



Solar Infrastructure and Battery Energy Storage System Project

Public Review Draft
Initial Study/Mitigated Negative Declaration

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ACRONYMS AND ABBREVIATIONS

°F	Fahrenheit
µg/m ³	micrograms per cubic meter
a-Si	amorphous silicon
AB	Assembly Bill
AC	alternating current
AFY	Acre-feet per year
amsl	above mean sea level
APN	Assessor's Parcel Number
ATCM	Airborne Toxic Control Measure
bcf/year	billion cubic feet per year
BESS	battery energy storage system
BMP	Best Management Practice
BPS	Best Performance Standards
BRA	Biological Resources Assessment
c-Si	crystalline silicon
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CAL FIRE	California Department of Forestry
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CAPE	Center for Analytic Political Engagement
CARB	California Air Resources Board
CBC	California Building Code
CBRSL	Campus Building Reserve and Support Land
CBSC	California Building Standards Commission
CCIC	Central California Information Center
CDFW	California Department of Fish and Wildlife
CdTe	Cadmium Telluride
CEC	California Energy Commission
CESA	California Environmental Species Act
CEQA	California Environmental Quality Act
CGP	Construction General Permit
CGS	California Geological Survey
CH ₄	methane
CHRIS	California Historical Resources Information System
City	City of Merced
CMU	Campus Mixed Use
CNDDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide

ACRONYMS AND ABBREVIATIONS (cont.)

CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
County	Merced County
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CTS	California tiger salamander
CUPA	Certified Unified Program Agency
CY	Cubic yard
dB	decibels
DC	direct current
DOC	California Department of Conservation
DMR	Division of Mine Reclamation
DPM	Diesel particulate matter
DTSC	Department of Toxic Substance Control
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EMCS	energy management control system
EOP	Emergency Operation Plan
EQ Zapp	Earthquake Zones of Required Investigation
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FESA	Federal Environmental Species Act
FHSA	Fire Hazard Severity Zone
FHSZ	Fire Hazards Severity Zone
FIRM	Flood Insurance Rate Maps
FMMP	Farmland Mapping and Monitoring Program
GHG	greenhouse gas
gpm	gallons per minute
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Program
GWP	global warming potential
HDPE	high-density polyethylene
HELIX	HELIX Environmental Planning, Inc.
HFC	hydrofluorocarbons
HMBP	Hazardous Materials Business Plan
HSC	Health and Safety Code
HVAC	heating, ventilation, air conditioning
Hz	Hertz
I-	Interstate-

ACRONYMS AND ABBREVIATIONS (cont.)

IEA	International Energy Agency
ILF	In-lieu fee
In/sec	inches per second
IPaC	Information for Planning and Consultation
IPCC	Intergovernmental Panel on Climate Change
IS/MND	Initial Study/Mitigated Negative Declaration
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
LAFCO	Merced County Local Agency Formation Commission
LCFS	Low Carbon Fuel Standard
L _{DN}	Day Night sound level
L _{EQ}	Time average noise levels of one hour
LEED	Leadership in Energy and Environmental Design
LID	low-impact development
L _{MAX}	Maximum noise levels
LOS	Level of Service
LRA	Local Responsibility Area
LRDP	Long Range Development Plan
LV	vibration velocity level
MBTA	Migratory Bird Treaty Act
MCDEH	Merced County Division of Environmental Health
MCRWMA	Merced County Regional Waste Management Authority
MCSD	Merced County School District
MFD	City of Merced Fire Department
mgd	million gallons per day
MID	Merced Irrigation District
MLC	Mineral Land Classification Studies
MM	Mitigation Measure
MND	Mitigated Negative Declaration
MOL	Mines Online
MRZ	Mineral Resource Zone
MSDS	material safety data sheets
MT	metric tons
MUHSD	Merced Union High School District
MWh	Megawatt-hour
MW	Megawatt
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission

ACRONYMS AND ABBREVIATIONS (cont.)

NFPA	National Fire Protection Association
NO _x	nitrogen oxides
NO ₂	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSLU	noise-sensitive land use
OEHHA	Office of Environmental Health Hazard Assessment
OSHA	Occupational Safety and Health Administration
P-F	Public Facility
PFC	perfluorocarbons
PG&E	Pacific Gas and Electric
PM	particulate matter
PM ₁₀	Coarse PM, 10 microns or less in diameter
PM _{2.5}	Fine PM, 2.5 microns or less in diameter
PPV	peak particle velocity
PRC	Public Resources Code
PS MM	Project-Specific Mitigation Measure
PTO	Potential to Occur
PV	Photovoltaic
ROG	reactive organic gases
ROS	Research Open Space
ROW	right-of-way
RWQCB	Regional Water Quality Control Board
SCH	State Clearinghouse
SEIR	Subsequent Environmental Impact Report
SF ₆	sulfur hexafluoride
SGMA	Sustainable Groundwater Management Act
SHPO	State Historic Preservation Officer
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO _x	sulfur oxides
SR	State Route
SRA	State Responsibility Area
SSC	Species of Special Concern
SUV	Sport Utility Vehicle
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminants
TCR	Tribal Cultural Resources

ACRONYMS AND ABBREVIATIONS (cont.)

The Regents	The Regents of the University of California
UCLC	University of California Learning Center
UBC	Uniform Building Code
UC Merced	University of California, Merced
UFC	Uniform Fire Code
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground Storage Tank
UWMP	Urban Water Management Plan
VMT	Vehicle Miles Traveled
WWTP	Wastewater Treatment Plant

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INITIAL STUDY INFORMATION SHEET

1. Project title: Solar Infrastructure and Battery Energy Storage System Project
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4. Project location: University of California, Merced
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5. Long Range Development Plan land use designation: Campus Building Reserve and Support Land (CBRSL) and Campus Mixed Use (CMU)

6. Description of project:

The project would include the demolition of an existing 1-megawatt (MW) ground-mounted solar array facility, and the construction of an up to 6-MW solar facility consisting of a dual-axis tracking system and a new battery energy storage system (BESS) with a minimum storage capacity of 3 megawatt-hour (MWh). The project would interconnect to the UC Merced campus' existing distribution system and power grid via the existing gen-tie line. The project would be served by existing water distribution infrastructure and would include upgrades to the existing fire water storage tank and/or the construction of a new water storage tank on-site to meet water storage requirements for the proposed project. Access to the project site would be provided by the existing ingress/egress access road off of Cottonwood Loop, which would be improved in accordance with the local fire ordinances to a minimum width of 22 feet. Six-foot-tall chain-link fencing would be installed around the proposed BESS and electrical components; however, depending on the final site design, fencing may be installed around the perimeter of the site. The fencing may be topped with barbed wire for site security. Following project construction, the undeveloped areas of the fenced portion of the project site would be available for seasonal animal grazing. A locked gate would be located at the project site entrance off of Cottonwood Loop to control ingress/egress.

7. Surrounding land uses and setting:

The approximately 86.7-acre project site is located on the UC Merced campus in the City of Merced (City), Merced County (County), California. The project site is located approximately 4.7 miles east of State Route (SR) 59 and 4.3 miles north of SR 140. The proposed project site is located east of the central portion of the UC Merced campus, off of Cottonwood Loop. The project site is bordered by Cottonwood Loop and Le Grand Canal to the north, Le Grand Canal and central campus to the east, and

undeveloped land to the south and west. The project site is currently partially developed with an approximately 10-acre, 1-MW ground-mount solar array site built in 2009. A chain-link fence surrounds the perimeter of the existing solar array site. An approximately 0.25-mile-long access road off of Cottonwood Loop provides access to the existing solar array site. The remaining portion of the project site surrounding the existing solar array site is undeveloped.

1.0 INTRODUCTION

1.1 PROJECT OVERVIEW

HELIX Environmental Planning, Inc. (HELIX) has prepared this Initial Study/Mitigated Negative Declaration (IS/MND) on behalf of the University of California, Merced (UC Merced) per the requirements of the California Environmental Quality Act (CEQA) of 1970 (Public Resources Code [PRC] Section 21000, et seq.) and the CEQA Guidelines (California Code of Regulations, Title 14, Section 15000, et seq.). The proposed Solar Infrastructure and Battery Energy Storage System Project (“project” or “proposed project”) would include the demolition of the existing 1-megawatt (MW) ground-mounted solar array facility and the construction of an up to 6-MW solar facility consisting of a dual-axis tracking system and a new battery energy storage system (BESS) with a minimum storage capacity of 3 megawatt-hour (MWh). The University of California is the CEQA Lead Agency for the proposed project.

In March 2009, the Regents certified a joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR; State Clearinghouse [SCH] No. 2008041009) for the UC Merced and University Community Project that analyzed and disclosed the impacts from implementation of UC Merced’s first Long Range Development Plan (LRDP) and an adjoining community. The Regents certified the Subsequent EIR (SEIR; SCH No. 2018041010) for the UC Merced 2020 Long Range Development Plan (“2020 LRDP”), which updated and replaced the UC Merced 2009 LRDP (“2009 LRDP”). The 2020 LRDP SEIR, in conjunction with the 2009 LRDP EIS/EIR, serves as the base environmental documents for tiering purposes when implementing individual projects under the 2020 LRDP. Pursuant to CEQA Guidelines Section 15152, this IS/MND tiers off of the 2020 LRDP SEIR and 2009 LRDP EIS/EIR (UC Merced 2019; UC Merced 2008).

1.2 CEQA GUIDELINES REGARDING TIERING

As defined in CEQA Guidelines Section 15152, “tiering” refers to using the analysis of general matters contained in a broader EIR (such as one prepared for a general plan or policy statement) with later EIRs and negative declarations on narrower projects; incorporating by reference the general discussions from the broader EIR; and concentrating the later EIR or negative declaration solely on the issues specific to the later project. Tiering focuses the environmental review on the project-specific significant effects that were not examined in the prior environmental review, or that are susceptible to substantial reduction or avoidance by specific revisions in the project, by the imposition of conditions or by other means. This IS/MND focuses on the potential project-specific significant effects that were not previously evaluated in the 2020 LRDP SEIR and 2009 LRDP EIS/EIR.

1.3 PREVIOUS RELEVANT ENVIRONMENTAL REVIEW

UC Merced Long Range Development Plans

UC Merced prepared the campus’s first LRDP in 2009, which addressed the physical development of the campus to accommodate a projected student enrollment level of 25,000 students by the year 2030 on an 815-acre site. The 2009 LRDP EIS/EIR prepared for the UC Merced and University Community Project analyzed and disclosed the potential environmental impacts from implementation of the 2009 LRDP, as well as an adjoining community, and was subsequently certified in March 2009.

Following approval of the 2009 LRDP, UC Merced substantially decreased the student enrollment projections through 2030 and acquired additional land for campus development as a result of the transfer of a portion of the adjoining University Community Land Company (UCLC) property to its former partner, the Virginia Smith Trust. UC Merced planned to accommodate the reduced projected enrollment growth on a smaller development footprint within the overall campus. The 2020 LRDP is a comprehensive land use plan that guides physical development on the UC Merced campus to accommodate the revised projected campus population and expanded and new program initiatives; the 2020 LRDP updates and replaces the 2009 LRDP. The 2020 LRDP SEIR is a program EIR prepared in accordance with CEQA Guidelines Section 15168 and was certified by the Regents in 2020. The 2020 LRDP SEIR provides a programmatic analysis of the proposed development and projected campus population outlined in the 2020 LRDP.

Following certification of the 2020 LRDP SEIR, UC Merced prepared an updated supplemental program-level transportation impact analysis of campus growth through 2030 under the 2020 LRDP based on vehicle miles traveled (VMT) metrics consistent with State CEQA Guidelines Section 15064.3, subdivision (b). The program-level VMT analysis was published in the UC Merced Medical Education Building Project Draft EIR in August 2022, and the Final EIR – including the supplemental VMT transportation analysis – was certified on November 17, 2022. The updated transportation impact analysis contained in the UC Merced Medical Education Building Project EIR replaces in full the previous level of service (LOS)-based transportation impact analysis method contained in the 2020 LRDP SEIR.

2020 LRDP SEIR and 2009 LRDP EIS/EIR

The 2020 LRDP SEIR evaluated the potential environmental impacts at a program level, pursuant to CEQA Guidelines that would result from implementation of the 2020 LRDP for the following environmental topics:

- Air Quality
- Biological Resources
- Energy
- Greenhouse Gas Emissions
- Hydrology and Water Quality
- Noise
- Population and Housing
- Public Services and Recreation
- Transportation (Supplemented in 2022)
- Tribal Cultural Resources
- Utilities and Service Systems

The Initial Study prepared for the 2020 LRDP determined that several environmental topics were adequately addressed in the 2009 LRDP EIS/EIR, and implementation of the 2020 LRDP would not result in new or more substantially severe impacts than previously disclosed. As such, the 2020 LRDP SEIR concluded that the following environmental topics did not require subsequent evaluation, and the previous analyses for each topic from the 2009 LRDP EIS/EIR were incorporated into the 2020 LRDP SEIR by reference:

- Aesthetics
- Agricultural Resources
- Cultural Resources
- Geology and Soils
- Hazards and Hazardous Materials
- Land Use and Planning
- Mineral Resources

Therefore, this IS/MND evaluates the impacts from the proposed project with respect to the determinations made in the 2020 LRDP SEIR and the 2009 LRDP EIS/EIR for all of the environmental

topics listed above. However, the CEQA Guidelines were amended in 2019 to include a discussion of wildfire impacts. Although impacts related to wildfire were not discussed in either the 2020 LRDP SEIR or 2009 LRDP EIS/EIR, this IS/MND includes an evaluation of potential impacts based on the criteria in Section XX, Wildfire, of Appendix G of the CEQA Guidelines.

This IS/MND identifies mitigation measures from the 2020 LRDP SEIR and the 2009 LRDP EIS/EIR that are applicable to the proposed project, and identifies new project-specific (PS) mitigation measures, where necessary, to reduce potential impacts to a less than significant level. As required by PRC Section 21081.6, a Mitigation Monitoring and Reporting Program (MMRP) has been prepared for the project and is included in Appendix A to this IS/MND.

1.4 PROJECT BACKGROUND AND PURPOSE

UC Merced adopted the use of solar photovoltaic (PV) facilities as part of its plan for campus development. The campus currently has three existing solar PV systems and is served by two redundant Pacific Gas and Electric (PG&E) feeders that supply a 12-kilovolt (kV) on-site distribution system. One of the existing solar PV systems is a 1-MW ground-mounted, single-axis tracking system that began operating in November 2009. However, due to expected panel degradation, this system is currently operating at less than 80 percent performance (UC Merced 2024).

2.0 PROJECT LOCATION AND DESCRIPTION

2.1 PROJECT LOCATION

The approximately 86.7-acre project site is located on the UC Merced campus in the City of Merced (City), Merced County (County), California. The project site encompasses portions of Assessor's Parcel Numbers (APNs) 060-010-007, 060-020-047, 170-220-008, and 170-220-025. The project site is located approximately 4.7 miles east of State Route (SR) 59 and 4.3 miles north of SR 140. The proposed project site is located east of the central portion of the UC Merced campus, off of Cottonwood Loop. The project site is bordered by Cottonwood Loop and Le Grand Canal to the north, Le Grand Canal and central campus to the east, and undeveloped land to the south and west. The project site is located in Township 6 South, Range 14 East, Section 34 of the U.S. Geological Survey (USGS) *Merced, California* 7.5-minute quadrangle map. Refer to Figure 1, *Site and Vicinity Map*, for a regional map and Figure 2, *Aerial Map*, for an aerial map of the project site.

The 2020 LRDP land use designation for the project site is primarily Campus Building Reserve and Support Land (CBRSL); however, a small portion of the project site off of Cottonwood Loop is designated Campus Mixed Use (CMU). The CBRSL land use designation includes areas of the campus that have not yet been designated for a specific use but allows for the development of small solar and other alternate energy projects. The CMU designation includes academic, research, student housing, student and support services, athletic and recreational facilities, administrative offices, service facilities, and parking (UC Merced 2019).

2.2 ENVIRONMENTAL SETTING

The project site is currently partially developed with an approximately 10-acre, 1-MW ground-mount solar array site built in 2009. A chain-link fence surrounds the perimeter of the existing solar array site. An approximately 0.25-mile-long access road off of Cottonwood Loop provides access to the existing

solar array site. The remaining portion of the project site surrounding the existing solar array site is undeveloped. Based on a review of historical imagery of the project site, the northern half of the site was rough graded during construction of the existing solar array, and the southern half of the site was previously an irrigated pasture. The project site is slightly sloped with higher elevations on the northern and eastern portions, and the lowest elevation in the southwestern corner of the site. The elevation of the project site ranges from 230 to 252 feet above mean sea level (msl).

2.3 PROJECT COMPONENTS

The project would include the demolition of the existing 1-MW ground-mounted solar array facility and the construction of an up to 6-MW solar facility and a new BESS with a minimum storage capacity of 3 MWh. The project would also include access road improvements, utility improvements, and site fencing. The proposed project components would comprise up to 48.1 acres of the 86.7-acre project site depending on the final project design. The remaining 38.6 acres would remain undeveloped. See Figure 3, *Conceptual Site Plan*, for a conceptual site plan of the proposed project and Figure 4, *Solar Expansion Area Detail*, for detail on the proposed solar PV facility. Each of the project components are discussed in greater detail below.

Solar Photovoltaic Facility

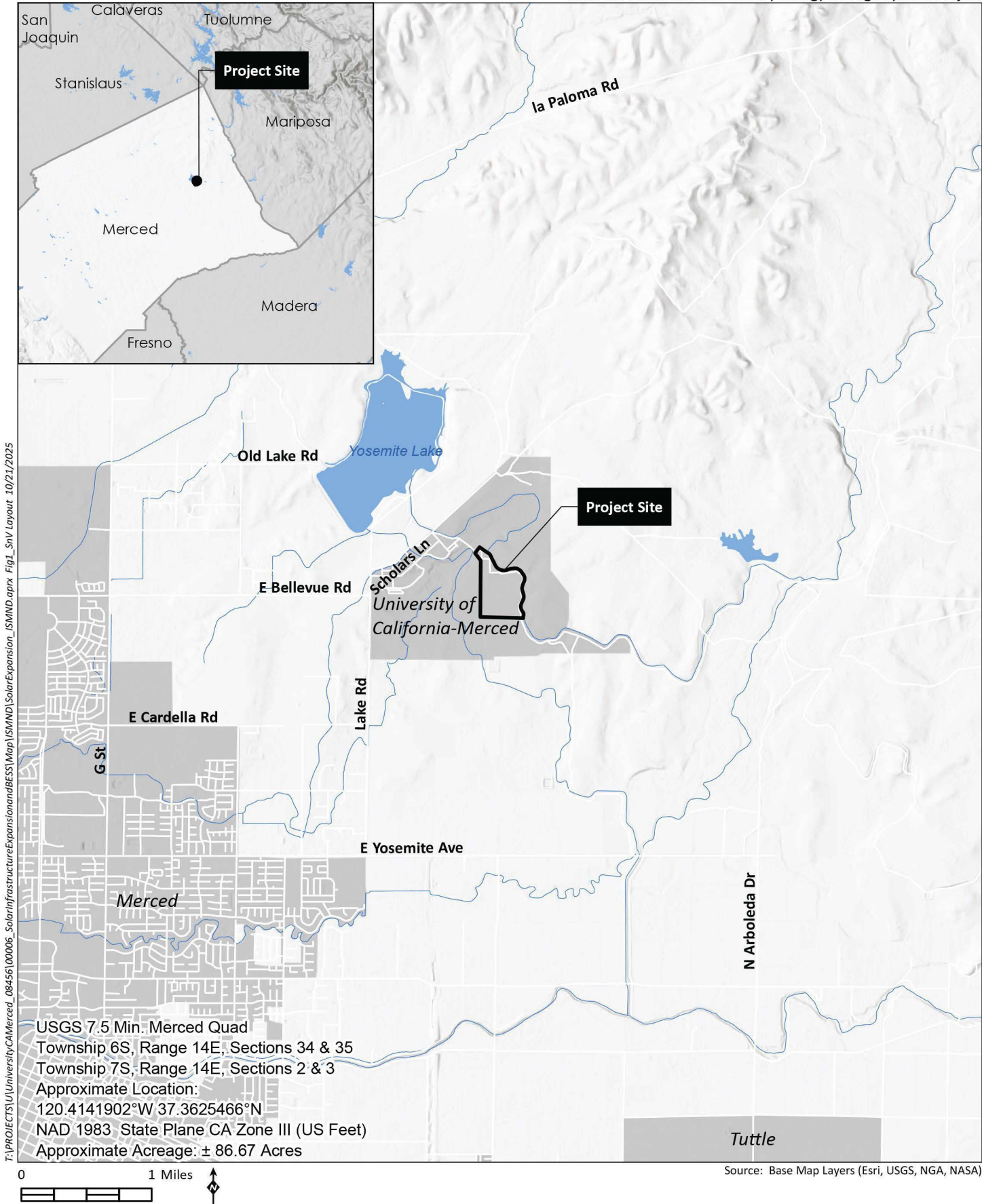
The proposed project would include the demolition of the existing 1-MW ground-mounted, single-axis tracking system and construction of an up to 6-MW solar PV facility. The proposed solar PV facility would consist of individual PV modules arranged in rows onto a dual-axis tracking system. The dimension of each PV module would be 35 feet by 60 feet, and each module would be spaced approximately 55 to 90 feet apart. Each row (or array) would be connected by low-voltage underground or aboveground electrical wiring to a central inverter station or to string inverters located throughout the facility, where the electricity would be converted from direct current (DC) to alternating current (AC).

The PV modules would be setback a minimum of 75 feet from the centerline of Le Grand Canal and a minimum of 15 feet from the project's ingress/egress access road. It is anticipated that the maximum height of the PV modules would be up to 36 feet at full tilt. There is potential for the proposed project to include the integration of dual uses that would allow for seasonal animal grazing on-site, referred to as agrivoltaics. The proposed solar PV facility components would be located on up to 46.2 acres of the overall 86.7-acre project site.

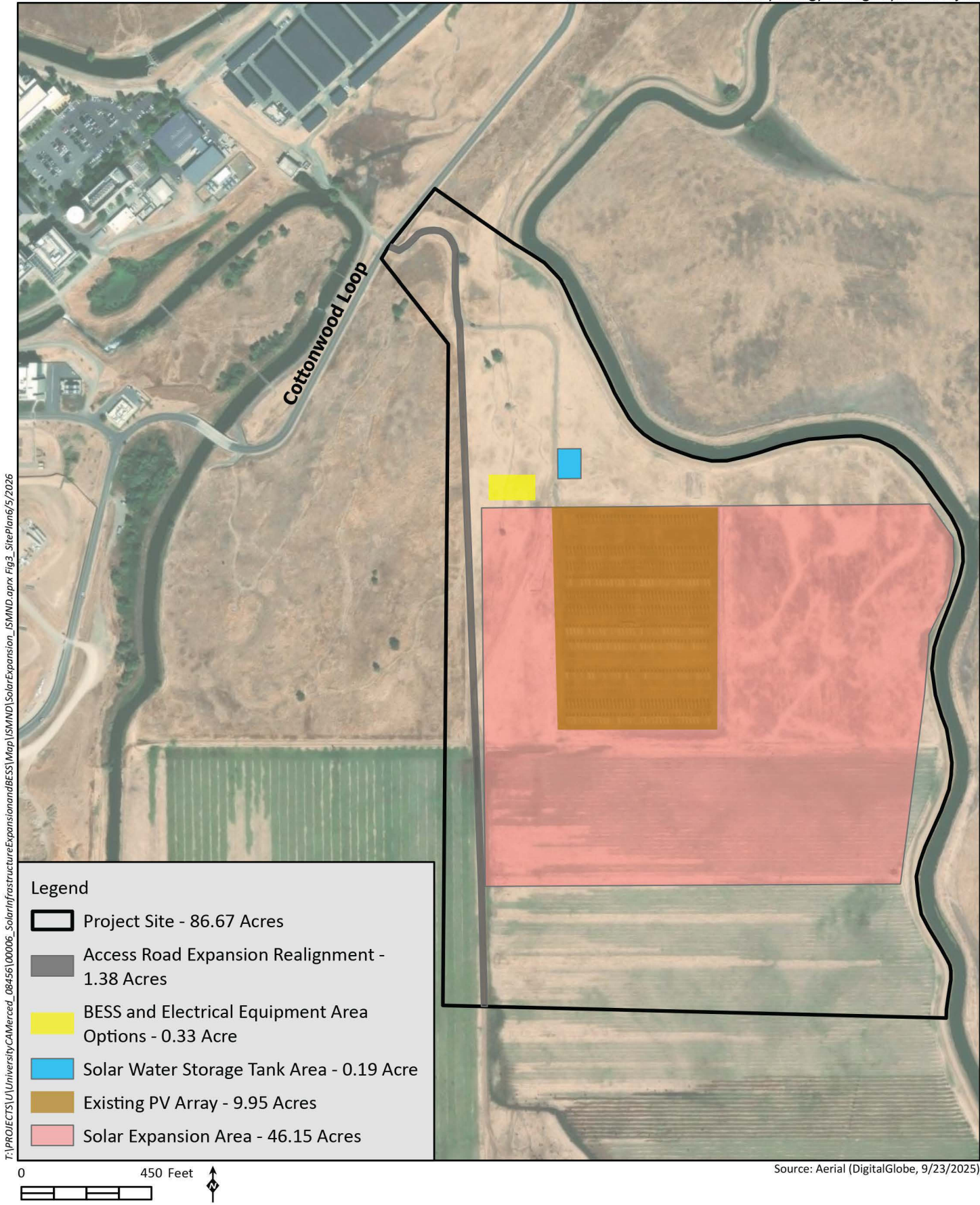
Battery Energy Storage System

The project would also include construction of a BESS with a minimum storage capacity of 3 MWh, which would store electrical energy generated by the proposed solar PV facility for later use. It is anticipated that the proposed BESS and electrical equipment area would be located immediately north of the solar PV area and adjacent to the west of the water storage tank area. The BESS would be enclosed in a storage container and installed on a concrete pad.

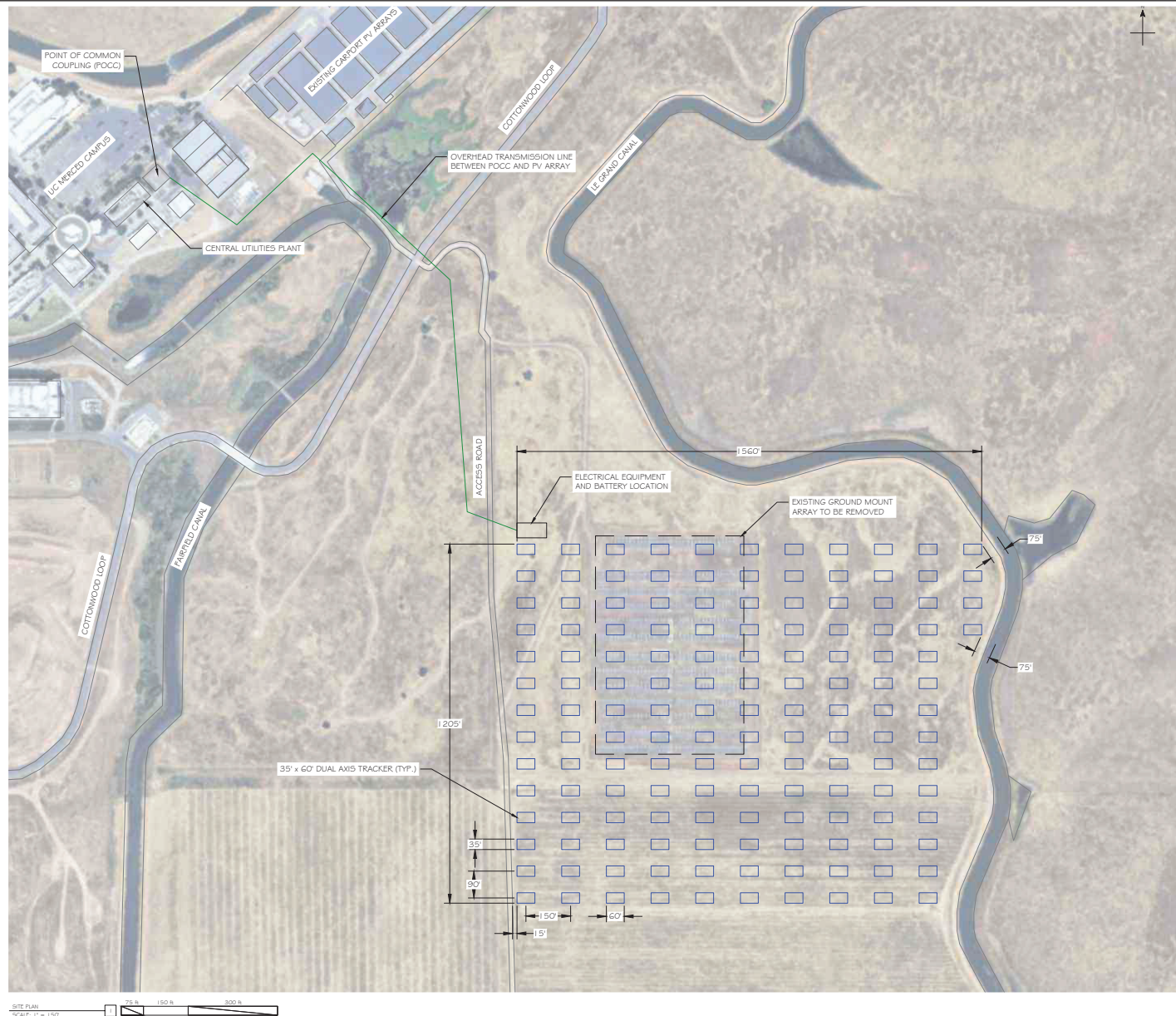
It is anticipated that the proposed BESS would deploy lithium-ion, vanadium redox, iron flow, or zinc hybrid batteries. The BESS would include fire alarm monitoring for a fire suppression system, and each battery unit would be constantly monitored by a battery management system to ensure safe operations. The battery management system monitors individual cell temperature, voltage, current, charge and







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discharge parameters, and other metrics to ensure health and safety of the batteries. The system would be designed to address individual or multiple failures as a multi-level safety system and to respond with shutdown of affected cells or power connections and to activate a fire suppression system if necessary. The batteries would be designed to last the lifetime of the project; however, some batteries may be repaired or replaced as part of regular maintenance activities, if needed.

Generation Intertie Line

The proposed BESS would connect to the existing overhead generation intertie (gen-tie) line that currently connects the existing 1-MW solar array facility to the campus's existing Central Utility Plant. No new substation would be constructed.

Utilities

Water

The proposed project would include upgrades to the existing fire water storage tank and/or the construction of a new water storage tank on-site to meet water storage requirements for the proposed project. The proposed project would be served by existing water distribution infrastructure.

Electricity

A PG&E meter is currently located at each feeder connection point in the campus's existing Central Utility Plant for each of the campus's solar PV systems. The proposed project would interconnect to the existing distribution system and the PG&E utility grid via the existing gen-tie line. The project would require upgrades or modifications to the existing main electrical panels on-site or installation of new panels for operation of the proposed solar PV facility. All major electrical components, including the inverter, isolation transformer, and metering would be contained within the project site, and a system monitoring and data retrieval system would be installed to integrate the project into the campus's energy management control system (EMCS).

Site Access

Access to the project site would be provided by the existing ingress/egress access road off of Cottonwood Loop, which would be improved in accordance with the City of Merced Fire Department (MFD) standards with a minimum width of 22 feet, plus a two-foot-wide shoulder. A portion of the access road within the project site would be reconfigured slightly to accommodate the expanded PV facility; however, the point of access off of Cottonwood Loop would not be altered.

Fencing

The perimeter of the proposed BESS and electrical components would be fenced with six-foot-tall chain-link fencing; however, depending on the final site design, fencing may be installed around the perimeter of the site. The proposed fencing may include barbed wire. Following project construction, the undeveloped areas of the fenced portion of the project site would be available for seasonal animal grazing. A locked gate would be located at the entrance to the site to control ingress/egress.

2.4 CONSTRUCTION

Schedule and Phasing

Project construction is anticipated to last approximately 9 months, commencing as early as October 2026 and completing in September 2027. Construction would occur in one single phase. Construction activities would include demolition and removal of the existing 1-MW ground mounted solar array; site preparation (clearing and grubbing), grading; support, panel, and inverter installation; and BESS installation and grid tie. Construction is assumed to occur five days per week during daylight hours with construction equipment operating for up to eight hours per day.

Demolition

The existing 1-MW ground-mounted solar array, including the PV panels, racks, and skids would be demolished and disposed of off-site.

Laydown and Stockpiling Areas

Laydown areas for construction vehicles and equipment would be located within the project site, including along the existing ingress/egress access road off of Cottonwood Loop.

Soil from site preparation and grading would be cleaned of debris and stockpiled on-site for future use by UC Merced.

California Tiger Salamander Exclusion Fencing

Prior to the start of construction activities, the perimeter of the site would be temporarily fenced with California tiger salamander (*Ambystoma californiense*) exclusion fencing, which would be a minimum of 3.3 feet tall. The proposed fencing would be constructed with smooth, rigid high-density polyethylene (HDPE) matrix that would be designed to prevent wildlife, specifically California tiger salamander, from climbing and entering the project site. The exclusion fencing would remain in place during the length of project construction. Following completion of construction, the fencing would be removed.

Best Management Practices

The University of California, as the Lead Agency, would require the implementation of the following Best Management Practices (BMPs) during project construction:

BMP-1: Spoils Removal

All spoils, surplus materials, and/or debris during all construction activities shall be cleaned up, removed, and hauled off-site, and shall be disposed of in a proper manner in accordance with all applicable local, State, and federal transport requirements. The work site shall be left clean and neat. All dirt that is clean of debris shall be stockpiled on-site for future use by UC Merced.

Upon request, the contractor shall provide UC Merced certification that bio-solids were disposed of in accordance with all applicable regulations set by the U.S. Environmental Protection Agency (USEPA),

pursuant to Code of Federal Regulations (CFR) Title 40, Part 503, and the State Water Resources Control Board (SWRCB) Water Quality Order No. 2004-12-DWQ.

BMP-2: Job Site Daily Cleanup

The work site shall be kept clean at the end of each day, and all debris and scrap materials no longer needed for the completion of work at the job site shall be safely removed and disposed of daily.

BMP-3: Vehicles and Equipment

All vehicles and equipment used during construction shall be maintained in good working order, free of rust, and shall be cleaned at the start of each working day prior to the commencement of work. No vehicles or equipment shall be operated that leak any fluids from the engine, working mechanism, or on-board water/debris storage tank.

BMP-4: Safety and Accident Prevention

The contractor shall be responsible for traffic and/or pedestrian control and protection of public and private properties adjacent to the work site and shall exercise due caution to avoid damage to such property. In the event of an accident, either vehicle, personnel, or property damage, the contractor shall immediately notify the designated UC Merced representative.

2.5 OPERATION

Once constructed, the proposed project would be privately owned, maintained, and operated by a third party. Power generated by the proposed project would interconnect with the campus's Central Utility Plant; no export of power off campus would occur. It is anticipated that the proposed project would have a 30-year operating life. During operation, the project would passively generate power during daylight hours seven days per week, 365 days per year; however, emergency maintenance would occur on an as-needed basis. The proposed project may include the integration of agrivoltaics, such as seasonal animal grazing.

Regular maintenance activities would occur only during the daytime, except for the occasional emergency maintenance which may require night dispatch. It is anticipated that up to two workers would be on-site for periodic maintenance and repairs, up to 24 total days per year. In addition, during the project's operational period, the PV modules would be cleaned with water once or twice per year over a total of 10 day period to clean accumulated dust and debris to maintain efficiency. Up to 10 workers would be on-site for annual washing. The PV panels would be washed with only water; soap or detergent for panel washing would not be necessary. It is estimated that approximately 250,000 gallons of water per year would be required for panel washing and livestock management.

2.6 PROJECT APPROVAL

A listing and brief description of the approvals and/or regulatory permits required to implement the proposed project are provided below. This environmental document is intended to address the environmental impacts associated with the following discretionary actions and approvals.

UC Merced

Anticipated actions required by UC Merced to implement the proposed project include, but are not limited to, the following:

- **Demolition Permit**
- **Grading Permit**
- **Project Approval:** The University of California, Merced will act as the Lead Agency as defined by CEQA and will have authority to determine if this environmental document is adequate under CEQA and the State CEQA Guidelines and will be responsible for approving the proposed project.

Other Agencies

Other actions from Responsible Agencies are anticipated to include, but are not limited to, the following:

- **California Department of Fish and Wildlife (CDFW):** Compliance with Incidental Take Permit (ITP) No. 2081-2009-010-04 (Amendment No. 4) that covers impacts to species that may occur in the project area.
- **Central Valley Regional Water Quality Control Board (CVRWQCB):** National Pollutant Discharge Eliminated System (NPDES) Construction General Permit, which requires the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

3.0 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a “Potentially Significant Impact” or “Less than Significant with Mitigation Incorporated” as indicated by the checklist on the following pages.

☒ Aesthetics	☐ Agriculture and Forestry Resources	☒ Air Quality
☒ Biological Resources	☒ Cultural Resources	☐ Energy
☒ Geology and Soils	☐ Greenhouse Gas Emissions	☒ Hazards and Hazardous Materials
☐ Hydrology and Water Quality	☐ Land Use and Planning	☐ Mineral Resources
☐ Noise	☐ Population and Housing	☒ Public Services
☐ Recreation	☐ Transportation	☐ Tribal Cultural Resources
☐ Utilities and Service Systems	☒ Wildfire	☒ Mandatory Findings of Significance

4.0 DETERMINATION

On the basis of this initial evaluation:

☐	I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
☒	I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
☐	I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
☐	I find that the proposed project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
☐	I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature

Date

Printed Name

For

5.0 ENVIRONMENTAL CHECKLIST

UC Merced has defined the column headings in the environmental checklist as follows:

- A. “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.
- B. “Less than Significant with Mitigation Incorporated” applies where the inclusion of mitigation measures has reduced an effect from “Potentially Significant Impact” to a “Less Than Significant Impact.” All mitigation measures are described, including a brief explanation of how the measures reduce the effect to a less than significant level. Mitigation measures from earlier analyses may be cross-referenced.
- C. “Less than Significant Impact” applies where the project does not create an impact that exceeds a stated significance threshold.
- D. “No Impact” applies where a project does not create an impact in that category. “No Impact” answers do not require an explanation if they are adequately supported by the information sources cited by the lead agency which show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project would not expose sensitive receptors to pollutants, based on a project specific screening analysis).

The explanation of each issue identifies the significance criteria or threshold used to evaluate each question; and the mitigation measure identified, if any, to reduce the impact to less than significance. Earlier analyses may be used where, pursuant to tiering [CEQA Guidelines Section 15063(c)(3)(D)]. Where appropriate, the discussion identifies the following:

- a) Earlier Analyses Used. Identifies that the 2020 LRDP SEIR, as supplemented in the 2022 UC Merced Medical Education Building Project Draft EIR to address program-level transportation impacts based on VMT metrics, and 2009 LRDP EIS/EIR comprehensively addressed the potential environmental effects of campus growth and development due to implementation of future projects and activities proposed under the 2020 LRDP which includes the proposed project.
- b) Impacts Adequately Addressed. Identifies which effects from the checklist were within the scope of and adequately analyzed in the 2020 LRDP SEIR, as supplemented in the 2022 UC Merced Medical Education Building Project Draft EIR to address program-level transportation impacts based on VMT metrics, and 2009 LRDP EIS/EIR pursuant to applicable legal standards, and states whether such effects were addressed by mitigation measures based on the earlier analysis.
- c) Mitigation Measures. For effects that are “Less Than Significant with Mitigation Incorporated,” describes if new project-specific mitigation is required or if mitigation measures were incorporated or refined from the 2020 LRDP SEIR, as supplemented in the 2022 UC Merced Medical Education Building Project Draft EIR to address program-level transportation impacts based on VMT metrics, and 2009 LRDP EIS/EIR to the extent to which they address site-specific conditions for the project.

I. AESTHETICS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☒	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☒	☐	☐

Environmental Setting

The proposed project site is located east of the central portion of the campus, off of Cottonwood Loop. The project site is bordered by Cottonwood Loop and Le Grand Canal to the north, Le Grand Canal and central campus to the east, and undeveloped land to the south and west. The project site is currently partially developed with an approximately 10-acre, 1-MW ground-mount solar array site built in 2009. A chain-link fence surrounds the perimeter of the existing solar array site. An approximately 0.25-mile-long access road off of Cottonwood Loop provides access to the existing solar array site. The remaining portion of the project site surrounding the existing solar array site is undeveloped.

The California Department of Transportation (Caltrans) manages the State Scenic Highway Program, which includes a list of highways that are either eligible for designation as scenic highways or have been officially designated. These highways are identified in Streets and Highways Code (Division 1, Chapter 2, Section 263). The closest officially designated State Scenic Highways to the project site include SR 140, located between the communities of Mariposa and El Portal in Mariposa County, approximately 27 miles northeast, and Interstate 5 (I-5) located within Stanislaus County, approximately 37 miles west. SR 49 is located approximately 23 miles east of the project site and is eligible for designation as a State Scenic Highway (Caltrans 2025).

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

Impacts related to aesthetics were analyzed in Section 4.1, Aesthetics, of the 2009 LRDP EIS/EIR. The 2020 LRDP SEIR determined that impacts to aesthetics were adequately addressed in the 2009 LRDP EIS/EIR and, therefore, did not require subsequent evaluation.

The 2009 LRDP EIS/EIR determined that buildout under the 2009 LRDP would result in a significant and unavoidable impact on scenic vistas after implementation of 2009 LRDP Mitigation Measure (MM) AES-1a and 2009 LRDP MM AES-1b. However, as the UC Merced campus is not located near State Scenic Highways, the 2009 LRDP EIS/EIR determined that implementation of the 2009 LRDP would not substantially damage scenic resources within the viewshed of a State Scenic Highway, and no impact would occur.

The 2009 LRDP EIS/EIR determined that buildout under the 2009 LRDP would result in a significant and unavoidable impact related to visual character and quality, as the visual characteristics of the campus would change from largely undeveloped grasslands and irrigated pasture to a fully urbanized area developed with buildings, sidewalks, paved parking lots, and landscaping. The 2009 LRDP EIS/EIR identified 2009 LRDP MM AES-3a and MM AES-3b; however, it was concluded that the impact would remain significant and unavoidable.

Lastly, the 2009 LRDP EIS/EIR concluded that development under the 2009 LRDP, specifically development on previously undeveloped agricultural land, would introduce new substantial sources of night light and daytime glare. The 2009 LRDP EIS/EIR identified 2009 LRDP MM AES-4; however, the impact was determined to remain significant and unavoidable.

Discussion of Impacts

a) Have a substantial adverse effect on a scenic vista?

Less Than Significant Impact. A scenic vista is generally defined as an expansive view of a highly valued landscape as observable from a publicly accessible vantage point. Generally, scenic views from the UC Merced campus include views of open rangeland and agricultural fields in the foreground and middle ground and rolling foothills and the Sierra Nevada range in the far background. Long-range views of the Sierra Nevada are currently available from locations on Lake Road west of the southern portion of the UC Merced campus and from Lake Yosemite Regional Park to the north (UC Merced 2008). In the project vicinity, long-range views of the Sierra Nevada are currently available from locations on Lake Road west of the southern portion of the campus and from Lake Yosemite Regional Park (Regional Park) to the north of the UC Merced campus. The proposed project site is located east of the central portion of the UC Merced campus and is bordered by Cottonwood Loop and Le Grand Canal to the north, Le Grand Canal and central campus to the east, and undeveloped land to the south and west. As such, due to the distance from the Regional Park and existing intervening structures, the project would not be visible from the Regional Park. In addition, the proposed project would be generally consistent with existing development on campus and would not result in a substantial adverse effect on a scenic vista. Therefore, the impact would be less than significant.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway?

No Impact. The closest officially designated State Scenic Highways to the project site include SR 140 between the communities of Mariposa and El Portal in Mariposa County, approximately 27 miles northeast; and I-5 within Stanislaus County, located approximately 37 miles west. SR 49 is located approximately 23 miles east of the project site and is eligible for designation as a State Scenic Highway (Caltrans 2025). Due to distance and existing intervening structures, the proposed project would not be

visible from SR 40, I-5, or SR 49; therefore, implementation of the proposed project would not damage scenic resources within a State Scenic Highway. Therefore, no impact would occur.

- c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

Less Than Significant with Mitigation Incorporated. Staging of construction equipment, vehicles, and materials would temporarily alter the visual character and quality of the site; however, the construction staging area would be located on-site and would be limited to the short-term construction period. The proposed project would include the demolition of the existing 1-MW ground-mounted, single-axis tracking system and construction of an up to 6-MW solar PV facility consisting of a dual-axis tracking system. It is anticipated that the maximum height of the PV modules would be up to 36 feet at full tilt. The proposed project would be required to comply with campus design guidelines and would implement 2009 LRDP MM AES-3a, which identifies design standards for all new aboveground infrastructure on the campus, including visual screening of the project site from public rights-of-way (ROW). Therefore, with implementation of 2009 LRDP MM AES-3a, the impact would be less than significant.

- d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Less Than Significant with Mitigation Incorporated. It is anticipated that construction of the proposed project would be limited to daytime construction hours, 7:00 AM and 6:00 PM. Once operational, the proposed project would include security lighting, which could create new sources of night light. In addition, the proposed solar infrastructure would create new sources of glare. However, the proposed project would be required to be designed in accordance with the UC Merced campus standards for site lighting, which would reduce the impact related to light spill and glare. The campus standards applicable to the proposed project include the following:

- To preserve the dark skies, all site lighting equipment will not emit light at angles greater than 90 degrees above nadir.
- Light fixtures adjacent to the boundaries of the campus will be equipped with house side shields to avoid unwanted spillage (UC Merced 2008).

In addition, 2009 LRDP MM AES-4, which would require all outdoor project lighting to be focused and shielded downwards to minimize glare, up-light, and light trespass, would be applicable to the proposed project and would be implemented. Therefore, with implementation of applicable campus standards and 2009 LRDP MM AES-4, the impact would be less than significant.

Mitigation Measures

No new project-specific mitigation measures would be required related to aesthetics. The following mitigation measures from the 2009 LRDP EIS/EIR would be applicable to the proposed project:

2009 LRDP MM AES-3a: The University shall design all new aboveground infrastructure on the Campus to the following standards: (a) Screen aboveground infrastructure from view from public rights-of-way

or scenic vistas, via landscaping, fencing, or other architectural screening; (b) Require creative design measures to camouflage structures by integrating them with existing buildings and among other existing uses; (c) Locate aboveground infrastructure on sites that are not visible from visually sensitive areas, such as residential communities and open space areas; (d) Require providers to co-locate their structure on a single site, where technically feasible and visually desirable; and (e) Locate antennae and equipment on other existing community facility sites, such as water tanks or utility poles

2009 LRDP MM AES-4: Prior to issuance of building permits, UC Merced shall ensure the final project plans include the following details:

- All outdoor lighting shall be focused and directed to the specific location (e.g., roads, walkways), be shielded to avoid the production of glare, minimize up-light, and light spill.
- All light fixtures shall be located, aimed, or shielded so as to minimize stray light trespassing across property boundaries and other sensitive areas.

II. AGRICULTURE AND FORESTRY RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☒	☐
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☒	☐
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☒	☐

Environmental Setting

The Farmland Mapping and Monitoring Program (FMMP), administered by the California Department of Conservation (DOC), produces maps and statistical data for use in analyzing impacts on California's agricultural resources. FMMP rates and classifies agricultural land according to soil quality, irrigation status, and other criteria. For environmental review purposes under CEQA, the categories of Prime Farmland, Farmland of Statewide Importance, and Unique Farmland constitute 'agricultural land' (PRC Section 21060.1). According to the FMMP, the project site is mapped as Urban and Built-Up Land, Grazing Land, Farmland of Local Importance, and Vacant or Disturbed Land. Land bordering the project site is mapped as Grazing Land to north and east, Farmland of Local Importance to the south, and Vacant or Disturbed Land to the west (DOC 2025a).

The project site is currently partially developed with an approximately 10-acre, 1-MW ground-mount solar array site built in 2009. The remaining portion of the project site surrounding the existing solar array site is undeveloped. Based on a review of historical imagery of the project site, the northern half of the site was rough graded during construction of the existing solar array, and the southern half of the site was previously an irrigated pasture. The UC Merced 2020 LRDP land use designation for the project site is primarily CBRSL; however, a small portion of the project site off of Cottonwood Loop is designated CMU. The project site is zoned by the City as Public Facility (P-F); however, the UC Merced campus is not subject to local zoning.

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

Impacts related to agricultural resources were analyzed in Section 4.2, Agricultural Resources, of the 2009 LRDP EIS/EIR. The 2020 LRDP SEIR determined that impacts to agricultural resources were adequately addressed in the 2009 LRDP EIS/EIR and, therefore, did not require subsequent evaluation.

The 2009 LRDP EIS/EIR concluded that buildout under the 2009 LRDP would result in the conversion of approximately 1,152 acres of Important Farmland, including Prime Farmland, Farmland of Statewide Importance, and Unique Farmland, to non-agricultural uses, and the impact would be significant and unavoidable after implementation of 2009 LRDP MM AG-1. However, the 2009 LRDP EIS/EIR noted that, although the campus contained areas of land that were mapped as Important Farmland, these areas were limited in extent and did not historically support the cultivation of high-value crops.

The 2009 LRDP EIS/EIR determined that buildout of the 2009 LRDP would not expose residents to agricultural nuisances, substantially conflict with existing general plan policies or zoning for agricultural use, or involve other changes that could result in the conversion of Important Farmland to non-agricultural uses, and the impact was concluded to be less than significant.

Discussion of Impacts

- a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?
- b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

Less Than Significant Impact. The proposed project site is mapped by the FMMP as Urban and Built-Up Land, Grazing Land, Farmland of Local Importance, and Vacant or Disturbed Land. Land bordering the project site is mapped as Grazing Land to north and east, Farmland of Local Importance to the south, and Vacant or Disturbed Land to the west (DOC 2025a). As such, implementation of the proposed project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use. In addition, the proposed project site is not currently used for agricultural production. The UC Merced 2020 LRDP land use designation for the project site is primarily CBRSL; however, a small portion of the project site off of Cottonwood Loop is designated CMU. The project site is located on the UC Merced campus and is not subject to City zoning; however, it should be noted the site is zoned Public Facility (P-F) and is not zoned for agricultural uses. Additionally, the project site is not under a Williamson Act contract. Therefore, the impact would be less than significant for questions a) and b).

- c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?
- d) Result in the loss of forest land or conversion of forest land to non-forest use?

No Impact. The project site is not zoned forest land, timberland, or timberland zoned Timberland Production, nor does the project site contain forest land. Therefore, implementation of the proposed

project would not conflict with existing zoning for forest land or result in the conversion or loss of forest land. No impact would occur for questions c) and d).

- e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

Less Than Significant Impact. As previously discussed in the responses to questions a) through d), the proposed project site is mapped by the FMMP as Urban and Built-Up Land, Grazing Land, Farmland of Local Importance, and Vacant or Disturbed Land. Land bordering the project site is mapped as Grazing Land to north and east, Farmland of Local Importance to the south, and Vacant or Disturbed Land to the west. The project site is currently developed with an approximately 10-acre ground-mount solar array and is not used for agricultural purposes. As such, implementation of the proposed project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use. Further, the project would not involve other changes that could result in the conversion of Prime Farmland, Farmland of Statewide Importance, or Unique Farmland to non-agricultural uses. Therefore, the impact would be less than significant.

Mitigation Measures

None of the mitigation measures identified in the 2009 LRDP EIS/EIR related to agriculture and forestry resources would be applicable to the proposed project, and no new project-specific mitigation measures would be required.

III. AIR QUALITY

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☒	☐	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☒	☐	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

This section is based on the Air Quality and Greenhouse Gas Emissions Technical Report prepared by HELIX in June 2026 for the proposed project (HELIX 2026a). The Air Quality and Greenhouse Gas Emissions Technical Report is included in Appendix B to this IS/MND.

Environmental Setting

The project site is located within the Merced County portion of the San Joaquin Valley Air Basin (SJVAB). Air quality in the San Joaquin County is regulated by the U.S. Environmental Protection Agency (USEPA) at the federal level, by the California Air Resources Board (CARB) at the State level, and by the San Joaquin Valley Air Pollution Control District (SJVAPCD) at the regional level.

Air Pollutants of Concern

Criteria Pollutants

Criteria pollutants are defined by State and federal law as a risk to the health and welfare of the general public. In general, criteria air pollutants include the following compounds:

- Ozone (O₃)
- Carbon monoxide (CO)
- Nitrogen dioxide (NO₂)
- Particulate matter (PM), which is further subdivided:
 - Coarse PM, 10 microns or less in diameter (PM₁₀)

- Fine PM, 2.5 microns or less in diameter (PM_{2.5}), a subset of PM₁₀.
- Sulfur dioxide (SO₂)
- Lead (Pb)

Criteria pollutants can be emitted directly from sources (primary pollutants; e.g., CO, SO₂, PM₁₀, PM_{2.5}, and lead), or they may be formed through chemical and photochemical reactions of precursor pollutants in the atmosphere (secondary pollutants; e.g., ozone, NO₂, PM₁₀, and PM_{2.5}). PM₁₀ and PM_{2.5} can be both primary and secondary pollutants. The principal precursor pollutants of concern are reactive organic gases ([ROGs] also known as volatile organic compounds [VOCs])¹ and nitrogen oxides (NO_x).

Attainment Designations

As shown in Table 1, *San Joaquin Valley Air Basin Attainment Status*, the SJVAB is designated as nonattainment for 8-hour ozone and PM_{2.5} with respect to NAAQS. The SJVAB is designated as nonattainment for 1-hour and 8-hour ozone, PM_{2.5}, and PM₁₀ with respect to CAAQS (SJVAPCD 2026).

Table 1
SAN JOAQUIN VALLEY AIR BASIN ATTAINMENT STATUS

Pollutant	Federal Standards	State Standards
Ozone – One hour	No Federal Standard	Nonattainment/Severe
Ozone – Eight hour	Nonattainment/Extreme	Nonattainment
PM ₁₀	Attainment	Nonattainment
PM _{2.5}	Nonattainment	Nonattainment
Carbon Monoxide	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide	Attainment/Unclassified	Attainment
Sulfur Dioxide	Attainment/Unclassified	Attainment
Lead (Particulate)	No Designation/Unclassified	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility Reducing Particles	No Federal Standard	Unclassified
Vinyl Chloride	No Federal Standard	Attainment

Source: SJVAPCD 2026

Monitored Air Quality

The SJVAPCD maintains monitoring stations to measure ambient concentrations of pollutants in Merced County. The closest monitoring station to the project is located at 2334 M Street in the City of Merced, approximately 5 miles southwest of the project site. This station monitors ambient pollutant concentrations of PM₁₀ and PM_{2.5}. The next nearest monitoring station to the site with data for ozone and NO₂ is located at 385 South Coffee Avenue in the City of Merced, approximately 5.4 miles south of the project site. Table 2, *Air Quality Monitoring Data*, presents a summary of the ambient pollutant concentrations monitored at the two air quality monitoring stations during the most recent three years (2022 through 2024) for which the SJVAPCD has reported data (CARB 2026a).

¹ CARB defines and uses the term ROGs while the USEPA defines and uses the term VOCs. The compounds included in the lists of ROGs and VOCs and the methods of calculation are slightly different. However, for the purposes of estimating criteria pollutant precursor emissions, the two terms are often used interchangeably.

Table 2
AIR QUALITY MONITORING DATA

Pollutant Standard	2022	2023	2024
<i>Ozone (O₃) – 385 South Coffee Avenue Station</i>			
Maximum concentration 1-hour period (ppm)	0.096	0.096	*
Maximum concentration 8-hour period (ppm)	0.083	0.079	*
Days above 1-hour state standard (>0.09 ppm)	3	1	*
Days above 8-hour state/federal standard (>0.070 ppm)	9	13	*
<i>Coarse Particulate Matter (PM₁₀) – 2334 M Street Station</i>			
Maximum 24-hour concentration (µg/m ³)	100.5	109.3	109.3
Measured Days above 24-hr state standard (>50 µg/m ³)	60	50	50
Measured Days above 24-hr federal standard (>150 µg/m ³)	0	0	0
Annual average (µg/m ³)	*	32.0	31.7
Exceed state annual standard (20 µg/m ³)	*	Yes	Yes
<i>Fine Particulate Matter (PM_{2.5}) – 2334 M Street Station</i>			
Maximum 24-hour concentration (µg/m ³)	43.7	38.5	51.5
Measured Days above 24-hour federal standard (>35 µg/m ³)	4	2	4
Annual average (µg/m ³)	10.5	9.6	7.8
Exceed state and federal annual standard (12 µg/m ³)	No	No	No
<i>Nitrogen Dioxide (NO₂) – 385 South Coffee Avenue Station</i>			
Maximum 1-hour concentration (ppm)	0.039	0.037	*
Days above state 1-hour standard (0.18 ppm)	0	0	*
Days above federal 1-hour standard (0.100 ppm)	0	0	*
Annual average (ppm)	0.007	0.006	*
Exceed annual federal standard (0.053 ppm)	No	No	*
Exceed annual state standard (0.030 ppm)	No	No	*

Source: CARB 2026a

ppb = parts per billion; ppm = parts per million; µg/m³ = micrograms per cubic meter, * = insufficient data available.

As shown in Table 2, the 1- and 8-hour ozone NAAQS and CAAQS were exceeded on multiple day in 2022 and 2023; the 24-hour PM₁₀ CAAQS was exceeded on multiple day in 2023 through 2024; and the annual PM₁₀ CAAQS was exceeded in 2023 and 2024.

Toxic Air Contaminants

The Health and Safety Code (§39655, subd. (a).) defines a toxic air contaminant (TAC) as “an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health.” A substance that is listed as a hazardous air pollutant pursuant to subsection (b) of Section 112 of the Federal Clean Air Act (CAA) (42 United States Code Section 7412[b]) is a TAC. Under State law, the California Environmental Protection Agency (CalEPA), acting through CARB, is authorized to identify a substance as a TAC if it determines the substance is an air pollutant that may cause or contribute to an increase in mortality or an increase in serious illness, or that may pose a present or potential hazard to human health.

Diesel engines emit a complex mixture of air pollutants, including both gaseous and solid material. The solid material in diesel exhaust is referred to as diesel particulate matter (DPM). Almost all DPM is 10 microns or less in diameter, and 90 percent of DPM is less than 2.5 microns in diameter (CARB 2026b). Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lung. In 1998, CARB identified DPM as a TAC based on published

evidence of a relationship between diesel exhaust exposure and lung cancer and other adverse health effects. DPM has a notable effect on California's population—it is estimated that about 70 percent of total known cancer risk related to air toxics in California is attributable to DPM (CARB 2026b).

Climate and Meteorology

The project site is located within the Merced County portion of the SJVAB. The SJVAB enjoys an inland Mediterranean climate, averaging more than 260 sunny days per year. The valley floor is characterized by warm, dry summers and cooler winters. Average daily temperatures in the basin range from 44.6 degrees °F in January to 76.7°F in July. Summer highs often exceed 100°F, averaging in the low 90s in the northern valley and high 90s to the south. Maximum temperatures of 90°F or greater occur about 88 days per year. Although the SJVAB enjoys a high frequency of sunshine, a reduction in sunshine occurs during December and January because of fog and intermittent stormy weather. Temperatures of 32°F and below occur about 22 days per year. Nearly 90 percent of the annual precipitation falls in the six months between November and April (UC Merced 2020).

Sensitive Receptors

CARB and the Office of Environmental Health Hazard Assessment (OEHHA) have identified the following groups of individuals as the most likely to be affected by air pollution: adults over 65, children under 14, infants (including in utero in the third trimester of pregnancy), and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis, known as sensitive receptors (CARB 2005; OEHHA 2015). Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved and are referred to as sensitive receptor locations. Examples of these sensitive receptor locations are residences, schools, hospitals, and daycare centers.

The closest existing sensitive receptor locations to the project site are UC Merced student housing buildings located 2,100 feet (0.4 mile) west of the project site. The nearest off-campus sensitive receptor locations to the project site is a single-family residence located on Lake Road, approximately 4,620 feet (0.9) mile west of the project site. There are no off-campus residences, schools, hospitals, or daycare centers within a mile of the project site.

Methodology

Criteria Pollutant and Precursor Emissions Calculations

Criteria pollutant and precursor emissions for the project construction activities and long-term operation were calculated using the California Emissions Estimator Model (CalEEMod), Version 2022.1. CalEEMod is a Statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant emissions associated with both construction and operations from a variety of land use projects. The model was developed for the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the California air districts. CalEEMod allows for the use of default data (e.g., emission factors, trip lengths, meteorology, source inventory) provided by the various California air districts to account for local requirements and conditions, and/or user-defined inputs. The model calculates emissions of criteria pollutants, Ozone precursors, and GHGs. The calculation methodology and input data used in CalEEMod can be found in the CalEEMod User's Guide Appendices A, C, and D (CAPCOA 2022). The CalEEMod output report is included in Appendix A of Appendix B.

SJVAPCD Significance Thresholds

SJVAPCD has established significance thresholds to assess the impacts of project-related air pollutant emissions. The significance thresholds are updated, as needed, to appropriately represent the most current technical information and attainment status in the SJVAB. Table 3, *SJVAPCD Air Quality Significance Thresholds*, presents the most current significance thresholds, including thresholds for construction and operational emissions and maximum incremental cancer risk and hazard indices for TACs. A project with emission rates and risk values below these thresholds is generally considered to have a less than significant impact on air quality.

Table 3
SJVAPCD AIR QUALITY SIGNIFICANCE THRESHOLDS

Mass Daily Thresholds (tons per year)		
Pollutant	Construction	Operation
ROG	10	10
NO _x	10	10
CO	100	100
PM ₁₀	15	15
PM _{2.5}	15	15
SO _x	27	27
Toxic Air Contaminants		
TACs	Maximum Incremental Cancer Risk ≥ 10 in 1 million Chronic & Acute Hazard Index ≥ 1.0 (project increment)	

Source: SJVAPCD 2015

ROG = reactive organic gas; NO_x = nitrogen oxides; CO = carbon monoxide; PM₁₀ = coarse particulate matter with a diameter of 10 microns or less; PM_{2.5} = fine particulate matter with a diameter of 2.5 microns or less; SO_x = sulfur oxides; TACs = toxic air contaminants; NO₂ = nitrogen dioxide; ppm = parts per million; $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter

As set forth in the SJVAPCD's Guidance for Assessing and Mitigating Air Quality Impacts, any proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact. Impacts of local pollutants (CO, TACs) are cumulatively significant when modeling shows that the combined emissions from the project and other existing and planned projects would exceed air quality standards.

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

Impacts related to air quality were analyzed in Section 4.1, Air Quality, of the 2020 LRDP SEIR. The 2020 LRDP SEIR concluded that, because a higher level of growth at the campus has been accounted for and included in the air quality planning efforts of the region, implementation of the 2020 LRDP would not conflict with or obstruct implementation of the applicable air quality plan. Although the emissions associated with campus operation at full development under the 2020 LRDP would result in a significant and unavoidable impact, the effect of campus buildout under the 2020 LRDP with respect to the regional air quality management plan would, in itself, be less than significant.

The 2020 LRDP SEIR determined that development under the 2020 LRDP was not anticipated to result in construction emissions that would result in a cumulatively considerable net increase of criteria pollutants that would exceed SJVAPCD thresholds. However, should a number of projects be constructed concurrently on campus, it is possible that the SJVAPCD threshold for NO_x could be

exceeded. The 2020 LRDP SEIR concluded that the impact from construction under the 2020 LRDP would be less than significant with implementation of 2020 LRDP MM AQ-1a and MM AQ-1b.

However, the 2020 LRDP SEIR concluded that the operational ROG and NO_x emissions would exceed the SJVAPCD thresholds. With the implementation of 2020 LRDP MM AQ-2a and MM AQ-2b, the 2020 LRDP SEIR concluded that campus operations would still result in annual emissions that exceed the SJVAPCD threshold for NO_x, and the impact from operation of development under the 2020 LRDP would remain significant and unavoidable.

The 2020 LRDP SEIR concluded that implementation of the 2020 LRDP would not expose sensitive receptors to substantial pollutant concentrations of carbon monoxide. The 2020 LRDP SEIR concluded that, with respect to small-scale projects located within lands designated CMU, CBRSL, or Research Open Space (ROS), due to the small size and nature of these projects, they would be unlikely to result in CO emissions that would exceed applicable thresholds.

Construction activities under the 2020 LRDP would require the use of materials with associated odors; however, the 2020 LRDP SEIR concluded that, as these odors would be short-term in use and would not be pervasive enough to cause objectionable odors, construction-related impacts would be less than significant. The operation of academic and athletic activities and student housing under the 2020 LRDP would not involve objectionable odors; therefore, operation-related impacts would be less than significant.

Although campus development under the 2020 LRDP would include sources that would result in TAC emissions, adequate information with respect to these sources was not available to allow for the quantification and evaluation or potential human health risk. Human health risk from TAC emissions were not discussed further in the 2020 LRDP SEIR. However, the 2020 LRDP SEIR noted that, to the extent that UC Merced proposes to add new sources such as diesel-operated emergency generators that could result in TAC emissions, UC Merced would conduct an evaluation of the testing emissions from the proposed generator to make sure its operation does not result in a human health impact on the campus population.

Discussion of Impacts

a) Conflict with or obstruct implementation of the applicable air quality plan?

Less Than Significant Impact. The SJVAPCD has adopted several attainment plans that outline long-term strategies designed to achieve compliance with the State and federal ambient air quality standards. SJVAPCD has established thresholds of significance for a project's criteria pollutant and precursor emissions for both temporary construction-related emissions and long-term operational-related emissions. These significance thresholds have been established to assist lead agencies in determining whether a project may have a significant air quality impact. A project with emissions lower than the thresholds would not conflict with or obstruct implementation of the district's air quality plans for attainment of the applicable NAAQS and CAAQS. As discussed under the response to question b) below, the project would not exceed the temporary construction-related or long-term operational-related thresholds of significance for criteria pollutants and precursor emissions.

The project would not result in growth in the numbers of students and faculty at UC Merced. During project construction and for annual vegetation maintenance and panel washing, short-term, temporary jobs would be created; however, it is anticipated that the majority of the labor force would be sourced from within the County. Therefore, the growth associated with the project has been accounted for and included in the air quality planning efforts of the region and implementation of the project would not conflict with or obstruct implementation of the applicable air quality plan. The project would not exceed the temporary construction-related or long-term operational-related thresholds of significance for criteria pollutants and precursor emissions. Additionally, the growth and capacity associated with the project has been accounted for and included in the air quality planning efforts of the region and implementation of the proposed project would not conflict with or obstruct implementation of the applicable air quality plan. Therefore, the impact would be less than significant.

- b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

Less Than Significant With Mitigation Incorporated. By its very nature, air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development within the region. The project would generate criteria pollutants and precursors in the short-term during construction and in the long-term during operation. To determine whether a project would result in cumulatively considerable emissions that would violate an air quality standard or contribute substantially to an existing or projected air quality violation, a project's emissions are evaluated based on the quantitative emission thresholds established by the SJVAPCD.

Construction Emissions

The project's construction emissions were estimated using CalEEMod. The complete CalEEMod output files are included in Appendix A of Appendix B. The emissions generated from construction activities include:

- Dust (including PM₁₀ and PM_{2.5}), primarily from fugitive sources such as soil disturbance and vehicle travel over paved and unpaved surfaces; and
- Combustion emissions of air pollutants (including ROG, NO_x, PM₁₀, PM_{2.5}, CO, and sulfur oxides [SO_x]), primarily from operation of heavy off-road equipment and haul trucks.

The results of the project construction emissions modeling are shown below in Table 4, *Annual Construction Criteria Pollutant and Precursor Emissions*. The data shown assumes application of water on exposed surfaces a minimum of two times per day in compliance with SJVAPCD Rule 8021, Construction, Demolition, Excavation, Extraction, and other Earth Moving Activities. As shown in Table 4, the project's individual construction emissions would not exceed SJVAPCD thresholds, therefore the impact during construction would be less than significant.

Table 4
ANNUAL CONSTRUCTION CRITERIA POLLUTANT AND PRECURSOR EMISSIONS

Year	Pollutant Emissions (tons per year)					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
2027	0.4	3.1	3.4	<0.1	2.0	0.4
<i>SJVAPCD Threshold</i>	<i>10</i>	<i>10</i>	<i>100</i>	<i>27</i>	<i>15</i>	<i>15</i>
<i>Significant Impact?</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>

Source: CalEEMod (Appendix A); Threshold: SJVAPCD 2015

ROG = reactive organic gas; NO_x = nitrogen oxides; CO = carbon monoxide; SO_x = sulfur oxides; PM₁₀ = particulate matter 10 microns or less in diameter; PM_{2.5} = particulate matter 2.5 microns or less in diameter; SJVAPCD = San Joaquin Valley Air Pollution Control District

Although construction of the proposed project on the individual level would not exceed SJVAPCD thresholds, 2020 LRDP MM AQ-1a and MM AQ-1b would be implemented to reduce potential cumulative impacts from project construction in combination with other UC Merced development projects. 2020 LRDP MM AQ-1a would ensure construction equipment rated by the USEPA as meeting Tier 4 (model year 2008 or newer) emission limits for engines between 50 and 750 horsepower is used by the construction contractor. Additionally, 2020 LRDP MM AQ-1b would ensure compliance with SJVAPCD Regulation VIII, *Fugitive PM₁₀ Prohibitions* and to reduce fugitive dust impacts.

Operational Emissions

The project's operational emissions were estimated using CalEEMod. The complete CalEEMod output files are included in Appendix A of Appendix B. Annual project operational emissions for all analyzed pollutants would be far below one ton per year and would not exceed the SJVAPCD operational thresholds which range from 10 to 100 tons per year (tpy). Therefore, the impact during operation would be less than significant.

Impact Summary

The project's construction and operational emissions would be below the SJVAPCD thresholds of significance, and with implementation of 2020 LRDP MMs AQ-1a and AQ-1b, the cumulative impact would be less than significant.

c) Expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant With Mitigation Incorporated.

Construction Activities

As discussed in question b), project construction would not result in emissions of PM in excess of the SJVAPCD thresholds. However, 2020 LRDP MM AQ-1b would be implemented to ensure compliance with SJVAPCD Regulation VIII, *Fugitive PM₁₀ Prohibitions* and to reduce fugitive dust impacts.

Implementation of the project would result in the use of heavy-duty construction equipment, haul trucks, and construction worker vehicles. These vehicles and equipment could generate the TAC DPM. Generation of DPM from construction projects typically occurs in a localized area (e.g., at the project site) for a short period of time. Because construction activities and subsequent emissions vary depending on the phase of construction (e.g., grading, building construction), the construction-related

emissions to which nearby receptors are exposed would also vary throughout the construction period. During some equipment-intensive phases, such as grading, construction-related emissions would be higher than other less equipment-intensive phases such as building construction. Concentrations of mobile-source DPM emissions are typically reduced by 70 percent at approximately 500 feet (CARB 2005). The use of heavy diesel-powered construction equipment would occur 2,100 feet or more from the closest sensitive receptor location. In addition, as discussed in the response to question b), 2020 LRDP MM AQ-1a would be applicable to the proposed project and would be implemented to ensure project diesel-powered construction equipment would comply with the USEPA Tier 4 (model year 2008 or newer) emission limits for engines between 50 and 750 horsepower is used by the construction contractor. USEPA Tier 4 certified engines reduce emissions of DPM by 90 percent or more compared to Tier 0 engines.

Considering this information, the short duration of construction activity, the highly dispersive nature of DPM and the distance to the closest sensitive receptor locations, construction of the project would expose off-site sensitive receptors to substantial DPM concentrations. Therefore, the impact during construction would be less than significant.

Operational Activities

Vehicle exhaust is the primary source of CO in California. In an urban setting, the highest CO concentrations are generally found near congested intersections. Under typical meteorological conditions, CO concentrations tend to decrease as distance from the emissions source (i.e., congested intersection) increases. Project-generated traffic has the potential of contributing to localized “hot spots” of CO off-site. Operation of the project would require one to two workers would be on-site periodically for maintenance and repairs, up to 24 days in a year, and up to 10 workers would be on-site once annually for module washing and vegetation management over a two-week period. Therefore, the project would contribute minimal traffic to area roadways the long-term operation of the project would not result in the violation of the CO standards and would not expose sensitive receptors to substantial CO concentrations. Therefore, the impact during operation would be less than significant.

Impact Summary

With implementation of 2020 LRDP MM AQ-1a and MM AQ-1b, the project would not expose sensitive receptors to substantial pollutant concentrations, including short term construction emission of fugitive dust and DPM. Therefore, the impact would be less than significant.

- d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Less Than Significant Impact. Emissions from construction equipment, such as diesel exhaust, may generate odors; however, these odors would be temporary, intermittent, and not expected to affect a substantial number of people. Additionally, noxious odors would be confined to the immediate vicinity of construction equipment and would cease when construction activity ends.

The SJVAPCD has developed screening distances for common sources of operational odors, including Wastewater Treatment Facility; Sanitary Landfill; Transfer Station; Composting Facility; Petroleum Refinery; Asphalt Batch Plant; Chemical Manufacturing; Fiberglass Manufacturing; Painting/Coating Operations (e.g., auto body shops); Food Processing Facility; Feed Lot/Dairy; and Rendering Plant (SJVAPCD 2015). The proposed project would include construction of a PV facility and BESS and would

not include any of these uses nor are there any of these land uses in the project vicinity. Therefore, the impact would be less than significant.

Mitigation Measures

No new project-specific mitigation measures would be required related to air quality. The following mitigation measures from the 2020 LRDP SEIR would be applicable to the proposed project:

2020 LRDP MM AQ-1a: The construction contractors shall be required via contract specifications to use construction equipment rated by the USEPA as meeting Tier 4 (model year 2008 or newer) emission limits for engines between 50 and 750 horsepower.

2020 LRDP MM AQ-1b: UC Merced shall include in all construction contracts the measures specified in SJVAPCD Regulation VIII (as it may be amended for application to all construction projects generally) to reduce fugitive dust impacts, including but not limited to the following:

- All disturbed areas, including storage piles, which are not being actively utilized for construction purpose, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, or vegetative ground cover.
- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions using application of water or by presoaking.
- When materials are transported off-site, all material shall be covered, effectively wetted to limit visible dust emissions, or at least 6 inches of freeboard space from the top of the container shall be maintained.
- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at least once every 24 hours when operations are occurring. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit visible dust emissions. Use of blower devices is expressly forbidden.)
- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, storage piles shall be effectively stabilized of fugitive dust emissions by using sufficient water or chemical stabilizer/ suppressant.

IV. BIOLOGICAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	☐	☐	☒	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

The discussion below is based on the Biological Resources Assessment (BRA) prepared by HELIX for the proposed project (HELIX 2026b). The BRA is included as Appendix C to this IS/MND.

Environmental Setting

Biological Study Area

The 86.67-acre biological Study Area (which is coterminous with the project site) is partially developed with an approximately 10-acre, 1-MW ground-mount solar array site. A chain-link fence surrounds the perimeter of the existing solar array. An approximately 0.25-mile-long access road off of Cottonwood Loop provides access to the existing solar array. The remaining portion of the Study Area is undeveloped land that supports primarily annual herbaceous vegetation, isolated wetlands, and pasture. Based on a review of historical imagery of the Study Area, the northern half of the Study Area was rough graded during construction of the existing solar array, and the southern half of the site was previously an

irrigated pasture; however, while cattle still graze the Study Area, the pasture no longer appears to be actively irrigated. The terrain in the Study Area is slightly sloped with higher elevations on the northern and eastern portions of the Study Area and the lowest elevation in the southwestern corner of the Study Area. Study Area elevation ranges from 230 to 252 feet amsl.

The Study Area is in the Middle San Joaquin-Lower Chowchilla Watershed (USGS Hydrologic Unit Code [HUC8] 18040001). The Study Area abuts the Le Grand Canal levee and slopes toward the Fairfield Canal to the east of the Study Area; however, the Study Area is not directly hydrologically connected to either canal and is hydrologically isolated. Fairfield Canal and Le Grand Canal are both hydrologically connected to Yosemite Lake located to the north of the Study Area.

Methodology

This section summarizes the methodology for preparation of the BRA, including database queries and literature reviewed and fieldwork/survey methods.

Biological Resources Assessment

Database Queries and Literature Review

Before conducting the field survey, background research was conducted to inform and create target species lists to focus the survey efforts. Accessible information in public databases pertaining to natural resources in the region of the Study Area were queried. The following site-specific published information was reviewed for preparation of the BRA:

- California Department of Fish and Wildlife (CDFW). 2025. *California Natural Diversity Database* (CNDDB). [Accessed October 27, 2025];
- California Native Plant Society (CNPS). 2025. *Inventory of Rare and Endangered Plants* (online edition, v9.5.1) For Merced, Winton, Yosemite Lake, Haystack Mtn., Planada, Atwater, Sandy Mush, El Nido, and Plainsburg USGS 7.5-minute series quadrangles, Sacramento, CA. [Accessed October 27, 2025];
- U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). 2025. *Web Soil Survey*. Available online at: <http://websoilsurvey.sc.egov.usda.gov>. [Accessed October 27, 2025];
- USDA Climate Data and Summary Reports from AgACIS (NRCS 2025b); and
- U.S. Fish and Wildlife Service (USFWS). 2025. *Information for Planning and Consultation* (IPaC) for the UC Merced Solar Expansion Project. [Accessed October 27, 2025].

Before the biological field survey, information obtained from the queries (Appendix A of Appendix C) were reviewed and compiled into a table (Appendix B of Appendix C) to provide target lists to inform the field survey efforts and evaluate the potential for each special-status species to occur.

Special-status species are plant and wildlife species that have been afforded special recognition by federal, State, or local resource agencies or organizations. They are generally of relatively limited distribution and may require specialized habitat conditions. Special-status species are defined as meeting one or more of the following criteria:

- Listed or proposed for listing under the California Endangered Species Act (CESA) or Federal Endangered Species Act (FESA);
- Protected under other regulations (e.g., Migratory Bird Treaty Act [MBTA]);
- Included on the CDFW Special Animals List;
- Identified as CNPS Rare Plant Rank (CRPR) 1 to 3;
- Receive consideration during environmental review under CEQA.

Biological Reconnaissance Survey

Biological reconnaissance surveys of the Study Area were conducted on November 11, 2025, and May 19, 2026, by HELIX Senior Scientist Patrick Martin. The Study Area was systematically surveyed on foot and aided by binoculars to ensure complete coverage, with special attention given to identifying those portions of the Study Area with the potential for supporting special-status species and sensitive habitats. During the field surveys, the biologists recorded plant and animal species observed and characterized biological communities occurring within the Study Area according to *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer 1988). Plant nomenclature is taken from *The Jepson Manual: Vascular Plants of California, second edition* (Baldwin et al. 2012). Focused or USFWS or CDFW protocol surveys for wildlife species were not conducted during the site survey.

Incidental Take Permit 2081-2009-010-04 (Amendment No. 4)

A CESA Incidental Take Permit (ITP) No. 2081-2009-010-04 (Amendment No. 4) has been issued for the University of California, Merced Campus and Community North Project, which includes the proposed project site/Study Area within the boundary. On March 30, 2011, the CDFW issued the original ITP No. 2081-2009-010-04, followed by three amendments. The original ITP's effective date was March 30, 2011, which remains the effective date for the original take authorization. This Amended ITP is effective as of the date signed by CDFW on December 9, 2025. Unless renewed by CDFW, this ITP's authorization to take the Covered Species shall expire on February 28, 2036. This ITP covers the following species:

1. California tiger salamander (*Ambystoma californiense*; Threatened)
2. Swainson's hawk (*Buteo swainsoni*; Threatened)
3. Succulent owl's clover (*Castilleja campestris* ssp. *Succulenta*; Endangered)
4. Colusa grass (*Neostapfia colusana*; Endangered)
5. San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*; Endangered)
6. San Joaquin kit fox (*Vulpes macrotis mutica*; Threatened)

Mitigation measures provided in this ITP that are applicable to the following species discussions are incorporated into the BRA to mitigate impacts to California tiger salamander, Swainson's hawk, succulent owl's clover, and San Joaquin kit fox. Habitat is not present in the Study Area for Colusa grass or San Joaquin Valley Orcutt grass. For purposes of clarity in this IS/MND, applicable measures from the ITP are numbered as "ITP MM BIO-X".

Aquatic Resources Delineation

Database Queries and Literature Review

The following sources were used in preparation for this jurisdictional delineation:

- Aerial photography taken August 16, 2024 downloaded from Esri®,
- USFWS National Wetlands Inventory (NWI) online wetland mapper (USFWS 2025);
- NRCS web soil survey (NRCS 2025a);
- Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987);
- Regional Supplement to the Corps of Engineers Wetland Delineation Manual: *Arid West Region* (Version 2.0; USACE 2008);
- National Ordinary High Water Mark Field Delineation Manual for Rivers and Stream: Final Version (USACE 2025);
- Field Indicators of Hydric Soils in the United States (Version 9; Natural Resource Conservation Service [NRCS] 2024); and
- USACE 2022 National Wetland Plant List for the Arid West (USACE 2023).

Jurisdictional Delineation Fieldwork

HELIX wetland scientists conducted an ARD of the Study Area, on November 11, 2025. Fieldwork for the jurisdictional delineation was conducted by HELIX biologists Patrick Martin and Sophia Drewelow. Mapping of aquatic resources followed the mapping guidelines stipulated by the U.S. Army Corps of Engineers (USACE) (February 10, 2016) *USACE Updated Map and Drawing Standards for the South Pacific Division Regulatory Program* and was consistent with the State Water Resources Control Board (April 6, 2021) *Procedures for Discharges of Dredged or Fill Material to Waters of the State* (Section III, *Wetland Delineation*). HELIX followed the USACE Wetlands Delineation Manual (USACE 1987), the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0; USACE 2008), and the *National Ordinary High Water Mark (OHWM) Field Delineation Manual for Rivers and Streams* (Version: Final). The results of the Aquatic Resources Delineation are addressed in Section 4.5.1, Aquatic Resources, of Appendix C.

Soils

A total of four soil map units are mapped within the project site including: Corning gravelly loam, 0 to 8 percent slopes; Corning gravelly sandy loam, 0 to 8 percent slopes; Montpellier coarse sandy loam, 0 to 3 percent slopes; and Redding gravelly loam, 0 to 15 percent slopes, dry (USDA 2025). The general characteristics and properties associated with these soil types are described below:

- **Corning gravelly loam, 0 to 8 percent slopes** occurs on stream terraces between 80 to 1,000 feet elevation and consists of gravelly alluvium derived from igneous, metamorphic and sedimentary rock. A typical soil profile is gravelly loam from 0 to 15 inches, cobbly clay from 15 to 30 inches and stratified gravelly sandy loam to gravelly clay loam from 30 to 60 inches. This soil unit is a well-drained soil with no frequency of ponding or flooding. The depth to water table

is more than 80 inches and a restrictive layer is located at greater than 80 inches. Minor components of this soil unit are considered hydric (USDA 2025).

- **Corning gravelly sandy loam, 0 to 8 percent slopes** occurs on stream terraces between 80 to 1,000 feet elevation and consists of gravelly alluvium derived from igneous, metamorphic and sedimentary rock. A typical soil profile is gravelly sandy loam from 0 to 15 inches, cobbly clay from 15 to 30 inches and stratified gravelly sandy loam to gravelly clay loam from 30 to 60 inches. This soil unit is a well-drained soil with no frequency of ponding or flooding. The depth to water table is more than 80 inches and a restrictive layer is located at greater than 80 inches. Minor components of this soil unit are considered hydric (USDA 2025).
- **Montpellier coarse sandy loam, 0 to 3 percent slopes** occurs on fan remnants between 110 to 520 feet elevation and consists of alluvium derived from granite rock. A typical soil profile is coarse sandy loam from 0 to 21, sandy clay loam from 21 to 40 and coarse sandy loam from 40 to 60 inches. This soil unit is a well-drained soil with no frequency of ponding or flooding. The depth to water table is more than 80 inches and a restrictive layer is located at greater than 80 inches. This soil unit is not considered hydric (USDA 2025).
- **Redding gravelly loam, 0 to 8 percent slopes, dry** occurs on fan remnants between 90 to 750 feet elevation. This soil unit consists of a complex layer of igneous, metamorphic and sedimentary rock over clayey and cemented layers. A typical soil profile is gravelly loam from 0 to 17 inches, clay from 17 to 22 inches, and cemented gravelly material from 22 to 60 inches. This soil unit is a moderately well-drained soil with no frequency of ponding or flooding. The depth to water table ranges from 5 to 39 inches and a duripan restrictive layer is located about 20 to 39 inches below the mineral surface. Minor components of this soil unit are considered hydric (USDA 2025).

Vegetation Communities

Upland vegetation communities that occur within the Study Area include pasture, annual grassland, ruderal, and urban (refer to Figure 5, Biological Communities, in the BRA). These habitat types are discussed below. A comprehensive list of all plant and wildlife species observed within the Study Area is provided in Appendix C of Appendix C. Representative site photographs are included in Appendix D of Appendix C.

Pasture

Approximately 35.76 acres of pasture occur in the Study Area, which is a managed and irrigated vegetation community used to provide forage for cattle. The pasture community consists of a fenced area where cattle are grazed. This vegetation community is predominantly comprised of grasses and forbs and is more heavily grazed than the surrounding grassland communities. Common species observed in pasture within the Study Area include Bermudagrass (*Cynodon dactylon*), subterranean clover (*Trifolium subterraneum*), and soft brome (*Bromus hordeaceus*). Pasture exhibits evidence of agricultural use (e.g., disking/furrowing) or other levels of disturbance to support livestock grazing.

Annual Grassland

Approximately 19.31 acres of annual grassland occurs in the Study Area. Non-native annual grassland habitats are open grasslands composed primarily of non-native annual plant species. Species of grasses are the predominant component within this habitat type, with herbaceous plant species also present to varying degrees. Many of these species also occur as understory plants in oak woodland and other adjacent vegetation communities. Structure in non-native annual grasslands depends largely on weather patterns and livestock grazing; dramatic differences in physiognomy, both between seasons and between years, are characteristic of this habitat. Introduced annual grasses are typically the dominant plant species in this habitat.

Common plant species observed within this habitat type in the Study Area include wild oats (*Avena barbata*), ripgut brome (*Bromus diandrus*), Bermudagrass, subterranean clover, narrow tarweed (*Holocarpha virgata*), soft brome, and rattail sixweeks grass (*Festuca myuros*). Annual grasslands may provide habitat for many wildlife species including foraging habitat for small burrowing rodents, foraging for nesting raptors, in addition to herpetofauna. Wildlife species observed using annual grassland habitat during the site visit included species such as horned lark (*Eremophila alpestris*), burrowing owl (*Athene cunicularia*), ferruginous hawk (*Buteo regalis*), western meadowlark (*Sturnella neglecta*), and coyote (*Canis latrans*).

Ruderal

Approximately 20.28 acres of ruderal land occur in the Study Area. Ruderal areas have been subject to past or on-going human disturbance but retain a soil substrate. If vegetated, there is no recognizable plant community, and the species assemblage depends on local colonization potential. Ruderal and disturbed areas include weedy open areas where the natural vegetation has been removed. Ruderal and disturbed areas are not described in treatments of plant communities; however, species found in adjacent habitats such as annual grassland are found in ruderal areas in the Study Area. Isolated trees found in the Study Area include argyle apple (*Eucalyptus cinerea*), red ironbark (*Eucalyptus sideroxylon*), and stone pine (*Pinus pinea*). The ruderal areas are located along the northwestern portion of the Study Area and are associated with areas that experience frequent disturbance from site maintenance, such as vegetation management, or are heavily disturbed from past projects.

Urban

A total of 11.27 acres of urban lands occur within the Study Area and is made up of paved surfaces, compacted dirt surfaces and graveled/cobbled or disturbed surfaces that lack native plant assemblages. Urban lands are often comprised of little to no vegetation and typically contain built structures and/or maintained surfaces such as roads, graveled areas, or parking lots. Vegetation that does occur within this habitat type is often ornamental, rather than invasive or noxious weeds such as in ruderal habitat types. Developed habitat generally does not provide habitat for native plants and wildlife, however, urban lands may provide nesting habitat for avian species such as European starlings (*Sturnus vulgaris*) and black phoebe (*Sayornis nigricans*).

Listed and Special-Status Species

Plant Species

According to the database query, 27 listed and/or special-status plants have the potential to occur in the vicinity of the Study Area (USFWS 2025; CDFW 2025; CNPS 2025). Based on field observations, published information, and literature review, five special-status plants have the potential to occur within the Study Area: Henderson's bent grass (*Agrostis hendersonii*), succulent owl's clover, dwarf downingia (*Downingia pusilla*), spiny-sealed button-celery (*Eryngium spinosepalum*), and shining navarretia (*Navarretia nigelliformis* ssp. *radians*). Special-status plant species with potential to occur in the Study Area include herbaceous species typically associated with annual grasslands or mesic sites in acidic soils. Habitat is not present in the Study Area for species that require vernal pools or deep aquatic habitat or alkaline soils, which are not present in the Study Area. The Study Area contains only small and shallow seasonal wetlands with moderately to strongly acidic soil in shallow alluvial to loam soil over a duripan. Special-status plant species with potential to occur in the Study Area are discussed below.

Henderson's Bent Grass

Henderson's bent grass is listed as CRPR Rank 3.2, which indicates that this species is rare in California and requires evaluation for consideration under CEQA, but it is not listed as threatened or endangered at the State or federal level. Henderson's bent grass is an annual herb found on mesic sites in valley and foothill grassland, including vernal pools from 70 to 305 meters (approximately 230 to 1,000 feet) elevation. Henderson's bent grass was not detected in the Study Area during reconnaissance level surveys in November 2025. This species is an annual herb that blooms from April to May and would not have been identifiable during the site visits during November 2025 but would have been identifiable during the survey conducted on May 19, 2026. This species was not observed in the Study Area. There are two CNDDDB reported occurrences of this species within a five-mile radius of the Study Area, both of which are located 3.9 miles to the northeast and are presumed extant. The record from 1999 documents this species in a vernal pool surrounded by annual grassland (CDFW 2025).

Succulent Owl's Clover

Succulent owl's clover is listed as a federally threatened and State endangered species. This species is an annual herb found in vernal pools from 50 to 750 meters (approximately 50 to 2,461 feet) elevation. Succulent owl's clover was not detected in the Study Area during reconnaissance level surveys in November 2025. This species is an annual herb that blooms from April to May and would not have been identifiable during the site visits during November 2025 but would have been identifiable during the survey conducted on May 19, 2026. This species was not observed in the Study Area. There are 20 CNDDDB reported occurrences of this species within a five-mile radius of the Study Area, the nearest of which is located 0.5 mile to the east of the site in a wetland reserve. The record documents hundreds of plants in vernal pools in 1999, 2017, and 2019 (CDFW 2025).

Dwarf Downingia

Dwarf downingia has a CRPR Ranking of 2B.2, which indicates that this species is rare in California and requires evaluation for consideration under CEQA, but it is not listed threatened or endangered at the State or federal level. Dwarf downingia is an annual herb found in vernal pools and mesic microsites from 1 to 445 meters (approximately 1 to 1,460 feet) elevation. Dwarf downingia was not detected in the Study Area during reconnaissance level surveys in November 2025. This species is an annual herb

that blooms from March to May and would not have been identifiable during the site visits during November 2025 but would have been identifiable during the survey conducted on May 19, 2026. This species was not observed in the Study Area. There are two CNDDDB reported occurrences of this species within a five-mile radius of the Study Area, the nearest of which is located 0.4 mile to the north of the site. The record documents hundreds of plants of this species in vernal pools during surveys in 1999, and they are presumed extant (CDFW 2025).

Spiny-sepaled Button-celery

Spiny-sepaled button-celery has a CRPR Ranking of 1B.2, which indicates that this species is rare in California and requires evaluation for consideration under CEQA, but it is not listed as threatened or endangered at the State or federal level. This species is an annual or perennial herb found in valley and foothill grasslands and vernal pools from 80 to 975 meters (approximately 262 to 3,199 feet) elevation. This species blooms from April through June (CNPS 2025). Spiny-sepaled button-celery was not detected during the reconnaissance level survey of the Study Area in November 2025. This species is an annual herb that blooms from April to June and would not have been identifiable during the site visits during November 2025 but would have been identifiable during the survey conducted on May 19, 2026. This species was not observed in the Study Area. There are five CNDDDB reported occurrences of this species within a five-mile radius of the Study Area, the nearest of which are located 1.5 miles to the east and south of the Study Area. The records have limited information but show this species occurring in vernal pools associated with Rascal Creek and tributaries in 2001 (CDFW 2025).

Shining Navarretia

Shining navarretia has a CRPR Ranking of 1B.2, which indicates that this species is rare in California and requires evaluation for consideration under CEQA, but it is not listed as threatened or endangered at the State or federal level. This species is an annual herb found in vernal pools and on clay soils in cismontane woodland and valley and foothill grassland from 65 to 1,000 meters (approximately 213 to 3,281 feet) elevation. This species blooms from April through July (CNPS 2025). This species does not appear to be limited to vernal pools, and it may occur in upland or non-wetland habitats. Shining navarretia was not detected during reconnaissance level surveys in the Study Area in November 2025. This species is an annual herb that blooms from April to July and would not have been identifiable during the site visits during November 2025 but would have been identifiable during the survey conducted on May 19, 2026. This species was not observed in the Study Area. There are 23 CNDDDB reported occurrences of this species within a five-mile radius of the Study Area, the nearest of which is located 0.8 mile to the southwest of the Study Area and was recorded as recently as 2001. The record documents this species in annual grassland (CDFW 2025).

Wildlife Species

According to the database query, 24 listed and/or special-status wildlife species have the potential to occur on-site or in the vicinity of the Study Area (CDFW 2025; USFWS 2025). Based on field observations, published information, and literature review, 11 special-status wildlife species have the potential to occur within the Study Area: Crotch's bumble bee (*Bombus crotchii*), Conservancy fairy shrimp (*Branchinecta conservatio*), vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardii*), California tiger salamander, western spadefoot (*Spea hammondi*), northwestern pond turtle (*Actinemys marmorata*), burrowing owl (*Athene cunicularia*), Swainson's hawk, San Joaquin kit fox, and American badger (*Taxidea taxus*). These species are discussed in more detail below. In addition to these special-status wildlife species, other migratory birds and raptors protected under

federal, State, and local laws/policies also have the potential to occur within the Study Area. The Study Area is not located within federally designated critical habitat for any wildlife species.

Crotch's Bumble Bee

Crotch's bumble bee is listed as candidate endangered species under CESA. This species occurs in grassland, scrub and other arid habitats. New colonies are initiated by solitary queens, generally in the early spring, which typically occupy abandoned rodent burrows (CDFW 2019). This species is a generalist forager and has been reported to visit a wide variety of flowering plants. Food plants include *Asclepias* spp., *Antirrhinum* spp., *Clarkia* spp., *Eschscholzia* spp., *Eriogonum* spp., *Chaenactis* spp., *Lupinus* spp., *Medicago* spp., *Phacelia* spp., and *Salvia* spp. (Koch *et al.* 2012). The flight period for queens in California is from February to October. New queens hibernate over the winter and initiate a new colony the following spring. This species is rare throughout its range and in decline in the Central Valley and Southern California (CDFW 2019). The current known range of this species follows a small strip from western Trinity County south to Tehama County and along the entire Central Valley and Coastal California south of Monterey to the southernmost portions of the State. The range is generally bound on the east by the high Sierra Nevada range and areas east of Bishop, Ridgecrest, and the Salton Sea (CDFW 2023).

Crotch's bumble bee was not observed in the Study Area during biological surveys in November 2025, however, focused or protocol surveys for bumble bees were not conducted as part of the reconnaissance level survey. There are two CNDDDB reported occurrences of this species within a five-mile radius of the Study Area, the nearest of which is located 1.6 miles to the east of the Study Area. The record documents one female observed in March 2024 (CDFW 2025). The annual grassland and ruderal areas in the Study Area provide potential habitat for Crotch's bumble bee where foraging habitat and small mammal burrows are present. Urban areas are subjected to routine management activities associated with landscape maintenance or weed control that make these areas unsuitable habitat for this species. Ground squirrel burrows along the Le Grand Canal levees and other areas in annual grassland and ruderal areas were observed within the Study Area that provide potential nesting/refuge habitat within the Study Area for this species.

Conservancy Fairy Shrimp

The Conservancy pool fairy shrimp is listed as a federally endangered species. This species varies in size, ranging from 14 to 27 millimeters (0.6 to 1.1 inch) in length and is found in large clay bottomed vernal pools to vernal lakes with turbid water in grasslands. The historical distribution of this species is unknown, and it is currently distributed throughout the Central Valley and southern coastal regions of California, with 10 known populations. It is most frequently found in pools that range in elevation between 5 and 1,700 meters (approximately 16 to 5,577 feet) amsl. Conservancy fairy shrimp reproduce by depositing fertilized eggs in vernal pools, and as the pools dry out, the eggs desiccate and form cysts, allowing them to withstand heat, cold, and prolonged desiccation. They remain in the dry pool bed until it rains and other environmental stimuli cause them to hatch. The average time to maturity is 37 days and 46 days to reproduce and an overall lifespan of 114 days (USFWS 2005).

Protocol surveys are required to identify presence or absence of this species. These surveys have not been conducted within the Study Area as part of the BRA. There are five CNDDDB reported occurrences of this species within a five-mile radius of the Study Area, the nearest of which is located 2.4 miles to the east of the Study Area. The record documents one individual in a shallow vernal pool as recently as 2009 (CDFW 2025). Suitable vernal pool habitat is not present in the Study Area. However shallow seasonal

wetlands within the Study Area could provide marginal habitat for this species. Conservancy fairy shrimp is currently known to occur in a wide range of vernal pool habitats and one of the known populations is located at UC Merced (USFWS 2005) and includes the Merced Vernal Pools and Grassland Reserve (CNDDDB 2025). Within California, the species is found in 10 known populations limited to the Central Valley. Dispersal may occur between disconnected pools through avian transport. Large vernal pools or other wetland complexes east of the Study Area in the Merced Vernal Pools and Grassland Reserve may also provide habitat for this species, which are located within 250 feet of the Study Area.

Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp is listed as a federally threatened species. This species varies in size, ranging from 11 to 25 millimeters (0.4 to 1.0 inch) in length and are found in vernal pools, vernal swales and other ephemeral water bodies near the middle of the Central Valley. It is most frequently found in pools measuring less than 0.05 acre; although the species has been collected from vernal pools exceeding 25 acres. These are most commonly in grass or mud bottomed swales or basalt flow depression pools in unplowed grasslands. Vernal pool fairy shrimp reproduce by depositing fertilized eggs in vernal pools, and as the pools dry out, the eggs desiccate and form cysts, allowing them to withstand heat, cold, and prolonged desiccation. They remain in the dry pool bed until it rains and other environmental stimuli cause them to hatch (USFWS 2005). The average time to maturity is forty-one days, although in warmer pools, it can be as little as eighteen. Within California, the species is found from the vicinity of Red Bluff in Shasta County southward through much of the Central Valley. The southernmost known populations of vernal pool fairy shrimp occur in the Santa Rosa Plateau in Riverside County (Eriksen and Belk 1999). Dispersal may continue between disconnected pools through avian transport.

Protocol surveys are required to identify presence or absence of this species. These surveys have not been conducted within the Study Area as part of the BRA. There are 46 CNDDDB reported occurrences of this species within a five-mile radius of the Study Area, the nearest of which is located east of the Study Area along the Fairfield Canal that abuts the Study Area. The record documents this species in vernal pools and swales from 2001 (CDFW 2025). Shallow seasonal wetlands within the Study Area could provide marginal habitat for this species. Vernal pool fairy shrimp are currently known to occur in a wide range of vernal pool habitats in the southern and Central Valley areas of California (USFWS 2005). Large vernal pools or other wetland complexes east of the Study Area in the Merced Vernal Pools and Grassland Reserve may also provide habitat for this species, which are located within 250 feet of the Study Area.

Vernal Pool Tadpole Shrimp

The vernal pool tadpole shrimp is listed as a federally endangered species. This species is a small freshwater crustacean that occupies unplowed freshwater vernal pools from 54 square feet to 89 acres, containing clear- to highly turbid water. Its known range is within the Central Valley and in the San Francisco Bay area. Vernal pool tadpole shrimp take a minimum of 25 days to mature and the mean age at first reproduction is 54 days (USFWS 2005). Vernal pool tadpole shrimp rely on motile species such as birds, mammals, and amphibians for dispersal. Shrimp eggs are transported in the stomachs of waterfowl and amphibians, and in small clumps of vernal pool soil attached to mammalian hooves and hair, bird feet, and feathers. Dispersal distances have not been measured but will likely equate with movement distances of the egg-transporting animals (Silveira 1998). As such, connectivity of upland and aquatic habitat between vernal pools or other wetted habitats will benefit shrimp dispersal by

increasing the opportunities for egg transport by mammals and amphibians. Dispersal may continue between disconnected pools through avian transport.

Protocol surveys are required to identify presence or absence of this species. These surveys have not been conducted within the Study Area as part of this BRA. There are 14 CNDDDB reported occurrences of this species within a five-mile radius of the Study Area, the nearest of which is located one mile to the southeast of the Study Area. The record documents 179 vernal pools occupied by this species during surveys in 2001 (CDFW 2025). Shallow seasonal wetlands within the Study Area could provide marginal habitat for this species. The seasonal wetlands found within the Study Area may provide suitable habitat for this species. Large vernal pools or other wetland complexes east of the Study Area in the Merced Vernal Pools and Grassland Reserve may also provide habitat for this species, which are located within 250 feet of the Study Area.

California Tiger Salamander

California tiger salamander is listed as a federal and State endangered species. The historic range of California tiger salamander included the San Joaquin-Sacramento River Valleys, bordering foothills and coastal valleys in what was considered a contiguous distribution. Currently, the population extends from Petaluma in Sonoma County (Sonoma DPS), east to the Colusa and Yolo County line, with an isolated population near Gray Lodge Wildlife Area north of the Sutter Buttes, and south through the Central Valley to Santa Barbara County (Santa Barbara DPS) (Jennings and Hayes 1994). Today the species is known to occur in about 23 counties and is found primarily in low elevation grassland-oak woodland plant communities of Central California (USFWS 2017). This species occupies a distinct habitat of both aquatic and terrestrial components that consist of aquatic breeding and non-breeding areas embedded within a matrix of habitats used for dispersal, or refugia. Breeding aquatic habitat consists typically of ephemeral freshwater bodies, such as ponds, vernal pools, constructed ponds, and other stock ponds. Permanent bodies of water are occasionally used for breeding, but permanent water bodies must be free of potential predators to eggs and larva, such as fish and American bullfrog (*Lithobates catesbeianus*). Non-breeding habitat is located in uplands away from ponds, typically in mammal burrows, where California tiger salamanders will spend most of their life. A complex of upland habitat with burrowing mammals and breeding ponds are necessary habitat components required for this species to persist (USFWS 2017). During the onset of fall precipitation, California tiger salamanders will emerge from their burrows and migrate to breeding habitat. Eggs are laid along the margins of ponds individually or in small clusters on vegetation or other debris (Jennings and Hayes 1994). The breeding season typically occurs from November through April and is likely influenced by local precipitation and ambient temperature. Females typically lay eggs between December and early April. Larvae typically metamorphose in three to six months and juveniles begin to move out of the natal pond in late spring or early summer, and rarely overwinter. When juveniles leave their natal ponds, they distribute into uplands in search of suitable underground refugia, which typically consists of mammal burrows excavated by California ground squirrel and Botta's pocket gopher (USFWS 2017). Very little is known of California tiger salamander behavior while underground.

No California tiger salamanders were observed in the Study Area during the reconnaissance-level biological survey conducted in November 2025. There are 14 CNDDDB reported occurrences of this species within a five-mile radius of the Study Area, the nearest of which is located 0.7 mile to the west of the Study Area. The record documents a subadult and adult in aquatic habitat surrounded by annual grassland with burrows in 2000 (CDFW 2025). There are several other records east the Study Area in the Merced Vernal Pools and Grassland Reserve with potential breeding habitat visible on aerial imagery

(Google Earth 2025). The Study Area is not located within federally designated critical habitat for California tiger salamander. Suitable upland habitat is present in small mammal burrows in the Study Area, which are heavily concentrated along the levee of the Le Grand Canal. Suitable burrows for this species are also found throughout the rest of the Study Area, but they are less abundant. Suitable aquatic habitat is not present in the Study Area, since seasonal wetlands and the seep within the Study Area are too shallow and do not appear to remain inundated for a long enough duration to support the larval development of this species. In 2011, a large apparent vernal pool is visible on aerial imagery, however, it is not regularly inundated after 2011 (Google Earth 2025), and no evidence of this feature was observed during the site visit on November 11, 2025.

Western Spadefoot

Western spadefoot is proposed for listing as a threatened species under FESA and listed as a CDFW species of special concern (SSC). This species occurs in a variety of habitats including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, and playas. It breeds in vernal pools, depressional wetlands, puddles, and other ephemeral water features including altered or constructed features, often after heavy rains. Breeding sites must remain inundated for at least 3–11 weeks for larvae to mature with water temperatures maintained between 48–86 degrees Fahrenheit. Spadefoots are primarily terrestrial and require upland habitats for feeding and for constructing burrows for long dry-season dormancy. Spadefoots typically burrow up to 3 feet below the surface and require sandy or friable soils which facilitate digging and water absorption. Dispersal through uplands may vary between wet and dry years but they may travel up to 262 meters in a dry year and up to 605 meters in a wet year (USFWS 2023a).

Western spadefoot was not observed in the Study Area during biological surveys in November 2025, however, focused or protocol surveys for western spadefoot were not conducted as part of this reconnaissance level survey. There is one CNDDB reported occurrence of this species within a five-mile radius of the Study Area located 2.5 miles to the southeast of the Study Area. The record documents this species in “pools” along Le Grand Canal during surveys in 2001 (CDFW 2025). Shallow seasonal wetlands within the Study Area could provide marginal breeding habitat. If present, this species is most likely to disperse through upland habitats in the Study Area. Sandy loam soil along levees could support burrow excavation by this species, for estivation during dry months. However, most upland habitats in the Study Area provide very little cover for this species, since soils are shallow and underlain by a hardpan and there is no leaf litter or other vegetative cover or debris for this species to hide under. However, the Study Area is located within the suggested upland dispersal limits of large suitable breeding wetland habitat and upland annual grassland habitat east of the Study Area in the Merced Vernal Pools and Grassland Reserve.

Northwestern Pond Turtle

Northwestern pond turtle is proposed for listing as a threatened species under FESA and listed as a CDFW SSC. This species occurs in a variety of aquatic habitats; typically, semi-permanent ponds, lakes, streams, irrigation ditches, canals, marshes, or pools in intermittent drainages. It prefers areas lined with abundant vegetation and either rocky or muddy substrates. It requires basking sites such as logs, rocks, cattail mats or exposed banks. The species is active from February to November, and breeding occurs from April to May. Females typically nest in compact and dry soils 3 to 400 meters (approximately 10 feet to 0.25 mile) from water, with a preference for south facing slopes between 0 and 60 degrees with little vegetation cover, however pond turtles occurring in forested areas will select nest sites under

forest canopy that is more open. Overwintering occurs in upland terrestrial habitats close to water sources in open areas (up to 500 meters [approximately 0.31 mile] from water), in which they will bury themselves under loose soil where leaf litter is present (USFWS 2023b). Northwestern pond turtle was not observed in the Study Area during biological surveys in November 2025, however, focused or protocol surveys for northwestern pond turtle were not conducted as part of this reconnaissance level survey. There are no CNDDDB reported occurrences of this species within a five-mile radius of the Study Area (CDFW 2025).

Suitable aquatic habitat for this species is not present in the Study Area; however, aquatic habitat is present in the Le Grand Canal and Fairfield Canal adjacent to the Study Area. Nesting or egg-laying habitat is present in upland habitats that include annual grassland, ruderal and urban habitats near the canals. Upland habitats may also provide habitat for northwestern pond turtles seeking refuge after aquatic habitats become dry prior to the onset of the rainy season. However, upland habitats in the Study Area provide very little cover for this species, since soils are shallow and there is no leaf litter or other vegetative cover for this species to hide under. However, the Study Area is located within the suggested upland dispersal limits of northwestern pond turtle, which abuts Le Grand Canal and is approximately 139 meters from the Fairfield Canal.

Burrowing Owl

This species is listed as a candidate endangered species under CESA and is protected by Section 3503 of the California Fish and Game Code (CFGF). Burrowing owls are often found in open, dry grasslands, agricultural and range lands, and desert habitats. They can also inhabit grass, forb, and shrub stages of pinyon and ponderosa pine habitats. Burrowing owls occur at elevations ranging from 60 meters (approximately 197 feet) below mean sea level (bmsl) to over 2,745 meters (approximately 9,005 feet) amsl. In California, the highest elevation where burrowing owls are known to occur is 1,615 meters (approximately 5,299 feet) amsl in Lassen County. In addition to natural habitats, burrowing owls can be found in urban habitats such as at the margins of airports and golf courses and in vacant urban lots. Burrowing owls forage in adjacent grasslands and other suitable habitats primarily for insects and small mammals, and less often for reptiles, amphibians, and other small birds. In the Central Valley of California, foraging occurs between 400 and 3,000 meters (approximately 0.25 to 1.9 miles) of the nest (Rosenberg *et al.* 2009).

Burrowing owls nest in burrows in the ground and commonly perch on fence posts or mounds near the burrow. The burrowing owls often use ground squirrel burrows, badger dens, or artificial burrows such as abandoned pipes or culverts. One burrowing owl was observed in the Study Area during the reconnaissance-level biological survey on November 11, 2025. This burrowing owl was observed in annual grassland near burrows but was not associated with any single burrow. One burrowing owl pellet was observed near this owl. Several artificial burrows were observed in the Study Area near the existing solar array, which may provide habitat for this species in addition to California ground squirrel burrows along the levees. There are two CNDDDB reported occurrences of this species within a five-mile radius of the Study Area, the nearest of which is located 0.6 mile to the west of the Study Area. The record documents several active burrows observed during the winter in 2000. However, only burrowing owl signs were documented, and no burrowing owls were observed as part of this record (CDFW 2025). Suitable habitat for burrowing owl is present in the Study Area in annual grassland and ruderal habitats and other open areas where suitable refuge sites are present, such as small mammal burrows, culverts, or other underground cavities. Burrowing owls could either occur nesting or wintering in California

ground squirrel burrows in the Study Area or in suitable annual grassland habitat adjacent to the Study Area.

Swainson's Hawk

Swainson's hawk is a California threatened species and protected by Section 3503 of the CFGC. This hawk migrates from their wintering grounds in the La Pampas Region in Argentina to their breeding grounds in western North America, including the Central Valley of California, from early March through early April. On breeding grounds, Swainson's hawk prefer open habitats, including mixed and short grass grasslands, with scattered trees or shrubs for perching; dry grasslands; irrigated meadows; and edges between two habitat types. Breeding occurs from late March to late August, peaking in late May through July (Zeiner *et al.* 1990). In the Central Valley, Swainson's hawk nest in stands with few trees in juniper-sage flats, riparian woodlands, and oak woodlands. This species nests in proximity to suitable foraging habitat, which can be located within a 10-mile radius of an active nesting site. Swainson's hawks leave their breeding grounds to return to their wintering grounds in late August or early September.

Swainson's hawk was not observed in the Study Area during biological surveys in November 2025; however, focused or protocol surveys for Swainson's hawk were not conducted as part of this reconnaissance level survey. Additionally, Swainson's hawk is migratory and is typically absent from California in November. There are two CNDDB reported occurrences of this species within a five-mile radius of the Study Area, the nearest of which is located along the northern boundary of the Study Area. The record documents a nest tree that was removed in 2016 (CDFW 2025). Trees present in ruderal areas of the Study Area provide suitable nesting habitat for the species. Ruderal areas, pasture, and annual grassland provide foraging habitat where small mammal prey is abundant. Suitable foraging habitat is also abundant in the surrounding area especially in the Merced Vernal Pools and Grassland Reserve east of the Study Area.

San Joaquin Kit Fox

San Joaquin kit fox is listed as federal endangered and State threatened species. This species inhabits a wide range of open and shrubby habitats, including grassland, scrublands, and agricultural areas where dens are available (e.g., unplowed fields, row crops, vineyards, or orchards), non-irrigated pastures, vernal pool grasslands, playas, and alkali meadows. San Joaquin kit fox dens are typically located on slopes less than 40 degrees, and pupping dens are usually on level ground; den entrances are typically 8 to 10 inches in diameter. San Joaquin kit foxes use many dens in a season, and occupied dens often show no signs of use. Common signs of use include a dirt ramp leading to the entrance, flattened grass around the entrance, scat, tracks, and prey remains. The largest extant populations of San Joaquin kit fox are at the western margins of the Central Valley and the eastern Coast Ranges. Population centers occur in western Kern County (Elk Hills and Pixley National Wildlife Refuge), eastern San Luis Obispo County (Carrizo Plain), western Fresno County and eastern San Benito County (Ciervo-Panoche Natural Area), Southern Monterey County (Fort Hunter-Liggett and Camp Roberts), western Merced County, and eastern Contra Costa County. These population centers generally form a meta-population lying west of Interstate 5 and/or south of Allensworth, with only isolated occurrences in the remainder of the valley (USFWS 2010).

San Joaquin kit fox was not observed in the Study Area during the biological survey in November 2025, however, focused or protocol surveys for San Joaquin kit fox were not conducted as part of this reconnaissance level survey. Coyote (*Canis latrans*) was observed in the Study Area on November 11,

2025, which is a potential competitor and predator of San Joaquin kit fox. There are two CNDDDB reported occurrences of this species within a five-mile radius of the Study Area, the nearest of which is located 1.8 miles to east of the Study Area. The record documents one individual observed foraging in annual grassland in 1999 (CDFW 2025). Habitat for San Joaquin kit fox is present throughout the Study Area where friable soil and small mammal prey are present. Habitat is present along the Le Grand Canal levee, which could provide denning, dispersal, and foraging habitat for this species. Additionally, this species could use canals as dispersal routes through the region to access adjacent habitats. The Study Area is not within known satellite or core populations, and this species is unlikely to den in the Study Area. However, the Study Area is within a linkage area for this species between core population areas (USFWS 2010) and suitable habitat is abundant east of the Study Area where this species was documented in 1999 (CDFW 2025). Suitable foraging habitat is also abundant in the surrounding area especially in the Merced Vernal Pools and Grassland Reserve east of the Study Area.

American Badger

American badger is listed as a CDFW SSC. This species occurs throughout most of California in a wide range of habitats but prefers open stages of forest and scrub habitats with friable soils. American badger dens are typically located in open areas with sparse vegetation. American badger will use many dens in a season, reusing the same den or excavating new dens each night. Common signs of use include a dirt ramp leading to the entrance, flattened grass around the entrance, scat, and tracks. The home range of a badger typically ranges from 400 to 600 acres but may range up to 1,549 acres (Zeiner *et al.* 1990).

American badger was not observed in the Study Area during biological surveys in November 2025, however, focused or protocol surveys for American badger were not conducted as part of this reconnaissance level survey. There are no CNDDDB reported occurrences of this species within a five-mile radius of the Study Area (CDFW 2025). Habitat for American badger is present throughout the Study Area where friable soil and small mammal prey are present. Habitat is present along the Le Grand Canal levee, which could provide denning, dispersal, and foraging habitat for this species. Additionally, this species could use canals as dispersal routes through the region to access adjacent habitats, such as the Merced Vernal Pools and Grassland Reserve. In the absence of records in the CNDDDB, the Study Area is within the known range of American badger, and the Study Area is situated in suitable habitat and is located adjacent to the Merced Vernal Pools and Grassland Reserve which provides expansive habitat for this species and additional linkage to other areas with suitable habitat.

Aquatic Resources

A total of 0.05 acre of aquatic resources has been delineated in the Study Area. Wetland features mapped within the Study Area include five seasonal wetlands (0.05 acre). Seasonal wetlands are shallow depressions that collect surface water from surrounding terrain or groundwater thus causing inundation or saturation at a duration and frequency sufficient to support the dominance of hydrophytic vegetation and the formation of hydric soils.

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

Impacts related to biological resources were analyzed in Section 4.2, Biological Resources, of the 2020 LRDP SEIR. The 2020 LRDP SEIR concluded that implementation of the LRDP would have a less than significant impact on State or federally protected wetlands, vernal pool wetlands or other seasonal wetlands, special-status plant species, special-status amphibians, western pond turtle, San Joaquin kit fox, special-status avian species, or special-status invertebrate species. However, implementation of the

2020 LRDP was determined to result in a potentially significant impact on nesting and overwintering habitat for Crotch's bumble bee. With implementation of 2020 LRDP MM BIO-4, requiring pre-construction surveys for Crotch's bumble bee, the impact was determined to be reduced to less than significant.

The 2020 LRDP SEIR concluded that, as UC Merced has already provided 35.6 acres of compensatory vernal pool mitigation, any campus development under the 2020 LRDP that would affect wetlands for which adequate compensatory mitigation has not been provided would be mitigated via purchase of vernal pool credits under the In Lieu Fee (ILF) program; therefore, the impact on State or federally protected wetlands would be less than significant.

Portions of the campus and adjacent lands contain suitable nesting habitat for numerous non-special-status migratory birds, and whose nests are protected under the MBTA and CFGC Sections 3503 and 3503.5. As such, the 2020 LRDP SEIR concluded that destruction of active nests would be a potentially significant impact, but with implementation of 2020 LRDP MM BIO-9a and MM BIO-9b, requiring pre-construction surveys, nest buffers, and bird-safe design practices, the impact would be reduced to less than significant.

Discussion of Impacts

- a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less Than Significant with Mitigation Incorporated.

Special-Status Plant Species

Of the 27 listed and/or special-status plants that have the potential to occur within the vicinity of the project site, five plants have the potential to occur on-site: Henderson's bent grass, succulent owl's clover, dwarf downingia, spiny-sepaed button-celery, and shining navarretia. Potential impacts to these species are discussed below.

Dwarf Downingia, Henderson's Bent Grass, Spiny-Sepaед Button-Celery, and Shining Navarretia

The annual grassland and seasonal wetlands where mesic sites are present provide suitable habitat for dwarf downingia, Henderson's bent grass, spiny-sepaed button-celery, and shining navarretia on-site. All four of these species are considered special-status rare plants based on their CRPR ranking; however, none are listed as threatened or endangered under CESA or FESA. A rare plant survey was conducted during the blooming season for this species on May 19, 2026, and the results were negative. Therefore, these special-status species are presumed to be absent from the Study Area, and no mitigation is recommended.

Succulent Owl's Clover

Succulent owl's clover is listed as a federally threatened and State endangered species. Marginal habitat for succulent owl's clover is present in the shallow seasonal wetlands on-site. A rare plant survey was conducted during the blooming season for this species on May 19, 2026, and the results were

negative. Therefore, this special-status species is presumed to be absent from the Study Area, and no mitigation is recommended.

Special-Status Wildlife Species

Of the 24 listed and/or special-status wildlife species that have the potential to occur within the vicinity of the project site, 11 species have the potential to occur on-site: Crotch's bumble bee, Conservancy fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander, western spadefoot, northwestern pond turtle, burrowing owl, Swainson's hawk, San Joaquin kit fox, and American badger. Potential impacts to these species are discussed below.

Special-Status Invertebrates

Crotch's Bumble Bee

Suitable habitat for Crotch's bumble bee is present on-site in the annual grassland and ruderal areas where foraging habitat and small mammal burrows are present. Implementation of the proposed project could result in direct and indirect adverse effects to Crotch's bumble bee if the species were to utilize the site for nesting, overwintering, or foraging during construction activities. Ground-disturbing activities associated with construction could adversely affect this ground-nesting species through direct mortality if individuals or nests are present. Ground clearing and grading may also result in the loss of suitable habitat. If ground nests are present on-site, excavation and destruction of those nests during grading would result in a potentially significant impact. However, 2020 LRDP MM BIO-4 would be implemented and would require pre-construction surveys for Crotch's bumble bee and consultation with CDFW if the species is determined to be present on-site during the surveys. Consultation with CDFW, if necessary, would require additional measures to avoid impacts to Crotch's bumble bee. Therefore, with implementation of 2020 LRDP MM BIO-4, the impact on Crotch's bumble bee would be less than significant.

Vernal Pool Branchiopods (conservancy fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp)

Shallow seasonal wetlands within the project site could provide marginal habitat for special-status vernal pool branchiopod species, including conservancy fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp. In the absence of protocol-level surveys, these species are assumed to be present on-site. Project construction activities could result in destruction of habitat for these species due to ground disturbance and/or siltation into wetlands. While these species may occur within the 0.05 acre of seasonal wetlands delineated on-site, UC Merced has already fully compensated for the loss of habitat for these species. As reflected in the 2020 LRDP SEIR, the University has acquired nearly 24,000 acres of Conservation Lands that would protect 1,006 acres of occupied habitat for vernal pool fairy shrimp. Mitigation ratios achieved for direct and indirect impacts are 8:1 for Tier 1(a) Conservation lands and 16:1 with the addition of the Tier 2 Conservation Lands, substantially above the 3:1 minimum target specified in the 2002 BO. Similarly, 14 acres of occupied habitat for vernal pool tadpole shrimp are being protected, reflecting a mitigation ratio of 3.5:1, which is above the 3:1 minimum target specified in the Conservation Measures in the 2002 BO. Therefore, the proposed project's impact on vernal pool fairy shrimp and vernal pool tadpole shrimp is accounted for under the impacts of the 2020 LRDP and fully compensated by the mitigation that has been already implemented. No additional mitigation is required, and the impact on vernal pool branchiopods would be less than significant.

Special-Status Amphibians

California tiger salamander

Suitable upland habitat for California tiger salamander is present in small mammal burrows on the project site, which are heavily concentrated along the levee of the Le Grand Canal. Project construction could result in adverse effects on California tiger salamander, including harm as a result of coming into contact with equipment or personnel, loss of habitat, and displacement from current habitat. Impacts that could harm this species or result in loss of individuals or permanent loss of habitat would be considered potentially significant. However, as discussed in Section 2.4, Construction, the perimeter of the project site would be temporarily fenced with California tiger salamander exclusion fencing, which would be a minimum of 3.3 feet tall and constructed with smooth, rigid HDPE matrix that would be designed to prevent wildlife, specifically California tiger salamander, from climbing and entering the project site. Following completion of construction, the fencing would be removed. In addition, applicable mitigation measures from ITP No. 2081-2009-010-04 (Amendment No. 4) would be required to be implemented to reduce impacts to this species. These measures include ITP MMs BIO-1 through 3, 8-11, 37, and 39-43, which are specific to California tiger salamander, as well as ITP MMs BIO-4 through 7, 21-36, 44-46, 51, and 62-64, which are general construction measures. With implementation of the applicable measures from ITP No. 2081-2009-010-04 (Amendment No. 4), the impact on California tiger salamander would be reduced to less than significant.

Western Spadefoot

Shallow seasonal wetlands on-site could provide marginal breeding habitat for western spadefoot. In addition, the project site is located within the suggested upland dispersal limits of large suitable breeding wetland habitat and upland annual grassland habitat east of the project site in the Merced Vernal Pools and Grassland Reserve. If present on-site, project construction could result in adverse effects to western spadefoot, including harm as a result of coming into contact with construction equipment or personnel, loss of habitat, displacement from current habitat, or loss of eggs and larval western spadefoot. Impacts that could harm western spadefoot or result in loss of individuals or permanent loss of habitat would be considered potentially significant. However, PS MM BIO-2 would be implemented and would require pre-construction surveys if project activities commence during the wet season and active dispersal period for this species (between approximately November 1 and March 31). If individuals are present during construction activities, all work in the immediate vicinity of the individual shall be halted, and relocation by an approved biologist may be necessary. With implementation of PS MM BIO-2, the impact on western spadefoot would be reduced to less than significant.

Special-Status Reptiles (northwestern pond turtle)

Suitable aquatic habitat for this species is not present within the project site; however, aquatic habitat is present in the Le Grand Canal and Fairfield Canal adjacent to the site. Nesting or egg-laying habitat is present in upland habitats that include annual grassland, ruderal and urban habitats near the canals. Upland habitats may also provide habitat for northwestern pond turtles seeking refuge after aquatic habitats become dry prior to the onset of the rainy season. If present on-site, project construction would result in adverse effects to northwestern pond turtle, including harm as a result of coming into contact with construction equipment or personnel, loss of habitat, displacement from current habitat, or loss of a nest and juvenile northwestern pond turtles. Impacts that could harm northwestern pond turtles or result in loss of a nest or permanent loss of habitat would be considered potentially

significant. However, PS MM BIO-3 would be implemented and would require pre-construction surveys within 24 hours before the start of grading or land-disturbing activities and the installation of temporary exclusion fencing around construction areas. Temporary exclusion fencing for this species would be the same as the CTS exclusion fencing. In addition, if individuals are encountered on-site during construction, all work in the immediate vicinity shall be halted, and relocation by an approved biologist may be necessary. With implementation of PS MM BIO-3, the impact on northwestern pond turtle would be reduced to less than significant.

Special-Status and Non-Special-Status Migratory Birds

Special-status and non-special status migratory birds, including Swainson's hawk and burrowing owl, have potential to occur on-site. Burrowing owl was present at the time of the reconnaissance surveys and has a high potential to occur within the ruderal, and annual grassland vegetation community, and along the margins of the pasture due to the presence of suitable nesting (e.g., burrows) and foraging habitat and known occurrences within the vicinity of the site. To avoid potential impacts to burrowing owl and other non-special-status migratory birds, 2020 LRDP MM BIO-9a would be implemented and would require pre-construction nesting bird surveys and consultation with CDFW to establish appropriate no-disturbance buffers around nests, if determined to be present within 500 feet of the project site, or occupied burrows. To minimize impacts to Swainson's hawk, applicable mitigation measures from ITP No. 2081-2009-010-04 (Amendment No. 4) would be required to be implemented. These measures include ITP MMs BIO-12, 47, 48, 49 and 50, which are specific to Swainson's hawk, as well as ITP MMs BIO-4 through 7, 21-36, 44-46, 51, and 62-64, which are general construction measures. Therefore, with implementation of 2020 LRDP MM BIO-9a and applicable measures from ITP No. 2081-2009-010-04 (Amendment No. 4), the impact on special-status birds and migratory birds would be reduced to less than significant.

Special-Status Mammals

San Joaquin Kit Fox

Suitable habitat for San Joaquin kit fox is present on-site where friable soil and small mammal prey are present, as well as along the Le Grand Canal levee, which could provide denning, dispersal, and foraging habitat for this species. Additionally, this species could use canals as dispersal routes through the region to access adjacent habitats. If present on-site during construction activities, impacts to San Joaquin kit fox could include harm as a result of coming into contact with equipment or personnel, loss of habitat, displacement from current habitat, or loss of a den. Impacts that could harm this species or result in loss of a den or a permanent loss of habitat would be considered potentially significant. To minimize impacts to San Joaquin kit fox, applicable mitigation measures from ITP No. 2081-2009-010-04 (Amendment No. 4) would be required to be implemented. These measures include ITP MMs BIO-13 through 15 which are specific to San Joaquin kit fox, as well as ITP MMs BIO-4 through 7, 21-36, 44-46, 51, and 62-64, which are general construction measures. Therefore, with implementation of the applicable measures from ITP No. 2081-2009-010-04 (Amendment No. 4), the impact on San Joaquin kit fox would be less than significant.

American Badger

American badger is most likely to occur on-site as transient individuals either foraging or dispersing through the site. If present on-site during construction activities, impacts to American badger could include harm as a result of coming into contact with equipment or personnel, loss of habitat,

displacement from current habitat, or loss of a den. Impacts that could harm American badger or result in loss of a den or a permanent loss of habitat would be considered potentially significant. However, implementation of San Joaquin kit fox mitigation measures 13 – 15; which are provided in the ITP No. 2081-2009-010-04 (Amendment No. 4) presented in Appendix E, in addition to general mitigation measures 4 – 7; 21 – 36; 44 – 46; 51; 62 – 64 as required above will avoid or reduce potential Project-related impacts to American badger to less than significant as the two species are known to occur in similar habitats.

Impact Summary

The proposed project would have the potential to result in adverse effects on 11 special-status wildlife species that have the potential to occur on-site. However, with implementation of 2020 LRDP MMs BIO-4 and BIO-9a; PS MMs BIO-1 and BIO-2; and ITP MMs 1-12, 16-37, 39-53, and 62-64 from ITP No. 2081-2009-010-04 (Amendment No. 4), potential impacts to special-status species would be reduced to a level of less than significant. Therefore, the proposed project would not result in substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW or USFWS, and the impact would be less than significant with mitigation incorporated.

- b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less Than Significant Impact. The 2020 LRDP SEIR defines sensitive natural communities on the UC Merced campus as generally containing riparian habitat, native grassland, and valley oak woodland. Riparian communities typically contain a canopy tree layer, subcanopy tree layer, understory shrub layer, and dense ground cover. Vegetation communities mapped on the project site include pasture, annual grassland, ruderal, and urban land. Non-native annual grassland habitats are open grasslands composed primarily of non-native annual plant species. The project site does not contain riparian habitat or other sensitive natural communities on the project site. Therefore, the proposed project would not result in a substantial adverse effect on any riparian habitat or other sensitive natural communities, and the impact would be less than significant.

- c) Have a substantial adverse effect on State or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Less Than Significant Impact. On April 29, 2009, the USACE took jurisdiction over the permitted activity and authorized work that would result in the discharge of fill into 77.79 acres of waters of the U.S. for the University of California Merced Campus and Community North Project (SPK-1999-00203; USACE 2022). The University of California Merced Campus and Community North Project was subsequently modified and the permit updated and extended on March 5, 2012, September 10, 2015, April 18, 2017, and April 21, 2022. The time limit for completing the work covered under SPK-1999-00203 has been extended through May 1, 2030, and the size of the University of California Merced Campus and Community North Project was expanded from 833 acres to 1,026 acres.

A total of 0.04 acre of aquatic resources are located within the project impact footprint, which includes four seasonal wetlands. However, the project site falls within the area permitted under SPK-1999-00203 and was a covered activity, and, therefore, the aquatic resources within the project site were previously

mitigated under SPK-1999-00203. Therefore, as no further mitigation for these aquatic resources is necessary, the impact on potential State and/or federally protected wetlands would be less than significant.

- d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Less Than Significant Impact. Wildlife corridors link areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. This fragmentation of habitat can also occur when a portion of one or more habitats is converted into another habitat; for instance, when woodland or scrub habitat is altered or converted into grasslands after a disturbance such as fire, mudslide, or construction activities. Wildlife corridors mitigate the effects of this fragmentation by (1) allowing animals to move between remaining habitats thereby permitting depleted populations to be replenished and promoting genetic exchange; (2) providing escape routes from fire, predators, and human disturbances, thus reducing the risk of catastrophic events (such as fire or disease) on population or local species extinction; and (3) serving as travel routes for individual animals as they move within their home ranges in search of food, water, mates, and other needs.

The project site is located within a partially developed area of the UC Merced campus surrounded by roadways and campus development. The Merced Vernal Pools and Grassland Reserve are located adjacent to the site and east of the Le Grand Canal. As such, the project site provides limited habitat for species, such as grassland species, which may provide foraging habitat for raptors or refuge habitat for amphibians. The levees of the Le Grand Canal may also provide dispersal routes for mammal species. Although the perimeter of the proposed BESS and electrical components would be fenced with six-foot-tall chain-link fencing, the fencing would not impede regional wildlife movement, as species would be able to move around the perimeter of the site. In addition, the Le Grand Canal levees would not be disturbed. Therefore, wildlife movement between the project site and the adjacent Merced Vernal Pools and Grassland Reserve would not be substantially restricted, and implementation of the proposed project would not significantly affect any documented or observed wildlife migration corridors. Therefore, the impact would be less than significant.

- e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

No Impact. A total of four trees are present on the project site, consisting of one argyle apple, one red ironbark, and two stone pine trees, which were planted during previous development on-site. Removal of these trees may be necessary during project implementation; however, mitigation for these trees would not be expected since these trees were planted as part of past landscaping activities, and they are not native to California or North America. Further, there are no local tree preservation policies or ordinances that would be applicable to the proposed project. Therefore, the proposed project would not conflict with local tree removal policies or ordinances, and no impact would occur.

- f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No Impact. The proposed project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State

habitat conservation plan, as no such plans have been adopted that encompass the project site. Therefore, no impact would occur.

Mitigation Measures

The following new project-specific mitigation measures, 2020 LRDP SEIR mitigation measures, and ITP No. 2081-2009-010-04 (Amendment No. 4) mitigation measures related to biological resources would be applicable to the proposed project:

PS MM BIO-1: Western Spadefoot

If project related activities commence during the wet season and active dispersal period for western spadefoot (between approximately November 1 and March 31), pre-activity surveys for this species shall be conducted on the project site no more than two weeks prior to the initiation of project related activities to ensure that western spadefoot is not actively using the work area or adjacent areas. Pre-activity surveys shall be conducted by a qualified biologist familiar with all life stages and shall cover all terrestrial and aquatic habitats in the project site that are suitable for western spadefoot.

- If western spadefoot are observed within the project site during work, specifically within the construction zone, all work shall immediately halt in the vicinity of the animal, and the animal will be allowed to leave the area of its own will. If the animal is in immediate danger, an approved biologist shall be obtained to relocate the animal outside of the construction zone, at a safe distance from all construction-related activities, and within suitable habitat. No one other than an approved biologist shall handle, take, or otherwise harass the animal. No work shall resume until the animal has moved or been removed from areas of potential disturbance so long as the animal is out of harm's way.

PS MM BIO-2: Northwestern Pond Turtle

If possible, all grading and land disturbing activities will be conducted outside of the breeding season for northwestern pond turtle (breeding season is generally April to May; construction activities conducted between June and September will avoid this species breeding seasons) to avoid potential impacts to breeding/dispersing individuals.

- If project construction commences during breeding season (April 1 to May 31), then a qualified biologist shall conduct a pre-construction survey for northwestern pond turtle within 24 hours before the start of grading or land-disturbing activities. If the survey shows that there is no evidence of this species, then a letter report will be prepared to document the survey and will be provided to UC Merced, and no additional measures are required. If construction activities do not commence within 24 hours of the survey, or halts for more than seven days, then an additional survey will be required before starting or resuming work.
 - If this species is observed during the survey, no project work shall begin until CDFW has been consulted to determine appropriate mitigation measures.
- If northwestern pond turtles are observed within the project site during work, specifically within the construction zone, all work shall immediately halt in the vicinity of the animal, and the animal will be allowed to leave the area of its own will. If the animal is in immediate danger, an approved biologist will be retained and will relocate the animal outside of the construction

zone, at a safe distance from all construction-related activities, and within suitable habitat. No one other than an approved biologist shall handle, take, or otherwise harass the animal. No work shall resume until the animal has moved or been removed from areas of potential disturbance so long as the animal is out of harm's way.

2020 LRDP MM BIO-4: Prior to any new development on previously undisturbed land, and as long as the species is considered a candidate endangered species or in the event that it becomes listed under the CESA, a qualified wildlife biologist shall conduct visual surveys of the development area during the flight season for the Crotch bumble bee (late February through late October). The following methodology shall apply unless the CDFW releases species-specific survey protocol; in this case, CDFW's survey protocol shall apply.

- Between two and four evenly spaced presence/absence surveys shall be conducted for the highest detection probability, which, at present time, is the greatest between early spring (late March/early April) and early summer (late June/July). Surveys shall take place when temperatures are above 60°F, preferably on sunny days with low wind speeds (e.g., less than 8 miles per hour) and at least 2 hours after sunrise and 3 hours before sunset. On warm days (e.g., over 85°F), bumble bees will be more active in the mornings and evenings. Surveyors shall conduct transect surveys focusing on detection of foraging bumble bees and underground nests using visual aids such as butterfly binoculars. Even if no Crotch bumble bees are observed, a preconstruction survey will be conducted within 30 days prior to start of construction. If no Crotch bumble bees or potential Crotch bumble bees are detected during the presence/absence surveys or the pre-construction survey, no further mitigation is required.
- If Crotch bumble bees or potential Crotch bumble bees are observed within the development area, a plan to protect Crotch bumble bee nests and individuals shall be developed and implemented in consultation with CDFW. The plan shall include, but not be limited to, the following measures:
 - Specifications for construction timing and sequencing requirements (e.g., avoidance of raking, mowing, tilling, or other ground disturbance until late March to protect overwintering queens);
 - Preconstruction surveys conducted within 30 days and consistent with any current available CDFW standards prior to the start of ground disturbing activities to identify active nests;
 - Establishment of appropriate no-disturbance buffers for nest sites and construction monitoring by a qualified biologist to ensure compliance;
 - Restrictions associated with construction practices, equipment, or materials that may harm bumble bees (e.g., avoidance of pesticides/herbicides, BMPs to minimize the spread of invasive plant species);
 - Provisions to avoid Crotch bumble bees or potential Crotch bumble bees if observed away from a nest during project activity (e.g., ceasing of project activities until the animal has left the work area on its own volition); and

- Prescription of an appropriate restoration seed mix targeted for the Crotch bumble bee, including native plant species known to be visited by native bumble bee species and containing a mix of flowering plant species with continual floral availability through the entire active season of the Crotch bumble bee (March to October).

LRDP MM BIO-9a: Avoid and minimize impacts on native birds protected under the MBTA, including listed species, fully protected species, special-status species of concern, and raptors and passerines.

- (a) Limit construction to the non-breeding season or, if breeding season work is required, conduct pre-construction (tree, shrub, and ground) nest surveys to identify and avoid active nests or as an option, remove potential breeding habitat during the non-breeding season.
 - If feasible, the applicant shall conduct all construction-related activities including (but not limited to) tree and shrub removal, other vegetation clearing, grading, or other ground disturbing activities during the non-breeding season (between August 16 and February 14) for special-status and non-special-status migratory birds and raptors. If construction activities are scheduled to occur during the breeding season, a qualified avian biologist, with knowledge of the species to be surveyed, shall be retained to conduct focused nesting surveys within 15 days of the start of ground-disturbing or construction activities and within the appropriate habitat.
 - Specifically, tree, shrub, and ground nesting surveys for special-status birds (including but not limited to white-tailed kite, northern harrier, burrowing owl, loggerhead shrike, and tricolored blackbird), and other migratory birds and raptors shall be conducted before any construction disturbances occur in or near suitable nesting habitat within 500 feet of the construction work area between February 15 and August 15.
 - If an active nest is located on or within 500 feet of the project area, CDFW shall be consulted to determine an appropriate no-disturbance buffer around the nest until the nest is no longer active and the young have fledged. No construction shall be allowed within this exclusion area without consulting with CDFW. A wildlife biologist shall monitor the nest site during construction at least once a week, or at a frequency determined by CDFW, to ensure that the nest site is not disturbed and the buffer is maintained.
 - If the project proponent elects to remove a nest tree, nest trees may only be removed between August 16 and February 28, after the qualified avian biologist has determined that the nests are unoccupied.
- (b) Minimize impacts to burrowing owl and compensate for habitat loss.
 - The CDFW 1995 (updated by CDFW 2012) recommends that preconstruction surveys be conducted to locate active burrowing owl burrows in the construction work area and within a 500-foot-wide buffer zone around the construction area. The project proponent or its contractor shall retain a qualified biologist to conduct preconstruction surveys for active burrows according to the CDFW's Staff Report on Burrowing Owl Mitigation (updated by CDFW 2012). The preconstruction surveys

shall include a breeding season survey and a wintering season survey. If no burrowing owls are detected, no further mitigation is required.

- If active burrowing owls are detected, the following additional measures are required:
 - Occupied burrows shall not be disturbed during the breeding season (February 1 to August 31), which requires a 250 foot no disturbance buffer.
 - If owls must be moved away from the project site during the nonbreeding season, passive relocation techniques (e.g., installing one-way doors at burrow entrances) shall be used instead of trapping, as described in CDFW guidelines. At least 1 week will be necessary to complete passive relocation and allow owls to acclimate to alternate burrows.
 - When destruction of occupied burrows is unavoidable during the nonbreeding season (September 1 to January 31), unsuitable burrows shall be enhanced (enlarged or cleared of debris) or new burrows created (by installing artificial burrows) at a ratio of 2:1 on protected lands approved by the CDFW. Newly created burrows shall follow guidelines established by the CDFW (2012). These guidelines also require compensation for loss of foraging habitat.

ITP MM BIO-1: Before initiating Covered Activities, Permittee shall designate a representative (Designated Representative) responsible for communications with CDFW and overseeing compliance with the ITP. Permittee shall notify CDFW in writing before starting Covered Activities of the Designated Representative's name, business address, and contact information, and shall notify CDFW in writing if a substitute Designated Representative is selected or identified at any time during the term of the ITP.

ITP MM BIO-2: Permittee shall submit to CDFW in writing the name, qualifications, business address, and contact information of Designated Biologist(s) and/or Designated Monitor(s) at least 30 days before starting Covered Activities using the Biologist Resume Form (Attachment 5) or another format containing the same information. CDFW may approve Designated Biologist(s) for one or more Covered Species in the ITP. For example, CDFW may approve a Designated Biologist to implement all Conditions of Approval for CTS or approve a Designated Biologist to implement all Conditions of Approval in the ITP. The Designated Biologist(s) maybe assisted by approved individuals identified as a Designated Monitor that may not meet the qualifications to be a Designated Biologist to assist in compliance monitoring and/or implementation of specific Conditions of Approval. Designated Monitor(s) and their specific activities shall be approved in advance and in writing by CDFW. Permittee shall ensure that the Designated Biologist(s) and Designated Monitor(s) are knowledgeable and experienced in the biology and natural history of the Covered Species. The Designated Biologist(s) and Designated Monitor(s) shall be responsible for monitoring Covered Activities to help minimize and fully mitigate or avoid the incidental take of individual Covered Species and to minimize disturbance of Covered Species' habitat. Permittee shall obtain CDFW approval of the Designated Biologist(s) and Designated Monitor(s) in writing before starting Covered Activities, and shall also obtain approval in advance in writing if the Designated Biologist(s) or Designated Monitor(s) must be changed.

ITP MM BIO-3: Permittee shall conduct an education program for all persons employed or otherwise working in the Project Area before they perform any work. The program shall consist of a presentation from the Designated Biologist that includes a discussion of the biology and general behavior of the Covered Species; information about the distribution and habitat needs of the Covered Species; sensitivity of the Covered Species to human activities; the status of the Covered Species pursuant to CESA including legal protection; recovery efforts; penalties for violations; and the Project-specific protective measures described in the ITP. Permittee shall provide interpretation for non-English speaking workers, and the same instruction shall be provided for any new workers before they perform work in the Project Area. Permittee shall prepare and distribute wallet-sized cards or a fact sheet handout containing this information for workers to carry in the Project Area. Upon completion of the program, employees shall sign a form stating they attended the program and understand all protection measures. Permittee shall also maintain a continuous public education program to inform the students, residents, and staff of sensitive resource protection needs.

ITP MM BIO-4: Permittee shall initiate a trash abatement program before starting Covered Activities and shall continue the program for the duration of the Project. Permittee shall ensure that trash and food items are contained in closed (animal-proof) containers and removed regularly (at least once a week) to avoid attracting opportunistic predators such as ravens, coyotes, and feral dogs.

ITP MM BIO-5: A Work Area is defined as a discrete construction zone and associated access routes, access points, staging/stockpiling areas within the Project Area where Covered Activities will occur. Permittee shall clearly delineate the boundaries of the Work Area with fencing, stakes, or flags where Covered Activities are planned to occur in the immediate future and before starting Covered Activities. Permittee shall restrict all Covered Activities to within the fenced, staked, or flagged areas. Permittee shall maintain all fencing, stakes, and flags in effective condition until the completion of Covered Activities.

ITP MM BIO-6: Before starting Covered Activities, Permittee shall clearly delineate habitat of the Covered Species within the Project Area with posted signs, posting stakes, flags, and/or rope or cord and place fencing as necessary to minimize the disturbance of Covered Species' habitat. Permittee shall maintain all fencing, stakes, and flags in effective condition until the completion of Covered Activities.

ITP MM BIO-7: The Designated Representative shall notify CDFW 14 calendar days before starting Covered Activities and shall document compliance with all pre-Project Conditions of Approval before starting Covered Activities.

ITP MM BIO-8: The Designated Biologist shall survey the work site no more than 14 days before the Permittee begins Covered Activities within 1.3 miles of known CTS breeding habitat. These surveys shall provide 100 percent visual coverage of potential habitat (including burrow and crevice openings) within the Work Area and a 50-foot buffer zone around the Work Area. If the Designated Biologist finds any life stages of CTS (adults, eggs, or larvae) the Designated Biologist or Designated Representative shall immediately contact CDFW. The Designated Biologist shall relocate any adult CTS that is found in accordance with the CDFW-approved California Tiger Salamander Relocation Plan and coordinate with CDFW if CTS eggs or larvae are found. The Designated Biologist shall hold the appropriate State and federal Scientific Collecting Permits (SCP) for amphibians to be authorized to capture and handle CTS. The Designated Biologist may be assisted by approved biologists that do not have an SCP; these biologists shall be identified as Designated Monitors. Permittee shall provide the survey results to CDFW in a written report before starting Covered Activities.

ITP MM BIO-9: The Designated Biologist shall prepare a CTS relocation plan and submit it to CDFW for approval at least 30 days prior to the beginning of Covered Activities occurring within 1.3 miles of known CTS breeding habitat and before conducting surveys per Condition of Approval California Tiger Salamander Surveys. Covered Activities within these areas may not proceed until the California Tiger Salamander Relocation Plan is approved by CDFW. Permittee shall submit any proposed changes to the California Tiger Salamander Relocation Plan to CDFW in writing and CDFW shall approve proposed changes prior to implementation of any activities pursuant to a modified California Tiger Salamander Relocation Plan.

ITP MM BIO-10: During surveys per Condition of Approval California Tiger Salamander Surveys, the Designated Biologist(s) shall flag any small mammal burrows and crevices suitable for CTS occupancy within the Work Area and a 50-foot buffer zone around the Work Area if the burrow/crevice is within 0.25 mile of known or potential CTS breeding habitat. Any small mammal burrows or crevices that cannot be fully avoided by 50 feet regardless of whether the burrow/crevice is in the Work Area or solely within the Work Area's 50-foot buffer zone shall be fully excavated by the Designated Biologist(s) before starting Covered Activities. The Designated Biologist(s) shall relocate any live CTS discovered during burrow excavation in accordance with the CDFW-approved California Tiger Salamander Relocation Plan. Designated Monitor(s) are prohibited from capturing and handling CTS unless specifically approved in writing by CDFW and under the direct supervision of the Designated Biologist(s).

ITP MM BIO-11: No later than 48 hours after surveying, flagging, and excavating small mammal burrows/crevices in accordance with Conditions of Approval California Tiger Salamander Surveys and Small Mammal Burrow Surveys and Excavation, Permittee shall install CTS exclusion fencing around the Work Area in upland habitat areas within 1.3 miles of potential or known CTS breeding habitat. Permittee shall maintain the California tiger salamander exclusion fencing throughout all construction activities. CTS exclusion fencing shall be installed under the direct supervision of a Designated Biologist. Permittee shall use wildlife exclusion fencing consisting of a fine (less than 0.4 inch) mesh equipped with one-way exits to avoid entrapment of amphibians inside the fence. Hardware cloth is not permitted. Permittee shall bury fencing to a depth of six inches and fencing shall be a minimum of 3.3 feet tall following installation. The fencing shall include the optional barrier lip designed to prevent species such as California tiger salamander from climbing over. The Permittee shall avoid small mammal burrows to the maximum extent possible during installation of the exclusion fencing. Where burrows cannot be avoided, the Designated Biologist shall excavate them by hand before the fence is installed. The Designated Biologist shall relocate any live CTS discovered during these inspections in accordance with the CDFW-approved California Tiger Salamander Relocation Plan. The Permittee may propose an alternative exclusion fence material and/or installation method for specific locations within the Project Area. Any alternative exclusion fence material and/or installation method shall be submitted to CDFW for written approval and shall be approved prior to its use. Permittee and/or Designated Biologist(s) shall inspect the entire length of the CTS exclusion fence and refuge areas (e.g., cover boards) a minimum of once a week during Covered Activities and during periods of inactivity. If Covered Species are found within the interior fence, the Designated Biologist(s) shall relocate them in accordance with the CDFW-approved California Tiger Salamander Relocation Plan.

ITP MM BIO-12: The Designated Biologist shall conduct preconstruction surveys during the raptor nesting season (February 15 through September 15), within 0.5 mile of Covered Activities. Raptor surveys will be conducted no more than 10 days prior to the start of Covered Activities. The Designated Biologist or Designated Representative shall provide the survey results, including negative findings, to CDFW in a written report within 30 days after the start of Covered Activities.

ITP MM BIO-16: Permittee shall develop a salvage plan for succulent owls' clover, San Joaquin Valley Orcutt grass, and Colusa grass and submit it to CDFW for approval at least 30 days prior to beginning Covered Activities within 1,000 feet of known vernal pools, swales, or other wetland habitat. Covered Activities within these areas may not proceed until the Salvage Plan is approved by CDFW.

ITP MM BIO-17: In areas with intact vernal pool, swale, or wetland habitat the Designated Biologist shall conduct botanical surveys prior to the Permittee beginning Covered Activities. The botanical surveys shall be floristic in nature, cover the entire area of direct and indirect effects, and should be timed appropriately to detect all species which may occur within the Project Area. The Designated Biologist or Designated Representative shall provide the survey results to CDFW in a written report within 30 days after the start of Covered Activities within areas with intact vernal pool, swale, or wetland habitat.

ITP MM BIO-18: Temporary fencing that delineates the Project Area as required by Conditions of Approval Delineation of Work Area Boundaries and Delineation of Habitat shall be placed by the Permittee such that it excludes the greatest number of Covered Species possible. Exact fencing locations shall be determined by the Designated Biologist.

ITP MM BIO-19: If any of the plant Covered Species are found in the Project Area, the Designated Biologist shall salvage and transplant them in accordance with the CDFW-approved Salvage Plan.

ITP MM BIO-21: To ensure compliance with the Conditions of Approval of the ITP, the Designated Biologist(s) and/or Designated Monitor(s) shall have authority to immediately stop any activity that is not in compliance with the ITP, and/or order any reasonable measure to avoid the unauthorized take of an individual of the Covered Species, or a species not covered by the ITP. Permittee shall provide unfettered access to the Project Area and otherwise facilitate the Designated Biologist(s) and/or Designated Monitor(s) in the performance of their duties. If the Designated Biologist(s) and/or Designated Monitor(s) are unable to comply with the ITP, then the Designated Biologist(s) and/or Designated Monitor(s) shall notify the CDFW Regional Representative (detailed in the Notices section below) immediately. Permittee shall not enter into any agreement or contract of any kind, including but not limited to non-disclosure agreements and confidentiality agreements, with its contractors and/or the Designated Biologist(s)/Designated Monitor(s) that prohibit or impede open communication with CDFW, including but not limited to providing CDFW staff with the results of any surveys, reports, or studies or notifying CDFW of any non-compliance or take. Failure to notify CDFW of any non-compliance or take or injury of a Covered Species as a result of such agreement or contract may result in CDFW taking actions to prevent or remedy a violation of the ITP.

ITP MM BIO-22: Permittee shall provide CDFW staff with reasonable access to the Project Area and mitigation lands under Permittee control, and shall otherwise fully cooperate with CDFW efforts to verify compliance with or effectiveness of mitigation measures set forth in the ITP.

ITP MM BIO-23: The Designated Biologist(s) and Designated Monitor(s) shall maintain a construction-monitoring notebook on-site throughout the construction period which shall include a copy of the ITP with attachments and a list of signatures of all personnel who have successfully completed the education program. Permittee shall ensure a copy of the construction-monitoring notebook is available for review in the Project Area upon request by CDFW.

ITP MM BIO-24: Permittee shall prohibit firearms and domestic dogs from the Project Area and access routes during construction activities, except those in the possession of authorized security personnel or local, State, or federal law enforcement officials.

ITP MM BIO-25: Permittee shall develop and establish leash rules and an animal control program.

ITP MM BIO-26: Permittee shall prohibit use of erosion control materials potentially harmful to Covered Species and other species, such as mono-filament netting (erosion control matting) or similar material, in potential Covered Species' habitat. This includes photodegradable or biodegradable synthetic netting.

ITP MM BIO-27: Permittee shall implement dust control measures during Covered Activities to facilitate visibility for monitoring of the Covered Species by the Designated Biologist. Permittee shall keep the amount of water used to the minimum amount needed, and shall not allow water to form puddles that last more than four (4) hours and watering shall not occur if puddles cannot percolate prior to one (1) hour before dusk.

ITP MM BIO-28: Project-related personnel shall access the Project Area using existing routes and shall not cross Covered Species' habitat outside of or en route to the Project Area. Permittee shall restrict Project-related vehicle traffic to established roads, staging, and parking areas. Permittee shall ensure that vehicle speeds do not exceed 20 miles per hour to avoid Covered Species on or traversing the roads. Permittee shall strictly prohibit off-road traffic outside the designated Project Area. If Permittee determines construction of routes for travel are necessary outside of the Project Area, the Designated Representative shall contact CDFW for written approval before carrying out such an activity. CDFW may require an amendment to the ITP, if among other reasons, if additional take of Covered Species or Covered Species habitat impacts will occur as a result of the Project modification.

ITP MM BIO-29: Permittee shall confine all Project-related parking, storage areas, laydown sites, equipment storage, and any other surface-disturbing activities to the Project Area using, to the extent possible, previously disturbed areas. Additionally, Permittee shall not use or cross Covered Species' habitat outside of the marked Project Area.

ITP MM BIO-30: Permittee shall immediately stop and following pertinent State and federal statutes and regulations arrange for repair and clean up by qualified individuals of any fuel or hazardous waste leaks or spills at the time of occurrence, or as soon as it is safe to do so. Permittee shall exclude the storage and handling of hazardous materials from the Project Area, except in areas that have completed development and have been determined not to be Covered Species habitat by the Designated Biologist, and shall properly contain and dispose of any unused or leftover hazardous products off-site.

ITP MM BIO-31: The Designated Representative shall immediately notify CDFW in writing if it determines that the Permittee is not in compliance with any Condition of Approval of the ITP, including but not limited to any actual or anticipated failure to implement measures within the time periods indicated in the ITP and/or the MMRP. The Designated Representative shall report any non-compliance with the ITP to CDFW within 24 hours.

ITP MM BIO-32: Initially, the Designated Biologist shall be on-site daily when Covered Activities occur. If Covered Activities occur in more than one Work Area, a Designated Biologist(s) shall be present on site in all Work Areas to conduct compliance inspections. The Designated Biologist shall conduct compliance inspections to (1) minimize incidental take of the Covered Species and to check for compliance with all mitigation and avoidance measures; (2) prevent unlawful take of species; (3) check for compliance with all measures of the ITP; (4) check all exclusion zones; and (5) ensure that signs, stakes, and fencing are intact, and that Covered Activities are only occurring in the Project Area. The Designated Representative or Designated Biologist shall prepare daily written observation and inspection records summarizing oversight activities and compliance inspections, observations of Covered Species and their sign, survey

results, and monitoring activities required by the ITP. Eventually, CDFW may approve, in writing, periodic inspections once Covered Activities are on-going and more routine in nature. To reduce compliance inspections, Permittee shall submit a written request to CDFW, including any additional information that CDFW requests to demonstrate that Covered Activities are on-going and more routine in nature.

ITP MM BIO-33: The Designated Biologist shall submit all confirmed Covered Species sightings to the California Natural Diversity Database (CNDDDB) within 60 calendar days of the observation. The Designated Biologist(s) shall include the following documented information: the date, time, and location of each occurrence using Global Positioning System (GPS) technology, the name of the party that actually identified the plant or animal, circumstances of the incident, the general condition and health of each individual, any diagnostic markings, sex, age (juvenile or adult), actions undertaken, and habitat description.

ITP MM BIO-34: The Designated Representative or Designated Biologist shall compile the observation and inspection records identified in Condition of Approval Compliance Monitoring into a Monthly Compliance Report (MCR) and submit it to CDFW along with a copy of the MMRP table with notes showing the current implementation status of each mitigation measure. Permittee shall submit MCRs to CDFW no more than 15 days after the end of the month. MCRs shall be submitted to CDFW's Central Region Office, Regional Representative, and Headquarters CESA Program. At the time of the ITP's approval, the Central Region Office email is R4CESA@wildlife.ca.gov, with a copy to the Regional Representative Ruby Kwan (Ruby.Kwan@wildlife.ca.gov) and Headquarters CESA Program (CESA@wildlife.ca.gov). CDFW may at any time increase the timing and number of compliance inspections and reports required under this provision depending upon the results of previous compliance inspections. If CDFW determines the reporting schedule must be changed, CDFW will notify Permittee in writing of the new reporting schedule.

ITP MM BIO-35: Permittee shall provide CDFW with an Annual Status Report (ASR) no later than January 31 of every year beginning with issuance of the ITP and continuing until CDFW accepts the Final Mitigation Report identified below. Each ASR shall include, at a minimum: (1) a summary of all MCRs, (2) a general description of the status of the Project Area and Covered Activities, including actual or projected completion dates, if known; (3) a copy of the table in the MMRP with notes showing the current implementation status of each mitigation measure; (4) an assessment of the effectiveness of each completed or partially completed mitigation measure in minimizing and mitigating Project impacts; (5) all available information about Project-related take of the Covered Species; (6) survivorship rates of Swainson's hawk replacement trees pursuant to Condition of Approval Tree Replacement; and (7) information about other Project impacts on the Covered Species. Permittee shall submit ASRs to CDFW's Central Region Office, Regional Representative, and Headquarters CESA Program.

ITP MM BIO-36: Permittee shall immediately notify the Designated Biologist if a Covered Species is killed or taken by a Project-related activity, or if a Covered Species is otherwise found dead or injured within the vicinity of the Project. The Designated Biologist or Designated Representative shall provide initial notification to CDFW by calling the Regional Office at (559) 243-4005 and by email to CDFW's Central Region Office (R4CESA@wildlife.ca.gov) and Regional Representative (Ruby.Kwan@wildlife.ca.gov). The initial notification to CDFW shall include information regarding the location, species, number of animals taken or injured, name of the CDFW-approved facility where the animal was taken, and the ITP Number. Following initial notification, Permittee shall send CDFW a written report within two calendar days. The report shall include the date and time of the finding or incident, location of the animal or carcass, and if

possible, provide a photograph, explanation as to cause of take or injury, and any other pertinent information.

ITP MM BIO-37: If CTS is found by any person in the Project Area before or during Covered Activities, the Permittee shall immediately stop all work that could potentially harm the CTS until the Designated Biologist can relocate the CTS to an active rodent burrow system in accordance with the CDFW-approved California Tiger Salamander Relocation Plan. Designated Monitor(s) are prohibited from capturing and handling CTS unless specifically approved in writing by CDFW and under the direct supervision of the Designated Biologist(s).

ITP MM BIO-39: The Permittee and Designated Biologist(s) shall monitor the National Weather Service 72-hour forecast for the Project Area. If a 70 percent or greater chance of rainfall is predicted within 72 hours, Permittee shall cease all Covered Activities in areas within 1.3 miles of potential or known CTS breeding habitat until no further rain is forecast unless the Work Area has been encircled with CTS exclusion fencing that is in effective condition pursuant to Condition of Approval California Tiger Salamander Exclusion Fencing. In addition, if a 70 percent or greater chance of rainfall is predicted within 72 hours, construction-related traffic moving through areas within 1.3 miles of potential or known CTS breeding habitat but outside of the CTS exclusion fencing (e.g., on roads) shall not occur at night or within two hours of sunrise and sunset unless a Designated Biologist leads the traffic by foot; further traffic shall not exceed 10 mph during daylight hours until no further rain is forecast. If Covered Activities must continue when rain is forecast in Work Areas within 1.3 miles from potential or known CTS breeding habitat, a Designated Biologist shall survey the Project construction footprint before construction begins each day that rain is forecast. If a Designated Monitor is used to conduct surveys, a Designated Biologist must remain on site to capture and relocate any CTS that are discovered during the surveys. If rain exceeds ¼ inch during a 24-hour period, Permittee shall cease work until no further rain is forecast.

ITP MM BIO-40: Permittee shall strictly prohibit all night work in areas within 1.3 miles of potential or known CTS breeding habitat when a 70 percent or greater chance of rainfall is predicted within 72 hours of Covered Activities until no further rain is forecast. This restriction is not applicable for areas within 1.3 miles of potential or known CTS breeding habitat once they have been encircled with CTS exclusion fencing pursuant to ITP Condition of Approval California Tiger Salamander Exclusion Fencing and is also not applicable to construction-related traffic led by a Designated Biologist by foot in accordance with Condition of Approval Rain Forecast.

ITP MM BIO-41: Permittee shall ensure that soil stockpiles are placed where soil will not pass into potential CTS breeding habitat or into any other “Waters of the State”. Permittee shall appropriately protect stockpiles to prevent soil erosion.

ITP MM BIO-42: Permittee shall construct roadways within 1.3 miles of known or potential CTS breeding habitat without steep curbs, berms, or dikes, which could prevent CTS from exiting the roadway. If curbs are necessary for safety and/or surface runoff, Permittee shall design and construct them to allow CTS to walk over them. If steep dikes are required, Permittee shall design and construct them to include over-side drains or curb/dike breaks spaced at intervals of 25 feet to allow CTS passage.

ITP MM BIO-43: To ensure that disease is not conveyed between work sites all Designated Biologist(s) and Designated Monitor(s) shall follow the fieldwork code of practice developed by the Declining Amphibian Populations Task Force Fieldwork Code of Practice (Attachment 2). The Designated

Biologist(s) and Designated Monitor(s) may substitute a bleach solution (0.5 to 1.0 cup of bleach to 1.0 gallon of water) for the ethanol solution. Care shall be taken so that all traces of the disinfectant are removed before entering the next aquatic habitat.

ITP MM BIO-44: The Designated Biologist shall inspect all open holes, sumps, and trenches within the Project Area at the beginning, middle, and end of each day for trapped animals. To prevent inadvertent entrapment of Covered Species or any other animals, the Designated Biologist shall oversee the covering of all excavated, steep-walled holes or trenches more than two feet deep, or of any depth if they contain water or other material, with plywood or other barrier materials at the close of each working day such that animals are unable to enter and become entrapped. Alternatively, Permittee shall provide earthen escape ramps of no more than 3:1 slope every 200 feet. Before holes or trenches are filled, the Designated Biologist shall thoroughly inspect them for trapped animals. If any worker discovers that Covered Species have become trapped, Permittee shall cease all Covered Activities in the vicinity and notify the Designated Biologist immediately. Project workers and the Designated Biologist shall allow the Covered Species to escape unimpeded if possible. If CTS is discovered in a hole or trench, the Designated Biologist shall relocate CTS as described in the CDFW-approved California Tiger Salamander Relocation Plan, before Covered Activities are allowed to continue. If an injured Covered Species is discovered at any time, the Designated Representative shall contact CDFW's Regional Representative within one working day of the incident pursuant to Condition of Approval Notification of Take.

ITP MM BIO-45: Workers shall inspect for Covered Species under vehicles and equipment before the vehicles and equipment are moved. If a Covered Species is present, the worker shall notify the Designated Biologist and wait for the Covered Species to move unimpeded to a safe location. Alternatively, especially if the animal is inside the fenced Project Area, the Designated Biologist shall move the Covered Species out of harm's way outside of the Project Area and in compliance with the CDFW-approved California Tiger Salamander Relocation Plan if applicable.

ITP MM BIO-46: Workers shall thoroughly inspect all construction pipe, culverts, or similar structures with a diameter of three inches or greater that are stored for one or more overnight periods for Covered Species before the pipe is subsequently moved, buried, or capped. If during inspection a Covered Species is discovered inside a pipe, workers shall notify the Designated Biologist and allow the Covered Species to safely escape that section of pipe before moving and utilizing the pipe.

ITP MM BIO-47: If a nesting Swainson's hawk is found within 0.5 mile of the Project Area during Raptor Surveys, or if a historic/potential nest becomes occupied, or a nesting Swainson's hawk is found at any time during Covered Activities, the Designated Biologist shall be present daily for the entire duration of Covered Activities during the nesting season (February 15 through September 15) to monitor the behavior of any Swainson's hawk nesting within 500 feet to 0.5 mile of Covered Activities. The Designated Biologist shall have the authority to order the cessation of all activities within 0.5 mile of any Swainson's hawk nest if the birds exhibit distress and/or abnormal nesting behavior (swooping/stooping, excessive vocalization (distress calls), agitation, failure to remain on nest, failure to deliver prey items for an extended time period, etc.) which may cause reproductive failure (nest abandonment and loss of eggs and/or young). Permittee shall not resume Covered Activities until CDFW has been consulted by the Designated Biologist, and both the Designated Biologist and CDFW confirm that the bird's behavior has normalized.

ITP MM BIO-48: The Permittee and Designated Biologist shall ensure that no Covered Activities occur within 500 feet of an active Swainson's hawk nest during the nesting season (February 15 through September 15).

ITP MM BIO-49: Permittee shall not remove any historic or active Swainson's hawk nest trees during the nesting season (February 15 through September 15). Permittee shall remove a historic or active Swainson's hawk nest tree only between September 16 and February 14 of any year to avoid impacts to nesting Swainson's hawk.

ITP MM BIO-50: If Covered Activities affecting Swainson's hawk result in the removal of a Swainson's hawk nest tree in the Project Area, Permittee shall plant native species replacement trees at a 4:1 ratio (four trees for each historic and active nest tree removed) on HM lands in close proximity to suitable foraging habitat. Permittee shall prepare a Swainson's Hawk Nest Tree Replacement Plan and submit it to CDFW for review and written approval. The Swainson's Hawk Nest Tree Replacement Plan shall identify replacement tree locations, planting methods, and any site-specific management activities necessary to ensure the performance criteria of this Condition of Approval are achieved. The HM Lands manager shall monitor the tree survival rates and shall report them in the ASR pursuant to the reporting requirements of Condition of Approval Annual Summary Report. Permittee shall ensure that the number of trees required as compensation under the ITP matches the number of healthy and thriving trees at the end of the initial five-years monitoring period.

ITP MM BIO-51: If a Covered Species is injured as a result of Covered Activities, the Designated Biologist shall immediately take it to a CDFW-approved wildlife rehabilitation or veterinary facility. Permittee shall identify the facility before starting Covered Activities. Permittee shall bear any costs associated with the care or treatment of such injured Covered Species. Permittee shall notify CDFW of the injury to the Covered Species immediately by telephone and e-mail followed by a written incident report. Notification shall include the date, time, location (GPS coordinates) and circumstances of the incident, and the name of the facility where the animal was taken.

ITP MM BIO-52: If a plant Covered Species is destroyed or damaged as a result of Project-related activities outside of the identified Project Area, or because avoidance and minimization measures included in the ITP were not followed, the Permittee shall notify CDFW of the incident immediately, including the extent to which damage to the Covered Species occurred via telephone and email, followed by a written incident report submitted to CDFW. Notification shall include the date, time, location (GPS coordinates), and circumstances of the incident.

ITP MM BIO-53: Permittee shall not collect inoculum from greater than 10 percent of the area of each donor pool. Permittee shall not collect inoculum from vernal pools within the designated inoculum collection area where CESA-listed (threatened, endangered, or rare) or invasive plants occur. Permittee shall provide a written report to CDFW, including maps, documenting the vernal pools used for inoculum collection.

ITP MM BIO-62: Upon completion of construction Permittee shall remove from the Project Area and properly dispose of all construction refuse, including, but not limited to, broken equipment parts, wrapping material, cords, cables, wire, rope, strapping, twine, buckets, metal or plastic containers, and boxes.

ITP MM BIO-63: No later than 45 days after completion of all mitigation measures, Permittee shall provide CDFW with a Final Mitigation Report. The Designated Biologist shall prepare the Final Mitigation Report which shall include, at a minimum: (1) a summary of all MCRs and all ASRs; (2) a copy of the table in the MMRP with notes showing when each of the mitigation measures was implemented; (3) all available information about Project-related take of the Covered Species; (4) information about other Project impacts on the Covered Species; (5) beginning and ending dates of Covered Activities; (6) an assessment of the effectiveness of the ITP's Conditions of Approval in minimizing and fully mitigating Project impacts of the taking on Covered Species; (7) recommendations on how mitigation measures might be changed to more effectively minimize take and mitigate the impacts of future projects on the Covered Species; and (8) any other pertinent information.

ITP MM BIO-64: CDFW accepts as complete the Permittee's Final Mitigation Report required by the ITP.

V. CULTURAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐

This section is based on information provided in Section 4.5, Cultural Resources, of the 2009 LRDP EIS/EIR (UC Merced 2008).

Environmental Setting

Prehistory

Although few archaeological sites demonstrate evidence of human occupation of the San Joaquin Valley during the late Pleistocene and early Holocene epochs (12,000–6000 B.C.), this is likely a product of the archaeological record itself rather than lack of human habitation in the valley. The closest-available prehistoric chronology for the project area comes from the west side of the San Joaquin Valley as a result of the excavations at several sites during archaeological efforts for reservoir construction of the San Luis, Los Banos, and Little Panoches Reservoirs (UC Merced 2008).

The following four cultural complexes were identified in the archaeological data collected during these excavations:

- The Positas Complex (5200-4600 years before present [B.P.]) is characterized by small, shaped mortars; cylindrical pestles; millingsstones; perforated flat cobbles; small flake scrapers; handstones; and spire- lopped *Olivella* beads. To date, archaeologists have not identified burials or structures associated with the Positas Complex (Mikkelsen and Hildebrandt 1990).
- The Pacheco Complex (4600-1600 B.P.) consists of two subcomplexes: Pacheco Complex A (3600–1600 B.P.) and Pacheco Complex B (4600–3600 B.P.). Pacheco Complex B is characterized by foliate bifaces, rectangular shell ornaments, flexed burials, and thick rectangular *Olivella* beads. Sites attributed to Pacheco Complex A exhibit spire-ground *Olivella* beads, perforated canine teeth, bone awls, whistles, grass saws, large stemmed and side-notched points, flexed burials, millingsstones, mortars, and pestles. Domestic structure remnants attributed to Pacheco Complex A were probably circular in outline and 10-12 feet in diameter (Mikkelsen and Hildebrandt 1990; Olsen and Payen 1969).
- The Gonzaga Complex (1600–1000 B.P.) is characterized by extended and flexed burials; bowl

mortars; shaped pestles; squared and tapered-stem points; few bone awls; distinctive shell ornaments; and thin rectangular, split-punched, and oval *Olivella* beads (Mikkelsen and Hildebrandt 1990; Olsen and Payen 1969). Archaeologists hypothesize that the Gonzaga Complex marks the arrival of the Yokuts in the San Joaquin Valley (Mikkelsen and Hildebrandt 1990).

- The Panoche Complex (400–200 B.P.) is recognized by large circular structures (pits), flexed burials and primary and secondary cremations, varied mortars and pestles, bone awls, whistles, small side-notched points, clamshell disk beads, and other bead types. The Panoche Complex appears to represent Yokuts occupation of the valley (Mikkelsen and Hildebrandt 1990; Olsen and Payen 1969).

Ethnography

The aboriginal inhabitants of the area in which the Area of Potential Effect is located are known as the Northern Valley Yokuts. “Yokuts” is a term applied to a large and diverse number of peoples inhabiting the San Joaquin Valley and Sierra Nevada foothills of central California. There was no Yokuts tribal organization that encompassed the whole of the peoples speaking Yokutsan languages, or even a tribal organization that encompassed an entire primary division, such as Foothill Yokuts. Similar to most Native American groups in California, the largest political entity among the Yokuts was that of the tribelet. A tribelet consisted of a large village and a few smaller surrounding villages. Larger villages and tribelets had a chief or headman – an advisory position that was passed from father to son (Wallace 1978).

In general, the Yokuts were seasonally mobile hunter-gathers with semi-permanent villages. Principal settlements were located on the tops of low mounds, on or near the banks of the larger watercourses. Settlements were composed of single-family dwellings, sweathouses, and ceremonial assembly chambers. Dwellings were small and lightly constructed, semi-subterranean and oval. The public structures were large and earth covered. Sedentism was fostered by the abundance of riverine resources in the area (Wallace 1978).

The Yokuts first came into contact with Europeans when Spanish explorers visited the area in the late 1700s, possibly followed by expeditions to recover Native Americans who had escaped from the missions. The North Valley Yokuts were far more affected by the missions than were other groups. The loss of individuals to the missions, the influence of runaway neophytes, various epidemics in the 1800s, and the arrival of settlers and miners all contributed to the disintegration of Yokuts culture (Wallace 1978). Although nearly obliterated, the descendants of the Northern Valley Yokuts still live in Merced County today and continue to rebuild their cultural identity (UC Merced 2008).

Methodology

Cultural Resources Records Search

During preparation of the 2009 LRDP EIS/EIR, a request was sent to the Central California Information Center (CCIC) of the California Historical Resources Information System (CHRIS) for a records search review of cultural resources information submitted to their data files. The staff of the CCIC at California State University (CSU) Stanislaus in Turlock, California conducted a search of their files and reviewed maps for the 2009 LRDP area plus an additional 0.5-mile radius around the area. The records review also included a review of the National Register of Historic Places (NRHP), the California Register of Historical

Resources (CRHR), the California Inventory of Historic Resources (1976), the California Historical Landmarks (1996), and the California Points of Historical Interest listing (May 1992 and updates), the Historic Property Data File and the Archaeological Determinations of Eligibility (Office of Historic Preservation [OHP] current computer lists dated 12/04/2007 and 12/03/2007), the Survey of Surveys (1989), General Land Office Plat maps, and other pertinent historic maps and data available at the CCIC (UC Merced 2008).

Survey and Results

The previous cultural resources investigations conducted during preparation of the 2009 LRDP EIS/EIR identified nine historic resources within the overall UC Merced campus boundary. Eight of these resources, the Fairfield and Le Grand irrigation canals, a historic farm complex, a historic fence segment, two historic and two prehistoric sites as well as a historic isolate were formally evaluated and recommended as not eligible for listing in either the NRHP or the CRHR. However, one of the identified cultural resources, Site MCN-4, which is a large prehistoric site, has not yet been evaluated for potential listing on the NRHP or the CRHR (UC Merced 2008).

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

Impacts related to cultural resources were analyzed in Section 4.5, Cultural Resources, of the 2009 LRDP EIS/EIR. The 2020 LRDP SEIR determined that impacts to cultural resource were adequately addressed in the 2009 LRDP EIS/EIR and, therefore, did not require subsequent evaluation.

The 2009 LRDP EIS/EIR concluded that development under the 2009 LRDP would have the potential to impact one historical resource, as well as two historic irrigation canals; however, the impact would be reduced to less than significant with implementation of 2009 LRDP MM CUL-1a and MM CUL-1b. The 2009 LRDP EIS/EIR concluded that development under the 2009 LRDP could potentially unearth and damage buried unknown cultural resources; however, 2009 LRDP MM CUL-2 was determined to reduce the potential impacts to a less than significant level. Similarly, the 2009 LRDP EIS/EIR determined that implementation of the 2009 LRDP could inadvertently unearth and damage buried human remains that were not identified during pedestrian field surveys of the campus. However, with implementation of 2009 LRDP MM CUL-3, the impact was determined to be reduced to less than significant.

There are no known paleontological resources within the UC Merced campus; however, the 2009 LRDP EIS/EIR determined that three of geologic formations underlying the campus are considered moderate to highly sensitive for paleontological resources. The 2009 LRDP EIS/EIR concluded that with implementation of MM CUL-4a and CUL-4b, the impact would be less than significant.

Discussion of Impacts

- a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?
- b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

Less Than Significant with Mitigation Incorporated. The previous cultural resources investigations conducted during preparation of the 2009 LRDP EIS/EIR identified nine historic resources within the overall UC Merced campus boundary. Eight of these resources, the Fairfield and Le Grand irrigation

canals, a historic farm complex, a historic fence segment, two historic and two prehistoric sites as well as a historic isolate were recommended as not eligible for listing in either the NRHP or the CRHR. One of the identified cultural resources has not yet been evaluated for potential listing on the NRHP or the CRHR (UC Merced 2008).

The proposed project site is partially developed with the existing 1-MW solar array constructed in 2009, and no previously identified historic resources are located on the project site. In addition, the project site is not located in an area of the campus where prehistoric sites were previously recorded. Although the project site is adjacent to Le Grand Canal, which traverses the eastern edge of the project site and runs roughly northwest to southeast, this canal was previously determined to be ineligible for listing on the NRHP and CRHR. However, construction of the proposed project could inadvertently unearth and damage buried archaeological or historical resources that were not identified during previous pedestrian field surveys, and ground-disturbing construction activities could result in substantial damage to potentially significant archaeological or historical resources.

In the event that archaeological or historical resources are discovered during project construction, 2009 LRDP MM CUL-2 would be applicable to the proposed project and would be implemented. 2009 LRDP MM CUL-2 would require construction activities to halt within 100 feet of the find until a qualified archaeologist assesses the potential significance of the find, and if necessary, develop appropriate treatment measures. With implementation of 2009 LRDP MM CUL-2, the impact would be reduced to less than significant for questions a) and b).

c) Disturb any human remains, including those interred outside of dedicated cemeteries?

Less Than Significant with Mitigation Incorporated. The 2009 LRDP EIS/EIR determined that no human remains have been discovered on the UC Merced campus since the start of campus development in 2002. The project site does not contain known human remains, and human remains were not previously encountered on-site during initial site disturbance and construction of the existing 1-MW solar array. However, as construction of the proposed project would involve ground disturbance, there is the potential that project construction could reveal previously undiscovered human remains, which could result in a potentially significant impact. However, in the event that human remains are encountered during project construction, 2009 LRDP MM CUL-3 would be applicable to the proposed project and would require compliance with State law, the stopping of work if human remains are discovered, and consultation with the County coroner. With implementation of 2009 LRDP MM CUL-3, the impact would be reduced to less than significant.

Mitigation Measures

No new project-specific mitigation measures would be required related to cultural resources. The following mitigation measures from the 2009 LRDP EIS/EIR would be applicable to the proposed project:

2009 LRDP MM CUL-2: If buried cultural resources, such as chipped or ground stone, historic debris, building foundations, or non-human bone are inadvertently discovered during ground-disturbing activities on the campus, work will stop in that area and within 100 feet of the find until a qualified archaeologist can assess the significance of the find and, if necessary, develop appropriate treatment measures. Treatment measures typically include development of avoidance strategies or mitigation of impacts through data recovery programs such as excavation or detailed documentation.

If cultural resources are discovered during construction activities, the construction contractor and lead contractor compliance inspector will verify that work is halted until appropriate treatment measures are implemented in coordination with UC Merced.

2009 LRDP MM CUL-3: If human remains of Native American origin are discovered during ground-disturbing activities, UC Merced shall comply with State laws relating to the disposition of Native American burials, which falls within the jurisdiction of the Native American Heritage Commission (NAHC; PRC Section 5097). If human remains are discovered or recognized in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

- the coroner of Merced County has been informed and has determined that no investigation of the cause of death is required; and
- if the remains are of Native American origin;
 - the descendants from the deceased Native Americans have made a recommendation to the land owner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98; or
 - the NAHC was unable to identify a descendant, or the descendant failed to make a recommendation within 24 hours after being notified by the NAHC.

VI. ENERGY

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

Environmental Setting

California Energy Sources

California's electricity needs are satisfied by a variety of entities, including investor-owned utilities, publicly owned utilities, electric service providers and community choice aggregators. In 2024, the California power mix totaled 278,338 gigawatt hours (GWh), down 1 percent from 2023. Clean energy resources accounted for 62 percent of California's power mix, a 4 percent increase from 58 percent in 2023. In-State generation was 216,181 GWh in 2024, virtually unchanged from the 2023 value of 216,047 GWh. Imported energy decreased to 62,157 GWh, down 5 percent (3,361 GWh) from 2023 (CEC 2026a). Table 5, *California Electricity Sources 2020*, provides a summary of California's electricity sources as of 2020.

Table 1
CALIFORNIA ELECTRICITY SOURCES 2020

Fuel Type	Percent of California Power
Coal	2.21
Large Hydro	11.06
Natural Gas	34.01
Nuclear	9.92
Oil	0.01
Other (Petroleum Coke/Waste Heat)	0.08
Total Non-GHG and Renewable Resources	62.23
Unspecified	1.46

Source: CEC 2026a

Natural gas provides the largest portion of the total in-State capacity and electricity generation in California, with nearly 45 percent of the natural gas burned in California used for electricity generation in a typical year. Much of the remainder is consumed in the residential, industrial, and commercial sectors for uses such as cooking, space heating, and as an alternative transportation fuel. In 2012, total natural gas demand in California for industrial, residential, commercial, and electric power generation was 2,313 billion cubic feet per year (bcf/year), up from 2,196 bcf/year in 2010 (CEC 2026b).

Transportation accounts for a major portion of California's energy budget. Automobiles and trucks consume gasoline and diesel fuel, which are nonrenewable energy products derived from crude oil. Gasoline is the most used transportation fuel in California, with 97 percent of all gasoline being consumed by light-duty cars, pickup trucks, and sport utility vehicles (SUVs). In 2024, 13.4 billion gallons of gasoline were sold in California (CEC 2026c). Diesel fuel is the second most consumed fuel in California, used by heavy-duty trucks, delivery vehicles, buses, trains, ships, boats, and farm and construction equipment. In 2024, 3.5 billion gallons of diesel were sold in California (CEC 2026d).

UC Merced Energy Profile

As detailed in the UC Merced Equitable Decarbonization Master Plan, the current electrical supply of UC Merced is supplied by PG&E. The campus currently has exceeded an existing 6-MW allocated backup demand limit, specifically in summer months when it oftentimes is reaching close to 7 MW. Two PG&E 12.47-kilovolt (kV) electrical service feeders, El Capitan and Wilson, each with 8.4 MW capacity, supply power to the existing campus. In 2018, the peak demand reached 5.38 MW. However, as of Summer 2022, the campus hit peak demand of 7.22 MW largely due to several buildings online (UC Merced 2024).

The UC Merced campus uses three on-site backup diesel generators with a combined capacity of 3 MW to supply power to critical buildings during a grid power outage. This supports a 2-MW critical load; one of the generators is maintained as a spare for added redundancy. In an outage condition, the backup generators provide power to critical circuits at the critical facilities (UC Merced 2024).

UC Merced adopted the use of solar PV plants early as part of its plan for campus development. The campus currently has three existing solar PV systems, one of which is the 1-MW ground-mounted, single-axis tracking system on the proposed project site. In addition, another 5.1 MW of solar (11,350 panels) with a 500-kilowatt (kW) energy storage system was added through a power purchase agreement (PPA) in the North Bowl Parking Lot and doubles as a carport. UC Merced also generates power through a 198.8-kW roof-top mounted solar plant comprising of 608 panels on the Half Dome building. The system includes a 483-kW energy storage system on-site. As of June 2019, the three plants generated 900,000 kilowatt-hours (kWh), which is equivalent to around 124 homes' electricity use for one year. The average monthly production from these PV plants is estimated as 628,471 kWh (UC Merced 2024).

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

Impacts related to energy were analyzed in Section 4.11, Energy, of the 2020 LRDP SEIR. The 2020 LRDP SEIR determined that construction activities under the 2020 LRDP would not involve the wasteful, inefficient, and unnecessary use of energy, and the impact would be less than significant. Additionally, during operation, development under the 2020 LRDP would be required to comply with the California Code of Regulations (CCR) Title 24, California Building Standards Code (CBSC), and the UC Sustainable Practices Policy; as such, electricity and natural gas use on the campus would not be inefficient, wasteful, or unnecessary, and the impact was determined to be less than significant. For these reasons, the 2020 LRDP SEIR concluded that implementation of the 2020 LRDP would not conflict with or obstruct a State or local plan, and the impact would be less than significant.

Discussion of Impacts

- a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Less Than Significant Impact.

Construction

The proposed project would include the demolition of the existing 1-MW ground-mounted solar array facility and construction of an up to 6-MW solar facility and BESS consisting of a dual-axis tracking system. During demolition and construction, the project would consume energy primarily in the form of petroleum-based fuels used to operate off-road construction vehicles and equipment on the project site, construction worker vehicles traveling to and from construction sites, as well as delivery truck trips; and to operate generators to provide temporary power for lighting and equipment. While construction activities would consume petroleum-based fuels, consumption of such resources would be temporary and would cease upon the completion of construction. Project construction would be required to comply with CARB's adopted Airborne Toxic Control Measure (ATCM) to limit heavy-duty diesel motor vehicle idling in order to reduce public exposure to diesel particulate matter and other toxic air contaminants. This measure prohibits diesel-fueled commercial vehicles greater than 10,000 pounds from idling for more than five minutes at any given time and thereby helps avoid wasteful use of energy. In addition, construction equipment rated by the USEPA as meeting Tier 4 (model year 2008 or newer) emission limits for engines between 50 and 750 horsepower would be used by the construction contractor, which would be more efficient than assumptions in the 2020 LRDP SEIR regarding energy consumption during construction. For these reasons, project construction would not result in the wasteful, inefficient, or unnecessary consumption of energy resources, and the impact would be less than significant.

Operation

Once operational, the project would passively generate power during daylight hours seven days per week, 365 days per year. The project would generate up to 6-MW of AC electricity under peak solar conditions. The project would also include a BESS with a minimum storage capacity of 3 MWh, which would store electrical energy generated by the proposed solar PV facility for later use. However, energy would be consumed during operation in the form of gasoline and diesel for regular maintenance and repair activities, including worker vehicle trips to and from the site, as well as for periodic cleaning of the PV modules. However, energy consumption during operation is anticipated to be minimal, as maintenance would only require up to two workers to be on-site for a maximum of 24 days per year. In addition, the PV modules would be cleaned with water once per year over a two-week period to clean accumulated dust and debris to maintain efficiency, which would require up to 10 workers to be on-site.

The amount of energy consumed during periodic maintenance, repairs, and cleaning during project operation would be inconsequential compared to the amount of energy generated by the project. As such, operation of the project would not result in the wasteful, inefficient, or unnecessary consumption of energy resources, and the impact would be less than significant.

Impact Summary

Project construction and operation would not result in the wasteful, inefficient, or unnecessary consumption of energy resources, and the impact would be less than significant.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Less Than Significant Impact. As discussed in the response to question a) above, implementation of the proposed project would not result in the wasteful, inefficient, or unnecessary consumption of energy resources. The proposed project would demolish the existing 1-MW solar PV system on-site and replace it with a solar PV facility that would generate up to 6-MW of AC electricity under peak solar conditions. The project would also include a BESS with a minimum storage capacity of 3 MWh, which would store electrical energy generated by the proposed solar PV facility for later use to support efficient, active management of renewable energy on the UC Merced campus. The 2024 UC Merced Equitable Decarbonization Master Plan determined that the existing 1-MW solar array on the project site, which began operations in 2009, is currently operating at less than 80 percent performance due to expected panel degradation (UC Merced 2024).

The 2020 LRDP SEIR concluded that, in compliance with the UC Sustainable Practices Policy, 100 percent of the power that will be needed by the campus at buildout of the 2020 LRDP will be obtained from a number of renewable and alternative technologies, including wind turbines, fuel cells, and PV systems. As such, the proposed project would further the goals of the UC Sustainable Practices Policy, which establishes goals for green building, clean energy, transportation, climate protection, facilities operations, zero waste, procurement, food service, and water systems. Operation of the project would support the UC Sustainable Practices Policy requirements regarding energy efficiency and UC Merced's goals to build all-electric facilities in support of campus-wide decarbonization. The proposed project would also comply with other UC Merced requirements related to energy reduction as outlined in the UC Merced CAP (UC Merced 2018). Therefore, the proposed project would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency, and the impact would be less than significant.

Mitigation Measures

None of the mitigation measures identified in the 2009 LRDP EIS/EIR related to energy would be applicable to the proposed project, and no new project-specific mitigation measures would be required.

VII. GEOLOGY AND SOILS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii. Strong seismic ground shaking?	☐	☐	☒	☐
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv. Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

Environmental Setting

Regional Geology

The project site is located in the San Joaquin Valley in the Great Valley geomorphic province. The Great Valley of California, also called the Central Valley of California, is a nearly flat alluvial plain extending from the Tehachapi Mountains in the south to the Klamath Mountains in the north and from the Sierra Nevada on the east to the Coast Ranges on the west. Geologically, the Great Valley geomorphic province is a large elongate northwest-trending asymmetric structural trough that has been filled with a very

thick sequence of sediments ranging in age from Jurassic to Recent. This asymmetric geosyncline has a long stable eastern shelf supported by the subsurface continuation of the granitic Sierran slope and a short western flank expressed by the upturned edges of the basin sediments (UC Merced 2008).

The UC Merced campus consists of low to high terraces, with some areas in alluvial fans and floodplains. The topography of the UC Merced campus consists of gently rolling flatland that rarely reaches 10 percent slopes. The major geologic formations in Merced County are the Basement Complex, Lone Formation, Valley Springs Formation, and Mehrten Formation. The Basement Complex consists of igneous and metamorphic rock. The Lone Formation consists of sandstone and conglomerate, and the Valley Springs Formation is mainly rhyolitic sandstone, siltstone, and claystone. The Mehrten Formation consists of sands, clays, conglomerate, sandstone, siltstone, and claystone. Soils within the UC Merced campus are generally alluvial, forming a thin layer over bedrock units beneath. The soils generally consist of poorly sorted gravel, sand, silt, and clay. These soil types are generally gravelly and acidic, and have low fertility. The soils have a moderate shrink-swell potential, with a granular, clayey, and relatively consolidated and cemented nature (UC Merced 2008).

Seismicity and Hazards

The Alquist-Priolo Earthquake Fault Zoning Act (1972) and the Seismic Hazards Mapping Act (1990) directs the State Geologist to delineate regulatory “zones of required investigation” to assist lead agencies in fulfilling their responsibilities for protecting the public safety from the effects of earthquake-triggered ground failure (DOC 2025b). According to the CGS’s Earthquake Zones of Required Investigation (EQ Zapp), the nearest active fault to the project site is the Ortigalita fault, located approximately 45 miles southwest of the project site. The Ortigalita Fault has not been active within historic times (1,800 years ago to present); however, surface rupture had occurred within the Holocene period, which is 11,000 B.P. (UC Merced 2008; DOC 2025b).

CGS’s EQ Zapp also maps liquefaction and landslide hazard zones. The proposed project site is not located within or near a mapped liquefaction or landslide hazard zone (DOC 2025b).

Soils

A total of four soil map units are mapped within the project site including: Corning gravelly loam, 0 to 8 percent slopes; Corning gravelly sandy loam, 0 to 8 percent slopes; Montpelier coarse sandy loam, 0 to 3 percent slopes; and Redding gravelly loam, 0 to 15 percent slopes, dry (USDA 2025). The general characteristics and properties associated with these soil types are described below:

- **Corning gravelly loam, 0 to 8 percent slopes** occurs on stream terraces between 80 to 1,000 feet elevation and consists of gravelly alluvium derived from igneous, metamorphic and sedimentary rock. A typical soil profile is gravelly loam from 0 to 15 inches, cobbly clay from 15 to 30 inches and stratified gravelly sandy loam to gravelly clay loam from 30 to 60 inches. This soil unit is a well-drained soil with no frequency of ponding or flooding. The depth to water table is more than 80 inches and a restrictive layer is located at greater than 80 inches. Minor components of this soil unit are considered hydric. This soil has a linear extensibility percentage (LEP) of 3.0 percent (USDA 2025).
- **Corning gravelly sandy loam, 0 to 8 percent slopes** occurs on stream terraces between 80 to 1,000 feet elevation and consists of gravelly alluvium derived from igneous, metamorphic and sedimentary rock. A typical soil profile is gravelly sandy loam from 0 to 15 inches, cobbly clay

from 15 to 30 inches and stratified gravelly sandy loam to gravelly clay loam from 30 to 60 inches. This soil unit is a well-drained soil with no frequency of ponding or flooding. The depth to water table is more than 80 inches and a restrictive layer is located at greater than 80 inches. Minor components of this soil unit are considered hydric. This soil has an LEP of 3.0 percent (USDA 2025).

- **Montpellier coarse sandy loam, 0 to 3 percent slopes** occurs on fan remnants between 110 to 520 feet elevation and consists of alluvium derived from granite rock. A typical soil profile is coarse sandy loam from 0 to 21, sandy clay loam from 21 to 40 and coarse sandy loam from 40 to 60 inches. This soil unit is a well-drained soil with no frequency of ponding or flooding. The depth to water table is more than 80 inches and a restrictive layer is located at greater than 80 inches. This soil unit is not considered hydric. This soil has an LEP of 1.9 percent (USDA 2025).
- **Redding gravelly loam, 0 to 8 percent slopes, dry** occurs on fan remnants between 90 to 750 feet elevation. This soil unit consists of a complex layer of igneous, metamorphic and sedimentary rock over clayey and cemented layers. A typical soil profile is gravelly loam from 0 to 17 inches, clay from 17 to 22 inches, and cemented gravelly material from 22 to 60 inches. This soil unit is a moderately well-drained soil with no frequency of ponding or flooding. The depth to water table ranges from 5 to 39 inches and a duripan restrictive layer is located about 20 to 39 inches below the mineral surface. Minor components of this soil unit are considered hydric. This soil has an LEP of 1.6 percent (USDA 2025).

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots (USDA 2008).

Paleontological Resources

Since paleontological resources most commonly are buried in the substrate, surface examination often cannot reveal whether the paleontological resources are present at a specific project location. As discussed in the 2009 LRDP EIS/EIR, the San Joaquin Valley region has been subjected to the combined influences of sporadic subsidence of the valley floor, uplift in the area of the Sierra Nevada Range and worldwide sea level changes (UC Merced 2008).

No known paleontological resources occur within the project site or within its vicinity. Furthermore, the majority of the UC Merced campus areas are overlain by vegetation and visual detection of fossils would be possible only in those areas where erosion has removed the grassland vegetation cover. A limited field survey of the UC Merced campus area was conducted by a qualified paleontologist in 2001 to support the preparation of the UC Merced 2002 LRDP EIR. That survey found no paleontological deposits in the area surveyed (UC Merced 2008). The closest paleontological resource is located approximately 3 miles from the UC Merced campus. However, one of the geologic formations underlying the UC Merced campus, North Merced Gravels, is considered moderate and two, Mehrten Formation and Riverbank Formation, are considered highly sensitive for paleontological resources.

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

Impacts related to geology and soils were analyzed in Section 4.6, Geology and Soils, of the 2009 LRDP EIS/EIR. The 2020 LRDP SEIR determined that impacts to geology and soils were adequately addressed in the 2009 LRDP EIS/EIR and, therefore, did not require subsequent evaluation.

The 2009 LRDP EIS/EIR concluded that, as the UC Merced campus is not located near an active fault, development under the 2009 LRDP would not be subjected to significant seismic hazards associated with active faults. Therefore, the 2009 LRDP EIS/EIR concluded that the campus would not expose people or structures to risk of injury or structural damage from fault rupture, and the impact would be less than significant. However, some portions of the campus may have the potential to be subject to liquefaction, slope stability issues, or other structural issues that could be aggravated during seismic events, and the development on these areas could expose structures or people to risk of damage or injury. However, with implementation of 2009 LRDP MM GEO-2, the impact was determined to be reduced to less than significant.

The majority of the UC Merced campus contains gently rolling flatland and lacks steep slopes. Further, given the granular, clayey, and relatively consolidated and cemented nature of the soils, the near-surface hardpan, and the gentle slopes throughout the campus, the 2009 LRDP EIS/EIR determined that the majority of the campus is not prone to landslides, and the impact was concluded to be less than significant with implementation of MM GEO-2. The 2009 LRDP EIS/EIR concluded that, as all future construction projects on the campus that would disturb one acre or more would be required to comply with the National Pollutant Discharge Elimination System (NPDES) requirements to control discharges from construction sites and would implement Stormwater Pollution Prevention Plans (SWPPP), the potential for significant soil erosion or sedimentation due to construction on the campus was determined to be less than significant.

The UC Merced campus contains soils that have a moderate to high shrink-swell potential (i.e. expansiveness). The 2009 LRDP EIS/EIR determined that if structures are constructed in areas with expansive and/or weak soils, structural damage could occur, and expansive soils could cause a risk for post-construction heave and cracking of concrete slabs, as well as lightly loaded foundations and pavements. The 2009 LRDP EIS/EIR concluded that implementation of MM GEO-2 would reduce the impact to less than significant. Lastly, the 2009 LRDP EIS/EIR determined that since the campus would not include the use of septic tanks or alternative wastewater disposal systems that would require percolation of treated effluent, no impact would occur related to inadequate soils for wastewater.

The 2009 LRDP EIS/EIR determined that, while the UC Merced campus does not contain known paleontological resources within its boundaries, three of the geologic formations underlying the campus are considered moderate to highly sensitive for paleontological resources and could be impacted by construction activities for the LRDP. The impact was determined to be less than significant with implementation of 2009 LRDP MM CUL-4a and 4b.

Discussion of Impacts

- a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:
 - i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other

substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?

- ii. Expose people or structures to increased risk from strong seismic ground shaking?

Less Than Significant Impact. According to the CGS's EQ Zapp, the project site is not within an Alquist-Priolo Earthquake Fault Zone and there are no active or early Quaternary faults within the boundaries of the project site. The nearest active fault to the project site is the Ortigalita fault zone, located approximately 45 miles southwest of the project site (DOC 2025b). The project site is located within Uniform Building Code (UBC) Seismic Hazard Zone 3 and is located in a region of California characterized by locally low historical seismic activity. The proposed project would be constructed in compliance with the current California Building Code (CBC) standards and the UC Seismic Policy, which includes structural design requirements and criteria to ensure the safety of people or structures. The UC Seismic Policy requires new UC facilities to comply with the current seismic provisions of the CCR Title 24 or local seismic requirements, whichever requirements are more stringent (UC Merced 2008). Therefore, the proposed project would not expose people or structures to increased risk from rupture of a known earthquake fault or strong seismic ground shaking, and the impact would be a less than significant for question a.i) and a.ii).

- iii. Seismic-related ground failure, including liquefaction?

- iv. Landslides?

Less Than Significant Impact. As discussed in the response to question a.i) and a.ii), the proposed project is located in a region of the State that is characterized by a low level of seismic activity and, as such, has low ground-shaking hazard. However, the project site, similar to the majority of the UC Merced campus, contains gently rolling flatland and lacks steep slopes; as such, the project site would not be at a significant risk of landslides or other slope failure. Further, the proposed project is not located within a mapped liquefaction or landslide zone (DOC 2025b). Therefore, the project would not be subject to significant risks related to liquefaction and landslides. In addition, the project would be constructed in compliance with the current CBC standards and the UC Seismic Policy, which includes structural design requirements and criteria to ensure the safety of people or structures. The UC Seismic Policy requires new UC facilities to comply with the current seismic provisions of the CCR Title 24 or local seismic requirements, whichever requirements are more stringent (UC Merced 2008). Therefore, the impact would be less than significant for questions a.iii) and a.iv).

- b) Result in substantial soil erosion or the loss of topsoil?

Less Than Significant Impact. Construction of the proposed project would include grading, excavation, and removal of vegetation cover, which could temporarily increase erosion and sedimentation. Construction activities could also result in soil compaction and wind erosion effects that could adversely affect soils and reduce the revegetation potential at the construction sites and staging areas. As the proposed project would disturb greater than one acre in size, the proposed project would be subject to NPDES Construction General Permit, which would require the preparation and implementation of a SWPPP during construction. The project would be required to obtain coverage under the Construction General Permit Order 2009-0009-DWQ adopted on September 2, 2009, as amended by 2010-0014-DWQ and 2012-006-DWQ. The SWPPP must include details of how the sediment and erosion control BMPs would be implemented. Typical erosion-prevention measures such as silt fences, staked straw

bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover would be used to minimize erosion impacts. Therefore, through compliance with existing NPDES regulations the proposed project would not result in substantial soil erosion or loss of topsoil, and the impact would be less than significant.

- c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?
- d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

Less Than Significant Impact. As discussed in the response to question a.i) and a.ii), the proposed project is located in a region of the State that is characterized by a low level of seismic activity and, as such, has low ground-shaking hazard. The project site, similar to the majority of the UC Merced campus, contains gently rolling flatland and lacks steep slopes, and therefore would not be at a significant risk of landslides or other slope failure. Based on a desktop review of the mapped soil units on the project site, the site consists of soil units with LEP values of 1.6, 1.9, and 3.0 percent, which indicates the site has a low shrink-swell (USDA 2025; USDA 2008). Lastly, the project includes the construction of a 6-MW solar PV facility, and would not include the construction of new habitable structures that would create potential risks to life. Therefore, the impact would be less than significant for questions c) and d).

- e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

No Impact. The proposed project would not generate wastewater and would not require the construction of a septic tank or alternative wastewater disposal system. Therefore, there would be no impact.

- f) Have the potential to disturb or destroy paleontological resources?

Less Than Significant with Mitigation Incorporated. Construction of the proposed project would include ground disturbing activities which, if occurring on areas considered moderate to highly sensitive for paleontological resources, could have a potentially significant impact. However, as the northern half of the project site was rough graded during construction of the existing solar array, it is unlikely that the previously disturbed portions of the site would contain paleontological resources. According to Figure 4.6-1, Geology of the Proposed Action Site, of the 2009 LRDP EIS/EIR, the proposed project site would be located on geologic unit T2 – Turlock Lake Formation, and rg – Riverbank Formation, Unit 3. The Riverbank Formation is considered to have a high potential to contain significant paleontological resources. However, 2009 LRDP MM CUL-4a would be applicable to the proposed project and would be implemented, which would require cultural personnel to be informed of the potential for encountering significant paleontological resources and requiring the presence of a qualified paleontologist during construction activities to ensure that paleontological resources are not destroyed. Therefore, with implementation of 2009 LRDP MM CUL-4a, the impact would be reduced to less than significant.

Mitigation Measures

No new project-specific mitigation measures would be required related to geology and soils. The following mitigation measures from the 2009 LRDP EIS/EIR would be applicable to the proposed project:

2009 LRDP MM CUL-4a: Prior to project construction, construction personnel will be informed of the potential for encountering significant paleontological resources. All construction personnel will be informed of the need to stop work in the vicinity of a potential discovery until a qualified paleontologist has been provided the opportunity to assess the significance of the find and implement appropriate measures to protect or scientifically remove the find. Construction personnel will also be informed of the requirements that unauthorized collection resources are prohibited.

VIII. GREENHOUSE GAS EMISSIONS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

This section is based on the Air Quality and Greenhouse Gas Emissions Technical Report prepared by HELIX in June 2026 for the proposed project (HELIX 2026a). The Air Quality and Greenhouse Gas Emissions Technical Report is included in Appendix B to this IS/MND.

Environmental Setting

Climate Change Overview

Global climate change refers to changes in average climatic conditions on Earth including temperature, wind patterns, precipitation, and storms. Global temperatures are moderated by atmospheric gases. These gases are commonly referred to as greenhouse gases (GHGs) because they function like a greenhouse by letting sunlight in but preventing heat from escaping, thus warming the Earth's atmosphere.

GHGs are emitted by natural processes and human (anthropogenic) activities. Anthropogenic GHG emissions are primarily associated with: (1) the burning of fossil fuels during motorized transport, electricity generation, natural gas consumption, industrial activity, manufacturing, and other activities; (2) deforestation; (3) agricultural activity; and (4) solid waste decomposition.

The temperature record shows a decades-long trend of warming, with Earth's average surface temperature in 2024 confirmed as the warmest on record. Per scientists at the National Aeronautics and Space Administration's [NASA's] Goddard Institute for Space Studies, global temperatures in 2025 were around 2.1 degrees Fahrenheit (°F) higher than the 1951-1980 average and 0.2 °F cooler than 2024 (NASA 2026).

The GHGs defined under California's Assembly Bill (AB) 32, described below, include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. Estimates of GHG emissions are commonly presented in carbon dioxide equivalents (CO₂e), which weigh each gas by its global warming potential (GWP). Expressing GHG emissions in CO₂e takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO₂ were being emitted. GHG emissions quantities in this analysis are presented in metric tons (MT) of CO₂e. For consistency with United Nations Standards, modeling, and reporting of GHGs in California and

the U.S. use the GWPs defined in the Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report (IPCC 2007): CO₂ – 1; CH₄ – 25; N₂O – 298.

Types of Greenhouse Gases

Carbon Dioxide. CO₂ is the most important and common anthropogenic GHG. CO₂ is an odorless, colorless GHG. Natural sources include the decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungi; evaporation from oceans; and volcanic outgassing. Anthropogenic sources of CO₂ include burning fuels, such as coal, oil, natural gas, and wood. Data from ice cores indicate that CO₂ concentrations remained steady prior to the current period for approximately 10,000 years. The atmospheric CO₂ concentration in 2010 was 390 ppm, 39 percent above concentration at the start of the Industrial Revolution (about 280 ppm in 1750). As of December 2024, the CO₂ concentration exceeded 425.40 ppm, a 52 percent increase since 1750 (National Oceanic and Atmospheric Administration [NOAA] 2025).

Methane. CH₄ is the main component of natural gas used in homes. A natural source of methane is from the decay of organic matter. Geological deposits known as natural gas fields contain methane, which is extracted for fuel. Other sources are from decay of organic material in landfills, fermentation of manure, and cattle digestion.

Nitrous Oxide. N₂O is produced by both natural and human-related sources. N₂O is emitted during agricultural and industrial activities, as well as during the combustion of fossil fuels and solid waste. Primary human-related sources of N₂O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic (fatty) acid production, and nitric acid production.

Hydrofluorocarbons. Fluorocarbons are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. Chlorofluorocarbons (CFCs) are nontoxic, nonflammable, insoluble, and chemically nonreactive in the troposphere (the level of air at Earth's surface). CFCs were first synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone; therefore, their production was stopped as required by the 1989 Montreal Protocol.

Sulfur Hexafluoride. SF₆ is an inorganic, odorless, colorless, nontoxic, nonflammable gas. SF₆ is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semi-conductor manufacturing, and as a tracer gas for leak detection.

GHGs have long atmospheric lifetimes that range from one year to several thousand years. Long atmospheric lifetimes allow for GHG emissions to disperse around the globe. Because GHG emissions vary widely in the power of their climatic effects, climate scientists have established a unit called global warming potential (GWP). The GWP of gas is a measure of both potency and lifespan in the atmosphere as compared to CO₂. For example, a gas with a GWP of 10 is 10 times more potent than CO₂ over 100 years. CO₂e is a quantity that enables all GHG emissions to be considered as a group despite their varying GWP. The GWP of each GHG is multiplied by the prevalence of that gas to produce CO₂e.

Historically, GHG emission inventories have been calculated using the GWPs from the IPCC's Second Assessment Report (AR2). In 2007, IPCC updated the GWP values based on the latest science at the time in its Fourth Assessment Report (AR4). In 2013, IPCC again updated the GWP values based on the latest science at the time in its Fifth Assessment Report (AR5) (IPCC 2013). In 2021, IPCC again updated the

GWP values based on the latest science in the Sixth Assessment Report (IPCC 2021). However, the United Nations Framework Convention on Climate Change (UNFCCC) reporting guidelines for national inventories require the use of GWP values from the AR5. To comply with international reporting standards under the UNFCCC, official emission estimates for California and the U.S. are reported using AR5 GWP values, as statewide and national GHG inventories have not yet updated their GWP values to the AR6 values. GHG emissions in this analysis are reported using the AR5 GWP values.

By applying the GWP ratios, CO₂e emissions can be tabulated in metric tons (MT) per year. Typically, the GWP ratio corresponding to the warming potential of CO₂ over a 100-year period is used as a baseline. The atmospheric lifetime and GWP of selected GHGs are summarized in Table 6, *Global Warming Potentials and Atmospheric Lifetimes*.

Table 6
GLOBAL WARMING POTENTIALS AND ATMOSPHERIC LIFETIMES

Greenhouse Gas	Atmospheric Lifetime (years)	IPCC SAR GWP	IPCC AR4 GWP	IPCC AR5 GWP	IPCC AR6 GWP
Carbon Dioxide (CO ₂)	50-200	1	1	1	1
Methane (CH ₄)	12	21	25	28	27
Nitrous Oxide (N ₂ O)	114	310	298	265	273
HFC-134a	14	1,300	1,430	1,300	1,530
PFC: Tetrafluoromethane (CF ₄)	50,000	6,500	7,390	6,630	7,380
PFC: Hexafluoroethane (C ₂ F ₆)	10,000	9,200	12,200	11,100	12,400
Sulfur Hexafluoride (SF ₆)	3,200	23,900	22,800	23,500	24,300

Source: IPCC 2021

IPCC = Intergovernmental Panel on Climate Change; GWP = global warming potential; HFC = hydrofluorocarbon;

PFC = perfluorocarbon

Worldwide GHG Inventory

In 2022, total GHG emissions worldwide were estimated at 50,115 million metric tons (MMT) of CO₂e emissions (Climate Watch 2026). By country, the U.S. contributed the second largest portion (11.2 percent) of global GHG emissions, behind the largest contributor, China (with 25.4 percent of global emissions). The total U.S. GHG emissions were 5,600 MMT CO₂e in 2020 (Climate Watch 2026). On a national level, approximately 90.4 percent of GHG emissions were associated with energy, including transportation energy (Climate Watch 2026).

California GHG Inventory

CARB performed Statewide inventories for the years 2000-2022, as shown in Table 7, *California Greenhouse Gas Emissions by Sector*. The inventory is divided into five broad sectors of economic activity: agriculture, commercial and residential, electricity generation, industrial, and transportation. Emissions are quantified in MMT CO₂e.

Table 7
CALIFORNIA GREENHOUSE GAS EMISSIONS BY SECTOR

Sector	Emissions (MMT CO ₂ e)			
	1990	2000	2020	2022
Agriculture and Forestry	18.9 (4%)	30.8 (7%)	31.4 (9%)	29.8 (8%)
Commercial and Residential	44.1 (10%)	44.3 (10%)	39.0 (11%)	39.5 (11%)
Electricity Generation	110.5 (26%)	104.7 (22%)	59.5 (16%)	59.8 (16%)
High Global Warming Potential	-	6.6 (1%)	21.3 (6%)	21.3 (6%)
Industrial	105.3 (24%)	92.8 (20%)	73.6 (20%)	72.7 (20%)
Recycling and Waste	-	7.0 (2%)	8.5 (2%)	8.2 (2%)
Transportation	150.6 (35%)	176.7 (38%)	135.2 (37%)	139.9 (38%)
Unspecified Remaining	1.3 (<1%)	0.0 (0%)	0.0 (0%)	0.0 (0%)
Total	430.7	462.9	368.5	371.1

Source: CARB 2007 and CARB 2026c

MMT = million metric tons; CO₂e = carbon dioxide equivalent

As shown in Table 6, Statewide GHG source emissions totaled 430.7 MMT CO₂e in 1990, 462.9 MMT CO₂e in 2000, 368.5 MMT CO₂e in 2020, and 371.1 MMT CO₂e in 2022. Transportation-related emissions consistently contribute the most GHG emissions, followed by electricity generation and industrial emissions (CARB 2007 and CARB 2026c).

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

Impacts to GHG emissions were not discussed in the 2009 LRDP EIS/EIR, but were analyzed in Section 4.3, Greenhouse Gas Emissions, of the 2020 LRDP SEIR.

The 2020 LRDP SEIR concluded that approximately 6,118 MT CO₂e of GHG emissions would be emitted during the approximately 10-year project construction period, which is about 612 MT CO₂e/year. Neither UC Merced nor any of the air districts, including SJVAPCD, has set forth quantitative thresholds for the evaluation of construction-phase GHG emissions. Construction GHG estimates are presented for informational purposes only. The 2020 LRDP SEIR also concluded that operational emissions would exceed the targeted emission level of 3,300 MT CO₂e/year, which would result in the 2020 LRDP having a significant and unavoidable impact on GHG emissions. However, with implementation of 2020 LRDP MMs GHG-1a through GHG-1c, the impact would be less than significant. Additionally, with the implementation of 2020 LRDP MM GHG-2, which implements 2020 LRDP MMs GHG-1a through GHG-1c, campus development under the 2020 LRDP would not conflict with the State laws and regulations related to GHG emissions, the UC Sustainable Practices Policy, or the UC Merced plans adopted to reduce GHG emissions. The impact would be less than significant with implementation of 2020 LRDP MM GHG-2.

Discussion of Impacts

- a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less Than Significant Impact. Neither UC Merced nor the SJVAPCD have adopted quantitative thresholds for the evaluation of construction-phase GHG emissions. Construction GHG estimates are disclosed for informational purposes. Project construction GHG emissions were estimated using

CalEEMod. The modeling shows that short-term construction of the project would result in a total of 998 MT of CO₂e during 2027.

Project operational GHG emissions were estimated using CalEEMod. The project's operational GHG emissions for the anticipated first full year of operation (2028) are shown in Table 8, *Annual Operational GHG Emissions*.

Table 8
ANNUAL OPERATIONAL GHG EMISSIONS

Emission Source	2029 Emissions (MT CO ₂ e per year)
Mobile	1.57
Area	0.00
Energy	0.00
Water	0.04
Waste	0.00
Refrigerants	0.00
Total	1.62

Source: CalEEMod (Appendix A of Appendix B)

GHG = greenhouse gas; MT = metric tons

CO₂e = carbon dioxide equivalent

The project would generate power from renewable sources, reducing the use of power from the state's electricity grid which is partially generated using fossil fuels. Therefore, the project would result in a net decrease in regional GHG emissions. The project's GHG reductions would gradually diminish over time as the State's clean energy procurement policies and net zero GHG emissions goal are implemented. Using the National Laboratory of the Rockies' PVWatts Calculator, a 6 MW PV facility using 2-axis tracking and located near Merced would generate 14,192 MWh of electricity per year (National Laboratory of the Rockies 2026). The PVWatts report is included as Appendix B of Appendix B. Using the CalEEMod default GHG emissions intensity factors for PG&E, in 2028 the project's electricity generation would reduce statewide energy source GHG emissions by 1,326 MT CO₂e per year, resulting in a net project operation GHG reduction of 1,324.4 MT CO₂e per year. The project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. Therefore, the impact would be less than significant.

- b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less Than Significant Impact. There are numerous State plans, policies, and regulations adopted for the purpose of reducing GHG emissions. Statewide plans and regulations such as GHG emissions standards for vehicles (AB 1493), the Low Carbon Fuel Standard (LCFS) are being implemented at the Statewide level; as such, compliance at the project level is not addressed. Therefore, the project would not conflict with those plans and regulations.

As discussed in the response to question a) above, operation of the project would result in a net reduction in GHG emissions. The project would support State policies for the procurement of renewable energy for the state's electricity grid, and the project would support the State goal of net zero GHG emission by 2045. The 2018 CAP notes that one approach to mitigating its climate effects is to generate

from on-site renewable sources as much energy as is consumed annually (net zero energy). The UC Sustainable Practices Policy notes that 100 percent of the power that will be needed by the campus at buildout of the 2020 LRDP will be obtained from a number of renewable and alternative technologies, including wind turbines, fuel cells, and PV systems. As such, the proposed project would comply with the 2018 CAP and further the goals of the UC Sustainable Practices Policy, which establishes goals for green building, clean energy, transportation, climate protection, facilities operations, zero waste, procurement, food service, and water systems. Operation of the project would support the UC Sustainable Practices Policy requirements regarding energy efficiency and UC Merced's goals to build all-electric facilities in support of campus-wide decarbonization. Therefore, the project would not conflict with the CARB's 2022 Scoping plan or other State GHG emissions reduction plans, policies and regulations. The project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs, and the impact would be less than significant.

Mitigation Measures

None of the mitigation measures identified in the 2020 LRDP SEIR related to GHG emissions would be applicable to the proposed project, and no new project-specific mitigation measures would be required.

IX. HAZARDS AND HAZARDOUS MATERIALS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☒	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☒	☐	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☒	☐
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☒	☐	☐

Environmental Setting

Hazardous Materials and Sites

The UC Merced campus includes research and instructional laboratories, which generate small quantities of biohazardous and chemical waste per year. The campus also generates small quantities of Universal Waste ("U-waste"), including batteries, fluorescent bulbs, and electronics. Campus hazardous waste is centrally stored for pick up by a licensed hazardous waste contractor. There are no known areas with soil or groundwater contamination on the campus site (UC Merced 2008).

The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies, and developers to comply with CEQA requirements in providing information about the

location of hazardous materials release sites. Section 65962.5(a)(1) of the Government Code requires the California Department of Toxic Substances Control (DTSC) to compile and submit to the Secretary for Environmental Protection a list of all sites listed pursuant to Section 25356 of the Health and Safety Code (HSC). According to the DTSC's EnviroStor Database, there are no hazardous waste sites on the project site. The nearest open hazardous materials site is located approximately 5.5 miles southwest of the project site (DTSC 2025).

The SWRCB maintains the GeoTracker Database, which was developed pursuant to AB 592 and SB 1189. GeoTracker is used by the State Board, regional boards, and local agencies to track and archive compliance data from authorized or unauthorized discharges of waste to land, or unauthorized releases of hazardous substances from underground storage tanks. There are no sites mapped by GeoTracker on the project site. The nearest open site is a Cleanup Program Site, located approximately 4.5 miles west of the project site (SWRCB 2025).

The USEPA maintains the National Priorities List (NPL), which is the list of sites of national priority among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the U.S. and its territories. The nearest NPL site is associated with the Castle Airforce Base, located approximately 8.4 miles west of the project site (USEPA 2026).

Adopted Emergency Response Plans

UC Merced has adopted an Emergency Operations Plan (EOP), which establishes policies, procedures, and an organizational structure for response in the event of a major campus emergency. In the event of an emergency on the campus, the UC Merced Police Department would implement evacuation procedures based on the severity, location, and nature of the emergency. In the event of an evacuation on campus, it is anticipated that evacuation routes would include Bellevue Road and North Lake Road. The UC Merced EOP utilizes the Standardized Emergency Management System (SEMS) in compliance with the National Incident Command System for managing response to multi-agency and multi-jurisdiction emergencies in California (UC Merced 2008).

Airport Hazards

The Merced County ALUCP contains individual plans for each of the five public-use airports in Merced County: Castle Airport, Gustine Municipal Airport, Los Banos Municipal Airport, Merced Regional Airport, and Turlock Municipal Airport. As adopted by the Merced County Airport Land Use Commission (ALUC), the basic function of the compatibility plans is to promote compatibility between each airport and the land uses which surround them to the extent that these areas have not already been devoted to incompatible uses (County 2012).

The UC Merced campus is located approximately seven miles to the northeast of the Merced Regional Airport and approximately six miles east of the Castle Airport. A private airstrip is located approximately 1.8 miles southeast of the campus; however, this airstrip does not support commercial flights and is used for a limited number of agricultural flights.

Fire Hazards

CAL FIRE prepared Fire Hazard Severity Zone (FHSZ) maps using a science-based and field-tested model that assigns a hazard score based on the factors that influence fire likelihood and fire behavior. Many factors are considered such as fire history, existing and potential fuel (natural vegetation), predicted

flame length, blowing embers, terrain, and typical fire weather for the area. According to CAL FIRE's FHSZ maps, the project site is located within a Local Responsibility Area (LRA) and is within a Moderate FHSZ. The project site is surrounded to the north, east, and west by land within LRA and classified as Moderate FHSZ and is surrounded to the south by land within LRA that has no FHSZ classification. A State Responsibility Area (SRA) classified as Moderate FHSZ is located adjacent to the northeast boundary of the campus within the Campus Natural Reserve of the Merced Vernal Pools and Grassland Reserve, northeast of the proposed project site (CAL FIRE 2025).

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

Impacts related to hazards and hazardous materials were analyzed in Section 4.7, Hazards and Hazardous Materials, of the 2009 LRDP EIS/EIR. The 2020 LRDP SEIR determined that impacts to hazards and hazardous materials were adequately addressed in the 2009 LRDP EIS/EIR and, therefore, did not require subsequent evaluation.

The 2009 LRDP EIS/EIR concluded that, through adherence with existing local, State, and federal regulations, buildout under the LRDP would not create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials. Similarly, as most uses proposed under the LRDP would not involve large quantities of hazardous materials, the 2009 LRDP EIS/EIR concluded that the LRDP would not result in hazards through reasonably foreseeable upset and accident conditions, and the impact would be less than significant. However, as there are no schools located within 0.25 mile of the UC Merced Campus, the 2009 LRDP EIS/EIR concluded that buildout under the LRDP would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school, and the impact was determined to be less than significant.

Based on a government records search, the 2009 LRDP EIS/EIR identified several sites and/or businesses on the project site that either currently or previously handled hazardous materials. These hazardous materials could be accidentally encountered during project construction, which could result in a potentially significant impact to the public or environment. Therefore, with implementation of MM HAZ-4, the 2009 LRDP EIS/EIR determined that the impact would be less than significant.

As the UC Merced campus is not located within an airport land use compatibility plan (ALUCP) and is not within two miles of a public or public use airport, the 2009 LRDP EIS/EIR concluded that no impact would occur related to this criterion. However, the campus is located within two miles of a private airstrip, and the operation could result in potential safety hazards for people residing or working within the LRDP project area. As UC Merced would be required to comply with applicable Federal Aviation Administration (FAA) and Caltrans Division of Aeronautics regulations and permits, the impact related to private airports was determined to be less than significant.

The 2009 LRDP EIS/EIR determined that development of individual projects under the LRDP would not impair the implementation of or physically interfere with an adopted emergency response or evacuation plan, as emergency response and evacuation plans would be established for all proposed buildings, which would be coordinated between campus buildings to ensure proper procedures in the case of a massive emergency or evacuation. In addition, the uses planned under the LRDP were determined to not impair or physically interfere with emergency response or evacuation plans, and the impact was concluded to be less than significant. Although there are high-fire-risk grazing pastures surrounding portions of the UC Merced campus, the 2009 LRDP EIS/EIR determined that with the implementation of

fire prevention measures contained in the Management Plan for Conservation Lands, the impact related to wildland fire would be less than significant.

Lastly, the 2009 LRDP EIS/EIR concluded that the implementation of the LRDP would not expose people to a significant public safety hazard associated with irrigation canals, as existing policies would require a combination of fencing and landscaping to limit access to the canals. Therefore, this impact was determined to be less than significant.

Discussion of Impacts

- a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?
- b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less Than Significant with Mitigation Incorporated.

Demolition

Demolition of the existing 10-acre solar array site would involve handling, transporting, and disposal of heavy metals commonly used in PV technology, such as lead and cadmium. Such materials are harmful to human health and the environment at high levels, and the accidental breakage of panels during removal or transport could release hazardous constituents into the environment. However, demolition activities would be subject to numerous federal solid and hazardous waste regulations for end-of-life solar panel management, including the Resource Conservation and Recovery Act (RCRA). Adherence to the RCRA would ensure that the PV panels are safely recycled and/or disposed of. In addition, as discussed below, project activities would be required to adhere to Titles 8 and 22 of the CCR, and Division 20 of the California HSC to minimize impacts during handling and transportation of potentially hazardous materials. Therefore, with adherence to existing regulations, the impact during demolition would be less than significant.

Construction

Construction of the proposed project would involve the use of hazardous materials, such as fuels and greases, to fuel and service construction equipment. Such substances may be temporarily stored on-site; however, the temporary storage of fuels on-site would be located in a locked container within a fenced and secure area. The use, storage, transport, and disposal of hazardous materials used in construction of the project would be required to adhere to existing local, State, and federal regulations, including Titles 8 and 22 of the CCR, and Division 20 of the California HSC. In addition, no extremely hazardous substances (i.e., those governed pursuant to Title 40, Part 355 of the CFR) would be produced, used, stored, transported, or disposed of as a result of project construction. As mandated by the Occupational Safety and Health Administration (OSHA), all hazardous materials stored on the project site would be accompanied by material safety data sheets (MSDS), which would inform on-site construction personnel as to the contents of the materials and in the event of accidental release and would provide the necessary remediation procedures.

In addition, the project would be required to implement a Hazardous Materials Business Plan (HMBP) in accordance with the requirements of the Merced County Division of Environmental Health (MCDEH) if

the project would handle, use, or store a hazardous material or mixture containing a hazardous material that has a quantity equal to or greater than 55 gallons of liquid, 500 pounds of a solid substance, 200 cubic feet of compressed gas, a hazardous compressed gas in any amount, or hazardous waste in any amount. UC Merced would be required to prepare and submit a HMBP to the MCDEH, which is the Certified Unified Program Agency (CUPA) for the County. The HMBP shall include a hazardous material inventory, emergency response procedures, training program information, and basic information on the location, type, quantity, and health risks of hazardous materials stored, used, or disposed of at the proposed project site, and procedures for handling and disposing of unanticipated hazardous materials encountered during construction. The HMBP shall include an inventory of the hazardous waste generated on-site and specify procedures for proper disposal. As required, hazardous waste would be transported by a licensed hauler and disposed of at a licensed facility. According to the HMBP reporting requirements, workers must be trained to respond to releases of hazardous materials in accordance with State and federal laws and regulations governing hazardous materials and hazardous waste. Any accidental release of small quantities of hazardous materials shall be promptly contained and abated in accordance with applicable regulatory requirements and reported to the MCDEH, which is responsible for implementation and enforcement of the HMBP. For these reasons, the impact for questions a) and b) would be less than significant during construction.

Operation

During operation, hazardous waste would include spent oil, hydraulic fluid, household batteries, and materials used in certain BESS battery technologies and PV panels. The proposed BESS would have a minimum storage capacity of 3 MWh, which would store electrical energy generated by the proposed solar PV facility for later use. It is anticipated that the proposed BESS would deploy lithium-ion, vanadium redox, iron flow, or zinc hybrid batteries. Following construction, the proposed solar modules and foundations would not be flammable and would not exacerbate fire risk; however, the proposed BESS could deploy lithium-ion, vanadium redox, iron flow, or zinc hybrid batteries. Vanadium redox, iron flow, and zinc hybrid batteries are non-flammable by design; however, lithium-ion batteries are highly flammable due to risk of thermal runaway (i.e. overheating of the battery, leading to failure, short circuiting, and ultimately fire). Thermal runaway can occur for several reasons including physical damage, aging, and exposure to external heat (FEMA 2025b). In addition, when burned, lithium-ion batteries release toxic chemicals into the air.

There are two dominant semiconducting materials used in PV technology: crystalline silicon (c-Si) which is the conventional material used in flat plate panels, and thin-film semiconductors such as amorphous silicon (a-Si) and Cadmium Telluride (CdTe). Silicon-based solar cells do not contain hazardous materials, although they may use lead-containing solders. CdTe is a semiconductor used in solar cells to convert solar energy into electricity. During the manufacturing process, the CdTe semiconductor layer is sealed between two sheets of glass. CdTe contained within PV modules is highly stable and, even if the modules become broken or damaged, would not mobilize from the glass and into the environment except under extreme laboratory conditions, which would not occur under foreseeable operational conditions. During operation, the PV panels, batteries, and inverters would not generate hazardous waste. Environmental risks of both crystalline silicon and thin film CdTe PV technologies have been evaluated by the International Energy Agency (IEA), using USEPA fate and transport methods for potential emissions to air, water, and soil from non-routine events such as fire and field breakage. Based on comparisons with USEPA health screening levels, crystalline silicon and thin film CdTe PV technologies do not present a health risk in the event of fire or breakage, with regards to their use of lead and cadmium compounds, respectively (IEA 2018; IEA 2019).

The potential for emissions of CdTe would be negligible during normal use of CdTe PV modules or under a foreseeable risk scenario such as accidental breakage or fire, as batteries do not result in emissions during their normal operations and accidental breakage is unlikely. Although the project would introduce batteries to the site, the use of these potentially hazardous substances would be subject to numerous federal, State, and local health and safety laws and regulations that minimize health risk to the public associated with hazardous materials, including preparation of an HMBP as discussed above. These regulations establish a comprehensive system for handling, using, and transporting hazardous materials in a manner that protects human health and the environment.

The BESS would be enclosed in a storage container and installed on a concrete pad. The BESS would include fire alarm monitoring for a fire suppression system, and each battery unit would be constantly monitored by a battery management system to ensure safe operations. The battery management system monitors individual cell temperature, voltage, current, charge and discharge parameters, and other metrics to ensure health and safety of the batteries. The system would be designed to address individual or multiple failures as a multi-level safety system and to respond with shutdown of affected cells or power connections and to activate a fire suppression system if necessary. At a minimum, these safety systems would include a mix of thermal, smoke, and gas detectors along with explosion prevention per National Fire Protection Association (NFPA) standards 68 or 69. The BESS would undergo extensive testing and would be certified to UL9540, which is a safety standard for energy storage systems.

The proposed project would be required to comply with all applicable MFD regulations and current Uniform Fire Code (UFC) regulations. In addition, the project would incorporate PS MM HAZ-1, which would require fire safety training for MFD personnel and on-site vegetation to be regularly managed to minimize fire risk, which would minimize accidental and reasonably foreseeable hazardous materials releases. Therefore, the impact during operation would be less than significant for questions a) and b).

Impact Summary

With adherence to existing local, State, and federal regulations, including preparation of an HMBP, and with implementation of PS MM HAZ-1, the routine transport, use, and disposal of hazardous materials would not create a significant hazard to the public or the environment during demolition, construction, and operation. In addition, implementation of the proposed project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Therefore, the impact would be less than significant with mitigation incorporated for questions a) and b).

- c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Less Than Significant with Mitigation Incorporated. The nearest K-12 school to the proposed project site is El Capitan High School, located approximately 2.9 miles to the northwest. However, the nearest educational buildings on the UC Merced campus are the Biomedical Science and Physics building and the Science and Engineering building, both of which are located approximately 0.25 to 0.3 mile west of the proposed BESS. As discussed in the response to questions a) and b) above, with implementation of PS MM HAZ-1, the project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials. Therefore, with implementation of PS MM HAZ-1, the project would not emit hazardous emissions

within 0.25 mile of an existing school, and the impact would be less than significant with mitigation incorporated.

- d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Less Than Significant Impact. Portions of the project site have been subject to prior disturbance, and no hazardous materials sites have been found within the footprint of the proposed project area. According to the DTSC's EnviroStor Database, there are no hazardous waste sites on the project site. The nearest open hazardous materials site is located approximately 5.5 miles southwest of the project site (DTSC 2025). In addition, there are no sites mapped by the SWRCB's GeoTracker Database on the project site. The nearest open site is a Cleanup Program Site, located approximately 4.5 miles west of the project site (SWRCB 2025). Therefore, as the project would not be located on a hazardous materials site pursuant to Section 65962.5 of the Government Code, the impact would be less than significant.

- e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

Less Than Significant Impact. The project site is located approximately 7.3 miles northeast of the Merced Regional Airport and approximately eight miles east of the Castle Airport. The project site is not located within the airport land use compatibility zones or the airport influence area for either of these airports (County 2012). A private airstrip is located approximately 1.8 miles southeast of the campus; however, this airstrip does not support commercial flights and is used for a limited number of agricultural flights. Further, all development on the UC Merced would be required to comply with applicable FAA and Caltrans Division of Aeronautics regulations and permits, such as building height restrictions and ratios, minimum distances from the runway to adjacent property lines, and airspace safety requirements. Therefore, although the project site is located within the vicinity of a private airstrip, the limited number of agriculture flights at the airstrip would not result in significant safety hazards for construction workers in the project area. Once operational, the project would not include habitable structures and would not result in a safety hazard for people residing in the project area. Therefore, the impact would be less than significant.

- f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less Than Significant Impact. UC Merced has adopted an EOP, which establishes policies, procedures, and an organizational structure for response in the event of a major campus emergency. In the event of an emergency on the campus, the UC Merced Police Department would implement evacuation procedures based on the severity, location, and nature of the emergency. In the event of an evacuation on campus, it is anticipated that evacuation routes would include Bellevue Road and North Lake Road. Access to the project site would be provided by the existing ingress/egress access road off of Cottonwood Loop, which would be improved in accordance with MFD ordinances with a minimum width of 22 feet. Construction of the proposed project would occur within the project site and would not involve changes to Cottonwood Loop or other existing roadways or evacuation infrastructure in the project vicinity. As such, the proposed project would not affect emergency access or substantially impair an adopted emergency response or evacuation plan, and the impact would be less than significant.

- g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

Less Than Significant with Mitigation Incorporated. The project site, similar to the majority of the UC Merced campus, contains gently rolling flatland and lacks steep slopes; therefore, slopes would not increase risk of wildfire or the spread of wildfire. Prevailing winds in and surrounding the City primarily derive from the west between February and November, and from the north between November and February. The windiest part of the year typically occurs between April and August, with June being the windiest month with wind speeds averaging 8.3 miles per hour (Weather Spark 2025). According to CAL FIRE's FHSZ maps, the project site is located within an LRA and is within a Moderate FHSZ (CAL FIRE 2025).

The proposed project would include the demolition of the existing 1-MW ground-mounted solar array facility and construction of an up to 6-MW solar facility and BESS. The proposed project would not include the construction of inhabitable structures; however, due to the distance to existing buildings on the UC Merced campus, including the Facilities and Services building, campus police department, Science and Engineering Building II, and the Biomedical Science and Physics Building – all approximately 600 feet to 0.25 mile north-northwest of the site, the project could expose nearby occupants to potential hazards in the event of a wildfire.

Construction

Construction of the proposed project would involve the demolition of the existing 1-MW ground-mounted solar array, and installation of PV solar arrays and construction of a BESS. Sparks generated from the operation of heavy equipment and vehicles used during construction could have the potential to start a fire, particularly in the presence of vegetation or other combustible materials on-site. However, the project would incorporate PS MM HAZ-1, which would require the implementation of fire suppression measures during construction, such as the use of spark arrestors or turbo chargers (which eliminate sparks in exhaust) for all heavy equipment, and would require the clearance of dried vegetation or other materials that could serve as fuel combustion from the construction areas, which would minimize the potential risk of ignition during construction. As such, project construction would not substantially increase fire risk. The impact during construction would be less than significant with mitigation incorporated for questions b) and c).

Operation

As discussed in the response to question a) above, the proposed solar modules and foundations would not be flammable and would not exacerbate fire risk; however, the proposed BESS could deploy lithium-ion, vanadium redox, iron flow, or zinc hybrid batteries. Vanadium redox, iron flow, and zinc hybrid batteries are non-flammable by design; however, lithium-ion batteries are highly flammable due to risk of thermal runaway (i.e. overheating of the battery, leading to failure, short circuiting, and ultimately fire). Thermal runaway can occur for several reasons including physical damage, aging, and exposure to external heat (FEMA 2025b).

However, the BESS would include fire alarm monitoring for a fire suppression system, and each battery unit would be constantly monitored by a battery management system to ensure safe operations. The battery management system monitors individual cell temperature, voltage, current, charge and discharge parameters, and other metrics to ensure health and safety of the batteries. The system would be designed to address individual or multiple failures as a multi-level safety system and to respond with

shutdown of affected cells or power connections and to activate a fire suppression system if necessary. The batteries would be designed to last the lifetime of the project; however, some batteries may be repaired or replaced as part of regular maintenance activities, if needed. The project would also include upgrades to the existing fire water storage tank to provide fire suppression to the expanded solar array facility. The proposed project would be required to comply with all applicable MFD regulations and current UFC regulations. In addition, the project would incorporate PS MM HAZ-1, which would require fire safety training for MFD personnel and on-site vegetation to be regularly managed to minimize fire risk. For these reasons, operation of the proposed project would not substantially increase fire risk, and the impact would be less than significant with mitigation incorporated for questions b) and c).

Impact Summary

With implementation of PS MM HAZ-1, which would require the implementation of fire suppression measures during construction and operation, the impact would be less than significant with new mitigation incorporated.

Mitigation Measures

The following new project-specific mitigation measure related to hazards and hazardous materials would be applicable to the proposed project:

PS MM HAZ-1: Fire Protection Plan

Prior to the issuance of construction permits, UC Merced shall coordinate with the California Office of the State Fire Marshall and the City of Merced Fire Department (MFD) to prepare a Fire Protection Plan and shall provide appropriate training for fire response personnel in the event of emergency incidents requiring fire suppression or rescue activities during construction and operation. The Fire Protection Plan shall include, but is not limited to, the following measures:

- Emergency fire kits shall be kept on-site during construction and operation. All construction, operation, and maintenance personnel shall be trained in basic fire prevention techniques. The training shall include, but is not limited to, the proper use and storage of flammable materials, use of fire extinguishers, and best construction practices to prevent wildland fires during construction.
- All heavy equipment shall be required to include mechanisms for fire suppression, including spark arresters or turbo-charging (which eliminates sparks in exhaust) and fire extinguishers.
- All areas in which work will be completed using spark-producing equipment, including staging areas and areas slated for development, shall be cleared of dried vegetation and/or all other materials that could serve as fire fuel. These areas shall be kept clear of combustible materials during construction in order to maintain a fire break.
- Work crews shall be required to park vehicles away from flammable vegetation such as dry grass and brush. At the end of each workday, heavy equipment shall be required to be parked over mineral soil, asphalt, or concrete, where available, to reduce the risk of fire.
- Smoking shall be prohibited at the project site, except within designated areas. Smoking shall be prohibited within 30 feet of any combustible material storage area (including fuels, gases, and

solvents). Smoking shall be prohibited in any location during a Red Flag Warning issued by the National Weather Service for the project area.

- All applicable MFD requirements shall be followed to ensure accessibility and ground clearance of emergency vehicles (e.g., fire engines). Security gates shall be approved by the MFD and shall include the installation of a key switch and/or padlock.

X. HYDROLOGY AND WATER QUALITY

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☐	☒	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i. Result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off- site?	☐	☐	☒	☐
iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional resources of polluted runoff?	☐	☐	☒	☐
iv. Impede or redirect flood flows?	☐	☐	☒	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

Environmental Setting

Regional Drainage Basin and Surface Water Resources

The San Joaquin Valley drainage basin is a long trough that is approximately 11,000 square miles in area and is approximately 110 miles long and 95 miles wide. The drainage basin extends from near the City of Stockton to the north to near the City of Fresno to the south, and from the Sierra Nevada on the east to the Coastal Ranges on the west (UC Merced 2019).

The UC Merced campus and proposed project site are located within the northerly San Joaquin subbasin. Merced County is further divided into two subbasins. One subbasin drains into the Merced River and the other drains into the San Joaquin River, the principal river within the UC Merced campus region. The San Joaquin River originates in the Sierra Nevada mountains and flows southwesterly to the

vicinity of Mendota before flowing northwesterly to its mouth in the Suisun Bay. Principal tributaries to the San Joaquin River include the Stanislaus, Tuolumne, and Merced Rivers. In addition to the rivers and streams, there are many reservoirs, agricultural canals, laterals, and drains that also convey runoff and irrigation water through San Joaquin Valley. Canals in the project vicinity include the Main Canal, Le Grand Canal, the Fairfield Canal, and Yosemite Lateral. The Main Canal diverts water from the Merced River and discharges it into Lake Yosemite, which is located to the north of the campus.

The UC Merced campus is situated south-southeast of Lake Yosemite, which is a regulating reservoir owned and operated by the Merced Irrigation District (MID). Le Grand Canal and Fairfield Canal convey water from the lake to agricultural areas to the south (UC Merced 2019). Le Grand Canal borders the northern and eastern edges of the project site. The project site is in the Middle San Joaquin-Lower Chowchilla Watershed (USGS Hydrologic Unit Code [HUC8] 18040001).

Groundwater

In 2014, the California legislature, including Assembly Bill (AB) 1739, Senate Bill (SB) 1168, and SB 1319, enacted the Sustainable Groundwater Management Act (SGMA) in response to the continued overdraft of California's groundwater resources, requiring local agencies to form groundwater sustainability agencies (GSAs) for the high and medium basins, and to develop and implement groundwater sustainability plans (GSPs) to avoid undesirable results and mitigated overdraft from groundwater basins within 20 years.

The project site is located within the Merced Subbasin (No. 5-022.04) of the San Joaquin Valley Groundwater Basin, which is a critically overdrafted basin and classified as a high priority (DWR 2025). As part of the region's compliance with SGMA, the County of Merced and water districts and cities within the Merced Subbasin formed three GSAs: Merced Irrigation-Urban Groundwater Sustainability Agency, Merced Subbasin Groundwater Sustainability Agency, and Turner Island Water District Groundwater Sustainability Agency No. 1. The three GSAs coordinated efforts to develop the GSP for the Merced Subbasin (UC Merced 2019).

Flooding

The Federal Emergency Management Agency (FEMA) provides information on flood hazard and frequency for cities and counties on its Flood Insurance Rate Maps (FIRM) and identifies designated zones to indicate flood hazard potential. The project is located on Panel No. 06047C0435G and is mapped as Flood Zone X – Area of Minimal Flood Hazard, which is defined by FEMA as being outside the floodplain with a 0.2 percent annual chance of flooding (FEMA 2025a).

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

Impacts related to hydrology and water quality were analyzed in Section 4.8, Hydrology and Water Quality, of the 2009 LRDP EIS/EIR and Section 4.4, Hydrology and Water Quality, of the 2020 LRDP SEIR.

The 2020 LRDP SEIR determined that implementation of the LRDP would not substantially interfere with groundwater recharge, as the presence of clay in the campus soils inhibits groundwater recharge. In addition, development under the LRDP was determined to not substantially decrease groundwater supplies, as UC Merced implements a Water Action Plan to reduce water demand and facilitate recharge, and because the amount of water withdrawn by the campus would be substantially less than the amount that was previously accounted for in the 2005 Merced Urban Water Management Plan

(UWMP). As such, the 2020 LRDP SEIR concluded that implementation of the LRDP would not conflict with or obstruct implementation of a GSP. Therefore, the impact related to groundwater recharge and supplies was determined to be less than significant.

The 2020 LRDP SEIR determined that development under the LRDP would not substantially alter the existing drainage pattern of the campus through alteration of a water course or through the addition of impervious surfaces such that it would result in substantial erosion or siltation on or off site, result in flooding on or off site, contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems, or impede or redirect flood flows. The 2020 LRDP SEIR concluded that since new development on the campus would be required to comply with UC Sustainable Practices Policy and the UC Merced Water Action Plan requiring that the integrity of the local watershed be protected and restored, the incorporation of retention and detention basins as well as other stormwater features into site design, and no portion of the campus site is within a 100-year flood hazard area, the impact related to alteration of the existing drainage pattern would be less than significant.

The 2009 LRDP EIS/EIR concluded that development under the LRDP would not result in discharges that would cause the City's wastewater treatment plan (WWTP) to violate water quality standards or waste discharge requirements because there was adequate capacity at the WWTP to accommodate increased flow from the UC Merced campus. Further, it was determined that, because construction under the LRDP would be required to comply with NPDES requirements, as applicable, construction activities would not substantially degrade water quality. Therefore, the impact related to water quality was determined to be less than significant, and the 2020 LRDP SEIR did not reevaluate this issue area.

Discussion of Impacts

- a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Less Than Significant Impact.

Construction

Construction of the proposed project would include grading, excavation, and removal of vegetation cover, which could temporarily increase erosion and sedimentation, and thereby impact receiving water bodies off-site. In addition, improper use or accidental spills of fuels, oils, and other hazardous construction materials, such as pipe sealant, solvents, and paints, could pose a threat to the water quality of local water bodies if not contained. However, as discussed in Section 5.VII, Geology and Soils, as the proposed project would disturb more than one acre of soil, the proposed project would be subject to NPDES Construction General Permit, which would require the preparation and implementation of a SWPPP during construction. The project would be required to obtain coverage under the Construction General Permit Order 2009-0009-DWQ adopted on September 2, 2009, as amended by 2010-0014-DWQ and 2012-006-DWQ. The primary objectives of the SWPPP are to: (1) identify pollutant sources that may affect the quality of stormwater associated with construction activity; and (2) identify, construct, and implement stormwater pollution prevention measures to reduce pollutants in stormwater discharges during and after construction. The SWPPP must include details of how the sediment and erosion control best management practices BMPs would be implemented. Typical BMPs to minimize erosion or siltation would include: diversion of runoff from disturbed areas, protective measures for sensitive areas, temporary soil stabilization measures, storm water runoff quality control measures, concrete waste management, watering for dust control, and installation of

perimeter silt fences, as needed. New requirements by the SWRCB also require the SWPPP to include post-construction treatment measures aimed at minimizing stormwater runoff.

As noted in Section 2.4, Construction, UC Merced would require the implementation of BMP-1 and BMP-2, which would require the project contractor to remove potential spoils, surplus materials, and/or debris from the construction site at the end of each day to avoid the potential for pollutants to leave the project site. In addition, BMP-3 would require that all vehicles and equipment be maintained in good working condition to avoid the potential spill of fuels, oils, and other hazardous materials. Therefore, through compliance with existing NPDES regulations for control of pollutant discharge during construction and implementation of standard construction BMPs, project construction would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. Therefore, the impact would be less than significant.

Operation

During operation, the PV modules would be cleaned with water once per year over a two-week period to clean accumulated dust and debris to maintain efficiency. The PV panels would be washed with only water, and soap or detergent for panel washing would not be necessary. As discussed in Section 5.IX, Hazards and Hazardous Materials, there are two dominant semiconducting materials used in PV technology: c-Si, which is the conventional material used in flat plate panels, and thin-film semiconductors such as a-Si and CdTe. Silicon-based solar cells do not contain hazardous materials, although they may use lead-containing solders. CdTe is a hazardous substance when not imbedded within a PV module (cadmium compounds are classified by USEPA as a probable human carcinogen). During the manufacturing process, the CdTe semiconductor layer is sealed between two sheets of glass. CdTe contained within PV modules is highly stable and, even if the modules become broken or damaged, would not mobilize from the glass and into the environment except under extreme laboratory conditions, which would not occur under foreseeable operational conditions. In addition, workers would be on-site during periodic maintenance and repairs would immediately clean up and remove broken PV modules to further reduce potential risk of contamination. During operation, the project would be required to implement low-impact development (LID) strategies per 2020 LRDP Goal IS-3 to control the peak flow and volume of stormwater runoff from the site. Therefore, project operation would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality, and the impact would be less than significant.

Impact Summary

With adherence to existing NPDES and 2020 LRDP requirements and implementation of construction BMP-1, -2, and -3, implementation of the proposed project would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. Therefore, the impact would be less than significant.

- b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Less Than Significant Impact. The City of Merced's water supply is drawn from 20 active production wells with a combined capacity of 54,100 gallons per minute (gpm) and provides potable water to the campus via its distribution system. The 2020 LRDP SEIR determined that buildout under the 2020 LRDP would result in an annual water demand of approximately 623 AFY.

The proposed project would require the temporary use of water during construction for dust suppression purposes, which could be sourced from groundwater. However, this use of water would be short-term and minimal and would not substantially decrease groundwater supplies. The proposed project would include upgrades to the existing fire water storage tank and/or the construction of a new water storage tank on-site to meet water storage requirements for the proposed project, which would be served by existing water distribution infrastructure. Once operational, the PV panels would be washed with water once per year over a two-week period to clean accumulated dust and debris to maintain efficiency. Per CalEEMod estimates based on similar projects, it is estimated that approximately 250,000 gallons of water per year (or approximately 0.77 AFY) would be required for panel washing and livestock management. However, the 2020 LRDP SEIR determined that buildout under the 2020 LRDP would result in an annual water demand of approximately 623 AFY; the proposed project's annual water demand would represent approximately 0.12 percent of annual campus water demand at full buildout under the 2020 LRDP. Therefore, water required during project operation would not substantially decrease groundwater supplies beyond what was anticipated for the UC Merced campus. In addition, the proposed project would be required to comply with the UC Merced Water Action Plan, which requires implementation of LID methods into the site design to manage 30 to 50 percent of total runoff on-site. Implementation of the proposed project would not substantially decrease groundwater supplies, interfere substantially with groundwater recharge, or impede the Merced Subbasin GSP. Therefore, the impact would be less than significant.

- c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
 - i. Result in substantial erosion or siltation on- or off-site?

Less Than Significant Impact. As previously discussed in Section 5.VII, Geology and Soils, and under question a) above, construction of the proposed project would include grading, excavation, and removal of vegetation cover, which could temporarily increase erosion and sedimentation. Construction activities could also result in soil compaction and wind erosion effects that could adversely affect soils and reduce the revegetation potential at the construction sites and staging areas. As the proposed project footprint is greater than one acre in size, the proposed project would be subject to NPDES stormwater regulations which would require the preparation and implementation of a SWPPP during construction. The primary objectives of the SWPPP are to: (1) identify pollutant sources that may affect the quality of stormwater associated with construction activity; and (2) identify, construct, and implement stormwater pollution prevention measures to reduce pollutants in stormwater discharges during and after construction. The SWPPP must include details of how the sediment and erosion control BMPs would be implemented. Typical BMPs to minimize erosion or siltation would include: diversion of runoff from disturbed areas, protective measures for sensitive areas, temporary soil stabilization measures, storm water runoff quality control measures, concrete waste management, watering for dust control, and installation of perimeter silt fences, as needed. New requirements by the SWRCB also require the SWPPP to include post-construction treatment measures aimed at minimizing stormwater runoff. Therefore, through compliance with existing NPDES regulations for control of pollutant discharge during construction, the impact would be less than significant.

- ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off- site?

- iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional resources of polluted runoff?
- iv. Impede or redirect flood flows?

Less Than Significant Impact. Construction of the proposed project would include grading, excavation, and removal of vegetation cover, which could temporarily increase erosion and sedimentation, as well as increased potential for flooding and pollutant runoff. However, as previously discussed, the project would be subject to NPDES stormwater regulations and would be required to prepare and implement a SWPPP and BMPs during project construction, which would minimize potential runoff, flooding, or polluted runoff on- or off-site. During operation, the project would be required to implement LID strategies to control the peak flow and volume of stormwater runoff from the site. As such, the project would not substantially increase the rate or amount of surface runoff on- or off-site. Further, the project site is mapped as Flood Zone X – Area of Minimal Flood Hazard, which is defined by FEMA as being outside the floodplain with a 0.2 percent annual chance of flooding (FEMA 2025a). As the project is not located near or within a FEMA floodplain, the project would not substantially alter the existing drainage pattern of the site through alteration of the course of a stream or river. Therefore, the impact would be less than significant for questions c.ii), c.iii), and c.iv).

- d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

Less Than Significant Impact. The project site is mapped as Flood Zone X – Area of Minimal Flood Hazard, which is defined by FEMA as being outside the floodplain with a 0.2 percent annual chance of flooding (FEMA 2025a). The project would not substantially alter the existing drainage pattern of the site through alteration of the course of a stream or river, and, therefore, would not impede or redirect flood flows. In addition, the project site is located approximately 110 miles east of the Pacific Ocean and is not at risk for potential tsunamis. The project site is not near an enclosed body of water that presents risk of seiche. Therefore, as the project site is not in a flood hazard, tsunami, or seiche zone, the project would not release risk of pollutants due to inundation. The impact would be less than significant.

- e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Less Than Significant Impact. As discussed in the response to question a) above, with compliance with existing NPDES regulations for control of pollutant discharge during construction, the project would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. As discussed in the response to question b), implementation of the proposed project would not substantially decrease groundwater supplies, interfere substantially with groundwater recharge, or impede the Merced Subbasin GSP. For these reasons, the proposed project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. Therefore, the impact would be less than significant.

Mitigation Measures

No mitigation measures were identified in the 2009 LRDP EIR/EIS or 2020 LRDP SEIR related to hydrology and water quality, and no new mitigation measures would be required for the proposed project.

XI. LAND USE AND PLANNING

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐

Environmental Setting

The overall UC Merced campus site, including the proposed project site, is located adjacent to large open spaces comprising grazing lands with scattered rural residences, a planned residential community, agricultural lands, and a rural residential area. Lake Yosemite Regional Park and a large residential area with a golf course lie to the northwest of the UC Merced campus. The 2020 LRDP land use designation for the project site is primarily CBRSL; however, a small portion of the project site off of Cottonwood Loop is designated CMU. The CBRSL land use designation includes areas of the campus that have not yet been designated for a specific use but allows for the development of small solar and other alternate energy projects. The CMU designation includes academic, research, student housing, student and support services, athletic and recreational facilities, administrative offices, service facilities, and parking (UC Merced 2019).

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

Impacts related to land use and planning were analyzed in Section 4.9, Land Use and Planning, of the 2009 LRDP EIS/EIR. The 2020 LRDP SEIR determined that impacts to land use and planning were adequately addressed in the 2009 LRDP EIS/EIR and, therefore, did not require subsequent evaluation.

The 2009 LRDP EIS/EIR concluded that buildout under the LRDP would not physically divide an established community as the campus is surrounded primarily by grazing lands, and no impact was determined to occur. As a constitutionally-created entity, the UC Merced campus is not subject to local land use regulations or plans; therefore, the 2009 LRDP EIS/EIR concluded that implementation of the LRDP would not conflict with the Merced County General Plan or the City of Merced General Plan land use designations or policies because the LRDP is the applicable land use plan. The impact was determined to be less than significant. As the land use plans contained in the 2009 LRDP were developed in a coordinated manner, the 2009 LRDP EIS/EIR concluded that the land use designations and buildout of the LRDP would not result in incompatible land uses, so long as the land use plans were developed as proposed. The impact was determined to be less than significant. In addition, the 2009 LRDP EIS/EIR determined that future annexation of the campus into the City would not conflict with Merced County Local Agency Formation Commission (LAFCO) policies, and the impact would be less than significant.

It should be noted that, at the time the 2009 LRDP EIS/EIR and the 2020 SEIR were prepared, the UC Merced campus was within Merced County. However, on July 18, 2024, the UC Merced campus, along

with a two-mile stretch of Bellevue Road, was annexed into the City limits. The City prepared an Addendum to the Merced Vision 2030 General Plan Program EIR (General Plan PEIR) for the UC Merced Annexation Project, which concluded that annexation of the approximately 1,026-acre campus would not result in new significant effects or a substantial increase in the severity of previously identified significant effects in the General Plan PEIR.

Discussion of Impacts

a) Physically divide an established community?

No Impact. The proposed project site is located east of the central portion of the UC Merced campus, off of Cottonwood Loop. The project site is bordered by Cottonwood Loop and Le Grand Canal to the north, Le Grand Canal and central campus to the east, and undeveloped land to the south and west. The project site is currently partially developed with an approximately 10-acre, 1-MW ground-mounted solar array site built in 2009. Implementation of the proposed project would not physically divide an established community, and no impact would occur.

b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

Less Than Significant Impact. On July 18, 2024, the UC Merced campus, along with a two-mile stretch of Bellevue Road, was annexed into the City limits. The City prepared an Addendum to the General Plan PEIR for the UC Merced Annexation Project, which concluded that annexation of the approximately 1,026-acre campus would not result in new significant effects or a substantial increase in the severity of previously identified significant effects in the GP PEIR. Although the UC Merced campus has been annexed into the City limits, as a constitutionally-created entity, the campus is not subject to local land use regulations or plans. The 2020 LRDP land use designation for the project site is primarily CBRSL; however, a small portion of the project site off of Cottonwood Loop is designated CMU. The CBRSL land use designation includes areas of the campus that have not yet been designated for a specific use but allows for the development of small solar and other alternate energy projects. The CMU designation includes academic, research, student housing, student and support services, athletic and recreational facilities, administrative offices, service facilities, and parking (UC Merced 2019).

The proposed project site is located east of the central portion of the UC Merced campus, off of Cottonwood Loop. The project site is bordered by Cottonwood Loop and Le Grand Canal to the north, Le Grand Canal and central campus to the east, and undeveloped land to the south and west. The project site is currently partially developed with an approximately 10-acre, 1-MW ground-mounted solar array site built in 2009. The proposed project would include the demolition of the existing 1-MW ground-mounted solar array facility and construction of an up to 6-MW solar facility and BESS, which would be located on the portion of the project site designated CBRSL. Although a small northern portion of the project site adjacent to Cottonwood Loop is designated CMU, no solar infrastructure would be located on that portion. Therefore, implementation of the proposed project would not conflict with a land use plan, policy, or regulation, and the impact would be less than significant.

Mitigation Measures

No mitigation measures were identified in the 2009 LRDP EIR/EIS related to land use and planning, and no new project-specific mitigation measures would be required for the proposed project.

XII. MINERAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Environmental Setting

The CGS prepares Mineral Land Classification (MLC) studies under the direction of the State Geologist as specified by the Surface Mining and Reclamation Act (SMARA) of 1975, (PRC 2710 et seq.). Two MLCs overlap with the project site, the 2021 Update of the Mineral Land Classification for Concrete Aggregate Resources of Merced County, and the 1999 Mineral Land Classification of Merced County (DOC 2025c).

In addition, the DOC maintains the Mines Online (MOL) interactive web map, which provides mine specific information as well as access to mine documents submitted to the Division of Mine Reclamation (DMR) pursuant to PRC Section 2774.2.5. According to the MOL map, the nearest mines to the project site are located approximately nine miles northwest of the site (DOC 2025d).

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

Impacts related to mineral resources were analyzed in Section 4.15, Other CEQA Considerations, of the 2009 LRDP EIS/EIR. The 2020 LRDP SEIR determined that impacts to mineral resources were adequately addressed in the 2009 LRDP EIS/EIR and, therefore, did not require subsequent evaluation.

The 2009 LRDP EIS/EIR identified patches of undetermined sand and gravel resources categorized as Mineral Resource Zone (MRZ) 3a and MRZ-3b located within the UC Merced campus. Land areas classified MRZ-3a are underlain by geologic settings that are favorable environments for the occurrence of sand and gravel. Land areas classified MRZ-3b are underlain by geologic settings that appear to be favorable environments for sand and gravel. However, the campus does not contain MRZ-2 areas, which are zones that require managed production.

Further, the 2009 LRDP EIS/EIR concluded that there are no delineated mineral recovery sites or locally important mineral resource recovery sites on the UC Merced campus. As such, it was concluded that implementation of the 2009 LRDP would not result in loss of availability of known mineral resources that would be of value to the region or residents of the State, and no impact would occur related to mineral resources.

Discussion of Impacts

- a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?
- b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

No Impact. The 2009 LRDP EIS/EIR determined that implementation of the 2009 LRDP would not result in the loss of availability of known mineral resources that would be of value to the region or residents of the State, and no impact would occur related to mineral resources.

Although the project site is located within two Countywide MLC studies, the project site does not contain known mineral resources that would be of value to the region and residents of the State. Further, there are no mineral resource recovery sites delineate on the project site; therefore, implementation of the project would not result in the loss of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. Therefore, no impact would occur for questions a) and b).

Mitigation Measures

No mitigation measures were identified in the 2009 LRDP EIR/EIS related to mineral resources, and no new project-specific mitigation measures would be required for the proposed project.

XIII. NOISE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐

Environmental Setting

Noise-sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise, including residences, hospitals, schools, hotels, resorts, libraries, sensitive wildlife habitat, or similar facilities where quiet is an important attribute of the environment. Noise receptors (receivers) are individual locations that may be affected by noise. The nearest off-campus NSLU to the project site are single-family residences located near the intersection of Bellevue and Lake Road, approximately 0.9 mile west of the project site. The nearest on-campus NSLUs to the project site include the Science and Engineering Building II, approximately 0.2 mile northwest of the site, and the Biomedical Science and Physics Building, approximately 0.25 mile west of the site.

Noise Metrics

All noise-level and sound-level values presented herein are expressed in terms of decibels (dB), with A weighting, abbreviated "dBA," to approximate the hearing sensitivity of humans. Time averaged noise levels of one hour are expressed by the symbol " L_{EQ} " unless a different time period is specified. Maximum noise levels are expressed by the symbol " L_{MAX} ." Some of the data also may be presented as octave-band-filtered and/or A-octave band-filtered data, which are a series of sound spectra centered on each stated frequency, with half of the bandwidth above and half of the bandwidth below, the stated frequency. These data are typically used for machinery noise analysis and barrier-effectiveness calculations. The Community Noise Equivalent Level (CNEL) is a 24-hour average, where noise levels during the evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dBA weighting, and sound levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dBA weighting. This is similar to the Day Night sound level (L_{DN}), which is a 24-hour average with an added 10 dBA weighting on the same nighttime hours but no added weighting on the evening hours.

Because decibels are logarithmic units, sound pressure level (S_{PL}) cannot be added or subtracted through standard arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3 dBA increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than from one source under the same conditions. For example, if one automobile produces an S_{PL} of 70 dBA when it passes an observer, two cars passing simultaneously would not produce 140 dBA, rather, they would combine to produce 73 dBA. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dBA louder than one source.

Under controlled conditions in an acoustic laboratory, the trained, healthy human ear is able to discern 1 dBA changes in sound levels, when exposed to steady, single-frequency (“pure-tone”) signals in the mid-frequency (1,000 Hertz [Hz]–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dBA are generally not perceptible. It is widely accepted, however, that people begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5 dBA increase is generally perceived as a distinctly noticeable increase, and a 10 dBA increase is generally perceived as a doubling of loudness.

Vibration Metrics

Groundborne vibration consists of rapidly fluctuating motions or waves transmitted through the ground with an average motion of zero. Sources of groundborne vibrations include natural phenomena and anthropogenic causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions). Peak particle velocity (PPV) is commonly used to quantify vibration amplitude. The PPV, with units of inches per second (in/sec), is defined as the maximum instantaneous positive or negative peak of the vibration wave. Decibels are also used to compress the range of numbers required to describe vibration. Vibration velocity level (LV) with units of VdB are commonly used in evaluating human reactions to vibrations.

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

Impacts related to noise were evaluated in Section 4.10, Noise, of the 2009 LRDP EIS/EIR and Section 4.5, Noise, of the 2020 LRDP SEIR. The 2020 LRDP SEIR determined that development under the 2020 LRDP would increase traffic volumes on the local roadway network, including Bellevue and Lake Road, that provide access to the campus. However, the 2020 LRDP SEIR determined that traffic generated under the 2020 LRDP would disperse with distance from the campus, and, as such, would not result in a noise increase of 3 dBA or more along these roadways. Therefore, the 2020 LRDP SEIR concluded that implementation of the 2020 LRDP would not substantially increase ambient traffic noise levels at NSLUs, and the impact was determined to be less than significant.

The 2020 LRDP SEIR determined that noise generated by daily campus activities would not exceed the noise standard of 65 dBA L_{DN} exterior and 45 dBA L_{DN} interior at off-site residential locations. As such, it was concluded that existing off-site receptors, including the residences along Bellevue and Lake Road, and on-site sensitive receptors, including student housing and academic buildings, would not be substantially affected by noise generated by on-site noise sources; therefore, the impact was determined to be less than significant.

The 2020 LRDP SEIR determined that daytime construction noise would be exempt from the County’s Noise Ordinance. However, construction activities occurring on the campus between the hours of 6:00 PM and 7:00 AM could result in significant noise impacts. However, the 2020 LRDP SEIR identified MM NOI-3, which requires the implementation of standard noise reduction techniques to minimize noise

exposure of nearby NSLUs to construction noise due to campus development. With implementation of 2020 LRDP MM NOI-3, construction noise impacts were determined to be less than significant.

The 2020 LRDP SEIR determined that pile driving would likely not be required during the construction of new development under the 2009 LRDP due to the underlying geology of Merced County. However, in the event that pile driving is required during construction, it could produce groundborne vibration levels that might be perceptible to nearby sensitive receptors. Impact pile driving within 50 feet of structures could cause structural damage to typical building structures and could cause annoyance to persons. Furthermore, for a few future campus facilities, such as laboratories, vibrations could have the potential to disrupt experiments, which is a potentially significant impact. The 2020 LRDP determined that with implementation of 2020 LRDP MMs NOI-4a and NOI-4b, the impact would be less than significant.

Lastly, the 2009 LRDP EIS/EIR determined that, as the UC Merced campus is located approximately seven miles to the northeast of the Merced Regional Airport and approximately six miles east of the Castle Airport, noise generated by aircraft operations at these facilities would not expose receptors on the campus to excessive noise levels. A private airstrip is located approximately 1.8 miles southeast of the campus; however, as this airstrip does not support commercial flights and is used for a limited number of agricultural flights, the 2009 LRDP EIS/EIR concluded that the airstrip would not substantially alter the ambient noise levels at or near the campus, and the impact was determined to be less than significant. As this impact was adequately addressed in the 2009 LRDP EIS/EIR, the 2020 LRDP SEIR determined that this topic did not require further evaluation.

Discussion of Impacts

- a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less Than Significant Impact.

Although UC Merced is not subject to local standards and ordinances, UC Merced has elected to use the County's noise standards and construction noise ordinance to evaluate the potential for development under the 2020 LRDP to adversely affect ambient noise levels in the vicinity of the campus. The County's noise regulations are contained in Chapter 10.60, Noise Control, of the Code of Ordinances.

Construction

Construction activities would result in temporary noise from the use of heavy construction equipment on the project site, from heavy trucks hauling electrical equipment, construction materials and water to the site, and from worker and vendor vehicles traveling to and from the site. Section 10.60.030(B)(5) of the Noise Control Ordinance exempts daytime construction noise from the provisions of the ordinance, provided that all construction in or adjacent to urban areas are limited to the daytime hours between 7:00 AM and 6:00 PM, and all construction equipment shall be properly muffled and maintained. However, a significant noise impact would occur if nighttime construction activity would result in: (1) maximum noise levels exceeding 75 dBA L_{MAX} at any residential property or 80 dBA L_{MAX} at any non-residential property between the hours of 6:00 PM and 7:00 AM; (2) an hourly average sound level that is more than 10 dBA L_{EQ} above the ambient sound level between the hours of 6:00 PM and 10:00 PM; or (3) an hourly sound level more than 5 dBA L_{EQ} above the ambient sound level between the hours of 10:00 PM and 7:00 AM. As such, the 2020 LRDP SEIR determined that construction activities occurring

within 300 feet of residences between the hours of 6:00 PM and 10:00 PM and within 500 feet of residences between the hours of 10:00 PM and 7:00 AM would result in a significant noise impact.

The nearest off-campus NSLU to the project site are single-family residences located near the intersection of Bellevue and Lake Road, approximately 0.9 mile west of the project site. The nearest on-campus NSLUs to the project site include the Science and Engineering Building II, approximately 0.2 mile (1,056 feet) northwest of the site, and the Biomedical Science and Physics Building, approximately 0.25 mile (1,320 feet) west of the site. As such, construction of the proposed project would not occur within 500 feet of existing off-site or on-site NSLUs. In addition, project construction would be limited to daytime construction hours, 7:00 AM and 6:00 PM. Therefore, project construction would not generate a substantial temporary increase in ambient noise levels, and the impact during construction would be less than significant.

Operation

Once operational, the project would passively generate power during daylight hours seven days per week, 365 days per year; however, emergency maintenance would occur on an as-needed basis. The proposed project may include the integration of agrivoltaics, such as seasonal animal grazing. Regular maintenance activities would occur only during the daytime, except for the occasional emergency maintenance which may require night dispatch. It is anticipated that up to two workers would be on-site for periodic maintenance and repairs, up to 24 total days per year. In addition, during the project's operational period, the PV modules would be cleaned with water once per year over a two-week period to clean accumulated dust and debris to maintain efficiency. Up to 10 workers would be on-site for annual washing.

The 2020 SEIR concluded that noise generated by daily campus activities is not expected to exceed the noise standard of 65 dBA L_{dn} exterior and 45 dBA L_{DN} interior at off-site residential locations. Therefore, the 2020 SEIR concluded that existing off-site receptors, including the residential homes along Bellevue and Lake Road, and on-site sensitive receptors, including student housing and academic buildings, would not be substantially affected by noise generated by on-site noise sources. As such, due to distance from existing NSLUs to the project site, the periodic use of off-road equipment for maintenance and cleaning, operation of the proposed project would not generate a substantial temporary increase in ambient noise levels. Therefore, the impact would be less than significant.

Impact Summary

Implementation of the proposed project would not generate a substantial temporary increase in ambient noise levels, and the impact would be less than significant.

b) Generation of excessive groundborne vibration or groundborne noise levels?

Less Than Significant Impact. Project construction is not anticipated to require blasting or pile driving; however, vibratory rollers may be required. However, as discussed above in the response to question a), project construction would not occur within 500 feet of existing off-site or on-site NSLUs, and construction activities would be limited to daytime construction hours, 7:00 AM and 6:00 PM. Once operational, the project would not include permanent sources of groundborne vibration or noise. Therefore, the impact related to groundborne vibration or groundborne noise levels would be less than significant.

- c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Less Than Significant Impact. The project site is located approximately 7.3 miles northeast of the Merced Regional Airport and approximately eight miles east of the Castle Airport. The project site is not located within the airport land use compatibility zones or the airport influence area for either of these airports (County 2012). A private airstrip is located approximately 1.8 miles southeast of the campus; however, this airstrip does not support commercial flights and is used for a limited number of agricultural flights. Further, all development on the UC Merced would be required to comply with applicable FAA and Caltrans Division of Aeronautics regulations and permits, such as building height restrictions and ratios, minimum distances from the runway to adjacent property lines, and airspace safety requirements. Therefore, although the project site is located within the vicinity of a private airstrip, the limited number of agriculture flights at the airstrip would not result in significant safety hazards for construction workers in the project area. Once operational, the project would not include habitable structures and would not result in a safety hazard for people residing in the project area. Therefore, the impact would be less than significant.

Mitigation Measures

None of the mitigation measures identified in the 2020 LRDP SEIR related to noise would be applicable to the proposed project, and no new project-specific mitigation measures would be required.

XIV. POPULATION AND HOUSING

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Environmental Setting

UC Merced opened in 2005 with 865 students, 67 faculty, and about 450 staff. The 2020 LRDP SEIR estimated that between 2020 and 2030, the student population would increase from 9,700 full-time equivalent students to 15,000 students, an increase of about 5,300 students. Over the same period, faculty and staff were projected to increase from 1,280 to 2,411, an increase of 1,131 persons. Overall, the campus population would increase by 6,431 persons. As such, by 2030 the UC Merced campus is projected to have a total population of 17,411 students, faculty, and staff.

As of the fall 2025, UC Merced had a total student population of 8,943 students, or 9,025 full-time equivalent students (UC Merced 2026), which is within the 2020 LRDP projections.

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

Impacts related to population and housing were analyzed in Section 4.6, Population and Housing, of the 2020 LRDP SEIR. It should be noted that the 2009 LRDP EIS/EIR determined that implementation of the 2009 LRDP would require the removal of three dwelling units, which would displace approximately 10 people, in order to accommodate campus development. However, as the 2009 LRDP would construct 11,616 dwelling units on the campus, which offset the loss of the three dwelling units, the impact was determined to be less than significant. As this impact was adequately addressed in the 2009 LRDP EIS/EIR, the 2020 LRDP SEIR determined that this topic did not require further evaluation, and, therefore, it is not further discussed herein.

The 2020 LRDP SEIR determined that, since the population increase due to the implementation of the 2020 LRDP would be substantially lower than the growth that has been accounted for in the general plans of the City of Merced and County of Merced, it would not represent substantial unplanned population growth. The impact related to population growth was concluded to be less than significant. The City of Merced prepared an addendum to the General Plan EIR, which evaluated the annexation of the campus into the City and found that the annexation would not result in any new or substantially severe environmental impacts from those identified in the City's General Plan EIR. Additionally, the annexation was found to not affect the campus' projected population numbers.

Discussion of Impacts

- a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

Less Than Significant Impact. The proposed project would include the demolition of the existing 1-MW ground-mounted solar array facility and construction of a 6-MW solar facility and BESS. The project would not include the construction of new residential units and would not directly increase population growth. During project construction, short-term, temporary jobs would be created; however, it is anticipated that the majority of the labor force would be sourced from within the County. In addition, as of the fall 2025, UC Merced had a total student population of 8,943 students, or 9,025 full-time equivalent students (UC Merced 2026), which is within the 2020 LRDP projections of 15,000 full-time equivalent students by 2030. The potential increase in population growth during construction would be minimal and temporary and would not represent a substantial increase in unplanned population growth beyond the 2020 LRDP projections. Therefore, the impact would be less than significant.

- b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

No Impact. As there are no dwelling units or habitable structures on the project site, the proposed project would not displace existing people or housing and would not require the construction of replacement housing. Therefore, no impact would occur.

Mitigation Measures

No mitigation measures were identified in the 2009 LRDP EIR/EIS or 2020 LRDP SEIR related to population and housing, and no new project-specific mitigation measures would be required for the proposed project.

XV. PUBLIC SERVICES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
a) Fire protection?	☐	☒	☐	☐
b) Police protection?	☐	☐	☒	☐
c) Schools?	☐	☐	☒	☐
d) Parks?	☐	☐	☐	☒
e) Other public facilities?	☐	☐	☐	☒

Environmental Setting

Fire protection services for the UC Merced campus is provided by the MFD. The MFD responds to incidents on the UC Merced campus using their established response model, which is to send the closest engine to an incident location. MFD's closest fire station to the project site is Fire Station 55, located approximately 2.75 miles southwest of the site (UC Merced 2019).

Law enforcement services for the UC Merced campus are provided by the UC Merced Police Department, stationed at the campus police station located approximately 800 feet northwest of the project site. The UC Merced Police Department is responsible for providing 24-hour service for on-campus calls (UC Merced 2019).

The project site is located within the boundaries of the Merced City School District (MCSD) and the Merced Union High School District (MUHSD). The MCSD provides education for kindergarten through eighth grade and the MUHSD serves students in grades 9 through 12. The nearest elementary school to the project site is Peterson Elementary School, located approximately 3.25 miles southwest of the site, and the nearest high school to the project site is El Capitan High School, located approximately 2.9 miles west of the site.

UC Merced provides extensive library resources through its Leo & Dottie Kolligian Library, located on the campus at 5200 N. Lake Road. The resources are primarily for the research and educational needs of students, faculty and staff; however, there is some public access (UC Merced 2019).

County-owned recreational facilities are managed by the Merced County Parks and Recreation Office. Lake Yosemite Regional Park is an important regional recreation facility serving thousands of area residents annually. The Merced Irrigation District owns the 486-acre lake and surrounding shoreline, which has been a regional recreational site since the late 1930s. The County operates the lake and shoreline for recreational uses under a 50-year lease. The City of Merced Parks and Community Services

Department maintains City parks and recreational facilities. Both active and passive recreational areas, which include a variety of park types, are available to residents, as well as an extensive off-street bicycle path system. The City maintains approximately 84 acres of community parks, 64 acres of neighborhood parks, 4 acres of mini-parks, 120 acres of linear parks, and 57 acres of other parks and recreational sites. Nearby community and neighborhood parks include Elmer Murchie Park, Fahrens Park, Bob Carpenter Neighborhood Park, Merino Park, Rahilly Park, and Burbank Park (UC Merced 2019).

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

Impacts related to public services were analyzed in Section 4.7, Public Services and Recreation, of the 2020 LRDP SEIR.

The 2020 LRDP SEIR concluded that development under the 2020 LRDP would result in less than significant impacts related to police services and facilities, fire protection facilities and services, schools, and the public library system. The 2020 LRDP SEIR concluded that development under the UC Merced 2020 LRDP would result in an increased demand for parks and recreational facilities but would not require the construction of new facilities off-campus; therefore, the impact would be less than significant. The 2020 LRDP SEIR also concluded that the 2020 LRDP would increase the use of Lake Yosemite Regional Park, which could accelerate physical deterioration of park facilities; however, implementation of 2020 LRDP MM PUB-6a through MM PUB-6c would reduce the impact to less than significant.

Discussion of Impacts

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

a) Fire protection?

Less Than Significant with Mitigation Incorporated. The proposed project would include the demolition of the existing 1-MW ground-mounted solar array facility and construction of an up to 6-MW solar facility and BESS. The BESS would be enclosed in a storage container and installed on a concrete pad. The proposed BESS would include fire alarm monitoring for a fire suppression system, and each battery unit would be constantly monitored by a battery management system to ensure safe operations. The battery management system monitors individual cell temperature, voltage, current, charge and discharge parameters, and other metrics to ensure health and safety of the batteries. The system would be designed to address individual or multiple failures as a multi-level safety system and to respond with shutdown of affected cells or power connections and to activate a fire suppression system if necessary. In addition, the project would include upgrades to the existing fire water storage tank and/or the construction of a new water storage tank on-site to meet water storage requirements for the proposed project. The existing ingress/egress access road off of Cottonwood Loop, which would be improved in accordance with MFD regulations with a minimum width of 22 feet.

The proposed project would be required to comply with all applicable MFD regulations and current UFC regulations. In addition, the project would incorporate PS MM HAZ-1, as previously discussed in Section 5.IX, Hazards and Hazardous Materials, which would require fire safety training for MFD personnel and on-site vegetation to be regularly managed to minimize fire risk. Therefore, the proposed project is not

anticipated to substantially increase the demand on fire protection services beyond what was projected to occur under implementation of the 2020 LRDP. The impact would be less than significant with mitigation incorporated.

b) Police protection?

Less Than Significant Impact. The proposed project would receive police protection services from the UC Merced Police Department, stationed at the campus police station located approximately 800 feet northwest of the project site. The proposed project would include the installation of fencing topped with barbed wire around the solar PV facility, BESS, and access road. A locked gate would be located at the site entrance off of Cottonwood Loop to control ingress/egress. The proposed fencing and gate would prevent unauthorized entry into the project site and would minimize demand on police protection services. As such, the proposed project is not anticipated to substantially increase the demand on campus police protection services beyond what was evaluated in the 2020 LRDP SEIR. Therefore, the impact would be less than significant.

c) Schools?

Less Than Significant Impact. As discussed in Section 5.XIV, Population and Housing, the proposed project would not include the construction of new residential units and would not directly increase population growth. During project construction, short-term, temporary jobs would be created; however, it is anticipated that the majority of the labor force would be sourced from within the County. In addition, as of the fall 2025, UC Merced had a total student population of 8,943 students, or 9,025 full-time equivalent students (UC Merced 2026), which is within the 2020 LRDP projections of 15,000 full-time equivalent students by 2030. The potential increase in population growth during construction would be minimal and temporary and would not represent a substantial increase in unplanned population growth beyond the 2020 LRDP projections. Therefore, the proposed project would not generate new school-age children in the area such that a substantial increase in demand on local schools would occur. The impact would be less than significant.

d) Parks?

e) Other public facilities?

No Impact. As previously discussed, the proposed project would not generate a substantial increase in unplanned population growth. As of the fall 2025, UC Merced had a total student population of 8,943 students, or 9,025 full-time equivalent students (UC Merced 2026), which is within the 2020 LRDP projections of 15,000 full-time equivalent students by 2030. Therefore, implementation of the project would not substantially increase the demand on existing parks such that new parks would be required. Similarly, implementation of the proposed project would not induce substantial demand on other public facilities, such as public libraries. Therefore, no impact would occur for questions d) and e).

Mitigation Measures

None of the mitigation measures identified in the 2020 LRDP SEIR related to public services would be applicable to the proposed project. The following new project-specific mitigation measure would be required for the proposed project:

Refer to Section 5.IX, Hazards and Hazardous Materials, for PS MM HAZ-1.

XVI. RECREATION

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Environmental Setting

County-owned recreational facilities are managed by the Merced County Parks and Recreation Office. Lake Yosemite Regional Park is an important regional recreation facility serving thousands of area residents annually. The Merced Irrigation District owns the 486-acre lake and surrounding shoreline, which has been a regional recreational site since the late 1930s. The County operates the lake and shoreline for recreational uses under a 50-year lease. The City of Merced Parks and Community Services Department maintains City parks and recreational facilities. Both active and passive recreational areas, which include a variety of park types, are available to residents, as well as an extensive off-street bicycle path system. The City maintains approximately 84 acres of community parks, 64 acres of neighborhood parks, four acres of mini-parks, 120 acres of linear parks, and 57 acres of other parks and recreational sites. Nearby community and neighborhood parks include Elmer Murchie Park, Fahrens Park, Bob Carpenter Neighborhood Park, Merino Park, Rahilly Park, and Burbank Park (UC Merced 2019).

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

Impacts related to recreation were analyzed in Section 4.7, Public Services and Recreation, of the 2020 LRDP SEIR.

The 2020 LRDP EIR concluded that development under the UC Merced 2020 LRDP would result in an increased demand for parks and recreational facilities but would not require the construction of new facilities off-campus; therefore, the impact would be less than significant. The 2020 LRDP SEIR also concluded that the 2020 LRDP would increase the use of Lake Yosemite Regional Park, which could accelerate physical deterioration of park facilities; however, implementation of 2020 LRDP MM PUB-6a through MM PUB-6c would reduce the impact to less than significant.

Discussion of Impacts

- a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

- b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

No Impact. As discussed in Section 5.XIV, Population and Housing, the proposed project would not generate a substantial increase in unplanned population growth. As of the fall 2025, UC Merced had a total student population of 8,943 students, or 9,025 full-time equivalent students (UC Merced 2026), which is within the 2020 LRDP projections of 15,000 full-time equivalent students by 2030. Therefore, as the proposed project would not induce substantial population growth beyond what has been planned for in the 2020 LRDP, implementation of the project would not substantially increase the demand on existing parks such that new parks would be required. The proposed project would not include recreational facilities or require the construction or expansion of recreational facilities that may have an impact on the environment. Therefore, no impact would occur for questions a) and b).

Mitigation Measures

None of the mitigation measures identified in the 2020 LRDP SEIR related to recreation would be applicable to the proposed project, and no new project-specific mitigation measures would be required.

XVII. TRANSPORTATION

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☒	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
d) Result in inadequate emergency access?	☐	☐	☒	☐

Environmental Setting

Roadway Network

SR 99 is the primary regional facility in the Merced area. SR 99 provides access to San Francisco and Sacramento to the north, and Fresno and Bakersfield to the south. Through the City of Merced, Highway 99 is a four-lane freeway with two lanes in each direction.

SR 140 is a major east-west highway serving recreational and local traffic. SR 140 is a two-lane rural highway that provides regional access to Yosemite National Park to the east.

Yosemite Avenue is an east-west road extending from Highway 59 to its eastern terminus at Arboleda Drive. Yosemite Avenue is a two-lane facility west of Arboleda Drive until Lake Road, where the roadway becomes a four-lane roadway. West of McKee Road, Yosemite Avenue narrows to three travel lanes (two eastbound and one westbound) and expands back to four lanes west of North Gardner Avenue.

Bellevue Road is a two-lane east-west road extending from Fox Road on the west to its eastern terminus at Lake Road and is one of the two access roads to the campus. This roadway currently carries approximately 8,500 vehicles per day, west of Lake Road.

Lake Road is a two-lane north-south road extending from Yosemite Avenue to its northern terminus at Lake Yosemite and is the other access road to the campus. This roadway currently carries approximately 5,600 vehicles per day, south of Bellevue Road.

Cottonwood Loop is a two-lane roadway on the northeastern corner of the campus that extends from Mineral King Road to N. Lake Road. The project site is currently accessed by an approximately 0.25-mile-long access road off of Cottonwood Loop.

Transit Service

Transit service in the vicinity of the UC Merced campus is provided by Amtrak, The Bus, CatTracks, and the Yosemite Area Regional Transportation System. CatTracks is funded by UC Merced and provides local bus service to the campus and connects to the surrounding areas, including downtown Merced and the former Castle Air Force base (UC Merced 2019).

Pedestrian and Bicycle Facilities

Pedestrian facilities include sidewalks, off-street paths, crosswalks, and pedestrian signals. Sidewalks are generally provided in developed areas in Merced and are being added in undeveloped areas as the adjacent parcels are developed. No sidewalks exist along Bellevue Avenue nor Lake Road within two miles of the project site. Crosswalks and pedestrian signals are provided at all signalized intersections in the area. The trail along Lake Road provides direct access to the UC Merced campus and joins with existing sidewalks along Yosemite Avenue and the Black Rascal Creek trail connector.

Bicycle facilities include the following:

- Bike paths (Class I) – Paved trails that are separated from roadways.
- Bike lanes (Class II) – Lanes on roadways designated for use by bicycles through striping, pavement legends, and signs.
- Bike routes (Class III) – Designated roadways for bicycle use by signs only; may or may not include additional pavement width for cyclists.
- Class IV bikeways (cycle tracks or “separated” bike lanes) - Provide a right-of-way designated exclusively for bicycle travel within a roadway and are protected from other vehicle traffic with devices, including, but not limited to, grade separation, flexible posts, inflexible physical barriers, or parked cars.

Class I bicycle facilities are provided along Fahrens Creek, Cottonwood Creek, Bear Creek, Black Rascal Creek, and Lake Road. Lake Road provides direct access to the UC Merced campus and can be accessed via Class II bicycle lanes along Yosemite Avenue and the recently completed Black Rascal Creek trail connector (UC Merced 2019).

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

Impacts related to transportation were analyzed in the 2020 LRDP SEIR; however, the SEIR did not provide an impact evaluation based on VMT and instead used the LOS metric. In December 2018, the California Natural Resources Agency certified and adopted the CEQA Guidelines update package, including the section implementing SB 743 (State CEQA Guidelines Section 15064.3). Per these changes to the State CEQA Guidelines, as of July 1, 2020, LOS shall not be considered a significant impact on the environment under CEQA, and VMT is the only legally acceptable metric for the evaluation of transportation-related environmental impacts pursuant to CEQA. The UC Merced Medical Education Building Supplemental EIR (August 2022) included a new program-level VMT analysis, which replaces in full the previous LOS analysis in the 2020 LRDP SEIR. The Medical Education Building Supplemental EIR determined that the project would not exceed an applicable VMT threshold of significance and

therefore would not conflict with State CEQA Guidelines Section 15064.3, subdivision (b). The impact related to VMT was determined to be less than significant.

The 2020 LRDP SEIR concluded that, as the 2020 LRDP does not include changes to transit service or infrastructure provided by non-University operators, the impact on transit facilities would be less than significant. Similarly, the 2020 LRDP does not include infrastructure changes outside the campus and, thus, would not disrupt existing facilities, interfere with existing or planned pedestrian and bicycle facilities, nor conflict with adopted plans. The 2020 LRDP includes a new entrance into the campus off Lake Road and incorporates another new entrance off Lake Road, which would not interfere with the off-street multi-use path that runs along the east side of Lake Road. The second new entrance would also be appropriately designed to avoid any impact on the off-street multi-use path. Therefore, the 2020 LRDP SEIR determined that the impact on pedestrian and bicycle facilities would be less than significant.

The 2020 LRDP SEIR determined that all transportation facilities, including connections to off-campus facilities, under the 2020 LRDP would be constructed in accordance with State standards and, therefore, would not substantially increase hazards due to a design standard nor result in inadequate emergency access. The impact was determined to be less than significant.

Discussion of Impacts

- a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Less Than Significant Impact. The project site is currently accessed by an approximately 0.25-mile-long access road off of Cottonwood Loop. There are no formal pedestrian or bicycle facilities or bus stops along Cottonwood Loop in the vicinity of the project site. Access to the project site would be provided by the existing ingress/egress access road off of Cottonwood Loop, which would be improved in accordance with MFD ordinances with a minimum width of 22 feet. The project would not include the construction of off-campus pedestrian, bicycle, or transit facilities, and would not disrupt or interfere with existing or planned pedestrian improvements or result in a physical change that would be inconsistent with any pedestrian-related policies in the 2020 LRDP. Therefore, the impact would be less than significant.

- b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

Less Than Significant Impact. The 2020 LRDP SEIR analyzed traffic generated by campus growth based on an analysis of LOS impacts at a number of study intersections to determine potential impacts to roadway systems and determined impacts due to the development of the LRDP would be significant and unavoidable. As of July 1, 2020, CEQA documents must evaluate transportation impacts based on VMT, consistent with SB 743. Following the certification of the 2020 LRDP SEIR in 2020, UC Merced prepared and circulated an updated supplemental program-level transportation impact analysis of campus growth through 2030 under the 2020 LRDP based on current (at the time) VMT metrics consistent with State CEQA Guidelines Section 15064.3, subdivision (b). The program-level VMT analysis was published in the UC Merced Medical Education Building Project Draft EIR in August 2022, and the Final EIR, including the supplemental VMT transportation analysis, was certified by the University on November 17, 2022. The updated LRDP transportation impact analysis in the UC Merced Medical Education Building Project EIR replaces in full the prior LOS-based LRDP transportation impact analysis that was included in the 2020 LRDP SEIR.

According to the Governor's Office of Land Use and Climate Innovation (LCI; formerly the Office of Planning and Research) Technical Advisory on Evaluating Transportation Impacts in CEQA, small land use projects that would generate or attract fewer than 110 trips per day generally may be assumed to cause a less than significant impact related to VMT. The proposed project would include the construction of an up to 6-MW solar facility and a new BESS with a minimum storage capacity of 3 MWh. The proposed project would passively generate power during daylight hours seven days per week, 365 days per year; however, emergency maintenance would occur on an as-needed basis. It is anticipated that up to two workers would be on-site for periodic maintenance and repairs, up to 24 total days per year. Therefore, as the proposed project would generate less than 110 vehicle trips per year, the impact related to VMT would be less than significant.

- c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?
- d) Result in inadequate emergency access?

Less Than Significant Impact. Access to the project site would be provided by the existing ingress/egress access road off of Cottonwood Loop, which would be improved in accordance with MFD ordinances with a minimum width of 22 feet. Construction of the proposed project would occur within the project site and would not involve changes to Cottonwood Loop or other existing roadways or evacuation infrastructure in the project vicinity. In addition, as noted in Section 2.4, Construction, UC Merced would require the implementation of BMP-4 during construction, which would require the project contractor to be responsible for traffic and/or pedestrian control and protection of public and private properties adjacent to the work site. Implementation of BMP-4 would ensure that project construction would not result in inadequate emergency access and would not increase hazards due to a design feature. Therefore, the impact would be less than significant for questions c) and d).

Mitigation Measures

No mitigation measures were identified in the 2020 LRDP SEIR related to transportation, and no new project-specific mitigation measures would be required for the proposed project.

XVIII. TRIBAL CULTURAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or	☐	☐	☒	☐
ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☒	☐

Information in this section is derived from the 2009 LRDP EIR/EIS and the 2020 LRDP SEIR (UC Merced 2008; UC Merced 2019).

Environmental Setting

Ethnography

The aboriginal inhabitants of the area in which the campus is located are known as the Northern Valley Yokuts. "Yokuts" is a term applied to a large and diverse number of peoples inhabiting the San Joaquin Valley and Sierra Nevada foothills of central California. The Yokuts cultures include three primary divisions, corresponding to gross environmental zones: the Southern San Joaquin Valley Yokuts, the Foothill Yokuts, and the Northern San Joaquin Valley Yokuts. The Yokuts languages, of which there are three subdivisions, belong to the Yokutsan family, Penutian stock. Each of the primary divisions included several dialects. The North Valley Yokuts lived in the northern San Joaquin Valley from around Bear Creek north of Stockton to the bend in the San Joaquin River near Mendota (UC Merced 2009).

There was no Yokuts tribal organization that encompassed the whole of the peoples speaking Yokutsan languages, or even a tribal organization that encompassed an entire primary division, such as Foothill Yokuts. These are linguistic and geographic designations only. Similar to most Native American groups in California, the largest political entity among the Yokuts was that of the tribelet. A tribelet consisted of a large village and a few smaller surrounding villages. Larger villages and tribelets had a chief or headman

– an advisory position that was passed from father to son. In general, the Yokuts were seasonally mobile hunter-gathers with semi-permanent villages. Seasonal movements to temporary camps would occur to exploit food resources in other environmental zones. The primary difference between the various Yokuts groups rests largely on the differences in available resources in their territory. The North Valley Yokuts relied heavily on acorns as a food staple, which was processed into a thick soup, along with salmon and other fish, grass seeds and tule roots (which were processed into meal), and probably waterfowl, tule elk, and pronghorn (UC Merced 2009).

Principal settlements were located on the tops of low mounds, on or near the banks of the larger watercourses. Settlements were composed of single-family dwellings, sweathouses, and ceremonial assembly chambers. Dwellings were small and lightly constructed, semi-subterranean and oval. The public structures were large and earth covered. Sedentism was fostered by the abundance of riverine resources in the area. The Yokuts first came into contact with Europeans when Spanish explorers visited the area in the late 1700s, possibly followed by expeditions to recover Native Americans who had escaped from the missions. The North Valley Yokuts were far more affected by the missions than were other groups. The loss of individuals to the missions, the influence of runaway neophytes, various epidemics in the 1800s, and the arrival of settlers and miners all contributed to the disintegration of Yokuts culture. Although nearly obliterated, the descendants of the Northern Valley Yokuts still live in Merced County today and continue to rebuild their cultural identity (UC Merced 2009).

Tribal Cultural Resources

As defined in PRC Section 21074, a resource is a tribal cultural resource if it is either:

- Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
 - Included or determined to be eligible for inclusion in the California Register of Historical Resources; or
 - Included in a local register of historical resources as defined in PRC Section 5020.1(k).
- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in PRC Section 5024.1(c). In applying the criteria set forth in PRC Section 5024.1(c), the lead agency shall consider the significance of the resource to a California Native American tribe.
- A cultural landscape that meets the criteria of PRC Section 21074(a) to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.
- A historical resource described in PRC Section 21084.1, a unique archaeological resource as defined in PRC Section 21083.2(g), or a “non-unique archaeological resource” as defined in PRC Section 21083.2(h), if it conforms with the criteria of PRC Section 21074(a).

In accordance with PRC Section 21084.2, lead agencies are required to consider Tribal Cultural Resources (TCR) including a site feature, place, cultural landscape, sacred place or object, of cultural value to the tribe and is listed on the CRHR or a local register, or the lead agency, at its discretion, chooses to treat resources as such.

Assembly Bill (AB) 52 Consultation

Although AB 52 requires the Native American tribes to request notification of projects that involve an EIR or a Mitigated Negative Declaration (MND) pursuant to CEQA Guidelines, the University proactively reached out to the NAHC and requested a list of Native American tribes with traditional lands or cultural places located within the region of each campus. During preparation of the 2020 LRDP SEIR, UC Merced sent out letters on September 17, 2018, to eight tribes identified by the NAHC for the campus region, informing them of the commencement of CEQA review of the proposed 2020 LRDP and asking them if they wished to consult regarding this proposed project pursuant to AB 52. Pursuant to AB 52, the tribes were provided 30 days from the receipt of the letter to request formal consultation with UC Merced. No requests for formal consultation were received by UC Merced from the tribes as of the publication of the 2020 LRDP SEIR.

California Register of Historical Resources

The State Historical Resources Commission has designed this program for use by State and local agencies, private groups and citizens to identify, evaluate, register and protect California's historical resources. The Register is the authoritative guide to the state's significant historical and archeological resources.

The California Register program encourages public recognition and protection of resources of architectural, historical, archeological and cultural significance, identifies historical resources for state and local planning purposes, determines eligibility for state historic preservation grant funding and affords certain protections under the California Environmental Quality Act. The criteria for designation include:

- Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States (Criterion 1).
- Associated with the lives of persons important to local, California or national history (Criterion 2).
- Embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of a master or possesses high artistic values (Criterion 3).
- Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation (Criterion 4).

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

Tribal cultural resources were evaluated in Section 4.9, Tribal Cultural Resources, of the 2020 LRDP SEIR. At the time the 2009 LRDP EIS/EIR was prepared, CEQA did not require an analysis of impacts to TCRs. The 2020 LRDP SEIR determined that based on surveys conducted prior to and in conjunction with the preparation of the 2009 LRDP EIS/EIR, no known prehistoric sites are located within the campus site and two are located on the Community North site located south of the UC Merced campus. Furthermore, no cultural resources were encountered during grading and excavation conducted on the campus site since 2002 when campus construction commenced. Therefore, the 2020 LRDP SEIR concluded that the UC Merced campus is not expected to contain any tribal cultural resources. The 2020 LRDP SEIR determined

that, with implementation of 2009 LRDP MMs CUL-2 and CUL-3, potential impacts to tribal cultural resources would be less than significant.

Discussion of Impacts

- a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:
 - i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?
 - ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?

Less Than Significant Impact. AB 52 requires Native American tribes to request notification of projects that involve an EIR or a MND pursuant to CEQA Guidelines. However, to date, no tribes have reached out to be included on the list of tribes to be notified of projects carried out by UC Merced pursuant to AB 52. As such, formal AB 52 consultation is not required for the proposed project.

Although AB 52 consultation is not required for the proposed project, the UC Merced campus staff elected to reach out to tribes identified by the NAHC. On January 16, 2026, UC Merced sent letters providing information about the proposed project to a total of 11 tribal representatives from the following seven tribes, which were identified by the NAHC to be associated with traditional lands or cultural places located within the region of each campus:

- Amah Mutsun Tribal Band
- Dumna Wo-Wah Tribal Government
- North Valley Yokuts Tribe
- Picayune Rancheria of Chukchansi Indians
- Southern Sierra Miwuk Nation
- Tule River Indian Tribe
- Wukasche Indian Tribe/Eshom Valley Band

Each tribal representative was provided with a brief project description and location of the proposed project. No responses were received from the tribes listed above regarding potential tribal cultural resources on the project site or requests for formal tribal consultation. Therefore, as no tribes responded or identified tribal cultural resources on the project site, the proposed project would not result in a substantial adverse change in the significance of a tribal cultural resource. The impact would be less than significant.

Mitigation Measures

None of the mitigation measures identified in the 2020 LRDP SEIR related to tribal cultural resources would be required, and no new project-specific mitigation measures would be required.

XIX. UTILITIES AND SERVICE SYSTEMS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	☒	☐
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐

Environmental Setting

Wastewater Capacity and Conveyance

The proposed project is located on the UC Merced campus, which is located within the City of Merced. Prior to annexation, the UC Merced campus received wastewater services from the City under an extraterritorial Urban Services agreement. The campus will continue to receive wastewater services from the City of Merced now that it is within City boundaries. The City owns and operates a municipal wastewater collection and treatment system and provides service to all areas within City limits and to some unincorporated areas outside the City limits, including the campus, which includes the project site. The City's system consists of wastewater conveyance pipelines and a WWTP located approximately 3 miles south of the City and approximately 10 miles southwest of the project site, which currently has the capacity to treat up to 12 million gallons per day (mgd) with an approval to expand the capacity to 20 mgd.

For wastewater conveyance, the campus is connected to the City's wastewater collection and treatment system. The 27-inch Bellevue Road trunk main was constructed to convey wastewater flows from the UC Merced campus based on projected wastewater flows from a 25,000-student campus as well as provide additional capacity for planned development along the Bellevue Road corridor between G Street and

Lake Road. The 2009 LRDP EIS/EIR projected a buildout population of 25,000 students, requiring an estimated 1.13 mgd of conveyance capacity. The Bellevue Road trunk main has the capacity to convey approximately 6.5 million gpd under peak conditions. The Bellevue Road trunk main connects the campus to the City's sewer system via a connection to the G Street trunk main. The *Wastewater Master Plan* indicates that the existing G Street trunk main is 21 to 30 inches in diameter and has capacity to convey approximately 4.14 mgd of wastewater under peak wet weather conditions. The *Wastewater Master Plan* determined that the available capacity of the G Street trunk is not sufficient to convey flow from the entitled properties expected to utilize this facility and recommended that a portion of the G Street trunk main be upgraded to a 24-inch pipe (UC Merced 2019).

Water Supply

The City of Merced's water supply is drawn from 20 active production wells with a combined capacity of 54,100 gpm and provides potable water to the campus via its distribution system. The water is primarily supplied by a 16-inch water line that was constructed within the roadway alignment of Bellevue Road. The City also produces potable water used to serve the campus from Well 17, which is located on the UC Merced campus and is capable of producing 2,500 gpm. UC Merced also owns a pump station and a large aboveground 250,000-gallon water storage tank near Well 17 that provides operational and emergency water storage for the campus.

Based on a conservative estimate, the 2020 LRDP SEIR determined that buildout under the 2020 LRDP would result in an annual water demand of approximately 623 AFY (UC Merced 2019).

Solid Waste

Merced County Regional Waste Management Authority (MCRWMA) oversees solid waste transportation and disposal operations of Class III municipal solid waste in Merced County. There are two landfills in the county, and waste from the campus is sent to the Merced County Highway 59 Landfill, located approximately 4.9 miles northwest of the project site.

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

Utilities and service systems were analyzed in Section 4.10, Utilities and Service Systems, of the 2020 LRDP SEIR. The SEIR determined that since the 2015 UWMP concluded that the City of Merced has an adequate groundwater supply to meet water demands in its service area through 2035, including the UC Merced water demand, during normal, single-dry, and multi-dry years, there would be sufficient water supplies to serve the LRDP's demand, and the impact of implementation of the LRDP on water supply would be less than significant.

The SEIR went on to analyze potential impacts related to construction of new water supply and conveyance facilities and determined that while the existing water main and well are expected to adequately serve campus needs through 2030, additional storage tanks may be constructed on the campus as needed to serve the growing campus' fire flow requirements under the 2020 LRDP. The SEIR ultimately concluded that the environmental impacts from the development of on-site water infrastructure that may be needed are evaluated in other sections of the SEIR, and that impacts found to be significant would be mitigated by the mitigation measures included in those sections. In summary, the SEIR determined that the environmental impacts related to construction of water infrastructure as part of the LRDP would be less than significant.

For wastewater utilities, the SEIR determined that the existing sewer line on G Street would not be adequate to handle campus flows through 2030, and the installation of a new line or an upgrade to the existing line on G Street would be needed. These improvements would likely take place within roadway shoulders or under the pavement consistent with current City practice. Thus, the 2020 LRDP SEIR concluded that although expansion of conveyance capacity would eventually be needed along G Street, the impact related to wastewater conveyance and treatment facilities would be less than significant. Impacts to storm water drainage facilities were discussed in Section 4.4, Hydrology and Water Quality, of the 2020 LRDP SEIR.

For solid waste, the 2020 LRDP SEIR determined that the campus would dispose of about 515 tons of waste per year at the Highway 59 landfill by 2030. The SEIR analyzed that with its capacity of 459,000 tons per year, the Highway 59 Landfill would adequately serve the needs of the campus, and an expansion would not be required. The SEIR concluded that implementation of the LRDP would have a less than significant impact to solid waste utilities.

For electric transmission lines and natural gas pipelines, the SEIR determined that power that will be needed by the campus at buildout will be obtained from a number of renewable and alternative technologies, including wind turbines, fuel cells, and PV systems, and that no-site improvements such as additional transmission lines nor off-site improvements to provide natural gas to the campus would be required. Therefore, the SEIR concluded that there would be no significant environmental effects and that the impact related to electricity and natural gas would be less than significant without mitigation incorporated.

Discussion of Impacts

- a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Less Than Significant Impact. The project site is not currently served by wastewater treatment, stormwater drainage, natural gas, or telecommunications facilities, and the proposed project would not include the construction or expansion of these facilities on- or off-site.

The proposed project would include upgrades to the existing fire water storage tank and/or the construction of a new water storage tank on-site to meet water storage requirements for the proposed project. However, the proposed project would be served by existing water distribution infrastructure and would not require the relocation or construction of new water facilities off-site.

The proposed BESS would connect to the existing overhead gen-tie line that currently connects the existing 1-MW solar array facility to the campus's existing Central Utility Plant. The proposed project would interconnect to the existing distribution system and the PG&E utility grid via this existing gen-tie line; however, no new substation would be constructed. The project would require upgrades or modifications to the existing main electrical panels on-site or installation of new panels for operation of the proposed solar PV facility. All major electrical components, including the inverter, isolation transformer, and metering would be contained within the project site, and a system monitoring and data retrieval system would be installed to integrate the project into the campus's EMCS. However, the project would not require the relocation or construction of new electric power facilities off-site.

Therefore, the proposed project would not require the relocation or construction of new or expanded utilities off-site and would not result in significant environmental impacts. Therefore, the impact would be less than significant.

- b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?

Less Than Significant Impact. The proposed project would require the short-term, temporary use of water during construction for dust suppression, earthwork, and cleaning of equipment. However, the use of water during construction would be minimal and would be readily available from existing supplies.

The proposed project would include upgrades to the existing fire water storage tank and/or the construction of a new water storage tank on-site to meet water storage requirements for the proposed project, which would be served by existing water distribution infrastructure. Once operational, the PV panels would be washed with water once per year over a two-week period to clean accumulated dust and debris to maintain efficiency. It is estimated that approximately 250,000 gallons of water per year (or approximately 0.77 AFY) would be required for panel washing and livestock management. However, the 2020 LRDP SEIR determined that buildout under the 2020 LRDP would result in an annual water demand of approximately 623 AFY; the proposed project's annual water demand would represent approximately 0.12 percent of annual campus water demand at full buildout under the 2020 LRDP. Therefore, as the 2020 LRDP SEIR determined that there would be sufficient water supplies to serve campus development under the 2020 LRDP, there would be sufficient water supplies to serve the proposed project. In addition, the proposed project would be required to comply with the UC Merced Water Action Plan, which requires implementation of LID methods into the site design to manage 30 to 50 percent of total runoff on-site. Therefore, the project would have sufficient water supplies available to serve the project and reasonably foreseeable future, and the impact would be less than significant.

- c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

No Impact. The proposed project would not include the construction of new inhabitable structures and would not construct wastewater facilities. Therefore, the proposed project would not increase demand on existing wastewater treatment facilities, and no impact would occur.

- d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?
- e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Less Than Significant Impact. MCRWMA oversees solid waste transportation and disposal operations of Class III municipal solid waste in Merced County. There are two landfills in the county, and waste from the campus is sent to the Merced County Highway 59 Landfill, located approximately 4.9 miles northwest of the project site. Project construction activities and demolition of the existing 1-MW ground-mounted solar array, including the PV panels, racks, and skids would temporarily generate solid waste that would be disposed of and recycled in accordance with applicable local and State regulations.

CALGreen mandates locally permitted construction and demolition projects to recycle and/or salvage for reuse a minimum 65 percent of the nonhazardous construction and demolition debris generated during construction activities (CALGreen Sections 4.408, 5.408, 301.1.1 and 301.3). In addition, the University of California Sustainable Practices Policy sets a goal of zero waste for UC campuses (meeting zero waste goal means that 90 percent of the waste will be diverted from landfills). The Sustainable Practices Policy also encourages recycling of construction waste. Once operational, the proposed project would not generate large amounts of solid waste, with the exception of occasional maintenance activities. Therefore, due to the minimal amount of solid waste generated during construction, the project would not adversely affect UC Merced's ability to comply with the State waste diversion requirements. Therefore, the proposed project would not exceed State or local solid waste standards or infrastructure capacity, nor would it fail to comply with solid waste reduction goals. Therefore, the impact for questions d) and e) would be less than significant.

Mitigation Measures

None of the mitigation measures identified in the 2020 LRDP SEIR related to utilities and service systems would be applicable to the proposed project, and no new project-specific mitigation measures would be required.

XX. WILDFIRE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☒	☐	☐
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☒	☐	☐
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☒	☐

Environmental Setting

CAL FIRE prepares FHSZ using a science-based and field-tested model that assigns a hazard score based on the factors that influence fire likelihood and fire behavior. Many factors are considered such as fire history, existing and potential fuel (natural vegetation), predicted flame length, blowing embers, terrain, and typical fire weather for the area. According to CAL FIRE's FHSZ maps, the project site is located within an LRA and is within a Moderate FHSZ. The project site is surrounded to the north, east, and west by land within LRA and classified as Moderate FHSZ and is surrounded to the south by land within LRA that has no FHSZ classification. An SRA classified as Moderate FHSZ is located adjacent to the northeast boundary of the campus within the Campus Natural Reserve of the Merced Vernal Pools and Grassland Reserve, northeast of the proposed project site (CAL FIRE 2025).

Fire protection services for the UC Merced campus is provided by the MFD. The MFD responds to incidents on the UC Merced campus using their established response model, which is to send the closest engine to an incident location. MFD's closest fire station to the project site is Fire Station 55, located approximately 2.75 miles southwest of the site (UC Merced 2019).

Impacts and Mitigation Measures from the UC Merced 2020 LRDP SEIR and 2009 LRDP EIS/EIR

The CEQA Guidelines were amended in 2019 to include a discussion of wildfire impacts. Although impacts related to wildfire were not discussed in either the 2020 LRDP SEIR or 2009 LRDP EIS/EIR, this

IS/MND includes an evaluation of potential impacts based on the criteria in Section XX of Appendix G of the CEQA Guidelines.

Discussion of Impacts

- a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

Less Than Significant Impact. UC Merced has adopted an EOP, which establishes policies, procedures, and an organizational structure for response in the event of a major campus emergency. In the event of an emergency on the campus, the UC Merced Police Department would implement evacuation procedures based on the severity, location, and nature of the emergency. In the event of an evacuation on campus, it is anticipated that evacuation routes would include Bellevue Road and North Lake Road.

Access to the project site would be provided by the existing ingress/egress access road off of Cottonwood Loop, which would be improved in accordance with MFD standards with a minimum width of 22 feet. Construction of the proposed project would occur within the project site and would not involve changes to Cottonwood Loop or other existing roadways or evacuation infrastructure in the project vicinity. As such, the proposed project would not affect emergency access or substantially impair an adopted emergency response or evacuation plan. Therefore, the impact would be less than significant.

- b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? and;
- c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

Less Than Significant with Mitigation Incorporated. The project site, similar to the majority of the UC Merced campus, contains gently rolling flatland and lacks steep slopes; therefore, slopes would not increase risk of wildfire or the spread of wildfire. Prevailing winds in and surrounding the City primarily derive from the west between February and November, and from the north between November and February. The windiest part of the year typically occurs between April and August, with June being the windiest month with wind speeds averaging 8.3 miles per hour (Weather Spark 2025). According to CAL FIRE's FHSZ maps, the project site is located within an LRA and is within a Moderate FHSZ (CAL FIRE 2025).

The proposed project would include the demolition of the existing 1-MW ground-mounted solar array facility and construction of an up to 6-MW solar facility and BESS. The proposed project would not include the construction of inhabitable structures; however, due to the distance to existing buildings on the UC Merced campus, including the Facilities and Services building, campus police department, Science and Engineering Building II, and the Biomedical Science and Physics Building – all approximately 600 feet to 0.25 mile north-northwest of the site, the project could expose nearby occupants to potential hazards in the event of a wildfire.

Construction

The proposed project would involve the installation of PV solar arrays and construction of a BESS. Sparks generated from the operation of heavy equipment and vehicles used during construction could have the potential to start a fire, particularly in the presence of vegetation or other combustible materials on-site. However, the project would incorporate PS MM HAZ-1, which would require the implementation of fire suppression measures during construction, such as the use of spark arrestors or turbo chargers (which eliminate sparks in exhaust) for all heavy equipment, and would require the clearance of dried vegetation or other materials that could serve as fuel combustion from the construction areas, which would minimize the potential risk of ignition during construction. As such, project construction would not substantially increase fire risk. Therefore, the impact during construction would be less than significant with mitigation incorporated for questions b) and c).

Operation

As discussed in greater detail in the response to questions a) and b) in Section 5.IX, Hazards and Hazardous Materials, the proposed solar modules and foundations would not be flammable and would not exacerbate fire risk; however, the proposed BESS could deploy lithium-ion, vanadium redox, iron flow, or zinc hybrid batteries. Vanadium redox, iron flow, and zinc hybrid batteries are non-flammable by design; however, lithium-ion batteries are highly flammable due to risk of thermal runaway (i.e. overheating of the battery, leading to failure, short circuiting, and ultimately fire). Thermal runaway can occur for several reasons including physical damage, aging, and exposure to external heat (FEMA 2025b). In addition, when burned, lithium-ion batteries release toxic chemicals into the air.

However, the BESS would include fire alarm monitoring for a fire suppression system, and each battery unit would be constantly monitored by a battery management system to ensure safe operations. The battery management system monitors individual cell temperature, voltage, current, charge and discharge parameters, and other metrics to ensure health and safety of the batteries. The system would be designed to address individual or multiple failures as a multi-level safety system and to respond with shutdown of affected cells or power connections and to activate a fire suppression system if necessary. The batteries would be designed to last the lifetime of the project; however, some batteries may be repaired or replaced as part of regular maintenance activities, if needed. The project would also include upgrades to the existing fire water storage tank to provide fire suppression to the expanded solar array facility. The proposed project would be required to comply with all applicable MFD regulations and current UFC regulations. In addition, the project would incorporate PS MM HAZ-1, which would require fire safety training for MFD personnel and on-site vegetation to be regularly managed to minimize fire risk. For these reasons, operation of the proposed project would not substantially increase fire risk, and the impact would be less than significant with mitigation incorporated for questions b) and c).

Impact Summary

With implementation of PS MM HAZ-1, which would require the implementation of fire suppression measures during construction and operation, the impact for questions b) and c) would be less than significant.

- d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

Less Than Significant Impact. The project site, similar to the majority of the UC Merced campus, contains gently rolling flatland and lacks steep slopes; as such, the project site would not be at a significant risk of landslides or other slope failure. Further, the proposed project is not located within a mapped landslide zone (DOC 2025b). In addition, the foothills of the Sierra Nevada Mountain range are located approximately 10 miles east of the project site (the nearest sloped topography to UC Merced and the project site); as such, the project site has a low susceptibility to downslope or downstream flooding or landslides as a result of runoff or post-fire slope instability. Therefore, implementation of the proposed project would not expose people or structures to significant risks as a result of runoff, post-fire slope instability, or drainage changes, and the impact would be less than significant.

Mitigation Measures

The following new project-specific mitigation measure related to wildfire would be required for the proposed project:

See Section 5.IX, Hazards and Hazardous Materials, for PS MM HAZ-1.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of past, present and probable future projects)?	☐	☒	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

Discussion of Impacts

- a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Less Than Significant with Mitigation Incorporated. As discussed in Sections 5.IV, Biological Resources; 5.V, Cultural Resources; and 5.XVIII, Tribal Cultural Resources, the proposed project has the potential to result in impacts to biological, cultural, and tribal cultural resources. However, with implementation of 2020 LRDP MMs BIO-4 and BIO-9a; PS MMs BIO-1 and BIO-2; and ITP MMs 1-12, 16-19, 21-37, 39-53, and 62-64 from ITP No. 2081-2009-010-04 (Amendment No. 4); and 2009 LRDP MM CUL-2 and CUL-3, the impact would be reduced to a level of less than significant. Therefore, the impact would be less than significant with new and previous mitigation incorporated.

- b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of past, present and probable future projects)?

Less Than Significant with Mitigation Incorporated. As discussed throughout this IS/MND, implementation of the proposed project has the potential to result in several potentially significant impacts. However, with implementation of 2009 LRDP MM AES-3a, 2009 LRDP MM AES-4, 2020 LRDP MMs AQ-1a and AQ-1b, 2020 LRDP MMs BIO-4 and BIO-9a; PS MMs BIO-1 and BIO-2; and ITP MMs 1-12, 16-19, 21-37, 39-53, and 62-64 from ITP No. 2081-2009-010-04 (Amendment No. 4); 2009 LRDP MM CUL-4a, and PS MM HAZ-1 all potentially significant impacts identified in this IS/MND would be mitigated to a level of less than significant. In addition, past, present, and probable future projects implemented during physical development of the UC Merced campus are guided by the campus LRDP, and potential cumulative impacts from buildout of the campus are evaluated in the 2009 LRDP EIS/EIR and the 2020 LRDP SEIR. Therefore, implementation of the proposed project would not result in a cumulatively considerable impact beyond what has been previously evaluated in the 2009 LRDP EIS/EIR and the 2020 LRDP SEIR. The impact would be less than significant with new and previous mitigation incorporated.

- c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Less Than Significant with Mitigation Incorporated. As discussed in Sections 5.III, Air Quality; 5.IX, Hazards and Hazardous Materials; 5.XIII, and 5.XX, Wildfire, the proposed project may have the potential to result in substantial adverse effects on human health and safety during construction and operation of the project. Refer to these sections for a detailed discussion of potential human health and safety impacts related to each of those environment resource areas. However, as identified throughout this IS/MND, potential impacts related to public health and safety would be minimized to a level of less than significant with implementation of 2020 LRDP MMs AQ-1a and AQ-1b and PS MM HAZ-1. Therefore, the impact would be less than significant with new and previous mitigation incorporated.

6.0 REFERENCES

California Air Resources Board (CARB). 2026a. California Ambient Air Quality Standards. Available at: <https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards>

2026b. Diesel Exhaust and Health. Accessed May 21 at: <https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health>.

2026c. Current California GHG Emission Inventory Data. Accessed May 21 at: <https://ww2.arb.ca.gov/ghg-inventory-data>.

2007. California Greenhouse Gas Inventory – By Sector and Activity. November 19. Available at: https://ww2.arb.ca.gov/sites/default/files/classic/cc/ghg_inventory_sector_sum_90-04_AR4.pdf.

2005. Air Quality and Land Use Handbook: A Community Health Perspective. April. Available at: https://ww2.arb.ca.gov/sites/default/files/2023-05/Land%20Use%20Handbook_0.pdf.

California Department of Conservation (DOC). 2025a. California Important Farmland Finder Map. Accessed November 4 at: <https://maps.conservation.ca.gov/DLRP/CIFF/>.

2025b. California Geological Survey. Earthquake Zones of Required Investigation Map. Accessed November 4 at: <https://maps.conservation.ca.gov/cgs/informationwarehouse/eqzapp/>.

2025c. California Geological Survey. Mineral Land Classification. Accessed November 6 at: https://maps.conservation.ca.gov/cgs/minerals/?page=Mineral-Land-Classification#data_s=id%3AdataSource_4-18a47b5b8e5-layer-10-192c08351d7-layer-30%3A8.

2025d. Division of Mine Reclamation. Mines Online. Accessed November 6 at: <https://maps.conservation.ca.gov/mol/index.html>.

California Department of Fish and Wildlife (CDFW). 2025. California Natural Diversity Database (For: *Merced, Winton, Yosemite Lake, Haystack Mtn., Planada, Atwater, Sandy Mush, El Nido, and Plainsburg* USGS 7.5-minute series quadrangles), Sacramento, CA. Accessed October 27.

2019. Report to the Fish and Game Commission: Evaluation of the Petition from the Xerces Society, Defenders of Wildlife and the Center for Food Safety to List Four Species of Bumble Bees as Endangered Under the California Endangered Species Act. April 2019. Special California Department of Fish and Wildlife, Sacramento, California, USA.

California Department of Forestry and Fire Protection (CAL FIRE). Find your Fire Hazard Severity Zone. 2025. Accessed November 6 at: <https://experience.arcgis.com/experience/5065c998b4b0462f9ec3c6c226c610a9>.

California Department of Toxic Substances Control (DTSC). 2025. EnviroStor Map. Accessed November 11 at: <https://www.envirostor.dtsc.ca.gov/public/map/?myaddress=UC+Merced>.

California Department of Transportation (Caltrans). 2025. California State Scenic Highway System Map. Accessed November 4 at: <https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aaca>.

California Energy Commission (CEC). 2026a. 2020 Total System Electric Generation. Accessed June 8. Available at: <https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2024-total-system-electric-generation>.

2026b. Supply and Demand of Natural Gas in California. Accessed June 8. Available at: <https://www.energy.ca.gov/data-reports/energy-almanac/californias-natural-gas-market/supply-and-demand-natural-gas-california>.

2026c. California Gasoline Data, Facts, and Statistics. Accessed June 8. Available at: <https://www.energy.ca.gov/data-reports/energy-almanac/transportation-energy/california-gasoline-data-facts-and-statistics>.

2026d. Diesel Fuel Data, Facts, and Statistics. Accessed June 8. Available at: <https://www.energy.ca.gov/data-reports/energy-almanac/transportation-energy/diesel-fuel-data-facts-and-statistics>.

California Native Plant Society (CNPS). 2025. Inventory of Rare and Endangered Plants (online edition, v9.5.1) For: *Merced, Winton, Yosemite Lake, Haystack Mtn., Planada, Atwater, Sandy Mush, El Nido, and Plainsburg* USGS 7.5-minute series quadrangles. Accessed October 27.

Climate Watch. 2026. Historical GHG Emissions. Accessed on February 5. Available at: <https://www.climatewatchdata.org/ghg-emissions?source=CAIT>.

County of Merced (County). 2012. Merced County Airport Land Use Compatibility Plan. June 21. Available at: https://web2.co.merced.ca.us/pdfs/planning/aluc/alucp_july2012/2012_mer_alucp_entire_document.pdf.

Department of Water Resources (DWR). 2025. California's Groundwater Bulletin 118. San Joaquin Valley Groundwater Basin Merced Subbasin. Accessed November 12 at: <https://water.ca.gov/programs/groundwater-management/bulletin-118>.

Eriksen, C. H. and D. Belk. 1999. Fairy shrimps of California's puddles, pools, and playas. Mad River Press, Eureka, California.

Federal Emergency Management Agency (FEMA). 2025a. National Flood Hazard Layer Viewer. Accessed November 12 at: <https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd>.

2025b. U.S. Fire Administration. Risks and Response Strategies for Lithium-ion Battery Fires. Accessed November 7 at: <https://www.usfa.fema.gov/a-z/lithium-ion-batteries/risks-and-response-strategies/>.

- Fraunhofer Institute for Mechanics of Materials. 2010. Scientific Comment of Fraunhofer to Life Cycle Assessment of CdTe Photovoltaics. June. Fthenakis 2003. Fthenakis, V. and K. Zweibel. 2003. CdTe PV: Real and Perceived EHS Risks. Presented at the 2003 NCPV Meeting. Available at: https://www.bnl.gov/pv/files/pdf/art_166.pdf.
- Fthenakis, V. and K. Zweibel. 2003. CdTe PV: Real and Perceived EHS Risks. Presented at the 2003 NCPV Meeting.
- Google Earth. 2025. Historic maps of the Study Area. Available at: <https://earth.google.com>. Accessed November 2025.
- HELIX Environmental Planning, Inc. (HELIX). 2026a. Air Quality and Greenhouse Gas Emissions Technical Report. Prepared June 2026. Available as Appendix B.
- 2026b. Biological Resources Assessment (BRA). Prepared May 2026. Available as Appendix C.
- Intergovernmental Panel on Climate Change (IPCC). 2021. Climate Change 2021. The Physical Science Basis. Working Group 1 Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Available at: <https://www.ipcc.ch/report/ar6/wg1/>.
2013. Climate Change 2013: The Physical Science Basis. Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Available at: <https://www.ipcc.ch/report/ar5/wg1/>.
2007. Climate Change 2007: The Physical Science Basis. Summary for Policymakers. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. February. Available at: <https://www.ipcc.ch/report/ar4/wg1/>.
- International Energy Agency (IEA). 2018. Human Health Risk Assessment Methods for PV. Photovoltaic Power Systems Programme. Part 1: Fire Risks. October. Available at: <https://docs.nrel.gov/docs/fy19osti/72141.pdf>.
2019. Human Health Risk Assessment Methods for PV. Photovoltaic Power Systems Programme. Part 2: Breakage Risks. September. Available at: https://iea-pvps.org/wp-content/uploads/2020/01/Task_12-Human_Health_Risk_Assessment_Methods_for_PV_part_2.pdf.
- Jennings, M.R., and M.P. Hayes. 1994. Amphibian and Reptile Species of Special Concern in California. California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California.
- Koch, J., J. Strange, and P. Williams. 2012. Bumble bees of the Western United States. USDA-Forest Service, Pollinator Partnership. Washington, DC. 144 pp.
- Mikkelsen, P., and W. Hildebrandt. 1990. Archaeological Inventory and Evaluation for the Proposed Los Banos Grandes Reservoir, Merced County, California. Submitted by Far Western Anthropological Research Group, Inc., Davis, California. Submitted to US Bureau of Reclamation, Mid-Pacific Region, Sacramento, California. Contract Number 0-CS-20-00570.

National Aeronautics and Space Administration, Goddard Institute for Space Studies (NASA). 2026. NASA Releases Global Temperature Data. January 14. Available at: <https://www.nasa.gov/news-release/nasa-releases-global-temperature-data/>.

National Laboratory of the Rockies. 2026. PVWatts Calculator. Accessed May 26 at: <https://pvwatts.nlr.gov/>.

Office of Environmental Health Hazard Assessment (OEHHA). 2015. Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. February. Available at: <https://oehha.ca.gov/media/downloads/cnr/2015guidancemanual.pdf>.

Olsen, W. H., and L. A. Payen. 1969. Archaeology of the Grayson Site, Merced County, California. California Department of Parks and Recreation, Archaeological Reports No. 12. Sacramento.

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2026. Ambient Air Quality Standards & Valley Attainment Status. Accessed May 21 at: <https://www.valleyair.org/air-quality-information/ambient-air-quality-standards-valley-attainmnet-status/>.

2015. Guidance for Assessing and Mitigating Air Quality Impacts. February 19. Available at: <https://www.valleyair.org/transportation/GAMAQI-2015/FINAL-DRAFT-GAMAQI.PDF>.

State Water Resources Control Board (SWRCB). 2025. GeoTracker Database. Accessed November 11 at: <https://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=UC+Merced>.

University of California, Merced (UC Merced). 2026. Student Statistics. Overall Enrollment Totals. Accessed June 5 at: <https://cie.ucmerced.edu/overall-enrollment-totals>.

2024. Equitable Decarbonization Master Plan. October 30. Available at: <https://sustainability.ucmerced.edu/current-projects/decarbonization-0>.

2020. Long Range Development Plan. Accessed November 4, 2025 at: <https://planning.ucmerced.edu/2020LRDP>.

2019. Long Range Development Plan Draft Subsequent Environmental Impact Report. Accessed November 4, 2025 at: <https://planning.ucmerced.edu/2020LRDP>.

2018. Climate Action Plan. Available at: <https://ucmerced.app.box.com/s/xxxbzvzrcavupqxhjay5hhxu8hgchqa4>.

2008. UC Merced and University Community Project Draft Environmental Impact Statement/Environmental Impact Report. Volumes 1-3. Accessed on January 29, 2025 at: <https://planning.ucmerced.edu/2020LRDP>.

U.S. Department of Agriculture (USDA). 2025. Natural Resource Conservation Service. Web Soil Survey: Area of Interest (AOI). Available online at: <http://websoilsurvey.sc.egov.usda.gov>.

2008. Natural Resource Conservation Service. Technical Guide Section II. May. Available at: <https://efotg.sc.egov.usda.gov/references/Public/CA/4j-SectionIIengininterp.pdf>.

U.S. Fish and Wildlife Service (USFWS). 2025. *Information for Planning and Consultation (IPaC) for the UC Merced Solar Expansion Project*. Accessed on October 27, 2025.

2023a. Species Status Assessment Report for the Western Spadefoot (*Spea hammondi*), Version 1.1. May 2023. U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, Sacramento, California.

2023b. Species status assessment report for the northwestern pond turtle (*Actinemys marmorata*) and southwestern pond turtle (*Actinemys pallida*), Version 1.1, April 2023. U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office, Ventura, California.

2010. San Joaquin Kit Fox (*Vulpes macrotus mutica*) 5-Year Review: Summary and Evaluation. Prepared by the Sacramento Fish and Wildlife Office.

2005. Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon. Region 1, U.S. Fish and Wildlife Service, Portland, OR. December 15.

U.S. Geological Survey (USGS). 1980. *Merced California*. 7.5-minute series topographic quadrangle. U.S. Department of the Interior.

U.S. Environmental Protection Agency (USEPA). 2026. Superfund National Priorities List (NPL). Accessed February 17 at:
https://experience.arcgis.com/experience/4822dbc3d1c04131a548d4404bb1496a#data_s=id%3Acb6fe0a3a447456eb7165abd4f777c9a-Superfund_National_Priorities_List_NPL_Sites_with_Status_Information_7557%3A88.

Wallace, W. 1991 Tulare Lake's Archaeological Past. In *Contributions to Tulare Lake Archaeology I*, edited by W. J. Wallace and F. A. Riddell, pp. 23–33. The Tulare Lake Archaeological Research Group, Redondo Beach, California.

1978. Northern Valley Yokuts. Pages 462-470 in R. F. Heizer (ed.), *Handbook of North American Indians*, Volume 8: California. Smithsonian Institution, Washington, DC.

Weather Spark. 2025. Average Weather in Merced, California. Accessed November 6 at:
<https://weatherspark.com/y/1324/Average-Weather-in-Merced-California-United-States-Year-Round>.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1988-1990. *California's Wildlife: California Wildlife Habitat Relationships*. Volumes I-III. Wildlife and Habitat Data Analysis Branch, California Department of Fish and Game. Available online at:
<http://www.dfg.ca.gov/whdab/html/cawildlife.html>.

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