms, science support areas with autoclave, plant and soils processing areas, and chemical storage. The building would also contain offices, collaborative areas, such as conference rooms, lunchroom, training room, and logistical areas.

An EA for the land acquisition of the parcel was prepared in July 2021 to address the potential environmental impacts, beneficial or adverse, that may result from the transfer of 3031 Second Street, Davis, CA, from UC Davis to the USDA-ARS (USACE, 2021a). The Land Acquisition EA found the

land acquisition will not have impacts to resources and therefore does not require mitigation measures (USACE, 2021a). A Finding of No Significant Impact (FONSI) was issued by USDA-ARS in July 2021.

1.2 Purpose and Need

The purpose of the Proposed Action is to better serve the expanding research and development needs of the USDA-ARS by providing modern and spacious facilities. The Proposed Action is needed by the USDA-ARS as the occupied facilities at UC Davis campus are outdated and confining. The lack of space and appropriate technology limits the research potential for multi-disciplinary endeavors. New facilities would effectively unify and expand the collaborative effort between Federal, state, and local researchers.

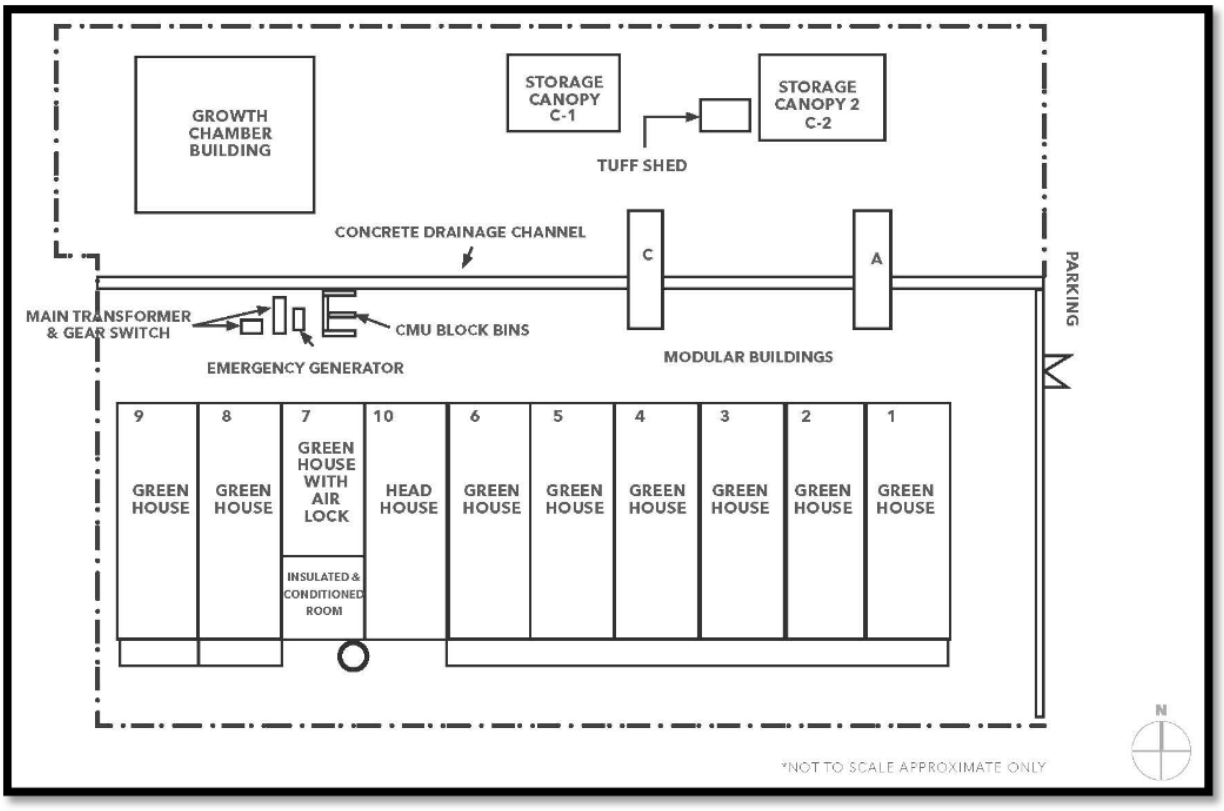
This Construction EA fulfills the USDA-ARS NEPA requirements by analyzing potential impacts to the human environment associated with the construction of a new facility. The previous Land Acquisition EA fulfilled the NEPA requirements for the land acquisition (USACE, 2021a). However, it only partially fulfilled the requirements for full development of the research facility. This Construction EA provides an analysis of potential effects associated with the construction of the research facility on the parcel and serves to fulfill the NEPA requirements for the Project.

1.3 Scope of Proposed Action

The Proposed Action is to construct additional and modernized facilities to support USDA-ARS collaborative research with UC Davis. The facility would consist of an approximately 66,000 SF Laboratory and Office Facility to support various USDA-ARS research unit operations and the Location Administration Office Support Staff in Davis, California. The Project would provide a building with various state-of-the-art laboratories, including supporting equipment, cold, and instrument rooms, science support areas with autoclave, plant and soils processing areas, and chemical storage. The building would hold offices, collaborative areas, such as conference rooms, lunchroom, training room, and logistical areas. To accomplish this goal, the FY 2020 Consolidated Appropriation Act included $76.4 million to design and build a facility to accommodate USDA-ARS staff, scientists, and location administrative support personnel currently in UC Davis facilities.

Figure 1-1: Project Location

Figure 1-2: Site Plan of Existing Facilities



2.0 DESCRIPTION OF ALTERNATIVES

The following sections describe the No Action Alternative and Action Alternative. These alternatives are evaluated in Chapter 3 of this EA.

2.1 No Action Alternative

Under the No Action Alternative, the Facility would not be constructed on the acquired property. Existing, outdated facilities would continue to be leased from UC Davis and utilized by USDA-ARS research units. USDA-ARS would be subject to potential lease conditions and termination should UC Davis move forward with plans to reacquire their laboratory and office space currently occupied by USDA-ARS research units co-located on campus. Staffing would need to be maintained at current levels, preventing future growth.

2.2 Action Alternative (Proposed Action)

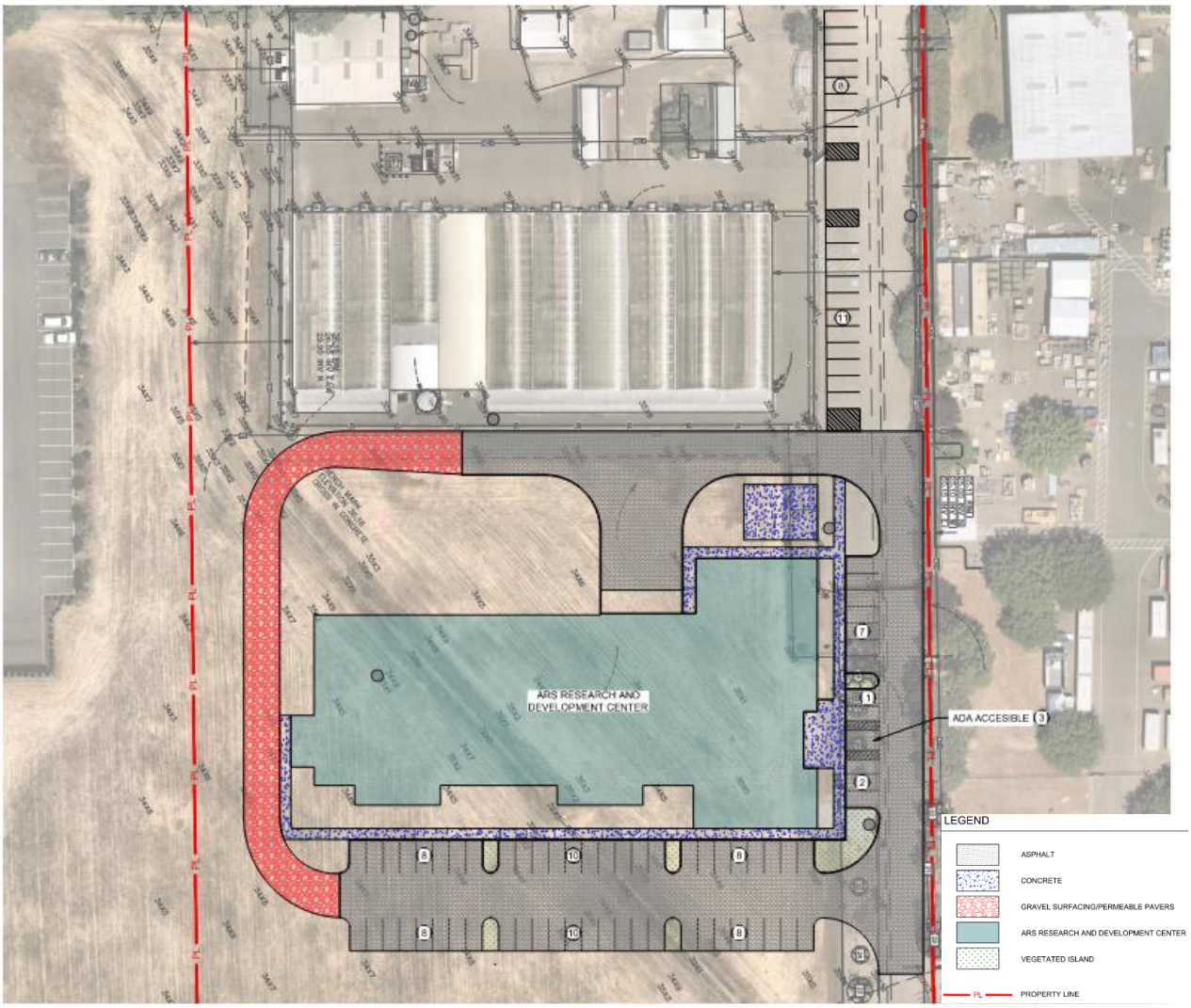
Only one Action Alternative is considered in this EA, which is referred to as the Proposed Action.

The Proposed Action is to expand the existing operation by constructing a new Facility that consists of an approximately 66,000 SF Laboratory and Office Facility to support various research unit operations and the Location Administration Office Support Staff. The new Facility configuration provides a two-story, linear footprint. The building interior would consist of private and open offices aligning the south façade, supporting lab spaces in the center, and open lab spaces facing the north façade. This allows full use of exterior walls and natural lighting. Scientist support, collaboration spaces, and building support are located at the east end along with the main entry. Primary features of the Proposed Action are as follows:

- Flexibility and agility are achieved by maximizing open office workstation space, limiting private offices and combining lab functions into shared larger and expansive lab spaces.
- Laboratory support spaces are centrally located with direct access from the laboratories and offices spaces.
- Office spaces and occupied laboratories are positioned on the exterior walls allowing direct natural light into the spaces.

The site of the Proposed Action is located at 3031 Second Street, Davis, CA 95618 with total land area of approximately 6.56 acres. The northern portion of the site includes existing greenhouse and supporting infrastructure. The existing facilities are planned to remain with the proposed facility and supporting infrastructure to be located south of the existing facilities in a mostly undeveloped portion of the site. See Figure 2-1 below for site layout.

Figure 2-1: Overall Site Plan



The parcel is currently zoned P-D#4-88 Light Industrial/Business Park Subarea. The yard requirements for this zone are a 25-foot front yard, 25-foot rear yard, and 20-foot side yard relative to the lot lines, per City of Davis code or ordinances (2021a).

The following features will be included in the Facility:

- **Access Drives**. Proposed access drives will be a minimum of 20-feet throughout the Facility to support emergency vehicle access in accordance with California Fire Code. Drive aisles in parking areas are to be 24-feet wide when supporting 2-way traffic and 90-degree parking stalls. Paved surfaces will be a combination of asphalt pavement and permeable pavers/aggregate surfacing.

- **Onsite parking.** Onsite parking will be provided for USDA employees and government-owned vehicles. Sixty-five (65) new parking spaces are anticipated. There are approximately nineteen (19) spaces adjacent to the existing greenhouses in the northeast portion of the site, which combines with the proposed Facility to provide eighty-four (84) total parking spaces. Parking spaces are to be 9-feet wide by 18-feet deep per City of Davis Municipal Code. Existing parking facilities and sidewalks are to remain with reconfiguration, as necessary.
- **Sidewalks and accessible ramps.** Sidewalks and accessible ramps will be incorporated to accommodate pedestrian movement from the parking area and adjacent facilities throughout the site. Proposed parking facilities, sidewalks, and building entrances will be designed in accordance with Architectural Barriers Act (ABA) and American with Disabilities Act (ADA) requirements.
- **Loading and unloading area**. A loading and unloading area will be provided near the Facility loading dock. Access to the loading/unloading area will be designed to accommodate a 40-foot box truck. Direct access from the loading/unloading area to the building loading dock will be provided to support forklift movements.
    - New asphalt pavement and Portland cement concrete for vehicular areas will be designed to meet HS-20 vehicle loading.
    - A dumpster pad will be included in the loading and unloading area. The dumpster location will be convenient to the Facility users as well as the trash trucks for pickup.
- **Onsite drainage.** Design will maintain positive drainage away from building.
    - The exterior finish grade around the Facility is set to be typically 6-inches below the facility finish floor, with exception to the finish floor elevations required at doorways and overhead door entrances into the facility. Door stoops or ramps will be provided for all personnel doors. All exterior pavements will be sloped to drain away from the building to the stormwater detention basins.
    - Proposed site improvements will maintain existing drainage paths to the extent possible. The Stormwater design at a minimum will meet Energy Independence and Security Act of 2007 (EISA) Section 438 and City of Davis stormwater quantity and quality requirements.
    - All storm drainage structures, and piping networks will be sized per City of Davis requirements. The minimum pipe size for the storm drainage piping will be 12-inches and 8-inches for roof drain collectors.

The USDA-ARS research units that are potentially included in this Project and would utilize the Facility are: CPGRU, NCGR, SAWSRU, and the Davis-based portion of the ISPHRU. It is anticipated

approximately 97 USDA staff members would report to the new Facility: 39 CPGRU, 14 NCGR, 29 SAWSRU, 12 ISPHRU, and 3 building and logical support staff.

Research units generally require office space, wet laboratory space, and field facilities such as equipment and vehicle storage, soil and plant processing areas, specialized plant growth areas, etc. Several units will retain existing field facilities currently owned by USDA or shared with UC Davis. New field facilities will generally not be provided within the new Facility unless they require immediate adjacency to wet laboratories.

The Facility will include offices, collaborative areas, such as conference rooms, lunchroom, and training room, various laboratories, including supporting equipment, cold and instrument rooms, science support areas with autoclave, plant and soils processing areas, chemical storage, and logistical areas. See conceptual Facility layouts in Figure 2-2 and Figure 2-3 below.

Construction of the Proposed Action is anticipated to be completed in 20 months, with site work beginning in early spring/March 2024 and building construction completing in March 2025. The preliminary construction schedule is included Table 2-1:

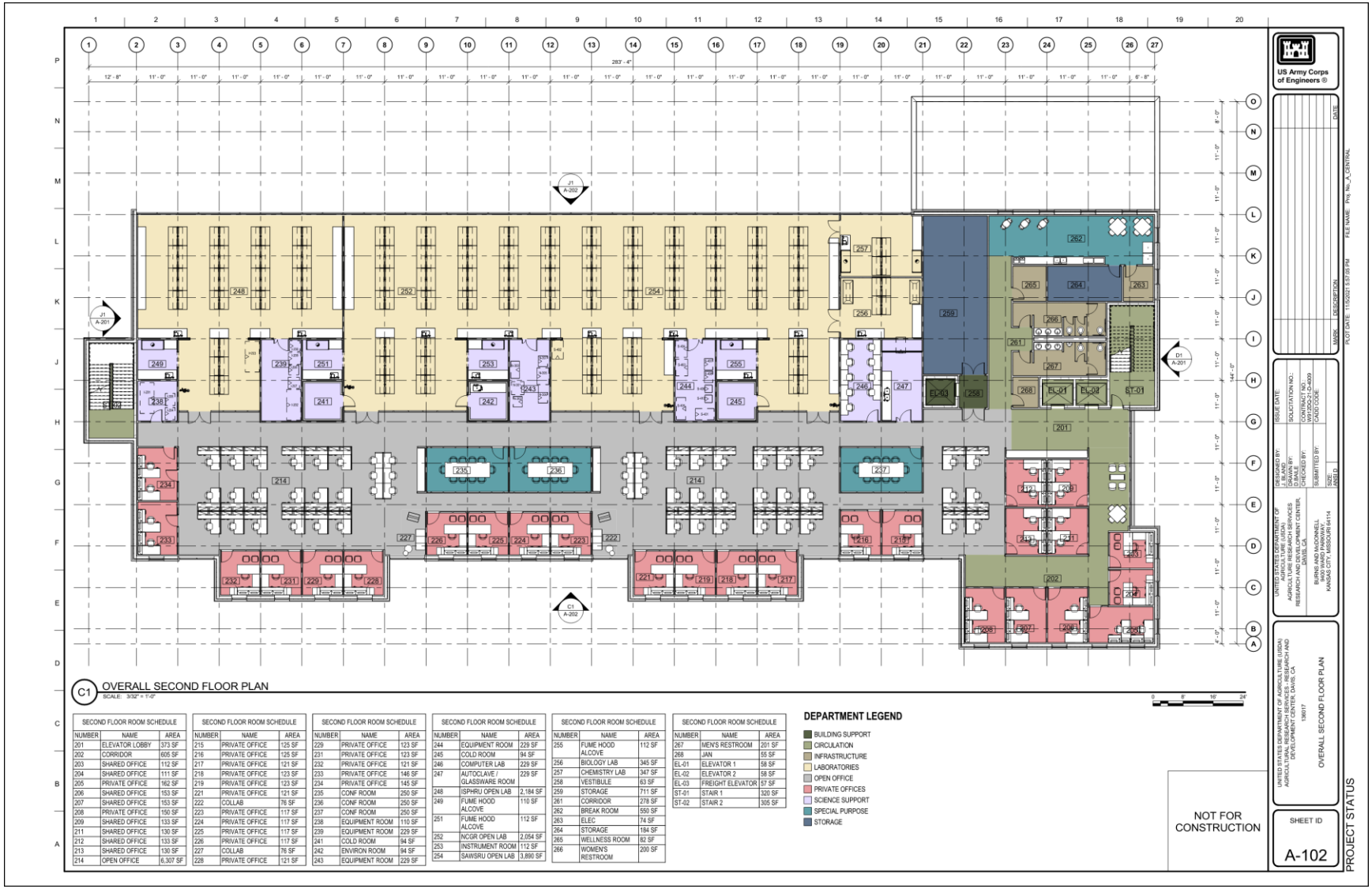
Table 2-1: Preliminary Construction Schedule

Construction Phase	Duration
Site Work	March 2024-April 2025
Foundations	May 2024-September 2024
Structural	July 2024-March 2025
Exterior Skin	December 2024-February 2025
First Floor	January 2025-November 2025
Second Floor	February 2025-November 2025

The anticipated construction equipment includes backhoes, one-ton pickup trucks, dump trucks, small trimmers, bulldozers, a concrete pumper truck, a small crane to place rebar cages, semi-trucks for delivery of supply materials, lifts, and a small bobcat grading vehicle. Construction related equipment and materials, such as vehicles and stockpiles, would be staged in a designated construction staging area located within the parcel.

Figure 2-2: Proposed Facility, Level 1

Figure 2-3: Proposed Facility, Level 2



SECOND FLOOR ROOM SCHEDULE		
NUMBER	NAME	AREA
201	ELEVATOR LOBBY	373 SF
202	CORRIDOR	605 SF
203	SHARED OFFICE	112 SF
204	SHARED OFFICE	111 SF
205	PRIVATE OFFICE	162 SF
206	SHARED OFFICE	153 SF
207	SHARED OFFICE	153 SF
208	PRIVATE OFFICE	150 SF
209	SHARED OFFICE	133 SF
211	SHARED OFFICE	130 SF
212	SHARED OFFICE	133 SF
213	SHARED OFFICE	130 SF
214	OPEN OFFICE	6,307 SF

SECOND FLOOR ROOM SCHEDULE		
NUMBER	NAME	AREA
215	PRIVATE OFFICE	125 SF
216	PRIVATE OFFICE	125 SF
217	PRIVATE OFFICE	121 SF
218	PRIVATE OFFICE	123 SF
219	PRIVATE OFFICE	123 SF
221	PRIVATE OFFICE	121 SF
222	COLLAB	76 SF
223	PRIVATE OFFICE	117 SF
224	PRIVATE OFFICE	117 SF
225	PRIVATE OFFICE	117 SF
226	PRIVATE OFFICE	117 SF
227	COLLAB	76 SF
228	PRIVATE OFFICE	121 SF

SECOND FLOOR ROOM SCHEDULE		
NUMBER	NAME	AREA
229	PRIVATE OFFICE	123 SF
231	PRIVATE OFFICE	123 SF
232	PRIVATE OFFICE	121 SF
233	PRIVATE OFFICE	146 SF
234	PRIVATE OFFICE	145 SF
235	CONF ROOM	250 SF
236	CONF ROOM	250 SF
237	CONF ROOM	250 SF
238	EQUIPMENT ROOM	110 SF
239	EQUIPMENT ROOM	229 SF
241	COLD ROOM	94 SF
242	ENVIRON ROOM	94 SF
243	EQUIPMENT ROOM	229 SF

SECOND FLOOR ROOM SCHEDULE		
NUMBER	NAME	AREA
244	EQUIPMENT ROOM	229 SF
245	COLD ROOM	94 SF
246	COMPUTER LAB	229 SF
247	AUTOCLAVE / GLASSWARE ROOM	229 SF
248	ISPHRU OPEN LAB	2,184 SF
249	FUME HOOD ALCOVE	110 SF
251	FUME HOOD ALCOVE	112 SF
252	NCGR OPEN LAB	2,054 SF
253	INSTRUMENT ROOM	112 SF
254	SAWSRU OPEN LAB	3,890 SF

SECOND FLOOR ROOM SCHEDULE		
NUMBER	NAME	AREA
255	FUME HOOD ALCOVE	112 SF
256	BIOLOGY LAB	345 SF
257	CHEMISTRY LAB	347 SF
258	VESTIBULE	63 SF
259	STORAGE	711 SF
261	CORRIDOR	278 SF
262	BREAK ROOM	550 SF
263	ELEC	74 SF
264	STORAGE	184 SF
265	WELLNESS ROOM	82 SF
266	WOMEN'S RESTROOM	200 SF

SECOND FLOOR ROOM SCHEDULE		
NUMBER	NAME	AREA
267	MEN'S RESTROOM	201 SF
268	JAN	55 SF
EL-01	ELEVATOR 1	58 SF
EL-02	ELEVATOR 2	58 SF
EL-03	FREIGHT ELEVATOR	57 SF
ST-01	STAIR 1	320 SF
ST-02	STAIR 2	305 SF

The description of the Proposed Action above is based on conceptual design and may be modified as the design process progresses. Modifications are not anticipated to be significant (e.g. are unlikely to modify the footprint of the Project onsite) or alter the evaluation performed in this Construction EA. If modifications are determined to be significant and alter the evaluation in this Construction EA, the document will be amended to reflect the Proposed Action.

The Proposed Action would address the Project purpose and need by providing USDA-ARS additional and modernized laboratory, office, administrative, and technical support space to better support research and development needs.

2.3 Alternatives Considered but Eliminated

A variety of alternatives were considered but ultimately did not fully meet the USDA-ARS needs. These alternatives included:

- Renovating and rehabilitating existing facilities
- U-shaped building footprint (Option 1)

The renovation and/or rehabilitation of existing facilities was considered but determined to have a high cost to benefit ratio. Existing labs no longer meet USDA-ARS research requirements and would need to be renovated for newly developed and highly specific scientific protocols and procedures. Additionally, some buildings cannot be expanded as they are in the center of the university and there is no additional surrounding space. For example, Robbins Hall, in the heart of campus on California and Shields Avenue, which contains the ISPHRU, is fully encompassed on all sides by existing facilities. Even if all the seven individual buildings and multiple off-campus worksites were renovated, the location of USDA-ARS facilities scattered around the UC Davis Campus would persist. This fragmented arrangement hinders the scientific process. Therefore, renovation/rehabilitation of existing facilities would not meet the Project purpose and need, and the alternative was not carried forward in this EA.

During conceptual design, an alternate floor plan was considered for the Facility, referred to as Option 1. Option 1 provided a two-story, U-shaped footprint. The layers of the building would include private and open offices on the north and south facades and work inward with centralized support lab spaces and open lab spaces facing a central courtyard. The double-wing approach would provide a shallower building depth but a less efficient configuration resulting in longer travel times throughout the building. The USDA research leaders disapproved of the configuration primarily due to the lack of natural light in individual offices. The floorplan did not meet the requirements of the users. For these reasons, the alternative was eliminated and not carried forward in this EA.

3.0 ENVIRONMENTAL CONDITIONS AND IMPACTS

3.1 NEPA Evaluation

The USDA-ARS Facilities Design Standards (Document ARS-242.1) provides guidance for assessing potential environmental impacts during the development of an EA (USDA-ARS, 2012). Section 1.3.3. of the USDA-ARS Facilities Design Standards document contains a list of 29 questions (A through CC) to first identify those resources potentially impacted by the Proposed Action and then to be considered in the EA. These questions are presented below with a corresponding response for the Project. Those resources that may be impacted by the Project are labeled as "Potentially" and will be described in further detail in Section 3.2. Resources that are not present within the parcel or Project footprint or not applicable will be labeled as such below. These resources will not be carried forward in Section 3.2.

This Draft EA and Finding of No Significant Impact (FONSI) was circulated publicly for ten business days starting January 5, 2022 and ending January 18, 2022. Since USACE is assisting USDA-ARS with environmental compliance, the EA was made available electronically at https://www.spk.usace.army.mil/media/usace-project-public-notices/. Written comments were directed at Keleigh.L.Duey@usace.army.mil, or mailed to Ms. Keleigh Duey, U.S. Army Corps of Engineers, Sacramento District, Planning Division 10th floor, 1325 J Street, Sacramento, California, 95814. Questions were directed to (916) 557-5131.

One agency comment was received during the public comment period. The comment letter from the U.S. Environmental Protection Agency and response from the USDA-ARS is included in Appendix D as a part of the official record. New analysis regarding greenhouse gas (GHG) emissions and noise levels during construction was conducted for the Final EA.

Will proposed construction action:

A. Cause or contribute to soil erosion by wind or water?

- **Existing Conditions.** The parcel is comprised of annual grassland and ruderal vegetation, which is mowed regularly. The parcel does not contain any undisturbed natural areas. The topography is generally flat and stormwater currently is directed through the parcel's man-made drainage to a municipal storm sewer. The average slope of the parcel is approximately 2 percent from east to west. The surrounding land use is light commercial/industrial development.

There are no active causes of soil erosion at the Site. The Site is currently vacant and any maintenance activities, such as driving or equipment operation, occur on paved or graveled areas. Mowing does occur on the Site, but does not contribute to soil erosion. The existing drainage ditch is gently sloped and vegetated, reducing soil erosion from water. There is no wind caused erosion on Site due to lack of bare ground and gently sloping topography.

- **Potentially.** Soils will be disturbed from general construction activities and subject to typical erosion factors. Soil disturbance would be limited to the construction footprint for the Facility and excavation and installation of utility service connections (water, electric, etc.). Best management practices (BMPs) associated with stormwater controls would typically reduce soil erosion and sedimentation prior to, during, and immediately following construction activities.

B. Affect soil surface stability?

- **Existing Conditions**. The parcel is comprised of annual grassland and ruderal vegetation, which is mowed regularly. There are no existing exposed soil piles in the parcel. Therefore, the parcel is considered to have a high level of soil stability.

- **Potentially.** Soils will be disturbed from general construction activities as noted previously and subject to typical surface instability. BMPs associated with stormwater controls would typically stabilize disturbed soil until sufficient vegetation re-growth occurs and permanent soil stabilization is achieved.

C. Degrade water quality in a sole source aquifer?

- **Existing Conditions**. There are no sole source aquifers in the general Project vicinity (U.S. Environmental Protection Agency [EPA], 2021b). The nearest sole source aquifer is approximately 140 miles southeast near Fresno, California.

- **Not Applicable.** As there are no sole source aquifers in the Project vicinity, the Proposed Action would not degrade water quality in a sole source aquifer.

D. Decrease aquifer yield or affect water rights?

- **Existing Conditions**. The Project area is within the Central Valley Aquifer System (USGS, 1995). The City of Davis uses groundwater for approximately 13 percent of its potable water supply. This water is pumped from aquifers that range from 200 feet to more than 1,700 feet

below the ground surface (City of Davis, 2021b). There are no water rights on the parcel. The City of Davis has an easement on the east property line for a storm drain that runs from Second Street to Fifth Street (USACE, 2021a).

- **Not Applicable.** The Project will convert undeveloped land with permeable soils into impermeable surfaces on the parcel, such as the Facility and its parking lot. The Proposed Action would not preclude precipitation from recharging typical groundwater conditions as stormwater onsite would be directed to stormwater detention basins where water would infiltrate soil. Overflow from the stormwater detention basins would be directed to municipal drains that currently receive stormwater from the parcel. The Facility design may also include features, such as permeable pavers and rain gardens, which would allow water to permeate the soil onsite. Additionally, undeveloped portions of the parcel will remain permeable and not prohibit precipitation from recharging typical groundwater conditions.

E. Affect aquatic life?

- **Existing Conditions**. There is a man-made drainage ditch that runs diagonally across the parcel (see Figure 1-1). Based on the wetland delineation conducted by Burns & McDonnell in September 2021 (Appendix B), an ephemeral drainage is located within the man-made ditch. It flows southeast through a culvert under a man-made berm before exiting the parcel into the municipal stormwater system. The ephemeral drainage 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 nearest known stream, Putah Creek, tributary of the Yolo Bypass and Sacramento River, is approximately 3,000 feet south of the parcel.

- **Not Applicable.** Based on the observed ephemeral drainage characteristics, it is unlikely to provide habitat for aquatic life. The USACE confirmed the ephemeral drainage onsite is a non-jurisdictional water defined under 33 CFR 328.3(b)(10) and 40 CFR 120.2(2)(x) on November 9, 2021 (Appendix B).

  The parcel is not hydrologically connected to Putah Creek; Second Street and Interstate-80, both running east-west, provide barriers. Based on this, it is not anticipated that the Proposed Action would impact Putah Creek. Therefore, the Proposed Action would not impact aquatic life.

F. Cause or contribute flow variation in a stream or spring?

- **Existing Conditions**. There are no streams or springs onsite. The water feature onsite was determined by the USACE to be an ephemeral drainage. The USACE also confirmed this man-made drainage is a non-jurisdictional water defined under 33 CFR 328.3(b)(10) and 40 CFR 120.2(2)(x) on November 9, 2021 (Appendix B). The nearest known stream, Putah Creek, is approximately 3,000 feet from the parcel.

- **Not Applicable.** The ephemeral drainage onsite will be partially filled for construction of the Facility and stormwater detention basins will be installed in various locations on the Site, which would modify its flow. The California Department of Fish and Wildlife (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. After construction, stormwater onsite will be directed to the stormwater detention basins. However, these flow variations would not affect other waterways because the ephemeral drainage is not hydrologically connected to another known stream or spring. The flow of Putah Creek would not be impacted by the Proposed Action.

G. Degrade the aesthetic properties and/or potential uses of either ground or surface waters?

- **Existing Conditions**. There is a man-made drainage ditch onsite only flows during and for a short duration after precipitation events. The next nearest known surface waterbody, Putah Creek, is approximately 3,000 feet from the parcel. The depth to groundwater in the vicinity is approximately 15 feet.

- **Not Applicable.** The man-made drainage ditch onsite is not considered to have aesthetic properties or have potential uses given it intermittency. The flow of Putah Creek would not be impacted by the Proposed Action. Therefore, the Proposed Action would not degrade any aesthetic qualities of surface waters, nor would it impact the potential use of surface waters. The Proposed Action would not require a well or require excavations at a depth that would impact groundwater sources. The new Facility would be connected to public water provided by the City of Davis.

H. Affect chemical quality of ground or surface waters (pH, dissolved oxygen, nutrients, dissolved solids, pesticides, etc.)?

- **Existing Conditions**. See existing conditions under 3.1(G) above.

- **Potentially.** Surface waters onsite include an existing ephemeral drainage, which will be partially filled during construction, and future stormwater detention basins, which will be installed in various locations on the Site. The Proposed Action may temporarily impact the surface water chemistry onsite during active construction. Construction of the Proposed Action would require construction equipment and materials which have the potential for spills and leaks, such as fuel from vehicles. The Proposed Action will include the construction of new impermeable surfaces, such as parking areas, where substances from vehicles could be introduced to runoff during rain events. These substances may affect the chemical quality of surface water at the parcel during operations. The next nearest known surface waterbody, Putah Creek, is approximately 3,000 feet from the parcel and flow would not be impacted by the Proposed Action. The Proposed Action would not require a well or require excavations at a depth that would impact groundwater sources and therefore, is unlikely to affect their chemical quality. It is anticipated that maximum excavation depth would be 10 feet and the depth to groundwater in the vicinity is approximately 15 feet.

I. Affect physical quality of ground or surface waters (suspended solids, turbidity, color, oil, temperature, etc.)?

- **Existing Conditions**. See existing conditions under 3.1(G) above.

- **Potentially.** Surface waters onsite include an existing ephemeral drainage, which will be partially filled during construction, and stormwater detention basins, which will be installed in various locations on the Site. The physical water qualities of the surface waters onsite may be affected by the Proposed Action through stormwater runoff from impervious surfaces during construction and operation of the Facility. The Proposed Action will include the construction of new impermeable surfaces, such as parking areas, where substances from vehicles could be introduced to runoff during rain events. These substances may affect the physical water quality of surface water onsite during operations. The next nearest known surface waterbody, Putah Creek, is approximately 3,000 feet from the parcel and flow would not be impacted by the Proposed Action. The Proposed Action would not require a well or require excavations at a depth that would impact groundwater sources and is unlikely to affect their physical water quality.

J. Cause odors or release odoriferous substances to air or water?

- **Existing Conditions**. The parcel is comprised of annual grassland and ruderal vegetation, which is mowed regularly. The surrounding land use is light commercial/industrial development. Odors in the area are primarily generated by emissions from vehicles on I-80 south of the parcel and the railroad that parallels I-80. Emissions odors could also occur from the emergency engine located at the existing facility, permitted under the University of California Agricultural & Natural Resources in the unlikely event it is operated.

- **Potentially.** Odors may be released during construction and operation of the Proposed Action. During construction, this may be due to activities such as equipment operation, welding and painting and during operation, due to infrequent standby generator use.

K. Release toxic substances to the air in quantities that could affect human health or safety, or environmental quality?

- **Existing Conditions**. Air toxics and hazard air pollutants are generated in the Project vicinity by vehicles and equipment on nearby roads and I-80.

- **Not Applicable.** Air toxics or hazard air pollutants would be generated during construction due to fossil fuel combustion in construction vehicles and equipment (EPA, 2018). The quantity released would not be substantial and would not affect human health or safety, or environmental quality. The Proposed Action would not emit toxic substances during operation or cause long-term affects to ambient air quality.

L. Release particulate matter to the air?

- **Existing Conditions**. The northeastern corner of the parcel contains existing facilities on 25,000 SF including nine greenhouses, headhouse, growth chamber, and support buildings (see Figure 1-2). These facilities do not currently release PM into the air. The Yolo-Solano Air Quality Management District (YSAQMD) noted during scoping that the emergency engine located at the existing facility is permitted under the University of California Agricultural & Natural Resources. Mowing of the site would periodically contribute minimal dust and emissions particulates to the site and surrounding area.

- **Potentially.** Dust and particulate matter may be generated during construction and from the operation of construction equipment. Particulate matter (PM) is a term for a mixture of solid

particles and liquid droplets found in the air. PM may pose health risks. Mitigation measures will be implemented to minimize PM entering the air during construction.

M. Change local meteorological conditions or air movement patterns?

- **Existing Conditions**. The City of Davis has a "temperate Mediterranean" climate with light rain during mild winters and hot, dry summers. The Sacramento River Delta breeze helps cool temperatures at night during the summer (City of Davis, 2021c).

- **Not Applicable.** The Proposed Action is not of the magnitude or type of project that would be necessary to alter local meteorological conditions or air movement patterns.

N. Release substances for which there is a National Ambient Air Quality Standard (i.e., sulfur oxides, nitrogen oxides, carbon monoxide, lead, particulate matter, etc.)?

- **Existing Conditions**. Under the Clean Air Act (CAA), the Federal government established the NAAQS to protect public health, safety, and welfare from known or anticipated effects of eight pollutants: SO_2, particulate matter 10 microns in diameter or less (PM10), particulate matter 2.5 microns in diameter or less (PM2.5), CO, nitrogen dioxide (NO2), ozone, lead, and GHGs.

  The California Air Resources Board (CARB) is required to designate areas of the State as attainment, nonattainment, or unclassified for any State standard. An "attainment" designation for an area signifies that pollutant concentrations do not violate the standard for that pollutant in that area. A "nonattainment" designation indicates that a pollutant concentration violated the standard at least once. The county is in the Sacramento Federal Non-Attainment area for ozone and PM2.5. The City of Davis and Yolo County are in attainment areas for the other six pollutants, indicating that the region complies with Federal clean air standards for SO_2, PM10 (EPA, 2021).

  The Project is within the Sacramento Valley Air Basin (SVAB). The YSAQMD is responsible for implementing emissions standards and other requirements of Federal and State laws in the Project area. As required by the California Clean Air Act (CCAA), YSAQMD has published various air quality planning documents to address requirements to bring the SVAB into compliance with the Federal and State ambient air quality standards. The Air Quality Attainment Plans are incorporated into the State Implementation Plan, which is subsequently submitted to the EPA, the Federal agency that administrates the Federal Clean Air Act of 1970, as amended in 1990.

The YSAQMD portion of the SVAB is currently in nonattainment for fine particulates (PM2.5) and ozone. Concentrations of all other pollutants meet State and Federal standards.

- **Potentially.** Substances regulated under the National Ambient Air Quality Standard (NAAQS) may be released during construction and operation of the Project. Carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen oxides (NO_x), volatile organic compounds (VOCs), and particulate matter (PM) may be emitted/generated by construction equipment onsite (gasoline/diesel engines), construction traffic along local roads, infrequent use of a standby generator onsite, and operation of natural gas-powered domestic water heaters and heating boilers to serve the internal needs of the Facility.

O. Affect undisturbed natural areas or a wild and scenic river?

- **Existing Conditions**. There are no undisturbed natural areas or wild and scenic rivers near the parcel (National Wild and Scenic Rivers System, Nd). The nearest wild and scenic river is the Lower American River which is 12 miles from the parcel. The parcel does not contain any undisturbed natural areas. The surrounding land use is light commercial/industrial development. The parcel is comprised of annual grassland and ruderal vegetation, which is mowed regularly.

- **Not Applicable.** There would be no effect to undisturbed natural areas or wild and scenic rivers from the Proposed Action due to their absence on the parcel.

P. Affect game animals or fish or their taking?

- **Existing Conditions**. No water resources exist at the parcel that would support fish species. The ephemeral drainage only flows during and after precipitation events for a short time in a typical year and does not provide suitable fish habitat. Game animals are not known to dwell within or immediately adjacent to the parcel, especially with the adjacent I-80 corridor and surrounding land use (light commercial/industrial development). Also, hunting is not allowed and does not occur on the property.

- **Not Applicable.** The Proposed Action is not anticipated to affect game animals or fish due to their absence in the Project vicinity.

Q. Affect rare, threatened, or endangered species, or a critical habitat? (A consultation with U.S. Fish & Wildlife Service under Section 7 of the Endangered Species Act may be required).

- **Existing Conditions**. Table 3-1 below provides all the federally listed threatened and endangered species within Yolo County, California. A search of the parcel was performed using the CDFW RareFind tool, Yolo County Habitat County Habitat Conservancy listings, and the USFWS Environmental Conservation Online System (ECOS) tool. There are no rare, threatened, or endangered species, or critical habitat found on the parcel. A habitat assessment was performed by Burns & McDonnell in September 2021.

- **Not Applicable.** The parcel does not overlap with federally designated critical habitat. Based on the habitat assessment performed by Burns & McDonnell in September 2021, the Proposed Action is anticipated to have no effect on federally threatened and endangered species, their habitats, or proposed or designated critical habitat (Appendix C). Therefore, a consultation with U.S. Fish and Wildlife Service was not needed.

  A previous biological resources report found a small elderberry shrub complex consisting of two mature shrubs just outside the fence near the northwest corner of the property (ICF International [ICF], 2016). Elderberry shrubs are the obligate larval host plants of the valley elderberry longhorn beetle (VELB, *Desmocerus californicus dimorphus*), listed as threatened under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). During the September 2021 habitat assessment, the presence of two elderberry trees were confirmed adjacent to but outside of the parcel boundary, along the western fence line. No exit holes that would indicate presence of VELB were detected, and no elderberry trees/shrubs were identified within the parcel.

  The last recorded California Natural Diversity Database (CNDDB) occurrence of Burrowing Owl was in 2004 and was located directly outside the parcel, near the western parcel boundary. Burrowing Owl are protected under the Migratory Bird Treaty Act (MBTA) and included as Birds of Conservation Concern (BCC) by the USFWS (2008). Ground squirrel burrows can serve as suitable nesting and foraging habitat for burrowing owl. During the September 2021 habitat assessment, 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 parcel. This finding is consistent with previous biological surveys of the

parcel, which found no burrowing owls or burrowing owl signs in or adjacent to the parcel. The 2019 survey also found no suitable nest trees for Swainson's hawk on the parcel, and few were available within 0.5 miles of the parcel (ICF, 2016 and 2019). Despite multiple negative surveys, nest surveys will be conducted prior to ground disturbance to ensure any potential burrows remain unoccupied.

Bald and golden eagles are federally protected under the Bald and Golden Eagle Protection Act (BGEPA) but are unlikely to occur in or adjacent to the parcel. Bald and golden eagle foraging and nesting habitat was not documented during the 2021 habitat assessment

Table 3-1: Federally Protected Species in Yolo County, CA

Species	Status	Typical Habitat	Potential Likelihood of Occurrence within Parcel Boundary
Tricolored Blackbird (*Agelaius tricolor*)	MBTA	Cropland/hedgerow, grassland, herbaceous/freshwater marshes of cattails, tule, bulrushes, and sedges	Unlikely to nest but may fly over the area
California Tiger Salamander (*Ambystoma californiense*)	Federal: Threatened	Grasslands and low foothills with pools or ponds necessary for breeding	None; no vernal pools or ponds are present
Golden Eagle (*Aquila chrysaetos*)	MBTA BGEPA	Open country, arctic to desert, including tundra, shrublands, grasslands, coniferous forests, farmland, and areas along rivers and streams	Unlikely to nest but may fly over the area or stop over if animal carcasses are present along roadways
Western Burrowing Owl (*Athene cunicularia hypugaea*)	MBTA BCC	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	Possible; CNDDB occurrence near parcel (2004)
Conservancy Fairy Shrimp (*Branchinecta conservatio*)	Federal: Endangered	Large, clay-bottomed vernal pool playas with turbid water	None; no vernal pools or streams are present
Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)	Federal: Threatened	Herbaceous wetland, scrub-shrub wetland, temporary pool, bog/fen	None; no vernal pools or herbaceous wetlands present
Swainson's Hawk (*Buteo swainsoni*)	MBTA	Open pine-oak woodland and cultivated lands, desert, grassland/herbaceous, cropland/hedgerow, savanna, woodland	Unlikely to nest but may fly over the area
Western Snowy Plover (*Charadrius nivosus*)	Federal: Threatened MBTA	Sand/dune, playa/salt flat/dry mud or salt flats	Unlikely to nest but may fly over the area
Palmate-Bracted Bird's-Beak (*Chloropyron palmatum*)	Federal: Endangered	Seasonally-flooded, saline-alkali soils in lowland plains, primarily along the edges of channels and drainages	Unlikely; nearest USFWS documented occurrence is ~5 miles north, and site soils are not saline and only mildly to moderately alkaline

Species	Status	Typical Habitat	Potential Likelihood of Occurrence within Parcel Boundary
Western Yellow-Billed Cuckoo (*Coccyzus americanus occidentalis*)	Federal: Threatened MBTA	Dense stands of cottonwood and willow/riparian, forested wetland	Unlikely to nest but may fly over the area
Monarch Butterfly (*Danaus plexippus*)	Federal: Candidate for Listing	Open fields and meadows with milkweed, breeding only where milkweeds are found	Unlikely; no milkweed documented within parcel boundary but may occur in adjacent areas
Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*)	Federal: Threatened	Riparian/shrubland/chaparral, woodland/hardwood	Unlikely; suitable habitat was identified adjacent to parcel boundary but is isolated from riparian corridor and outside area of disturbance for this Project
White Tailed Kite (*Elanus leucurus*)	MBTA	Cropland/hedgerow, savanna, grassland/herbaceous, woodland/hardwood/open woodland, marshes, partially cleared lands and fields	Possible; open grounds present but minimal tree cover for perching and nesting
Delta Green Ground Beetle (*Elaphrus viridis*)	Federal: Threatened	Bare, sparsely vegetated ground along the edges of vernal pools	None; no vernal pools are present
Bald Eagle (*Haliaeetus leucocephalus*)	MBTA BGEPA	Nest in forested areas adjacent to large bodies of water, away from heavily developed areas when possible	Unlikely to nest but may fly over the area
Delta Smelt (*Hypomesus transpacificus*)	Federal: Threatened	River mouth/tidal river, bay/sound	None; no water bodies or streams present
Burke's Goldfields (*Lasthenia burkei*)	Federal: Endangered	Moist spring meadows and vernal pools	None; no vernal pools or meadows are present
Vernal Pool Tadpole Shrimp (*Lepidurus packardi*)	Federal: Endangered	Herbaceous wetland, temporary pool, scrub-shrub wetland	None; no vernal pools or wetlands present
Colusa Grass (*Neostapfia colusana*)	Federal: Threatened	Vernal pools, shallow freshwater ponds	None; no vernal pools are present
California Red-Legged Frog (*Rana draytonii*)	Federal: Threatened	Pools of slow-moving streams, perennial or ephemeral ponds, and upland sheltering habitat	Unlikely; burrows, culverts, and rocks present

Species	Status	Typical Habitat	Potential Likelihood of Occurrence within Parcel Boundary
		such as rocks, small mammal burrows, logs, and man-made structures	but parcel is regularly maintained
Bank Swallow (*Riparia riparia*)	MBTA	Aerial, riparian/steep sand, dirt, or gravel banks, in burrows dug near the top of the bank	Unlikely to nest but may fly over the area
Keck's Checker-Mallow (*Sidalcea keckii*)	Federal: Endangered	Clay soils in foothill annual grasslands of central western Sierra Nevada Mountains, soils high in magnesium with heavy metals, burned areas	None; parcel is outside Sierra Nevada Mountain region
Northern Spotted Owl (*Strix occidentalis caurina*)	Federal: Threatened MBTA	Forests characterized by dense canopy closure of mature and old-growth trees, abundant logs, standing snags, and live trees with broken tops	Unlikely to nest but may fly over the area
California Freshwater Shrimp (*Syncaris pacifica*)	Federal: Endangered	Streams with water flowing year round, predominately low gradient flowing waters	None; no streams are present
Giant Garter Snake (*Thamnophis gigas*)	Federal: Threatened	Agricultural wetlands and other waterways such as irrigation and drainage canals, sloughs, ponds, and small lakes	None; no water bodies or streams present
Solano Grass (*Tuctoria mucronata*)	Federal: Endangered	Northern claypan vernal pools within annual grasslands	None; no vernal pools are present
Least Bell's Vireo (*Vireo bellii pusillus*)	Federal: Endangered MBTA	Dense brush, mesquite, willow-cottonwood forest, streamside thickets, and scrub oak, in arid regions but often near water	Unlikely to nest but may fly over the area

Source: Information for Planning and Consultation (USFWS, 2021).
Notes: Federal = Listed under ESA; BGEPA = Protected under Bald and Golden Eagle Act; MBTA = Protected under Migratory Bird Treaty Act ; BCC = Birds of Conservation Concern (USFWS, 2008).

R. Affect species balance, especially among predators?

- **Existing Conditions**. No water resources exist at the parcel that would support fish or animal species. The ephemeral drainage only flows during and after precipitation events for a short time in a typical year and does not provide suitable habitat. The developed nature of the surrounding area and limited habitat on the site does not support a diversity of species, including predators. Any predators using the site are expected to be transient.

- **Not Applicable.** The Project is not anticipated to impact species balance due to lack of suitable habitat and proximity to previously developed areas minimizing the presence of wildlife, including predators.

S. Involve special hazards, such as radioactivity or electromagnetic radiation?

- **Existing Conditions.** A Phase I Environmental Site Assessment (ESA) for the acquisition of the parcel was completed in May 2021 (USACE, 2021b). The Phase I ESA found that during the Department of Homeland Security (DHS) radioactive use license decommissioning and decontamination processes, shallow soils in greenhouses #7 and #8 were found to have Carbon 14 or Tritium isotope levels above State DHS release criteria. To remediate this finding, approximately 210 cubic feet of contaminated soil was excavated in 2006 to approximately three feet below ground surface and disposed at a licensed Low-Level radioactive waste (LLRW) disposal facility in Utah. After excavation, the property was released by State DHS for unrestricted use.

  A Phase II ESA was prepared in May 2019 in conformance with American Society for Testing and Materials (ASTM) Practice E1527, which revealed a few Historical Recognized Environmental Conditions (REC). Calgene historically used 5 millicuries of radioactive isotopes Carbon-14 and Tritium at the greenhouse facilities, primarily at Greenhouse #7 between 1984 and 1996. Radioactive materials were sprayed directly onto plants offsite at the 5th Street facility and transported to greenhouses. As part of the radiological decommissioning and decontamination process, 130 soil samples were taken in which five soil samples in greenhouses #7 and #8 were found to have levels above release criteria of 12 picocuries per gram. Following the excavation of approximately 210 cubic feet of contaminated soil and disposal of the soil at a licensed LLRW disposal facility, 13 confirmatory soil samples in greenhouse #8 and 21 confirmatory soil samples in greenhouse #7 were taken and indicated no radiation levels above background.

A former deep wastewater holding pond was located west of the greenhouses along the north side of the parcel that received reject wastewater from the reverse osmosis water filtration system and greenhouse French drain. This wastewater pond, which is located outside the limits of disturbance, was closed and filled after a soil salinity investigation in 1991 through 1992 under the oversight of the Central Valley Regional Water Quality Control Board (RWQCB). Although this work was performed, there is no documentation of the soil investigation or closure; however, there is no indication that any significant soil or groundwater contamination existed. The Phase I ESA concluded, if future land use changes to more sensitive residential use, it may be prudent to investigate the former pond area for trace residual pesticide impacts in shallow soils.

A variety of restricted and non-restricted pesticides were used on the parcel in the 1980s inside a vented pesticide spray booth in the Growth Chamber building. Organochlorine pesticides such as DDT were phased out in the 1970s prior to Monsanto operations, but trace residual pesticides are assumed to be in gravel and shallow soil open floor areas within the existing greenhouse footprints and significantly lower trace residuals in the open field areas. The Phase I ESA concluded, typically, general application of pesticides according to labeled instructions do not pose any significant risk. However, if land use changes from agricultural operations to more sensitive residential use, it would be prudent to assess the levels of trace residual pesticides in shallow soils (particularly within the greenhouse footprint) at that time to assess the need for any mitigation measures.

- **Not Applicable.** Due to the location of the former wastewater pond and the proposed land use, this discussion is not applicable to the Proposed Action.

Trace residual pesticides are assumed to be in gravel and shallow soil open floor areas within the existing greenhouse footprints and significantly lower trace residuals in the open field areas. The Phase I ESA concluded, typically, general application of pesticides according to labeled instructions do not pose any significant risk. Due to the proposed land use, this discussion is not applicable to the Proposed Action.

The Phase I and II ESAs did not identify any concerns for potential exposure to contamination during construction activities or for future industrial land uses. Therefore, the Proposed Action is not anticipated to involve special hazards, such as radioactivity or electromagnetic radiation.

T. Affect or to be located in a wetland, flood plain, or the coastal zone?

- **Existing Conditions**. The parcel is not located in a wetland, flood plain, or coastal zone. The USACE confirmed the ephemeral drainage onsite is a non-jurisdictional water defined under 33 CFR 328.3(b)(10) and 40 CFR 120.2(2)(x) on November 9, 2021. The FEMA Flood Insurance Rate Map (FIRM) for the Project vicinity (Map Number 06113C0612G) shows that the Facility will be located in Zone X (areas determined to be outside the 0.2 percent annual chance flood plain).

- **Not Applicable.** The Proposed Action is not located within a wetland, flood plain, or coastal zone. Therefore, it is not anticipated that the Proposed Action will affect these resources.

U. Affect a known or potential cultural, historical, or archaeological site, district, or area? (A consultation with the State Historical Preservation Officer is required).

- **Existing Conditions**. Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended (Section 106), USDA carried out appropriate measures to identify any potential historic properties within the APE, in consultation with the State Historic Preservation Officer (SHPO) and Native American Tribes. USDA invited the following Native American tribes and communities identified by the California Native American Heritage Commission as having cultural resources interests in the APE to consult under Section 106: Colusa Indian Community Council Cachil Dehe Band of WinTun Indians, Cortina Indian Rancheria – Kletsel Dehe Band of Wintun Indians, Wilton Rancheria, and Yocha Dehe Wintun Nation. No potential historic properties were identified in the Area of Potential Effects (APE).

- **Not Applicable.** The USDA found that no historic properties will be affected by the Proposed Action. In a letter dated October 28, 2021, the SHPO expressed no objection to USDA's identification efforts and finding of effect. Native American Tribes have also not objected. The Yocha Dehe Wintun Nation has requested to provide cultural sensitivity training and to monitor during ground disturbance, to which USDA has agreed. USDA will continue to consult with the SHPO and Tribes pursuant to Section 106. In the event of an inadvertent discovery, USDA will comply with the requirements at 36 CFR § 800.13.

  The Yocha Dehe Wintun Nation also responded to the agency scoping performed for the Project. In a letter dated September 29, 2021, they recommended cultural sensitivity training for any

Project personnel and requested detailed project information, including any plans for ground disturbance (Appendix A).

The USDA-ARS, assisted by USACE, has continued consultation with interested Tribes and met with the Yocha Dehe Wintun Nation on November 18, 2021. USACE and USDA facilitated Yocha Dehe Wintun Nation monitoring during January 2022 geotechnical investigations. USDA-ARS will continue to consult with tribes and will invite them to be present during ground disturbing activities at the Site.

V. Affect local or regional systems related to:

1) Transportation?

Existing Conditions. The parcel is located on Second Street. It is bordered on the east by Cousteau Place, on the west by Pena Drive, and Spafford Street to the north. The facility will also be located directly north of I-80. There is a railroad south of the parcel which parallels Second Street. There are bus stops along Fifth Street, Pena Drive, and Second Street. No other major transportation facilities are located within a notable distance from the facility. I-80 is the busiest road near the parcel, with average vehicle counts over 60,000 per day. Traffic volume on other roads near the parcel are less than 10,000 vehicles per day (City of Davis, 2017). Second Street average daily traffic is approximately 9,000 cars per day (City of Davis, 2021d).

Potentially. The Proposed Action will increase traffic on local roads during construction and operations.

2) Water supply?

Existing Conditions. Water for the Facility will be provided by the City of Davis Water Division. Though the city's water supplies are currently stable, the surrounding areas have experienced a strong pattern of droughts in recent years.

Potentially. The Proposed Action would require a connection to the municipal water supply. The City of Davis is the service provider for the Project area. There is an existing water main on the north side of Second Street and an existing water line servicing the greenhouses and supporting infrastructure in the northeast corner of the parcel. It is anticipated that the

existing water service line would be relocated and used to provide water to the Facility. A new 8-inch fire service line would also be required by the Project.

3) Power and heating?

Existing Conditions. PG&E provides the City of Davis with electricity. The proposed Facility will receive power and natural gas from PG&E. Natural gas will serve the domestic water heaters and heating boilers. The City of Davis contracts with Valley Clean Energy (VCE) to allow customers to increase the amount of renewable energy that is being used for their needs to levels above what is currently available from PG&E.

Potentially. The Proposed Action will require power and heating during construction and operations. During operation, the Proposed Action would require a connection to the local electrical grid. The Project would be fed from the existing PG&E distribution to a utility transformer. PG&E is the natural gas service provider for the Project area. There is an existing gas service connection along Second Street.

4) Solid waste management?

Existing Conditions. Solid waste is currently managed by City of Davis Public Works, Utilities and Operations. Garbage, recycling, and green waste collection is provided by Recology Davis under contract with the City of Davis.

Potentially. Solid waste will be generated during construction. The contractor would be responsible for abatement, removal, and disposal of all solid waste according to Federal, state, and local regulations. During operation of the Proposed Action, solid waste will be collected by the City of Davis waste agreement contractor.

5) Sewer or storm drainage?

Existing Conditions. Sewers and storm drainage is currently managed by City of Davis Public Works, Utilities and Operations. The City of Davis is the sanitary service provider in the Project area. There is an existing 8-inch gravity sewer line along the eastern side of the parcel. An ephemeral drainage is located within the man-made ditch on the parcel. It flows southeast through a culvert under a man-made berm before exiting the parcel through a municipal stormwater culvert.

Potentially. The Proposed Action will require connection to the municipal sewer system. The City of Davis is the sanitary service provider in the Project area. There is an existing 8-inch gravity sewer line along the eastern side of the parcel. Additionally, storm drainage will be affected by the Proposed Action, as the existing man-made drainage ditch will be regraded, and stormwater detention basins will be installed on the parcel.

W. Affect local land use through effects on:

1) Flood plains or wetlands?

Existing Conditions. The FEMA FIRM for the Project vicinity (Map Number 06113C0612G) shows that the Facility will be located in Zone X (areas determined to be outside the 0.2 percent annual chance flood plain). Based on the wetland delineation conducted by Burns & McDonnell in September 2021 (Appendix B), there are no wetlands on the parcel.

Not Applicable. The parcel does not contain any flood plains or wetlands.

2) Location land use?

Existing Conditions. The parcel is currently an undeveloped, grassed parcel, zoned Planned Development (PD) #4-88 (Mace Ranch) as a designated Light Industrial/Business Park subarea. The new proposed Facility would be constructed on the currently undeveloped area of the parcel.

Not Applicable. The Proposed Action would fit into the zoning category of the parcel and therefore, would not alter the parcel's intended land use. The Natural Resources Conservation Service (NRCS) confirmed via email on October 7, 2021, that lands identified as "urbanized area" (UA) on Census Bureau maps, such as the proposed Project site, are not subject to Provision of Farmland Protection Policy Act (FPPA; refer to the Part 523.10 of the FPPA Manual). Therefore, it is not necessary to complete an AD-1006 form for farmland conversion.

3) Aesthetics?

Existing Conditions. The proposed Facility would be located in a grass lot on UC Davis property. This area is surrounded by other university buildings as well as commercial

businesses. Views are obstructed to the north, east, and west by these buildings and the view to the south includes I-80, Second Street, and a railroad.

Potentially. The Proposed Action would introduce a new two-story facility to the parcel which would alter the appearance of the parcel but would be consistent with the local viewshed.

4) Access to minerals?

Existing Conditions. Mineral mining does not occur on the parcel. No known deposits of recoverable minerals are located at the parcel.

Not Applicable. It is not anticipated that the Proposed Action would affect access to minerals on the parcel.

X. Affect socioeconomic aspects of an area including:

1) Population?

Existing Conditions. The City of Davis has an estimated population of 66,850 people as of 2020 (U.S. Census Bureau, 2020). The City's population has grown approximately 1.9 percent since 2010 (U.S. Census Bureau, 2021).

Not Applicable. The Proposed Action would not significantly affect the surrounding population. A majority of the Facility will be staffed by existing USDA-ARS researchers who already live and work in the Davis area. An increase of six to twenty new residents is minor when compared to the local population.

2) Housing supply or demand?

Existing Conditions. Over half of UC Davis faculty and staff lived in the City of Davis during the 2010-2011 academic year (City of Davis, 2017). There is only one faculty and staff housing development on campus (Aggie Village), which has a long wait list for new residents. Limited housing availability has been a recruitment challenge for UC Davis (City of Davis, 2017).

Not Applicable. The Proposed Action would not meaningfully affect housing supply or demand in the area. Construction of the Proposed Action would not meaningfully affect

housing supply or demand in the area as no permanent populations would be brought to the area for Project construction. Existing USDA-ARS' researchers already live and work in the Davis area. Once facilities are constructed, the hiring of new research members would not cause a measurable impact on housing compared to the regular high demand associated with student turnover at UC Davis.

3) Employment?

Existing Conditions. An estimated 59,630 people are employed in the City of Davis, with a civilian unemployment rate of 5.8 percent (U.S. Census Bureau, 2019). The most common occupations are in management, business, science, and arts (63.1 percent). The most common industries for employment are educational services, and health care and social assistance (U.S. Census Bureau, 2019). UC Davis employed 24,278 people as of Fall 2015 (City of Davis, 2017). It is anticipated that UC Davis will increase on-campus employment from 12,181 (2015 estimate) to 14,500 by the 2027-2028 academic year (City of Davis, 2017).

Not Applicable. Project construction may provide short term construction employment to a small number of local persons (up to 80 construction employees at peak construction). During operation, it is anticipated that the USDA will employ approximately 97 staff members, including six to twenty new employees. Approximately 57.5 percent of the City of Davis population is in the civilian labor force (over the age of 16 years old) (U.S. Census Bureau, 2019), which equates to over 38,000 people. Considering the labor force of the City of Davis, is the increase of jobs during construction and operation of the Proposed Action are minor when compared to the available local work force.

4) Commercial activities?

Existing Conditions. Approximately 6.6 percent of land use in the City of Davis is classified as commercial (City of Davis, 2017). The Commercial Core area of the City is located approximately 1.8 miles west of the parcel. Several commercial facilities such as the Davis Furniture and Appliance Outlet, FMC Technologies, and JRP Historical Consulting are located around the site.

Not Applicable. The Proposed Action would not meaningfully affect commercial activities in the area. Some increases in sales of materials and supplies to construction workers and of

locally acquired construction materials may occur but these would be small compared to the overall economic activity in the area and short term of construction.

5) Industrial activities?

Existing Conditions. Approximately 1.6 percent of land use in the City of Davis is classified as industrial. The City contains only 3.1 percent of Yolo County's industrial inventory as of 2016 and has limited available space for industrial activities (City of Davis, 2017). The nearest industrial parcel is approximately 0.4 mile west of the parcel on Fifth Street.

Not Applicable. The Proposed Action would not meaningfully affect industrial activities in the area.

6) Cultural patterns?

Existing Conditions. Cultural patterns are the similar behaviors that arise in a population due to shared beliefs, values, norms, and social practices. The Project vicinity includes extensive facilities associated with UC Davis as well as other commercial properties and residential areas, some of which may be associated with UC Davis.

Not Applicable. The Proposed Action would not affect cultural patterns as the Facility is compatible with adjacent land uses and would build on existing research activities in the area.

7) Environmental justice?

Existing Conditions. Using the EPA EJSCREEN Tool, the block group the Project is located within was evaluated for minority populations and low-income populations. The Project would be located within Block Group 061130106065. For this environmental justice analysis, the block group was considered an environmental justice minority area if either (1) the minority population exceeded 50 percent, or (2) the minority population was 10 percentage points greater than the benchmark or reference region. For this analysis, the benchmark geographic areas were the city, county, and state. Table 3-2 shows that the block group which contains the proposed Facility does not qualify as a minority or low-income area in comparison to the benchmark geographic areas.

Table 3-2: Percent Minority and Low-Income Populations near the Project

Geographic Area	Percent Minority	Percent Low-Income
Block Group 061130106065	18	14
City of Davis	34	23
Yolo County	53	36
California	62	33

Source: U.S. EPA EJSCREEN Tool, Version 2020

Not Applicable. The Project is not located within an environmental justice area or community.

Y. Cause or contribute to unacceptable noise level?

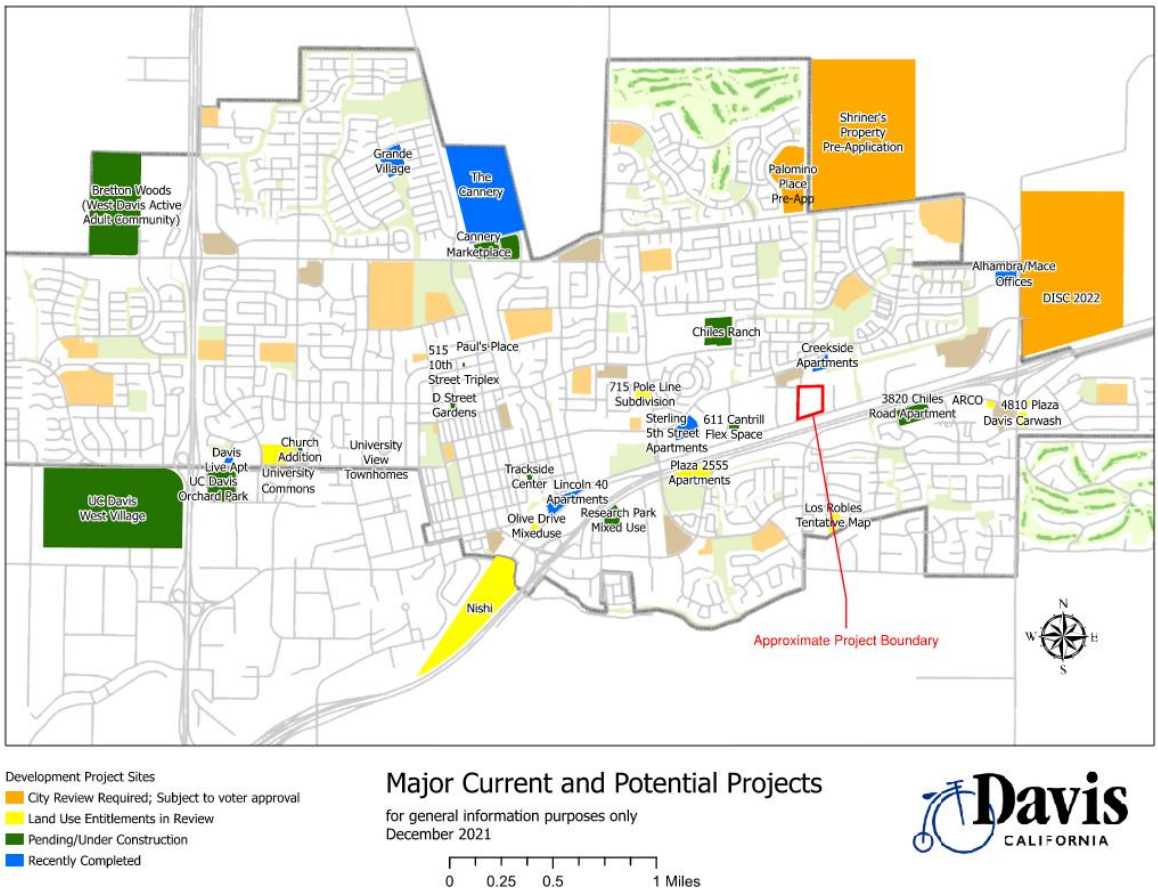
- **Existing Conditions.** Existing noise in the area is generated by vehicles on nearby roads (Second Street, Fifth Street, and I-80) as well as the railroad south of the proposed Facility. Mowing and other maintenance activities on the property may also contribute to noise levels at the parcel. No similar construction type activities were observed in the vicinity of the parcel during field reconnaissance in September 2021, and most of the surrounding parcels have already been developed. Figure 3-1 provides a map of development projects in the City of Davis.

  Creekside Apartments was recently completed and is located northeast of the parcel. The nearest projects pending construction or under construction (based on December 2021 information) are:
  - Chiles Ranch subdivision (2411 E. 8th Street) – an integrated housing development (approximately 107 homes)
  - 611-614 Cantrill Flex Space – new light industrial building
  - 3820 Chiles Road Apartments – 225 new apartment units

- **Potentially.** The ambient noise levels at the parcel are high due to its location adjacent to Interstate-80. Construction of the Proposed Action would result in increased noise compared to ambient levels. This noise would be temporary in nature and cease after construction is complete. Additionally, a standby generator will be installed onsite to power critical equipment in the Facility during a power outage. Use of this standby generator would generate noise, but its use would be rare and temporary. There are a few commercial businesses nearby as well as a daycare center that could experience elevated noise levels during construction and during operation due to

the infrequent use of the standby generator. However, it is not anticipated that construction or operation of the Proposed Action would cause or contribute to an unacceptable noise level.

Figure 3-1: City of Davis Development Projects Map



Source: City of Davis Community Development and Sustainability

Z. Affect public health or safety?

- **Existing Conditions.** The nearest medical facility to the proposed Facility location is Davis Urgent Care, which is approximately 1.1 miles east of the proposed Facility location. The Davis Police Department is approximately 0.5 miles west and provides public safety services to the area. Fire protection is provided by the Davis Fire Department. UC Davis contains numerous research facilities anticipated to contain chemicals and materials similar to those anticipated for this Project. Proper storage, fire suppression and containment serve to provide for the safety and health of the public in the areas surrounding these facilities.

- **Not Applicable.** Construction of the Proposed Action would require the use of heavy machinery and construction equipment. The construction site would be restricted and monitored during

construction to minimize the access and safety risk to the public. The 2021 Phase 1 ESA concluded that no further investigations are warranted, and remediation is not necessary for the compounds present, including arsenic, pesticides, or fertilizers, as they do not represent a risk to current or future receptors that would require special handling. Air toxics or hazard air pollutants would be generated during construction due to fossil fuel combustion in construction vehicles and equipment (EPA, 2018). The quantity released would not be substantial and would not affect human health or safety. During operations, various solvents and other hazardous chemicals would be stored and utilized within the Facility. The primary chemicals to be used are acids in small amounts. Large quantities of flammable materials are not anticipated. Designated hazardous material storage rooms and spill containment and clean-up equipment would be provided on each floor of the Facility designed in accordance with Federal, state, and local regulations. Laboratories will be limited to day quantities of hazardous materials (less than ½ gal) for open use at any given time. It is not anticipated that operation of the Proposed Action would considerably affect public health or safety.

AA. Cause public reaction or controversy?

- **Existing Conditions.** This Draft EA and Draft FONSI will be circulated publicly for ten business days starting January 5, 2022 and ending January 18, 2022. No public comments were received. USACE is assisting the USDA-ARS with environmental compliance, design, and construction of the Facility.

- **Not Applicable.** No public opposition or controversy is anticipated. If public concerns exist, they will be brought forward and addressed during the public review. Although no significant concerns are expected.

BB. Cause Climate Change?

- **Existing Conditions.** Current evidence suggests the earth is warming on a global scale. Earth's average temperature has risen by 1.5 °F over the past century and is projected to rise another 0.5 to 8.6 °F over the next one hundred years. Rising global temperatures have been accompanied by changes in weather and climate. Many places have seen changes in rainfall, resulting in more droughts, floods/intense rain as well as heat waves. Oceans are warming and becoming more acidic (EPA, 2019). Ice caps and glaciers are melting, causing sea levels to rise. Other effects include, but are not limited to, the spread of diseases out of their normal range, habitat loss,

negative impacts to agriculture production, increased air pollution episodes, and impacts to the economy are expected to result from climate change (EPA, 2021).

- **Not Applicable.** The Proposed Action is not of the magnitude or type that would be necessary to change climate conditions. Construction of the Proposed Action will require the use of heavy machinery which will generate emissions. This will cease with the conclusion of construction. An standby generator will be installed onsite to power critical equipment in the Facility during a power outage. Use of this standby generator would generate emissions, but its use would be rare and temporary. Also, during operations, natural gas will serve the domestic water heaters and heating boilers to serve the internal needs of the Facility. The Facility would be Leadership in Energy and Environmental Design (LEED) V4 Silver certifiable.

CC. Have impacts from energy usage or alternative energy?

- **Existing Conditions.** PG&E provides the City of Davis with electricity. The proposed Facility will receive power and natural gas from PG&E. Natural gas will serve the domestic water heaters and heating boilers. The City of Davis contracts with Valley Clean Energy (VCE) to allow customers to increase the amount of renewable energy that is being used for their needs to levels above what is currently available from PG&E.

- **Potentially.** The Proposed Action will increase energy usage. Construction of the Proposed Action would require electricity at the job site. Operations of the facility would increase energy usage as well.

3.2 NEPA Evaluation Applied to Alternatives

This section discusses those resources listed in Section 3.1 as potentially impacted by the Action Alternative in further detail.

A. Cause or contribute to soil erosion by wind or water?

Alternatives

No Action Alternative: The No Action Alternative would not result in any soil disturbance, or subject soils to associated erosion. The property would not be developed by the USDA-ARS.

Action Alternative: Construction activities would disturb approximately 3.5 acres of the ground surface (Figure 3-2). The areas around the Facility and parking areas would be revegetated. Until

the disturbed ground is re-stabilized and revegetated following Project construction, soils would be exposed to wind and water erosion.

Figure 3-2: Preliminary Project Footprint

Mitigation

A Project-specific Stormwater Pollution Prevention Plan (SWPPP) to describe the BMPs to be implemented during construction would be prepared for the Project as part of the submittals for the Construction General Permit (CGP) from the State Water Resources Control Board. The SWPPP would include appropriate BMPs to properly manage and minimize soil erosion by temporarily stabilizing exposed soil and controlling sedimentation. No discharge of pollutants from vehicle and equipment cleaning would be allowed into any storm drains or watercourses. Spill containment kits would be maintained onsite at all times during construction operations.

Disturbance will be limited to that necessary for the construction of the Facility. Once Project construction is completed, all disturbed ground surfaces that have not been converted to impervious surface (i.e. building, parking areas, sidewalks, pavement), would be revegetated to stabilize the parcel. Permanent erosion control measures such as bio-filtration strips and swales to receive storm water discharges from paved or impervious surfaces would be incorporated into the design and construction of the Project. The site drainage design at a minimum will meet Federal, State of California, and City of Davis stormwater quantity and quality requirements.

B. Affect soil surface stability?

Alternatives

No Action Alternative: The No Action Alternative would not result in any soil stability change.

Action Alternative: Construction activities would disturb the vegetated ground surface, exposing soils and therefore decreasing soil stability.

Mitigation

Refer to the mitigation described in Section 3.2, Response A.

H. Affect chemical quality of ground or surface waters (pH, dissolved oxygen, nutrients, dissolved solids, pesticides, etc.)?

Alternatives

No Action Alternative: The No Action Alternative would not affect the chemical quality of ground or surface waters.

Action Alternative: The Proposed Action may impact the man-made drainage ditch water chemistry. The drainage ditch only flows during and for a short duration after precipitation

events. Construction of the Proposed Action would require construction equipment and materials which have the potential for spills and leaks, such as fuel from vehicles. Additionally, the Proposed Action will include the construction of new impermeable surfaces, such as parking areas, where substances from vehicles could be introduced to runoff during rain events. These substances may affect the chemical quality of surface water at the parcel. Stormwater runoff would be directed to stormwater detention basins on the parcel which would overflow to municipal drains. The next nearest known surface waterbody, Putah Creek, is approximately 3,000 feet from the parcel and flow would not be impacted by the Proposed Action. The Proposed Action would not require a well or require excavations at a depth that would impact groundwater sources and therefore, is unlikely to affect their chemical quality.

Mitigation

A Project-specific SWPPP to describe the BMPs to be implemented during construction would be prepared for the Project. A spill response plan would be prepared for construction activities as part of the SWPPP. BMPs outlined in the SWPPP would prevent, to the extent practicable, minor spills or releases of hazardous materials to stormwater, the ground, or local drains that could contribute to degraded water quality. If a spill were to occur, it would be cleaned promptly by trained personnel, reported to the appropriate agencies, and disposed of in accordance with local, State, and Federal policies. The design for the Facility includes stormwater detention basins that would provide stormwater control during construction and operations.

Phase I and Phase II Environmental Site Assessments were performed from 2019-2021 and concluded there was no potential for exposure of contaminants during construction. The active construction site will have restricted access and regular monitoring to ensure compliance with the SWPPP and prevent accidental spills which could affect ground water quality. During operations, the Facility would participate in the Hazardous Materials Business Plan (HMBP) program, which includes spill response planning, to prevent or minimize harm to public health and the environment from a release or threatened release of a hazardous material.

I. Affect physical quality of ground or surface waters (suspended solids, turbidity, color, oil, temperature, etc.)?

Alternatives

No Action Alternative: The No Action Alternative would not affect the physical quality of ground or surface waters.

Action Alternative: The physical water qualities of the ephemeral drainage in the onsite man-made ditch may be impacted by the Proposed Action through stormwater runoff from impervious surfaces during construction and operation of the Facility. Runoff from impervious surfaces may increase the number of suspended solids in the stormwater and increase turbidity. However, given the frequency of which water flows within the drainage ditch, the Proposed Action is unlikely to significantly impact the physical water quality. Additionally, the Proposed Action will include the construction of new impermeable surfaces, such as parking areas, where substances from vehicles could be introduced to runoff during rain events. These substances may affect the physical water quality of surface water at the parcel. Stormwater runoff would be directed to stormwater detention basins on the parcel. The Proposed Action would not require a well or require excavations at a depth that would impact groundwater sources and is unlikely to affect their physical water quality.

Mitigation

A Project-specific SWPPP to describe the BMPs to be implemented during construction would be prepared for the Project. The SWPPP would include approved components to reduce erosion, suspended solids, turbidity, and downstream sedimentation that may degrade water quality and adversely impact aquatic life. Graded areas would be protected from erosion using a combination of silt fences, fiber rolls, etc. along toes of slopes or along edges of designated staging areas, and erosion control netting (such as jute or coir) on sloped areas. Refueling and equipment maintenance would occur at a minimum of 50 feet from any aquatic habitat, culvert, or drainage feature.

The design for the Facility includes stormwater detention basins that would provide stormwater control during construction and operations. The Facility design may also include features, such as permeable pavers and rain gardens, which would allow water to permeate the soil onsite. The site drainage design at a minimum will meet Federal requirements defined by the Energy Independence Security Act of 2007 (EISA) State law, and City of Davis stormwater quantity and quality requirements. EISA Section 438 requires the Project to maintain predevelopment hydrology and prevent net increase in stormwater runoff for the design storm event. The design storm event is the 95th percentile rainfall depth and is based on 24-hour rainfall depth. Post-construction rate, volume, duration, and temperature of runoff must not exceed pre-development rates.

J. Cause odors or release odoriferous substances to air or water?

Alternatives

No Action Alternative: The No Action Alternative would not generate any new odors as no construction would occur.

Action Alternative: During construction, the Proposed Action may generate odors. Odors may be generated by construction vehicle emission, equipment onsite, paints, solvents, or adhesives necessary for construction of the Project. These odors would be temporary in nature and intermittent. Also, odors generated during construction would likely not be noticeable outside the construction area, especially once the structure is enclosed. During operation, a standby generator will be installed onsite to power critical equipment in the Facility during a power outage. Use of this standby generator may generate odors, but its use would be rare and temporary. Due to this, it is not anticipated that odors would substantially impact the surrounding community.

Mitigation

Contractors will be required to turn off vehicles and equipment when not in use to reduce emissions odors from idling. Substances used during construction of the Project that may create odors, such as paints, solvents, adhesives, etc., will be used according to the manufacturer's guidelines.

L. Release particulate matter to the air?

Alternatives

No Action Alternative: The No Action Alternative would not generate PM as no construction or other activities would occur on the parcel.

Action Alternative: The Proposed Action may release fugitive dust, a form of PM, into the air during construction. The Proposed Action would require earth-disturbing activities at the parcel. Also, PM may be emitted/generated by construction equipment onsite (gasoline/diesel engines) and by construction traffic along local roads. During operation, a standby generator will be installed onsite to power critical equipment in the Facility during a power outage. Use of this standby generator may generate PM, but its use would be rare and temporary. The Facility would comply with conditions set forth in applicable permits. PM emissions from operations of the Project are not expected to have a negative impact on ambient air quality in the area surrounding the Project.

Mitigation

Contractors will be required to comply with YSAQMD mitigation measures for construction dust as outlined in the Handbook for Assessing and Mitigation Air Quality Impacts (2007). All driveways, sidewalks, and parking lots shall be paved as soon as possible during construction to prevent fugitive dust.

The following fugitive dust mitigation measures shall be implemented by contractors during construction:

- Water the construction site daily based on type of operation, soil, and wind exposure.
- Cover trucks hauling soil or other loose materials.
- Plant vegetative ground cover in disturbed areas as soon as possible.
- Cover inactive storage piles.
- Sweep streets if visible soil material is carried out from the construction site.
- Treat accesses to a distance of 100 feet from the paved road with a 6- to 12-inch layer of wood chips, gravel or mulch.
- Suspend excavation and grading activities if wind speeds exceed 25 mph.
- Display notices with information including contact information for any dust complaints in a conspicuous manner, such as on construction site fences.

The following mitigation measures shall be implemented by contractors regarding construction equipment exhaust mitigation and other emission sources:

- Construction vehicles and/or equipment will comply with CARB's In-Use Off-Road Diesel-Fueled Fleets Regulation. Construction vehicles will use a CARB Tier 3 engine when feasible.
- Maintain vehicles in good working order and turn off vehicles and equipment when inactive. Limit idling of vehicles to no more than five minutes.
- Employ equipment and power tools that are powered by electric or natural gas engines.
- Use reformulated and emulsified fuels, if feasible.
- Use diesel oxidation catalysts and/or catalyzed diesel particulate traps on diesel equipment.
- Limit vehicle speeds to 15 miles per hour onsite.
- Recommend carpooling to the Project to reduce number of vehicles onsite.

N. Release substances for which there is a National Ambient Air Quality Standard (i.e., sulfur oxides, nitrogen oxides, carbon monoxide, lead, particulate matter, etc.)?

Alternatives

No Action Alternative: The No Action Alternative would not generate emissions of any NAAQS pollutants as no construction would occur.

Action Alternative: Substances regulated under the NAAQS may be released during construction of the Project. CO, SO_2, NO_x, VOCs, and PM may be emitted/generated during construction activities from gasoline/diesel engines onsite, and from construction traffic along local roads.

The Project is located in Yolo County, which is a moderate non-attainment area for $PM_{2.5}$ category and a serious non-attainment area for ozone (Sacramento Metro Area). The General Conformity threshold for $PM_{2.5}$ moderate nonattainment areas is 100 tons per year. The General Conformity threshold for severe ozone nonattainment areas is 25 tons per year (NOx and VOC, each). Emissions of NO_X, VOC, and $PM_{2.5}$ were estimated for the construction phase of the Project. The numbers and types of construction equipment discussed in Section 2.2 were used to estimate emissions. Timelines for each construction phase were based on the timelines discussed in Section 3.2. A conservative estimate of 8 hours of equipment usage per day was used. Conservative emission factors were used for construction equipment, such as Tier II for diesel engines. A conservative estimate of 80 workers per day (peak construction work force) was used. To calculate particulate emissions from earthmoving, a grading area of 3.5 acres was assumed at a depth of 1 foot. Detailed calculations and assumptions used are included in Appendix E. A summary of these construction emission estimates is shown in Table 3-3.

Table 3-3 Construction Emission Estimates

Pollutant	Estimated Emissions (tons per year)	General Conformity Threshold (tons per year)
NOx	18.79	25
VOC	7.48	25
$PM_{2.5}$	1.42	100

As shown in Table 3-3, construction emissions are not anticipated to exceed the General Conformity threshold for $PM_{2.5}$ or ozone. Construction emissions will be temporary in nature and will drop off rapidly from the construction site. A standby generator will be installed onsite to power critical equipment in the Facility during a power outage. Use of this standby generator

would generate emissions, but its use would be rare and temporary. The standby generator, natural gas-powered domestic water heaters, and heating boilers would meet or exceed YSAQMD standards (Rule 2.37) and will be permitted through the YSAQMD, if required. Due to the temporary nature of generation of emissions onsite, emissions from the Project are not expected to have a negative impact on ambient air quality in the area surrounding the Project. Any required mitigation fees will be awarded through the contract to YSAQMD. The Facility would comply with conditions set forth in applicable permits. Emissions from operations of the Project are not expected to have a negative impact on ambient air quality in the area surrounding the Project.

Mitigation

Refer to the mitigation described in Section 3.2, Response L.

V. Affect local or regional systems related to:

1) Transportation?

Alternatives

No Action Alternative: The No Action Alternative would not impact transportation facilities as no construction would occur.

Action Alternative: The Proposed Action will increase traffic on local roads during construction due to equipment being moved to the area, construction employees traveling to the construction site, and materials being delivered to the parcel. Anticipated construction equipment is as follows:

- Clearing and Grubbing (1 week): One (1) backhoe, three (3) pickup trucks, one (1) dump truck, and small trimmers (sheers).
- Grading (2 Weeks): 1 backhoe, 3 pickup trucks, 1 dump truck, and 1 bulldozer.
- Foundations (2 weeks): 1 backhoe, 3 pickup trucks, 1 dump truck, 1 concrete pumper truck, and 1 small crane to place rebar cages.
- Building Assembly (20 weeks): 2 backhoes, 3 pickup trucks, 1 dump truck, 1 small crane, 3 semi-trucks for delivery of supply materials, and 3 lifts.
- Landscaping and Clean Up (1 week): 1 backhoe, 3 pickup truck, and 1 small bobcat grading vehicle.

Construction traffic would most likely come from the east and will travel via Interstate 80 to the Mace Blvd exit, drive north on Mace, and then west on 2nd Street to reach the parcel. From the north, construction traffic would most likely take Highway 113 to W Covell, then drive on E Covell south to Pole Line Road, then east on 2nd Street to the parcel.

Once construction is complete, employees traveling to the Facility will increase traffic in the immediate area. Approximately 97 total staff will report to the Facility, however, a majority of the facility will be staffed by existing USDA-ARS researchers who already live and work in the Davis area. It is anticipated that six to twenty employees would be hired as part of the Project. Due to this number of employees traveling to the Facility, it is not anticipated that transportation would be meaningfully impacted during Project operation. The existing driveway on Second Street for the existing facilities would be used for the Project.

Mitigation

Construction activities will primarily be scheduled during daytime hours. Contractors will coordinate proper construction signage near the Project as necessary to make drivers aware of the potential for increased hazards associated with construction vehicles. Appropriate changes to signaling, signage, and parking will be instituted once the Facility begins operations.

2) Water Supply

Alternatives

No Action Alternative: The existing water supply would not be impacted under the No Action Alterative as no construction would occur.

Action Alternative: The Proposed Action will require access to municipal water systems managed by the City of Davis Water Division for construction and operation. It is anticipated that the existing water service line would be relocated and used to provide water to the Facility. A new 8-inch fire service line would also be required by the Project. It is anticipated that the City of Davis has the capacity to serve the Facility.

Mitigation

Contractors will coordinate with the City of Davis to minimize any impacts to local water

systems. USDA-ARS will obtain the proper permits to connect to existing municipal water infrastructure in the area.

The Facility is being designed to LEED V4 Silver standards to help minimize its carbon footprint. As such, it will have the following water-saving features incorporated into its design: low flow restroom lavatories (0.35 gpm), urinals (0.125 gpf), water closets (1.28 gpf), and showers (if included in the final design) (1.8 gpm).

3) Power and heating?

Alternatives

No Action Alternative: The No Action Alternative would not impact local or regional power and heating facilities. Current power and heating facilities would remain as is.

Action Alternative: The Proposed Action would increase USDA's power consumption from the existing grid. The Project will use multiple energy-saving technologies onsite, including high efficiency boilers, LED lighting, and unoccupied air change rate turn down. A high efficiency chiller, exhaust air heat recovery system, automated building controls, enhanced building envelope, and onsite photovoltaic and solar hot water heating will be evaluated for potential for use at the Facility. USDA-ARS will consider enrolling the Facility in the VCE program. Based on these features, it is anticipated that PG&E has the capacity to serve the Facility.

Mitigation

Contractors will coordinate with PG&E when working at the service entrance to minimize risk of damage and/or injury to construction workers. USDA-ARS will coordinate with PG&E and the City of Davis to obtain the proper permits required to connect to the existing electric infrastructure.

The Facility is being designed to LEED V4 Silver standards to increase energy efficiency, therefore minimizing the Facility's load on the system. Overall, the LEED framework provides for healthy, highly efficient, and cost saving green buildings. Buildings designed to LEED standards, have been found to consume 25 percent less energy on average (Fowler et al., 2011). The Facility will evaluate enrolling in VCE's program to utilize more renewable energy sources for its power needs. This will assist the USDA-ARS in meeting the requirements of the 2021 Executive Order 14057 Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability of net-zero emissions

building portfolio by 2045 and net-zero emissions from overall federal operations by 2050.

4) Solid waste management?

Alternatives

No Action Alternative: The No Action Alternative would not impact solid waste management as no additional solid wastes associated with construction would be generated.

Action Alternative: Solid waste will be generated during construction from packaging materials for equipment, scrap, as well as by construction workers. The contractor would be responsible for abatement, removal, and disposal of all solid waste according to Federal, state, and local regulations. During operation of the facility, solid waste will also be generated. It is anticipated that the City's contractor for solid waste collection will be able to accommodate the additional waste generated by the Project.

Mitigation

All solid waste, including recycling, will be disposed of properly according to Federal, state, and local regulations.

5) Sewer or storm drainage?

Alternatives

No Action Alternative: The No Action Alternative would not impact existing sewers or storm drains as no construction would occur.

Action Alternative: The Proposed Action will require connection to the municipal sewer system. Additionally, storm drainage will be affected by the Proposed Action, as stormwater would initially be directed to stormwater detention basins onsite and overflow from the basins would be directed to the municipal stormwater culvert. The existing man-made drainage will be regraded, and stormwater detention basins will be installed on the parcel. It is anticipated that the existing stormwater system has the capacity to receive stormwater from the parcel as the amount of stormwater directed at the municipal system must not exceed pre-development rates, see below.

Mitigation

Debris from the construction site will be properly disposed of so that they do not interfere

with runoff to storm drains. USDA-ARS will coordinate with the City of Davis to obtain the proper permits required to connect to the existing sewer infrastructure. Stormwater onsite would be directed to stormwater detention basins where water would infiltrate soil. The Facility design may also include features, such as also includes permeable pavers and rain gardens, which would allow water to permeate the soil onsite.

W. Affect local land use through effects on:

3) Aesthetics?

Alternatives

No Action Alternative: The No Action Alternative would not impact existing aesthetics of the area as no construction would occur.

Action Alternative: The Proposed Action would involve the introduction of a two story, approximately 66,000 SF Laboratory and Office Facility. During construction, aesthetics of the area would be affected by the presence of construction vehicles and equipment onsite. The Facility post-construction would be consistent with the aesthetics of the surrounding light commercial/industrial development.

Mitigation

USDA will direct its contractors to minimize disturbance to vegetation and soil during Project construction. During construction, work areas would be maintained in an orderly manner and trash and construction debris removed. Following construction activities, disturbed areas would be restored and revegetated. Native landscaping is planned for the areas surrounding the Facility and would complement the overall aesthetic of the Facility. The Facility is being designed for consistency with aesthetic qualities of the surrounding commercial/industrial areas.

Y. Cause or contribute to unacceptable noise level?

Alternatives

No Action Alternative: The No Action Alternative would not alter existing noise in the area as no construction would occur.

Action Alternative: The ambient noise levels at the parcel are high due to its location adjacent to Interstate-80. The Proposed Action would temporarily increase noise in the area during

construction due to construction vehicles, equipment, and construction activities. Table 3-3 provides typical construction equipment noise levels.

Table 3-4: Typical Construction Equipment Noise Levels[a,b]

Generic Construction Equipment	Average Noise at 50 feet (dBA)
Backhoes	80
Pickup truck	55
Dump truck	84
Small trimmers (sheers)	85
Bulldozers	85
Concrete pumper truck	82
Small crane	85
Semi-truck (deliveries)	84
Lift	85
Bobcat grading vehicle	85

(a) Values taken from the Federal Highway Administration Construction Noise Handbook
(b) Values taken from the Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, 2006

The increase in noise is anticipated to be minor, temporary, and intermittent in nature. During operation, a standby generator onsite may be used during power outages to power critical equipment in the Facility. Use of this standby generator would generate noise, but its use would be rare and temporary. There are a few commercial businesses nearby as well as a daycare center/school (Montessori Country Day II facility) that could experience elevated noise levels during construction and the infrequent use of the standby generator.

Noise levels resulting from construction equipment are dependent on several factors, including the number and type of equipment operating, the level of operation, the distance between sources and receptors, and any screening such as other buildings or vegetation, that may be present. During a typical day, equipment would not be operated continuously at peak levels. Construction vehicles will not idle for more than 5.0 minutes at any location While the average noise levels would represent noise levels near the construction site, the noise would attenuate with increasing distance, fading into ambient background levels at greater distances.

The types of equipment may be used at various times and for various periods of time. Typically, construction equipment has a usage factor ranging between 15 and 50 percent of the day, according to the FHWA Roadway Construction Noise Handbook. However, the actual amount of

use for each type of equipment would vary day to day. The composite L_{eq}, or average noise level, generated by construction equipment is a daily average of all equipment operating based on their respective FHWA average usage factors. The typical construction equipment required for the building assembly phase of construction is listed in Table 3-5, along with the average equipment sound levels from FHWA and cumulative construction sound levels based on usage factors at 50 and 600 feet. The Montessori Country Day II facility is located approximately 600 feet from the center of construction activities.

Table 3-5: Construction Activities (Building Assembly Phase)

Construction Phase	Construction Equipment	Equipment Noise Level at 50 ft (dBA)	Usage Factor	Average Daily Noise Leve at 50 ft (dBA)	Composite Noise Level at 50 ft (dBA)	Composite Noise Level at 600 ft (dBA)
Building Assembly (20 weeks)	Backhoe	80	40%	76	87	65
	Backhoe	80	40%	76		
	Pickup	55	40%	51		
	Pickup	55	40%	51		
	Pickup	55	40%	51		
	Dump Truck	84	40%	80		
	Crane	85	16%	77		
	Semi-Truck	84	5%	71		
	Semi-Truck	84	5%	71		
	Semi-Truck	84	5%	71		
	Lift	85	20%	78		
	Lift	85	20%	78		
	Lift	85	20%	78		

1. Equipment Noise Level and Usage Factor from FHWA Construction Noise Handbook
2. Composite noise level is the sum total average daily noise level based on equipment usage factor
3. Calculated sound level at 600 feet per inverse distance law
4. Semi-Truck usage factor set to 5% as the trucks are delivery vehicles that would not remain onsite

The calculated construction sound level at the Montessori Country Day II facility is approximately 65 dBA outside the building. This is a highly conservative calculation due to the fact that no shielding or ground absorption are considered in the calculation. In reality, there would be some shielding provided by the neighboring structures and the equipment and materials onsite. During building assembly some of the equipment would be located on the opposite side of the structure from the Montessori Country Day II facility, thus the Project itself would shield that equipment from emitting noise in the direction of the facility.

According to the World Health Organization Environmental Noise Guidelines, the differences between outdoor and indoor sound levels of a building are usually estimated at around 10 dBA for fully open windows, 15 dBA for tilted or half-open windows, and about 25 dBA for closed windows. As such, it is anticipated that the sound levels due to construction inside the Montessori Country Day II facility building could be up to 40 dBA at the nearest corner of the facility. Due to the existing urban environment of the Project area, it is expected that the current daytime ambient sound levels would be above the ANSI acoustical performance criteria for classrooms, when the facility's windows are open, without consideration of the Proposed Action. Noise from construction activities will be temporary and there will be periods where no construction activities are occurring and noise construction noise is generated.

Based on this, it is not anticipated that construction or operation of the Proposed Action would cause or contribute to an unacceptable noise level. It is expected that noise levels during operations will generally be similar to existing levels.

Mitigation

Construction activities will be scheduled between 7:00 am and 7:00 pm on Mondays through Fridays, and between the hours of 8:00 am and 8:00 pm on Saturdays and Sundays, per Section 24.02.040 of the Davis Municipal Code. The following mitigation measure shall be implemented by contractors during construction, if applicable:

- Maintain vehicles in good working order and turn off vehicles and equipment when not in use. Limit idling of vehicles to no more than 5.0 minutes at any location.
- Use properly functioning mufflers on appropriate machinery.
- Provide written notice to residents and businesses within 1,000 feet of the construction zone, advising them of the estimated construction schedule. This notice will include school administrators at the Montessori Country Day II facility. This written notice will be provided at least one week prior to the start of construction at that location.
- A pre-construction meeting will be held for adjacent interested parties to attend to address any concerns, including noise.
- Display notices with information including, but not limited to, contractor contact telephone number(s) and proposed construction dates and times in a conspicuous manner, such as on construction site fences.
- A noise disturbance coordinator will be identified who would promptly respond to noise complaint calls and monitor noise and construction activity.

- Per the Davis Municipal Code, no individual piece of equipment shall produce a noise level exceeding 83 dBA at a distance of 25 feet. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to twenty feet from the equipment as possible.
- Per the Davis Municipal Code, the noise level at any point outside of the property plane of the project shall not exceed 86 dBA.
- Note, the Davis Municipal Code shall not be applicable to impact tools and equipment; provided, that such impact tools and equipment shall have intake and exhaust mufflers recommended by manufacturers thereof and approved by the Director of Public Works as best accomplishing maximum noise attenuation, and that pavement breakers and jackhammers shall also be equipped with acoustically attenuating shields or shrouds recommended by the manufacturers thereof and approved by the Director of Public Works as best accomplishing maximum noise attenuation. In the absence of manufacturer's recommendations, the Director of Public Works may prescribe such means of accomplishing maximum noise attenuation as he or she may determine to be in the public interest.
- Employ equipment that is powered by electric or natural gas engines, as opposed to those powered by gasoline fuel or diesel, when feasible.
- Locate generators and staging areas as far from the day school as possible to reduce both noise and air quality impacts.
- Limit the use of high impact equipment when children are present, if appropriate.
- Temporary noise barriers or fencing will be used to minimize noise impacts on adjacent properties, if appropriate.

CC. Have impacts from energy usage or alternative energy?

Alternatives

No Action Alternative: The No Action Alternative would not affect energy usage or alternative energy in the area as no construction would occur.

Action Alternative: Construction and operation of the Proposed Action will require energy usage. The Facility will be designed to LEED V4 Silver which will help minimize its energy needs. To the extent practical, the Project will be designed to meet the goals established in Executive Order 14057, subject to Federal appropriations.

The Project is within the early design phase (15%) and extensive coordination between the City of Davis, the expected site users (researchers) and the Federal agencies is ongoing to meet Project objectives while minimizing fossil fuel use and GHG pollution and maximizing clean electricity throughout the Facility. Early implementation and planned phasing of carbon net-zero technologies into the Project design will reduce the need for costly retrofitting.

Mitigation

The Facility is being designed to LEED V4 Silver standards to help minimize its carbon footprint. As such, it will have the following energy-saving features incorporated into its design: high efficiency boilers, LED lighting, and unoccupied air change rate turn down. A high efficiency chiller, exhaust air heat recovery system, automated building controls, enhanced building envelope, and onsite photovoltaic and solar hot water heating will be evaluated for potential for use at the Facility. Additionally, the USDA-ARS will consider enrolling the Facility in the VCE program, which will allow the Facility to increase the amount of renewable energy (wind and solar) that is being used for their needs to levels above what is currently available from PG&E.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The following sections discuss the recommended alternative for the Project as well as a summary of mitigation commitments.

4.1 Recommended Alternative

The Proposed Action, which is the construction of the Facility, addresses the purpose for the Project, which is to create additional laboratory, office, administrative, and technical support space to meet USDA-ARS research demands. The No Action Alternative does not address the Project purpose, however. As such, it is not the recommended alternative.

4.2 Summary of Mitigation Commitments

The following is a summary of mitigation commitments described in Section 3.2.

A. Cause or contribute to soil erosion by wind or water?

- A Project-specific Stormwater Pollution Prevention Plan (SWPPP) to describe the BMPs to be implemented during construction would be prepared for the Project as part of the submittals for the Construction General Permit (CGP) from the State Water Resources Control Board. The SWPPP would include appropriate BMPs to properly manage and minimize soil erosion by temporarily stabilizing exposed soils and controlling sedimentation. No discharge of pollutants from vehicle and equipment cleaning would be allowed into any storm drains or watercourses. Spill containment kits would be maintained onsite at all times during construction operations.

  Disturbance will be limited to that necessary for the construction of the Facility. Once Project construction is completed, all disturbed ground surfaces that have not been converted to impervious surface (i.e. building, parking areas, sidewalks, pavement), would be revegetated to stabilize the parcel. Permanent erosion control measures such as bio-filtration strips and swales to receive storm water discharges from paved or impervious surfaces would be incorporated into the design and construction of the Project. The site drainage design at a minimum will meet Federal, State of California, and City of Davis stormwater quantity and quality requirements.

B. Affect soil surface stability?

- Refer to the mitigation described in Section 4.2, Response A.

H. Affect chemical quality of ground or surface waters (pH, dissolved oxygen, nutrients, dissolved solids, pesticides, etc.)?

- A Project-specific SWPPP to describe the BMPs to be implemented during construction would be prepared for the Project. A spill response plan would be prepared for construction activities as part of the SWPPP. BMPs outlined in the SWPPP would prevent, to the extent practicable, minor spills or releases of hazardous materials to stormwater, the ground, or local drains that could contribute to degraded water quality. If a spill were to occur, it would be cleaned promptly by trained personnel, reported to the appropriate agencies, and disposed of in accordance with local, State, and Federal policies. The design for the Facility includes stormwater detention basins that would provide stormwater control during construction and operations.

  Phase I and Phase II Environmental Site Assessments were performed from 2019-2021 and concluded there was no potential for exposure of contaminants during construction. The active construction site will have restricted access and regular monitoring to ensure compliance with the SWPPP and prevent accidental spills which could affect ground water quality. During operations, the Facility would participate in the Hazardous Materials Business Plan (HMBP) program, which includes spill response planning, to prevent or minimize harm to public health and the environment from a release or threatened release of a hazardous material.

I. Affect physical quality of ground or surface waters (suspended solids, turbidity, color, oil temperature, etc.)?

- A Project-specific SWPPP to describe the BMPs to be implemented during construction would be prepared for the Project. The SWPPP would include approved components to reduce erosion, suspended solids, turbidity, and downstream sedimentation that may degrade water quality and adversely impact aquatic life. Graded areas would be protected from erosion using a combination of silt fences, fiber rolls, etc. along toes of slopes or along edges of designated staging areas, and erosion control netting (such as jute or coir) on sloped areas. Refueling and equipment maintenance would occur at a minimum of 50 feet from any aquatic habitat, culvert, or drainage feature.

  The design for the Facility includes stormwater detention basins that would provide stormwater control during construction and operations. The Facility design may also include features, such as permeable pavers and rain gardens, which would allow water to permeate the soil onsite. The site drainage design at a minimum will meet Federal requirements defined by the Energy

Independence Security Act of 2007 (EISA) State law, and City of Davis stormwater quantity and quality requirements. EISA Section 438 requires the Project to maintain predevelopment hydrology and prevent net increase in stormwater runoff for the design storm event. The design storm event is the 95th percentile rainfall depth and is based on 24-hour rainfall depth. Post-construction rate, volume, duration, and temperature of runoff must not exceed pre-development rates.

J. Cause odors or release odoriferous substances to air or water?

- Contractors will be required to turn off vehicles and equipment when not in use to reduce emissions odors from idling. Substances used during construction of the Project that may create odors, such as paints, solvents, adhesives, etc., will be used according to the manufacturer's guidelines.

L. Release particulate matter to the air?

- Contractors will be required to comply with YSAQMD mitigation measures for construction dust as outlined in the Handbook for Assessing and Mitigation Air Quality Impacts (2007). All driveways, sidewalks, and parking lots shall be paved as soon as possible during construction to prevent fugitive dust.

  The following fugitive dust mitigation measure shall be implemented by contractors during construction:

  - Water the construction site daily based on type of operation, soil, and wind exposure.
  - Cover trucks hauling soil or other loose materials.
  - Plant vegetative ground cover in disturbed areas as soon as possible.
  - Cover inactive storage piles.
  - Sweep streets if visible soil material is carried out from the construction site.
  - Treat accesses to a distance of 100 feet from the paved road with a 6- to 12-inch layer of wood chips, gravel or mulch.
  - Suspend excavation and grading activities if wind speeds exceed 25 mph.
  - Display notices with information including contact information for any dust complaints in a conspicuous manner, such as on construction site fences.

The following mitigation shall be implemented by contractors regarding construction equipment exhaust mitigation and other emission sources:

- Construction vehicles and/or equipment will comply with CARB's In-Use Off-Road Diesel-Fueled Fleets Regulation. Construction vehicles will use a CARB Tier 3 engine when feasible.
- Maintain vehicles in good working order and turn off vehicles and equipment when inactive. Limit idling of vehicles to no more than five minutes.
- Employ equipment and power tools that are powered by electric or natural gas engines.
- Use reformulated and emulsified fuels, if feasible.
- Use diesel oxidation catalysts and/or catalyzed diesel particulate traps on diesel equipment.
- Limit vehicle speeds to 15 miles per hour onsite.
- Recommend carpooling to the Project to reduce number of vehicles onsite.

N. Release substances for which there is a National Ambient Air Quality Standard (i.e., sulfur oxides, nitrogen oxides, carbon monoxide, lead, particulate matter, etc.)?

- Refer to the mitigation described in Section 4.2, Response L.

V. Affect local or regional systems related to:

1) Transportation?

Construction activities will primarily be scheduled during daytime hours. Contractors will coordinate proper construction signage near the Project as necessary to make drivers aware of the potential for increased hazards associated with construction vehicles. Appropriate changes to signaling, signage, and parking will be instituted once the Facility begins operations.

2) Water supply?

Contractors will coordinate with the City of Davis to minimize any impacts to local water systems. USDA-ARS will obtain the proper permits to connect to existing municipal water infrastructure in the area.

The Facility is being designed to LEED V4 Silver standards to help minimize its carbon footprint. As such, it will have the following water-saving features incorporated into its

design: low flow restroom lavatories (0.35 gpm), urinals (0.125 gpf), water closets (1.28 gpf), and showers (if included in the final design) (1.8 gpm).

3) Power and heating?

   Contractors will coordinate with PG&E when working at the service entrance to minimize risk of damage and/or injury to construction workers. USDA-ARS will coordinate with PG&E and the City of Davis to obtain the proper permits required to connect to the existing electric infrastructure.

   The Facility is being designed to LEED V4 Silver standards to increase energy efficiency, therefore minimizing the Facility's load on the system. Overall, the LEED framework provides for healthy, highly efficient, and cost saving green buildings. Buildings designed to LEED standards, have been found to consume 25 percent less energy on average (Fowler et al., 2011). The Facility will evaluate enrolling in VCE's program to utilize more renewable energy sources for its power needs. This will assist the USDA-ARS in meeting the requirements of the 2021 Executive Order 14057 Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability of net-zero emissions building portfolio by 2045 and net-zero emissions from overall federal operations by 2050.

4) Solid waste management?

   All solid waste, including recycling, will be disposed of properly according to Federal, state, and local regulations.

5) Sewer or storm drainage?

   Debris from the construction site will be properly disposed of so that they do not interfere with runoff to storm drains. USDA-ARS will coordinate with the City of Davis to obtain the proper permits required to connect to the existing sewer infrastructure. Stormwater onsite would be directed to stormwater detention basins where water would infiltrate soil. The Facility design may also include features, such as also includes permeable pavers and rain gardens, which would allow water to permeate the soil onsite.

W. Affect local land use through effects on:

3) Aesthetics?

USDA will direct its contractors to minimize disturbance to vegetation and soil during Project construction. During construction, work areas would be maintained in an orderly manner and trash and construction debris removed. Following construction activities, disturbed areas would be restored and revegetated. Native landscaping is planned for the areas surrounding the Facility and would complement the overall aesthetic of the Facility. The Facility is being designed for consistency with aesthetic qualities of the surrounding commercial/industrial areas.

Y. Cause or contribute to unacceptable noise level?

- Construction activities will be scheduled between 7:00 am and 7:00 pm on Mondays through Fridays, and between the hours of 8:00 am and 8:00 pm on Saturdays and Sundays, per Section 24.02.040 of the Davis Municipal Code. The following mitigation measure shall be implemented by contractors during construction, if applicable:

    - Maintain vehicles in good working order and turn off vehicles and equipment when not in use. Limit idling of vehicles to no more than 5.0 minutes at any location.
    - Use properly functioning mufflers on appropriate machinery.
    - Provide written notice to residents and businesses within 1,000 feet of the construction zone, advising them of the estimated construction schedule. This notice will include school administrators at the Montessori Country Day II facility. This written notice will be provided at least one week prior to the start of construction at that location.
    - A pre-construction meeting will be held for adjacent interested parties to attend to address any concerns, including noise.
    - Display notices with information including, but not limited to, contractor contact telephone number(s) and proposed construction dates and times in a conspicuous manner, such as on construction site fences.
    - A noise disturbance coordinator will be identified who would promptly respond to noise complaint calls and monitor noise and construction activity.
    - Per the Davis Municipal Code, no individual piece of equipment shall produce a noise level exceeding 83 dBA at a distance of 25 feet. If the device is housed within a structure

on the property, the measurement shall be made outside the structure at a distance as close to twenty feet from the equipment as possible.

- Per the Davis Municipal Code, the noise level at any point outside of the property plane of the project shall not exceed 86 dBA.
- Note, the Davis Municipal Code shall not be applicable to impact tools and equipment; provided, that such impact tools and equipment shall have intake and exhaust mufflers recommended by manufacturers thereof and approved by the Director of Public Works as best accomplishing maximum noise attenuation, and that pavement breakers and jackhammers shall also be equipped with acoustically attenuating shields or shrouds recommended by the manufacturers thereof and approved by the Director of Public Works as best accomplishing maximum noise attenuation. In the absence of manufacturer's recommendations, the Director of Public Works may prescribe such means of accomplishing maximum noise attenuation as he or she may determine to be in the public interest.
- Employ equipment that is powered by electric or natural gas engines, as opposed to those powered by gasoline fuel or diesel, when feasible.
- Locate generators and staging areas as far from the day school as possible to reduce both noise and air quality impacts.
- Limit the use of high impact equipment when children are present, if appropriate.
- Temporary noise barriers or fencing will be used to minimize noise impacts on adjacent properties, if appropriate.

CC. Have impacts from energy usage or alternative energy?

- The Facility is being designed to LEED V4 Silver standards to help minimize its carbon footprint. As such, it will have the following energy-saving features incorporated into its design: high efficiency boilers, LED lighting, and unoccupied air change rate turn down. A high efficiency chiller, exhaust air heat recovery system, automated building controls, enhanced building envelope, and onsite photovoltaic and solar hot water heating will be evaluated for potential for use at the Facility. Additionally, the Facility intends to enroll in the VCE program, which will allow the Facility to increase the amount of renewable energy (wind and solar) that is being used for their needs to levels above what is currently available from PG&E.

5.0 LIST OF PREPARERS

The environmental assessment for the Project was prepared by Burns & McDonnell under the direction of USDA-ARS. The following is a list of preparers of this document.

USDA-ARS

- Cal Mather, Chief Safety, Health and Environmental Management Branch
- Ken Cushman, Area Safety & Occupational Health Manager
- Linda Wurzberger, Chief RPMB, Administration and Financial Management
- Frank King, Supervisory Management
- Richard Williams, Engineering Project Management
- Lindsey David, Environmental Protection Specialist

USACE

- Keleigh Duey, Environmental Manager
- Andrea Meier, Chief, Environmental Analysis Section
- Mariah Brumbaugh, NEPA Regional Technical Specialist
- Tatum Clinton-Selin, Historian
- Jessica Phelps, Senior Archaeologist and Acting Chief, Cultural Resources Section

Burns & McDonnell

- Steve Thornhill, Project Manager
- Tara Krahe, Environmental Engineer
- Crystal Chang, Environmental Engineer
- Kate Samuelson, Environmental Scientist
- Amanda Chao, Environmental Scientist
- Emily Burns, Environmental Scientist
- Saundie Franz, Assistant Environmental Scientist

6.0 REFERENCES

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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.

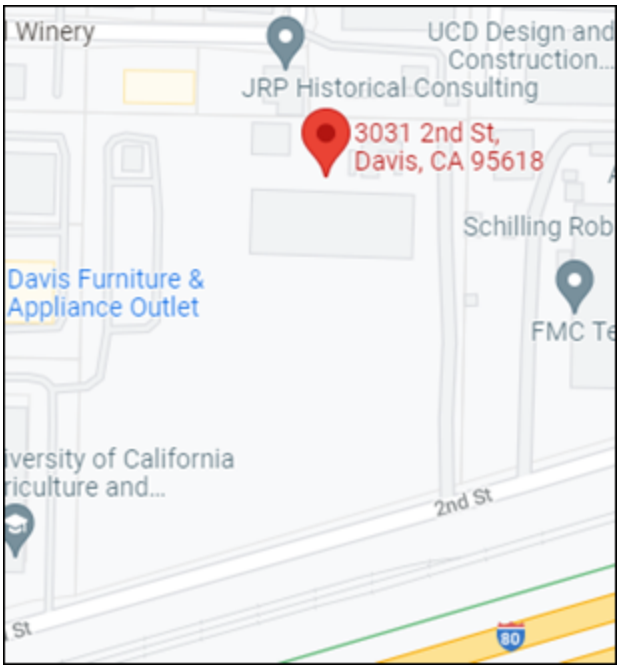

Figure 1. Area of Interest (TIGERweb - census.gov)

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,

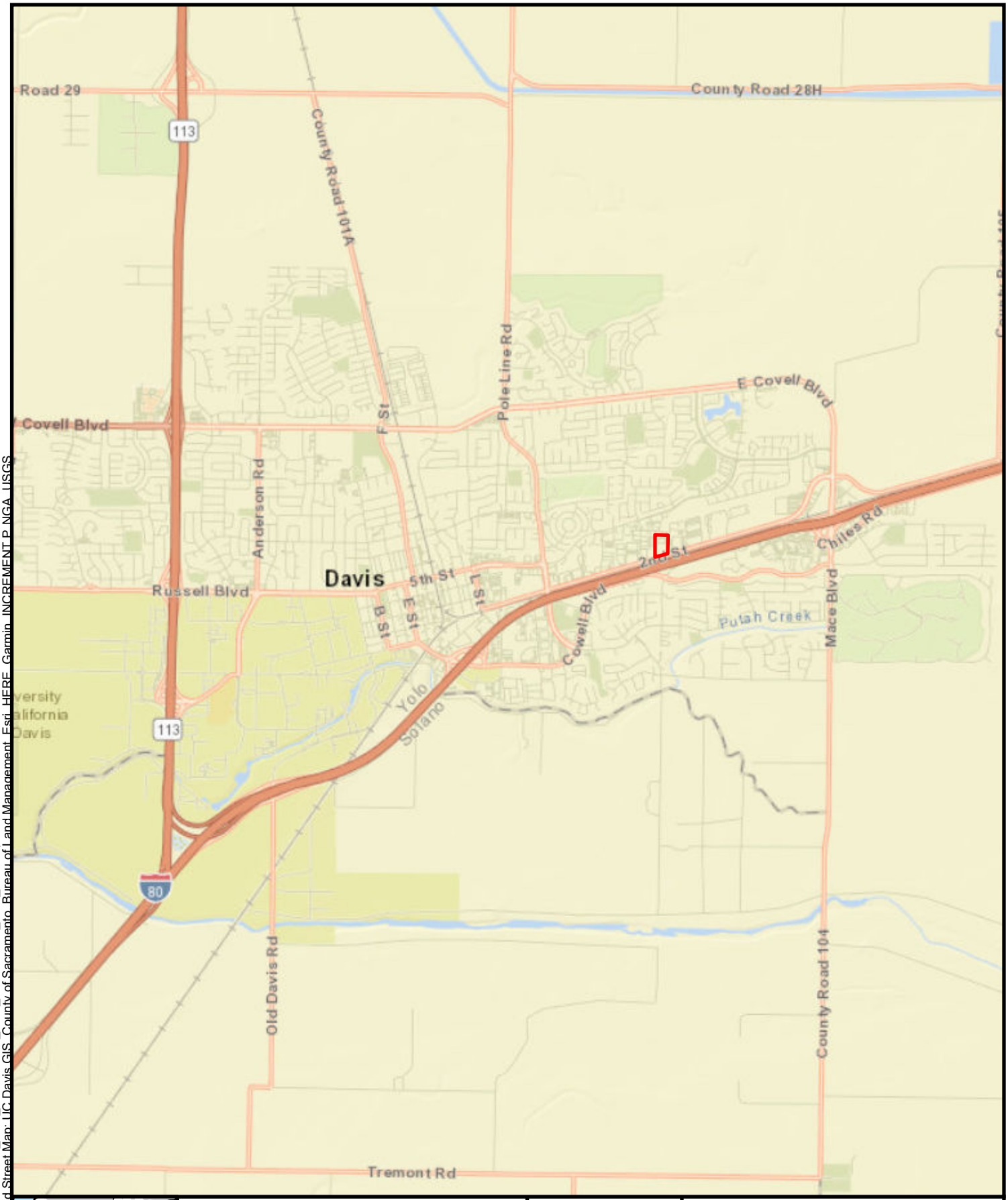
Craig Adams
Wetland Scientist

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



Project Area

NORTH

1 0.5 0 1

Miles

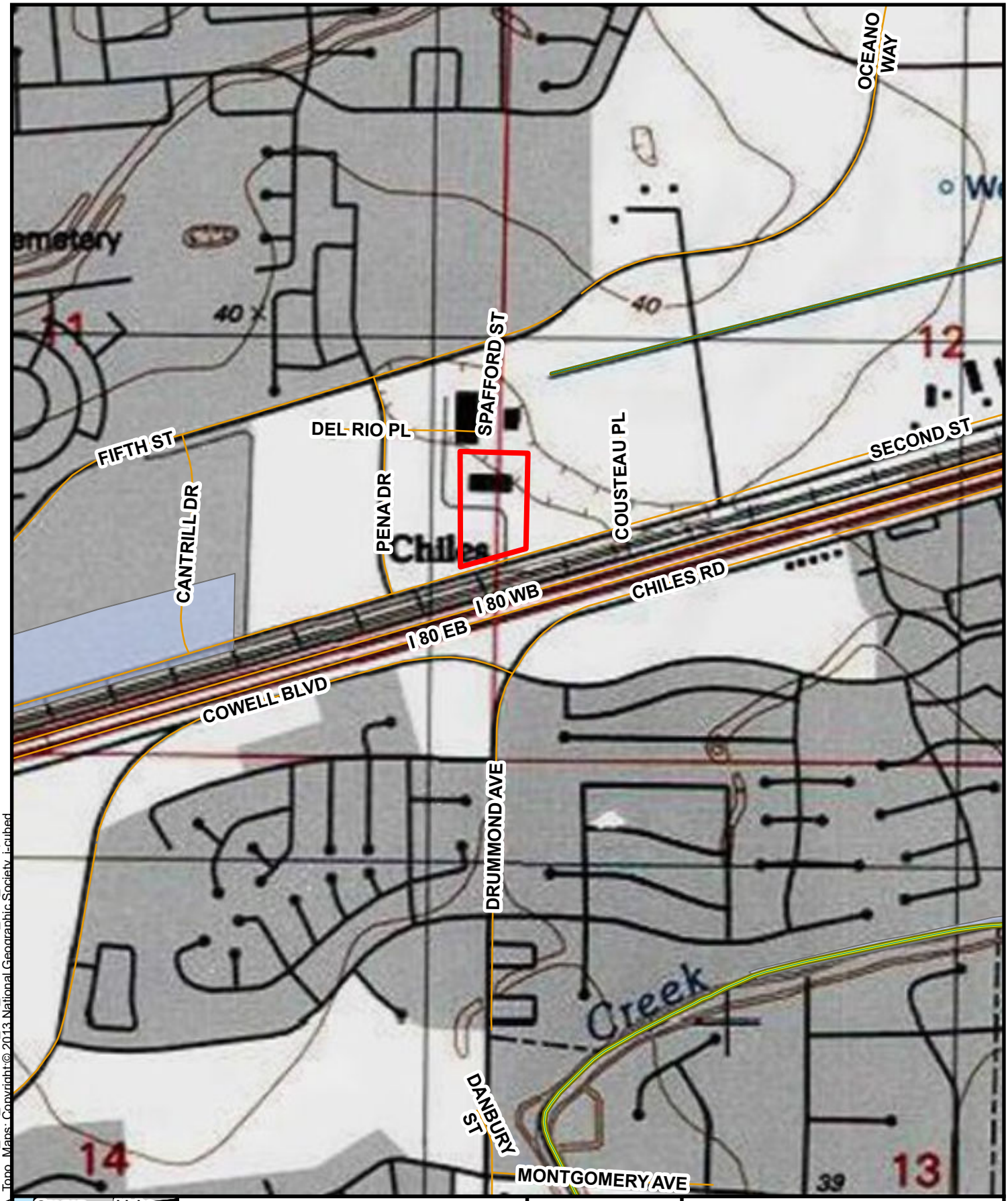
BURNS McDONNELL

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

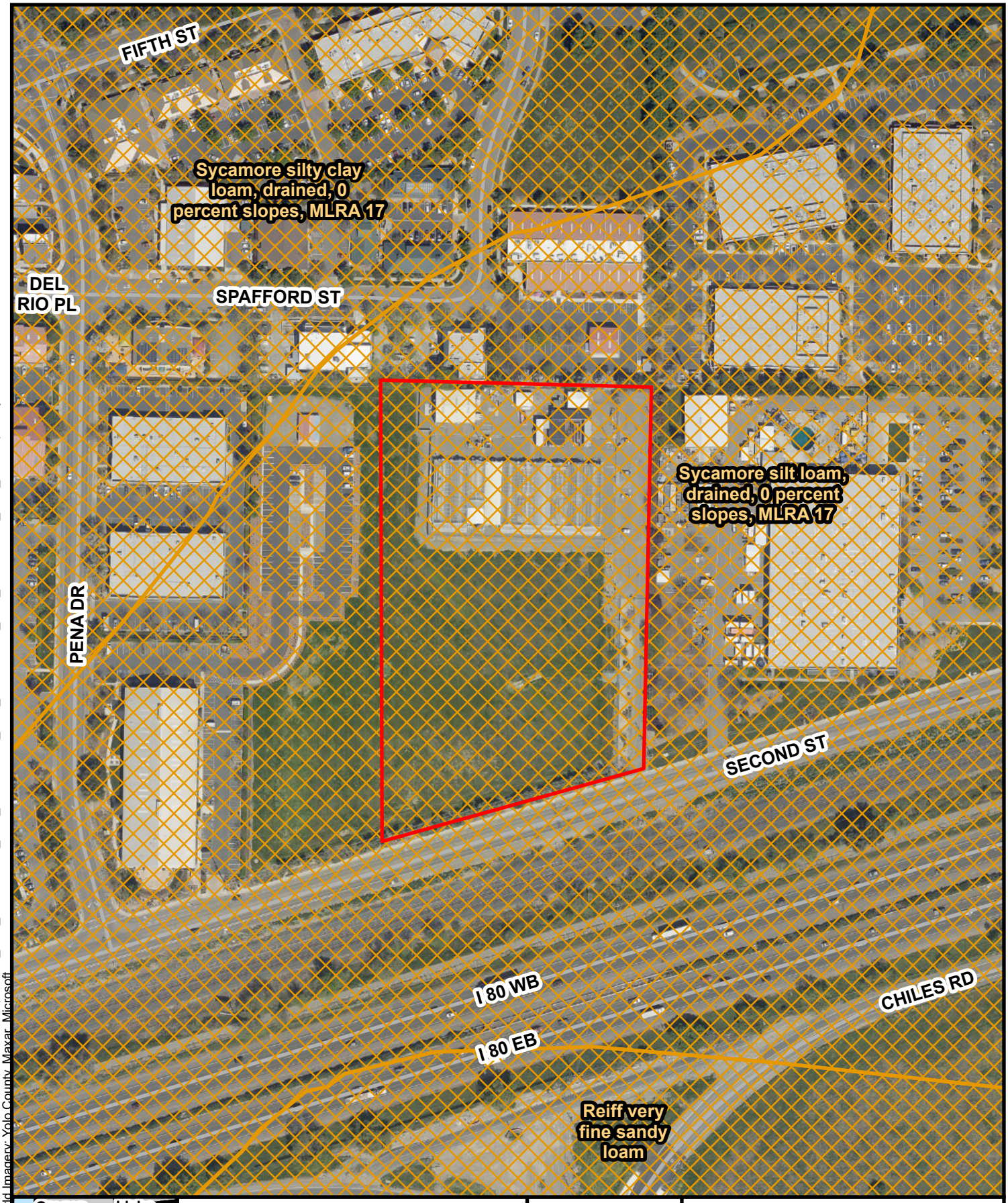
BURNS McDONNELL

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

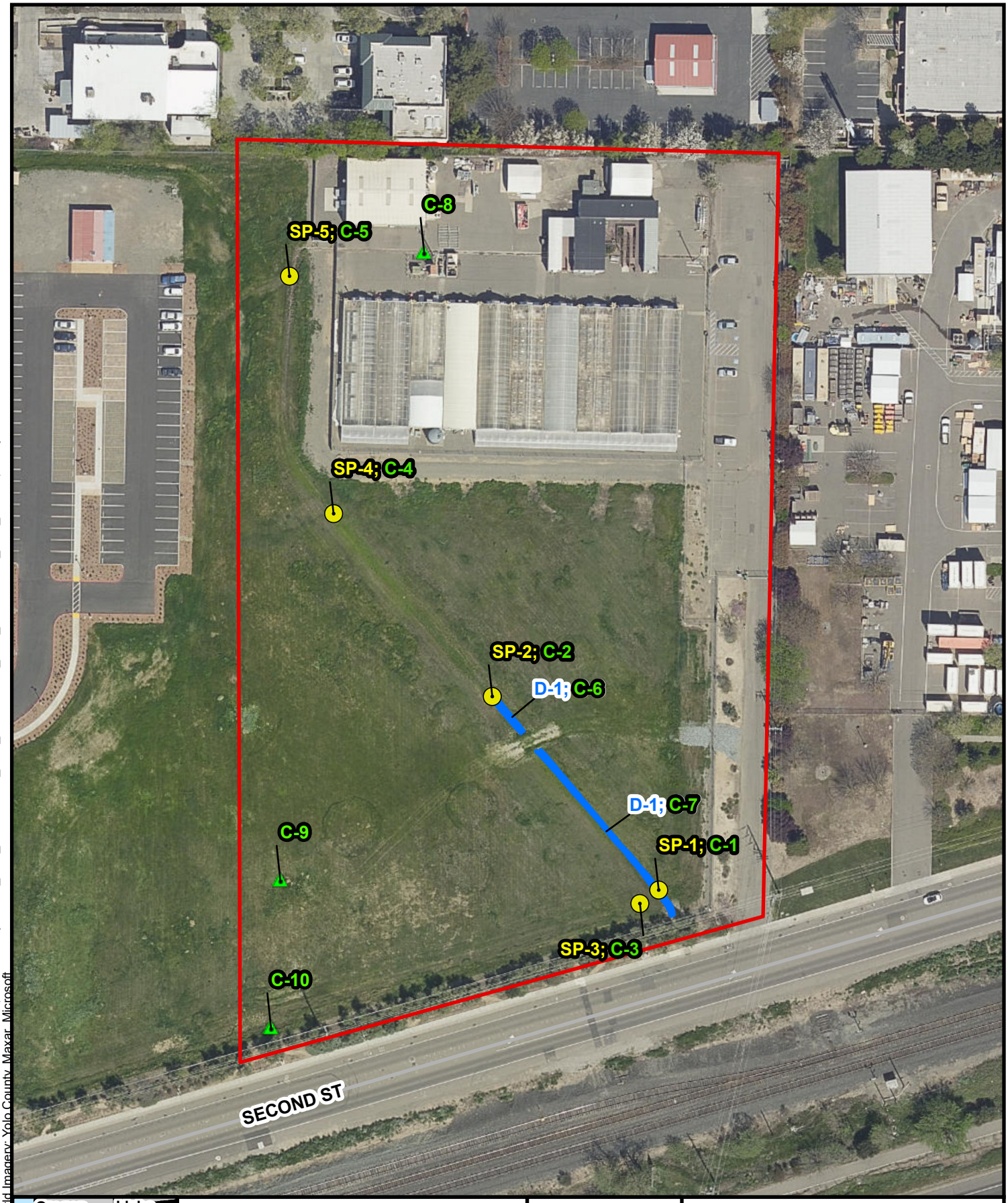


Figure A-4
Delineated Drainages Map
Research and Development Center Facility Project
USDA-ARS
Davis, California

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)	%	Redox Features Color (moist)	%	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)	Matrix %	Redox Features Color (moist)	Redox Features %	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.

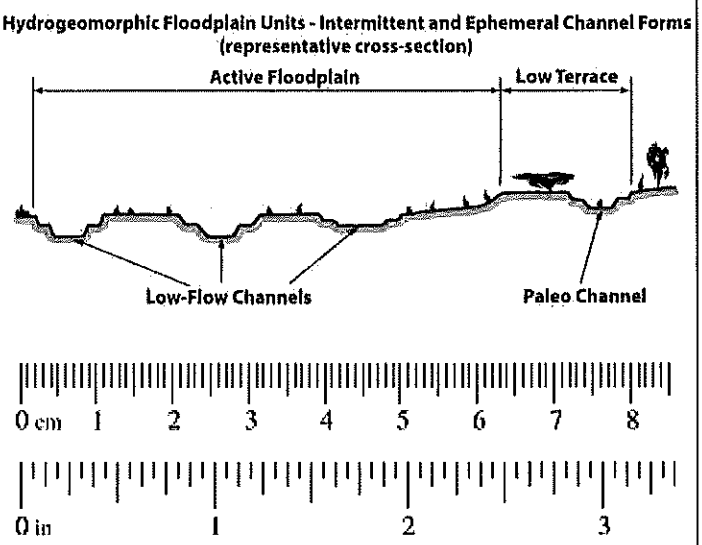
Brief site description: The site area consists primarily of maintained grasslands & developed land. A man-made ditch was present, which was used for greenhouse water & stormwater runoff. This ditch ties directly into a municipal stormwater drain, located at the southeast corner of the site.

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 patterns
☐ 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
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ 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.

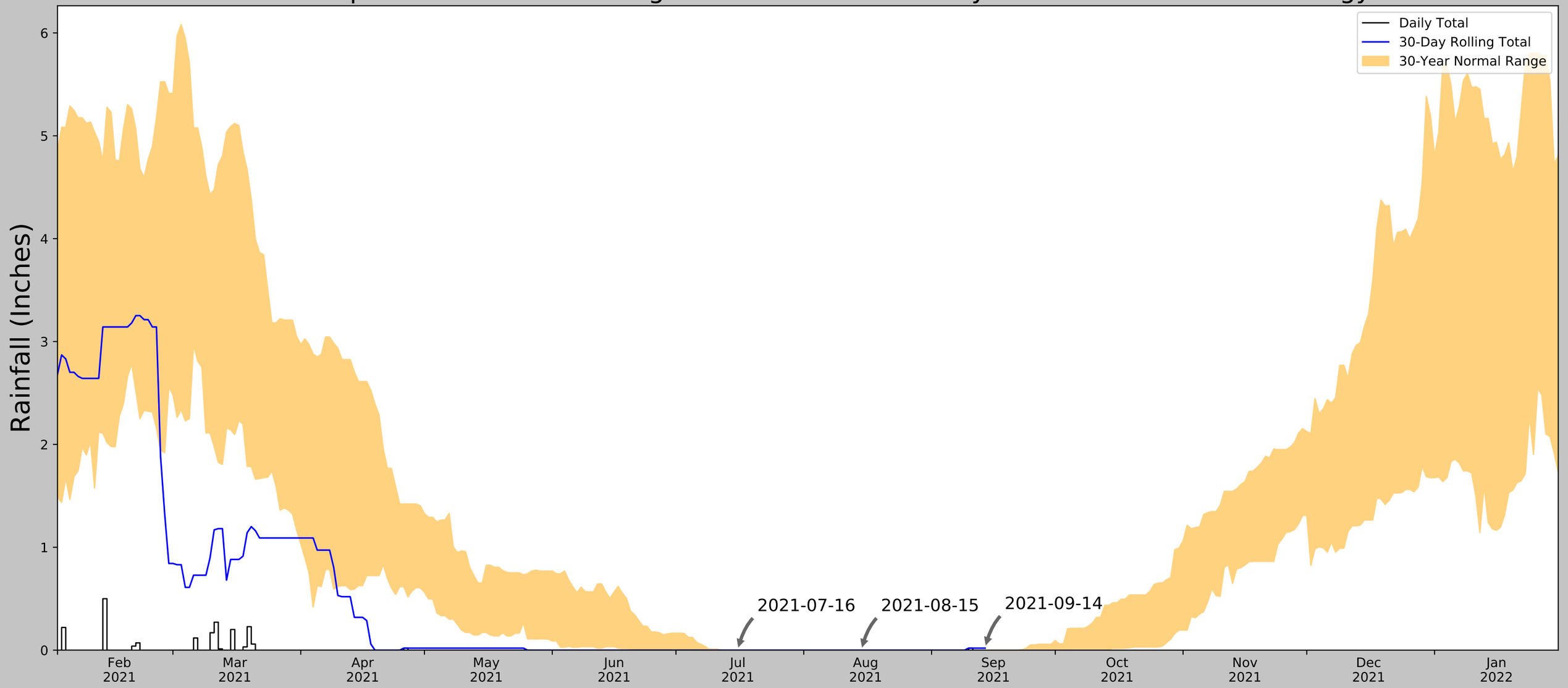
Photograph C-8: View of drainage leading into upland swale, facing west.

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	30th %ile (in)	70th %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,

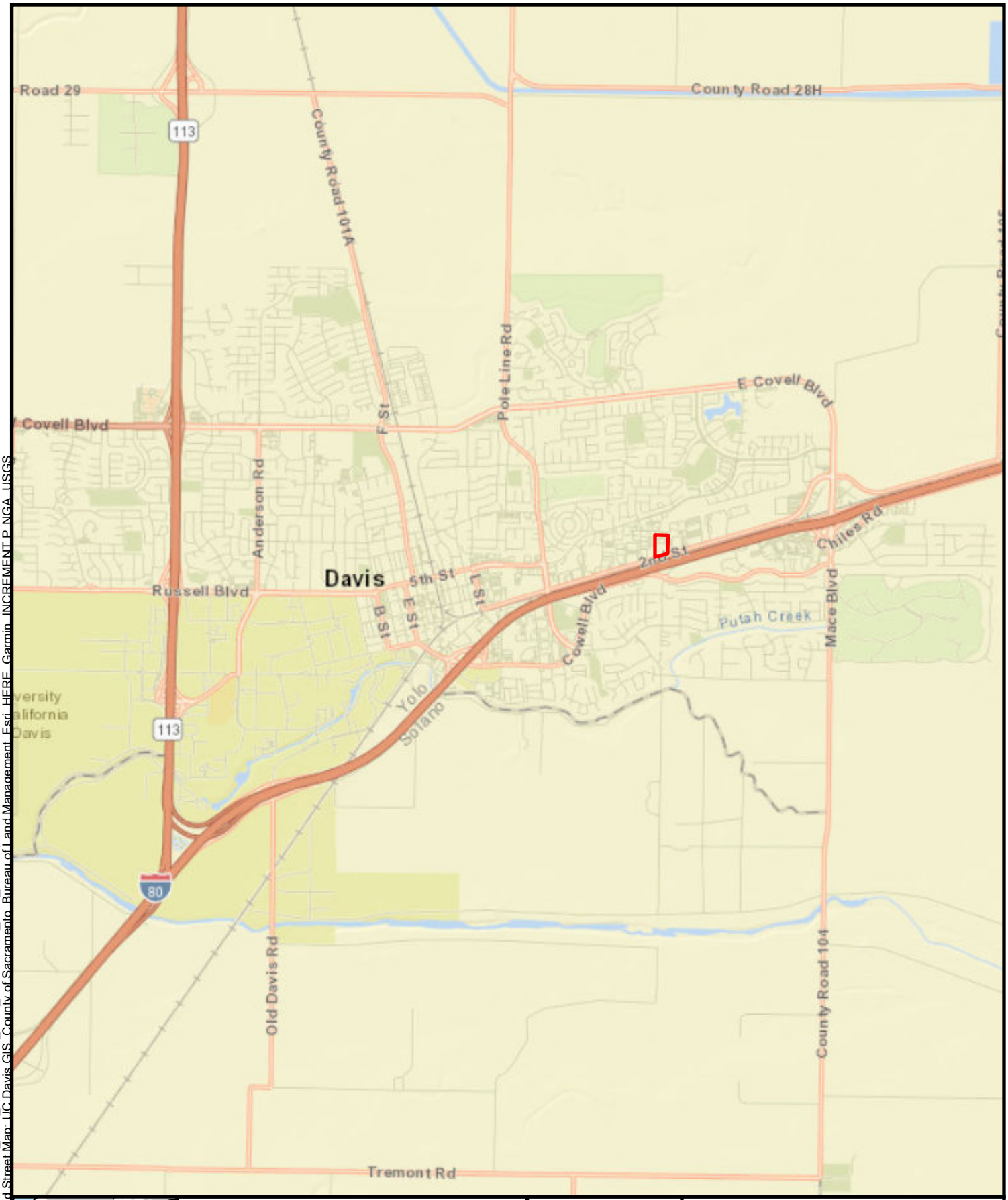
Craig Adams
Environmental Scientist

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



Project Area

NORTH

1 0.5 0 1

Miles

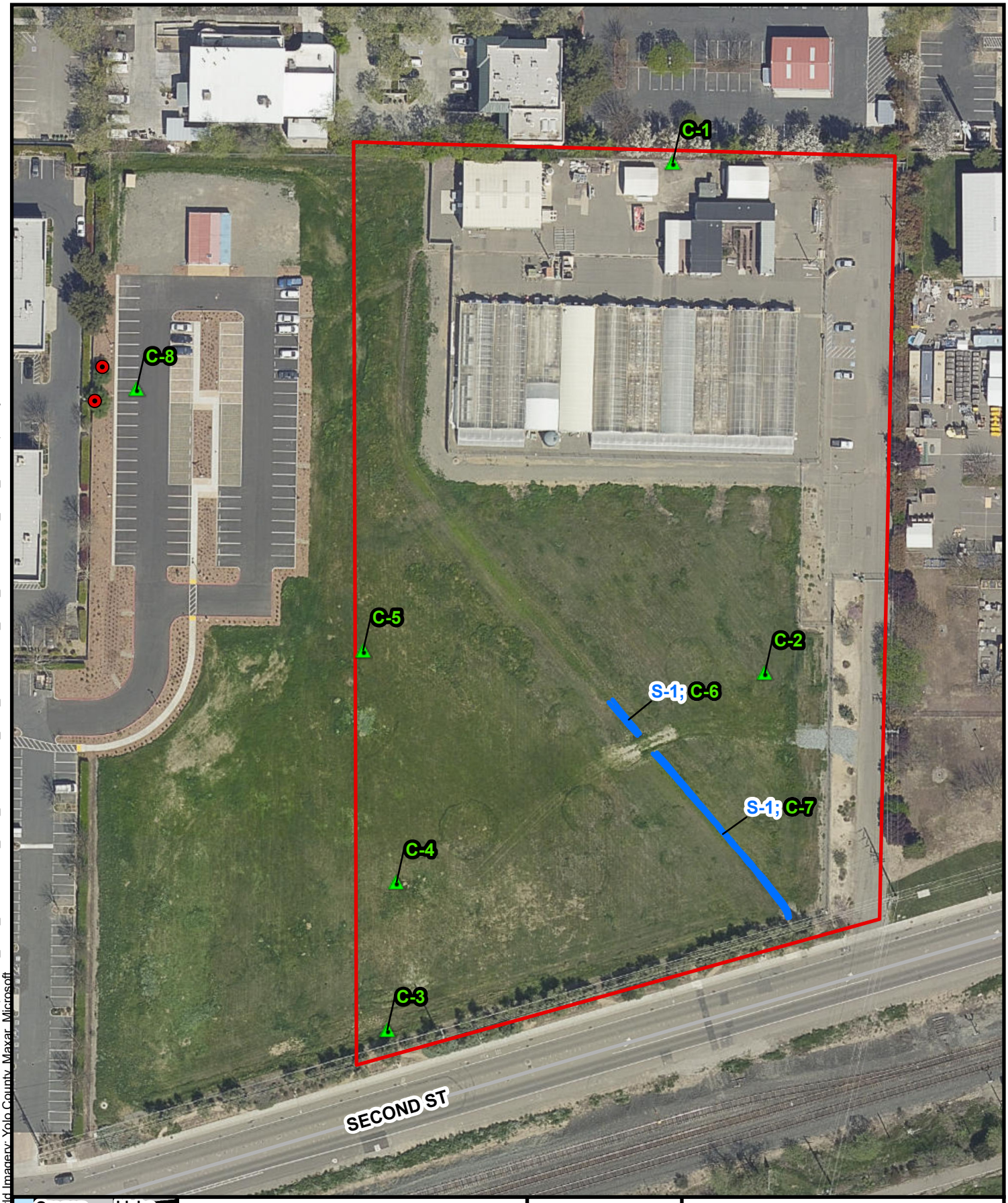
BURNS McDONNELL

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
Ephemeral Stream (S)
Street
Photo Point (C)
Elderberry Tree

NORTH

0 50 100
Feet

BURNS McDONNELL

Figure A-2
Habitat Assessment 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 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

Duey, Keleigh L CIV USARMY CESPK (USA)

From: Duey, Keleigh L CIV USARMY CESPK (USA)
Sent: Wednesday, January 5, 2022 5:27 PM
To: Duey, Keleigh L CIV USARMY CESPK (USA)
Subject: USDA Agricultural R&D Facility, Davis CA, Draft EA Available, Comments Requested by 18JAN2022
Attachments: USDA-ARS R&D Facility Aggie Advertisement.png

Follow Up Flag: Follow up
Flag Status: Flagged

To All Interested Parties,

The U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS) has prepared a Draft Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the proposed Agricultural Research and Development Center Facility to be constructed at 3031 2nd Street, Davis, CA. The USDA-ARS is requesting your review of the EA during the 10-day public review period, ending on January 18, 2022. The public has been notified via the local newspaper in both the Davis Enterprise and the California Aggie.

The United States Army Corps of Engineers (USACE) is assisting the USDA-ARS with environmental compliance, design and construction of the Facility.

Please visit the USACE, Sacramento District website to access the EA/FONSI:
https://www.spk.usace.army.mil/Media/USACE-Project-Public-Notices/

Written comments will be accepted via email: Keleigh.L.Duey@usace.army.mil
For questions, please contact myself, Ms. Keleigh Duey at 916-557-5131.

Or can be mailed:
U.S Army Corps of Engineers
c/o Keleigh Duey, Planning Division, 10th Floor
1325 J Street
Sacramento, CA 95814

All comments received by January 18, 2022 will be considered in the finalization of the EA.

Thank you for your time. The team looks forward to hearing from you.

Very/respectfully,

Keleigh Duey
Environmental Manager
U.S. Army Corps of Engineers
Sacramento District
☎ (916) 557-5131

Teleworking: Tues-Thurs
Leave: Mon and Fri

Announcement of Availability from the

U.S. Department of Agriculture – Agricultural Research Service

and

U.S. Army Corps of Engineers

The USDA-ARS invites the public to review the *Draft Environmental Assessment and Finding of; No Significant Impact (FONSI) for the Agricultural Research and Development Center Facility* to be constructed at 3031 2nd Street, Davis, CA.

Comment Period: Jan. 5, 2022 – Jan. 18, 2022

The document is available electronically:
https://www.spk.usace.army.mil/media/us-ace-project-public-notices/

USACE is assisting the USDA-ARS with design, construction and environmental compliance of the Facility at Davis, CA.

USDA

US Army Corps of Engineers®
Sacramento District

Written comments can be directed to Keleigh.L.Duey@usace.army.mil or mailed to Ms. Keleigh Duey, 10th Floor, 1325 J Street, Sacramento CA, 95814.

Questions, call (916) 557-5131.

THE DAVIS enterprise

PROOF OF PUBLICATION
(2015.5 C.C.P.)

Proof of Publication
PUBLIC NOTICE
#1616

Keleigh Duey

STATE OF CALIFORNIA
County of Yolo

I am a citizen of the United States and a resident of the County aforesaid; I'm over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am principal clerk of the printer at the Davis Enterprise, 315 G Street, a newspaper of general circulation, printed and published Monday, Wednesday, and Friday, in the City of Davis, County of Yolo, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court to the County of Yolo, State of California, under the date of July 14, 1952, Case Number 12680; that the notice, of which the annexed is a printed copy (set in type no smaller than non-pareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

January 5

All in the year **2022.**
I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Davis, California, this **5th day** of **January, 2022.**

Shawn Collins
Legal Advertising Clerk

Announcement of Availability from the U.S. Department of Agriculture – Agricultural Research Service (USDA-ARS) and U.S. Army Corps of Engineers (USACE)

The USDA-ARS invites the public to review the Draft Environmental Assessment and Finding of; No Significant Impact (FONSI) for the Agricultural Research and Development Center Facility to be constructed at 3031 2nd Street, Davis, CA.

The document is available electronically:
https://www.spk.usace.army.mil/media/usace-project-public-notices/

USACE is assisting the USDA-ARS with design, construction and environmental compliance of the Facility at Davis, CA.

Public Comment Period:
January 5, 2022 – January 18, 2022

Written comments can be directed to Ms. Keleigh Duey at Keleigh.L.Duey@usace.army.mil or mailed to Ms. Keleigh Duey, 10th Floor, 1325 J Street, Sacramento CA, 95814. Questions, call (916) 557-5131.
Published January 5, 2022 #1616

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

January 18, 2022

John Dyer, Acting Area Director
Pacific West Area
USDA Agricultural Research Service
800 Buchanan Street
Albany, California 94710

Subject: Draft Environmental Assessment of USDA's Agricultural Research and Development Center, Yolo County, California

Dear John Dyer:

The U.S. Environmental Protection Agency has reviewed the USDA-Agricultural Research Service's Draft EA on the proposed construction of an Agricultural Research and Development Center pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act. The USDA-Agricultural Research Service has contracted with the U.S. Army Corps of Engineers to help prepare the Draft EA and provide building design assistance.

The proposed action involves building a new, 66,000 square foot research lab and office facility, 18,000 sq. ft. of storage facilities, and renovating or replacing 1,200 sq. ft. of an existing greenhouse on 3.5 acres in Davis, CA at an estimated cost of $76.4 million dollars. Such an endeavor presents the opportunity to reduce climate-changing greenhouse gas (GHG) emissions and minimize the buildings' energy and water usage to sustainable levels pursuant to federal law and policy. As the USDA considers a Finding of No Significant Impact, the EPA recommends that the Final EA present more detailed building design components that offer energy savings and reduce greenhouse gas emissions, address potential noise impacts to sensitive receptors, and discuss responses to tribal concerns, as set out below in detailed comments.

The EPA appreciates the opportunity to review the Draft Environmental Assessment. Please email the Final EA to Robin Truitt, the lead reviewer for this project, at Truitt.Robin@epa.gov. If you have any questions, please contact me at (415) 947-4167, or Robin Truitt, at (415) 972-3742.

Sincerely,

JEAN PRIJATEL

Digitally signed by JEAN PRIJATEL
Date: 2022.01.18 16:13:51 -08'00'

Jean Prijatel
Manager, Environmental Review Branch

Cc: Keleigh Duey, U.S. Army Corps of Engineers

EPA'S DETAILED COMMENTS ON THE PROPOSED AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER, YOLO COUNTY, CALIFORNIA - January 18, 2022

Greenhouse Gas Emissions and Energy Consumption

According to the Department of Energy, the Federal Government is the nation's largest energy consumer. Operating more than 500,000 facilities comprising of more than 3 billion square feet, the government spends approximately $7 billion annually on energy for these facilities.[1] As such, the Federal Government is working to transform how it builds, buys, and manages electricity in buildings to create cleaner, healthier, and more resilient and sustainable communities. These policy objectives, embodied in executive orders and regulations,[2] apply to new, federal construction and operations and call for reducing energy consumption and emissions and investing in American clean energy industries and manufacturing. More specifically, Executive Order 14057 on *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*, [3] dated December 8, 2021 states that agencies shall design new construction and modernization projects greater than 25,000 gross square feet to achieve net-zero greenhouse gas emissions by 2030. While recognizing that this DEA is based on a conceptual preliminary design, the EPA recommends that the USDA's construction plans focus on specific ways to incorporate design features that would achieve water and energy savings and reduce greenhouse gas emissions to the maximum extent possible.

In the DEA, Table 1 section BB on Climate Change concludes that the resource would be unaffected by authorization of this project (pg. 1-1), but then notes that gases that contribute to the greenhouse effect by absorbing infrared radiation, like carbon monoxide and nitrogen oxides, may be released during construction and operation of the project (pg. 3-7). While the EPA appreciates the mitigation measures to limit some construction-related emissions and fugitive dust, Appendix E quantifies only nitrates of oxygen, volatile organic compounds and particulate matter but not carbon dioxide, ozone, or other greenhouse gases (GHG) or other pollutants that may be generated by construction or operations of this facility.

Similarly, the Table 1 section CC on Energy Usage states that the project would have "insignificant effects [on energy usage] due to mitigation" while acknowledging that the project would increase power consumption on the existing grid (pg. 3-35). The DEA says that the proposed Facility would receive power and natural gas from Pacific Gas & Electric and natural gas would power water heaters, boilers, and generators. Although the DEA states that the USDA has the intent to consider enrolling with Valley Clean Energy to increase the amount of renewable energy being used at levels above what is currently available from PG&E (pgs. 3/24-25), there is an opportunity to combine building electrification strategies in conjunction with carbon pollution-free energy use to shift energy demand to renewable energy sources.

Further, while the EPA acknowledges USDA leadership in designing to LEED v4 Silver building standards, EPA would recommend designing to the Gold or even Platinum LEED standards to meet the upcoming temporal targets of EO 14057. Proposed use of a high efficiency chiller, an exhaust air heat

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[1] https://www.fedcenter.gov/programs/energy.

[2] EO 14008 *Tackling the Climate Crisis at Home and Abroad***,** dated January 27, 2021. See also the Energy Act of 2020, Section 1002(g) with Energy and Water Conservation Measures, and the *Guide to Integrating Renewable Energy in Federal Construction* at https://www.energy.gov/sites/prod/files/2013/10/f3/re_construction_guide.pdf.

[3] https://www.federalregister.gov/d/2021-27114

recovery system, automated building controls, and on-site photovoltaic and solar hot water heating would reduce the building's carbon footprint and achieve higher LEED performance standards.

***Recommendations*:** Given the priority actions and timelines established under EO 14057 Sections 205-208, the EPA encourages the USDA to estimate all greenhouse gas or carbon emissions in the Final EA and detail which building design elements or components would be implemented to comply with the following performance targets:

- Building design, construction, and operation. Ensure all new construction and modernization projects greater than 25,000 gross square feet entering the design phase in fiscal year 2022 and beyond are designed to be net-zero emissions by 2030, and where feasible, net-zero water and waste buildings.
- Federal Building Performance Standards. Performance standards are powerful tools that drive efficiency and emissions reductions in buildings. Pursuant to section 510(b)(ii) of the EO, CEQ will issue Federal building performance standards to accelerate on-site emissions reductions and achieve building emissions goals. Agencies must use the standards in accordance with the guidance issued by CEQ.
- Capital planning and building retrofits. Agencies must complete deep energy retrofits, prioritizing reductions of on-site emissions to achieve net-zero or near net-zero emissions at the building level where technically practicable, in at least 30 percent of covered facilities by 2030. Agencies must ensure that capital planning and retrofit projects consider and prioritize building electrification and replacement of fossil-fuel consuming equipment with technologies that use carbon pollution-free energy; incorporation of on-site generation of carbon pollution-free energy and energy storage; use of technologies that meet performance needs while reducing greenhouse gas emissions from building, campus, or installation operations; and where practical, use of ongoing data analytics for system diagnostics and persistence of savings.
- Leveraging Performance Contracting. Performance contracting has proven to be an effective tool to improve efficiency and resilience of federal facilities; deploy clean and innovative technologies; and reduce energy, water, and greenhouse gas emissions. Section 1002 of the Energy Act of 2020 requires agencies to use performance contracting to address at least 50 percent of energy- and water-saving measures identified through energy and water evaluations. [A]gencies should seek opportunities to use direct funding, as authorized, in combination with performance contracts to increase project benefits, enable deployment of innovative technologies, and meet the goals and targets established under the EO.[4]

Noise

We appreciate the recommendations identified in the DEA that address noise impacts during construction. These measures include providing one week of advance notice to residents and businesses located within 1,000 feet of the construction zone; posting contractor contact telephone number(s) and proposed construction dates and times; identifying a noise disturbance coordinator to respond to noise complaints and monitor noise and construction activity; and complying with noise provisions in the Davis Municipal Code.

[4] *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability* at https://www.whitehouse.gov/wp-content/uploads/2021/12M-22-06.pdf

It is not clear from the DEA how construction noise would impact the Montessori Day School which is located adjacent to the project parcel. Noise has been found to impact child learning – especially young children – including speech interference, disturbance of information extraction (e.g., comprehension and reading acquisition), message communication and annoyance. To be able to hear and understand spoken messages in classrooms, the American National Standards Institute (ANSI) standard S12.60-2002 has established acoustical performance criteria for classrooms specifying that one-hour average background noise levels not exceed 35 dBA in core learning spaces smaller than 20,000 cubic feet and 40 dBA in larger spaces.[5]

Recommendations: The EPA recommends the following be addressed in the Final EA.

- Discuss potential noise effects on childhood learning at the Montessori Day School and the likelihood that indoor learning spaces would achieve ANSI acoustical performance criteria during construction, considering noise attenuation that the building would provide with windows open and closed.
- Retain the recommendations identified in the DEA regarding noise and include them in the FONSI and contracting specifications. We recommend the following additional mitigation recommendations: (1) locate generators and staging areas as far from the day school as possible to reduce both noise and air quality impacts, and (2) limit the use of high impact equipment when children are present, if appropriate.
- Ensure the posted notice explicitly directs the community on how to report noise complaints.
- Provide for the noise disturbance coordinator to reach out to the school administrators, well in advance of any construction activities, to ensure they are aware of the noise complaint procedure and actions they can take to reduce noise, e.g., close windows during learning periods. Should the noise disturbance coordinator receive complaints from the school during construction, we recommend the erection of temporary noise barriers or fencing be considered, consistent with EO 13045 on the *Protection of Children from Environmental Health Risks and Safety Risks.*

Cultural Resources

Pursuant to Section 106 of the National Historic Preservation Act, the DEA says that four tribes were identified as having cultural resource interests or aboriginal affiliations with the lands in the proposed project area (p. 3-15). EPA understands that these communities were contacted and that consultation is ongoing. The Yocha Dehe Wintun Nation responded that it was not aware of any known cultural resources in or near the project site, but it did recommend adding cultural sensitivity training for project personnel to the project permit and to be informed of any plans for ground disturbance (Sept. 29, 2021 letter, App. A).

Recommendations: For the Final EA, please identify any questions or concerns raised by tribes as a result of continuing consultations and how these concerns have been addressed by the USDA. Consider whether tribal representatives should be present during surface disturbing activities.

[5] ANSI S12.60-2002 American National Standard, *Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools.*

Response to Comments

The United States Department of Agriculture – Agricultural Research Service (USDA-ARS) has received the United States Environmental Protection Agency (USEPA) comments on the Draft Environmental Assessment (EA) for the Agricultural Research and Development Center Facility at 3031 2nd Street, Davis, California. The Proposed Action includes the construction of an approximately 66,000 square foot Laboratory and Office Facility (Project) to support USDA-ARS research operations and the Location Administration Office support staff.

To address the USEPA Recommendations, the following response along with subsequent revisions have been incorporated into the EA, as applicable:

Recommendation Summary	USDA- ARS Response	EA Modifications
GREENHOUSE GAS EMISSIONS AND ENERGY CONSUMPTION		
Under EO 14057 Sections 205-208, the EPA encourages the USDA to estimate all greenhouse gas or carbon emissions in the Final EA and detail which building design elements or components would be implemented to comply with the following performance targets.	A greenhouse gas (GHG) emissions analysis was conducted for the Final EA.	See Appendix E.
Ensure all new construction and modernization projects greater than 25,000 gross square feet entering the design phase in fiscal year 2022 and beyond are designed to be net-zero emissions by 2030, and where feasible, net-zero water and waste buildings.	To the extent practical, the Project will be designed to meet the goals established in Executive Order (EO) 14057, subject to Federal appropriations.	Added to Section 3.2 (CC) Energy Usage.
Pursuant to section 510(b)(ii) of the EO, CEQ will issue Federal building performance standards to accelerate on-site emissions reductions and achieve building emissions goals. Agencies must use the standards in accordance with the guidance issued by CEQ.	Acknowledged. To the extent practical, the Project will be designed to meet the goals established in EO 14057, subject to Federal appropriations.	Added to Section 3.2 (CC) Energy Usage.
Agencies must complete deep energy retrofits, prioritizing reductions of on-site emissions to achieve net-zero or near net-zero emissions at the building level where technically practicable, in at least 30 percent of covered facilities by 2030.	The Project is within the early design phase (15%) and extensive coordination between the City of Davis, the expected site users (researchers) and the Federal agencies is ongoing to meet Project objectives while minimizing fossil fuel use and GHG pollution and maximizing clean electricity throughout the Facility.	Added to Section 3.2 (CC) Energy Usage.

Recommendation Summary	USDA- ARS Response	EA Modifications
	Early implementation and planned phasing of carbon net-zero technologies into the Project design will reduce the need for costly retrofitting.	
Section 1002 of the Energy Act of 2020 requires agencies to use performance contracting to address at least 50 percent of energy- and water-saving measures identified through energy and water evaluations.	Contract specifications will maximize energy and water saving measures to the greatest extent possible.	No change to EA.
NOISE		
Discuss potential noise effects on childhood learning at the Montessori Day School and the likelihood that indoor learning spaces would achieve ANSI acoustical performance criteria during construction, considering noise attenuation that the building would provide with windows open and closed.	New analysis regarding noise levels anticipated during construction was conducted for the Final EA. The Montessori Day School, which is a sensitive receptor in the area, was contacted during the NEPA scoping process, but no comments were received. Coordination to minimize effects is ongoing.	See 3.2 (Y) for updated noise analysis.
Retain the recommendations identified in the DEA regarding noise and include them in the FONSI and contracting specifications. We recommend the following additional mitigation recommendations: (1) locate generators and staging areas as far from the day school as possible to reduce both noise and air quality impacts, and (2) limit the use of high impact equipment when children are present, if appropriate.	Measures are retained and will be added to contracting specifications. A new measure has been added which involves a pre-construction meeting for adjacent interested parties to attend to address any concerns, including noise. Recommendation (1) is accepted. Recommendation (2) is being evaluated. Coordination with the school is ongoing to reduce construction noise levels concurrent with critical learning time.	Added to Section 4.2 (Y) as additional mitigation measures.
Ensure the posted notice explicitly directs the community on how to report noise complaints.	This will be included in the contract specifications.	No change to EA.
Provide for the noise disturbance coordinator to reach out to the school administrators, well in advance of any construction activities, to ensure they are aware of the noise complaint procedure and actions they can take to reduce noise, e.g., close windows during learning periods. Should the noise disturbance coordinator receive complaints from the school during construction, we recommend the erection of temporary noise barriers or fencing be considered, consistent with	As indicated in the FONSI and EA, businesses within 1,000 feet of construction will be notified of the schedule and provided contact information for making noise complaints. The recommendation for temporary noise fencing/barrier is accepted and will be added as a condition in the contract specifications.	Added to FONSI and Section 4.2 (Y) as an additional mitigation measure.

Recommendation Summary	USDA- ARS Response	EA Modifications
EO 13045 on the *Protection of Children from Environmental Health Risks and Safety Risks.*		
CULTURAL RESOURCES		
For the Final EA, please identify any questions or concerns raised by tribes as a result of continuing consultations and how these concerns have been addressed by the USDA. Consider whether tribal representatives should be present during surface disturbing activities.	The USDA-ARS, assisted by USACE, has continued consultation with interested Tribes and met with the Yocha Dehe Wintun Nation on November 18, 2021. USACE and USDA facilitated Yocha Dehe Wintun Nation monitoring during January 2022 geotechnical investigations. USDA-ARS will continue to consult with tribes and will invite them to be present during ground disturbing activities at the Site.	Section 3.1 (U) has been updated accordingly.

APPENDIX E – DETAILED EMISSIONS CALCULATIONS

UC Davis

Emissions Summary

Description	Project Emissions (tons)			GHG Emissions (tons)			
	NO_x	VOC	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Construction engine emissions	18.62	7.35	0.82	5.77	2.37E-04	4.74E-05	5.77
Construction Worker Trips	0.17	0.13	0.01	248.82	1.34E-02	4.27E-03	250.43
Unpaved roads - Particulates	--	--	0.53	--	--	--	--
Paved roads - Particulates	--	--	6.17E-03	--	--	--	--
Earthmoving - Particulates	--	--	0.06	--	--	--	--
Total emissions	**18.79**	**7.48**	**1.42**	**254.59**	**1.36E-02**	**4.31E-03**	**256.20**

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)			GHG Emission Factors (g/hp-hr)[a]			GHG Emissions (tons per year)[b]			
									NO_x	VOC	$PM_{2.5}$		NO_x	VOC	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O	CO_2e
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	188.19	7.63E-03	1.53E-03	0.42	1.69E-05	3.38E-06	0.42
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	178.67	7.63E-03	1.53E-03	0.40	1.69E-05	3.38E-06	0.40
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	188.19	7.63E-03	1.53E-03	0.42	1.69E-05	3.38E-06	0.42
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	188.19	7.63E-03	1.53E-03	0.42	1.69E-05	3.38E-06	0.42
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	188.19	7.63E-03	1.53E-03	0.42	1.69E-05	3.38E-06	0.42
Grading	14	Pickup Truck	3	8	330	Gasoline	0.8		0.35	0.30	0.02	g/mile	0.341	0.292	0.019	178.67	7.63E-03	1.53E-03	0.40	1.69E-05	3.38E-06	0.40
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	188.19	7.63E-03	1.53E-03	0.42	1.69E-05	3.38E-06	0.42
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	188.19	7.63E-03	1.53E-03	0.42	1.69E-05	3.38E-06	0.42
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	188.19	7.63E-03	1.53E-03	0.42	1.69E-05	3.38E-06	0.42
Foundations	14	Pickup Truck	3	8	330	Gasoline	0.8		0.35	0.30	0.02	g/mile	0.341	0.292	0.019	178.67	7.63E-03	1.53E-03	0.40	1.69E-05	3.38E-06	0.40
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	188.19	7.63E-03	1.53E-03	0.42	1.69E-05	3.38E-06	0.42
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	188.19	7.63E-03	1.53E-03	0.42	1.69E-05	3.38E-06	0.42
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	188.19	7.63E-03	1.53E-03	0.42	1.69E-05	3.38E-06	0.42
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	188.19	7.63E-03	1.53E-03	0.42	1.69E-05	3.38E-06	0.42
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	178.67	7.63E-03	1.53E-03	0.40	1.69E-05	3.38E-06	0.40
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	188.19	7.63E-03	1.53E-03	0.42	1.69E-05	3.38E-06	0.42
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	188.19	7.63E-03	1.53E-03	0.42	1.69E-05	3.38E-06	0.42
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	188.19	7.63E-03	1.53E-03	0.42	1.69E-05	3.38E-06	0.42
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	188.19	7.63E-03	1.53E-03	0.42	1.69E-05	3.38E-06	0.42
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	188.19	7.63E-03	1.53E-03	0.42	1.69E-05	3.38E-06	0.42
Landscaping	7	Pickup Truck	3	8	330	Gasoline	0.8		0.35	0.30	0.02	g/mile	0.170	0.146	0.009	178.67	7.63E-03	1.53E-03	0.40	1.69E-05	3.38E-06	0.40
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	188.19	7.63E-03	1.53E-03	0.42	1.69E-05	3.38E-06	0.42
												Total	**18.615**	**7.345**	**0.817**			**Total**	**5.77**	**2.37E-04**	**4.74E-05**	**5.77**

(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"

					Criteria Emission Factors[b]				Emissions (tons)			(g/mile)			GHG Emissions (tons per year)[d]			
Vehicle Type	**Fuel**	**Percentage**	**Quantity**	**Estimated Travel Distance (miles/vehicle/day)[a]**	**NO_x**	**VOC**	**$PM_{2.5}$**	**Units**	**NO_x**	**VOC**	**$PM_{2.5}$**	**CO_2[c]**	**CH_4[b]**	**N_2O[b]**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
	Gasoline	63%	50	20	0.14	1.79E-01	1.17E-02	g/mile	5.58E-02	7.25E-02	4.72E-03	348.17	1.14E-02	5.58E-03	141.20	4.60E-03	2.26E-03	141.99
Passenger Car	Diesel	7%	6	20	0.51	6.93E-02	9.87E-03	g/mile	2.28E-02	3.12E-03	4.45E-04	348.17	6.33E-02	7.00E-04	15.69	2.85E-03	3.15E-05	15.77
	Gasoline	27%	22	20	0.35	2.99E-01	1.90E-02	g/mile	6.06E-02	5.20E-02	3.31E-03	476.00	2.58E-02	1.10E-02	82.73	4.49E-03	1.92E-03	83.42
Passenger Truck	Diesel	3%	2	20	1.78	1.52E-01	5.06E-02	g/mile	3.45E-02	2.93E-03	9.76E-04	476.00	7.57E-02	2.81E-03	9.19	1.46E-03	5.42E-05	9.25
								Total	**0.17**	**0.13**	**9.45E-03**			**Total**	**248.82**	**1.34E-02**	**4.27E-03**	**250.43**

(a) Round trip distance

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

(c) CO2 emission factors from the US EPA Report "Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 through 2014"

(d) Global warming potentials: (Table A-1 to Subpart A of 40 CFR 98)

CO_2 1

CH_4 25

N_2O 298

UC Davis
Unpaved Road Emission Calculations

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

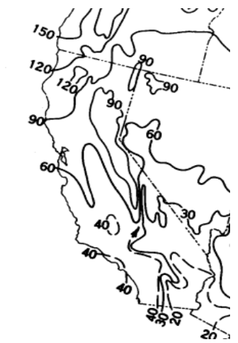
$$E = k\,(s/12)^a (W/3)^b \qquad (1a)$$

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

UC Davis
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**

UC Davis
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 $PM_{2.5}$