

Copperopolis Road Solar Project, PA- 2500127

Initial Study – Mitigated Negative Declaration

prepared by

San Joaquin County
Community Development Department
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October 2026

RINCON CONSULTANTS

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Initial Study

1. Project Title

Copperopolis Road Solar Project, PA- 2500127

2. Lead Agency Name and Address

San Joaquin County
Community Development Department
1810 East Hazelton Avenue
Stockton, California 95205

3. Contact Person and Phone Number

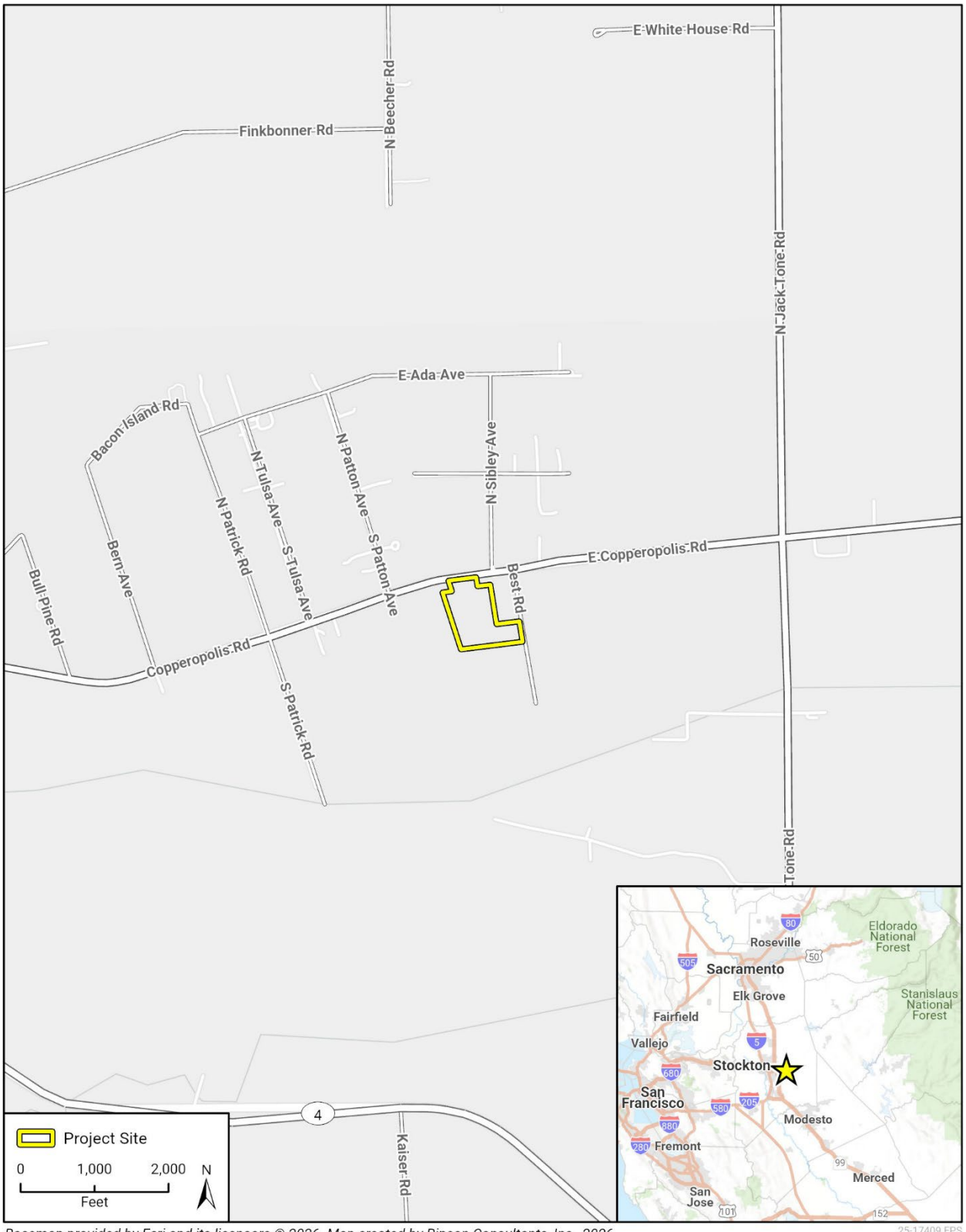
Jacob Pahule, Associate Planner
Community Development Department
1810 East Hazelton Avenue
Stockton, California 95205
209-468-3186

4. Project Location

The Copperopolis Road Solar Project (Project) would be located on approximately 12.2-acres of a parcel totaling 14.2 gross acres of privately owned land (Assessor Parcel Numbers: 103-220-220, 103-220-240, and 103-220-250; collectively, the Project Site) approximately 4 miles east of the City of Stockton in unincorporated San Joaquin County. The Project Site abuts Copperopolis Road, west of Best Road. Figure 1 shows the
regional location of the Project Site and Figure 2 shows the Project Site and surrounding land uses.

The Project Site is located within the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) and would participate in the SJMSCP. The SJMSCP is a comprehensive conservation planning strategy that addresses the needs of multiple plant and animal species while protecting the region's agricultural interests as the population increases over the next 50 years (2001–2051). The SJMSCP is administered by the San Joaquin Council of Governments, Inc., which is a non-profit corporation established by San Joaquin County and the cities of Escalon, Lathrop, Lodi, Manteca, Ripon, Stockton and Tracy. The SJMSCP provides coverage for impacts to biological resources pursuant to the California Environmental Quality Act (CEQA), the California Endangered Species Act (CESA), and Federal Endangered Species Act (ESA), and is approved and authorized by the California Department of Fish and Wildlife (CDFW) and United States Fish and Wildlife Service (USFWS). The Applicant has opted into the SJMSCP and therefore would implement all applicable incidental take permit minimization measures included therein. These would be included as conditions of the Conditional Use Permit (CUP).

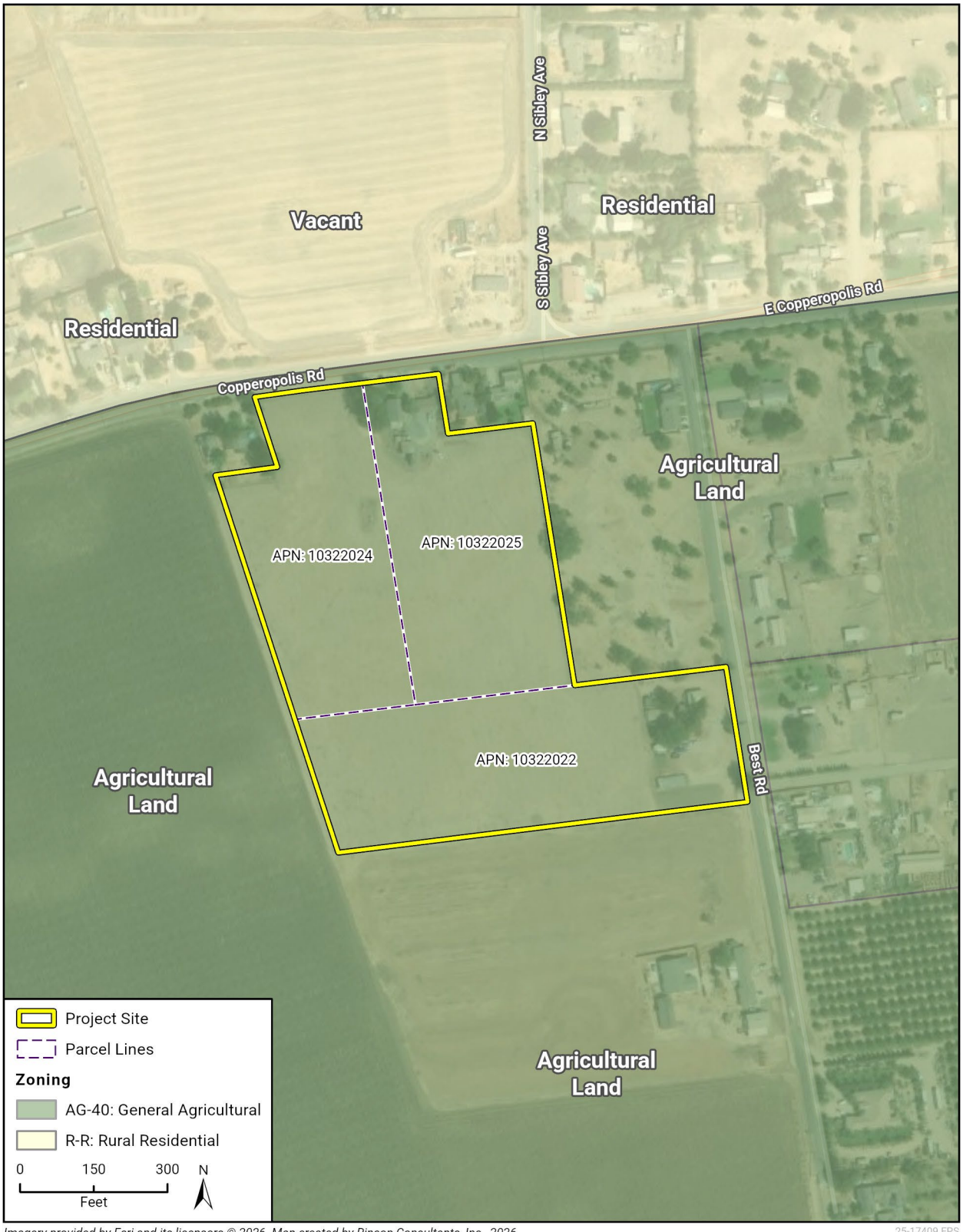
Figure 1 Regional Location



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25-17409 EPS
EIRFig 1 Regional Location

Figure 2 Project Site Location, Zoning, and Surrounding Land Uses



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25-17409 EPS
EIRFig 2 Project Location

5. Project Applicant Name and Address

RPCA Solar 19, LLC
Ryan Nyberg, Permitting Manager
44 Montgomery Street, Suite 3150
San Francisco, California 94104

6. General Plan Designation

The Project Site has a land use designation of General Agriculture (A/G) (San Joaquin County 2025).

7. Zoning

The Project Site is zoned AG-40 (General Agriculture, 40-acre minimum).

8. Description of Project

RPCA Solar 19, LLC (Applicant) proposes to construct, operate, maintain, and decommission a ground-mounted solar photovoltaic (PV) energy generation facility and associated equipment and infrastructure (Copperopolis Road Solar Project or Project). Once constructed, the Project would generate approximately 2 megawatts (MW) of solar energy by utilizing PV solar modules, inverters, and appurtenant electrical equipment to convert the sun's energy to usable power distributed to the electrical grid. The Project meets the San Joaquin County (County) definition of a Solar Energy System, which according to Chapter 9-203.020 of the San Joaquin County Code, is an allowed use on this site subject to a CUP in compliance with Chapter 9-804.

Descriptions of the Project components are provided below. Figure 3 shows the preliminary Project Site plan.

Photovoltaic Modules and Arrays

The Project would use solar PV technology that converts the sun's light energy into direct current (DC) electrical energy within the PV solar panels, referred to as "modules." Modules consist of photovoltaic cells (typically silicon) encapsulated between protective layers of glass and back sheet material; all housed within an aluminum frame. The PV modules installed would have an anti-reflective coating on the glass. The PV modules can be mounted together in different configurations or arrays, depending on the equipment selected and on a common support framework.

The Project would include approximately 4,945 solar modules (each measuring approximately 4 feet x 7.5 feet), which would be mounted on a steel racking system employing single-axis tracker technology that efficiently tracks the sun's movement throughout the day and maximizes the efficiency of solar collection. The rows of modules would be anchored in the ground using driven piers to a depth of approximately 6 to 12 feet. For maximum efficiency, panels are typically installed between 12 and 24 inches off the ground when at their lowest point, which would result in a height of approximately 9 feet from ground level. However, engineering constraints and/or topography may require an increase in height for some panels; therefore, it is assumed that maximum height of panels may be approximately 10 to 15 feet to the top from ground level once installed. The arrays would be arranged in a slight northwest to southeast orientation with approximately nine feet of spacing between each row. Because solar energy technologies continue to evolve at a rapid rate, the exact arrangement and specifications of the PV systems would be determined during the final design. The Project would be set back 30 feet from the property line. The nearest off-site residential properties are located along Copperopolis Road and adjacent to the northwestern boundary of the Project Site and adjacent to the northeastern boundary of the Project Site. The residential property to

the northwest is approximately 39 feet west of the nearest solar array. The residential property to the northeast is approximately 120 feet north of the nearest solar array.

Inverter Stations

The DC output from the PV arrays would be transmitted to inverters through a combination of aboveground and underground DC electrical cables. The inverter stations (ranging from 250-350 kilowatts [kW]) are where the energy is converted to alternating current (AC) and then transmitted to a medium-voltage transformer centrally located with the Project. The stations consist of DC collection equipment and utility-scale string inverters. The number of modules connected to each inverter would depend on the specific model of modules, inverters, and their capacities, which would be determined in the final design.

Electrical Collection System

Power from the inverter stations would be transmitted to a medium-voltage transformer where the power would be stepped up to 12 kilovolts (kV) and transferred to the existing Pacific Gas and Electric (PG&E) electrical distribution system that is located in the public right-of-way along the south side of Copperopolis Road, via an underground medium voltage electrical collection line and pole mounted infrastructure. The medium voltage electrical collection line would be buried in approximately 5-foot-deep trenches and would run adjacent to the Project's site access road. The Project would also include the construction of up to four new utility poles along the northern boundary of the Project Site. The point of interconnection (POI) to the existing PG&E electrical distribution system would be via pole mounted infrastructure and an approximately 25-foot overhead wiretap to the existing 12 kV transmission line adjacent to the site along Copperopolis Road. The line tap would occur within the public right-of-way. This work would require similar equipment and intensity of construction activities as the rest of the Project. It would require no ground disturbance outside of the Project Site. Therefore, activities associated with the POI are analyzed as part of construction impacts throughout this document.

Ancillary Facilities

Site Access

The Project would include a new internal gravel access road within the Project Site and a paved driveway access for ingress and egress to the Project Site from Copperopolis Road in accordance with San Joaquin County's *Fire Apparatus Access Road Standard* (San Joaquin County 2015). New internal access roads and site access improvements would require grading and surfacing. There would be a locked gate that provides access to the fenced solar array area on the Project Site with one remotely operated security camera.

Perimeter Fence

The perimeter of the Project's solar arrays would be permanently fenced to restrict public access during construction and operations. The fence posts would be set in concrete or driven into the ground, and the chain-link fence would be installed to the ground. The chain-link fence would be 6 feet tall with an additional 1 foot of security wiring mounted on top.

Monitoring Systems

The Project would include a solar meteorological station[1], supervisory control and data acquisition system[2], and telecommunications system that would be skid mounted in the center of the Project Site. The meteorological station and associated camera would be mounted on a pole that is ten feet in height.

[1] Solar meteorological stations typically measure solar irradiance, ambient temperature, wind speed and direction, humidity, and other atmospheric parameters.

[2] A computer-based system used at a solar facility to monitor and control facility operations by collecting real-time data from solar panels, inverters, weather stations, and electrical equipment, and enabling operators to remotely oversee performance, respond to alarms, and optimize energy generation.

Lighting

The Project may require minimal nighttime lighting near the transformer, which would be down shielded if nighttime lighting is required.

Landscaping

The Project would include a 10-foot landscape buffer that may consist of ground cover or other landscaping material consistent with Section 9-409.430(b)(10) of the San Joaquin County Code, which requires utility-scale solar energy systems to provide a 10-foot-wide landscape buffer along any facility fencing and between such fencing and the public right-of-way and adjacent residential and agricultural uses.

As a condition of the Power Purchase Agreement (PPA), the entire Project Site would be revegetated with plant species that are appropriate for native pollinator species such as bees and butterflies upon completion of construction.

Other

The Project does not include on-site restroom facilities because there would be no occupied facilities or permanent on-site personnel. No new water or wastewater facilities would be constructed as part of the Project. Additionally, in accordance with San Joaquin County Code Section 9-409.430(b)(7), the Project would include creation and implementation of a fire prevention plan.

Construction

It is estimated that construction of the facility would take six (6) months to complete, with a workforce of 5 to 50 workers, depending on the phase. The average number of workers on site during construction would be 15 individuals.

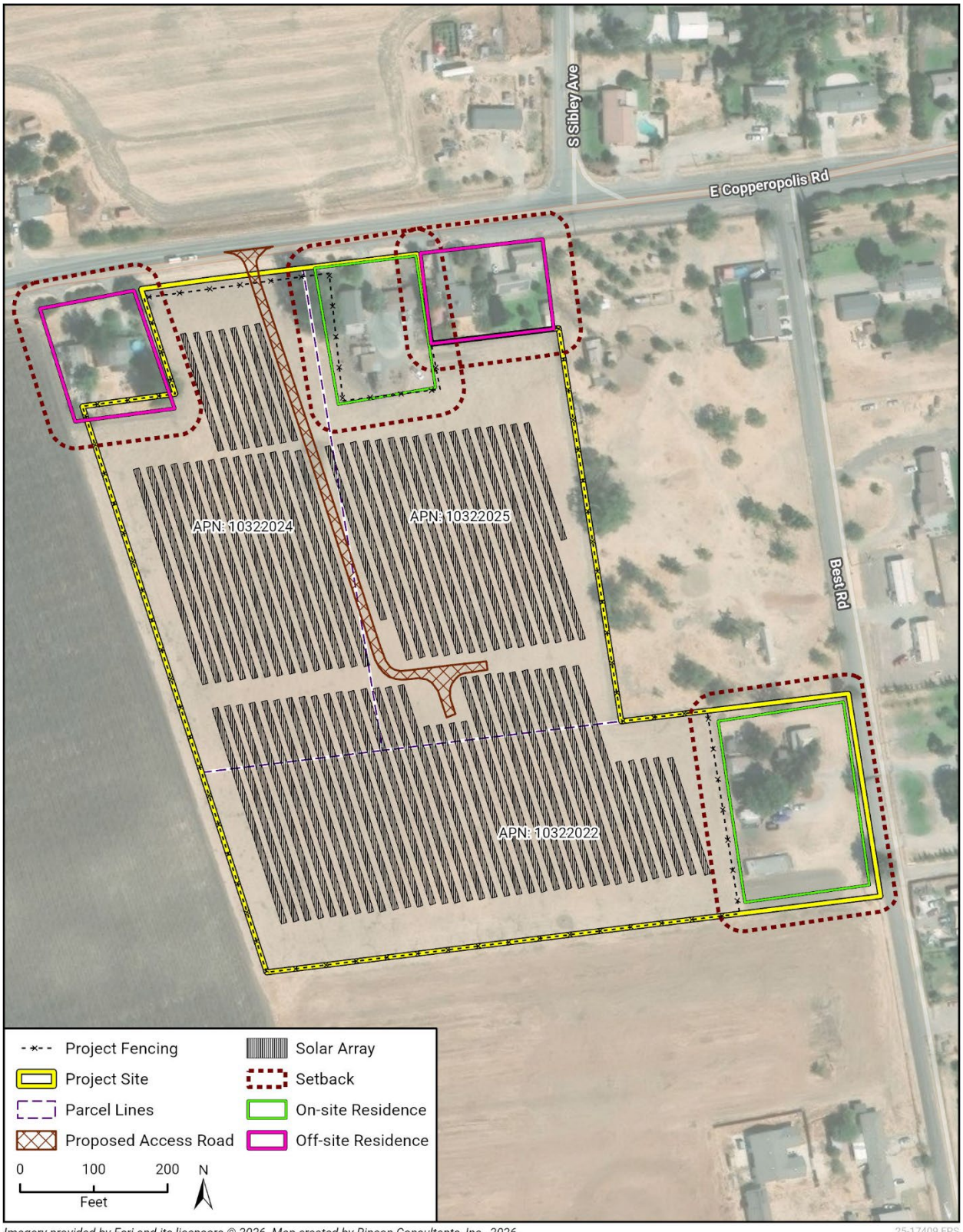
Ground-disturbing activities associated with Project construction include site preparation, on-site and off-site surface grading for the access road, trenching for the underground medium voltage utility line, installation of solar panel pile mounts, installation of four new utility poles, and installation of fencing. Trenching on site would be at a maximum depth of 5 feet and 3 feet wide. Installation of solar panel pile mounts would be at a maximum depth of 12 feet. Installation of utility poles would be at a maximum depth of 8 feet. Utility pad installation would be at a maximum depth of 3 feet. Installation of fence posts would be at a maximum depth of 4 feet. Construction would not require export of soil as all soil would be used to backfill on site. Limited import of soil may be needed for trench backfill if existing soil is not sufficient.

The solar PV modules would be manufactured at an off-site location and transported to the Project Site via truck. There would be up to a maximum of 104 daily construction vehicle trips during installation, which would be the most trip-intensive construction phase and construction traffic would use Highway 99, N. Main Street, and Copperopolis Road to access the Project Site. Construction worker parking and construction staging would be on site.

During construction, restroom facilities would be provided by portable units to be serviced by licensed providers. A small amount of solid waste would be produced from Project construction activities. This may include paper, wood, glass, plastics from packing material, waste lumber, insulation, scrap metal and concrete, empty nonhazardous containers, and vegetation waste. These wastes would be segregated, where practical, for recycling. Non-recyclable wastes would be placed in covered dumpsters and removed on a regular basis by a certified waste-handling contractor for disposal at a Class III landfill.

Small quantities of hazardous wastes, which would be typical for most construction projects of this type, would likely be generated over the course of construction. These wastes may include waste paint, spent construction solvents, waste cleaners, waste oil, oily rags, waste batteries, and spent welding materials. Workers would be trained to properly identify and handle all hazardous materials. Hazardous waste would be either recycled or disposed of at a permitted and licensed treatment or disposal facility. All hazardous waste shipped off-site for recycling or disposal would be transported by a licensed and permitted hazardous waste hauler and disposed of at an approved location.

Figure 3 Project Site Plan



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Fig 3 Site Plan

Operation

The Project is expected to be commercially operational in June 2027. Power generated by the Project would be sold to PG&E through their Renewable Market Adjusting Tariff program. Hours of operation for solar generation would be expected to span from 5:30 A.M. to 8:30 P.M. seven days per week under the most ideal conditions (i.e., sunny conditions).

Once constructed, the Project would require minimal regularly planned maintenance and would be operated remotely. An average of 20 annual operations and maintenance visits are expected for the Project, typically involving two employees traveling to and from the Project Site in one light to medium duty truck. Included in the annual operational trip estimation, two panel washings per year are expected, each involving two light- to medium-duty trucks, four employees, and a mobile water trailer. Panel washing activities and water for the landscaping buffer are expected to generate a total annual water demand of 65,000 gallons per year, on average. Of this total, 15,000 gallons per year is assumed to be required for on-site landscaping over a period of 2-5 years. Once this landscaping is established over the course of 2-5 years, water used for landscaping would gradually decrease due to the use of drought tolerant species. The remaining 50,000 gallons per year would be used for panel washing activities for the duration of the Project life. The pollinator vegetation required as part of the PPA would be planted through seeding and would require minimal water because they would be native drought tolerant species. Water for panel washing and landscaping would be obtained from a commercially available off-site source. Vegetation on site would be mowed periodically and managed in accordance with the California Fire Code. Additionally, the Project would include the creation and implementation of a stormwater pollution prevention plan (SWPPP) to regulate stormwater discharge on site.

The Project would produce a small amount of waste associated with maintenance activities, which could include broken and rusted metal, defective or malfunctioning modules, electrical materials, empty containers, and other miscellaneous solid waste, including the typical refuse generated by workers. Most of these materials would be collected and returned to the manufacturer or delivered to recyclers. Nonrecyclable waste would be removed on a regular basis by workers for disposal at a Class III landfill.

Decommissioning

The Project Site would be reclaimed and fully restored to original conditions upon the closure of the facility at the end of its anticipated 35-year life span, and Project infrastructure would be removed in compliance with San Joaquin County Code Section 9-409.430 (b)(2) which requires a decommissioning plan to be created and followed. Removal of Project infrastructure would be similar in process, scale, and duration to Project construction, excluding site preparation activities such as site clearing. Decommissioning would involve the removal of all above ground components and the removal of piers up to three feet below grade. Solar panels would be recycled to the extent feasible. Water demand for decommissioning would be similar to that of construction and would come from a commercially available source.

9. Surrounding Land Uses and Setting

As noted above, the Project would be located on approximately 12.2 acres, of a parcel totaling 14.2 gross acres of privately owned land in unincorporated San Joaquin County. The Project Site is zoned as AG-40 (General Agriculture, 40-acre minimum) and has a General Plan land use designation of General Agriculture (A/G). Based on historical aerial imagery, an orchard was previously planted on the Project Site and was removed sometime in 2023 or 2024, and the Site has since been fallow and is disked once per year. The majority of the Project Site is disturbed and developed with non-native grasses and forbs. The Site is relatively flat, with an elevation of 55 feet above sea level. Two existing residences and accessory structures are located on the Project Site that would not be demolished or altered by the Project. The existing structures are located at the northeast corner, along Copperopolis Road, and along the southeast corner, along Best Road, of the Project Site. The two residences on site would remain inhabited throughout Project construction, operation, and decommissioning. The Project Site is classified as Farmland of

Statewide Importance on the California Department of Conservation's Farmland Mapping and Monitoring Program. As described above, the Project Site is also within and would participate in the San Joaquin SJMSCP, which provides coverage for impacts to biological resources pursuant to the CEQA, the CESA, and the ESA, and is approved and authorized by the CDFW and USFWS. An existing agricultural well is located within the central portion of the Project Site.

The Project is located in an area that is primarily agricultural in nature. The parcels surrounding the Project Site to the east, south, and west are characterized by the same General Agricultural zoning and land use designations present at the Project Site. The parcels surrounding the Project Site to the north, across Copperopolis Road, are characterized by Rural Residential zoning and land use designations. The Project Site is surrounded to the east, south, and west by fallow agricultural land. Existing sub-transmission lines parallel both sides of Copperopolis Road, which abuts the Project Site to the north. Scattered single-family residences exist immediately to the east of the Project Site as well as north of Copperopolis Road, separating the Project Site from additional fallow agricultural land. The nearest offsite residence is adjacent to the northwestern boundary of the Project Site along Copperopolis Road, and another residential property is adjacent to the eastern boundary of the Project Site along Copperopolis Road. Both offsite residences are approximately 30 feet away from the Project Site. Most of the residences in the surrounding area are naturally screened from the Project by their own agricultural uses and existing trees. The Project Site is approximately 1.84 miles south of Highway 26, 4.2 miles east of Highway 99, and 1.1 miles north of Highway 4. Mormon Slough, a waterway channel, runs approximately 0.3 miles south of the Project Site. Garden Acres, a census designated place within San Joaquin County, is two miles west of the Site. The location of the Project Site and surrounding land uses are shown above in Figure 2.

10. Required Entitlements and Public Agencies Whose Approval is Required

- San Joquin County Conditional Use Permit (CUP) and lot line adjustment/merger request (if required)
- San Joaquin Valley Air Pollution Control District (SJVAPCD)
- San Joaquin Council of Governments (SJCOG)
- State Water Resources Control Board (SWRCB)

At this time federal funds are not anticipated to be used for this Project, but should they be in the future the Project would be subject to United States Department of Agriculture (USDA) approval.

11. Have California Native American Tribes Traditionally and Culturally Affiliated with the Project Area Requested Consultation Pursuant to Public Resources Code Section 21080.3.1?

On November 6, 2025, San Joaquin County sent Assembly Bill (AB) 52 notification letters via certified mail to Native American tribes who requested notification under AB 52. Under AB 52, Native American tribes have 30 days to respond and request further Project information and request formal consultation. The County did not receive a request for formal consultation under AB 52.

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Environmental Factors Potentially Affected

This project would potentially affect the environmental factors checked below, involving at least one impact that is “Potentially Significant” 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

Determination

Based on this initial evaluation:

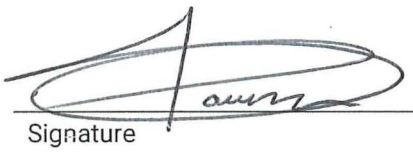
☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

■ 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 to 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 “less than significant with mitigation incorporated” 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 potential 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

10/19/2026

Date

JACOB PANULE

Printed Name

ASSOCIATE PLANNER

Title

Environmental Checklist

1 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 a 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 that would adversely affect daytime or nighttime views in the area?	☐	☐	☐	■

a. Would the project have a substantial adverse effect on a scenic vista?

A scenic vista is generally defined as a view from a public place that is expansive and considered by the County to be important. It can be seen from an elevated position or from a roadway with a longer-range view of the landscape.

The San Joaquin County General Plan states that views of the Delta, agriculturally rich valley floor, and Coast Ranges and Sierra Nevada mountains serve as the primary scenic resources within the county (San Joaquin County 2016). Due to the flat topography of the Project Site and surrounding terrain, distant views of the Sierra Nevada mountains and the Coast Ranges are available in the Project vicinity. However, due to distance, atmospheric haze, intervening vegetation and structures, views of the Sierra Nevada mountains are largely obscured from the Project Site. Views of the Delta and the Coast Ranges from the Project Site are completely obscured. Expansive views of agricultural resources in the Project vicinity are limited due to the intervening rural residences and associated structures and vegetation. In addition, there are no scenic vistas through the Project Site, as there are no elevated public viewpoints in the surrounding area from which views of the surrounding mountain ranges or valley floor are available. Therefore, the Project would not have a substantial adverse effect on a scenic vista. No impact related to scenic vistas would occur.

NO IMPACT

b. Would the project substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

According to the California Department of Transportation (Caltrans) State Scenic Highway System Map, there are no State-designated scenic highways in the vicinity of the Project Site. The nearest designated scenic highways are Route 580, located just southwest of the City of Tracy and approximately 26 miles

southwest of the Project Site, and Route 160 located approximately 27 miles northwest of the Project Site along Sacramento River (Caltrans 2018). These portions of Route 580 and Route 160 are not visible from the Project Site due to distance and existing intervening vegetation and development. Furthermore, the Project Site has historically been used for agricultural production and is currently disturbed and undeveloped. The Project would not include the removal of existing trees, and there are no rock outcroppings or historic buildings on the Project Site. Additionally, as described in Figure NCR-1 included in the Natural and Cultural Resources Element of the San Joaquin County General Plan, the nearest locally designated scenic roadway is State Route (SR) 26 which is approximately 1.8 miles north of the Project Site (San Joaquin County 2016). Due to intervening landscaping and development, the Project Site is not visible from this roadway. Therefore, the Project would not result in damage to scenic resources within a designated or eligible State Scenic Highway or a locally designated scenic roadway. No impact related to scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway, would occur.

NO IMPACT

c. *Would the project, 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 a 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?*

The Project Site is in a non-urbanized area;[3] therefore, this discussion analyzes the Project's potential to substantially degrade the existing visual character or quality of public views of the Project Site and its surroundings.

The Project Site is comprised of disturbed land, largely occupied by non-native grasses and forbs. The Project Site is surrounded to the north, west, and south by fallow agricultural land. Scattered single-family residences exist immediately to the northwest, northeast, and east of the Project Site as well as north of Copperopolis Road, separating the Project Site from additional fallow agricultural land. The Project involves the construction, operation, and future decommissioning of a ground-mounted solar PV energy generation facility, which would interconnect to the existing Pacific Gas and Electric (PG&E) electrical distribution system that is located in the public right-of-way along the south side of Copperopolis Road, where existing sub-transmission lines parallel both sides of the public right-of-way, via an underground medium voltage electrical collection line and pole mounted infrastructure. The new interconnection infrastructure associated with the Project would not represent a substantial deviation from the existing visual character of the public right-of-way, where transmission infrastructure is already present. Under present conditions, public views of the Project Site can be obtained from the adjacent rights-of-way of Copperopolis Road and Best Road. The solar facility would have limited (approximately 380 feet) frontage on Copperopolis Road and would be set back at least 80 feet from the roadway; therefore, views of the Project from Copperopolis Road would be limited. Additionally, due to the on-site residence along Best Road, the Project would not be visible from that roadway.

While the Project would introduce a moderate degree of change in local visual quality (from fallow field to a solar facility), given the low-to-moderate visual sensitivity of motorists traveling along Copperopolis Road,the short duration, and 80 foot setback from the roadway, impacts to visual character and quality from this vantage point would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

[3] California Public Resources Code Section 21071 defines an unincorporated area as an "Urbanized area" only when the area is completely surrounded by one or more incorporated cities, or located within an urban growth boundary and has an existing residential population of at least 5,000 persons per square mile. The nearest city to the Project Site is Stockton which does not surround the Project Site. The site is also not within the City's sphere of influence (San Joaquin LAFCO 2022).

d. Would the project create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?

Due to the rural nature of the area around the Project Site, existing light and glare in the area is minimal with most light and glare coming from existing residences or cars travelling on adjacent roads including Copperopolis Road and Best Road. Construction and future decommissioning of the Project would occur during daylight hours and would not require lighting. During operation, the Project may require minimal nighttime lighting near the transformer. If nighttime lighting is required, this lighting would be down shielded resulting in no light spillover beyond the Project boundaries in compliance with Section 9-403.050 of the San Joaquin County Code. Therefore, the Project would not create a new source of substantial light that would adversely affect daytime or nighttime views in the area and no impact would occur.

Solar PV generation systems are inherently designed to absorb rather than reflect solar rays. Further, the solar modules used for the Project have an anti-reflective coating that would limit the potential to cause glare. This would ensure the Project would not introduce new sources of light and substantial glare. Therefore, the proposed Project would not create a new source of substantial glare that would adversely affect daytime or nighttime views in the area, and no impact would occur.

NO IMPACT

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2 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 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?	☐	☐	■	☐

a. Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

The 14.2-gross-acre Project Site is classified by the California Department of Conservation (DOC) as Farmland of Statewide Importance (DOC 2026a). Farmland of Statewide Importance is defined as similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date. As described in the *Surrounding Land Uses and Setting* above, an orchard was previously planted on the Project Site (including the surrounding parcels to the west and south) and was removed sometime in 2023 or 2024, and the Site has since been fallow and is disked once per year. Thus, although no agricultural production is currently present on the Project Site, the Site was used for irrigated agricultural production within the last four years. The Project Site overlies the Eastern San Joaquin Subbasin, which is part of the San Joaquin Valley Groundwater Basin (California SWRCB 2006). Groundwater level measurements within the Eastern San Joaquin Subbasin have been in continuous decline over the last 40 years which impacts groundwater resources available for agricultural production (San Joaquin County 2014). As of 2022, the DOC mapped approximately 81, 239 acres of Farmland of Statewide Importance in the County (DOC 2026b); therefore, the Project Site represents approximately 0.02 percent of the County's Farmland of Statewide Importance. The San Joaquin County General Plan includes Policy NCR-5.6 which discourages the placement of energy facilities on Prime Farmland. The Project would not be located on Prime Farmland and would not permanently convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use. The Project Site is not currently used for agricultural operations and future agricultural operations are not planned on the Project Site.

The Project involves the construction, operation, and decommissioning of a solar PV facility on approximately 12.2 acres of the 14.2-gross-acre parcel. The chemical and physical soil properties of the soil would remain substantially the same under Project conditions. Soil must meet the physical and chemical criteria for Prime Farmland or Farmland of Statewide Importance as determined by the United States Department of Agriculture Natural Resources Conservation Service (NRCS). Factors considered in qualification of a soil by the United States National Resources Conservation Service include, but are not limited to, acid-alkali balance, soil sodium content, erodibility, rock fragment content, and water moisture regimes (DOC 2026c). For the reasons explained below, Project construction, operation and maintenance would have a less-than-significant impact on the physical and chemical composition of on-site soils, which underly the Project, at the end of the Project's anticipated 35 year lifespan. No application of fertilizers or other soil amendments, which would alter the chemical composition of the existing soil by adding supplemental nutrients, is proposed. Water-based dust suppression or appropriate soil stabilizers would be used for dust suppression, limiting on-site erosion and maintaining present erodibility. Upon decommissioning, Project infrastructure would be removed and the Project Site returned to a condition suitable for agricultural use pursuant to the requirements of a County-approved Decommissioning Plan and all applicable federal, state, and County regulations. The access road and other areas that were compacted during construction, operations, and decommissioning would be tilled to restore the sub-grade material to match the depth and density of surrounding properties pursuant to the required decommissioning plan. Therefore, the Project would not permanently impact the agricultural value of the Project Site. Additionally, as stated above, the Project Site is not actively used for agriculture. The Project would not remove any active agricultural uses and would not preclude future agricultural uses at the Site. The Project would include the planting of pollinator vegetation across the entire Project Site consisting of native drought tolerant species. This vegetation would attract pollinators to the area which could have off site benefits on nearby agricultural operations. The pollinator vegetation would be removed during Project decommissioning. Planting of the pollinator vegetation on site would not substantially change the characteristics of the soil on site, nor would it preclude the planting of agricultural crops after Project decommissioning. Overall, the Project would not affect the Project Site's long-term suitability for agricultural use or permanently convert Prime Farmland to a non-agricultural use. As such, impacts related to conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

b. Would the project conflict with existing zoning for agricultural use or a Williamson Act contract?

The Project Site is zoned AG-40 (General Agriculture, 40-acre minimum) and has a General Plan land use designation of General Agriculture (A/G) (San Joaquin County 2025a). Solar energy facilities within the AG-40 (General Agriculture, 40-acre minimum) zoning district are conditionally permitted uses in San Joaquin County according to San Joaquin County Ordinance Code, Chapter 9-203.020, and require approval of a CUP in compliance with Chapter 9-804. As such, the Project would not conflict with existing agricultural zoning, with compliance with applicable County development standards and CUP conditions of approval. While the Project Site is designated as Farmland of Statewide Importance, it does not currently support active agricultural use. As discussed throughout this section, implementation of the Project would not adversely affect or preclude future agricultural production on the Project Site following the Project's anticipated 35-year lifetime in accordance with San Joaquin County Code Section 9-409.430(b)(5), Farmland Protection.

San Joaquin County participates in the Williamson Act program; however, the Project Site (Assessor Parcel Numbers: 103-220-220, 103-220-240, and 103-220-250) is not subject to a Williamson Act contract (DOC 2025). Therefore, the Project would not conflict with existing zoning for agricultural use or a Williamson Act contract and impacts related to existing zoning for agricultural use and existing Williamson Act contracts would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

c. *Would the project 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. *Would the project result in the loss of forest land or conversion of forest land to non-forest use?*

The Project Site does not contain any forest land or timberland, and the Project Site is not zoned as forest land, timberland, or timberland zoned Timberland Production. Additionally, the surrounding properties are not zoned as forest land, timberland, or timberland zoned Timberland Production; and the surrounding properties do not contain any forest land or timberland. Therefore, there would be no impact to forest land.

NO IMPACT

e. *Would the project 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?*

The Project Site is bordered to the west by fallow agricultural land on a parcel classified as Prime Farmland. The Project Site is located in an area generally characterized by rural residences and agricultural uses. The Project would temporarily convert approximately 12.2 acres of land classified as Farmland of Statewide Importance to solar energy use. The solar energy use is temporary (35-year Project life), reversible upon decommissioning, and limited in scope, as described under impact a. Therefore, agricultural operations could resume on the Project Site after Project decommissioning and the Project would not impact the Site's ability to be used for agricultural operations. No induced or indirect conversion of additional farmland beyond the Project boundary would occur. The Project Site does not contain agricultural support infrastructure such as agricultural processing facilities and would not cause the closure of these off-site. Additionally, no new uses proposed within the Project Site would inhibit or preclude present or future agricultural use in the surrounding area. For example, implementation of the Project would not divide or physically interfere with an existing agricultural operation, would not degrade existing soil quality, and would yield relatively low water consumption compared to surrounding agricultural uses. Additionally, as described in criterion a, the Project would include the planting of pollinator vegetation across the entire Project Site consisting of native drought tolerant species. This vegetation would attract pollinators to the area which could have off site benefits on nearby agricultural operations. Since no forest land exists on or adjacent to the Project Site, there will be no conversion of forest land to non-forest use. Overall, impacts related to conversion of Farmland to non-agricultural use would be less than significant

LESS-THAN-SIGNIFICANT IMPACT

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3 Air Quality

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than - Significant Impact	No Impact
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?	☐	☐	■	☐

Criteria air pollutant emissions generated by Project construction, operation, and decommissioning were estimated using the California Emissions Estimator Model (CalEEMod), version 2022.1. CalEEMod uses project-specific information, including the Project's land use and location to model a Project's construction and operational emissions. The calculation methodology and input data used in CalEEMod can be found in the CalEEMod User's Guide Appendices C, D, and G (California Air Pollution Control Officers Associated [CAPCOA] 2022). The analysis reflects the construction, operation, and decommissioning of the Project as described in the *Description of Project* section.

Project construction would primarily generate temporary criteria pollutant from construction equipment operation on-site, construction worker vehicle trips to and from the site, and export of demolished materials off-site. Construction of the proposed Project was assumed to occur over six months, with start and end dates subject to permitting and project scheduling. Applicant-provided information was used to populate the construction schedule and their respective equipment lists. Where specific information was not available, CalEEMod default information was utilized. Construction emissions account for emissions generated by construction equipment used on-site and emissions generated by vehicle trips associated with construction, such as worker and vendor trips. CalEEMod estimates construction emissions by multiplying the amount of time equipment is in operation by emission factors. Because decommissioning would utilize the same equipment for roughly the same duration, decommissioning emissions are estimated to be equal to those of construction.

Operational emissions modeled include mobile source emissions from the 20 annual operations and maintenance visits, including the two annual panel washings. Because operation of the solar arrays would generate electricity, there would not be any criteria pollutant emissions attributed to energy use. The following analysis is based upon the calculations found in Appendix A.

a. Would the Project conflict with or obstruct implementation of the applicable air quality plan?

The Project Site is in the San Joaquin Valley Air Basin (SJVAB) and is under the jurisdiction of the SJVAPCD. The SJVAPCD is in non-attainment for ozone, particulate matter with diameters less than 10 microns (PM_{10}), and particulate matter with diameters less than 2.5 microns ($PM_{2.5}$). The SJVAPCD has prepared several air quality attainment plans to achieve ozone and particulate matter standards, the most recent of which include the *2020 Reasonably Available Control Technology Demonstration for the 2015 8-Hour Ozone Standard* and the *2013 Plan for the Revoked 1-Hour Ozone Standard, 2007 PM_{10} Maintenance Plan and Request for Re-designation, 2012 $PM_{2.5}$ Plan,* and *2015 Plan for the 1997 $PM_{2.5}$ Standard*. The SJVAB is in

attainment for carbon monoxide (CO), sulfur dioxide, and lead, and there are no attainment plans for those pollutants.

Construction, operation, and decommissioning of the Project would result in emissions of criteria pollutants including ozone precursors (such as reactive organic compounds [ROG] and nitrogen oxides [NO_X]) and particulate matter. Per Section 7.12 of the *Guide for Assessing and Mitigating Air Quality Impacts* (GAMAQI), the SJVAPCD has determined that projects with emissions above the thresholds of significance for criteria pollutants would conflict with/obstruct implementation of the SJVAPCD's air quality plans (SJVAPCD 2015). As discussed under criterion 3(b), below, Project construction, operation, and decommissioning would not exceed regulatory thresholds and thus would not have significant impacts with respect to criteria pollutant emissions. Therefore, the Project emissions would not conflict with, or obstruct implementation of, existing air quality plans at a local level. As such, impacts related to the applicable air quality plan would be less-than-significant.

LESS-THAN-SIGNIFICANT IMPACT

b. Would the Project 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?

Air pollution is largely a cumulative impact. The nonattainment status of the SJVAPCD for regional pollutants is a result of past and present development, and SJVAPCD develops and implements plans for the future attainment of ambient air quality standards. Using the emissions levels required based on the air quality management plans, the SJVAPCD has developed emissions thresholds under which individual Projects would not be anticipated to hinder the SJVAPCD's attainment of the ambient air quality standards. Based on these considerations, Project-level thresholds of significance for criteria pollutants are relevant in the determination of whether a project's individual emissions would have a cumulatively significant impact on air quality.

The SJVAB is a nonattainment area for ozone, PM_{10}, and $PM_{2.5}$ under the National Ambient Air Quality Standards (NAAQS) and/or California Ambient Air Quality Standards (CAAQS). The current air quality in the SJVAB is the result of cumulative emissions from motor vehicles, off-road equipment, commercial and industrial facilities, and other emission sources. Projects that emit these pollutants or their precursors (i.e., ROG and NO_X for ozone) potentially contribute to poor air quality.

The SJVAPCD provides quantitative thresholds to determine the significance of temporary construction-related pollutant emissions and long-term operational-related pollutant emissions. These thresholds are shown in Table 1.

Table 1 SJVAPCD Air Quality Significance Thresholds

Pollutant	Construction Thresholds (tons per year)	Operation Thresholds (tons per year)
NO_X	10	10
ROG[1]	10	10
PM_{10}	15	15
$PM_{2.5}$	15	15
SO_X	27	27
CO	100	100

NO_X= nitrous oxides; ROG = reactive organic gases; PM_{10} = particulate matter with a diameter of 10 microns or less; $PM_{2.5}$ = particulate matter with a diameter of 2.5 microns or less; SOx = sulfur oxide; CO = carbon monoxide

[1] ROG are formed during combustion and evaporation of organic solvents. ROG are also referred to as VOC.

Source: San Joaquin Valley Air Pollution Control District 2015

In addition to the criteria pollutant thresholds outlined above, the SJVAPCD has published the *Ambient Air Quality Analysis Project Daily Emissions Assessment* guidance, which is summarized in Section 8.4.2, *Ambient Air Quality Screening Tools*, of the GAMAQI. The GAMAQI provides a screening threshold of 100 pounds per day of any of the following pollutants: NO_X, ROG, PM_{10}, $PM_{2.5}$, sulfur oxide, and CO. The screening threshold was used to evaluate localized construction activities and operational activities separately. SJVAPCD recommends that an ambient air quality analysis be performed when the increase in on-site emissions from construction activities exceeds the 100 pounds per day screening level of any criteria pollutant. Pursuant to SJVAPCD's GAMAQI and Rule 9510 – Indirect Source Review, when assessing the significance of Project-related impacts on local air quality, the impacts may be significant if on-site emissions from construction or operational activities exceed the 100 pounds per day screening level after implementation of all enforceable mitigation measures (SJVAPCD 2015). The Project would be subject to Rule 9510, because it would develop more than 9,000 square feet, which is the ambient air quality analysis screening level threshold for unconventional land use developments not identified as residential, commercial, or industrial (e.g., a solar facility).

Construction and Decommissioning Emissions

Annual Criteria Air Pollutant Emissions

Project construction would generate air pollutant emissions from entrained dust, off-road equipment uses, vehicle emissions, and architectural coatings. Off-site emissions would be generated by construction workers' daily commute trips and heavy-duty diesel haul and vendor truck trips. Project construction is assumed to occur over approximately 6 months. Construction emissions would vary substantially from day-to-day, depending on the level of activity, the specific type of operation, and, for dust, the prevailing weather conditions.

At the time of preparation of this environmental document, the nature of the equipment available at the time of decommissioning is unknown, as is the extent of activities that would be required during decommissioning. Therefore, for this analysis, it was assumed that decommissioning activities would be similar to those of construction activities and therefore emissions from decommissioning would be equal to that of construction emissions. It is likely that decommissioning activities would be less intensive than construction especially given the fact that decommissioning would commence approximately 35 years into the future, and the efficiency of vehicles and equipment would be better and emit fewer pollutants.

Table 2 shows the estimated annual construction and decommissioning emissions by construction phase. Most particulate matter emissions are fugitive emissions. As shown, the annual construction and decommissioning emissions would not exceed the SJVAPCD's annual significance thresholds for any criteria pollutant. As such, impacts related to criteria pollutants would be less-than-significant.

Table 2 Annual Construction and Decommissioning Emissions

	Emissions (Tons per Year)					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Full Duration of Construction	<1	1	1	<1	<1	<1
Full Duration of Decommissioning	<1	1	1	<1	<1	<1
Significance Threshold	10	10	100	27	15	15
Exceed Significance Threshold?	No	No	No	No	No	No

ROG = reactive organic gases; NO_X = nitrous oxides; CO = carbon monoxide; SO_x = sulfur oxide; PM_{10} = particulate matter with a diameter of 10 microns or less; $PM_{2.5}$ = particulate matter with a diameter of 2.5 microns or less

Notes: Rounded values shown; columns may not total exactly. See Appendix A for calculations.

Furthermore, the Project would comply with SJVAPCD Rule 9510, Indirect Source Review, which requires large development projects to reduce exhaust emissions from construction equipment by 20 percent for NO_X and 45 percent for PM_{10} compared to the statewide average or demonstrate use of a clean fleet (such as United States Environmental Protection Agency [USEPA] Tier 4 equipment).[4] Compliance with SJVAPCD Rule 9510 could result in additional emissions reductions that were conservatively not included in Project estimates. In addition, the Project Applicant would create a dust control plan and implement dust control measures pursuant to SJVAPCD Rule 8021 which would further reduce dust emissions.

Daily Criteria Air Pollutant Emissions

Construction and decommissioning activities would not exceed SJVAPCD's recommended 100 pounds per day screening threshold during construction, as shown in Table 3. Because daily emissions from Project construction and decommissioning would not exceed screening thresholds, the Project would not contribute cumulatively to a net increase in criteria pollutants.

Table 3 Maximum Daily Construction and Decommissioning Emissions

	Emissions (pounds/day) by Phase					
	ROG	NO_X	CO	SO_X	PM_{10}[1]	$PM_{2.5}$[1]
Maximum Daily Emissions (Construction)	1.1	10.4	16.2	<1	1.1	0.5
Maximum Daily Emissions (Decommissioning)	1.1	10.4	16.2	<1	1.1	0.5
Screening Threshold	100	100	100	100	100	100
Exceed Screening Threshold?	No	No	No	No	No	No

ROG = reactive organic gases; NO_X = nitrous oxides; CO = carbon monoxide; SO_x = sulfur oxide; PM_{10} = particulate matter with a diameter of 10 microns or less; $PM_{2.5}$ = particulate matter with a diameter of 2.5 microns or less

[1] Includes compliance with Rule 8021 dust control measures, which accounts for watering.

Source: Appendix A

Operational Impacts

Annual and Daily Criteria Air Pollutants

The Project would generate criteria pollutants during operations resulting from area sources (e.g., consumer products used during maintenance activities), and mobile sources (e.g., vehicle emissions). CalEEMod default values for operations were used for the most conservative estimates for emissions, and would generally overestimate the amount of vehicle trips, water usage, energy usage, etc. for Project operations. As shown in Table 4, operational emissions from the Project would not exceed SJVAPCD annual significance thresholds for any criteria pollutant. In addition, Table 5 demonstrates that daily operational emissions would not exceed SJVAPCD daily screening thresholds for any criteria pollutant. As such, impacts related to criteria air pollutants would be less-than-significant.

[4] While the Project may use construction equipment outfitted with engines that meet the USEPA Tier 4 standard, modeling assumed default engine tiers for the most conservative estimates.

Table 4 Estimated Annual Operational Emissions

	Emissions (tons/year)					
Source	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Area[1]	<1	<1	<1	<1	<1	<1
Energy	0	0	0	0	0	0
Mobile	<1	<1	<1	<1	<1	<1
Total	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**
Significance Threshold	10	10	100	27	15	15
Exceed Significance Threshold?	No	No	No	No	No	No

ROG = reactive organic gases; NO_X = nitrous oxides; CO = carbon monoxide; SO_x = sulfur oxide; PM_{10} = particulate matter with a diameter of 10 microns or less; $PM_{2.5}$ = particulate matter with a diameter of 2.5 microns or less

[1]Area source emissions are associated with emissions of consumer products used for cleaning and landscaping emissions, and are conservatively included for this analysis

Totals may not add up due to rounding vehicles. See Appendix A for calculations.

Table 5 Estimated Daily Operational Emissions

	Emissions (lbs/day)					
Source	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Combined Total Daily Operations	<1	<1	<1	<1	<1	<1
SJVAPCD Operational Screening Threshold	100	100	100	100	100	100
Exceed Screening Threshold?	No	No	No	No	No	No

ROG = reactive organic gases; NO_X = nitrous oxides; CO = carbon monoxide; SO_x = sulfur oxide; PM_{10} = particulate matter with a diameter of 10 microns or less; $PM_{2.5}$ = particulate matter with a diameter of 2.5 microns or less

Totals may not add up due to rounding vehicles. See Appendix A for calculations.

Furthermore, renewable energy projects, such as the Project, assist utilities like PG&E and the State of California in achieving criteria air pollutant emission reductions by providing the means of generating electricity as a source of renewable energy. By expanding access to renewable energy systems, the Project would support reducing the need for additional electricity to be generated by fossil fuel power plants. The energy conservation achieved by the Project would reduce fossil fuel consumption, thereby reducing criteria air pollutant emissions from the electricity sector.

For the reasons stated above, impacts related to criteria pollutants for Project construction, operation, and decommissioning would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

c. Would the Project expose sensitive receptors to substantial pollutant concentrations?

The nearest sensitive off-site receptors to the Project Site, located along Copperopolis Road, are a residential property adjacent to the western boundary of the Project Site and another residential property adjacent to the eastern boundary of the Project Site. The residential property to the west is approximately 39 feet west of the nearest solar array. The residential property to the east is approximately 120 feet north of the nearest solar array. Other nearby residences are to the northwest, northeast, east, and south of the Project Site. Air quality varies based on the amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. Air quality problems leading to health impacts arise when the rate of pollutant emissions exceeds the rate of dispersion. Some land uses are more sensitive to changes in air quality than others, depending on the population groups and the activities involved. Sensitive receptors that are most likely to be affected by air pollution include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases (CARB 2026a, SJVAPCD 2015). Potential harmful airborne pollutants that could be generated by the Project are toxic air

contaminants (TAC), CO, and spore-containing fugitive dust that can cause Valley Fever. Therefore, each of these is addressed under this criterion with respect to the Project.

Toxic Air Contaminants

TACs are airborne substances that are a diverse group of air pollutants that may cause or contribute to an increase in deaths or serious illness, or that may pose a present or potential hazard to human health. TAC impacts are described by carcinogenic risk and by chronic (i.e., long duration) and acute (i.e., severe but of short duration) adverse effects on human health.

Construction and Decommissioning

The greatest potential for TAC emissions during construction and decommissioning would be diesel particulate matter (DPM) emissions associated with heavy-duty equipment during the 6-month construction period and decommissioning activities. Generation of DPM from construction projects typically occurs in a single area for a short period. The dose to which the receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance or substances in the environment and the extent of exposure that a person has with the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the Maximally Exposed Individual. The risks estimated for a Maximally Exposed Individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to toxic emissions, should be based on a 30-year exposure period, the approximate time that a person spends in a household. Construction and decommissioning of the Project would occur over 6 months, which is less than 2 percent of the 30-year exposure period and would limit the impact of TAC emission exposure to sensitive receptors around the Project Site.

As shown in Table 4 and Table 5, the total PM10 emissions[5] from construction would be well below the SJVAPCD annual and maximum daily significance thresholds. As DPM is a component of PM_{10} exhaust that contributes to the total PM_{10} emissions, DPM emissions would be low as well. Furthermore, as construction and decommissioning of the Project would occur across the Project Site, emissions from these activities also would be diluted across the large Project Site. In addition, the most intensive construction activities would occur where the solar arrays would be installed, which would be at least 71 feet away from the nearest sensitive receptor. Air pollutants concentrations from Project construction and decommissioning would also drop off rapidly as air dispersion occurs, minimizing potential exposure and potential health risks to sensitive receptors. The Project would adhere to all applicable SJVAPCD requirements and control strategies intended to reduce emissions from construction equipment and activities, including all rules under Regulation VIII, *Fugitive PM_{10} Prohibitions,* and Rule 9510, *Indirect Source Review*. Furthermore, the Project would comply with the CARB Air Toxics Control Measure that limits diesel powered equipment and vehicle idling to no more than five minutes at a location, and the CARB In-Use Off-Road Diesel Vehicle Regulation; compliance with these would minimize emissions of TACs during construction. Therefore, due to the short-term nature of construction and decommissioning activities and the time between construction and decommissioning activities, air quality impacts related to construction and decommissioning generated TAC emissions would be less than significant.

Operation

CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (April 2005) recommends against siting sensitive receptors within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day, and within 1,000 feet of industrial land uses such as warehouses and distribution centers with more than 100 truck trips per day. These distances are used as general guidance for the recommended distance between sensitive receptors and sources of TAC emissions, with the primary source of TAC emissions coming from DPM. The solar Project is not a land use typically associated

[5] Total PM_{10} emissions reported in Table 4 and Table 5 are comprised of PM_{10} from fugitive dust and PM_{10} from engine exhaust, which are particulate emissions from combustion engines and would include DPM.

with high health risk, and there are no stationary sources of TAC. The Project would result in trips from 20 annual operations and maintenance visits, including two panel washings, which would generate minor amounts of DPM to be emitted from maintenance vehicles that will occasionally access the site. Furthermore, TACs would not be generated by operation of the solar panels at the Project Site. Therefore, the level of emissions and duration of exposure would be minimal and the Project would not emit substantial amounts of TACs during normal operations, as shown in Table 5. As such, Project operations would not expose sensitive receptors to substantial TAC concentrations and impacts would be less-than-significant.

Carbon Monoxide Hotspots

A CO hotspot is a localized concentration of CO that is above a CO ambient air quality standard and is associated with long-term operational emissions. Localized CO hotspots can occur at intersections with heavy peak hour traffic. Specifically, hotspots can be created at intersections where traffic levels are sufficiently high such that the local CO concentration exceeds the federal one-hour standard of 35 parts per million or the federal and State eight-hour standard of 9 parts per million (CARB 2026). The entire SJVAB is in conformance with State and federal CO standards and no air quality monitoring stations report CO levels in the SJVAPCD jurisdiction. Additionally, CARB no longer reports CO concentrations anywhere in California. Based on the low background level of CO in the SJVAB (indicated by the lack of monitoring at State or local levels), the low and the ever-improving emissions standards for new sources in accordance with State and federal regulations, and the fact that the Project would result in 20 annual operations and maintenance visits, including two panel washings per year, the Project would not result in a CO hotspot. Additionally, as demonstrated under criterion 3(b), above, CO emissions during construction, operation, and decommissioning for the overall Project, including mobile sources, would not exceed ambient air quality standards. Therefore, the Project would not expose sensitive receptors to substantial CO concentrations, and localized air quality impacts related to CO hot spots would be less-than-significant.

Valley Fever

Construction activities that include ground disturbance can result in fugitive dust, which can cause fungus *Coccidioides* spores to become airborne if they are present in the soil. These spores can cause Valley Fever, which is a lung infection caused by the fungus *Coccidioides* that is found in the soil in some parts of the United States. Workers who disturb soil where fungal spores are found, whether by digging, operating earthmoving equipment, driving vehicles, or by working in dusty, wind-blown areas, are more likely to breathe in spores and become infected. It is not a contagious disease, and secondary infections are rare. The Project is located in San Joaquin County, which reported 119 preliminary[6] cases between January 1, 2026 and May 31, 2026 (California Department of Public Health 2026).

Construction and decommissioning activities associated with the Project would include ground-disturbing activities that could result in an increased potential for exposure of nearby residents and on-site workers to airborne spores if they are present. Compliance with dust control measures required by SJVAPCD Rule 8021 would minimize personnel and public exposure to Valley Fever and reduce the potential risk of nearby resident and on-site worker exposure to Valley Fever. In addition, the Project would adhere to the California Code of Regulations (CCR), Title 8, Sections 342, 3203, 5141, 5144, and 14300, related to Valley Fever protection and exposure, which would reduce potential risks by requiring incident reporting; requiring implementation of an Injury and Illness Prevention Program; and providing respiratory protection guidance. However, impacts related to Valley Fever resulting from the Project may still be potentially significant. Therefore, a mitigation measure is necessary to provide for protection beyond the regulatory requirements in order to reduce this potentially significant impact to a less- than-significant level. As such, implementation of Mitigation Measure AQ-1 is required to reduce impacts to a less-than-significant level.

[6] Preliminary cases include confirmed, probable, and suspected cases that are not yet finalized or confirmed by California local health jurisdictions.

Mitigation Measures

AQ-1 Minimize Personnel and Public Exposure to Valley Fever

Prior to site preparation, grading activities, or ground disturbance, the Project Applicant shall prepare a Fugitive Dust Control Plan for the Project. The Fugitive Dust Control Plan shall include the following at a minimum:

- Equipment, vehicles, and other items shall be cleaned thoroughly of dust before they are moved off-site to other work locations.
- Wherever possible, grading, and trenching work shall be phased, so that earth-moving equipment works well ahead or down-wind of workers on the ground.
- The area immediately behind grading or trenching equipment shall be sprayed with water before ground workers move into the area.
- If a water truck runs out of water before dust is dampened sufficiently, ground workers exposed to dust are to leave the area until a full truck resumes water spraying.
- All heavy-duty earth-moving vehicles shall be closed-cab and equipped with a High Efficiency Particulate Arrestance-filtered air system, or High Efficiency masks that can be worn by the vehicle operators.
- N95 respirators shall be available to on-site workers for the duration of the construction period.
- Workers shall receive training to recognize the symptoms of Valley Fever and shall be instructed to promptly report suspected symptoms of work-related Valley Fever to a supervisor. Evidence of training shall be kept on-site for review as required by regulatory agencies.
- Valley Fever information shall be available on-site for all construction personnel. The information shall provide, at a minimum, a description of the symptoms, health effects, preventative measures, and treatment.

Significance After Mitigation

Mitigation Measure AQ-1 would ensure that construction worker exposure to Valley Fever is less-than-significant by requiring the preparation and implementation of a Fugitive Dust Control Plan for the Project which includes dust suppression measures, respiratory protection for workers, and Valley Fever awareness and training to minimize worker exposure to airborne dust. Overall, impacts would be less than significant after mitigation.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

d. Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

The Project would generate oil and diesel fuel odors during construction and decommissioning from equipment use and odors related to paving the access driveway to the Project Site. The odors would be limited to the construction and/or decommissioning period and would be intermittent and temporary. Furthermore, these odors would dissipate rapidly with distance from in-use construction equipment. With respect to operation, CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (2005) provides recommendations regarding the siting of new sensitive land uses near potential sources of odors (e.g., sewage treatment plants, landfills, recycling facilities, biomass operations, autobody shops, fiberglass manufacturing, and livestock operations). Project Site solar energy operations are not identified on this list and would not have odor sources during normal operations. Therefore, the Project would not generate objectionable odors affecting a substantial number of people, and impacts would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

4 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, or regulations, or by the California Department of Fish and Wildlife or U.S. 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 following analysis is based upon the Limited Biological Resources Assessment Memorandum (BRA) prepared for the Project by Rincon Consultants dated April 2025 (Appendix B).

a. *Would the project 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?*

Critical Habitat is a term defined and used in the ESA to specify geographic areas that contain features essential to the conservation of an endangered or threatened species, and that may require special management and protection. Critical Habitat may also include areas that are not currently occupied by the species but will be needed for its recovery.

The Project Site does not fall within critical habitat limits for any special-status wildlife or plant species. The nearest mapped critical habitat is approximately 6.50 miles east of the Project Site for vernal pool fairy shrimp (*Branchinecta lynchi*).

Special-Status Plant Species

As discussed in Appendix B, results of the USFWS Information for Planning and Consultation (IPaC), the CDFW California Natural Diversity Database (CNDDB), and California Native Plant Society (CNPS) searches identified 18 special-status plant species known to occur within the 2-mile/nine-quad search radius of the Project Site (CNPS 2026, CNDDB 2026, USFWS 2026a). None of these are expected to occur on the Project Site due to a lack of suitable habitat or because the Project Site is outside of the species known elevation range. In addition, the disturbed nature of the Site likely precludes special-status plants from occurring. Therefore, the Project would result in no impact to special-status species.

Special-Status Wildlife Species

Results of the CNDDB and IPaC searches indicated 26 special-status wildlife species are known to occur within the 2-mile/nine-quad search radius of the Project Site (CNDDB 2026, USFWS 2026a). Of these, five species have a moderate potential to occur in the Project Site and are discussed further below. The remaining 21 special-status wildlife species, including tricolored blackbird (*Agelaius tricolor*), are not expected to occur or have a low potential to occur due to a lack of suitable habitat or the Project Site is outside of the species' known range. Therefore, these 21 species were removed from further consideration.

Burrowing owl (*Athene cunicularia*; state SSC and candidate for listing) utilizes abandoned ground squirrel burrows in open habitats, grasslands, and disturbed areas, typically on levees, mounds or areas where there are unobstructed views of possible predators such as raptors or foxes. Prey items include insects, small mammals, reptiles and amphibians. The Project Site is within the species' known range, there are suitable burrows for nesting, and foraging habitat is present within and in the vicinity of the Project Site. In addition, there are four documented occurrences of burrowing owl within 5 miles of the Project Site (CNDDB 2026). This species is covered under the SJMSCP.

As the burrowing owl is a Covered Species under the SJMSCP, the Project Applicant would be required to comply with all provisions of the SJMSCP, which includes incidental take minimization measures to protect burrowing owls, such as discouraging the presence of ground squirrels, passively relocating burrowing owls during the non-breeding season, and implementing buffers around active burrows during the breeding season. With implementation of these measures as included in the SJMSCP, potential impacts to burrowing owl would be less than significant.

Swainson's hawk (*Buteo swainsoni;* state threatened) breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or rows of trees. Swainson's hawk requires suitable foraging areas within 10–12 miles of a nest site, such as grasslands, alfalfa, or grain fields that support small mammal populations. Swainson's hawks are known to nest in single trees on agricultural landscapes. Suitable foraging habitat for this species is present within the Project Site and in agricultural fields in the vicinity of the Project Site. Trees that may support nesting are present in adjacent rural residential parcels and the surrounding vicinity. In addition, there are 15 documented occurrences of Swainson's hawk within 5 miles of the Project Site (CNDDB 2026). This species is covered under the SJMSCP.

As the Swainson's hawk is a Covered Species under the SJMSCP, the Project Applicant would be required to comply with all provisions of the SJMSCP, which includes incidental take minimization measures to protect Swainson's Hawk, such as protecting nest trees and foraging habitat. Specifically, "[i]f the Project Proponent elects to retain a nest tree, and in order to encourage tree retention, the following Incidental Take Minimization Measure shall be implemented during construction activities:

> If a nest tree becomes occupied during construction activities, then all construction activities shall remain a distance of two times the dripline of the tree, measured from the nest.
>
> If the Project Proponent elects to remove a nest tree, then nest trees may be removed between September 1 and February 15, when the nests are unoccupied."

With implementation of these measures as included in the SJMSCP, potential impacts to Swainson's hawk would be mitigated to less than significant by ensuring construction and operation activities are conducted a safe distance from the active nests and foraging habitat is preserved.

White-tailed kite (*Elanus leucurus*; state SSC) utilizes rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. White-tailed kite forages in open grasslands, meadows, or marshes close to isolated, dense-topped trees for nesting and perching. Suitable foraging habitat for this species is present within the Project Site in the fields in the vicinity of the Project Site. Suitable nesting trees are present in the adjacent residential parcels and the surrounding vicinity of the Project Site. The nearest documented occurrence of this species is approximately 5.75 miles southwest of the Project Site from 2002 (CNDDB 2026). This species is covered under the SJMSCP.

As the white-tailed kite is a Covered Species under the SJMSCP, the Project Applicant would be required to comply with all provisions of the SJMSCP, which includes incidental take minimization measures to protect white-tailed kite, such as conducting preconstruction surveys during the nesting season (February 15 to September 15) whenever white-tailed kites are noted on site or within the vicinity of the Project Site during the nesting season, and implementing a setback of 100 feet from active nests whenever construction or other ground-disturbing activities must begin during the nesting season in the presence of nests which are known to be occupied. With implementation of these measures as included in the SJMSCP, potential impacts to white-tailed kite would be less than significant.

Loggerhead shrike (*Lanius ludovicianus*; state SSC) utilizes broken woodlands, savannah, grasslands, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub and washes. Loggerhead shrike prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting. Suitable foraging habitat for this species is present within the Project Site and in the adjacent fields in the vicinity of the Project Site. Suitable nesting habitat is present in the adjacent residential parcels and the surrounding vicinity of the Project Site. The nearest documented occurrence of this species is approximately 13.60 miles southwest of the Project Site from 2002 (CNDDB 2026). This species is covered under the SJMSCP.

As the loggerhead shrike is a Covered Species under the SJMSCP, the Project Applicant would be required to comply with all provisions of the SJMSCP, which includes incidental take minimization measures to protect loggerhead shrike, such as implementing a setback of 100 feet from active nests whenever construction or other ground-disturbing activities must begin during the nesting season in the presence of nests which are known to be occupied. With implementation of these measures as included in the SJMSCP, potential impacts to loggerhead shrike would be less than significant.

Crotch's bumble bee (*Bombus crotchii*; state candidate for listing) habitat requirements include availability of suitable colony nesting sites, floral resources to obtain nectar and pollen throughout the duration of the colony period (spring, summer and fall), and suitable overwintering sites for queens. Most bumble bees are primitively eusocial insects that live in colonies composed of a queen, workers, and, near the end of the season, reproductive members of the colony (new queens, or gynes, and males). Nest sites typically include underground cavities, wood or rock piles, brush piles, and other cavities on open west-southwest slopes bordered by trees. Little is known about hibernacula or overwintering sites. Suitable floral resources and potential nesting sites were present in the Project Site during the field survey. While there are no documented CNDDB occurrences within the nine-quad search area, the Project Site is within the current range for this species. The nearest documented occurrence in Bumble Bee Watch is approximately 22 miles southwest of the Project Site (Xerces Society 2026).

This species is not covered under the SJMSCP. As such, this species would need to be evaluated separately from the SJMSCP, as species that are candidates for listing under CESA are afforded the same protections as formally listed species. Because impacts to Crotch's bumble bee may occur in the Project Site during the Colony Active Period, this impact is potentially significant and Mitigation Measure BIO-1 is required.

Nesting Bird Species. Native nesting birds protected by the Migratory Bird Treaty Act or the California Department of Fish and Game Code may use the Project Site and surrounding habitat during the breeding season (typically February 1 through August 31). These species could be impacted by vegetation removal

(herbaceous species in the Project Site), as well as grading and other construction activities on the Project Site. Therefore, impacts to nesting birds are potentially significant and Mitigation Measure BIO-2 is required.

Mitigation Measures

BIO-1 Crotch's Bumble Bee Avoidance

Should construction begin during the Colony Active Period (March – August), a formal habitat assessment shall be performed by a qualified biologist prior to initiating ground disturbing activities to determine if suitable nesting or foraging habitat is present in the Project Site. The assessment shall include:

- Review of occurrence record data
- Analysis of foraging, nesting, and overwintering resources
- Documentation of plant species observed (including what is blooming at the time of the survey and percent cover)

The locations of any nesting resources, including rodent burrows, cavities, thatched grasses, brush, rock piles, logs, and manmade structures like dumped furniture, shall be mapped during the assessment. Areas adjacent to the Project shall also be considered, as accessible, to determine if there is suitable nesting or foraging habitat for Crotch's bumble bee.

If suitable nesting and foraging resources are detected in the Project Site during the habitat assessment, surveys following the CDFW *Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species* (CDFW 2023) shall be conducted by a qualified biologist (i.e. someone with a valid CDFW Scientific Collecting Permit for Crotch's bumble bee) to determine if Crotch's bumble bee is present in the Project Site. A minimum of three visits shall be conducted during the Colony Active Period (March – August) and will be spaced 2-4 weeks apart. If no Crotch's bumble bees are detected on the Site, no further mitigation would be required if construction begins before the next Colony Active Period. If Crotch's bumble bees are detected, nest surveys for Crotch's bumble bee shall be conducted throughout the Project Site and a 50-foot buffer, as accessible, according to the CDFW *Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species* (CDFW 2023) document. If active Crotch's bumble bee nests are detected during the surveys, they shall be avoided by a 50-foot buffer, if avoidance is possible. If avoidance is not possible, consultation with CDFW shall be initiated to determine the most appropriate strategy to avoid impacts to bumble bees on the Site, which may include obtaining an Incidental Take Permit. If construction does not begin prior to the next Colony Active Period, a new habitat assessment shall be conducted to determine site suitability for Crotch's bumble bee, and a new suite of surveys shall be conducted if suitable nesting and foraging resources are present.

If suitable foraging habitat is absent from the Project Site, but suitable nesting habitat is present on the Site and foraging habitat occurs adjacent to the Site (i.e. within 500 feet of the Site, as visible with binoculars), preconstruction nest surveys for Crotch's bumble bee shall be conducted throughout the Project Site and a 50-foot buffer, as accessible, according to the CDFW *Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species* (CDFW 2023) document 72 hours prior to construction to determine if any active Crotch's bumble bee nests are present. If no active Crotch's bumble bee nests are detected during the preconstruction nest survey, no further mitigation would be required. If Crotch's bumble bee nests are detected, they shall be avoided by a 50-foot buffer, if avoidance is possible. If avoidance is not possible, consultation with CDFW shall be initiated to determine the most appropriate strategy to avoid impacts to bumble bees on the site, which may include obtaining an Incidental Take Permit. Any Crotch's bumble bee detections in the Project Site shall be documented in the California Natural Diversity Database (CNDDB).

BIO-2 Preconstruction Nesting Bird Surveys

A preconstruction nesting bird survey shall be performed by a qualified biologist no earlier than one week prior to any ground disturbance or vegetation removal activities that start during the nesting season (February 1–August 31) to determine if any native birds are nesting on or near the Project Site (including a 250-foot buffer for raptors, where accessible). If any active nests are detected during surveys, a suitable avoidance buffer from the nests shall be determined by a qualified biologist based on species, location, and extent and type of planned construction activity. These nests shall be avoided until the chicks have fledged and/or the nests are no longer active, as determined by the qualified biologist.

Any ground disturbance or suitable nesting habitat (i.e., trees and vegetation) that would need to be removed under the Project shall occur outside of the bird breeding season (September 1–January 31) to avoid impacts to nesting birds, when feasible.

Significance After Mitigation

Mitigation Measure BIO-1 would reduce potential impacts to Crotch's bumble bee to less-than-significant by requiring a formal habitat assessment and focused surveys for this species be completed should construction begin during the Colony Active Period to determine if suitable habitat and Crotch's bumble bees are present on the Project Site. If suitable habitat is present and subsequent surveys identify Crotch's bumble bee on the Project Site that cannot be avoided, consultation with CDFW would be required to determine if issuance of an Incidental Take Permit (ITP) would be necessary to avoid and/or minimize impacts to Crotch's bumble bee. Therefore, impacts would be less than significant after mitigation.

Mitigation Measure BIO-2 would reduce potential impacts to nesting birds to less-than-significant by requiring the completion of nesting bird surveys prior to the start of any ground disturbance conducted within the nesting season, enacting nest avoidance buffers for any active nests, and by removing suitable nesting material outside of the nesting season. Therefore, impacts would be less than significant after mitigation.

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b. Would the project 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?

The Project Site is disturbed and dominated by non-native grasses and forbs. No riparian habitat or sensitive vegetation communities were detected during the field survey, nor have any been mapped by CDFW or USFWS in the Project Site, including areas designated as Critical Habitat for federally endangered species or protected wildlife movement corridors (Appendix B).

No wetlands or other waters have been mapped in or adjacent to the Project Site by the National Wetlands Inventory (USFWS 2026c), and no wetlands, waters, or other potentially jurisdictional aquatic features were observed on the Project Site during the field survey. As such, no riparian habitat is present on the Site

Therefore, there would be no impacts to riparian habitat or sensitive natural communities.

NO IMPACT

c. Would the project 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?

No wetlands or other waters have been mapped in or adjacent to the Project Site by the National Wetlands Inventory (USFWS 2026c), and no wetlands, waters, or other potentially jurisdictional aquatic features were observed in the Project Site during the field survey.

Thus, there would be no impact to waters or wetlands.

NO IMPACT

d. Would the project 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?

Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the migration of animals. Habitat linkages are small patches that join larger blocks of habitat and help reduce the adverse effects of habitat fragmentation; they may be continuous habitat or discrete habitat islands that function as stepping-stones for wildlife dispersal.

The Project Site is not recognized as an important wildlife corridor by any regional or state agency or jurisdiction and is not considered critical to the ecological functioning of adjoining open space areas (CDFW 2026b). Due to the disturbed nature of the Project Site and level of development and human disturbance surrounding the Site, common wildlife species like raccoon (*Procyon lotor*) may pass through the Site to access adjacent patches of cover and foraging habitat, but migratory wildlife use of the Site is unlikely. Therefore, no impacts to wildlife movement would occur.

NO IMPACT

e. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The Project would not conflict with San Joaquin County policies or ordinances protecting biological resources. No existing trees would be removed from the Project Site. Additionally, the Project would support biological resource goals within the San Joaquin County General Plan (San Joaquin County 2016), including Natural and Cultural Resources (NCR) Element Goals NCR-2 and NCR-5. No trees are present on the Project Site and none would be removed under the Project; therefore, County ordinances and guidelines protecting trees would not apply. Therefore, the Project would result in no impact related to local policies or ordinances.

NO IMPACT

f. Would the project 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 Project Site is located within the SJMSCP area and the Project would participate in the SJMSCP. The SJMSCP is a comprehensive conservation planning strategy that addresses the needs of multiple plant and animal species while protecting the region's agricultural interests as the population increases over the next 50 years (2001–2051). The SJMSCP is administered by the SJCOG, which is a non-profit corporation established by San Joaquin County and the cities of Escalon, Lathrop, Lodi, Manteca, Ripon, Stockton and Tracy.

The SJMSCP provides coverage for impacts to biological resources pursuant to CEQA, the CESA, and ESA, and is approved and authorized by the CDFW and USFWS. As such, the Project would be subject to review under the SJMSCP. As part of this process, the Project would be required to comply with all provisions of the SJMSCP, including implementation of applicable Incidental Take Minimization Measures and payment of mitigation fees. These fees must be paid prior to the initiation of construction activities to ensure compliance with the plan and to mitigate potential impacts to covered species and habitats. Additionally, the implementation of all applicable Incidental Take Minimization Measures would be conditions of approval for the Project's CUP entitlement. With compliance with these regulatory measures, implementation of the Project would not conflict with provisions of the SJMSCP, and, therefore, no impacts related to conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan would occur.

NO IMPACT

5 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 formal cemeteries?	☐	☐	■	☐

The analysis in this section is informed by the Cultural Resources Technical Report prepared by Rincon Consultants in May 2025 (Appendix C).

a. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?

As detailed in the Cultural Resources Technical Report (Appendix C), a records search of the California Historical Resources Information System (CHRIS) did not identify any previously recorded cultural resources documented within or immediately adjacent to the Project area. However, the field survey and background research identified two historic-period built environment properties within the Project Site, the two onsite single-family residences and agricultural properties located at 11620 East Copperopolis Road and 289 South Best Road. The properties were determined ineligible for listing in the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) under any criteria due to a lack of historical or architectural significance. Therefore, 11620 East Copperopolis Road and 289 South Best Road are not considered a historical resources under CEQA. Furthermore, the single-family residences and associated agricultural structures including storage sheds, water towers, and barns would remain in place and would not be altered, demolished, relocated, or otherwise affected by Project construction, operation, or decommissioning activities; therefore, even if the properties were determined to qualify as a historical resource under CEQA, no impact would occur.

The Project would not result in a substantial adverse change in the significance of any known or potential historical resource pursuant to CEQA Guidelines Section 15064.5. No impact would occur.

NO IMPACT

b. Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

The Cultural Resources Technical Report records search of the CHRIS and the archaeological field survey identified no known pre-contact or historic-period archaeological resources within the Project area. However, the Sacred Lands File (SLF) search result was positive, indicating that documented sacred lands occur in the vicinity of the Project area, and the Project is located approximately 0.3 miles north of Mormon Slough, a freshwater feature that would have been attractive for past habitation, which generally increases regional archaeological sensitivity. At the same time, the Project area is underlain by late Pleistocene alluvial fan deposits and soils that do not contain a buried A horizon, which are geomorphic characteristics that are less favorable for the natural burial and preservation of archaeological deposits compared to younger Holocene alluvium with buried topsoil horizons. Historic maps and aerial imagery show that the Project Site has been subject to intensive agricultural disturbance since at least the 1950s, and any

archaeological materials that may have been present in near-surface contexts have likely been displaced, fragmented, or destroyed by repeated plowing, grading, and associated activities. Considering the positive SLF result and proximity to Mormon Slough in the broader area alongside the site-specific geologic, soil, and disturbance conditions documented in the technical report, the potential for encountering intact archaeological deposits within the Project area that may qualify as historical resources or unique archaeological resources is considered low but not negligible. Unanticipated discoveries remain a possibility during ground disturbance, and archaeological resources discovered during ground-disturbing activities could qualify as historical resources or unique archaeological resources. Project-related ground disturbing activities associated with trenching (up to 5 feet below ground surface), utility pole installation (6 to 8 feet below ground surface), solar photovoltaic energy panel pier or footing installation (6 to 12 feet below ground surface), and fence post installation (3 to 4 feet below ground surface) may extend into underlying native soils and there is the potential to inadvertently encounter intact archaeological materials. As such, there is a possibility that ground disturbing activities associated with the Project could result in a substantial adverse change in the significance of an archaeological resource. Impacts would be potentially significant and Mitigation Measure CUL-1 and Mitigation Measure CUL-2 are required to reduce impacts to a less than significant level.

Mitigation Measures

CUL-1 Workers Environmental Awareness Program

Prior to the commencement of Project-related, ground-disturbing activities, including, but not limited to, site clearing, grubbing, trenching, and excavation, a Worker's Environmental Awareness Program (WEAP) shall be conducted for all Project personnel working on the Project. The WEAP shall be prepared and conducted under the direction of a qualified archaeologist who meets the Secretary of the Interior's Professional Qualifications Standards for archaeology (National Park Service [NPS] 1983). The WEAP training shall include a description of the types of cultural material that may be encountered, cultural sensitivity issues, the regulatory environment, and the proper protocol for treatment of the materials in the event of a find.

CUL-2 Unanticipated Discovery of Cultural Resources

In the event that archaeological resources are unexpectedly encountered during ground-disturbing activities, work within 50 feet of the find shall halt and an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for archaeology (National Park Service 1983) shall be contacted immediately to evaluate the resource. If the resource is determined by the qualified archaeologist to be precontact, then a Native American representative shall also be contacted to participate in the evaluation of the resource. The qualified archaeologist will evaluate the resource for its eligibility as a historical resource or unique archaeological resource under the California Environmental Quality Act (CEQA) through appropriate means, such as archaeological testing and/or additional research, based on the nature of the find. If the resource proves to be eligible for the California Register of Historical Resources (CRHR), and significant impacts to the resource cannot be avoided via Project redesign, a qualified archaeologist shall prepare a data recovery plan tailored to the physical nature and characteristics of the resource, per the requirements of CEQA Guidelines Section 15126.4(b)(3)(C). The data recovery plan shall identify data recovery excavation methods, measurable objectives, and data thresholds to reduce any significant impacts to cultural resources related to the resource. Pursuant to the data recovery plan, the qualified archaeologist and Native American representative, as appropriate, shall recover and document the scientifically consequential information that justifies the resource's significance. The County shall review and approve the treatment plan and archaeological testing as appropriate, and the resulting documentation shall be submitted to the regional repository of the California Historical Resources Information System, per CEQA Guidelines Section 15126.4(b)(3)(C).

Significance After Mitigation

Implementation of Mitigation Measures CUL-1 and CUL-2 would reduce potential impacts to archaeological resources to a less-than-significant level by requiring site personnel to participate in a Workers Environmental Awareness Program, led by a qualified archaeologist, and by implementing standard procedures in the event archaeological resources are unexpectedly encountered during ground-disturbing activities.

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c. Would the project disturb any human remains, including those interred outside of formal cemeteries?

No human remains are known to be present within the Project Site. However, the discovery of human remains is a possibility during ground disturbing activities, which include site preparation, surface grading for the access road, trenching for the underground medium voltage utility line, installation of solar panel pile mounts, and installation of fencing. If human remains are found, California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code (PRC) Section 5097.98. In the event of an unanticipated discovery of human remains, the County Coroner must be notified immediately. If the human remains are determined to be of Native American origin, the Coroner will notify the Native American Heritage Commission, which will determine and notify a Most Likely Descendant (MLD). The MLD has 48 hours from being granted site access to make recommendations for the disposition of the remains. If the MLD does not make recommendations within 48 hours, the landowner shall reinter the remains in an area of the property secure from subsequent disturbance. With adherence to these regulations, the Project would have a less-than-significant impact related to disturbance of human remains

LESS-THAN-SIGNIFICANT IMPACT

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6 Energy

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than - Significant Impact	No Impact
Would the project:				
a. Result in a 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?	☐	☐	☐	■

a. Would the Project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation?

Construction and Decommissioning

Construction and future decommissioning of the Project would result in fuel (diesel and gasoline) and electricity consumption from the use of construction tools and equipment, vendor truck trips, and vehicle trips generated from workers traveling to and from the Project Site.[7] The consumption of energy would be temporary in nature, as construction and decommissioning would each last approximately six months and would not present a significant demand for available supplies. The Project Site features no unusual Project characteristics or construction or decommissioning processes that would require inordinately higher amounts of energy than for neighboring comparable activities; or equipment that would not conform to current emissions standards (and related fuel efficiencies). In addition, as required by CCR Title 13 Sections 2449 and 2485, idling time of construction vehicles are limited to no more than five minutes, thereby minimizing, or eliminating unnecessary and wasteful consumption of fuel due to unproductive idling of construction equipment. Equipment employed in the construction and future decommissioning of the Project would therefore not result in wasteful, inefficient, or unnecessary consumption of energy resources, and impacts during construction and future decommissioning would be less than significant.

Operation

Once the Project is operational, up to 2 MW of energy would be generated at the ground-mounted solar PV energy generation site. Electricity would be required during operation and maintenance, such as for appurtenant electrical equipment. In addition, gasoline and diesel fuel would be required for occasional maintenance equipment and trips. Routine maintenance is expected to necessitate approximately two workers to travel to the facility up to 20 times per year, including two annual panel washings. Operations would also require up to two workers in a medium-duty utility truck to visit the substation up to 20 times per year and a crew may need to periodically visit the site to address any maintenance issues picked up by the remote monitoring system. The associated fuel consumption would be minimal and would not be considered an inefficient use of fuel, given that it would be associated with a renewable energy generation facility. Thus, although irreversible commitments of small quantities of nonrenewable resources would occur during operation of the Project, the amount of diesel and gasoline fuel consumed during Project operation would be relatively minimal and would not be considered an inefficient use.

Furthermore, as a solar facility sited to generate renewable energy, the Project would result in a beneficial impact to renewable energy availability within the state. Therefore, due to the inherent nature of the Project

[7] Equipment mix by construction activity as well as worker, vendor, and hauling trips may be found in Appendix A.

as a solar facility, the Project would not result in a wasteful use of energy. Operational impacts related to wasteful, inefficient, or unnecessary consumption of energy resources would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

b. Would the Project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

The Project would assist the State of California in meeting its energy goals, including those identified in CARB's 2022 Scoping Plan Update (CARB 2022), the Renewables Portfolio Standard, and Senate Bill (SB) 100 by implementing a solar PV facility sited to support future renewable energy Project, and thereby assisting in the increased supply of renewable solar energy within the state.

The Project would be consistent with the following specific electricity goals outlined in CARB's 2022 Scoping Plan Update:

- Scale up renewable energy and electric grid infrastructure to handle increased demand.
- Meet increased demand for electrification without new fossil gas-fired resources.

Additionally, the Project would be consistent with SB 100. SB 100 accelerated the state's Renewables Portfolio Standard Program by increasing California's procurement of electricity from renewable sources to 33 percent of total retail sales by 2020, 60 percent by 2030, and 100 percent by 2045. The Project would generate up to 2 MW of solar energy. Overall, the Project would increase the amount of renewable energy generated for the PG&E system that would be compliant with the Renewables Portfolio Standard Program. Contributing renewable energy to the existing transmission network would improve California's ability to supply renewable energy to end-use customers, specifically within the greater PG&E service area, and to achieve statewide renewable energy goals. The additional energy generated by the Project would be added to the power grid and would directly support energy goals under SB 100.

The SJVAPCD adopted the Climate Change Action Plan in August 2008. The Climate Change Action Plan directed the District Air Pollution Control Officer to develop guidance to assist lead agencies, Project proponents, permit applicants, and interested parties in assessing and reducing the impacts of Project specific GHG emissions on global climate change (SJVAPCD 2009a). In December 2009, the SJVAPCD adopted the guidance: *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA* and the policy: *District Policy – Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency* (SJVAPCD 2009a, SJVAPCD 2009b). The guidance includes Best Performance Standards which focus on measures that improve energy efficiency. The Project would help facilitate the expansion of renewable energy into PG&E's energy mix which serves San Joaquin County. Therefore, the Project would help implement the guidance from SJVAPCD and thereby would not conflict with their adopted policy and guidance documents.

Additionally, the San Joaquin County General Plan Public Health and Safety Element sets reduction targets and provides strategies to reduce GHG emissions and associated impacts. In particular, Policy PHS-6.3 (GHG Reduction Strategies) states "[t]he County shall promote greenhouse gas emission reductions by encouraging efficient farming methods (e.g., no-till farming, crop rotation, cover cropping); supporting the installation of renewable energy technologies; and protecting grasslands, open space, oak woodlands, riparian forest and farmlands from conversion to urban uses" (San Joaquin County 2016). The Project would help facilitate the expansion of renewable energy into PG&E's energy mix which serves the County. Therefore, the Project would not conflict with the County's General Plan.

For the reasons described above, the Project would have no impacts related to conflicts with or obstruction of a State or local plan for renewable energy or energy efficiency.

NO IMPACT

7 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:				
1. 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?	☐	☐	☐	■
2. Strong seismic ground shaking?	☐	☐	■	☐
3. Seismic-related ground failure, including liquefaction?	☐	☐	■	☐
4. 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 wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	■
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	■	☐	☐

The analysis in this section is informed by the Geotechnical Report prepared for the Project by ANS in April 2025 (Appendix D).

a.1. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving 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?

Alquist-Priolo Earthquake Fault Zones are regulatory zones established throughout California by the California Geological Survey. These zones identify areas where potential surface rupture along an active fault could prove hazardous and identify where special studies are required to characterize the fault rupture hazard potential to habitable structures. According to the Geotechnical Report, the Project Site is not intersected by a known earthquake fault (Appendix D). The Geotechnical Report further confirms the nearest active fault segment in the region is the West Tracy fault located approximately 22 miles southwest

of the Project Site (Appendix D). Therefore, the Project would not cause the risk of loss, injury, or death involving rupture of an Alquist-Priolo designated earthquake fault. No impact would occur.

NO IMPACT

a.2. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?

The Project Site, and much of the surrounding greater Stockton area, is categorized as Underevaluated Areas by the California Geologic Survey (DOC 2024). Although no designated fault lines intersect the Project Site or are mapped in the vicinity of the Project Site, much of California is subject to some degree of seismic risk due to the major fault lines that run throughout the State, including the San Andreas Fault which generally parallels the San Joaquin Valley. Additionally, the nearest active fault segment in the region is the West Tracy fault located approximately 22 miles southwest of the Project Site. Therefore, the Project Site may be subject to seismic ground shaking in the event of an earthquake.

The Project is an unmanned solar facility. The Project would be designed and constructed in accordance with the seismic safety requirements of the 2025 California Building Code (CBC), which is adopted as part of Title 8 Division 1 of the San Joaquin County Code (San Joaquin County 2026a). It requires that all improvements be constructed to withstand anticipated ground shaking from regional fault sources. The CBC requires that a licensed geotechnical engineer be retained to design the Project components to withstand probable seismically induced ground shaking and consolidate recommendations into a site-specific geotechnical report. The CBC requires that a final geotechnical investigation be performed after Project design plans are finalized and prior to construction, and that a final geotechnical report be completed to provide engineering and design requirements. All construction would adhere to the specifications, procedures, and site conditions contained in the final design plans, which would comply with the seismic recommendations of a California-registered, professional geotechnical engineer contained in the geotechnical report in accordance with the CBC. The final structural design would be subject to approval and follow-up inspection by the County. Final design requirements would be provided to the on-site construction supervisor and the County Building Inspector to ensure compliance. Compliance with the CBC would minimize the risk of loss, injury, or death involving strong seismic ground shaking. Thus, this impact would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

a.3. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?

a.4. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?

c. Would the project 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?

The Project Site is relatively flat and surrounded by flat land and therefore is not subject to landslide risk. Additionally, the Project Site is not located within a liquefaction zone (DOC 2024). The proposed Project would not create steep slopes or otherwise increase the risk of landslides at the Project Site. The Geotechnical Report prepared for the Project confirms that the Project Site has a low potential of liquefaction (Appendix D). Project design and construction would incorporate standard safety measures from the CBC to address potential seismic hazards, including lateral spreading, subsidence, liquefaction and collapse. Compliance with the CBC would ensure the Project would result in a less-than-significant impact related to unstable soils and directly or indirectly causing the risk of loss, injury, or death related to liquefaction or landslides. Therefore, impacts related to seismic-related ground failure, liquefaction, landslides, lateral spread, subsidence, or collapse would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

b. Would the project result in substantial soil erosion or the loss of topsoil?

Soil erosion is the removal of soil by water, wind, and gravity. Ground-disturbing activities associated with Project construction would include vegetation clearing, surface grading for the access road, installation of solar panel pile mounts, and installation of fencing. Additionally, the Project would include the planting of pollinator vegetation following Project construction. Construction of the Project would require minimal cut and fill of soils during ground disturbing activities. Nonetheless, exposed or stored soil could result in soil erosion or the loss of topsoil, as soil would be loosened and exposed to precipitation and wind. As further discussed in Section 10, *Hydrology and Water Quality*, the proposed Project would be required to obtain coverage under a Construction Stormwater General Permit to comply with all established regulations of the National Pollutant Discharge Elimination System (NPDES) permitting program to control construction stormwater discharges. Compliance with the conditions of the Construction Stormwater General Permit would require the Applicant to develop and implement a Stormwater Pollution Prevention Plan (SWPPP) to reduce potential erosion and loss of topsoil during Project construction activities. Typical Best Management Practices (BMP) required by a SWPPP would include covering of inactive stockpiles, silt fences and gravel bag berms to trap sediments, inlet protection, and slope stabilization to limit discharge of eroded soils from the construction site and sedimentation of surface waters off-site. Pursuant to Title 5 Division 10 of the San Joaquin County Code, all applicable BMPs are required to be implemented to reduce erosion and other stormwater impacts. With adherence to these State and local regulations, the proposed Project would not result in substantial soil erosion or the loss of topsoil, and impacts would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

d. Would the project 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?

The Geotechnical Report prepared for the Project identifies that the Swelling Clays Map of the Conterminous United States maps the Project Site as having generally less than 50 percent clay with moderate to slight swelling potential. However, based on laboratory testing on selected samples, as included in the Geotechnical Report, native soils generally consist of medium plasticity clays, indicating a low risk of swelling soils (Appendix D). Although the proposed Project does not involve the construction of habitable structures or placement of permanent on-site personnel, it would still be required to comply with San Joaquin County Code Title 8, which adopts the CBC by reference, because the proposed Project requires a building permit from the County. Chapter 18 of the CBC provides criteria for geotechnical and structural considerations for design and installation of foundation systems, as well as requirements for soil investigations and site preparation. With adherence to the CBC, impacts related to expansive soil would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

e. Would the project 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?

The Project does not include septic tanks or alternative wastewater disposal systems. Therefore, no impact related to soil support regarding septic tanks or wastewater disposal systems would occur.

NO IMPACT

f. Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Paleontological resources, or fossils, are the evidence of once-living organisms preserved in the rock record. They include both the fossilized remains of ancient plants and animals and the traces thereof (e.g., trackways, imprints, burrows, etc.). Paleontological resources are not found in “soil” but are contained within the geologic deposits or bedrock that underlies the soil layer. Typically, fossils are greater than 11,700 years old (i.e., Pleistocene or older) and are typically preserved in sedimentary rocks. Although rare,

fossils can also be preserved in volcanic rocks and low-grade metamorphic rocks under certain conditions (Society of Vertebrate Paleontology [SVP] 2025). Fossils occur in a non-continuous and often unpredictable distribution within some sedimentary units, and the potential for fossils to occur within sedimentary units depends on several factors. It is possible to evaluate the potential for geologic units to contain scientifically important paleontological resources, and therefore evaluate the potential for impacts to those resources and provide mitigation for paleontological resources if they are discovered during construction of a development project.

Rincon evaluated the paleontological sensitivity of the geologic units that underlie the Project Site to assess the Project's potential for significant impacts to scientifically important paleontological resources. The analysis was based on the results of a review of existing information in the scientific literature regarding known fossils within geologic units mapped at the Project Site. In the absence of other sensitivity criteria required by certain federal, state, or local regulatory agencies, the SVP's Fossil Prediction Map System (FPMS) is used to assign paleontological sensitivity to geologic units (SVP 2025). FPMS assignments are based on rock units within which vertebrate or significant invertebrate fossils have been determined by previous studies to be present or likely to be present. Fossil occurrences are correlated with the geologic units that contain them, so the history of a geologic unit in producing fossils can be used to predict its potential for producing fossils in the future. The FPMS is a 5-tier scale ranging from FPMS 1 (Very Low Potential) to FPMS 5 (Very High Potential) geologic units along with other rankings for geologic units with unknown potential or areas covered by water or ice. Following the literature review, a paleontological sensitivity classification was assigned to each geologic unit mapped within the Project Site. This criterion is based on rock units within which vertebrate or significant invertebrate fossils have been determined by previous studies to be present or likely to be present. The potential for impacts to significant paleontological resources is based on the potential for ground disturbance to directly impact paleontologically sensitive geologic units.

The Project is located in the Great Valley geomorphic province (California Geological Survey 2002). The Great Valley is an elongate lowland approximately 50 miles wide and 400 miles long. It is bounded to the east by the Sierra Nevada Range and to the west by the Coast Range. A relatively undeformed basin, the Great Valley rises from about sea level to approximately 400 feet in elevation at the north and south ends. The northern portion of the valley, referred to as the Sacramento Valley, is drained by the Sacramento River, while the southern portion of the valley, referred to as the San Joaquin Valley, is drained by the San Joaquin River. Consequently, the Great Valley is predominantly alluvial, flood, and delta plains formed by these two major river systems (Weissmann et al. 2005).

The Project is located in the *Stockton East* United States Geological Survey 7.5-minute topographic quadrangle. The geology of the region surrounding the Project was mapped by Delattre et al. (2023), who identified a single geologic unit, the Modesto Formation, underlying the Project Site.

The Modesto Formation underlies the entire Project Site. The Modesto Formation is late Pleistocene in age and consists of stratified, poorly sorted, fine-grained sand and silt of flood basins, lower fans and interdistributary fan areas (Delattre et al. 2023). The Modesto Formation has produced scientifically significant resources including mammoth (*Mammuthus*), ground sloth (*Megalonyx*), and bison (*Bison*) (Jefferson 2010; University of California Museum of Paleontology 2026). Although the Modesto Formation is known to preserve paleontological resources, such discoveries are not incredibly common given the wide geographic distribution of this geologic unit. Therefore, the Modesto Formation is assigned FPMS 3 (Moderate) paleontological sensitivity. Aerial imagery shows the Project Site has been previously used for agriculture, which is assumed to have disturbed the uppermost 2 feet of sediment. Disturbed and/or fill sediments are not considered paleontologically sensitive, so they are assigned FPMS 1 (Very Low) paleontological sensitivity. Therefore, the Project Site is assigned FPMS 1 (Very Low) paleontological sensitivity from the surface to 2 feet below the surface and FPMS 3 (Moderate) paleontological sensitivity greater than 2 feet below the surface.

Ground-disturbing activities for the Project would include driving piles to mount photovoltaic panels, trenching for underground electric transmission cables, installation of utility poles, and, potentially, excavations for drainage infrastructure. Pile-driving does not produce spoils capable of preserving

significant paleontological resources, so this activity would not significantly impact paleontological resources. Installation of utility poles below 3 feet in diameter are too narrow to produce spoils capable of preserving significant paleontological resources, so this activity would also not significantly impact paleontological resources. Trenching for underground cables and potential excavations for infrastructure would require excavations up to 12 feet below the surface. Therefore, these activities would likely impact previously undisturbed sediments with FPMS 3 (Moderate) paleontological sensitivity and could significantly impact paleontological resources. This impact related to unique paleontological resources or unique geologic features would be potentially significant and implementation of Mitigation Measure GEO-1 is required.

Mitigation Measures

GEO-1 Unanticipated Fossil Discovery

Paleontological Worker Environmental Awareness Program. Prior to the start of construction, a Paleontological Principal Investigator, as defined by the Society of Vertebrate Paleontology (SVP), or their designee shall prepare and conduct a paleontological Worker Environmental Awareness Program (WEAP) training for construction personnel regarding the appearance of fossils and the procedures for notifying paleontological staff should fossils be discovered by construction personnel. The WEAP shall discuss the potential to discover paleontological resources in the Project Site, legal obligations to protect paleontological resources, examples of paleontological resources that may be found in the Project Site, procedures in case a paleontological resource is discovered, and contact information for the Paleontological Principal Investigator.

Unanticipated Discovery of Paleontological Resources. The Project Applicant shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement: If a potential fossil is discovered during Project construction, construction activity within 50 feet of the find shall cease until the discovery is examined by a Paleontological Principal Investigator. If the find is determined to be significant, the Paleontological Principal Investigator shall direct all mitigation efforts related to paleontological resources consistent with SVP standards, which may include, but are not limited to: paleontological monitoring; fossil salvage, preparation, and curation; and reporting to summarize the paleontological mitigation efforts that would be submitted to the lead CEQA agency.

Significance After Mitigation

Mitigation Measure GEO-1 would ensure that impacts to paleontological resources would be less-than-significant by requiring the preparation and implementation of a Paleontological WEAP and including a standard inadvertent discovery clause for the Project. Implementation of Mitigation Measure GEO-1 would reduce potential impacts to paleontological resources to less than significant level and would effectively mitigate the Project's impacts to these resources through the recovery, identification, and curation of previously unrecovered fossils. Therefore, impacts would be less than significant after mitigation.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

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8 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?	☐	☐	■	☐

Methodology for Project modeling may be found in Section 3, *Air Quality*. Construction GHG emissions are amortized over the estimated 35-year lifetime of the Project. The following analysis is based upon the calculations found in Appendix A.

a. Would the Project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Construction, operation, and decommissioning of the Project would generate GHG emissions. This analysis considers the combined impact of GHG emissions from construction, operation, and decommissioning.

Construction and Decommissioning Emissions

Construction and decommissioning of the Project would result in GHG emissions, which are primarily associated with use of off-road equipment, on-road vendor and haul trucks, and worker vehicles. GHG emissions associated with the Project were modeled in CalEEMod. As shown in Table 6, construction and decommissioning of the Project would result in a total of approximately 325 metric tons (MT) of carbon dioxide equivalents (CO_2e) for the 6-month construction period. Emissions were then amortized over the lifetime of the Project (i.e., 35 years). Amortized emissions would be approximately 19 MT CO_2e per year. It is assumed that decommissioning GHG emissions would be similar to construction GHG emissions. In all likelihood, decommissioning emissions would be lower than construction emissions due to the reduced earthwork required and cleaner equipment available during decommissioning of the Project.

Table 6 Estimated Construction GHG Emissions

	Project Emissions (MT CO_2e)
Total Construction GHG Emissions	325
Total Decommissioning GHG Construction	325
Total Amortized over 35 Years	19

MT = metric tons; CO_2e = carbon dioxide equivalents

See Appendix A for CalEEMod worksheets.

Operational Emissions

The Project would generate GHG emissions during operation from minimal area source, energy consumption, and mobile emissions.[8] As shown in Table 7, the Project would generate approximately 30 MT of CO_2e per year from the operation of the Project. [9]

Over the Project's up to 35-year operational life—including amortized construction and decommissioning activities—total GHG emissions are estimated at 1,062MT CO_2e (30 MT CO_2e times 35 years). The Project is expected to offset approximately 6,557 MT CO_2e over the same period, or 187 MT CO_2e annually through the generation of renewable energy.[10]

Table 7 Combined Annual Emissions of Greenhouse Gases

Emission Source	Annual Emissions (CO_2e/year in metric tons)
Construction and Decommissioning	19
Operational	
Mobile	8
Area	<1
Energy	3
Water	<1
Waste	<1
Refrigerants	<1
Total	**30**
Annual GHG Offset by Solar Panels	**187**
Net Annual GHG Emissions	**(157)**

MT = metric tons; CO_2e = carbon dioxide equivalent

May not add directly due to rounding. Parenthetical notation indicates a negative number.

See Appendix A for CalEEMod worksheets.

By generating up to 2 MW of solar energy, the Project would support growing renewable energy demand and is expected to result in a net reduction in GHG emissions. Electricity supplied to meet consumer demand is generated from both renewable sources (such as solar) and non-renewable sources (such as natural gas combustion). Additional renewable generation reduces the need for electricity produced from non-renewable sources, which would generate GHG emissions. The estimated displaced emissions represent the amount of GHGs that would otherwise be generated by non-renewable energy sources but are avoided due to the Project. Because the Project would generate electricity from renewable sources and would offset greenhouse gas emissions associated with construction and operation of the Project, the Project would result in net negative annual GHG emissions and an overall reduction in GHG emissions relative to existing conditions. As such, impacts related to the generation of GHG emissions would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

[8] Area sources for this Project refer to consumer products (such as aerosol cleaners), and architectural coating (maintenance re-coating activities for the Project).

[9] Annual GHG produced includes annual operational emissions as well as construction and decommissioning emissions amortized over the 35-year Project lifetime.

[10] Calculations for GHG offsets may be found in Appendix A. Emissions reductions assumes a robust renewable mix, with the energy generated by the Project only displacing emissions from natural gas and coal.

b. Would the Project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The Project is a renewable energy project and would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. California's primary GHG reduction framework—such as AB 32, SB 32, and the 2022 Scoping Plan prepared by CARB—focuses on reducing GHG emissions through increased energy efficiency, transportation improvements, and expanded use of renewable energy sources.

The Project consists of a 2 MW solar PV facility that would generate clean, renewable electricity and displace electricity that would otherwise be produced by fossil fuel–based generation. As such, the Project directly supports statewide goals to increase renewable energy generation and reduce reliance on GHG-intensive energy sources.

In addition, the Project would be consistent with the San Joaquin County 2035 General Plan, which serves as the County's framework for reducing GHG emissions through land use planning, energy efficiency, and promotion of renewable energy systems (San Joaquin County 2016). For example, the Project would be consistent with Goal LU-6.8, *Sustainable Technologies*, and Goal NCR-H, *Solar Energy Ordinance*, as it would involve installation of solar arrays to generate renewable electricity. The Project also would support Goal IS-3.6, *Clean Energy and Fuel Sources*, and Goal NCR-5.2, *Alternative Energy*, as it would provide a source of renewable energy for operations throughout the County. By providing up to 2 MW of renewable energy, the Project would contribute to reducing GHG emissions and advancing California's and the County's climate policy objectives.

Therefore, the Project would not conflict with applicable GHG reduction plans, policies, or regulations, and impacts would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

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9 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 0.25 mile of an existing or proposed school?	☐	☐	☐	■
d. Be located on a site that is included on a list of hazardous material 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 in 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?	☐	☐	☐	■

a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

b. Would the project 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?

Construction and operation of the proposed 2 MW solar PV facility would involve the limited use of hazardous materials typical of similar construction and maintenance activities. These materials would primarily include fuels (e.g., diesel), lubricants, hydraulic fluids, and small quantities of solvents or cleaning agents. During operation, solar PV systems do not require fuel combustion or chemical processing, and therefore would not involve the routine use of substantial quantities of hazardous materials.

The transport, handling, storage, and disposal of hazardous materials associated with the Project would be subject to a comprehensive regulatory framework. At the federal level, hazardous wastes and materials are regulated under the Resource Conservation and Recovery Act (RCRA; 40 CFR Parts 260–273), which governs the generation, transport, and disposal of hazardous waste. Worker safety and hazardous materials handling during construction are regulated under Occupational Safety and Health Administration

standards (29 CFR Part 1926). In addition, hazardous materials transportation is regulated by the United States Department of Transportation (49 CFR Parts 171–180).

At the state level, hazardous materials management is governed by the California Hazardous Waste Control Law (Health and Safety Code Section 25100 et seq.) and the CCR Title 22, which establishes requirements for hazardous waste identification, handling, and disposal. The California Environmental Protection Agency's Unified Program further regulates hazardous materials through the Hazardous Materials Business Plan (HMBP) requirements (Health and Safety Code Section 25500 et seq.) and the California Accidental Release Prevention Program. Locally, the San Joaquin County Environmental Health Department, acting as the Certified Unified Program Agency, enforces these programs, including the HMBP, Hazardous Waste Generator Program, and petroleum storage requirements. Facilities handling reportable quantities of hazardous materials must prepare and maintain an HMBP to ensure proper management and emergency response procedures. However, the Project would not require handling reportable quantities of hazardous materials.

There is a limited potential for accidental releases of hazardous materials during construction, such as spills of fuel or hydraulic fluids from construction equipment or storage containers. However, such incidents would be short-term, localized, and minimized through implementation of standard BMPs, including proper storage and labeling, secondary containment, spill prevention measures, and worker training.

Federal and state regulations require that construction activities implement spill prevention and response procedures, including measures to prevent the discharge of pollutants from spills and leaks (e.g., as required under federal construction stormwater regulations, 40 CFR Section 450.21). In addition, applicable spill prevention requirements, such as the Spill Prevention, Control, and Countermeasure Rule (40 CFR Part 112), would apply where relevant.

During operation, the solar facility would not use or store substantial quantities of hazardous materials and therefore would not present a meaningful risk of accidental release. Solar panels generate electricity without combustion or chemical reactions and do not pose a risk of large-scale hazardous material releases. Routine maintenance activities would involve only small quantities of materials, which would be managed in accordance with applicable regulations and manufacturers' instructions.

In the unlikely event of an accidental release, adherence to regulatory requirements and BMPs—including spill containment, cleanup procedures, and emergency response planning—would ensure that impacts are minimized and promptly addressed.

Decommissioning activities would similarly involve standard construction practices with minimal hazardous material use, and would be subject to the same regulatory controls described above.

Therefore, the Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or 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 and related impacts would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

c. Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?

There are no existing or proposed schools within 0.25 mile of the Project Site. The nearest schools to the Project Site are Glenwood Elementary School, located approximately 2.3 miles to the northwest, and Henry Elementary School, located approximately 3.6 miles to the west. Both schools exist within the boundaries of the City of Stockton. In addition, the Project would not involve the handling of acutely hazardous materials and would not generate hazardous emissions. There would be no impact related to hazardous emissions or handling hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school.

NO IMPACT

d. Would the project be located on a site that is included on a list of hazardous material 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?

Government Code Section 65962.5 requires the California Environmental Protection Agency to develop an updated Hazardous Waste and Substances Sites List, also known as the Cortese List. The California Department of Toxic Substances Control (DTSC) is responsible for a portion of the information contained in the Cortese List; other state and local government agencies are also required to provide additional hazardous material release information for the Cortese List. The following resources were reviewed on July 8, 2026, to obtain hazardous material release information:

- State Water Resources Control Board (SWRCB) GeoTracker database (SWRCB 2026)
- California Department of Toxic Substances Control EnviroStor database (DTSC 2026)

Based on the database review, the Project Site and properties in its immediate vicinity are not included on the list of hazardous material sites compiled pursuant to Government Code Section 65962.5. According to the SWRCB GeoTracker database, the nearest listing is a private residence cleanup site, located approximately 0.4 mile west of the Project Site with a status of "Open – Eligible for Closure." Due to distance from the Project Site, this cleanup site does not pose an environmental concern to the Project. Therefore, no impact related to hazardous materials sites would occur.

NO IMPACT

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?

The Project Site is not located within two miles of a public or public use airport. The closest airport to the Project Site is the Stockton Metropolitan Airport, located approximately 6.9 miles southwest of the Project Site. According to the Airport Land Use Compatibility Plan for the Stockton Metropolitan Airport, the Project Site is not located within the Airport Influence Area of the Stockton Metropolitan Airport (San Joaquin County 2018). Therefore, the Project would not result in a safety hazard or excessive noise for people residing or working in the area, and no impact related to an adopted airport land use plan would occur.

NO IMPACT

f. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

The Project Site is within the jurisdiction of the San Joaquin County Local Hazard Mitigation Plan (San Joaquin County 2023). The Project would not involve the development of structures or infrastructure that would potentially impair implementation of or physically interfere with this plan. The proposed 12.2-acre solar facility would be developed on a relatively small, discrete site and would not introduce substantial new population, traffic, or barriers that could hinder emergency access or evacuation. The Project would include an internal access road that would be designed to accommodate emergency vehicles and would maintain compliance with applicable fire code requirements. Driveway access to the Project Site from the driveway on Copperopolis Road would be maintained at all times to ensure that emergency responders can enter and exit the site without obstruction in compliance with Section 9-409.430(9) of the San Joaquin County Code. Additionally, the access road on site would be constructed in accordance with San Joaquin County's *Fire Apparatus Access Road Standard* (San Joaquin County 2015).

During construction, there may be a temporary increase in traffic from construction workers and equipment; however, construction activities would be short-term and would not substantially affect surrounding roadway operations or regional evacuation routes. Construction equipment and construction worker vehicles would be staged on the Project Site and would not result in substantial delays on Copperopolis Road. Project construction, including installation of the POI is not anticipated to result in a partial or full closure of Copperopolis Road. Any potential partial or full road closure associated with the

Project would be subject to the requirements and permitting of the San Joaquin County Public Works Department. Additionally, any potential closure would be temporary in nature, similar to construction traffic.

Operation of the solar facility would generate minimal traffic, limited to periodic maintenance visits, and would not materially affect roadway capacity or circulation patterns. The Project would not require road closures, permanent re-routing of traffic, or installation of structures that would obstruct existing public streets or designated emergency evacuation routes.

The minimal, infrequent vehicle trips associated with construction and operation and maintenance activities would not disturb traffic patterns on Copperopolis Road in such a manner that could affect emergency response or evacuations.

As required by San Joaquin County Code Section 9-409.430(b)(7), a Fire Prevention Plan would be developed and implemented for the Project, which would be approved by the County Fire Marshall and local fire protection district. The Fire Prevention Plan would include procedures including, but not limited to, emergency vehicle access and turnaround at the Project Site, vegetation management, and fire break maintenance around all structures.

Because the Project would not obstruct roadways, would maintain adequate site access for emergency vehicles, and would not interfere with regional evacuation routes or emergency response operations, it would not impair implementation of adopted emergency response or evacuation plans, and potential impacts on emergency response would be less-than-significant.

LESS-THAN-SIGNIFICANT IMPACT

g. Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

As described in Section 20, *Wildfire*, the Project Site is not within a State Responsibility Area or lands classified as a Very High Fire Hazard Severity Zone (FHSZ), as delineated by the California Department of Forestry and Fire Protection's (CAL FIRE) Fire Hazard Severity Zone Viewer (CAL FIRE 2024). The Project Site is not located within a FHSZ and is within a Local Responsibility Area (LRA). The nearest FHSZ is a moderate fire hazard zone located approximately 9 miles east of the Project Site. The Project Site is located within the central valley in an area of predominately agricultural use, and is not located in the vicinity of wildlands. The Project Site is surrounded by fallow agriculture, vacant land, and sparse rural residences. The Project would also be operated remotely, which would eliminate the potential for exposure of any on-site employees to wildland fire risks. Thus, the proposed Project would not expose people or structures to a risk of loss, injury, or death involving wildland fires. No impact related to wildland fires would occur.

NO IMPACT

10 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 ground water 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 sources of polluted runoff; or	☐	☐	■	☐
(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?	☐	☐	■	☐

a. Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Construction activities associated with the Project have the potential to affect water quality because stormwater runoff over disturbed soil surfaces can pick up sediment, debris, and contaminants and convey them to downstream receiving waters. Ground-disturbing activities such as clearing, grading, trenching, and foundation installation would temporarily increase the potential for erosion and sedimentation. If construction or future decommissioning occurs during the rainy season or storm events, exposed soils could be mobilized and transported off-site. In addition, construction materials such as fuels, lubricants, paints, solvents, and concrete-related waste could be spilled or leaked and carried in stormwater runoff if not properly managed.

An existing agricultural well is located within the central portion of the Project Site, which is not planned to be utilized as part of the Project. The Project would be set back at least 5 feet from the well. No new water supply or wastewater infrastructure would be constructed as part of the Project. However, construction

and future decommissioning activities would generate typical construction-related pollutants (e.g., sediment, debris, and trace amounts of chemicals) that could affect surface water quality in the absence of appropriate controls.

Because the Project would disturb more than one acre, it would be required to comply with the SWRCB's NPDES Construction Stormwater General Permit (Order No. 2022-0057-DWQ). Compliance with this permit requires preparation and implementation of a SWPPP that identifies potential pollutant sources and prescribes BMPs to minimize pollutant discharge. BMPs would include, but are not limited to, erosion and sediment control measures (e.g., silt fencing, stabilized construction entrances, and soil stabilization) and good housekeeping practices (e.g., proper material storage, spill prevention, and waste management) designed to prevent off-site transport of pollutants.

In addition, the Project would be required to comply with San Joaquin County Code Title 5, Division 10 (Stormwater Management and Discharge Control), which prohibits unauthorized discharges to the stormwater system, requires implementation of BMPs, and mandates spill prevention and response measures. Adherence to these regulatory requirements would ensure that construction-related discharges do not violate applicable water quality standards or waste discharge requirements.

Operational impacts on water quality would be minimal. As mentioned above, the existing agricultural well is located within the central portion of the Project Site and is not planned to be utilized as part of the Project. Operation of the solar facility would not involve process wastewater discharges or the routine use of substantial quantities of hazardous materials. Periodic panel washing would use small water quantities that would percolate into the soil on-site and would not runoff off site. Additionally, operational water use would be required to comply with applicable County stormwater regulations and BMPs to further prevent runoff-related impacts. As a result, operation of the Project would not result in stormwater pollution or degradation of surface or groundwater quality.

With implementation of required regulatory measures, including preparation and adherence to a SWPPP and compliance with state and local stormwater regulations, the Project would not violate water quality standards or waste discharge requirements, nor would it otherwise substantially degrade surface or groundwater quality, and impacts would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

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

The Project Site overlies the Eastern San Joaquin Subbasin, which is part of the San Joaquin Valley Groundwater Basin (SWRCB 2006). The Eastern San Joaquin Subbasin is not adjudicated, although it is in condition of critical overdraft (Department of Water Resources [DWR] 2026). The subbasin is managed through the Eastern San Joaquin Groundwater Subbasin Groundwater Sustainability Plan which was adopted by the Eastern San Joaquin Groundwater Authority in November 2024.

The Project would require a water supply during construction, operation, and decommissioning. During construction and decommissioning, nominal amounts of water would be used for dust suppression and earthwork. During operation, solar panel washings would occur twice per year, and water would be used for landscaping which would generate an annual total water demand of approximately 65,000 gallons. Of this total, 15,000 gallons per year is assumed to be required for on-site landscaping over a period of 2-5 years. Once this landscaping is established over the course of 2-5 years, water used for landscaping would gradually decrease due to the use of drought tolerant species. The remaining 50,000 gallons per year would be used for panel washing activities for the duration of the Project life. Water for these purposes would be provided by temporary on site tanks or trucked to the Project Site from an external source. While groundwater from the San Joaquin Valley Basin supplies approximately 30 percent of water in the region (USGS 2024), groundwater level measurements within the Eastern San Joaquin Subbasin have been in continuous decline over the last 40 years (San Joaquin County 2014). The amount of water required during construction and decommissioning of the Project would be temporary and nominal. Water to be used during operation would be obtained from an external source, and would not affect groundwater supplies

directly within the Project area. Therefore, the Project would not substantially decrease groundwater supplies or impede sustainable groundwater management of the basin.

The Project would not substantially increase impervious surface areas on the Project Site such that development of the Site would affect groundwater recharge. According to the Geotechnical Report prepared for the Project (Appendix D), groundwater was not observed within any of the conducted soil borings at the time of geotechnical field investigation. However, it is noted that groundwater conditions fluctuate due to seasonal and climate influences, and the region is generally characterized by a shallow groundwater table. Rainfall may accumulate water on site due to the fine-grained nature of native soils and as such, dewatering may be necessary for shallow excavations (Appendix D). Project construction and decommissioning is not anticipated to require substantial amounts of groundwater dewatering such that regional supplies or sustainable groundwater management of the basin would be inhibited. Project operation would not extract groundwater on-site.

Overall, the Project would not substantially decrease groundwater supplies or substantially interfere with groundwater recharge and, therefore, impacts related to groundwater management would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

c.(i) Would the project 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 result in substantial erosion or siltation on- or off-site?

c.(ii) Would the project 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 substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

c.(iii) Would the project 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 that would create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

c.(iv) Would the project 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 impede or redirect flood flows?

The Project Site is generally flat. The Project would not substantially increase impervious surface areas on the Project Site, as the ground beneath the proposed solar array components would be left in existing conditions, and the new access road on the Project Site would be gravel-covered which is semi-pervious. Introduction of the new gravel access road or the small section of paved driveway on site would not substantially alter existing drainage on site since the access road would cover a relatively small area of the Project Site. To prepare the Project Site for use as solar facility, site clearing, excavation, and grading would occur. However, the Project would not involve any activities which could alter the course of nearby waterways.

Given the Project Site's relatively flat topography, erosion during construction and decommissioning is unlikely to be substantial. However, the implementation of the BMPs required for the previously discussed SWPPP would control any erosion and siltation during construction. Hazardous materials used during construction, operation, maintenance, and decommissioning would be properly stored, used, and disposed of as discussed under criterion 9(a).

Because pervious surfaces would continue to exist at the Project Site following Project implementation, natural stormwater infiltration would continue. Therefore, any potential drainage alterations associated with the Project would not result in substantial erosion or siltation and would not provide substantial additional sources of polluted runoff and would not exceed the capacity of existing or planned stormwater drainage systems.

According to the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map, the Project Site is located in Zone X, 0.2 Percent Chance Annual Flood Hazard (FEMA 2024). Given that the Project is not located in a flood hazard area, would not increase the rate of surface runoff, and would only result in a marginal increase in runoff volume, the Project would not impede or redirect flood flows or result in on- or off-site flood impacts.

Overall, impacts associated with existing drainage patterns for the Project would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

d. In flood hazard, tsunami, or seiche zones, would the project risk release of pollutants due to project inundation?

As described above, the Project Site is located within Zone X, 0.2 Percent Chance Annual Flood Hazard, which is an area of minimal flood hazard according to FEMA. The Project Site is located approximately 80 miles east of the Pacific Ocean and approximately 17 miles northwest of the nearest lake, the Woodward Reservoir. Accordingly, the Project Site is not subject to inundation from tsunamis or seiche, and no impact would occur.

NO IMPACT

e. Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

The Project Site is within the jurisdiction of the Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin and the Eastern San Joaquin Groundwater Subbasin Groundwater Sustainability Plan (California RWQCB 2019, Eastern San Joaquin Groundwater Authority 2024). As described in criterion 10(a), the Project would not violate water quality standards with adherence to regulations such as the NPDES Construction Stormwater General Permit and the San Joaquin County Code. The water quality goals of the Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin are enforced through these policies. With adherence to these regulatory requirements, the Project would not interfere with or obstruct achievement of the water quality goals within the Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin.

As described under criterion 10(b), the Project would require water usage during construction, operation, and future decommissioning. Water to be used for these phases would be trucked to the Project Site from an external source. If groundwater were provided to the Project, the groundwater would be distributed in compliance with the management requirements of the *Eastern San Joaquin Subbasin Groundwater Sustainability Plan*. Accordingly, the Project's use of groundwater would not conflict with or obstruct implementation of a sustainable groundwater management plan. Therefore, impacts related to existing water quality control plans or sustainable groundwater management plans would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

11 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?	☐	☐	■	☐

a. Would the project physically divide an established community?

Types of projects that have the potential to divide an established community include the construction of a new freeway or highway through an established neighborhood. The Project consists of the construction, operation, and decommissioning of a ground-mounted solar PV facility on an agricultural parcel that is currently fallow grassland. The Project Site is surrounded by lands disturbed by historical agricultural use, active agriculture, and rural residences. The Project does not involve construction of freeways, walls, or other features that would divide an established community. Therefore, no impact related to the division of an established community would occur.

NO IMPACT

b. Would the project 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?

The applicable plans and policies relating to a conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to, the General Plan and County Development Title) adopted for the purpose of avoiding or mitigating an environmental effect are summarized below.

San Joaquin County General Plan

Community Development Element

The Project Site is located within the jurisdiction of the County's General Plan and subject to the policies of the General Plan Community Development Element. The Project is consistent with the goals and policies of the General Plan related to continued agricultural land stewardship, including Policy LU-1.7 which aims to preserve farmland, due to the fact that it would not permanently alter the land such that agricultural uses would not be feasible on-site. Therefore, the proposed use is consistent with the Community Development Element of the General Plan.

Public Facilities and Services

The County's Public Facilities and Services Element includes goals and policies related to transportation and mobility, and infrastructure and services. The Project would not result in substantial impacts to transportation and mobility or public infrastructure and services. Refer to Section 17, *Transportation*, for further discussion on the Project's potential impacts related to transportation and mobility. Refer to Section 15, *Public Services*, and Section 19, *Utilities and Service Systems*, for further discussion on the Project's potential impacts to public infrastructure and services. For the reasons discussed in those sections, the Project would not conflict with the Public Facilities and Services Element of the General Plan.

Public Health and Safety

The County's Public Health and Safety Element includes policies related to air quality, geologic hazards, flooding, hazardous materials, noise, and wildfire. These environmental topics have been addressed under the applicable section throughout this analysis. For the reasons discussed in those sections, the Project would not conflict with the Public Health and Safety Element of the General Plan.

Natural and Cultural Resources Element

The County's Natural and Cultural Resources Element contains policies addressing agricultural resources, biological resources, water quality, energy, cultural and historic resources, scenic resources, and recreation. These environmental topics have been addressed under the applicable section throughout this analysis. In cases where impacts were identified as potentially significant, mitigation is identified to reduce impacts to a less-than-significant level. For the reasons discussed in those sections, the Project would not conflict with the Natural and Cultural Resources Element of the General Plan.

San Joaquin County Code

The Project Site is zoned AG-40 (General Agriculture, 40-acre minimum). Pursuant to the San Joaquin County Development Title Update, most recently updated in June of 2025, utility scale solar generation facilities are permitted in the AG-40 zone with approval of a CUP by the Planning Commission (San Joaquin County 2025b). The Project must comply with the provisions set forth in the County Development Title, unless relief is granted through a variance. Additionally, the Project would satisfy Code Section 9-409.430(b)(5) requirement regarding farmland protection by returning the land to its current state after Project decommissioning which would allow for future agricultural uses on the land as described under threshold a in Section 2, *Agriculture and Forestry Resources*. Therefore, the Project would not conflict with the San Joaquin County Code.

In summary, the Project would not 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 and this impact would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

12 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?	☐	☐	☐	■

a. Would the project 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. Would the project 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?

The San Joaquin County General Plan indicates there are sand and gravel deposits of regional significance in the County, primarily in rivers and creeks (San Joaquin County 2016). The Project Site is not located within a mapped mineral production consumption region (DOC 2026d). There are no known mineral resources or resource recovery sites on or in the vicinity of the Project Site (DOC 2016). Further, the Project would not involve substantial excavation or mineral extraction. Therefore, the Project would not result in the loss of availability of a known mineral resource or locally important mineral resource recovery site and, as such, there would be no impact related to mineral resources.

NO IMPACT

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13 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?	☐	☐	☐	■

a. *Would the project result in 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?*

Construction and Decommissioning

The significance of construction noise impacts is determined through compliance with the San Joaquin County Code. Per Section 9-404.020(c), noise associated with construction and decommissioning, provided such activities do not take place before 6:00 a.m. or after 9:00 p.m. on any day or at any time on Sunday or federal holidays, is exempt from the County's noise ordinance. Project construction and decommissioning would not occur within these hours or on Sunday or federal holidays. Therefore, construction noise impacts would be less than significant. Construction noise levels are provided below for informational purposes.

Construction noise was estimated at nearby uses with the FHWA Roadway Construction Noise Model (RCNM). The model predicts construction noise levels for a variety of construction operations based on empirical data and the application of acoustical propagation formulas. RCNM provides reference noise levels for standard construction equipment, with an attenuation rate of 6 weighted decibels (dBA) per doubling of distance for stationary equipment.

Variation in power imposes additional complexity in characterizing the noise source level from construction equipment. Power variation is accounted for by describing the noise at a reference distance from the equipment operating at full power and adjusting it based on the duty cycle of the activity to determine the Equivalent Continuous Sound Pressure Level (L_{eq}) of the operation (FHWA 2006). Each phase of construction has a specific equipment mix, depending on the work to be accomplished during that phase. Each phase also has its own noise characteristics; some will have higher continuous noise levels than others, and some have high-impact noise levels.

Construction activity would result in temporary noise in the Project Site vicinity, exposing nearby receivers to increased noise levels. Using the three loudest pieces of construction equipment during each phase, construction noise would typically be higher during the more intensive phases of construction (i.e., solar equipment installation) and would be lower during the less intensive construction phases (i.e., paving and

staging). Per information provided by the Applicant, heavy construction equipment during the solar equipment installation phase could include a pile driver, backhoe, and manlift construction equipment. The less intensive phases of paving and staging could include roller, excavator and backhoe construction equipment and would have lower construction noise levels. It is assumed diesel engines would power all construction equipment.

The closest residences to Project construction during solar equipment installation would be a single-family residence to the northwest at 11510 Copperopolis Road (approximately 25 feet from the nearest pile driver activity to the Property line). Table 8 summarizes construction noise associated with each phase of construction at the nearest residence, based on the equipment list provided by the Applicant. As shown in Table 8, construction noise levels would be up to 100 dBA L_{eq} at the nearest residence during solar equipment installation. As discussed above, construction activities would be conducted within the allowable hours specified in San Joaquin County Code Section 9-404.020(c) and would therefore be exempt from the County's noise ordinance. Accordingly, temporary construction noise impacts would be less than significant.

Table 8 Construction Noise Levels

Phase	Noise Level at Residences (dBA L_{eq})	
	RCNM Reference Noise Level (50 feet)	Single-Family Residential – 11510 Copperopolis Road (25 feet) [1]
Site Preparation	78	84
Solar Equipment Installation	94	100
Paving	73	79
Staging	76	82

See Appendix E for RCNM worksheets.

[1] Distance from the nearest use of pile driver activity.

Decommissioning activities would involve the removal of Project components using construction-type equipment similar to, but generally less intensive than that used during Project construction. Temporary decommissioning noise levels would therefore be comparable to or lower than the construction noise levels shown in Table 8 and would occur over a limited duration. As discussed above, decommissioning activities would be conducted within the allowable hours specified in San Joaquin County Code Section 9-404.020(c) and would therefore be exempt from the County's noise ordinance. Accordingly, temporary decommissioning noise impacts would also be less than significant.

Construction and Decommissioning Traffic Noise

San Joaquin County does not have quantified traffic noise significance thresholds. A project normally has a significant effect on the environment related to noise if it substantially increases the ambient noise levels for adjoining areas. Changes of less than 1 dBA are usually indiscernible. Changes of 1 to 3 dBA are detectable under quiet, controlled conditions. Most people can detect changes in sound levels of approximately 3 dBA under normal, quiet conditions. A change of 5 dBA is readily discernible to most people in an exterior environment. Therefore, less of an increase from roadway noise is allowed. Based on similar criteria from the Federal Aviation Administration (FAA) (FICON 2020), the following thresholds of significance are used to assess roadway vehicle noise impacts at sensitive receiver locations:

- Greater than 1.5 dBA CNEL increase for ambient noise environments of 65 dBA CNEL and higher;
- Greater than 3 dBA CNEL increase for ambient noise environments of 60-64 dBA CNEL;
- Greater than 5 dBA CNEL increase for ambient noise environments of less than 60 dBA CNEL and where the resulting future noise level would exceed 60 dBA CNEL.

The Project could generate up to maximum of 104 daily construction vehicle trips during the solar equipment installation phase, which is the most intensive phase of construction. Trip generation during the decommissioning phase is anticipated to be similar to that of the construction phase. Construction and decommissioning traffic would primarily use Copperopolis Road, which has an existing average daily traffic (ADT) volume of 1,681 vehicles (Replica 2025). The addition of construction and decommissioning traffic would result in an increase of approximately 0.3 dBA CNEL.

The Project is located in a rural area of San Joaquin County where ambient noise levels are expected to be below 60 dBA CNEL. Therefore, the applicable significance threshold is a 5 dBA CNEL increase. Because the estimated increase of 0.3 dBA CNEL would remain below this threshold, off-site construction and decommissioning traffic noise impacts would be less than significant.

Operational Traffic Noise

Routine operations and maintenance visits, including approximately two annual water truck trips for panel washing, would require up to two workers in a light to medium-duty utility truck to visit the facility up to 20 times per year. Operational vehicle activity would primarily consist of light-duty pickup trucks, utility vehicles, and infrequent water truck visits. Although water trucks generate more noise than passenger vehicles, the limited number of annual trips would result in only temporary and localized noise increases. Given the infrequent nature of these trips, they would not measurably increase traffic noise levels. Therefore, operational traffic noise and impacts would be less than significant.

Operational Equipment

The Project would generate operational noise from individual PV inverters distributed throughout the site. To represent Project inverter noise emissions, the Project Applicant provided specifications for a CPS FlexOM Gateway (CPS SCH350KTL-DO/US-800), a 350-kW, 800-volt inverter. According to the manufacturer's specifications, each inverter has a noise level of 82 dBA at a reference distance of 1 meter (3.3 feet), which was used as the basis for the operational noise analysis. (Manufacturer specification sheets for inverter located in Appendix E).

San Joaquin County's daytime and nighttime exterior noise standards for stationary noise sources are 55 dBA L_{eq} and 45 dBA L_{eq}, respectively. Noise from an inverter is steady and broadband, generated primarily by cooling fans and electrical components, and occurs only during daylight hours when the solar array is producing power. However, while inverters typically operate only during daytime hours (7 a.m. to 10 p.m.), this analysis applies the more restrictive nighttime standard to account for the possibility that the equipment could operate or emit residual noise outside of daytime hours.

The nearest sensitive receptor is approximately 365 feet from the nearest inverter. Using standard attenuation of 6 dBA per doubling of distance, the inverter noise level of 82 dBA at 3.3 feet would attenuate to 41 dBA L_{eq} at a distance of 365 feet between the nearest inverter to the nearest sensitive receptor. The predicted operational noise level of 41 dBA L_{eq} would be approximately 14 dBA below the County's daytime exterior noise limit of 55 dBA L_{eq}. Although inverter operation would primarily occur during daylight hours, startup could occur prior to 7:00 a.m. as solar production begins. Therefore, the predicted noise level is also compared to the more restrictive nighttime exterior noise standard of 45 dBA L_{eq}. Compared to this nighttime standard, the operational noise level of 41 dBA L_{eq} would be approximately 4 dBA below the County's 45 dBA L_{eq} exterior noise standard. Therefore, operational noise impacts would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

b. Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

Construction and Decommissioning

Project construction and decommissioning could use equipment that would temporarily result in groundborne vibration such as a vibratory roller or bulldozer. Based on Caltrans *Transportation and Construction Vibration Guidance Manual* recommendations, limiting vibration levels to below 0.5 inches per second (in/sec) peak particle velocity (PPV) inches per second at older residential structures would prevent structural damage regardless of building construction type (Caltrans 2020). The nearest sensitive receptor is located approximately 55 feet away from the nearest Project component where pile driving would occur. In addition, other construction activities could occur within 35 feet from the off-site residence. Construction vibration levels from pile driving and other construction equipment are shown in Table 9. As shown in the table, an impact pile driver creates a vibration level of approximately 0.465 in/sec PPV at 55 feet. Additionally, a vibratory roller creates a vibration level of 0.127 in/sec PPV at 35 feet. At these distances, vibration levels from construction equipment would be below the 0.5 in/sec PPV threshold for architectural damage to older residential structures.

Therefore, Project construction and decommissioning would not result in excessive ground-borne vibration or ground-borne noise, and impacts would be less than significant.

Table 9 Groundborne Vibration Levels

Equipment	Approximate Vibration Level (in/sec PPV)
Distance	**35 feet**
Vibratory Roller	0.127
Large Bulldozer	0.054
Loaded Truck	0.046
Small Bulldozer	0.002
Distance	**55 feet**
Impact Pile Driver	0.465

Source: FTA 2018

Operation

Operation of the proposed solar facility would not include any substantial vibration sources; therefore, operational vibration impacts would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

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?

The Project Site is not located within an airport land use plan or within two miles of a public or private airport (San Joaquin 2018). The closest airport to the Project Site is the Stockton Airport, located approximately 6.1 miles southwest of the Project Site. Therefore, the Project would not expose people residing or working in the Project area to excessive noise levels related to airstrip/airport operation. No impact would occur related to an existing airport or airport land use compatibility plan.

NO IMPACT

14 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 (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☐	☐	■	☐
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	■

a. Would the project 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)?

The Project is a proposed solar facility that does not include any housing or business development that would directly induce population growth. The Project would not create housing, employment centers, or other land uses that would attract new permanent residents or businesses. Construction and decommissioning activities would require a temporary workforce; however, these workers would be drawn from the existing regional labor pool and would not result in long-term population increases.

Operation of the Project would require visits to the Project Site up to 20 times per year inclusive of the two panel washings per year. It is anticipated that maintenance workers would live locally and would not relocate to the area. If workers were required to relocate to the area, the additional population would not represent a substantial population change.

The Project also would not indirectly induce population growth. It would not require or result in the extension of major infrastructure—such as roads, water supply systems, wastewater facilities, or other urban services—that could facilitate additional development or growth in the surrounding area. The Project would primarily consist of energy generation equipment and associated minor infrastructure necessary to interconnect with the existing electrical grid.

While the Project would contribute renewable energy to meet existing and forecasted electricity demand, including demand associated with anticipated regional growth, it would not itself drive or accelerate growth. Rather, it would support the reliability of the existing electrical system and help accommodate planned development consistent with adopted land use plans. Because the Project would not directly or indirectly induce substantial unplanned population growth, impacts would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

b. Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

The Project would not displace any existing housing or people as the Project Site is primarily undeveloped. The existing residences on site would not be demolished or altered by the Project. Therefore, no impact related to the need for replacement housing would occur.

NO IMPACT

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15 Public Services

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than - Significant Impact	No Impact
a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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:				
1 Fire protection?	☐	☐	☐	■
2 Police protection?	☐	☐	☐	■
3 Schools?	☐	☐	☐	■
4 Parks?	☐	☐	☐	■
5 Other public facilities?	☐	☐	☐	■

a.1. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered fire protection facilities, or the need for new or physically altered fire protection facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

a.2. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered police protection facilities, or the need for new or physically altered police protection facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

a.3. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered schools, or the need for new or physically altered schools, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives?

a.4. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered parks, or the need for new or physically altered parks, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives?

a.5. Would the project result in substantial adverse physical impacts associated with the provision of other new or physically altered public facilities, or the need for other new or physically altered public facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

The Project is an unmanned solar facility that does not include the need for new or physically altered governmental facilities. The Project does not include the construction of residential structures, nor would it induce population growth on the Project Site or in the surrounding area. As discussed under criterion 14(a), operation of the Project would not require daily on-site employees and construction and decommissioning phases would be short term in nature. Construction workers are anticipated to be drawn from the existing regional labor pool and would not result in long-term population increases. As such, the Project would not increase the need for new or physically altered governmental services, including fire protection services, police protection services, schools, parks, and other facilities, to maintain acceptable service ratios, response times or other performance objectives. No impacts related to public services would occur.

NO IMPACT

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16 Recreation



	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than - Significant Impact	No Impact
a. Would the project 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?	☐	☐	☐	■

a. Would the project 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?

As described in Section 14, *Population and Housing*, the Project does not include development of housing or businesses that would directly or indirectly result in population growth. Therefore, the Project would not increase the population served by local recreation facilities or otherwise result in increased demand for or degradation of those facilities. No impact to existing neighborhood and regional parks or other recreational facilities would occur.

NO IMPACT

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?

As described in Section 14, *Population and Housing*, the Project does not include development of housing or businesses that would directly or indirectly result in population growth. Therefore, the Project would not 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. In addition, the Project would not include or require the construction or expansion of recreational facilities, the construction of which could have an adverse physical effect on the environment. Therefore, no impact related to the construction or expansion of recreational facilities would occur.

NO IMPACT

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17 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. 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 use (e.g., farm equipment)?	☐	☐	☐	■
d. Result in inadequate emergency access?	☐	☐	☐	■

a. Would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Regional and local plans addressing the circulation system include the SJCOG 2022 Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS), and San Joaquin Regional Transit District's (SJRTD) San Joaquin Coordinated Public Transportation Plan (SJCOG 2022, SJRTD 2025). Access to the Project Site during construction, operation, and decommissioning would be provided by a new paved driveway access from Copperopolis Road. There are no transit stops located adjacent to the Project Site; the nearest transit stops are located approximately 4 miles west of the Project Site at the edge of the Stockton metropolitan area. There are no existing bicycle facilities on Copperopolis Road, and none are proposed for future installation on the portions of the roads nearest to the Project Site. The portions of Copperopolis Road and Best Road adjacent to the Project Site do not contain sidewalks; the nearest sidewalks are located approximately 3 miles west of the Project Site in the City of Stockton.

On average approximately 15 construction workers and 10 truck trips would be on the Project Site during construction, with up to 104 daily construction vehicle trips total during solar equipment installation, which would be the most trip-intensive construction phase. During construction and decommissioning, equipment and worker vehicles would be staged on the Project Site. Project construction, including installation of the POI is not anticipated to result in a partial or full closure of Copperopolis Road. Any potential partial or full road closure associated with the Project would be subject to the requirements and permitting of the San Joaquin County Public Works Department. Additionally, any potential closure would be temporary in nature, similar to construction traffic. During the decommissioning phase, removal of Project infrastructure would be similar in process, scale, and duration to Project construction, excluding site preparation activities such as site clearing, and thus worker and truck trip generation would be similar to that for Project construction. Construction and decommissioning traffic would be temporary and limited to the duration of the approximately 6-month construction schedule. After construction is complete, operation of the Project would not generate substantial amounts of traffic, because the Project would be operated remotely. Routine operations would require up to 20 operations and maintenance visits per year. The minimal level of additional trips generated would not have the potential to conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities. Therefore, impacts related to a program, plan, ordinance or policy addressing the circulation system would be less than significant.

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

CEQA Guidelines Section 15064.3(b) identifies criteria for evaluating transportation impacts. Specifically, the guidelines state VMT exceeding an applicable threshold of significance may indicate a significant impact. In 2018, the Governor's Office of Planning and Research (OPR) published the *Technical Advisory on Evaluating Transportation Impacts in CEQA* which provides on evaluating the potential significance of a Project's VMT impacts. As stated in the Technical Advisory, Projects that generate or attract fewer than 110 passenger vehicle trips per day generally are assumed to have a less-than-significant impact related to VMT (OPR 2018).

Overall, the Project is expected to generate an average of 15 worker trips and 10 truck trips per day during the 6-month construction phase. Trip generation during the decommissioning phase is anticipated to be similar to that of the construction phase. The estimated number of construction-phase trips is based on the planned work activities, construction schedule, and Project Applicant experience on similar Projects. After construction is complete, the Project would function as an unmanned facility that is controlled remotely from an off-site location. No daily operational trips would typically be generated by the Project. Routine operations and maintenance would require up to 20 visits per year during the operational lifespan of the Project. Included in these trips are two anticipated panel washings per year. Accordingly, vehicle trips would not exceed the OPR threshold of 110 passenger vehicle trips per day, and, therefore, the Project would result in a less-than-significant VMT impact without conducting a detailed traffic study based on OPR's recommendations for small Projects. Therefore, the Project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3(b), and impacts would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

c. Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible use (e.g., farm equipment)?

d. Would the project result in inadequate emergency access?

The Project would be accessed via a new paved driveway on Copperopolis Road. The proposed driveway would comply with existing County requirements which would ensure that this would not introduce sharp curves, dangerous intersections, or other roadway design features that could increase traffic hazards would not be introduced. Construction and decommissioning activities would involve temporary delivery trucks and equipment; however, these vehicles would use established routes and comply with applicable traffic safety requirements, and their presence would not create long-term hazards or conflicts with existing uses, including agricultural operations. Operation of the facility would generate minimal traffic, limited to periodic maintenance visits, and would not interfere with surrounding land uses. In addition, the Project would be designed to comply with San Joaquin County Code standards related to emergency access, including Chapter 4-1006, which sets standards for emergency access for fire apparatuses and emergency vehicles based on San Joaquin County's *Fire Apparatus Access Road Standard*. The Project would not block or restrict existing roadways or access points, and emergency responders would be able to enter and exit the site without obstruction. Therefore, the Project would not increase transportation hazards or impede emergency access and there would be no impact.

NO IMPACT

18 Tribal Cultural Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than - Significant Impact	No Impact
Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in a Public Resources Code Section 21074 as either a site, feature, place, or 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:				
a. 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)?	☐	☐	■	☐
b. 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.	☐	☐	■	☐

On July 1, 2015, California AB 52 went into effect, expanding CEQA by defining a new resource category of "tribal cultural resources." AB 52 establishes that "a Project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a Project that may have a significant effect on the environment" (PRC Section 21084.2). It further states the lead agency shall establish measures to avoid impacts that would alter the significant characteristics of a tribal cultural resource, when feasible (PRC Section 21084.3). PRC Section 21074 (a)(1) (A-B) defines tribal cultural resources as "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe" and is:

1. Listed or eligible for listing in the CRHR, or in a local register of historical resources as defined in PRC Section 5020.1(k), or
2. 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 these criteria, the lead agency shall consider the significance of the resource to a California Native American Tribe.

AB 52 establishes a formal consultation process for California Tribes regarding those resources. The consultation process must be completed before a CEQA document can be certified. Under AB 52, lead agencies are required to "begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the Project," specifically with those Native American Tribes that have requested notice of Projects proposed within the jurisdiction of the lead agency. Consultation begins with a written notification that must include a brief description of the Project, the Project's location, the lead CEQA agency contact information, and notification that the California Native American Tribe has 30 days to request consultation. Upon receipt of a written response from a California Native American Tribe requesting consultation, the lead CEQA agency and the California Native American Tribe requesting consultation shall begin the AB 52 process.

a. *Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code Section 21074 that is 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)?*

b. *Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code 21074 that is 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?*

As part of cultural resources background research for the Project, Rincon Consultants requested an SLF search from the Native American Heritage Commission (NAHC). In a letter dated March 17, 2025, the NAHC reported that the SLF search results were positive and provided a list of Native American tribes that may have knowledge of cultural resources in the Project area, noting that the SLF is not a substitute for consultation with all tribes traditionally and culturally affiliated with the geographic area of the project.

On November 6, 2025, the San Joaquin County Community Development Department, as the lead agency, initiated early consultation and agency referral for the Project. As part of this referral, the County transmitted Project information and an opportunity to comment to the NAHC, California Tribal Temporary Assistance for Needy Families (TANF) Partnership, and other tribal-related entities traditionally and culturally affiliated with the Project area, consistent with PRC Section 21080.3.1. The referral described the Project, its location on the south side of East Copperopolis Road approximately 475 feet west of South Best Road (APNs 103-220-22, -24, and -25), and provided contact information for the Project planner, along with a response deadline of December 4, 2025. The notice advised that recommendations and/or comments received after that date may not be considered in staff analysis.

As of preparation of this Initial Study – Mitigated Negative Declaration, no tribe has requested formal AB 52 consultation for the Project, and no tribal cultural resources, as defined in PRC Section 21074, have been identified within the Project Site through the SLF search, NAHC tribal contact list, or the County's referral process. Based on the absence of requested consultation, the lack of identified tribal cultural resources within the Project Site, and the findings of the cultural resources technical report, the Project would not cause a substantial adverse change in the significance of a tribal cultural resource that is listed or eligible for listing in the California Register of Historical Resources or a local register, nor in a resource determined by the lead agency to be significant pursuant to PRC 5024.1(c).

If human burials found to be of Native American origin are encountered during Project construction, all work shall halt in the vicinity of the discovery and the San Joaquin County Coroner shall be notified immediately. At the same time, a qualified archaeologist shall be contacted to evaluate the find. If the remains are determined to be Native American, the Coroner shall notify the Native American Heritage Commission and the Most Likely Descendant shall be identified, and treatment of the remains shall follow the requirements of Health and Safety Code Section 7050.5 and PRC Section 5097.98, as well as the procedures set forth in State CEQA Guidelines Section 15064.5. Implementation of these procedures would ensure that any unanticipated discovery of Native American human remains is handled in a respectful and legally compliant manner and would avoid or substantially lessen potential impacts to tribal cultural resources. Therefore, impacts to tribal cultural resources would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

19 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?	☐	☐	■	☐

a. Would the project 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?

The Project is a 12.2-acre solar facility that would not require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects. The Project would include the installation of four new utility poles on the Project Site which have been analyzed as part of Project construction throughout the environmental analysis contained within this document. The PG&E POI associated with the Project would not necessitate the use of substantial construction equipment or include ground disturbance or intensive construction activities because the Project only requires a line tap to existing PG&E infrastructure. Therefore, impacts related to public utility infrastructure interconnections associated with the Project would not have a substantial environmental effect. The Project is a solar generation facility that would provide new electricity to the existing energy grid through a proposed connection to an existing transmission line, the construction of which is evaluated throughout this document along with total Project construction and decommissioning impacts. No additional impacts related to electric power facilities would occur.

NO IMPACT

b. Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

The Project would not require permanent on-site personnel and does not include the installation of potable water service connections or groundwater wells. Water required for construction and decommissioning for dust suppression would be delivered to the site by truck by a local purveyor. Groundwater from the San Joaquin Valley Basin supplies approximately 30 percent of water in the region (USGS 2024).

As discussed in Section 10, *Hydrology and Water Quality*, the Project Site overlies the Eastern San Joaquin Subbasin, which is part of the San Joaquin Valley Groundwater Basin (SWRCB 2006). The Eastern San Joaquin Subbasin is not adjudicated, although it is in condition of critical overdraft (DWR 2026). Groundwater level measurements within the Eastern San Joaquin Subbasin have been in continuous decline over the last 40 years (San Joaquin County 2014).

The amount of water required during construction and decommissioning of the Project would be temporary and nominal. Once operational, the Project would require up to 65,000 gallons of water per year. Operational water would be obtained from an external commercially available source and would not affect groundwater supplies directly within the Project area. The minimal quantities of water required during construction, operation, and decommissioning would not substantially impact regional water supplies. Therefore, the Project would have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years, and impacts would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

c. Would the project 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?

The Project is an unmanned solar facility that does not include wastewater treatment connections. Therefore, no impact related to wastewater treatment capacity would occur.

NO IMPACT

d. Would the project 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. Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

The Project Site would not require any demolition during construction. Construction and eventual decommissioning of the solar facility would generate typical construction-related waste (e.g., packaging materials, scrap metal, and minor debris), which would be temporary and disposed of at permitted facilities. Waste would be segregated, where practical, for recycling. Non-recyclable wastes would be placed in covered dumpsters and removed on a regular basis by a certified waste-handling contractor for disposal at a Class III landfill. The nearest Class III landfill to the Project Site is the Republic Services Forward Landfill, located approximately 6.7 miles south of the Project Site. The Forward Landfill has a remaining capacity of 24 million cubic yards and operations are projected to continue through 2036 (California Department of Resources Recycling and Recovery [CalRecycle] 2020). Construction of the Project would result in a minimal quantity of waste, which could be accommodated by the remaining capacities of the Forward Landfill. Furthermore, the construction contractor would adhere to State regulations pertaining to construction waste and recycling requirements, such as the California Green Building Standards Code, which requires diversion of at least 65 percent of construction debris.

Operation of the Project would generate minimal solid waste, limited to small amounts of maintenance-related materials, and would not place a measurable demand on local landfill capacity.

While decommissioning would involve the removal of all above ground components and the removal of piers up to 12 feet below grade, solar panels and accessory infrastructure would be recycled to the extent

feasible. Therefore, the Project would not generate solid waste in excess of State or local standards, local infrastructure capacity, or otherwise impair the attainment of solid waste regulation goals and would comply with applicable statutes and regulations related to solid waste. Impacts related to adherence to existing regulatory requirements would be less than significant.

LESS-THAN-SIGNIFICANT IMPACT

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20 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 downslopes or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	■

a. *If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project substantially impair an adopted emergency response plan or emergency evacuation plan?*

b. *If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project, 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. *If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project 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. *If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project expose people or structures to significant risks, including downslopes or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?*

The Project Site is not within a State Responsibility Area or lands classified as a Very High FHSZ, as delineated by CAL FIRE's Fire Hazard Severity Zone Viewer (CAL FIRE 2024). The nearest fire hazard zone is a moderate fire hazard zone located in a local responsibility area approximately 9 miles east of the Project Site. Vacant lands and existing agricultural development, roads, and agricultural canals separate the moderate fire hazard zone from the Project Site. The Project Site is not near lands classified as a Very High FHSZ within a State Responsibility Area and would therefore not substantially impair an adopted emergency response plan or emergency evacuation plan, exacerbate wildfire risks, or expose people or structures to significant risks such as flooding, slope instability, or drainage changes. Therefore, no impact associated with wildfires would occur.

NO IMPACT

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21 Mandatory Findings of Significance

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than - Significant Impact	No Impact
Does the project:				
a. 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. Have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	■	☐	☐
c. Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	■	☐	☐

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?*

As discussed in Section 4, *Biological Resources*, the Project would not significantly impact the total mapped habitat area of a species or result in the loss of a locally or regionally important population of any of these species with implementation of Mitigation Measures BIO-1 and BIO-2. Therefore, the Project would not 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, or substantially reduce the number or restrict the range of a rare or endangered plant or animal.

As discussed in Section 5, *Cultural Resources*, and in Section 7, *Geology and Soils*, the Project would not substantially alter the built environment resources on-site and would not result in an adverse change in the significance of an archaeological or paleontological resource with implementation of Mitigation Measure CUL-1, Mitigation Measure CUL-2, and Mitigation Measure GEO-1. Therefore, the Project would not eliminate important examples of the major periods of California history or prehistory and, as such, impacts would be less than significant with mitigation incorporated.

LESS THAN SIGNIFICANT WITH 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 considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

As described throughout the Initial Study – Mitigated Negative Declaration with respect to all environmental issues, the Project would not result in significant and unmitigable impacts to the environment. All anticipated impacts associated with Project construction, operation, and decommissioning would be either less-than-significant or less than significant with mitigation incorporated. The Project would have no impact on aesthetics (scenic vistas, scenic resources within a State Scenic Highway, new sources of substantial light or glare), forestry resources (conflict with existing zoning or result in the loss of forest land or timberland), biological resources (riparian habitats, protected wetlands, migratory species, and conflict with local policies and ordinances or and adopted habitat plan), cultural resources (significance of historical resources), energy (conflict with a state or local plan for energy efficiency or renewable energy), geology and soils (rupture of a known earthquake fault and septic tanks or alternative wastewater disposal systems), hazards and hazardous materials (hazards within 0.25 mile of a school, location on a hazardous materials site, hazards within two miles of an airport, and exposure to wildland fire risks), hydrology and water quality (release of pollutants due to inundation), land use and planning (physically divide an established community), mineral resources, noise (exposure within two miles of an airport), population and housing (displacement of people or housing), public services, recreation, transportation (conflict with *CEQA Guidelines* 15064.3, subdivision (b), hazards due to geometric design or incompatible uses, and inadequate emergency access), utilities and service systems (relocation or expansion utility infrastructure or wastewater treatment capacity), or wildfire. Thus, the Project would not contribute to cumulative impacts for these resource topics and these topics are not discussed further.

Section 15355 of the *CEQA Guidelines* defines a cumulative impact as the condition under which "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The cumulative impact from several projects is the change in the environment which results from the incremental impact of the Project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time" (CCR Section 15355). A list of projects within a 5-mile radius of the Project Site are included in Table 10, below.

Table 10 Planned and Pending Projects within 5 Miles of Proposed Project

Project Name/ Description	Agency	Project Description[1]	Distance from Project Site (in miles)	Status
State Route (SR) 26 and Jack Tone Road Roundabout	County	Install roundabout at intersection of SR 26 and Jack Tone Road.	2.29	Not Available
Installation of Pedestrian Crosswalks and Flashing Beacons at Various Locations (EA 1Q520)	Caltrans	Install new and replace existing pedestrian crosswalks and new rectangular rapid flashing beacons in San Joaquin, Merced, and Stanislaus Counties, on Routes 26, 140 and 120 at various locations.	1.80 to 5.00	Not Available
SR-26 Duncan Road Safety Project (EA 1S810)	Caltrans	In San Joaquin. Replace Light Emitting Diode (LED) lamp bulbs, LED blinker beacon, beacon pole, and red/yellow signpost reflector On SR-26 PM 10.0.	4.92	Not Available
Jack Tone Road Resurfacing	County	Roadway resurfacing of Jack Tone Road (SR 26 to Eight Mile Road).	2.29	Not Available
Map Amendment/Rezoning	County	General Plan Map Amendment from C/G (General Commercial) to R/L (Low Density Residential) at 985 S Rossi Ave, Stockton.	3.49	Routed for Review
Conditional Use Authorization	County	Proposed conversion and expansion of an existing truck fleet maintenance facility at 3333 S State Route 99 W Frontage Rd, Stockton	4.70	Final
Conditional Use Authorization	County	Proposed waste tire hauler operation at 3331 E Munford Ave, Stockton	4.70	Final
Conditional Use Authorization	County	The construction of a proposed trucking business, maintenance facility, and truck parking at 4082 S State Route 99 E Frontage Rd, Stockton; 4082 Sr 99 Frontage E, Stockton	4.82	Plan Review
Waivers	County	Proposed modified street setback at 3111 E Lewis St, Stockton	4.95	Plan Review

[1] Cumulative project details were sources from: San Joaquin Council of Governments 2026, San Joaquin County 2026b

Project impacts are primarily temporary or localized effects that would occur from Project construction. The potential for the Project to contribute to cumulative impacts would be limited to the limited to the following issues:

Aesthetics

The geographic area used to assess cumulative impacts to aesthetics includes the viewshed of the agricultural environment experienced from public views on Copperopolis Road proximate to the Project Site. There are no pending or approved development projects in the same viewshed as the Project Site; therefore, a cumulative aesthetics impact would not occur.

Agriculture

The geographic area used to assess cumulative impacts to agriculture and forestry resources is San Joaquin County. A significant cumulative impact would occur if cumulative projects would convert substantial quantities of existing Farmland such that the agricultural nature of the County is altered. As a result of a historical pattern of Farmland conversion in the region, caused primarily by development pressure and water scarcity, a significant adverse cumulative impact related to farmland conversion does exist in San Joaquin County. However, currently planned cumulative development, as listed in Table 10, does not include other land use conversion projects within agricultural zones in the County. All future development in the unincorporated County would be subject to the provisions of the San Joaquin County Code, including applicable Development Title regulations. Development in incorporated cities within the County would be subject to the applicable municipal code. . Additionally, future development would be subject to the restrictions of any active Williamson Act contracts in place. Adherence to these applicable regulations, as they apply to the conversion of existing farmland, would be evaluated in the permitting and entitlement process to be facilitated by the County prior to development. With appropriate regulatory compliance, cumulative impacts related to agriculture and forestry resources would be less than significant. As such, the Project's cumulative impacts related to agriculture and forestry resources would be less than significant.

Air Quality

The geographic area used to assess cumulative impacts to air quality is the SJVAB. The evaluation of the Project's potential to result in impacts to air quality is, in itself, a cumulative analysis, as the *CEQA Guidelines* Appendix G thresholds asks if the Project would result in a cumulatively considerable net increase of a criteria pollutant for which the Project region is in non-attainment. The SJVAB is a nonattainment area for ozone, PM_{10}, and $PM_{2.5}$ under the NAAQS and/or CAAQS. Therefore, cumulative air quality impacts currently exist for these pollutants. As discussed in Section 3, *Air Quality*, Project construction, operation, and decommissioning would not generate emissions of these criteria air pollutants exceeding SJVAPCD's significance thresholds, which are intended to assess whether a Project's contribution to existing cumulative air quality impacts is considerable. Additionally, air quality impacts would be further reduced through implementation of Mitigation Measure AQ-1 which would ensure that construction worker exposure to Valley Fever is reduced by requiring the preparation and implementation of a Fugitive Dust Control Plan for the Project which includes dust suppression measures, respiratory protection for workers, and Valley Fever awareness and training to minimize worker exposure to airborne dust. Therefore, the Project's contribution to cumulative air quality impacts would not be cumulatively considerable. As such, the Project's cumulative impacts related to air quality would be less than significant.

Biological Resources

The geographic area used to assess cumulative impacts to biological resources is the nonnative annual grasslands within the SJMSCP's Central/Southwest Transition Zone within San Joaquin County. Cumulative impacts consider impacts that would occur from the reasonably foreseeable future development, including those projects listed in Table 10 and cumulative development assumed in the SJMSCP. Most cumulative impacts to biological resources occur when a disproportionate number of development projects occur at once and regionally impact a local population of a special-status wildlife species. Impacts to special-status species like habitat loss can aggregate across a region as a result of a disproportionate number of development projects in one area and can therefore cause cumulative impacts. All cumulative development would comply with all applicable laws and regulations governing biological resources. However, regulatory compliance does not guarantee a reduction of potential impacts to biological resources, particularly the special-status species that are present in the environment of the cumulative setting. Cumulative development would have the potential to disturb special-status species and their habitats or conflict with the SJMSCP, which would contribute to the decline of species population, including the potential to result in a decline of a listed species. Accordingly, cumulative impacts to biological resources would be potentially significant.

The Project would participate in the SJMSCP and would adhere to all applicable regulatory requirements to minimize potential impacts to special-status species. Specifically, with implementation of Mitigation Measures BIO-1 and BIO-2, the Project would not contribute to cumulative impacts to biological resources such as the aggregation of habitat loss, due to the fact that the specific biological resources the Project could affect are common and abundant beyond the Project Site. Furthermore, the Project Applicant would be required to implement Mitigation Measures BIO-1 and BIO-2 which would require preconstruction surveys and implementation of avoidance measures, to reduce Project-level impacts to less-than-significant. Implementation of these measures would be required to reduce the Project's contribution such that it would not be cumulatively considerable.

Cultural Resources

The geographic area used to assess cumulative impacts to cultural resources is San Joaquin County. Cumulative development includes past, present, and reasonably foreseeable planned and future development, including the projects in Table 10, that could potentially disturb sensitive areas for cultural resources. Future development near the Project Site could potentially be located in a sensitive area for cultural resources. In addition, unknown resources may be uncovered at other cumulative development sites. Existing County regulations within Chapter 9-1053 of the County Code and the San Joaquin County General Plan Natural and Cultural Resources Element would protect any unknown resources that might be uncovered during Project development. General Plan Policy NCR-6.5 requires an archeological report be prepared prior to permits and approvals. In the event that future cumulative development would result in impacts to known or unknown cultural resources, impacts to such resources would be addressed on a case-by-case basis. For the purposes of this analysis, impacts to cultural resources are assumed to be potentially significant.

As discussed under Section 5, *Cultural Resources*, there are no known historical or archaeological resources on the Project Site. In addition, the Project Applicant would be required to implement Mitigation Measure CUL-1 and Mitigation Measure CUL-2, which would require site personnel to participate in a Workers Environmental Awareness Program, led by a qualified archaeologist; implementing archaeological monitoring during ground-disturbing activities; and implementing standard procedures in the event archaeological resources are unexpectedly encountered during ground-disturbing activities to reduce Project-level impacts to less-than-significant. With implementation of these measures, the Project's contribution would not be cumulatively considerable.

Energy

The geographic area used to assess cumulative impacts to energy considers the cumulative effects of energy use in San Joaquin County. Foreseeable cumulative development would be subject to State requirements for energy efficiency, such as the California Building Energy Efficiency Standards and the California Green Building Standards Code which would ensure projects are designed and constructed to be energy efficient. Construction of cumulative development would be carried out in accordance with CCR Title 13 Sections 2449 and 2485 which would ensure construction would not use energy in a wasteful, inefficient, or unnecessary manner. Because cumulative development would be required to comply with existing State regulations for energy-efficiency, cumulative impacts to energy would be less than significant. Further, as a utility scale solar generation facility, the Project would inherently result in a net negative draw on regional energy use.

Geology and Soils

Geologic hazards are dependent on site-specific conditions, such that development at one project site would not increase another project's geologic hazards impacts. Therefore, this discussion pertains to cumulative impacts to paleontological resources. The geographic area used to assess cumulative impacts to paleontological resources is development within the San Joaquin Valley. Cumulative development within the San Joaquin Valley would continue to disturb areas with the potential to contain paleontological resources. Cumulative development projects have undergone or would be required to undergo CEQA

review, which would determine the extent of potential paleontological resources impacts and mitigate those impacts appropriately. This analysis conservatively assumes a cumulative impacts to paleontological resources would be potentially significant. The Project would be required to implement Mitigation Measure GEO-1 which would require WEAP training, paleontological monitoring, and fossil salvage, preparation and curation, and preparation of a final paleontological mitigation report, if necessary to reduce Project-level impacts to less-than-significant. Implementation of Mitigation Measure GEO-1 would reduce the Project's potential contribution such that it would not be cumulatively considerable.

Greenhouse Gas Emissions

GHG emissions and climate change are, by definition, cumulative impacts. The adverse environmental impacts of cumulative GHG emissions, including sea level rise, increased average temperatures, more drought years, and more large forest fires, are already occurring. As a result, cumulative impacts related to GHG emissions are significant. Thus, the issue of climate change involves an analysis of whether a Project's contribution towards an impact is cumulatively considerable. As discussed in Section 8, *Greenhouse Gas Emissions,* the Project would be consistent with plans to minimize GHG emissions, including the 2022 Scoping Plan, Renewables Portfolio Standard, SB 100, and the SJVAPCD Climate Change Action Plan. Additionally, operation of the Project would ultimately result in an expansion of renewable energy technology which would promote the reduction of fossil fuel use and associated GHG emissions. Therefore, the Project's impact would not be cumulatively considerable.

Hazards and Hazardous Materials

The geographic area used to assess cumulative impacts to hazards and hazardous materials includes the area within five miles of the Project Site, as hazardous materials releases from cumulative development could result exposure of people to hazardous materials proximate to the Project Site. The Project Site is located within a primarily agricultural and rural portion of San Joaquin County. Existing hazardous materials use in the cumulative study area is limited and typically associated with agricultural operations (e.g., fuels, fertilizers, pesticides), transportation corridors, and small-scale industrial or utility uses. These activities are regulated under federal, state, and local hazardous materials management programs, including the California Accidental Release Prevention Program and Unified Program oversight by the Certified Unified Program Agency (CUPA). Project-related hazardous materials would be limited to small quantities and stored, handled, and disposed of in compliance with applicable regulations and best management practices. No acutely hazardous materials in quantities that would trigger off-site consequence planning are proposed. Any releases from cumulative development, including the projects listed in Table 10 would be site-specific, regulated, and localized in extent such that a cumulative impact would not occur.

Hydrology and Water Quality

The geographic area used to assess cumulative impacts to surface water is the San Joaquin River watershed. The geographic area used to assess cumulative impacts to groundwater is land overlying the Eastern San Joaquin Subbasin. A cumulative impact could occur if foreseeable planned and future development within the geographic area, including those projects listed in Table 10, would discharge pollutants to the same watershed and violate water quality standards, or if these projects underly the same groundwater basin and would result in substantially decreased groundwater supplies. Due to the existing overdraft conditions present throughout the San Joaquin Basin region, a cumulative impact related to groundwater management exists.

Ground disturbance by the Project and cumulative projects could cause the release of sediment and other pollutants into surface water or groundwater. As noted in Table 10, the cumulative scenario includes multiple projects, such as the proposed subdivision, that, like the Project, involve ground disturbance over relatively flat terrain. Because the topography of the Project Site along with the sites of other projects in the cumulative scenario do not contain steep slopes, the potential for erosive conditions is low. Projects that could generate stormwater runoff during soil-disturbing construction activities and discharge to surface waters would be required to comply with federal, State, and County water quality requirements,

such as the Construction Stormwater General Permit and Chapter 9-1125 of the County's Development Title Code and conditions of County grading permits. These regulations would require implementation of a SWPPP and its associated BMPs to maintain and treat stormwater and prohibit waste discharge in or adjacent to water bodies, which would reduce the incremental contributions of projects. Therefore, cumulative impacts related to surface water quality and management would be less-than-significant.

Cumulative development could result in increased water demand from the Eastern San Joaquin Subbasin. However, all water use would occur in compliance with the Eastern San Joaquin Subbasin Sustainable Groundwater Management Act. A majority of the planned projects identified in Table 10, by nature, would not generate substantially increased operational water demands relative to present conditions, including the various planned transportation improvement projects to occur in the vicinity of the Project. The Project would not require substantial regular water use during operation and maintenance activities. During operation, biannual solar panel washings and landscaping is anticipated to generate an annual water demand of approximately 65,000 gallons. It is anticipated that landscaping included as part of the buffer required by the county and the pollinator vegetation planted on site required by the PPA would be comprised of native plants, requiring minimal water once established. As a result, the Project's contribution to existing significant cumulative groundwater management impacts related to sustainable groundwater management would be less-than-significant.

Land Use and Planning

The geographic scope for evaluating cumulative land use and planning impacts is San Joaquin County because land use plans, policies, and regulations applicable within the County establish the framework governing the location, type, intensity, and environmental effects of development in the surrounding region. The cumulative analysis considers the Project together with the reasonably foreseeable projects identified in Table 10.

A significant cumulative land use impact could occur if the Project, in combination with other past, present, and reasonably foreseeable future development, would result in a substantial conflict with an applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. As discussed in Section 11, *Land Use and Planning*, the Project would not conflict with applicable County General Plan policies, zoning regulations, or other land use requirements adopted to avoid or reduce environmental impacts. Therefore, the Project would not result in a significant land use impact on its own.

The related projects identified in Table 10 would be subject to review by the applicable lead agencies and would be required to demonstrate consistency with the land use plans, policies, and regulations governing their respective jurisdictions. These regulatory frameworks are intended to ensure that development occurs in a manner that avoids or minimizes environmental effects associated with land use incompatibility, growth, and resource protection.

Because the Project would not conflict with applicable land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating environmental effects, and because other cumulative projects would be subject to similar regulatory requirements, the Project would not combine with other development to create a significant cumulative land use conflict. Accordingly, a significant cumulative impact related to conflicts with land use plans, policies, or regulations adopted to avoid or mitigate environmental effects would not occur and would be less than significant.

Noise

Construction noise and vibration are localized and rapidly attenuate. Cumulative construction noise and vibration impacts would therefore occur if other projects are located proximate to the Project such that overlapping construction schedules could result in increased construction noise and vibration at the same sensitive receptors. However, no projects are currently planned to be developed in the immediate vicinity of the Project Site during active construction of the Project. Additionally, similar to the Project, cumulative development projects would be subject to compliance with the noise level limits established in the San Joaquin County Code. Therefore, operational noise from the Project would not combine to create a

substantial cumulative increase in noise levels. Therefore, cumulative noise impacts would be less-than-significant.

Population and Housing

Foreseeable cumulative development within the County could include transportation and residential projects in Table 10 which could result in direct impacts to population growth (due to the proposal of new homes) and indirect impacts to population growth (due to the expansion of transportation services and related infrastructure). The development of cumulative projects could potentially result in substantial population growth within the County. However, cumulative projects would be developed in accordance with the population and housing projections of the San Joaquin County General Plan goals and policies and the San Joaquin Council of Governments Regional Housing Needs Plan and would result in a less-than-significant cumulative impact.

Transportation

The geographic area used to assess cumulative transportation impacts is San Joaquin County. A cumulative transportation impact could occur if cumulative County development would result in exceedance of long-term countywide VMT targets. Cumulative development in San Joaquin County could include residential and transportation projects, including those in Table 10, which could increase population, employment, and subsequently countywide VMT. Therefore, cumulative impacts are potentially significant. The Project would be remotely monitored during operations and is expected to generate trips up to approximately 20 trips per year during operations and maintenance activities. This amount would not exceed County thresholds for VMT screening. Therefore, the Project's contribution to VMT would not be cumulatively considerable.

Tribal Cultural Resources

The geographic area for considering cumulative impacts to tribal cultural resources is based on the ethnographic use patterns of the Project Site and surrounding region. Cumulative development in the County, including projects listed in Table 10, could cumulatively contribute to the erasure of tribal cultural resources important to these Tribes from the landscape. However, compliance with the provisions of AB 52 would ensure that any known or potential tribal cultural resources are treated in consultation with local Native American groups. Compliance with AB 52, implementation of Project-specific measures to protect tribal cultural resources on a case-by-case basis, and continued involvement by local Native American groups in regional planning would limit the destruction of tribal cultural resources such that cumulative impacts would be less-than-significant.

Utilities and Service Systems

The Project would have no impact on wastewater, electric, or natural gas, infrastructure; therefore, these utilities are not discussed in the above analysis. The geographic area used to assess cumulative utilities and service systems impacts is the Eastern San Joaquin Subbasin service area for water and San Joaquin County for solid waste disposal. A cumulative utilities and service systems impact could occur if cumulative development would increase water demand in the Eastern San Joaquin Subbasin service area such that the Eastern San Joaquin Subbasin cannot adequately meet cumulative demands or generate solid waste that exceeds the current capacity of the Forward Landfill. Groundwater from the San Joaquin Valley Basin supplies approximately 30 percent of water in the region (USGS 2024). The Eastern San Joaquin Subbasin is not adjudicated, although it is in condition of critical overdraft (DWR 2026). Groundwater level measurements within the Eastern San Joaquin Subbasin have been in continuous decline over the last 40 years (San Joaquin County 2014). Therefore, cumulative impacts to groundwater would be potentially significant. The amount of water required during construction and decommissioning of the Project would be temporary and nominal. Water to be used during operation would be obtained from an external commercially available source, and would not directly affect groundwater supplies within the

Project area. Therefore, cumulative development would be adequately served by the existing water supply, and cumulative water supply impacts would be less-than-significant.

The Forward Landfill has a remaining capacity of 24 million cubic yards and operations are projected to continue through 2036 (CalRecycle 2020). Accordingly, sufficient landfill capacity exists to serve cumulative development. Therefore, cumulative impacts to solid waste would be less-than-significant.

Based on the above, the Project does not have impacts that are individually limited, but cumulatively considerable. As such, the Project's cumulative impacts related to utilities and service systems would be less than significant.

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

Adverse effects on human beings are typically associated with air quality, hazards and hazardous materials, and noise impacts. As detailed in Section 3, *Air Quality*; Section 9, *Hazards and Hazardous Materials*; and Section 13, *Noise*, the Project would not result, either directly or indirectly, in substantial adverse effects related to air quality, hazardous materials, and noise with implementation of Mitigation Measure AQ-1. Therefore, impacts to human beings would be less than significant with mitigation incorporated.

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Mitigation Monitoring and Reporting Program

The Initial Study-Mitigated Negative Declaration identifies the applicable mitigation measures that will be implemented to reduce the impacts associated with the Copperopolis Road Solar Project. The California Environmental Quality Act (CEQA) requires a public agency to adopt a monitoring and reporting program for assessing and ensuring compliance with any required mitigation measures applied to proposed development. As stated in section 21081.6(a)(1) of the Public Resources Code:

> ...the public agency shall adopt a reporting or monitoring program for the changes made to the project or conditions of project approval, adopted in order to mitigate or avoid significant effects on the environment.

Section 21081.6 also provides general guidelines for implementing mitigation monitoring programs and indicates that specific reporting and/or monitoring requirements, to be enforced during project implementation, shall be defined as part of adopting an Initial Study-Mitigated Negative Declaration.

To ensure that the mitigation measures are properly implemented, a monitoring program has been devised which identifies the timing and responsibility for monitoring each measure. The project Applicant will have the responsibility for implementing the measures that apply to development activity, and the various San Joaquin County departments will have the primary responsibility for monitoring and reporting the implementation of the mitigation measures.

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Mitigation Measure	Implementation Procedures	Monitoring and Reporting Action	Monitoring Timing	Monitoring Responsibility	Compliance Verification (Initial, Date, Comments)
Air Quality					
AQ-1: Minimize Personnel and Public Exposure to Valley Fever					
Prior to site preparation, grading activities, or ground disturbance, the Project Applicant shall prepare a Fugitive Dust Control Plan for the Project. The Fugitive Dust Control Plan shall include the following at a minimum: • Equipment, vehicles, and other items shall be cleaned thoroughly of dust before they are moved off-site to other work locations. • Wherever possible, grading, and trenching work shall be phased, so that earth-moving equipment works well ahead or down-wind of workers on the ground. • The area immediately behind grading or trenching equipment shall be sprayed with water before ground workers move into the area. • If a water truck runs out of water before dust is dampened sufficiently, ground workers exposed to dust are to leave the area until a full truck resumes water spraying. • All heavy-duty earth-moving vehicles shall be closed-cab and equipped with a High Efficiency Particulate Arrestance-filtered air system, or High Efficiency masks that can be worn by the vehicle operators. • N95 respirators shall be available to on-site workers for the duration of the construction period. • Workers shall receive training to recognize the symptoms of Valley Fever and shall be instructed to promptly report suspected symptoms of work-related Valley Fever to a supervisor. Evidence of training shall be kept on-site for review as required by regulatory agencies. • Valley Fever information shall be available on-site for all construction personnel. The information shall provide, at a minimum, a description of the symptoms, health effects, preventative measures, and treatment.	Prepare and submit a FDCP to the San Joaquin County Department of Community Development for review. Implement the requirements of the FDCP.	Verify FDCP is completed. Verify measures are implemented during construction as needed.	Prior to ground disturbance. During site preparation, grading, and ground disturbance.	San Joaquin County Department of Community Development	
Biological Resources					
BIO-1: Crotch's Bumble Bee Avoidance					
Should construction begin during the Colony Active Period (March – August), a formal habitat assessment shall be performed by a qualified biologist prior to initiating ground disturbing activities to determine if suitable nesting or foraging habitat is present in the Project Site. The assessment shall include: • Review of occurrence record data • Analysis of foraging, nesting, and overwintering resources • Documentation of plant species observed (including what is blooming at the time of the survey and percent cover) The locations of any nesting resources, including rodent burrows, cavities, thatched grasses, brush, rock piles, logs, and manmade structures like dumped furniture, shall be mapped during the assessment. Areas adjacent to the Project shall also be considered, as accessible, to determine if there is suitable nesting or foraging habitat for Crotch's bumble bee. If suitable nesting and foraging resources are detected in the Project Site during the habitat assessment, surveys following the CDFW *Survey Considerations for California Endangered Species Act Candidate Bumble Bee Species* (CDFW 2023) shall be conducted by a qualified biologist (i.e. someone with a valid CDFW Scientific Collecting Permit for Crotch's bumble bee) to determine if Crotch's bumble bee is present in the Project Site. A minimum of three visits shall be conducted during the Colony Active Period (March – August) and will be spaced 2-4 weeks apart. If no Crotch's bumble bees are detected on the Site, no further mitigation would be required if construction begins before the next Colony Active Period. If Crotch's bumble bees are detected, nest surveys for Crotch's bumble bee shall be conducted throughout the Project Site and a 50-foot buffer, as accessible, according to the CDFW *Survey Considerations for California Endangered Species Act Candidate Bumble Bee Species* (CDFW 2023) document. If active Crotch's bumble bee nests are detected during the surveys, they shall be avoided by a 50-foot buffer, if avoidance is possible. If avoidance is not possible, consultation with CDFW shall be initiated to determine the most appropriate strategy to avoid impacts to bumble bees on the Site, which may include obtaining an Incidental Take Permit. If construction does not begin prior to the next Colony Active Period, a new habitat assessment shall be conducted to determine site suitability for Crotch's bumble bee, and a new suite of surveys shall be conducted if suitable nesting and foraging resources are present. If suitable foraging habitat is absent from the Project Site, but suitable nesting habitat is present on the Site and foraging habitat occurs adjacent to the Site (i.e. within 500 feet of the Site, as visible with binoculars), preconstruction nest	A habitat assessment for Crotch's bumble bee shall be conducted within the Project footprint and on surrounding accessible sites by a qualified biologist, if construction begins within the Colony Active Period (March – August). If suitable nesting and foraging resources are detected in the Project Site during the habitat assessment, protocol-surveys will be conducted by a qualified biologist. If Crotch's bumble bees are detected during protocol surveys nest surveys shall be conducted in the Project Site and a 50-foot buffer. Any nests detected during the nest survey will be avoided by a minimum 50-foot buffer. If avoidance of nests is not possible, consultation with CDFW will be initiated to determine the most appropriate strategy to avoid impacts to Crotch's bumble bees on the site. If construction does not begin prior to the next Colony Active Period, a new habitat assessment shall be conducted to determine site suitability for Crotch's bumble bee, and a new suite of surveys shall be conducted if suitable nesting and foraging resources are present. If suitable foraging habitat is absent from the Project Site, but suitable nesting habitat is present on the Site and foraging habitat occurs adjacent to the Site, preconstruction nest surveys for Crotch's	Verify that a habitat assessment has been conducted prior to initiation of ground disturbing activities, if they occur within the Colony Active Period (March – August). Verify sufficient action is taken as needed based on findings of the habitat assessment including the completion of protocol surveys, the completion of preconstruction nest surveys, and consultation with CDFW if needed.	Prior to any ground disturbing activities during the Colony Active Period (March – August). Prior to any ground disturbing activities, as needed.	San Joaquin County Department of Community Development	

Mitigation Measure	Implementation Procedures	Monitoring and Reporting Action	Monitoring Timing	Monitoring Responsibility	Compliance Verification (Initial, Date, Comments)
surveys for Crotch's bumble bee shall be conducted throughout the Project Site and a 50-foot buffer, as accessible, according to the CDFW *Survey Considerations for California Endangered Species Act Candidate Bumble Bee Species* (CDFW 2023) document 72 hours prior to construction to determine if any active Crotch's bumble bee nests are present. If no active Crotch's bumble bee nests are detected during the preconstruction nest survey, no further mitigation would be required. If Crotch's bumble bee nests are detected, they shall be avoided by a 50-foot buffer, if avoidance is possible. If avoidance is not possible, consultation with CDFW shall be initiated to determine the most appropriate strategy to avoid impacts to bumble bees on the site, which may include obtaining an Incidental Take Permit. Any Crotch's bumble bee detections in the Project Site shall be documented in the California Natural Diversity Database (CNDDB).	bumble bee shall be conducted throughout the Project Site 72 hours prior to construction. Any nests detected during surveys will be avoided by a 50-foot buffer. If avoidance is not possible, consultation with CDFW will be initiated to determine the most appropriate strategy to avoid impacts to Crotch's bumble bees on the site. All Crotch's bumble bee detections will be added to the CNDDB.				
BIO-2: Preconstruction Nesting Bird Surveys					
A preconstruction nesting bird survey shall be performed by a qualified biologist no earlier than one week prior to any ground disturbance or vegetation removal activities that start during the nesting season (February 1–August 31) to determine if any native birds are nesting on or near the Project Site (including a 250-foot buffer for raptors, where accessible). If any active nests are detected during surveys, a suitable avoidance buffer from the nests shall be determined by a qualified biologist based on species, location, and extent and type of planned construction activity. These nests shall be avoided until the chicks have fledged and/or the nests are no longer active, as determined by the qualified biologist. Any ground disturbance or suitable nesting habitat (i.e., trees and vegetation) that would need to be removed under the Project shall occur outside of the bird breeding season (September 1–January 31) to avoid impacts to nesting birds, when feasible.	If construction starts during the nesting season (February 1-August 31), a nesting bird survey shall be conducted by a qualified biologist of the disturbance area plus a 250-foot buffer for raptors, where accessible.	Verify that surveying has occurred if construction starts during the nesting season (February 1-August 31)	Prior to construction.	San Joaquin County Department of Community Development	
	If active nests are detected, establish an appropriate avoidance buffer and assign a biological monitor, as necessary.	Enforce appropriate avoidance buffer and confirm biological monitor presence, as necessary.	Prior to construction, as necessary.		
Cultural Resources					
CUL-1: Workers Environmental Awareness Program					
Prior to the commencement of Project-related, ground-disturbing activities, including, but not limited to, site clearing, grubbing, trenching, and excavation, a Worker's Environmental Awareness Program (WEAP) shall be conducted for all Project personnel working on the Project. The WEAP shall be prepared and conducted under the direction of a qualified archaeologist who meets the Secretary of the Interior's Professional Qualifications Standards for archaeology (National Park Service [NPS] 1983). The WEAP training shall include a description of the types of cultural material that may be encountered, cultural sensitivity issues, the regulatory environment, and the proper protocol for treatment of the materials in the event of a find.	Retain a Qualified Archaeologist and conduct a WEAP for all workers participating in ground-disturbing activity for Project development.	Verify WEAP training has occurred.	Prior to ground-disturbing activities.	San Joaquin County Department of Community Development	
CUL-2: Unanticipated Discovery of Cultural Resources					
In the event that archaeological resources are unexpectedly encountered during ground-disturbing activities, work within 50 feet of the find shall halt and an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for archaeology (National Park Service 1983) shall be contacted immediately to evaluate the resource. If the resource is determined by the qualified archaeologist to be precontact, then a Native American representative shall also be contacted to participate in the evaluation of the resource. The qualified archaeologist will evaluate the resource for its eligibility as a historical resource or unique archaeological resource under the California Environmental Quality Act (CEQA) through appropriate means, such as archaeological testing and/or additional research, based on the nature of the find. If the resource proves to be eligible for the California Register of Historical Resources (CRHR), and significant impacts to the resource cannot be avoided via Project redesign, a qualified archaeologist shall prepare a data recovery plan tailored to the physical nature and characteristics of the resource, per the requirements of CEQA Guidelines Section 15126.4(b)(3)(C). The data recovery plan shall identify data recovery excavation methods, measurable objectives, and data thresholds to reduce any significant impacts to cultural resources related to the resource. Pursuant to the data recovery plan, the qualified archaeologist and Native American representative, as appropriate, shall recover and document the scientifically consequential information that justifies the resource's significance. The County shall review and approve the treatment plan and archaeological testing as appropriate, and the resulting documentation shall be submitted to the regional repository of the California Historical Resources Information System, per CEQA Guidelines Section 15126.4(b)(3)(C).	If archaeological resources are found, halt work with 50 feet of any find and contact an archeologist to evaluate the resource.	Verify an archaeologist is contracted if archaeological resources are found.	During ground-disturbing activities, if archaeological resources are found.	San Joaquin County Department of Community Development	
	Contact a Native American representative if the resource is determined to be prehistoric.	Verify a Native American representative is contacted if required.	During ground-disturbing activities, if archaeological resources are found.		
	Complete archaeological testing for CRHR eligibility, as required.	Review and approve the treatment plan and archaeological testing, as appropriate.	During ground-disturbing activities, if archaeological resources are found.		

Mitigation Measure	Implementation Procedures	Monitoring and Reporting Action	Monitoring Timing	Monitoring Responsibility	Compliance Verification (Initial, Date, Comments)
Geology and Soils					
GEO-1: Unanticipated Fossil Discovery					
Paleontological Worker Environmental Awareness Program. Prior to the start of construction, a Paleontological Principal Investigator, as defined by the Society of Vertebrate Paleontology (SVP), or their designee shall prepare and conduct a paleontological Worker Environmental Awareness Program (WEAP) training for construction personnel regarding the appearance of fossils and the procedures for notifying paleontological staff should fossils be discovered by construction personnel. The WEAP shall discuss the potential to discover paleontological resources in the Project Site, legal obligations to protect paleontological resources, examples of paleontological resources that may be found in the Project Site, procedures in case a paleontological resource is discovered, and contact information for the Paleontological Principal Investigator.	Retain a Qualified Professional Paleontologist to conduct WEAP training for all construction personnel.	Verify Professional Paleontologist has been retained and conducted WEAP training for construction personnel.	Prior to ground disturbance.	San Joaquin County Department of Community Development	
Unanticipated Discovery of Paleontological Resources. The Project Applicant shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement: If a potential fossil is discovered during Project construction, construction activity within 50 feet of the find shall cease until the discovery is examined by a Paleontological Principal Investigator. If the find is determined to be significant, the Paleontological Principal Investigator shall direct all mitigation efforts related to paleontological resources consistent with SVP standards, which may include, but are not limited to: paleontological monitoring; fossil salvage, preparation, and curation; and reporting to summarize the paleontological mitigation efforts that would be submitted to the lead CEQA agency.	The Project Applicant shall include a discovery clause in every construction contract.	Verify that a standard inadvertent discovery clause has been added to every construction contract.	Prior to construction.		
	In the event of a fossil discovery by the paleontological monitor or construction personnel, halt construction activity within 50 feet of the find. If it is determined that the fossil(s) is (are) scientifically significant, follow outlined procedures.	Verify procedures are followed in the event paleontological resources are identified.	During ground disturbance, as needed.		

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References

Bibliography

California Air Pollution Control Officers Association (CAPCOA). 2022. California Emissions Estimator Model User Guide Version 2022.1. April 2022. https://www.caleemod.com/documents/user-guide/CalEEMod_User_Guide_v2022.1.pdf

California Air Resources Board (CARB). 2005. Air Quality and Land Use Handbook: A Community Health Perspective. https://www.aqmd.gov/docs/default-source/ceqa/handbook/california-air-resources-board-air-quality-and-land-use-handbook-a-community-health-perspective.pdf (accessed July 2026).

_____. 2022. 2022 Scoping Plan for Achieving Carbon Neutrality. https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf (accessed July 2026).

_____. 2026a. People at Risk. https://ww2.arb.ca.gov/our-work/programs/people-risk/about (accessed July 2026).

_____. 2026b. Carbon Monoxide & Health. https://ww2.arb.ca.gov/resources/carbon-monoxide-and-health (accessed July 2026).

California Department of Conservation (DOC). 2016. Mines Online. https://maps.conservation.ca.gov/mol/index.html (accessed July 2026).

_____. 2024. Earthquake Zones of Required Investigation. https://maps.conservation.ca.gov/cgs/informationwarehouse/eqzapp/ (accessed July 2026).

_____. 2025. California Williamson Act Enrollment Finder. https://maps.conservation.ca.gov/dlrp/WilliamsonAct/ (accessed July 2026).

_____.2026a. California Important Farmland Finder. Available at: https://maps.conservation.ca.gov/DLRP/CIFF/ (accessed July 2026

_____. 2026b. Important Farmland Categories. https://conservation.ca.gov/dlrp/fmmp/Pages/Important-Farmland-Categories.aspx (Accessed July 2026).

_____. 2026c. Prime Farmland and Farmland of Statewide Importance. https://www.conservation.ca.gov/dlrp/fmmp/Pages/prime_farmland_fmmp.aspx (Accessed July 2026).

_____. 2026d. Mineral Land Classification. https://maps.conservation.ca.gov/cgs/minerals/?page=Mineral-Land-Classification (accessed July 2026).

California Department of Fish and Wildlife (CDFW). 2026a. Biogeographic Information and Observation System (BIOS). Retrieved from www.wildlife.ca.gov/data/BIOS (accessed March 2026).

_____. 2026b. California Natural Diversity Database (CNDDB). January 2026. Special Animals List. California Department of Fish and Wildlife. Sacramento, CA.

California Department of Forestry and Fire Protection (CALFIRE). 2024. San Joaquin County State Responsibility Area Fire Hazard Severity Zones. https://calfire.app.box.com/s/viyymvmweaaciuhwfb2bdxqdok3zo0ke/file/1483769711922 (accessed July 2026).

California Department of Public Health. 2026. Year-to-Date Preliminary Valley Fever Cases in California. https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/ValleyFeverProvisionalDashboard.aspx#notes (accessed July 2026).

California Department of Transportation (Caltrans). 2018. California Scenic Highway Mapping System. https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aacaa (accessed July 2026).

California Department of Toxic Substances Control (DTSC). 2026. EnviroStor. https://www.envirostor.dtsc.ca.gov/public/ (accessed July 2026).

California Department of Water Resources (DWR). 2026. SGMA Basin Prioritization Dashboard. https://gis.water.ca.gov/app/bp-dashboard/final/ (accessed March 2026).

California Native Plant Society (CNPS), Rare Plant Program. 2026. Inventory of Rare and Endangered Plants of California (online edition, v9.5.1). https://www.rareplants.cnps.org (accessed March 2026).

California Natural Diversity Database (CNDDB). 2026. California Department of Fish and Wildlife (CDFW)., Rarefind, Version 5.3.0 (accessed March 2026).

California Department of Resources Recycling and Recovery (CalRecycle). 2020. SWIS Facility/Site Activity Details Forward Landfill, Inc. (39-AA-0015). https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/1434?siteID=3106 (accessed July 2026).

Central Valley Water Quality Control Board (RWQCB). 2019. The Sacramento River Basin and San Joaquin River Basin Plan. https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_201902.pdf (accessed July 2026).

Eastern San Joaquin Groundwater Authority. 2024. Eastern San Joaquin Groundwater Subbasin 2024 Sustainability Plan Amendment. https://www.esjgroundwater.org/Portals/0/ThemePluginPro/uploads/2025/1/16/ESJ%202024%20GSP%20Compiled_November%202024%20Compressed.pdf (accessed July 2026).

Federal Emergency Management Agency (FEMA). 2024. Flood Map Service Center. https://msc.fema.gov/portal/search (accessed June 2026).

San Joaquin Council of Governments (SJCOG). 2022. 2022 Regional Transportation Plan/ Sustainable Communities Strategy. https://www.sjcog.org/DocumentCenter/View/10255/RTPSCS-CH1-9-with-ES (accessed July 2026).

_____. 2026. 2026 Draft RTP/SCS Update Appendix F – Plan Project List. https://www.sjcog.org/DocumentCenter/View/11296/F-Plan-Project-List-COMPLETE-PN?bidId= (accessed June 2026).

San Joaquin County. 2014. General Plan 2035 Draft EIR. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/Planning/Environmental%20Impact%20Reports/GENERAL%20PLAN%202035%20-%20DRAFT%20EIR.pdf (accessed July 2026).

_____. 2015. Fire Apparatus Access Road Standard. https://www.sjgov.org/docs/default-source/community-development/fire-prevention/handouts-forms/fire-access-roads.pdf. (accessed July 2026).

_____. 2016. General Plan. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/Planning/General%20Plan%202035/GENERAL%20PLAN%202035.pdf (accessed July 2026).

_____. 2018. San Joaquin County's Aviation System Stockton Metropolitan Airport Land Use Compatibility Plan. https://www.sjcog.org/DocumentCenter/View/1318/2016-Stockton-Metropolitan-Airport-ALUCP---Amended-February-2018?bidId= (accessed July 2026).

_____. 2023. San Joaquin County Local Hazard Mitigation Plan. https://www.sjgov.org/docs/default-source/covid-19/2023-lhmp-final-approved.pdf?Status=Master&sfvrsn=f64fc505_3 (accessed July 2026).

_____. 2025a. San Joaquin County General Plan Amendments Land Use Map -- Stockton. Available at: https://sjmap.org/mapdocs/SJCGIS_GeneralPlanSeries_Stockton.pdf (accessed July 2026).

_____. 2025b. Development Title. Available online: https://library.municode.com/ca/san_joaquin_county/codes/development_title?nodeId=DETICOSAJOCA (accessed July 2026)

_____. 2026a. Ordinance Code of San Joaquin County. https://library.municode.com/ca/san_joaquin_county/codes/code_of_ordinances?nodeId=TIT8BURE_DIV1BUST (accessed July 2026).

_____. 2026b. Recent Activities. https://permits.sjgov.org/Departments/Community-Development/Recent-Activities (accessed June 2026).

San Joaquin Local Agency Formation Commission (LAFCO). 2022. 10-Year Planning Horizon Annexation Areas. https://www.sjlafco.org/city-sphere-of-influence-maps#docaccess-8415e1fb927a8c7cd448322ab0a1dcb4e35d829a6d187310b3143d5f5008c7f1 (accessed July 2026).

San Joaquin Regional Transit District's (SJRTD). 2025. San Joaquin Coordinated Public Transportation Plan. https://sanjoaquinrtd (accessed July 2026).

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2009a. Final Staff Report: Addressing Greenhouse Gas Emissions Impacts under the California Environmental Quality Act. https://www.valleyair.org/media/mdfm0lsd/1-ccap-final-ceqa-ghg-staff-report-dec-17-2009.pdf (accessed July 2026).

_____. 2009b. Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA. https://ww2.valleyair.org/media/dnsnicdv/3-ccap-final-lu-guidance-dec-17-2009.pdf (accessed July 2026).

_____. 2015. Guidance for Assessing and Mitigating Air Quality Impacts. https://www.valleyair.org/media/g4nl3p0g/gamaqi.pdf (accessed July 2026).

State Water Resources Control Board (SWRCB). 2006. San Joaquin Valley Groundwater Basin Eastern San Joaquin Subbasin. https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/2003-Basin-Descriptions/5_022_01_EasternSanJoaquinSubbasin.pdf (accessed July 2026).

State Water Resources Control Board (SWRCB). 2026. Geotracker Database Search. https://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=Sacramento (accessed July 2026).

United States Department of Agriculture (USDA). 2019. Web Soil Survey. https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx (accessed July 2026).

United States Fish and Wildlife Service (USFWS). 2026a. Information for Planning and Consultation. http://ecos.fws.gov/ipac/ (accessed March 2026).

_____. 2026b. Critical Habitat Online Mapper. http://criticalhabitat.fws.gov (accessed March 2026).

_____. 2026c. National Wetlands Inventory. https://www.fws.gov/wetlands/data/mapper.html (accessed March 2026).

United States Geological Survey (USGS). 2024. The Central Valley: San Joaquin Basin. https://ca.water.usgs.gov/Projects/central-valley/san-joaquin-basin.html (accessed July 2026).

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Copperopolis Road Project
Construction Start Date	10/1/2026
Operational Year	2027
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.40000
Precipitation (days)	23.4000
Location	Best Rd & Copperopolis Rd, California 95215, USA
County	San Joaquin
City	Unincorporated
Air District	San Joaquin Valley APCD
Air Basin	San Joaquin Valley
TAZ	2121
EDFZ	4
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.43

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
General Light Industry	1.000000	1000sqft	14.5000	1,000.000	0.00000	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.31028	1.09283	9.91213	16.2188	0.04025	0.24031	0.82762	1.06794	0.22302	0.21318	0.43619	—	5,070.05	5,070.05	0.16231	0.29047	4.82796	5,165.50
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.31258	1.09342	10.4415	15.9582	0.04026	0.25724	0.82762	1.08486	0.23858	0.21318	0.45176	—	5,076.18	5,076.18	0.16529	0.29146	0.14201	5,167.31
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.32859	0.27595	2.47527	3.88829	0.00992	0.06142	0.19189	0.25331	0.05695	0.04937	0.10632	—	1,236.02	1,236.02	0.04055	0.06800	0.48534	1,257.79
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.05997	0.05036	0.45174	0.70961	0.00181	0.01121	0.03502	0.04623	0.01039	0.00901	0.01940	—	204.638	204.638	0.00671	0.01126	0.08035	208.241

2.2. Construction Emissions by Year

2.2.1. Total Construction Emissions by Year, Unmitigated

Includes both onsite and offsite emissions.

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	1.31028	1.09283	9.91213	16.2188	0.04025	0.24031	0.82762	1.06794	0.22302	0.21318	0.43619	—	5,070.05	5,070.05	0.16231	0.29047	4.82796	5,165.50
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	1.31258	1.09342	10.4415	15.9582	0.04026	0.25724	0.82762	1.08486	0.23858	0.21318	0.45176	—	5,076.18	5,076.18	0.16529	0.29146	0.14201	5,167.31
2027	1.28446	1.07890	10.0717	15.8241	0.04025	0.24031	0.82762	1.06794	0.22302	0.21318	0.43619	—	5,033.94	5,033.94	0.16522	0.29144	0.12496	5,125.05
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.18894	0.15769	1.41476	2.10012	0.00560	0.03717	0.09730	0.13447	0.03444	0.02509	0.05954	—	693.883	693.883	0.02299	0.03620	0.28267	705.529
2027	0.32859	0.27595	2.47527	3.88829	0.00992	0.06142	0.19189	0.25331	0.05695	0.04937	0.10632	—	1,236.02	1,236.02	0.04055	0.06800	0.48534	1,257.79
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.03448	0.02878	0.25819	0.38327	0.00102	0.00678	0.01776	0.02454	0.00629	0.00458	0.01087	—	114.880	114.880	0.00381	0.00599	0.04680	116.808
2027	0.05997	0.05036	0.45174	0.70961	0.00181	0.01121	0.03502	0.04623	0.01039	0.00901	0.01940	—	204.638	204.638	0.00671	0.01126	0.08035	208.241

2.2.2. Onsite Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	1.04428	0.87726	7.88620	13.5987	0.02821	0.21624	0.00000	0.21624	0.19894	0.00000	0.19894	—	3,044.68	3,044.68	0.12351	0.02470	0.00000	3,055.13
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	1.05117	0.88304	8.15167	13.5776	0.02823	0.23316	0.00000	0.23316	0.21451	0.00000	0.21451	—	3,046.50	3,046.50	0.12358	0.02472	0.00000	3,056.96
2027	1.04428	0.87726	7.88620	13.5987	0.02821	0.21624	0.00000	0.21624	0.19894	0.00000	0.19894	—	3,044.68	3,044.68	0.12351	0.02470	0.00000	3,055.13
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.15833	0.13302	1.14473	1.81968	0.00415	0.03411	0.00000	0.03411	0.03138	0.00000	0.03138	—	447.955	447.955	0.01817	0.00363	0.00000	449.493

2027	0.27138	0.22798	1.98272	3.35207	0.00715	0.05586	0.00000	0.05586	0.05139	0.00000	0.05139	—	771.424	771.424	0.03129	0.00626	0.00000	774.071
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.02889	0.02428	0.20891	0.33209	0.00076	0.00622	0.00000	0.00622	0.00573	0.00000	0.00573	—	74.1641	74.1641	0.00301	0.00060	0.00000	74.4187
2027	0.04953	0.04161	0.36185	0.61175	0.00130	0.01019	0.00000	0.01019	0.00938	0.00000	0.00938	—	127.718	127.718	0.00518	0.00104	0.00000	128.156

2.2.3. Offsite Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2027	0.26600	0.21558	2.02594	2.62013	0.01204	0.02407	0.82762	0.85170	0.02407	0.21318	0.23725	—	2,025.38	2,025.38	0.03880	0.26577	4.82796	2,110.37
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.26141	0.21037	2.28986	2.38060	0.01204	0.02407	0.82762	0.85170	0.02407	0.21318	0.23725	—	2,029.68	2,029.68	0.04171	0.26674	0.14201	2,110.35
2027	0.24018	0.20164	2.18551	2.22537	0.01204	0.02407	0.82762	0.85170	0.02407	0.21318	0.23725	—	1,989.27	1,989.27	0.04171	0.26674	0.12496	2,069.92
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.03061	0.02467	0.27003	0.28045	0.00145	0.00306	0.09730	0.10036	0.00306	0.02509	0.02816	—	245.928	245.928	0.00482	0.03257	0.28267	256.036
2027	0.05722	0.04797	0.49255	0.53622	0.00278	0.00556	0.19189	0.19745	0.00556	0.04937	0.05493	—	464.599	464.599	0.00926	0.06174	0.48534	483.715
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.00559	0.00450	0.04928	0.05118	0.00026	0.00056	0.01776	0.01832	0.00056	0.00458	0.00514	—	40.7162	40.7162	0.00080	0.00539	0.04680	42.3897
2027	0.01044	0.00876	0.08989	0.09786	0.00051	0.00101	0.03502	0.03604	0.00101	0.00901	0.01002	—	76.9197	76.9197	0.00153	0.01022	0.08035	80.0845

2.3. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.05437	0.05118	0.03339	0.26387	0.00060	0.00134	0.04534	0.04668	0.00130	0.01153	0.01283	1.11141	73.5443	74.6557	0.11621	0.00350	0.43148	79.0357
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.04521	0.04256	0.03643	0.18711	0.00056	0.00126	0.04534	0.04660	0.00124	0.01153	0.01277	1.11141	69.4429	70.5543	0.11639	0.00368	0.26474	74.8258
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.04706	0.04434	0.03299	0.19424	0.00052	0.00126	0.04057	0.04183	0.00123	0.01032	0.01155	1.11141	65.7859	66.8973	0.11613	0.00338	0.32744	71.1358
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.00859	0.00809	0.00602	0.03545	0.00010	0.00023	0.00740	0.00763	0.00022	0.00188	0.00211	0.18401	10.8916	11.0756	0.01923	0.00056	0.05421	11.7773

2.4. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.02274	0.02076	0.02189	0.21102	0.00053	0.00042	0.04534	0.04575	0.00039	0.01153	0.01192	—	53.8843	53.8843	0.00180	0.00227	0.17117	54.7777
Area	0.03041	0.02981	0.00037	0.04349	< 0.000005	0.00008	—	0.00008	0.00006	—	0.00006	—	0.17885	0.17885	0.00001	< 0.000005	—	0.17949
Energy	0.00122	0.00061	0.01114	0.00935	0.00007	0.00085	—	0.00085	0.00085	—	0.00085	—	19.0598	19.0598	0.00211	0.00014	—	19.1538
Water	—	—	—	—	—	—	—	—	—	—	—	0.44313	0.42132	0.86445	0.04551	0.00109	—	2.32628
Waste	—	—	—	—	—	—	—	—	—	—	—	0.66828	0.00000	0.66828	0.06679	0.00000	—	2.33810
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.26030	0.26030
Total	0.05437	0.05118	0.03339	0.26387	0.00060	0.00134	0.04534	0.04668	0.00130	0.01153	0.01283	1.11141	73.5443	74.6557	0.11621	0.00350	0.43148	79.0357

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.02131	0.01927	0.02529	0.17776	0.00049	0.00042	0.04534	0.04575	0.00039	0.01153	0.01192	—	49.9617	49.9617	0.00198	0.00245	0.00444	50.7473
Area	0.02267	0.02267	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00122	0.00061	0.01114	0.00935	0.00007	0.00085	—	0.00085	0.00085	—	0.00085	—	19.0598	19.0598	0.00211	0.00014	—	19.1538
Water	—	—	—	—	—	—	—	—	—	—	—	0.44313	0.42132	0.86445	0.04551	0.00109	—	2.32628
Waste	—	—	—	—	—	—	—	—	—	—	—	0.66828	0.00000	0.66828	0.06679	0.00000	—	2.33810
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.26030	0.26030
Total	0.04521	0.04256	0.03643	0.18711	0.00056	0.00126	0.04534	0.04660	0.00124	0.01153	0.01277	1.11141	69.4429	70.5543	0.11639	0.00368	0.26474	74.8258
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.01935	0.01753	0.02167	0.16344	0.00045	0.00038	0.04057	0.04094	0.00036	0.01032	0.01068	—	46.2166	46.2166	0.00171	0.00216	0.06713	46.9688
Area	0.02649	0.02619	0.00018	0.02145	< 0.000005	0.00004	—	0.00004	0.00003	—	0.00003	—	0.08820	0.08820	< 0.000005	< 0.000005	—	0.08852
Energy	0.00122	0.00061	0.01114	0.00935	0.00007	0.00085	—	0.00085	0.00085	—	0.00085	—	19.0598	19.0598	0.00211	0.00014	—	19.1538
Water	—	—	—	—	—	—	—	—	—	—	—	0.44313	0.42132	0.86445	0.04551	0.00109	—	2.32628
Waste	—	—	—	—	—	—	—	—	—	—	—	0.66828	0.00000	0.66828	0.06679	0.00000	—	2.33810
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.26030	0.26030
Total	0.04706	0.04434	0.03299	0.19424	0.00052	0.00126	0.04057	0.04183	0.00123	0.01032	0.01155	1.11141	65.7859	66.8973	0.11613	0.00338	0.32744	71.1358
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00353	0.00320	0.00395	0.02983	0.00008	0.00007	0.00740	0.00747	0.00006	0.00188	0.00195	—	7.65168	7.65168	0.00028	0.00036	0.01111	7.77622
Area	0.00483	0.00478	0.00003	0.00391	< 0.000005	0.00001	—	0.00001	0.00001	—	0.00001	—	0.01460	0.01460	< 0.000005	< 0.000005	—	0.01465
Energy	0.00022	0.00011	0.00203	0.00171	0.00001	0.00015	—	0.00015	0.00015	—	0.00015	—	3.15558	3.15558	0.00035	0.00002	—	3.17113
Water	—	—	—	—	—	—	—	—	—	—	—	0.07337	0.06975	0.14312	0.00753	0.00018	—	0.38514
Waste	—	—	—	—	—	—	—	—	—	—	—	0.11064	0.00000	0.11064	0.01106	0.00000	—	0.38710
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04310	0.04310
Total	0.00859	0.00809	0.00602	0.03545	0.00010	0.00023	0.00740	0.00763	0.00022	0.00188	0.00211	0.18401	10.8916	11.0756	0.01923	0.00056	0.05421	11.7773

3. Construction Emissions Details

3.1. Staging and Site Preparation (2026)

3.1.1. Onsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.67494	0.56713	4.22314	5.97557	0.01684	0.13740	—	0.13740	0.12641	—	0.12641	—	1,823.33	1,823.33	0.07396	0.01479	—	1,829.59
Dust From Material Movement	—	—	—	—	—	—	0.00000	0.00000	—	0.00000	0.00000	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02774	0.02331	0.17355	0.24557	0.00069	0.00565	—	0.00565	0.00520	—	0.00520	—	74.9315	74.9315	0.00304	0.00061	—	75.1887
Dust From Material Movement	—	—	—	—	—	—	0.00000	0.00000	—	0.00000	0.00000	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.00506	0.00425	0.03167	0.04482	0.00013	0.00103	—	0.00103	0.00095	—	0.00095	—	12.4058	12.4058	0.00050	0.00010	—	12.4483
Dust From Material Movement	—	—	—	—	—	—	0.00000	0.00000	—	0.00000	0.00000	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.1.2. Offsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04005	0.03633	0.03175	0.38135	0.00000	0.00000	0.08401	0.08401	0.00000	0.01969	0.01969	—	81.8600	81.8600	0.00220	0.00350	0.00806	82.9671
Vendor	0.01420	0.00842	0.35836	0.11711	0.00201	0.00401	0.07633	0.08034	0.00401	0.02109	0.02510	—	278.249	278.249	0.00534	0.04189	0.01776	290.883
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00164	0.00149	0.00117	0.01604	0.00000	0.00000	0.00340	0.00340	0.00000	0.00080	0.00080	—	3.44824	3.44824	0.00008	0.00014	0.00551	3.49869
Vendor	0.00059	0.00036	0.01443	0.00472	0.00008	0.00016	0.00310	0.00326	0.00016	0.00086	0.00102	—	11.4292	11.4292	0.00022	0.00172	0.01214	11.9598
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00030	0.00027	0.00021	0.00293	0.00000	0.00000	0.00062	0.00062	0.00000	0.00015	0.00015	—	0.57090	0.57090	0.00001	0.00002	0.00091	0.57925
Vendor	0.00011	0.00007	0.00263	0.00086	0.00002	0.00003	0.00057	0.00060	0.00003	0.00016	0.00019	—	1.89223	1.89223	0.00004	0.00029	0.00201	1.98008
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.2. Grading (2026)

3.2.1. Onsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.67494	0.56713	4.22314	5.97557	0.01684	0.13740	—	0.13740	0.12641	—	0.12641	—	1,823.33	1,823.33	0.07396	0.01479	—	1,829.59
Dust From Material Movement	—	—	—	—	—	—	0.00000	0.00000	—	0.00000	0.00000	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02774	0.02331	0.17355	0.24557	0.00069	0.00565	—	0.00565	0.00520	—	0.00520	—	74.9315	74.9315	0.00304	0.00061	—	75.1887
Dust From Material Movement	—	—	—	—	—	—	0.00000	0.00000	—	0.00000	0.00000	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipm	0.00506	0.00425	0.03167	0.04482	0.00013	0.00103	—	0.00103	0.00095	—	0.00095	—	12.4058	12.4058	0.00050	0.00010	—	12.4483
Dust From Material Movement	—	—	—	—	—	—	0.00000	0.00000	—	0.00000	0.00000	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.2.2. Offsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04005	0.03633	0.03175	0.38135	0.00000	0.00000	0.08401	0.08401	0.00000	0.01969	0.01969	—	81.8600	81.8600	0.00220	0.00350	0.00806	82.9671
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.02712	0.01102	0.86818	0.19996	0.00463	0.01323	0.18540	0.19863	0.01323	0.05076	0.06399	—	686.531	686.531	0.01102	0.10869	0.04149	719.237
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00164	0.00149	0.00117	0.01604	0.00000	0.00000	0.00340	0.00340	0.00000	0.00080	0.00080	—	3.44824	3.44824	0.00008	0.00014	0.00551	3.49869
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00113	0.00048	0.03492	0.00813	0.00019	0.00054	0.00753	0.00808	0.00054	0.00206	0.00261	—	28.2035	28.2035	0.00045	0.00446	0.02824	29.5714
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00030	0.00027	0.00021	0.00293	0.00000	0.00000	0.00062	0.00062	0.00000	0.00015	0.00015	—	0.57090	0.57090	0.00001	0.00002	0.00091	0.57925
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00021	0.00009	0.00637	0.00148	0.00003	0.00010	0.00137	0.00147	0.00010	0.00038	0.00048	—	4.66941	4.66941	0.00008	0.00074	0.00468	4.89589

3.3. Installation (2026)

3.3.1. Onsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.05117	0.88304	8.15167	13.5776	0.02823	0.23316	—	0.23316	0.21451	—	0.21451	—	3,046.50	3,046.50	0.12358	0.02472	—	3,056.96
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10285	0.08640	0.79762	1.32854	0.00276	0.02281	—	0.02281	0.02099	—	0.02099	—	298.092	298.092	0.01209	0.00242	—	299.115
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01877	0.01577	0.14557	0.24246	0.00050	0.00416	—	0.00416	0.00383	—	0.00383	—	49.3526	49.3526	0.00200	0.00040	—	49.5220
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.3.2. Offsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.17623	0.15984	0.13969	1.67795	0.00000	0.00000	0.36963	0.36963	0.00000	0.08664	0.08664	—	360.184	360.184	0.00970	0.01541	0.03546	365.055
Vendor	0.08519	0.05053	2.15017	0.70266	0.01204	0.02407	0.45799	0.48207	0.02407	0.12654	0.15061	—	1,669.49	1,669.49	0.03201	0.25133	0.10655	1,745.30
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01715	0.01564	0.01226	0.16805	0.00000	0.00000	0.03562	0.03562	0.00000	0.00834	0.00834	—	36.1244	36.1244	0.00085	0.00151	0.05777	36.6530
Vendor	0.00846	0.00520	0.20609	0.06746	0.00118	0.00236	0.04425	0.04660	0.00236	0.01224	0.01459	—	163.274	163.274	0.00313	0.02459	0.17348	170.854
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00313	0.00285	0.00224	0.03067	0.00000	0.00000	0.00650	0.00650	0.00000	0.00152	0.00152	—	5.98081	5.98081	0.00014	0.00025	0.00957	6.06832
Vendor	0.00154	0.00095	0.03761	0.01231	0.00021	0.00043	0.00807	0.00850	0.00043	0.00223	0.00266	—	27.0319	27.0319	0.00052	0.00407	0.02872	28.2869
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.4. Installation (2027)

3.4.1. Onsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	1.04428	0.87726	7.88620	13.5987	0.02821	0.21624	—	0.21624	0.19894	—	0.19894	—	3,044.68	3,044.68	0.12351	0.02470	—	3,055.13
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.04428	0.87726	7.88620	13.5987	0.02821	0.21624	—	0.21624	0.19894	—	0.19894	—	3,044.68	3,044.68	0.12351	0.02470	—	3,055.13
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.24115	0.20258	1.82108	3.14021	0.00651	0.04993	—	0.04993	0.04594	—	0.04594	—	703.076	703.076	0.02852	0.00570	—	705.489
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04401	0.03697	0.33235	0.57309	0.00119	0.00911	—	0.00911	0.00838	—	0.00838	—	116.402	116.402	0.00472	0.00094	—	116.802
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.4.2. Offsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.17817	0.16372	0.09733	1.96932	0.00000	0.00000	0.36963	0.36963	0.00000	0.08664	0.08664	—	392.193	392.193	0.00679	0.01444	1.23039	397.898
Vendor	0.08783	0.05185	1.92860	0.65080	0.01204	0.02407	0.45799	0.48207	0.02407	0.12654	0.15061	—	1,633.18	1,633.18	0.03201	0.25133	3.59757	1,712.48
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15499	0.15111	0.12622	1.55075	0.00000	0.00000	0.36963	0.36963	0.00000	0.08664	0.08664	—	354.601	354.601	0.00970	0.01541	0.03183	359.469
Vendor	0.08519	0.05053	2.05929	0.67461	0.01204	0.02407	0.45799	0.48207	0.02407	0.12654	0.15061	—	1,634.66	1,634.66	0.03201	0.25133	0.09312	1,710.45
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03579	0.03489	0.02581	0.36858	0.00000	0.00000	0.08407	0.08407	0.00000	0.01969	0.01969	—	83.9270	83.9270	0.00179	0.00356	0.12264	85.1552
Vendor	0.01998	0.01167	0.46570	0.15273	0.00278	0.00556	0.10442	0.10998	0.00556	0.02888	0.03444	—	377.278	377.278	0.00739	0.05804	0.35774	395.115
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00653	0.00637	0.00471	0.06727	0.00000	0.00000	0.01534	0.01534	0.00000	0.00359	0.00359	—	13.8951	13.8951	0.00030	0.00059	0.02030	14.0984
Vendor	0.00365	0.00213	0.08499	0.02787	0.00051	0.00101	0.01906	0.02007	0.00101	0.00527	0.00629	—	62.4627	62.4627	0.00122	0.00961	0.05923	65.4158
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.5. Paving (2027)

3.5.1. Onsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road	0.73566	0.61816	3.93335	5.15536	0.01536	0.14411	—	0.14411	0.13258	—	0.13258	—	1,663.14	1,663.14	0.06746	0.01349	—	1,668.84
Paving	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03023	0.02540	0.16164	0.21186	0.00063	0.00592	—	0.00592	0.00545	—	0.00545	—	68.3481	68.3481	0.00277	0.00055	—	68.5826
Paving	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.00552	0.00464	0.02950	0.03867	0.00012	0.00108	—	0.00108	0.00099	—	0.00099	—	11.3158	11.3158	0.00046	0.00009	—	11.3546
Paving	0.00000	0.00000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

3.5.2. Offsite - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04049	0.03721	0.02212	0.44757	0.00000	0.00000	0.08401	0.08401	0.00000	0.01969	0.01969	—	89.1348	89.1348	0.00154	0.00328	0.27963	90.4313
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00145	0.00141	0.00104	0.01491	0.00000	0.00000	0.00340	0.00340	0.00000	0.00080	0.00080	—	3.39458	3.39458	0.00007	0.00014	0.00496	3.44426
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00026	0.00026	0.00019	0.00272	0.00000	0.00000	0.00062	0.00062	0.00000	0.00015	0.00015	—	0.56201	0.56201	0.00001	0.00002	0.00082	0.57024
Vendor	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Hauling	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	—	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.02274	0.02076	0.02189	0.21102	0.00053	0.00042	0.04534	0.04575	0.00039	0.01153	0.01192	—	53.8843	53.8843	0.00180	0.00227	0.17117	54.7777
Total	0.02274	0.02076	0.02189	0.21102	0.00053	0.00042	0.04534	0.04575	0.00039	0.01153	0.01192	—	53.8843	53.8843	0.00180	0.00227	0.17117	54.7777
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Light Industry	0.02131	0.01927	0.02529	0.17776	0.00049	0.00042	0.04534	0.04575	0.00039	0.01153	0.01192	—	49.9617	49.9617	0.00198	0.00245	0.00444	50.7473
Total	0.02131	0.01927	0.02529	0.17776	0.00049	0.00042	0.04534	0.04575	0.00039	0.01153	0.01192	—	49.9617	49.9617	0.00198	0.00245	0.00444	50.7473
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.00353	0.00320	0.00395	0.02983	0.00008	0.00007	0.00740	0.00747	0.00006	0.00188	0.00195	—	7.65168	7.65168	0.00028	0.00036	0.01111	7.77622
Total	0.00353	0.00320	0.00395	0.02983	0.00008	0.00007	0.00740	0.00747	0.00006	0.00188	0.00195	—	7.65168	7.65168	0.00028	0.00036	0.01111	7.77622

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	5.77297	5.77297	0.00093	0.00011	—	5.83006
Total	—	—	—	—	—	—	—	—	—	—	—	—	5.77297	5.77297	0.00093	0.00011	—	5.83006
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	5.77297	5.77297	0.00093	0.00011	—	5.83006
Total	—	—	—	—	—	—	—	—	—	—	—	—	5.77297	5.77297	0.00093	0.00011	—	5.83006
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	0.95578	0.95578	0.00015	0.00002	—	0.96523

Total	—	—	—	—	—	—	—	—	—	—	—	—	0.95578	0.95578	0.00015	0.00002	—	0.96523

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.00122	0.00061	0.01114	0.00935	0.00007	0.00085	—	0.00085	0.00085	—	0.00085	—	13.2869	13.2869	0.00118	0.00003	—	13.3237
Total	0.00122	0.00061	0.01114	0.00935	0.00007	0.00085	—	0.00085	0.00085	—	0.00085	—	13.2869	13.2869	0.00118	0.00003	—	13.3237
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.00122	0.00061	0.01114	0.00935	0.00007	0.00085	—	0.00085	0.00085	—	0.00085	—	13.2869	13.2869	0.00118	0.00003	—	13.3237
Total	0.00122	0.00061	0.01114	0.00935	0.00007	0.00085	—	0.00085	0.00085	—	0.00085	—	13.2869	13.2869	0.00118	0.00003	—	13.3237
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.00022	0.00011	0.00203	0.00171	0.00001	0.00015	—	0.00015	0.00015	—	0.00015	—	2.19979	2.19979	0.00019	< 0.000005	—	2.20590
Total	0.00022	0.00011	0.00203	0.00171	0.00001	0.00015	—	0.00015	0.00015	—	0.00015	—	2.19979	2.19979	0.00019	< 0.000005	—	2.20590

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.02140	0.02140	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.00127	0.00127	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.00774	0.00714	0.00037	0.04349	< 0.000005	0.00008	—	0.00008	0.00006	—	0.00006	—	0.17885	0.17885	0.00001	< 0.000005	—	0.17949
Total	0.03041	0.02981	0.00037	0.04349	< 0.000005	0.00008	—	0.00008	0.00006	—	0.00006	—	0.17885	0.17885	0.00001	< 0.000005	—	0.17949
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.02140	0.02140	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.00127	0.00127	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.02267	0.02267	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.00391	0.00391	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.00023	0.00023	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Landsca Equipment	0.00070	0.00064	0.00003	0.00391	< 0.000005	0.00001	—	0.00001	0.00001	—	0.00001	—	0.01460	0.01460	< 0.000005	< 0.000005	—	0.01465
Total	0.00483	0.00478	0.00003	0.00391	< 0.000005	0.00001	—	0.00001	0.00001	—	0.00001	—	0.01460	0.01460	< 0.000005	< 0.000005	—	0.01465

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	0.44313	0.42132	0.86445	0.04551	0.00109	—	2.32628
Total	—	—	—	—	—	—	—	—	—	—	—	0.44313	0.42132	0.86445	0.04551	0.00109	—	2.32628
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	0.44313	0.42132	0.86445	0.04551	0.00109	—	2.32628
Total	—	—	—	—	—	—	—	—	—	—	—	0.44313	0.42132	0.86445	0.04551	0.00109	—	2.32628
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	0.07337	0.06975	0.14312	0.00753	0.00018	—	0.38514
Total	—	—	—	—	—	—	—	—	—	—	—	0.07337	0.06975	0.14312	0.00753	0.00018	—	0.38514

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	0.66828	0.00000	0.66828	0.06679	0.00000	—	2.33810
Total	—	—	—	—	—	—	—	—	—	—	—	0.66828	0.00000	0.66828	0.06679	0.00000	—	2.33810
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	0.66828	0.00000	0.66828	0.06679	0.00000	—	2.33810
Total	—	—	—	—	—	—	—	—	—	—	—	0.66828	0.00000	0.66828	0.06679	0.00000	—	2.33810
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	0.11064	0.00000	0.11064	0.01106	0.00000	—	0.38710
Total	—	—	—	—	—	—	—	—	—	—	—	0.11064	0.00000	0.11064	0.01106	0.00000	—	0.38710

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.26030	0.26030
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.26030	0.26030
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.26030	0.26030
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.26030	0.26030
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04310	0.04310
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04310	0.04310

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Staging and Site Preparation	Site Preparation	10/1/2026	10/21/2026	5.00000	15.0000	—
Grading	Grading	10/22/2026	11/11/2026	5.00000	15.0000	—
Installation	Building Construction	11/12/2026	4/28/2027	5.00000	120.000	—
Paving	Paving	4/29/2027	5/19/2027	5.00000	15.0000	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Staging and Site Preparation	Skid Steer Loaders	Diesel	Average	2.00000	8.00000	71.0000	0.37000
Staging and Site Preparation	Off-Highway Trucks	Diesel	Average	1.000000	8.00000	376.000	0.38000
Grading	Skid Steer Loaders	Diesel	Average	2.00000	8.00000	71.0000	0.37000
Grading	Off-Highway Trucks	Diesel	Average	1.000000	8.00000	376.000	0.38000

Installation	Tractors/Loaders/Back	Diesel	Average	1.000000	6.00000	84.0000	0.37000
Installation	Cement and Mortar Mixers	Diesel	Average	1.000000	2.00000	10.00000	0.56000
Installation	Rough Terrain Forklifts	Diesel	Average	2.00000	6.00000	96.0000	0.40000
Installation	Bore/Drill Rigs	Diesel	Average	2.00000	6.00000	83.0000	0.50000
Installation	Skid Steer Loaders	Diesel	Average	2.00000	6.00000	71.0000	0.37000
Installation	Off-Highway Trucks	Diesel	Average	1.000000	8.00000	376.000	0.38000
Paving	Paving Equipment	Diesel	Average	1.000000	6.00000	89.0000	0.36000
Paving	Rollers	Diesel	Average	1.000000	6.00000	36.0000	0.38000
Paving	Off-Highway Trucks	Diesel	Average	1.000000	8.00000	376.000	0.38000

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Staging and Site Preparation	Worker	10.00000	11.8900	LDA,LDT1,LDT2
Staging and Site Preparation	Vendor	10.00000	9.10000	HHDT,MHDT
Staging and Site Preparation	Hauling	0.00000	20.0000	HHDT
Staging and Site Preparation	Onsite truck	0.00000	—	HHDT
Grading	Worker	10.00000	11.8900	LDA,LDT1,LDT2
Grading	Vendor	0.00000	9.10000	HHDT,MHDT
Grading	Hauling	10.00000	20.0000	HHDT
Grading	Onsite truck	—	—	HHDT
Installation	Worker	44.0000	11.8900	LDA,LDT1,LDT2
Installation	Vendor	60.0000	9.10000	HHDT,MHDT
Installation	Hauling	0.00000	20.0000	HHDT
Installation	Onsite truck	—	—	HHDT
Paving	Worker	10.00000	11.8900	LDA,LDT1,LDT2
Paving	Vendor	0.00000	9.10000	HHDT,MHDT

Paving	Hauling	0.00000	20.0000	HHDT
Paving	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%

5.5. Architectural Coatings

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Staging and Site Preparation	—	—	0.00000	0.00000	0.00000
Grading	—	—	0.00000	0.00000	0.00000
Paving	0.00000	0.00000	0.00000	0.00000	0.00000

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%

5.7. Construction Paving

Phase Name	Land Use	Area Paved (acres)	% Asphalt
Paving	General Light Industry	0.00000	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2026	0.00000	203.983	0.03300	0.00400
2027	0.00000	203.983	0.03300	0.00400

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
General Light Industry	4.96000	1.99000	5.00000	1,657.62	63.1464	25.3349	63.6556	21,103.4

5.10. Operational Area Sources

5.10.1. Hearths

Land Use	Hearth Type	Unmitigated (number)	Mitigated (number)
General Light Industry	Wood Fireplaces	0	0
General Light Industry	Gas Fireplaces	0	0
General Light Industry	Propane Fireplaces	0	0
General Light Industry	Electric Fireplaces	0	0
General Light Industry	No Fireplaces	0	0
General Light Industry	Conventional Wood Stoves	0	0
General Light Industry	Catalytic Wood Stoves	0	0
General Light Industry	Non-Catalytic Wood Stoves	0	0
General Light Industry	Pellet Wood Stoves	0	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0.00000	0.00000	1,500.00	500.000	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00000
Summer Days	day/yr	180.000

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
General Light Industry	10,330.0	203.983	0.0330	0.0040	41,458.6

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Light Industry	231,250	0.00000

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)

General Light Industry	1.24000	0.00000

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Light Industry	Other commercial A/C and heat pumps	R-410A	2,088.00	0.30000	4.00000	4.00000	18.0000

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

5.16.2. Process Boilers

5.17. User Defined

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	22.1900	annual days of extreme heat
Extreme Precipitation	2.55000	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	0.00000	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	1	0	0	N/A

Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	0	0	0	N/A
Drought	0	0	0	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	1	1	1	2
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	1	1	1	2
Drought	1	1	1	2
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	50.5414
AQ-PM	51.2757
AQ-DPM	19.4151
Drinking Water	99.6503
Lead Risk Housing	55.3245
Pesticides	93.1724
Toxic Releases	26.1065
Traffic	5.13750
Effect Indicators	—
CleanUp Sites	0.00000
Groundwater	35.0158
Haz Waste Facilities/Generators	0.00000
Impaired Water Bodies	43.7841
Solid Waste	0.00000
Sensitive Population	—
Asthma	43.2702
Cardio-vascular	72.4327
Low Birth Weights	0.42340
Socioeconomic Factor Indicators	—
Education	85.7884
Housing	36.6540
Linguistic	86.3040
Poverty	75.1131
Unemployment	—

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	44.62979597
Employed	35.14692673
Median HI	38.58591043
Education	—
Bachelor's or higher	40.07442577
High school enrollment	26.24149878
Preschool enrollment	11.42050558
Transportation	—
Auto Access	70.20402926
Active commuting	34.38983703
Social	—
2-parent households	92.15963044
Voting	69.02348261
Neighborhood	—
Alcohol availability	93.301681
Park access	2.194276915
Retail density	4.465546003
Supermarket access	5.979725395
Tree canopy	93.09636854
Housing	—
Homeownership	72.09033748
Housing habitability	80.64930065
Low-inc homeowner severe housing cost burden	87.97638907
Low-inc renter severe housing cost burden	77.3643013

Uncrowded housing	41.84524573
Health Outcomes	—
Insured adults	27.75567817
Arthritis	0.0
Asthma ER Admissions	67.3
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	4.8
Cognitively Disabled	70.6
Physically Disabled	36.0
Heart Attack ER Admissions	61.9
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	19.6
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0

Children	65.5
Elderly	25.8
English Speaking	28.1
Foreign-born	51.5
Outdoor Workers	4.9
Climate Change Adaptive Capacity	—
Impervious Surface Cover	97.9
Traffic Density	3.9
Traffic Access	0.0
Other Indices	—
Hardship	62.1
Other Decision Support	—
2016 Voting	53.4

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	53.0000
Healthy Places Index Score for Project Location (b)	43.0000
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

8.1. Justifications

Screen	Justification
Land Use	14.5 acre project
Construction: Construction Phases	Based on data provided by applicant. assuming staging and site preparation will occur at the same time.
Construction: Off-Road Equipment	based on equipment data from applicant
Construction: Trips and VMT	2 trips per flat bed truck during staging activity (5 trucks total); otherwise based on applicant estimates. Assumes 10 trips per day of hauling during grading to account for potential waste disposal of construction soil or debris.

8.3. Land Use

Model Parameter	Units	Default Value	New Value
Lot Area	acre	0.02296	14.5000
Landscape Area	sq. ft	—	0.00000

8.4. Construction

8.4.1. Construction Phases

Phase Type	Phase Name	Model Parameter	Default Value	New Value
Grading	Grading	Start Date	11/14/2026	10/22/2026
Grading	Grading	End Date	12/26/2026	11/11/2026
Grading	Grading	Work Days per Phase	30.0000	15.0000
Paving	Paving	Start Date	2/21/2028	4/29/2027
Paving	Paving	End Date	3/20/2028	5/19/2027

Paving	Paving	Work Days per Phase	20.0000	15.0000

8.4.2. Off-Road Equipment

Phase Name	Equipment Type	Model Parameter	Default Value	New Value
Installation	Tractors/Loaders/Backhoes	Number per Day	3.00000	1.000000
Installation	Tractors/Loaders/Backhoes	Hours Per Day	7.00000	6.00000
Installation	Rough Terrain Forklifts	Horsepower	82.0000	96.0000
Installation	Rough Terrain Forklifts	Load Factor	0.20000	0.40000
Paving	Paving Equipment	Number per Day	2.00000	1.000000
Paving	Paving Equipment	Hours Per Day	8.00000	6.00000
Paving	Rollers	Number per Day	2.00000	1.000000
Paving	Rollers	Hours Per Day	8.00000	6.00000

8.4.6. Trips and VMT

Phase Name	Trip Type	Model Parameter	Default Value	New Value
Staging and Site Preparation	Worker	One-Way Trips per Day	7.50000	10.00000
Grading	Worker	One-Way Trips per Day	7.50000	10.00000
Grading	Hauling	One-Way Trips per Day	0.00000	10.00000
Installation	Worker	One-Way Trips per Day	0.42000	44.0000
Installation	Vendor	One-Way Trips per Day	0.16390	60.0000
Paving	Worker	One-Way Trips per Day	7.50000	10.00000

GHG Offset Calculations

Construction - Annual Emissions (By Year)

	Pollutants (tons/year)					
	ROG	**NOx**	**CO**	**SO_2**	**PM10T**	**PM2.5T**
Construction Emissions	<1	<1	0.7	<1	<1	<1
Decommissioning Emissions	<1	<1	0.7	<1	<1	<1
SJVAPCD Operational Annual Threshold (tons/year)	**10**	**10**	**27**	**100**	**15**	**15**
Threshold Exceeded?	No	No	No	No	No	No

Construction - Maximum Daily Emissions (By Year)

	Pollutants (lb/day)					
	ROG	**NOx**	**CO**	**SO_2**	**PM10T**	**PM2.5T**
Maximum Daily Construction Emissions	1.1	10.4	16.2	<1	1.1	<1
Maximum Daily Decommissioning Emissions	1.1	10.4	16.2	<1	1.1	<1
SJVAPCD Construction Screening Threshold (lb/day)	**100**	**100**	**100**	**100**	**100**	**100**
Threshold Exceeded?	No	No	No	No	No	No

Operational - Annual Emissions

	Pollutants					
	ROG	**NOx**	**CO**	**SO_2**	**PM10T**	**PM2.5T**
Mobile	<1	<1	<1	<1	<1	<1
Area	<1	<1	<1	<1	<1	<1
Energy	<1	<1	<1	<1	<1	<1
Total	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**
SJVAPCD Operational Annual Threshold (tons/year)	**10**	**10**	**27**	**100**	**15**	**15**
Threshold Exceeded?	No	No	No	No	No	No

Operational - Maximum Daily Emissions

	Pollutants					
	ROG	**NOx**	**CO**	**SO_2**	**PM10T**	**PM2.5T**
Mobile	<1	<1	<1	<1	<1	<1
Area	<1	<1	<1	<1	<1	<1
Energy	<1	<1	<1	<1	<1	<1
Total	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**
SJVAPCD Operational Screening Threshold (lb/day)	**100**	**100**	**100**	**100**	**100**	**100**
Threshold Exceeded?	No	No	No	No	No	No

GHG

Total Construction	**325**
Amortized over 35 Years	**9**
Total Decommissioning	**325**
Amortized over 35 Years	**9**
Total Emissions	**650**
Amortized over 35 Years	**19**

GHG Source	**MT CO_2e**
Construction/Decommissioning (Amortized)	19
Mobile	8
Area	<1
Energy	3
Water	<1
Waste	<1
Refrig.	<1
Total (without Construction/Decommissioning)	**12**
Total (with Construction/Decommissioning)	**30**

Copperopolis Rd Solar Project

Displaced Energy Production during 35-year Project life (2023 CA Power Mix and Increased Renewable Accountability)

Annual Energy Production		Annual Average Solar Radiation Hours/Day/Year
Grid Size (MW)	2	
Total hrs/year	2,920	
% Operational time [1]	*100%*	
Operational hours/year	2,920	
KWh produced per year	5,840,000	
Assumed Heat Rate (Btu/KWh)	10,000	
Annual Fuel Equivalent (MMBtu)[2]	58,400	

If not provided by client:		Units
	2	MW Generation
	8	hrs/day
	16	MWh/day
	365	days/year
	5840	MWh/year
	1000	kWh/MWh
	5,840,000	**kWh/year**

CA Power Mix[3]		Annual Fuel Displacement (MMBtu)
Coal[4]	1.77%	1,034
Large Hydro	11.70%	6,833
Natural Gas[4]	36.56%	21,351
Nuclear	9.34%	5,455
Oil	0.01%	6
Other (petroleum coke/waste heat)	0.07%	41
Renewables	36.86%	21,526
Unspecified sources of Power	3.69%	2,155
Total	**100.0%**	**58,400**

Annual Pollutant Displacement[4]

Natural Gas Turbine Emissions

Pollutant	AP-42 Emission Factor (lb/MMBtu)[5]	Controlled Emission Factor (lb/MMBtu)	Controlled Emissions (lb)	Controlled Emissions (ton)	AP-42 Emission Factor Source Notes[5]
NO_x	0.099	0.099	2,114	1.06	Table 3.1-1, lean premix; Assume SCR Control Efficiency
CO	0.015	0.015	320	0.16	Table 3.1-1, lean premix; Assume Ox. Cat. Control Efficiency
PM_{10}	0.0047	0.0047	100	0.05	Table 3.1-2a, PM (condensible)
$PM_{2.5}$	0.0019	0.0019	41	0.02	Table 3.1-2a, PM (filterable)
SO_2	0.0034	0.0034	73	0.04	Table 3.1-2a
CO_2	110	110	2,348,614	1,174.31	Table 3.1-2a

Coal Combustion Emissions

Pollutant	AP-42 Emission Factor (lb/ton)[6]	Controlled Emission Factor (lb/ton)	Emissions (lb)[7]	Emissions (ton)	AP-42 Emission Factor Source Notes[6]
NOx	12	12	517	0.26	Table 1.1-3 pulverized coal, wall fired, bituminous coal NSPS
CO	0.5	0.5	22	0.01	Table 1.1-3 pulverized coal, wall fired, bituminous coal NSPS
PM_{10}[8]	0.46	0.084	4	0.00	Table 1.1-4, PC-fired dry bottom wall-fired, scrubber control
$PM_{2.5}$[8]	0.12	0.06	3	0.00	Table 1.1-4, PC-fired dry bottom wall-fired, scrubber control
SO_2[9]	2.85	0.57	25	0.01	Table 1.1-3 pulverized coal, wall fired, bituminous coal NSPS
CO_2	6040	6040	260143	130.07	Table 1.1-20
Total NMHC	0.06	0.06	3	0.00	Table 1.1-19; assumed all hydrocarbons are reactive
CH_4	0.04	0.04	2	0.00	Table 1.1-19
N_2O	0.03	0.03	1	0.00	Table 1.1-19

Total Displaced Emissions Associated With Direct Combustion

Pollutant	tons/year[8]	tons/lifetime (35 years (Static))	tons/lifetime (35 years (Increased Renewable))
ROG (NMHC)	0	0	
NO_x	1	46	
CO	0	6	
PM_{10}	0	2	
$PM_{2.5}$	0	1	
SO_x	0	2	
CO_2E (Metric Ton)	1,183	41,422	11,287

Notes:
1. Operational time is based on annual average solar radiation hours per day per year (5.38) for the project area. Source: solardirect.com (https://www.solardirect.com/archives/pv/systems/gts/gts-sizing-sun-hours.html)
2. The Project is assumed to displace existing power generation equivalent to the current power mix each year of operation.
3. CA Power Mix assumptions are based on data from the 2024 Total System Electric Generatin Table. https://www.energy.ca.gov/programs-and-topics/programs/power-source-disclosure-program/power-content-label
4. Combustion of natural gas and coal for power are of the greatest concern related to the generation of criteria pollutants and GHG emissions, therefore only fuel displacement of natural gas and coal due to electricty production from the Solar Scarlet facility are considered in this assessment.
5. EPA Air Pollution Emission Factors AP-42 Section 3.1, Stationary Gas Turbines
6. EPA Air Pollution Emission Factors AP-42 Section 1.1, Bituminous and Subbituminous Coal Combustion
7. Coal characteristics used for conversion: Assumed coal heat content = 24 MMBtu/ton
8. Total particulate matter (CPM-TOT) is expressed in terms of coal ash content therefore emission factor is determined by multiplying % ash content of coal (assumed to be 20% herein) by value listed in Table 1.1-4. Organic fraction of particulate matter is 20% of total CPM-TOT (Table 1.1-5) and listed as controlled emission factor.
9. SO_2 emission factor calculated by multiplying the weight percent of sulfur (assumed to be 7.5%) by the value listed in Table 1.1-3
10. CO_2E volumes are in metric tons rather than short (US) tons

Constants:

# years for project duration	35
GWP CH4	30
GWP N2O	273

Copperopolis Rd Solar Project

Displaced Energy Production during 35-year Project life (2023 CA Power Mix and Increased Renewable Accountability)

https://www.energy.ca.gov/programs-and-topics/programs/power-source-disclosure-program/power-content-label

Offset based on Increased Renewable Percentage

Year	Renewable %	Change in %	reduction per year	Non Renewable %	Total MT GHG	GHG per %
2024	45.00%			55.00%	1,183	21.51810557
2025	45.03%			54.97%	1,183	
2026	45.06%			54.94%	1,182	
2027	45.09%			54.91%	1,182	
2028	45.12%			54.88%	1,181	
2029	45.15%			54.85%	1,180	
2030	60%	60.0000%	0.000295567	40.00%	861	
2031	66.00%			34.00%	732	
2032	72.00%			28.00%	603	
2033	78.00%			22.00%	473	
2034	84.00%			16.00%	344	
2035	90%	30%	0.06	10.00%	215	
2036	91.00%			9.00%	194	
2037	92.00%			8.00%	172	
2038	93.00%			7.00%	151	
2039	94.00%			6.00%	129	
2040	95%	5%	0.01	5.00%	108	
2041	96.00%			4.00%	86	
2042	97.00%			3.00%	65	
2043	98.00%			2.00%	43	
2044	99.00%			1.00%	22	
2045	100%	5%	0.01	0.00%	0	

*Beyond 2045 would be equalt to 2045

		GHG Emissions (MT CO2e Per Year)
Total Offset Ov	Total Offset Over Project Lifetime:	6,557
Annual offset (	**Annual offset (Operational Year 2028)**	**187**
	Construction Emissions (Amortized)[1]	9
	Decommissioning Emissions (Amortized)[1]	9
	Annual Operational Emissions	12
	Annual GHG Emissions Generated	**30**
	Net Annual Emissions Offset	**157**

Note

[1] Uses a Project Lifetime of 35 years.

Appendix B

Biological Resources Assessment

Rincon Consultants, Inc.
601 University Avenue, Suite 221
Sacramento, California 95825
916-706-1374

August 6, 2026
Project No: 25-17409

Ryan Nyberg
RPCA Solar 19, LLC
44 Montgomery Street, Suite 3150
San Francisco, California 94104
Via email: ryan@renewprop.com

Subject: Limited Biological Resources Assessment Memorandum for the Copperopolis Road Solar Project in San Joaquin County, California

Dear Ryan:

This memorandum describes the methods and results of an environmental review conducted to describe biological resources in the approximate 12.2-acre Copperopolis Road Solar Project (project) area and 100-foot buffer (survey area), located on 14.2 gross acres of three parcels (Assessor's Parcel Numbers 10322024,10322025, and 10322022) in San Joaquin County, California.

Background and Project Description

Land uses surrounding the project area include agriculture and rural residential parcels in unincorporated San Joaquin County, east of the City of Stockton (Attachment 1, Figure 1). The project area is situated south of Copperopolis Road and west of Best Road (Attachment 1, Figure 2), at an elevation of approximately 55 feet above mean sea level. The latitude and longitude of the approximate center of the site is 37.9673528° North, -121.1632639° West.

The proposed project consists of a ground-mounted solar photovoltaic energy facility. The project will generate up to two megawatts of clean, reliable solar energy by utilizing photovoltaic solar modules, inverters, and appurtenant electrical equipment to convert energy from the sun to usable power distributed to the electrical grid. The modules will be mounted on a steel racking system employing single-axis tracker technology that efficiently tracks the movement of the sun throughout the day and maximizes the efficiency of solar collection. The rows of modules will be anchored in the ground using driven piers, and the overall height of the array is not expected to exceed 15 feet above the existing ground surface at maximum tilt. The project will interconnect to the existing Pacific Gas and Electric Company electrical distribution system adjacent to the site along Copperopolis Road.

Regulatory Setting

Regulated or sensitive resources described in this assessment include special-status plant and wildlife species, native nesting birds, sensitive plant communities, jurisdictional waters and wetlands, wildlife movement corridors, federally designated Critical Habitat, and locally protected resources. Regulatory authority over biological resources is shared by federal, state, and local jurisdictions. Primary authority for regulation of general biological resources lies within the land use control and planning authority of local jurisdictions. See Attachment 2 for a detailed description of the Regulatory Setting.

Literature Review

Special-status plant and wildlife species present or potentially present within or adjacent to the project area were identified through a desktop literature review using the following sources:

- United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) Trust Resource Report (USFWS 2026a)
- California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB 2026)
- California Native Plant Society (CNPS) Online Inventory of Rare and Endangered Vascular Plants (CNPS 2026)
- United States Department of Agriculture (USDA), Natural Resources Conservation Service Web Soil Survey (USDA 2026)
- USFWS Critical Habitat Portal (USFWS 2026b)
- USFWS National Wetland Inventory (NWI) Wetland Mapper (USFWS 2026c)
- CDFW Biogeographic Information and Observation System (CDFW 2026a)
- CDFW Special Animals List (CDFW 2026b)
- San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP 2000)

The CNDDB and CNPS database searches included the 7.5-minute United States Geological Survey *Stockton East, California* quadrangle and surrounding eight quadrangles (referred to as a "nine-quad search"). The IPaC search included the project area and a 2-mile buffer surrounding the project area. Following a review of these resources, Rincon Consultants (Rincon) also reviewed relevant life history information on those species documented as occurring in the region, including habitat type, soils, and elevation preferences.

The potential for wildlife movement corridors was evaluated based on the California Essential Habitat Connectivity Project commissioned by the California Department of Transportation and CDFW (Spencer et al. 2010).

Field Survey

A general biological field survey was performed by Rincon biologist Nicole Carpenter on March 4, 2026. The survey was conducted by walking throughout the project area and buffer to document existing conditions and evaluate the potential for the project area to support special-status plant and wildlife species, sensitive vegetation communities, and potentially jurisdictional aquatic resources. Binoculars were used to aid in identification of resources and to achieve visual coverage of the survey area. An aerial photograph and georeferenced mobile map with an overlay of the survey area boundary was used to map vegetation communities and record any special-status or sensitive biological resources, while in the field. Representative photographs were taken to document existing conditions, vegetation communities, and sensitive biological resources (Attachment 3).

Definition of Special-Status Species

For the purposes of this report, special-status species include:

- Plant and wildlife species listed as threatened or endangered under the federal Endangered Species Act (ESA), including species proposed for listing
- Plant and wildlife species listed as threatened or endangered under the California Endangered Species Act (CESA), including species that are candidates for listing
- Wildlife species designated as Fully Protected by the California Fish and Game Commission, and as Species of Special Concern (SSC) by CDFW
- Plant species with CNPS California Rare Plant Ranks 1A, 1B, 2A and 2B, per the following definitions:
  - Rank 1A = Presumed extirpated in California and rare or extinct elsewhere
  - Rank 1B = Rare, threatened, or endangered in California and elsewhere

- Rank 2A = Presumed extirpated in California but common elsewhere
- Rank 2B = Rare, threatened, or endangered in California, but common elsewhere.

Special-status plant and wildlife species are discussed below in terms of California Environmental Quality Act (CEQA) thresholds of significance. A threshold of significance for a given environmental impact defines the level of effect above which the lead agency will normally consider impacts to be significant, and below which it will normally consider impacts to be less than significant. Lead agencies are responsible for establishing the thresholds of significance for all documents they prepare.

A list of special-status plant species with potential to occur in the search area defined above is included in Attachment 4, and a list of special-status wildlife species is included in Attachment 5. Definitions regarding potential for species occurrence for this assessment are as follows:

- **Not Expected to Occur.** Habitat within and adjacent to the project area is lacking for the species' life history requirements (foraging, breeding, cover, range, elevation, hydrology, vegetation community, site history, and/or disturbance regime). There are no documented occurrences of the species in the larger vicinity of the project area.
- **Low.** Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the project area is unsuitable or of poor quality. Because of this, the species is highly unlikely to be found within the project area. Any documented occurrences of the species are likely further in distance than possible for the species to disperse to the site, or the date of the occurrence is several decades old, or the vicinity of the project area has been developed in a manner that likely precludes the species from presently occurring.
- **Moderate.** Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the project area is unsuitable. There are recently documented occurrences in the near vicinity of the project area; therefore, the species has a moderate probability of occurring within the project area.
- **High.** All of the habitat components meeting the species requirements are present, and/or most of the habitat on or adjacent to the project area is highly suitable. There are documented occurrences of the species on or immediately adjacent to the project area; therefore, the species has a high probability of occurring within the project area.
- **Present.** Species was observed within the project area during field surveys or has been recorded (i.e., CNDDB, or other reports) within the project area recently (within the last ±10 years).

Based on these definitions, there would be no impact or less-than-significant impacts to species that are not expected to occur or that have a low potential to occur in the project area.

Results

Soils

One soil type, Jacktone clay, 0 to 2 percent slopes, has been mapped in the project area (USDA 2026a; Attachment 1, Figure 3). Jacktone soils are somewhat poorly drained soils formed from alluvium derived from mixed rock sources. They are typically found on valley floors at elevations from approximately 0 to 100 feet above mean sea level. The frequency of flooding is rare, the frequency of ponding is none, and the available water supply is low (about 5.1 inches). This soil type is listed as predominantly hydric on the USDA Natural Resources Conservation Service List of Hydric Soils (USDA 2026b).

Land Cover Types

Based on historical aerial imagery, an orchard was previously planted in the project area and was removed sometime in 2023 or 2024, and the site has since been fallow and is disked once per year. The project area can currently be characterized as disturbed and developed and is dominated by non-native grasses and forbs (Attachment 1, Figure 4). Non-native grasses and forbs such as charlock (*Sinapis arvensis*), cheeseweed (*Malva parviflora*), and ripgut brome (*Bromus diandrus*) were observed during the field survey. California ground squirrel (*Otospermophilus beecheyi*) burrows were observed scattered throughout the project area where the vegetation was sparse. Developed areas include Copperopolis Road to the north and rural residences to the north and east.

Special-Status Plant Species

Results of the IPaC, CNDDB, and CNPS searches identified 18 special-status plant species known to occur within the 2-mile/nine-quad search radius of the project area (CNPS 2026, CNDDB 2026, USFWS 2026a). None of these are expected to occur due to a lack of suitable habitat in the project area or the project area is outside of the species known elevation range. In addition, the disturbed nature of the site likely precludes special-status plants from occurring. Attachment 4 includes a list of the 18 special-status plant species evaluated for potential to occur in the project area.

Special-Status Wildlife Species

Results of the CNDDB and IPaC searches indicated 26 special-status wildlife species are known to occur within the 2-mile/nine-quad search radius of the project area (CNDDB 2026, USFWS 2026a). Of these, five species have a moderate potential to occur in the project area and are discussed further below. The remaining 21 are not expected to occur or have a low potential to occur due to a lack of suitable habitat or the project area is outside of the species' known range. Therefore, these 21 species were removed from further consideration. Attachment 5 includes a list of the 26 special-status wildlife species evaluated for potential to occur in the project area.

Burrowing owl (*Athene cunicularia*; state SSC and candidate for listing) utilizes abandoned ground squirrel burrows in open habitats, grasslands, and disturbed areas, typically on levees, mounds or areas where there are unobstructed views of possible predators such as raptors or foxes. Prey items include insects, small mammals, reptiles and amphibians. The project area is within the species' known range, there are suitable burrows for nesting, and foraging habitat is present within and in the vicinity of the project area. In addition, there are four documented occurrences of burrowing owl within 5 miles of the project area (CNDDB 2026). This species is covered under the SJMSCP.

Swainson's hawk (*Buteo swainsoni*; state threatened) breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or rows of trees. Swainson's hawk requires suitable foraging areas within 10–12 miles of a nest site, such as grasslands, alfalfa, or grain fields that support small mammal populations. Swainson's hawks are known to nest in single trees on agricultural landscapes. Suitable foraging habitat for this species is present within the project area and in agricultural fields in the vicinity of the project area. Trees that may support nesting are present in adjacent rural residential parcels and the surrounding vicinity. In addition, there are 15 documented occurrences of Swainson's hawk within 5 miles of the project area (CNDDB 2026). This species is covered under the SJMSCP.

White-tailed kite (*Elanus leucurus*; state SSC) utilizes rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. White-tailed kite forages in open grasslands, meadows, or marshes close to isolated, dense-topped trees for nesting and perching. Suitable foraging habitat for this species is present within the project area in the fields in the vicinity of the project area. Suitable nesting trees are present in the adjacent residential parcels and the surrounding vicinity of the project area. The nearest documented occurrence of this species is approximately 5.75

miles southwest of the project area from 2002 (CNDDB 2026). This species is covered under the SJMSCP.

Loggerhead shrike (*Lanius ludovicianus*; state SSC) utilizes broken woodlands, savannah, grasslands, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub and washes. Loggerhead shrike prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting. Suitable foraging habitat for this species is present within the project area and in the adjacent fields in the vicinity of the project area. Suitable nesting habitat is present in the adjacent residential parcels and the surrounding vicinity of the project area. The nearest documented occurrence of this species is approximately 13.60 miles southwest of the project area from 2002 (CNDDB 2026). This species is covered under the SJMSCP.

Crotch's bumble bee (*Bombus crotchii*; state candidate for listing) habitat requirements include availability of suitable colony nesting sites, floral resources to obtain nectar and pollen throughout the duration of the colony period (spring, summer and fall), and suitable overwintering sites for queens. Most bumble bees are primitively eusocial insects that live in colonies composed of a queen, workers, and, near the end of the season, reproductive members of the colony (new queens, or gynes, and males). Nest sites typically include underground cavities, wood or rock piles, brush piles, and other cavities on open west-southwest slopes bordered by trees. Little is known about hibernacula or overwintering sites. Suitable floral resources and potential nesting sites were present in the project area during the field survey. While there are no documented CNDDB occurrences within the nine-quad search, the project area is within the current range for this species. The nearest documented occurrence in Bumble Bee Watch is approximately 22 miles southwest of the project area (Xerces Society 2026).

This species is not covered under the SJMSCP. As such, this species would need to be evaluated separately from the SJMSCP, as species that are candidates for listing under CESA are afforded the same protections as formally listed species. The following Avoidance and Minimization Measure (AMM) would reduce potential impacts to Crotch's bumble bees that may occur in the project area during the Colony Active Period (April – August) to less than significant.

> **AMM-1: Crotch's Bumble Bee.** Should construction begin during the Colony Active Period (April – August), a formal habitat assessment shall be performed prior to initiating ground disturbing activities to determine if suitable nesting and/or foraging habitat is present in the project area. The assessment shall include:
>
> 1. Review of occurrence record data
> 2. Analysis of foraging, nesting, and overwintering resources
> 3. Documentation of plant species observed (including what is blooming at the time of the survey and percent cover)
>
> The locations of any nesting resources, including rodent burrows, cavities, thatched grasses, brush, rock piles, logs, and manmade structures like dumped furniture, shall be mapped during the assessment. Areas adjacent to the project shall also be considered, as accessible, to determine if there is suitable nesting or foraging habitat.
>
> If suitable nesting and foraging resources are detected in the project area during the habitat assessment, protocol-surveys following the CDFW *Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species* (CDFW 2023) will be conducted to determine if Crotch's bumble bee is present in the project area. A minimum of three visits will be conducted during the Colony Active Period (April – August) and will be spaced 2-4 weeks apart. If no Crotch's bumble bees are detected on the site, no further mitigation would be required. If Crotch's bumble bees are detected, consultation with CDFW will be initiated to determine the most appropriate strategy to avoid impacts to bumble bees on the site.

If suitable foraging habitat is absent from the project area, but suitable nesting habitat is present and foraging habitat occurs adjacent to the project area, preconstruction nest surveys for Crotch's bumble bee will be conducted according to the *CDFW Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species* (CDFW 2023) document 48 hours prior to construction to determine if any active Crotch's bumble bee nests are present. If no active Crotch's bumble bee nests are detected during the preconstruction nest survey, no further mitigation would be required. If Crotch's bumble bee nests are detected, they will be avoided by a 50-foot buffer, as possible. If avoidance is not possible, consultation with CDFW will be initiated to determine the most appropriate strategy to avoid impacts to bumble bees on the site.

Critical Habitat

Critical Habitat is a term defined and used in the federal ESA to specify geographic areas that contain features essential to the conservation of an endangered or threatened species, and that may require special management and protection. Critical Habitat may also include areas that are not currently occupied by the species but will be needed for its recovery.

The project area does not fall within critical habitat limits for any special-status wildlife or plant species. The nearest mapped critical habitat is approximately 6.50 miles east of the project area for vernal pool fairy shrimp (*Branchinecta lynchi*).

Wildlife Corridors

Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the migration of animals. Habitat linkages are small patches that join larger blocks of habitat and help reduce the adverse effects of habitat fragmentation; they may be continuous habitat or discrete habitat islands that function as stepping-stones for wildlife dispersal.

The project area is not recognized as an important wildlife corridor by any regional or state agency or jurisdiction and is not considered critical to the ecological functioning of adjoining open space areas (CDFW 2026b). Due to the disturbed nature of the site and level of development and human disturbance surrounding the site, common wildlife species like raccoon (*Procyon lotor*) may pass through the site to access adjacent patches of cover and foraging habitat, but migratory wildlife use of the site is unlikely.

Potentially Jurisdictional Aquatic Features

No wetlands or other waters have been mapped in the project area by the National Wetlands Inventory (USFWS 2026c), and no wetlands, waters, or other potentially jurisdictional aquatic resources were observed within the project area during the field survey.

San Joaquin Multi-Species Habitat Conservation and Open Space Plan

The SJMSCP is a comprehensive conservation planning strategy that addresses the needs of multiple plant and animal species while protecting the region's agricultural interests as the population increases over the next 25 years (2001–2051). The SJMSCP is administered by the San Joaquin Council of Governments, Inc., which is a non-profit corporation established by San Joaquin County and the cities of Escalon, Lathrop, Lodi, Manteca, Ripon, Stockton and Tracy.

The SJMSCP provides coverage for impacts to biological resources pursuant to CEQA, the CESA, and ESA, and is approved and authorized by the CDFW and USFWS. As such, if the project proponent chooses to participate in this permitting pathway, the proposed project will be subject to review under the SJMSCP. As part of this process, the project will be required to comply with all provisions of the SJMSCP, including implementation of applicable Incidental Take Minimization Measures and payment of

mitigation fees. These fees must be paid prior to the initiation of construction activities to ensure compliance with the plan and to mitigate potential impacts to covered species and habitats.

Summary

The project area is disturbed and dominated by non-native grasses and forbs. No sensitive habitats or sensitive vegetation communities were detected during the field survey, nor have any been mapped by CDFW or USFWS in the project area, including areas designated as Critical Habitat for federally endangered species or protected wildlife movement corridors. No special-status plants are expected to occur in the project area; however, five special-status wildlife species have a moderate potential to occur in or adjacent to the project area.

Burrowing owl, Swainson's hawk, white-tailed kite, and loggerhead shrike are Covered Species under the SJMSCP, and the project proponent will be required to comply with all provisions of the SJMSCP; therefore, potential impacts to burrowing owl, Swainson's hawk, white-tailed kite, and loggerhead shrike would be mitigated to less than significant through participation in the SJMSCP. Crotch's bumble bee is not a Covered Species under the SJMSCP, as this species became a candidate for listing in 2023. Incorporation of the AMM described above would reduce potential impacts to Crotch's bumble bee to less than significant.

Additionally, native nesting birds protected by the MBTA or the California Department of Fish and Game code may use the site and surrounding habitat during the breeding season (typically February 1 through August 31).To comply with CEQA and the MBTA, a preconstruction nesting bird survey would be required if construction activities were to occur during the breeding season.

If you have any questions about this memorandum, please contact Lisa Achter at 530-217-8952 or lachter@rinconconsultants.com.

Sincerely,
Rincon Consultants, Inc.

Lisa Achter
Senior Biologist, Project Manager

Attachments

Attachment 1 Figures
Attachment 2 Regulatory Setting
Attachment 3 Site Photographs
Attachment 4 Plant Species with Potential to Occur
Attachment 5 Wildlife Species with Potential to Occur

References

California Department of Fish and Wildlife (CDFW). 2026a. Biogeographic Information and Observation System (BIOS). Retrieved from www.wildlife.ca.gov/data/BIOS (accessed March 2026).

_____. 2026b. California Natural Diversity Database (CNDDB). January 2026. Special Animals List. California Department of Fish and Wildlife. Sacramento, CA.

California Native Plant Society (CNPS), Rare Plant Program. 2026. Inventory of Rare and Endangered Plants of California (online edition, v9.5.1). https://www.rareplants.cnps.org (accessed March 2026).

California Natural Diversity Database (CNDDB). 2026. California Department of Fish and Wildlife (CDFW)., Rarefind, Version 5.3.0 (accessed March 2026).

California Environmental Quality Act (CEQA) *Statute and Guidelines*. 2026

Google Earth Pro 2026. Version 7.3.6.9796 (accessed March 2026).

Jepson Flora Project. 2026. Jepson eFlora Geographic Subdivisions of California. https://ucjeps.berkeley.edu/eflora/geography.html (accessed March 2026).

San Joaquin Multiple Species Habitat Conservation and Open Space Plan (SJMSCP). 2000. https://www.sjcog.org/DocumentCenter/View/5. (accessed March 2026).

Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Strittholt, M. Parisi, and A. Pettler. 2010. California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration.

United States Department of Agriculture (USDA), Natural Resources Conservation Service. 2026a. Web Soil Survey. https://websoilsurvey.sc.egov.usda.gov/App/HomePage.html (accessed March 2026).

_____. 2026b. Lists of Hydric Soils. National Cooperative Soil Survey, U.S. Department of Agriculture. https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/ (accessed March 2026).

United States Fish and Wildlife Service (USFWS). 2026a. Information for Planning and Consultation. http://ecos.fws.gov/ipac/ (accessed March 2026).

_____. 2026b. Critical Habitat Online Mapper. http://criticalhabitat.fws.gov (accessed March 2026).

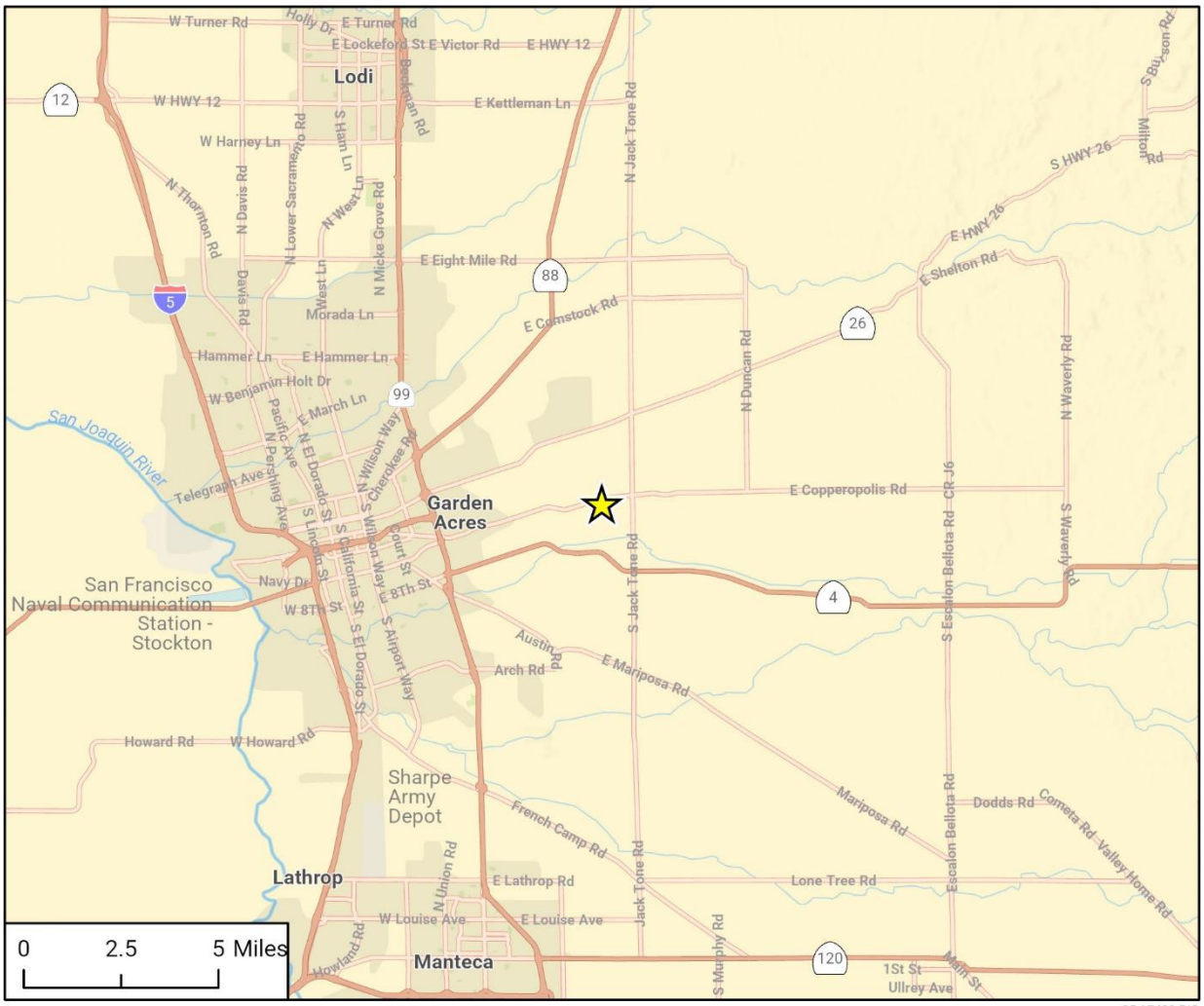
_____. 2026c. National Wetlands Inventory. https://www.fws.gov/wetlands/data/mapper.html (accessed March 2026).

The Xerces Society, Wildlife Preservation Canada, York University, University of Ottawa, The Montreal Insectarium, The London Natural History Museum, BeeSpotter. Data accessed from Bumble Bee Watch, a collaborative website to track and conserve North America's bumble bees. Available at https://www.bumblebeewatch.org/. Accessed March 2026.

Attachment 1

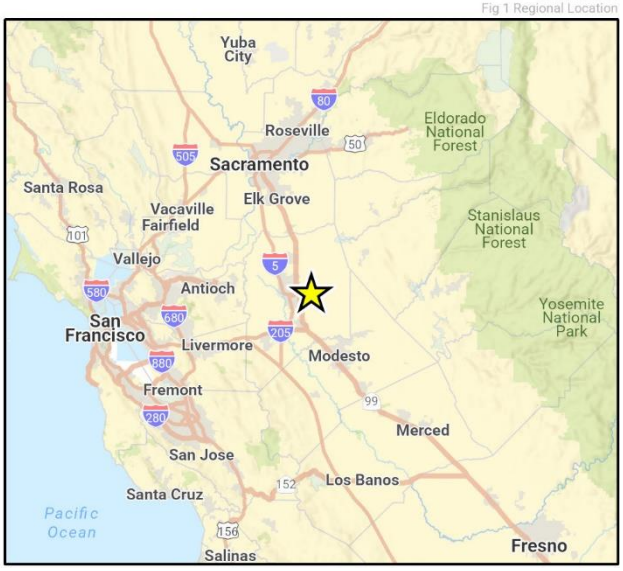
Figures

Figure 1 Regional Location



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Map created by Rincon Consultants, Inc., 2026.

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Fig 1 Regional Location



Project Location

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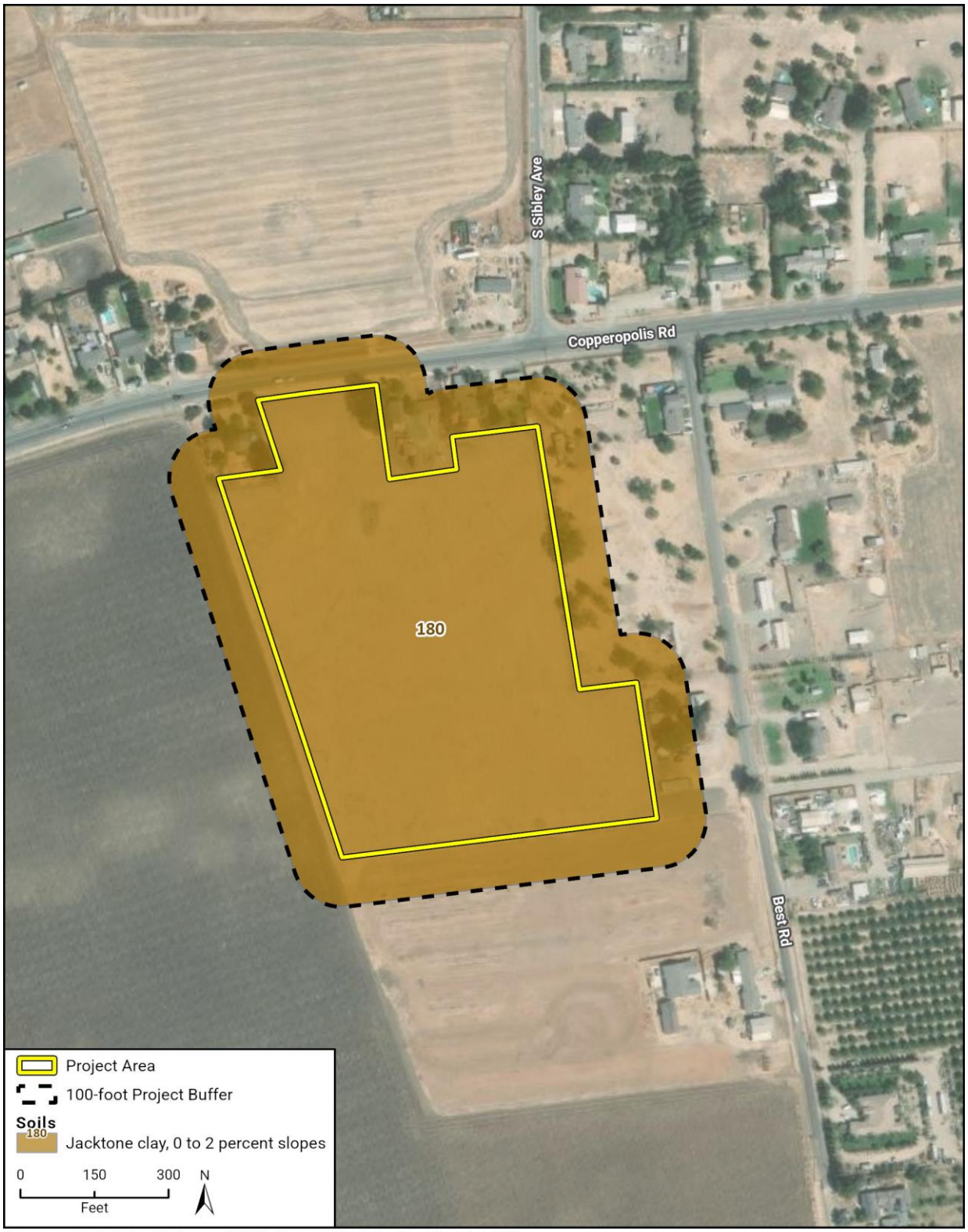
Figure 2 Project Area



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Fig X Project Location

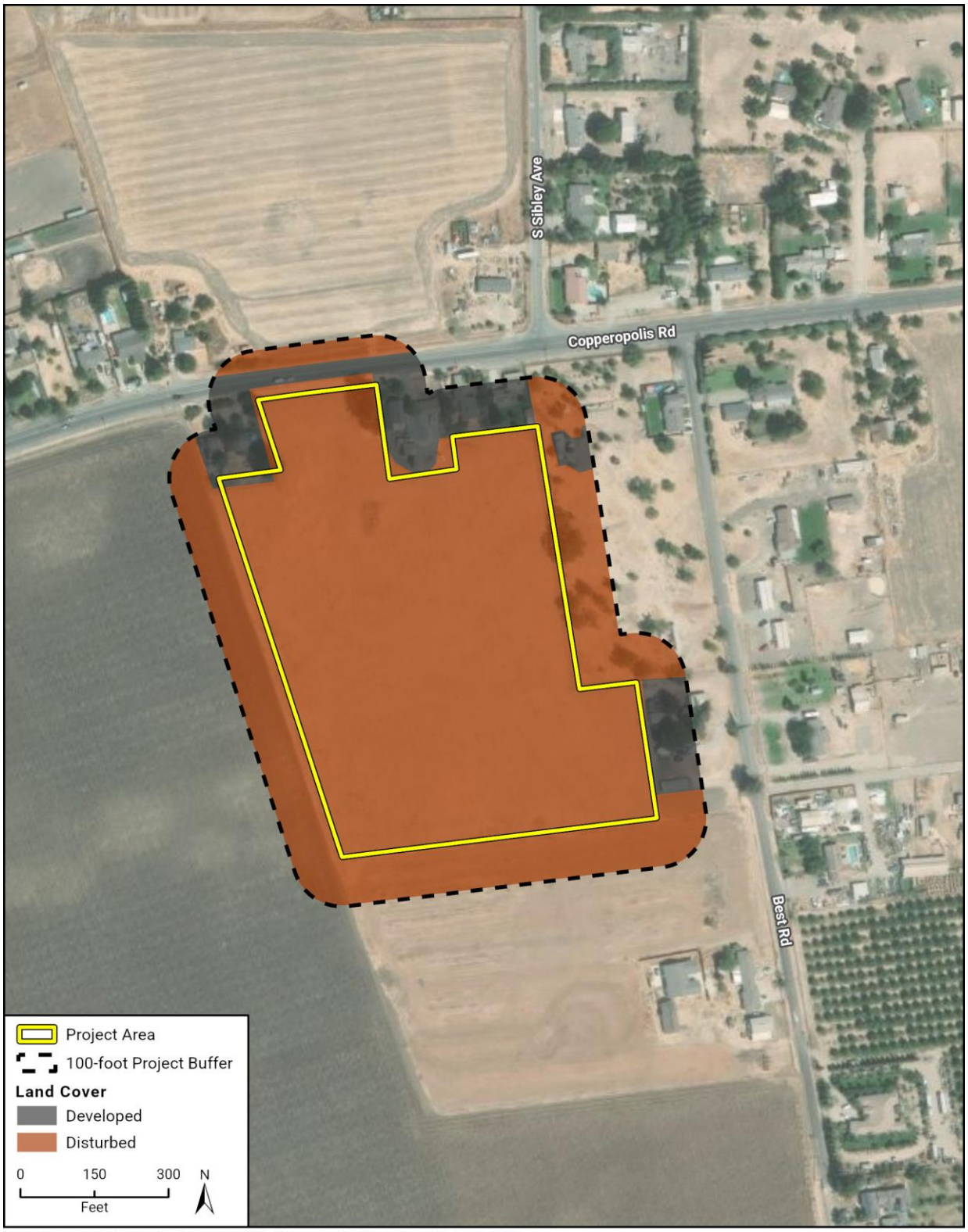
Figure 3 Soils



Imagery provided by Esri and its licensors © 2026. Map created by Rincon Consultants, Inc., 2026.
Soil data provided by SSURGO Downloader, NRCS, USDA, 2026.

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Fig X Soils

Figure 4 Land Cover Types



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Fig X Landcover

Attachment 2

Regulatory Setting

Regulatory Framework

The following is a brief summary of the regulatory context under which biological resources are managed at the federal, state, and local levels. A number of federal and state statutes provide a regulatory structure that guides the protection of biological resources. Agencies with the responsibility for protection of biological resources within the project site include the following:

- U.S. Army Corps of Engineers (wetlands and other waters of the United States)
- U.S. Fish and Wildlife Service (federally listed species and migratory birds)
- National Marine Fisheries Service (marine wildlife and anadromous fishes)
- Regional Water Quality Control Board (waters of the State)
- California Department Fish and Wildlife (riparian areas, streambeds, and lakes; state-listed species; nesting birds, marine resources)
- California Coastal Commission

United States Army Corps of Engineers

The United States Army Corps of Engineers (USACE) is responsible for administering several federal programs related to ensuring the quality and navigability of the nation's waters.

Clean Water Act Section 404

Congress enacted the Clean Water Act (CWA) "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The CWA establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. The basis of the CWA was enacted in 1948 and was called the Federal Water Pollution Control Act, but the law was significantly reorganized and expanded in 1972. "Clean Water Act" became the law's common name with amendments in 1972.

Section 404 of the CWA establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Section 404 of the CWA authorizes the Secretary of the Army, acting through the USACE, to issue permits regulating the discharge of dredged or fill materials into the "navigable waters at specified disposal sites." Section 404 requires that a permit be issued before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from regulation under Section 404 (e.g., certain farming and forestry activities).

Waters of the U.S.

The USACE and US Environmental Protection Agency (USEPA) have undertaken several efforts to modernize their regulations defining "waters of the United States" (e.g., the 2015 Clean Water Rule and 2020 Navigable Waters Protection Rule), but these efforts have been frustrated by legal challenges which have invalidated the updated regulations. As a result of the Supreme Court ruling in *Sackett v. Environmental Protection Agency*, EPA and USACE issued a final rule that amends the "Revised Definition of 'Waters of the United States'" to conform key aspects of the regulatory text to the U.S. Supreme Court's decision (88 Federal Register 61964–61969, September 8, 2023).

Under the "Revised Definition of 'Waters of the United States'; Conforming" rule, the term "waters of the United States" is defined as follows (33 CFR 328.3[a]):

(1) Waters which are:
   (i) Currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
   (ii) The territorial seas; or
   (iii) Interstate waters;

(2) Impoundments of waters otherwise defined as waters of the United States under this definition, other than impoundments of waters identified under paragraph (a)(5) of this section;

(3) Tributaries of waters identified in paragraph (a)(1) or (2) of this section that are relatively permanent, standing or continuously flowing bodies of water;

(4) Wetlands adjacent to the following waters:
   (i) Waters identified in paragraph (a)(1) of this section; or
   (ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3) of this section and with a continuous surface connection to those waters;

(5) Intrastate lakes and ponds not identified in paragraphs (a)(1) through (4) of this section that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in paragraph (a)(1) or (a)(3) of this section.

In addition, the amended regulations include eight types of excluded waters (33 CFR 328.3[b]) which are not “waters of the United States” even where they otherwise meet the terms of paragraphs (a)(2) through (5) of this section:

(1) Waste treatment systems, including treatment ponds or lagoons, designed to meet the requirements of the Clean Water Act;

(2) Prior converted cropland designated by the Secretary of Agriculture. The exclusion would cease upon a change of use, which means that the area is no longer available for the production of agricultural commodities. Notwithstanding the determination of an area’s status as prior converted cropland by any other Federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA;

(3) Ditches (including roadside ditches) excavated wholly in and draining only dry land and that do not carry a relatively permanent flow of water;

(4) Artificially irrigated areas that would revert to dry land if the irrigation ceased;

(5) Artificial lakes or ponds created by excavating or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing;

(6) Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating or diking dry land to retain water for primarily aesthetic reasons;

(7) Waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States; and

(8) Swales and erosional features (e.g., gullies, small washes) characterized by low volume, infrequent, or short duration flow.

The lateral limits of USACE jurisdiction in non-tidal waters is defined by the "ordinary high-water mark" (OHWM) unless adjacent wetlands are present. The OHWM is a line on the shore or edge of a channel established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed upon the bank, shelving, changes in the character of soil, destruction of vegetation, or the presence of debris (33 CFR 328.3(e)). As such, waters are recognized in the field by the presence of a

defined watercourse with appropriate physical and topographic features. If wetlands occur within, or adjacent to, waters of the United States, the lateral limits of USACE jurisdiction extend beyond the OHWM to the outer edge of the wetlands (33 CFR 328.4 (c)). The upstream limit of jurisdiction in the absence of adjacent wetlands is the point beyond which the OHWM is no longer perceptible (33 CFR 328.4; see also 51 FR 41217).

Wetlands

The USACE defines wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3). Indicators of three wetland parameters (hydric soils, hydrophytic vegetation, and wetlands hydrology), as determined by site investigation, must be present at a site for USACE to classify the site as a wetland (Environmental Laboratory 1987).

Limitations on Jurisdiction based on Sackett v. USEPA Supreme Court Decision

On May 25, 2023, the Supreme Court issued its decision on the petition from the Sacketts, a family in Idaho that was subject to a compliance order from the USEPA for backfilling their lot near Priest Lake, which the USEPA claimed contained federally regulated wetlands. The wetlands in question were adjacent to a ditch that fed a creek that ultimately drained into Priest Lake, a navigable water body. The USEPA asserted that the Sacketts had violated the law by filling the wetlands on their property without a permit. The Court's decision addressed controversy over whether, and under what conditions, the CWA reaches navigable waters' tributaries or adjacent wetlands. The Supreme Court's decision in Sackett provides definitive guidance to the agencies in determining the limits of their Clean Water Act authority. Major tenets of the decision have been incorporated into the agencies' current regulations through the September 2023 Conforming Rule.

The Court decided:

- "Adjacent wetlands" are WOTUS only if there is a continuous surface connection between the wetland and a navigable or relatively permanent water body, such that it is difficult to determine the boundary between the wetland and the water body. The opinion notes that "temporary interruptions to surface connection may sometimes occur because of phenomena like low tides or dry spells." The agencies addressed this element by defining the term "adjacent" to mean "having a continuous surface connection" in the Conforming Rule.
- The Significant Nexus Standard, introduced by the Court in prior decisions, is not mentioned in the Clean Water Act and should not be used. The Court determined that the standard applies ecological factors whose use in determining jurisdiction is not supported by the statute. The Conforming Rule removed significant nexus considerations from the definition.
- Although jurisdiction over tributaries was not addressed by the Court, the decision stated that "…the [Clean Water Act's] use of "waters" encompasses only those relatively permanent, standing or continuously flowing bodies of water forming geographical features that are described in ordinary parlance as streams, oceans, rivers, and lakes." The Conforming Rule makes clear that only relatively permanent tributaries qualify as "waters of the United States."

Rivers and Harbors Act Section 10

Section 10 of the Rivers and Harbors Act of 1899 requires authorization from the USACE for the construction of any structure in or over any navigable water of the United States. Structures or work outside the limits defined for navigable waters of the United States require a Section 10 permit if the

structure or work affects the course, location, or condition of the water body. The law applies to any dredging or disposal of dredged materials, excavation, filling, re-channelization, or any other modification of a navigable water of the United States, and applies to all structures and work. It further includes, without limitation, any wharf, dolphin, weir, boom breakwater, jetty, groin, bank protection (e.g., riprap, revetment, bulkhead), mooring structures such as pilings, aerial or subaqueous power transmission lines, intake or outfall pipes, permanently moored floating vessel, tunnel, artificial canal, boat ramp, aids to navigation, and any other permanent, or semi-permanent obstacle or obstruction. It is important to note that Section 10 applies only to navigable waters, and thus does not apply to work in non-navigable wetlands or tributaries. In some cases, Section 10 authorization is issued by the USACE concurrently with CWA Section 404 authorization, such as when certain Nationwide Permits are used.

Coastal Zone Management Act of 1972

The Coastal Zone Management Act of 1972 (16 USC 1451 et seq.), administered by the National Oceanic and Atmospheric Administration (NOAA), provides for the management of the nation's coastal resources, including the Great Lakes. The goal is to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone." Each federal agency activity within or outside of the coastal zone that affects any land or water use or natural resources of the coastal zone must be carried out in a manner consistent to the maximum extent practicable with the enforceable policies of the approved state management programs. The policies of the California Coastal Act of 1976 (Coastal Act) govern the types of developments and uses allowed within wetlands and other waters within the Coastal Zone, including open coastal waters. Along the Pacific coast, open coastal waters extend from the mean high-water (MHW) line to the state's outer limit of jurisdiction, approximately 3 miles offshore.

Regional Water Quality Control Board

The State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCBs) have jurisdiction over "waters of the State," which are defined as any surface water or groundwater, including saline waters, within the boundaries of the state (California Water Code sec. 13050(e)). These agencies also have responsibilities for administering portions of the CWA.

Clean Water Act Section 401

Section 401 of the CWA requires an applicant requesting a federal license or permit for an activity that may result in any discharge into navigable waters (such as a Section 404 Permit) to provide state certification that the proposed activity will not violate state and federal water quality standards. In California, CWA Section 401 Water Quality Certification (Section 401 Certification) is issued by the RWQCBs and by the SWRCB for multi-region projects. The process begins when an applicant submits an application to the RWQCB and informs the USACE (or the applicable agency from which a license or permit was requested) that an application has been submitted. The USACE will then determine a "reasonable period of time" for the RWQCB to act on the application; this is typically 60 days for routine projects and longer for complex projects but may not exceed one year. When the period has elapsed, if the RWQCB has not either issued or denied the application for Section 401 Certification, the USACE may determine that Certification has been waived and issue the requested permit. If a Section 401 Certification is issued it may include binding conditions, imposed either through the Certification itself or through the requested federal license or permit.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) is the principal law governing water quality regulation in California. It establishes a comprehensive program to protect water quality and the

beneficial uses of water. The Porter-Cologne Act applies to surface waters, wetlands, and ground water and to both point and nonpoint sources of pollution. Pursuant to the Porter-Cologne Act (California Water Code section 13000 et seq.), the policy of the State is as follows:

- The quality of all the waters of the State shall be protected
- All activities and factors affecting the quality of water shall be regulated to attain the highest water quality within reason
- The State must be prepared to exercise its full power and jurisdiction to protect the quality of water in the State from degradation

The Porter-Cologne Act established nine RWQCBs (based on watershed boundaries) and the SWRCB, which are charged with implementing its provisions and which have primary responsibility for protecting water quality in California. The SWRCB provides program guidance and oversight, allocates funds, and reviews RWQCB decisions. In addition, the SWRCB allocates rights to the use of surface water. The RWQCBs have primary responsibility for individual permitting, inspection, and enforcement actions within each of nine hydrologic regions. The SWRCB and RWQCBs have numerous nonpoint source related responsibilities, including monitoring and assessment, planning, financial assistance, and management.

Section 13260 of the Porter-Cologne Act requires any person discharging or proposing to discharge waste that could affect the quality of waters of the State to file a Report of Waste Discharge with the appropriate RWQCB. The RWQCB may then authorize the discharge, subject to conditions, by issuing Waste Discharge Requirements (WDRs). While this requirement was historically applied primarily to outfalls and similar point source discharges, the SWRCB's *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State*, effective May 2020, make it clear that the agency will apply the Porter-Cologne Act's requirements to discharges of dredge and fill material as well. The *Procedures* state that they are to be used in issuing CWA Section 401 Certifications and WDRs, and largely mirror the existing review requirements for CWA Section 404 Permits and Section 401 Certifications, incorporating most elements of the USEPA's *Section 404(b)(1) Guidelines*. Following issuance of the *Procedures*, the SWRCB produced a consolidated application form for dredge/fill discharges that can be used to obtain a CWA Section 401 Water Quality Certification, WDRs, or both.

Non-Wetland Waters of the State

The SWRCB and RWQCBs have not established regulations for field determinations of waters of the state except for wetlands currently. In many cases the RWQCBs interpret the limits of waters of the State to be bounded by the OHWM unless isolated conditions or ephemeral waters are present. However, in the absence of statewide guidance each RWQCB may interpret jurisdictional boundaries within their region and the SWRCB has encouraged applicants to confirm jurisdictional limits with their RWQCB before submitting applications. As determined by the RWQCB, waters of the State may include riparian areas or other locations outside the OHWM, leading to a larger jurisdictional area over a given water body compared to the USACE.

Wetland Waters of the State

Procedures for defining wetland waters of the State pursuant to the SWRCB's *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* went into effect May 28, 2020. The SWRCB defines an area as wetland if, under normal circumstances:

(i) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both;
(ii) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and
(iii) the area's vegetation is dominated by hydrophytes or the area lacks vegetation.

The SWRCB's Implementation Guidance for the Wetland Definition and Procedures for Discharges of Dredge and Fill Material to Waters of the State (2020), states that waters of the U.S. and waters of the State should be delineated using the standard USACE delineation procedures, taking into consideration that the methods shall be modified only to allow for the fact that a lack of vegetation does not preclude an area from meeting the definition of a wetland.

California Coastal Act of 1976

The Coastal Act (Public Resources Code Section 30000 et seq.) was enacted to establish policies and guidelines that provide direction for the conservation and development of the California coastline. The Coastal Act established the California Coastal Commission (CCC) and created a state and local government partnership to ensure that public concerns regarding coastal development are addressed. Some of the basic goals of this program are to protect, maintain, and, where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources; maximize public access to and public recreational opportunities along the coast; and ensure priority for coastal-dependent and coastal-related development over other development on the coast.

The CCC serves as the coastal management and regulatory agency with jurisdiction over the Coastal Zone (Public Resources Code Section 30103). The California Coastal Zone generally extends seaward 3 miles and inland anywhere from 0.5 miles to 5 miles. The CCC is responsible for assisting in the preparation, review, and certification of Local Coastal Programs/Local Coastal Plans (LCPs), which are developed by municipalities for that portion of their jurisdiction that falls within the Coastal Zone. Once the LCP has been certified, regulatory responsibility is delegated to the local jurisdiction, although the CCC retains jurisdiction over the immediate shoreline.

United States Fish and Wildlife Service

The United States Fish and Wildlife Service (USFWS) implements several laws protecting the Nation's fish and wildlife resources, including the Endangered Species Act (ESA; 16 United States Code [USC] Sections 153 et seq.), the Migratory Bird Treaty Act (MBTA; 16 USC Sections 703-711) and the Bald and Golden Eagle Protection Act (16 USC Section 668).

Endangered Species Act

The USFWS and National Marine Fisheries Service (NMFS) share responsibility for implementing the ESA. Generally, the USFWS implements the FESA for terrestrial and freshwater species, while the NMFS implements the FESA for marine and anadromous species. Projects that would result in "take" of any threatened or endangered wildlife species, or a threatened or endangered plant species if occurring on federal land, are required to obtain permits from the USFWS or NMFS through either Section 7 (interagency consultation with a federal nexus) or Section 10 (Habitat Conservation Plan) of the ESA, depending on the involvement by the federal government in funding, authorizing, or carrying out the project. The permitting process is used to determine if a project would jeopardize the continued existence of a listed species and what measures would be required to avoid jeopardizing the species. "Take" under federal definition means to harass, harm (which includes habitat modification), pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Proposed or candidate species do not have the full protection of the ESA; however, the USFWS and NMFS advise project applicants that they could be elevated to listed status at any time.

Migratory Bird Treaty Act

The MBTA of 1918 implements four international conservation treaties that the U.S. entered into with Canada in 1916, Mexico in 1936, Japan in 1972, and Russia in 1976. It is intended to ensure the sustainability of populations of all protected migratory bird species. The law has been amended with the signing of each treaty, as well as when any of the treaties were amended, such as with Mexico in 1976 and Canada in 1995. The MBTA prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the USFWS.

The list of migratory bird species protected by the law, in regulations at 50 CFR Part 10.13, is primarily based on bird families and species included in the four international treaties. A migratory bird species is included on the list if it meets one or more of the following criteria:

1. It occurs in the United States or U.S. territories as the result of natural biological or ecological processes and is currently, or was previously listed as, a species or part of a family protected by one of the four international treaties or their amendments.
2. Revised taxonomy results in it being newly split from a species that was previously on the list, and the new species occurs in the United States or U.S. territories as the result of natural biological or ecological processes.
3. New evidence exists for its natural occurrence in the United States or U.S. territories resulting from natural distributional changes and the species occurs in a protected family.

In 2004, the Migratory Bird Treaty Reform Act limited the scope of the MBTA by stating the MBTA applies only to migratory bird species that are native to the United States or U.S. territories, and that a native migratory bird species is one that is present as a result of natural biological or ecological processes. The MBTRA requires the USFWS to publish a list of all nonnative, human-introduced bird species to which the MBTA does not apply, and an updated list was published in 2020. The 2020 update identifies species belonging to biological families referred to in treaties the MBTA implements but are not protected because their presence in the United States or U.S. territories is solely the result of intentional or unintentional human-assisted introductions.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act prohibits anyone, without a permit issued by the USFWS, from "taking" bald or golden eagles, including their parts (including feathers), nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

"Disturb" means “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

California Department of Fish and Wildlife

The California Department of Fish and Wildlife (CDFW) derives its authority from the Fish and Game Code of California and administers several State laws protecting fish and wildlife resources and the habitats upon which they depend.

California Endangered Species Act

The California Endangered Species Act (CESA) (Fish and Game Code Section 2050 et. seq.) prohibits take of state listed threatened or endangered. Take under CESA is defined as “Hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill” (Fish and Game Code sec. 86). This definition does not prohibit indirect harm by way of habitat modification, except where such harm is the proximate cause of death of a listed species. Where incidental take would occur during construction or other lawful activities, CESA allows the CDFW to issue an Incidental Take Permit upon finding, among other requirements, that impacts to the species have been minimized and fully mitigated. Unlike the federal ESA, CESA’s protections extend to candidate species during the period (typically one year) while the California Fish and Game Commission decides whether the species warrants CESA listing.

Native Plant Protection Act

The CDFW also has authority to administer the Native Plant Protection Act (NPPA) (Fish and Game Code Section 1900 et seq.). The NPPA requires the CDFW to establish criteria for determining if a species, subspecies, or variety of native plant is endangered or rare, and prohibits the take of listed plant species. Effective in 2015, CDFW promulgated regulations (14 CCR 786.9) under the authority of the NPPA, establishing that the CESA’s permitting procedures would be applied to plants listed under the NPPA as "Rare." With this change, there is little practical difference for the regulated public between plants listed under CESA and those listed under the NPPA.

Fully Protected Species Laws

The CDFW enforces Sections 3511, 4700, 5050, and 5515 of the Fish and Game Code, which prohibit take of species designated as Fully Protected. The CDFW is not allowed to issue an Incidental Take Permit for Fully Protected species; therefore, impacts to these species must be avoided. The exception is situations where a Natural Community Conservation Plan (NCCP) is in place that authorizes take of the fully protected species.

Avian Protection Laws

California Fish and Game Code sections 3503, 3503.5, and 3513 describe unlawful take, possession, or destruction of native birds, nests, and eggs. Section 3503.5 of the Code protects all birds-of-prey and their eggs and nests against take, possession, or destruction of nests or eggs. Section 3513 makes it a state-level offense to take any bird in violation of the federal Migratory Bird Treaty Act.

Protection of Lakes and Streambeds

California Fish and Game Code section 1602 states that it is unlawful for any person to "substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake" without first notifying the California Department of Fish and Wildlife (CDFW) of that activity. Thereafter, if CDFW determines and informs the entity that the activity will not substantially adversely affect any existing fish or wildlife resources, the entity may commence the activity. If, however, CDFG determines that the activity may substantially adversely affect an existing fish

or wildlife resource, the entity may be required to obtain from CDFW a Streambed Alteration Agreement (SAA), which will include reasonable measures necessary to protect the affected resource(s), before the entity may conduct the activity described in the notification. Upon receiving a complete Notification of Lake/Streambed Alteration, CDFW has 60 days to present the entity with a Draft SAA. Upon review of the Draft SAA by the applicant, any problematic terms are negotiated with CDFW and a final SAA is executed.

The CDFW has not defined the term "stream" for the purposes of implementing its regulatory program under Section 1602, and the agency has not promulgated regulations directing how jurisdictional streambeds may be identified, or how their limits should be delineated. However, four relevant sources of information offer insight as to the appropriate limits of CDFW jurisdiction as discussed below.

- The plain language of Section 1602 of CFGC establishes the following general concepts:
  - References "river," "stream," and "lake"
  - References "natural flow"
  - References "bed," "bank," and "channel"
- Applicable court decisions, in particular Rutherford v. State of California (188 Cal App. 3d 1276 (1987), which interpreted Section 1602's use of "stream" to be as defined in common law. The Court indicated that a "stream" is commonly understood to:
  - Have a source and a terminus
  - Have banks and a channel
  - Convey flow at least periodically, but need not flow continuously and may at times appear outwardly dry
  - Represent the depression between the banks worn by the regular and usual flow of the water
  - Include the area between the opposing banks measured from the foot of the banks from the top of the water at its ordinary stage, including intervening sand bars
  - Include the land that is covered by the water in its ordinary low stage
  - Include lands below the OHWM
- CDFW regulations defining "stream" for other purposes, including sport fishing (14 CCR 1.72) and streambed alterations associated with cannabis production (14 CCR 722(c)(21)), which indicate that a stream:
  - Flows at least periodically or intermittently
  - Flows through a bed or channel having banks
  - Supports fish or aquatic life
  - Can be dry for a period of time
  - Includes watercourses where surface or subsurface flow supports or has supported riparian vegetation
- Guidance documents, including A Field Guide to Lake and Streambed Alteration Agreements (CDFG 1994) and Methods to Describe and Delineate Episodic Stream Processes on Arid Landscapes for Permitting Utility-Scale Solar Power Plants (Brady and Vyverberg 2013), which suggest the following:
  - A stream may flow perennially or episodically
  - A stream is defined by the course in which water currently flows, or has flowed during the historic hydrologic course regime (approximately the last 200 years)
  - Width of a stream course can reasonably be identified by physical or biological indicators
  - A stream may have one or more channels (single thread vs. compound form)

- Features such as braided channels, low-flow channels, active channels, banks associated with secondary channels, floodplains, islands, and stream-associated vegetation, are interconnected parts of the watercourse
- Canals, aqueducts, irrigation ditches, and other means of water conveyance can be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife
- Biologic components of a stream may include aquatic and riparian vegetation, all aquatic wildlife including fish, amphibians, reptiles, invertebrates, and terrestrial species which derive benefits from the stream system
- The lateral extent of a stream can be measured in different ways depending on the particular situation and the type of fish or wildlife resource at risk

The tenets listed above, among others, are applied to establish the boundaries of streambeds in various environments. Importance of each factor may be weighted based on site-specific considerations and the applicability of the indicators to the streambed at hand.

San Joaquin Multi-Species Habitat Conservation and Open Space Plan

The San Joaquin County Multi Species Habitat Conservation Plan and Open Space Plan (SJMSCP) is a comprehensive conservation planning process that addresses the needs of multiple plant and animal species while protecting the region's agricultural interests as the population increases over a period of 50 years (2001–2051) (SJMSCP 2000). The SJMSCP, in accordance with ESA Section 10(a)(1)(B) and CESA Section 2081(b) offers compensation for the Conversion of Open Space to non-Open Space which affect one or more of the 97 species covered under the SJMSCP (Covered Species) (SJMSCP 2000).

The project area is mapped as the agriculture land use type per the SJMSCP and is also located in the SJMSCP's Central Zone, which provides incidental take coverage for several Covered Species. If a project proponent opts into the SJMSCP, permit conditions would require avoidance and minimization measures to offset impacts to Covered Species.

For all project activities subject to the SJMSCP and seeking coverage under the SJMSCP, the project proponent must submit an applicant checklist and review form to the San Joaquin Council of Governments to establish eligibility for coverage. The form details the activities not subject to the SJMSHCP and those that may have the potential to impact a biological resource covered by the SJMSHCP. Project applicants have four options to receive coverage, with approval by the San Joaquin Council of Governments:

1. Pay the appropriate fee. A fee is assessed depending on which of the four habitats the project lies within.
2. Dedicate habitat lands as conservation easement or fee title.
3. Purchase mitigation bank credits from a mitigation bank approved by SJMSCP.
4. Propose an alternative mitigation plan, consistent with the goals of the SJMSCP and equivalent in biological value.

Attachment 3

Site Photographs



Photograph 1. View of project area from the northern boundary of the project area, facing south. March 4, 2026.



Photograph 2. California ground squirrel burrow in middle of project area. March 4, 2026.



Photograph 3. Representative view of dense vegetation scattered throughout project area. March 4, 2026.



Photograph 4. View of project area from southern project boundary, facing north. March 4, 2026.

Attachment 4

Special-Status Plant Species with Potential to Occur

Special-Status Plant Species in the Nine-Quad/Two-Mile Search Radius of the Project Area

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
Astragalus tener var. *tener* alkali milk-vetch	None/None G2T1/S1 1B.2	Annual herb. Playas, valley and foothill grassland, vernal pools. Alkaline soils. Elevations: 5-195 feet. Blooms Mar-Jun.	Not Expected	Suitable vernal pool habitat is not present within the project area.
Atriplex cordulata var. *cordulata* heartscale	None/None GNRT2/S2 1B.2	Annual herb. Chenopod scrub, meadows and seeps, valley and foothill grassland. Alkaline soils (sometimes). Elevations: 0-1,835 feet. Blooms Apr-Oct.	Not Expected	Suitable scrub and grassland habitat is not present within the project area.
Blepharizonia plumosa big tarplant	None/None G1G2/S1S2 1B.1	Annual herb. Valley and foothill grassland. Clay soils (usually). Elevations: 100-1,655 feet. Blooms Jul-Oct.	Not Expected	Suitable grassland habitat is not present within the project area.
Brasenia schreberi watershield	None/None G5/S3 2B.3	Perennial rhizomatous herb (aquatic). Marshes and swamps. Aquatic known from water bodies both natural and artificial in California. Elevations: 0-7,220 feet. Blooms Jun-Sep.	Not Expected	Suitable aquatic habitat is not present within the project area.
Chloropyron palmatum palmate-bracted bird's-beak	FE/SE G1/S1 1B.1	Annual herb (hemiparasitic). Chenopod scrub, valley and foothill grassland. Alkaline. Elevations: 15-510 feet. Blooms May-Oct.	Not Expected	Suitable scrub and grassland habitat is not present within the project area.
Cirsium crassicaule slough thistle	None/None G1/S1 1B.1	Annual to perennial herb. Chenopod scrub, marshes and swamps, riparian scrub. Sloughs, riverbanks, and marshy areas. Elevations: 10-330 feet. Blooms May-Aug.	Not Expected	Suitable scrub and marsh habitat is not present within the project area.
Delphinium recurvatum recurved larkspur	None/None G2?/S2 1B.2	Perennial herb. Chenopod scrub, cismontane woodland, valley and foothill grassland. Alkaline soils. Elevations: 10-2,590 feet. Blooms Mar-Jun.	Not Expected	Suitable woodland and grassland habitat is not present within the project area.
Eryngium racemosum Delta button-celery	None/SE G1/S1 1B.1	Annual/perennial herb. Riparian scrub. Seasonally inundated floodplain on clay. Elevations: 10-100 feet. Blooms May-Oct.	Not Expected	Suitable riparian scrub habitat is not present within the project area.

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
Extriplex joaquinana San Joaquin spearscale	None/None G2/S2 1B.2	Annual herb. Chenopod scrub, meadows and seeps, playas, valley and foothill grassland. In seasonal alkali wetlands or alkali sink scrub with *Distichlis spicata*, *Frankenia*, etc. Elevations: 5-2,740 feet. Blooms Apr-Oct.	Not Expected	Suitable alkaline soils are not present within the project area.
Hibiscus lasiocarpos var. *occidentalis* woolly rose-mallow	None/None G5T3/S3 1B.2	Perennial rhizomatous herb (emergent). Marshes and swamps. Moist, freshwater-soaked river banks and low peat islands in sloughs; can also occur on riprap and levees. In California, known from the delta watershed. Elevations: 0-395 feet. Blooms Jun-Sep.	Not Expected	Suitable marsh habitat is not present within the project area.
Lathyrus jepsonii var. *jepsonii* Delta tule pea	None/None G5T2/S2 1B.2	Perennial herb. Marshes and swamps. In freshwater and brackish marshes. Often found with *Typha*, *Aster lentus*, *Rosa californica*, *Juncus* spp., *Scirpus*, etc. Usually on marsh and slough edges. Elevations: 0-15 feet. Blooms May -Sep.	Not Expected	Suitable marsh habitat is not present within the project area.
Lilaeopsis masonii Mason's lilaeopsis	None/SR G2/S2 1B.1	Perennial rhizomatous herb. Marshes and swamps, riparian scrub. Tidal zones, in muddy or silty soil formed through river deposition or river bank erosion. In brackish or freshwater. Elevations: 0-35 feet. Blooms Apr-Nov.	Not Expected	Suitable marsh and scrub habitat is not present within the project area.
Sagittaria sanfordii Sanford's arrowhead	None/None G3/S3 1B.2	Perennial rhizomatous herb (emergent). Marshes and swamps. In standing or slow-moving freshwater ponds, marshes, and ditches. Elevations: 0-2,135 feet. Blooms May-Oct (Nov).	Not Expected	Suitable aquatic habitat is not present within the project area.
Symphyotrichum lentum Suisun Marsh aster	None/None G2/S2 1B.2	Perennial rhizomatous herb. Marshes and swamps. Most often seen along sloughs with *Phragmites*, *Scirpus*, blackberry, *Typha*, etc. Elevations: 0-10 feet. Blooms Apr-Nov.	Not Expected	Suitable marsh habitat is not present within the project area. The project area is above the known elevation range for this species.

Scientific Name Common Name	Status Fed/State ESA CRPR	Habitat Requirements	Potential to Occur	Rationale
Trichocoronis wrightii var. *wrightii* Wright's trichocoronis	None/None G4T3/S1 2B.1	Annual herb. Marshes and swamps, meadows and seeps, riparian forest, vernal pools. Mud flats of vernal lakes, drying river beds, alkali meadows. Elevations: 15-1,425 feet. Blooms May-Sep.	Not Expected	Suitable mesic habitat is not present within the project area.
Trifolium hydrophilum saline clover	None/None G2/S2 1B.2	Annual herb. Marshes and swamps, valley and foothill grassland, vernal pools. Mesic, alkaline sites. Elevations: 0-985 feet. Blooms Apr-Jun.	Not Expected	Suitable mesic habitat is not present within the project area.
Tropidocarpum capparideum caper-fruited tropidocarpum	None/None G1/S1 1B.1	Annual herb. Valley and foothill grassland. Alkaline clay. Elevations: 5-1,495 feet. Blooms Mar-Apr.	Not Expected	Suitable alkaline grassland habitat is not present within the project area.
Tuctoria greenei Greene's tuctoria	FE/SR G1/S1 1B.1	Annual herb. Vernal pools. Vernal pools in open grasslands. Elevations: 100-3,510 feet. Blooms May-Sep.	Not Expected	Suitable vernal pool habitat is not present within the project area.

Status (Federal/State)
FE = Federal Endangered
FT = Federal Threatened
FPE = Federal Proposed Endangered
FPT = Federal Proposed Threatened
FC = Federal Candidate
SE = State Endangered
ST = State Threatened
SCE = State Candidate Endangered
SCT = State Candidate Threatened
SR = State Rare
SSC = CDFW Species of Special Concern
FP = CDFW Fully Protected
WL = CDFW Watch List

CRPR (CNPS California Rare Plant Rank)
1A = Presumed extirpated in California, and rare or extinct elsewhere
1B = Rare, Threatened, or Endangered in California and elsewhere
2A = Presumed extirpated in California, but common elsewhere
2B= Rare, Threatened, or Endangered in California, but more common elsewhere

CRPR Threat Code Extension
.1 = Seriously endangered in California (>80% of occurrences threatened/high degree and immediacy of threat)
.2 = Moderately threatened in California (20-80% of occurrences threatened/moderate degree and immediacy of threat)
.3 = Not very endangered in California (<20% of occurrences threatened/low degree and immediacy of threat)

Other Statuses
G1 or S1 Critically Imperiled Globally or Subnationally (state)
G2 or S2 Imperiled Globally or Subnationally (state)
G3 or S3 Vulnerable to extirpation or extinction Globally or Subnationally (state)
G4/5 or S4/5 Apparently secure, common and abundant
GH or SH Possibly Extirpated – missing; known from only historical occurrences but still some hope of rediscovery

Additional notations may be provided as follows
T – Intraspecific Taxon (subspecies, varieties, and other designations below the level of species)
Q – Questionable taxonomy that may reduce conservation priority
? – Inexact numeric rank

Attachment 5

Special-Status Wildlife Species with Potential to Occur

Special-Status Wildlife Species in the Nine-Quad/Two-Mile Search Radius of the Project Area

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
Invertebrates				
Crotch's bumble bee *Bombus crotchii*	None/SCE G2/S2	Crotch's bumble bee habitat requirements include availability of suitable colony nesting sites, floral resources to obtain nectar and pollen throughout the duration of the colony period (spring, summer and fall), and suitable overwintering sites for queens. Most bumble bees are primitively eusocial insects that live in colonies composed of a queen, workers, and, near the end of the season, reproductive members of the colony (new queens, or gynes, and males). Nest sites typically include underground cavities, wood or rock piles, brush piles, and other cavities on open west-southwest slopes bordered by trees. Little is known about hibernacula or overwintering sites.	Moderate	Suitable floral resources and potential nesting/overwintering sites are present within the project area. While there are no documented CNDDB occurrences within the 9-quad search, the project area is within the current range for this species. The nearest documented occurrence in Bumble Bee Watch is approximately 22 miles southwest of the project area (Xerces Society 2026).
Bombus occidentalis western bumble bee	None/SCE G3/S1	Western bumble bee habitat requirements include availability of suitable colony nesting sites, floral resources to obtain nectar and pollen throughout the duration of the colony period (spring, summer and fall), and suitable overwintering sites for queens. Most bumble bees are primitively eusocial insects that live in colonies composed of a queen, workers, and, near the end of the season, reproductive members of the colony (new queens, or gynes, and males). Nest sites typically include underground cavities, wood or rock piles, brush piles, and other cavities on open west-southwest slopes bordered by trees. Little is known about hibernacula or overwintering sites.	Not Expected	The project area is outside of the currently known range for this species.
Branchinecta conservatio conservancy fairy shrimp	FE/None G2/S2	Endemic to the grasslands of the northern two-thirds of the Central Valley. Inhabits astatic pools located in swales formed by old, braided alluvium filled by winter/spring rains with standing water lasting until June.	Not Expected	Suitable vernal pool habitat is not present within the project area.

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
Branchinecta lynchi vernal pool fairy shrimp	FT/None G3/S3	Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mountains, in astatic rain-filled pools. Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	Not Expected	Suitable vernal pool habitat is not present within the project area.
Danaus plexippus plexippus monarch - California overwintering population	FPT/None G4T1T2Q/S2	Monarch adults make massive, multi-generation migrations from spring to fall, flying thousands of miles to breed and hibernate along the California coast and in central Mexico. Monarchs stop to feed on flower nectar and to roost together at night. During warm winter days, the butterflies may take moisture and flower nectar. Most mating happens before they journey north in the spring, when females lay single eggs along the way under host plant leaves (*Asclepias* sp.); caterpillars eat flowers and leaves. Overwintering sites along the California coast are important for conservation of this species and roosts are located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.	Not Expected	Suitable milkweed host plants were not observed during the field survey when they would have been evident and identifiable. Additionally, monarchs are only known to overwinter along the coast.
Desmocerus californicus dimorphus valley elderberry longhorn beetle	FT/None G3T3/S3	Occurs only in the Central Valley of California, in association with blue elderberry (*Sambucus mexicana*). Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference shown for "stressed" elderberries.	Not Expected	Suitable elderberry host plants were not observed during the field survey.
Lepidurus packardi vernal pool tadpole shrimp	FE/None G3/S3	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools commonly found in grass-bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	Not Expected	Suitable vernal pool habitat is not present within the project area.

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
Fish				
Acipenser medirostris pop. 1 green sturgeon - southern DPS	FT/None G2T1/S1 SSC	Exhibits spawning site fidelity. Spawns in the Sacramento, Feather and Yuba Rivers. Presence in upper Stanislaus and San Joaquin Rivers may indicate spawning. Non-spawning adults occupy marine/estuarine waters. Delta Estuary is important for rearing juveniles. Spawning occurs primarily in cool (52-59° F) sections of mainstem rivers in deep pools (26-30 feet) with substrate containing small to medium sized sand, gravel, cobble, or boulder.	Not Expected	Suitable aquatic habitat is not present within the project area.
Hypomesus transpacificus Delta smelt	FT/SE G1/S1	Found in Sacramento-San Joaquin Delta, and seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay. Seldom found at salinities > 10 parts per thousand (ppt). Most often at salinities < 2ppt.	Not Expected	Suitable aquatic habitat is not present within the project area.
Oncorhynchus mykiss irideus pop. 11 steelhead - Central Valley DPS	FT/None G5T2Q/S2 SSC	Central Valley steelhead spawn downstream of dams on every major tributary within the Sacramento and San Joaquin River systems. Regardless of life history strategy, for the first year or two of life, rainbow trout and steelhead are found in cool, clear, fast-flowing permanent streams and rivers where riffles predominate over pools, there is ample cover from riparian vegetation or undercut banks, and invertebrate life is diverse and abundant.	Not Expected	Suitable aquatic habitat is not present within the project area.

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
Spirinchus thaleichthys pop. 2 longfin smelt - San Francisco Bay-Delta DPS	FE/ST G5TNRQ/S1	Pelagic and anadromous within the Sacramento-San Joaquin River Delta, San Francisco Bay, and Gulf of the Farallones. Spawns in lower freshwater reaches of Sacramento and San Joaquin Rivers. First year in Suisun Bay; later SF Bay or Gulf of the Farallones. Occurs in salinities ranging from pure freshwater to pure saltwater; typically salinities ranging from 14-28 parts per thousand (ppt). Generally occupies water temperatures from 61-68°F, with spawning occurring in water temperatures from 41-58°F.	Not Expected	Suitable aquatic habitat is not present within the project area.
Amphibians				
Ambystoma californiense pop. 1 California tiger salamander - central California DPS	FT/ST G3T3/S3 WL	Lives in vacant or mammal-occupied burrows throughout most of the year; in grassland, savanna, or open woodland habitats. Need underground refuges, especially ground squirrel burrows, and vernal pools or other seasonal water sources for breeding.	Not Expected	Suitable aquatic breeding habitat is not present within or adjacent to the project area and upland habitat is highly disturbed in and in the vicinity of the project area.
Spea hammondii western spadefoot	FPT/None G2G3/S3S4 SSC	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	Not Expected	Suitable aquatic breeding habitat is not present within or adjacent to the project area and upland habitat is highly disturbed in and in the vicinity of the project area.
Reptiles				
Actinemys marmorata northwestern pond turtle	FPT/None G2/SNR SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, and basking sites below 6,000 feet elevation. Typically nests on sandy banks or grassy open fields within 330 feet of water; but has been observed nesting up to 1,640 feet from water.	Not Expected	Suitable aquatic and upland habitat is not present within the project area.
Anniella pulchra Northern California legless lizard	None/None G3/S2S3 SSC	Sandy or loose loamy soils under sparse vegetation. Soil moisture is essential. They prefer soils with a high moisture content.	Not Expected	Suitable soils are not present within the project area.

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
Thamnophis gigas giant gartersnake	FT/ST G2/S2	Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals and irrigation ditches. This is the most aquatic of the gartersnakes in California.	Not Expected	Suitable aquatic habitat is not present within or adjacent to the project area.
Birds				
Agelaius tricolor tricolored blackbird	None/ST G3/S2 SSC	Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few miles of the colony.	Low	Suitable open water habitat with dense vegetation for nesting is not present within the project area; however, this species may forage in the project area.
Athene cunicularia burrowing owl	None/SCE G4/S2 SSC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Moderate	Suitable burrows and foraging habitat are present within the project area. There are four documented occurrences of this species within five miles of the project area (CNDDB 2026).
Buteo swainsoni Swainson's hawk	None/ST G5/S4	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	Moderate	Suitable foraging habitat is present within the project area and in agricultural fields in the vicinity of the project area. Suitable nesting trees are present in the adjacent residential parcels and the surrounding vicinity of the project area. There are 15 documented occurrences of this species within five miles of the project area (CNDDB 2026).

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
Elanus leucurus white-tailed kite	None/None G5/S3S4 FP	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	Moderate	Suitable foraging habitat is present within and adjacent to the project area. Suitable nesting trees are present in the adjacent residential parcels and the surrounding vicinity of the project area. The nearest documented occurrence of this species is approximately 5.75 miles southwest of the project area from 2002 (CNDDB 2026).
Lanius ludovicianus loggerhead shrike	None/None G4/S4 SSC	Broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub and washes. Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	Moderate	Suitable foraging habitat is present within and adjacent to the project area. Suitable nesting trees are present in the adjacent residential parcels and the surrounding vicinity of the project area. The nearest documented occurrence of this species is approximately 13.60 miles southwest of the project area from 2016 (CNDDB 2026).
Melospiza melodia pop. 1 song sparrow ("Modesto" population)	None/None G5T3?Q/S3? SSC	Central lower basin of Great Valley, from Colusa County south to Stanislaus County and east of Suisun Marshes. Breeds chiefly below 200 feet elevation. Freshwater marshes, riparian thickets, sparsely vegetated irrigation canals, and Valley oak restoration sites. Cover consists of willow and nettle thickets, growth of tules and cattails, and riparian oak forests with sufficient understory of blackberry.	Not Expected	Suitable riparian thickets are not present within the project area.
Vireo bellii pusillus least Bell's vireo	FE/SE G5T2/S3	Summer resident of Southern California in low riparian in vicinity of water or in dry river bottoms; below 2,000 feet. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, *Baccharis*, mesquite.	Not Expected	Suitable riparian habitat is not present within the project area.

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
Xanthocephalus xanthocephalus yellow-headed blackbird	None/None G5/S3 SSC	Nests in freshwater emergent wetlands with dense vegetation and deep water. Often along borders of lakes or ponds. Nests only where large insects such as Odonata are abundant, nesting timed with maximum emergence of aquatic insects.	Not Expected	Suitable wetland habitat with dense vegetation is not present within the project area.
Mammals				
Antrozous pallidus pallid bat	None/None G4/S3 SSC	Found in a variety of habitats including deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts in crevices of rock outcrops, caves, mine tunnels, buildings, bridges, and hollows of live and dead trees which must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Low	Suitable foraging habitat is present within the project area. However, suitable roosting habitat is limited within and adjacent to the project area. The nearest documented occurrence of this species is approximately 9.60 miles southwest of the project area from 1951 (CNDDB 2026).
Sylvilagus bachmani riparius riparian brush rabbit	FE/SE GNRT2/S2	Riparian areas on the San Joaquin River in northern Stanislaus County. Dense thickets of wild rose, willows, and blackberries.	Not Expected	Suitable riparian habitat is not present within the project area.

Status (Federal/State)

FE = Federal Endangered
FT = Federal Threatened
FPE = Federal Proposed Endangered
FPT = Federal Proposed Threatened
FD = Federal Delisted
FC = Federal Candidate
SE = State Endangered
ST = State Threatened
SCE = State Candidate Endangered
SCT = State Candidate Threatened
SR = State Rare
SD = State Delisted
SSC = CDFW Species of Special Concern

Other Statuses

G1 or S1 Critically Imperiled Globally or Subnationally (state)
G2 or S2 Imperiled Globally or Subnationally (state)
G3 or S3 Vulnerable to extirpation or extinction Globally or Subnationally (state)
G4/5 or S4/5 Apparently secure, common and abundant
GH or SH Possibly Extirpated – missing; known from only historical occurrences but still some hope of rediscovery

Additional notations may be provided as follows

T – Intraspecific Taxon (subspecies, varieties, and other designations below the level of species)
Q – Questionable taxonomy that may reduce conservation priority
? – Inexact numeric rank

Scientific Name Common Name	Status Fed/State ESA CDFW	Habitat Requirements	Potential to Occur	Rationale
FP = CDFW Fully Protected				
WL = CDFW Watch List				

Appendix C

Cultural Resources Assessment



Copperopolis Road Solar Development Project

Cultural Resources Technical Report

prepared for

RPCA Solar 19, LLC
44 Montgomery Street
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May 2025

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Executive Summary

Renewable Properties retained Rincon Consultants, Inc. (Rincon) to conduct a cultural resources study for the Copperopolis Road Solar Development Project in San Joaquin County, California (Project). Located in the unincorporated area of San Joaquin County, the Project will construct a ground-mounted solar photovoltaic ("PV") energy facility. The Project may utilize United States Department of Agriculture (USDA) funding and therefore would be subject to Section 106 of the National Historic Preservation Act (Section 106) with the United Stated Department of Agriculture (USDA) acting as the federal lead agency. The Project is also subject to the California Environmental Quality Act (CEQA) with San Joaquin County (County) acting as the lead agency under CEQA. This cultural resources study was prepared to support compliance with Section 106 and CEQA and includes the methods and results of a cultural resources records search, field survey, Native American Heritage Commission Sacred Lands File Search, interested parties outreach, geoarchaeological review and sensitivity assessment, and National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR) evaluation of two properties.

Two single-family agricultural properties located at 11620 East Copperopolis Road and 289 South Best Road were evaluated and recommended ineligible for listing in the NRHP and the CRHR due to a lack of historic significance and architectural merit. The properties are not considered historic properties as defined by 36 CFR 800.16(l)(1) or historical resources as defined by CEQA Section 15064.5(a).

This study did not identify any archaeological resources or archaeological deposits within the APE. The records search and field survey were negative for archaeological resources. Although the SLF search yielded positive results, there is no indication that a sacred site or resource of Native American origin exists within the APE. Additionally, the geologic units and soil mapping within the APE are not conducive to the natural burial and preservation of archaeological resources; thus, there is a low potential for encountering intact subsurface archaeological deposits within the APE. As a result, Rincon recommends a mitigation measure to address unanticipated discoveries during construction.

Based on the information summarized above, Rincon recommends a finding of ***no historic properties affected*** for the undertaking under Section 106 of the NHPA. In the event of a post review discovery during ground disturbance associated with the undertaking, the procedures under 36 CFR Part 800.13 should be followed by the lead federal agency.

Under CEQA, Rincon recommends a finding of ***no impact to historical resources*** and ***less than significant impact with mitigation for archaeological resources***. As standard best management practices under CEQA, Rincon has recommended measures in the unlikely event of an unanticipated discovery during construction. Lastly, with adherence to existing regulations such as Health and Safety Code Section 7050.5 and PRC Section 5097.98, Rincon recommends a finding of ***less-than-significant impact to human remains***.

1 Introduction

RPCA Solar 19, LLC retained Rincon Consultants, Inc. (Rincon) to conduct a cultural resources study for the Copperopolis Road Solar Project in San Joaquin County, California (Project). The purpose of this technical report is to document the methods and results of a cultural resources records search, Native American Heritage Commission Sacred Lands File (SLF) search, field survey, interested parties outreach, geoarchaeological review and sensitivity assessment, and National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR) evaluation of two properties. The Project may utilize United States Department of Agriculture (USDA) funding and therefore would be subject to Section 106 of the National Historic Preservation Act (Section 106) with the United Stated Department of Agriculture (USDA) acting as the federal lead agency. The Project is also subject to the California Environmental Quality Act (CEQA) with San Joaquin County (County) acting as the lead agency under CEQA.

1.1 Project Description

The following project description was provided by RPCA Solar 19, LLC on April 17, 2025. The Copperopolis Road Solar Project ("Project") is a ground-mounted solar photovoltaic ("PV") energy facility. The Project will be located on approximately 12.2 acres, just south of Copperopolis Road and east of Best Road, of an overall 14.2-gross-acre tract of land. The Project is located on an undeveloped portion of the overall parcel and does not propose alterations or impacts to existing residential structures at the southeast corner of the parcel.

Once constructed, the Project will generate up to 2 megawatts ("MW") of clean, reliable solar energy by utilizing PV solar modules, inverters, and appurtenant electrical equipment to convert the sun's energy to usable power distributed to the electrical grid. The modules will be mounted on a steel racking system employing single-axis tracker technology that efficiently tracks the sun's movement throughout the day and maximizes the efficiency of solar collection. The rows of modules will be anchored in the ground using driven piers, and the overall height of the array is not expected to exceed 15 feet above the existing ground surface at maximum tilt. The depth of ground disturbance associated with the Project is 12 feet below ground surface for the module piers. The Project will interconnect to the existing Pacific, Gas, and Electric electrical distribution system adjacent to the site along Copperopolis Road.

The Project encompasses portions of Section 1 of Township 1 North, Range 7 East on the *Stockton East*, *California* United States Geological Survey (USGS) 7.5-minute topographic quadrangle (Figure 1).

1.2 Area of Potential Effects

The Area of Potential Effects (APE) is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties. Determination of the APE is influenced by the project's setting, the scale and nature of the undertaking, and the different kinds of effects that may result from the undertaking (36 CFR 800.16[d]).

The APE was developed by Rincon to identify resources in the area that have potential for historic significance, that should be evaluated for eligibility for the NRHP, and that may be directly or indirectly affected by the undertaking, pursuant to 36 CFR 800.16(d).

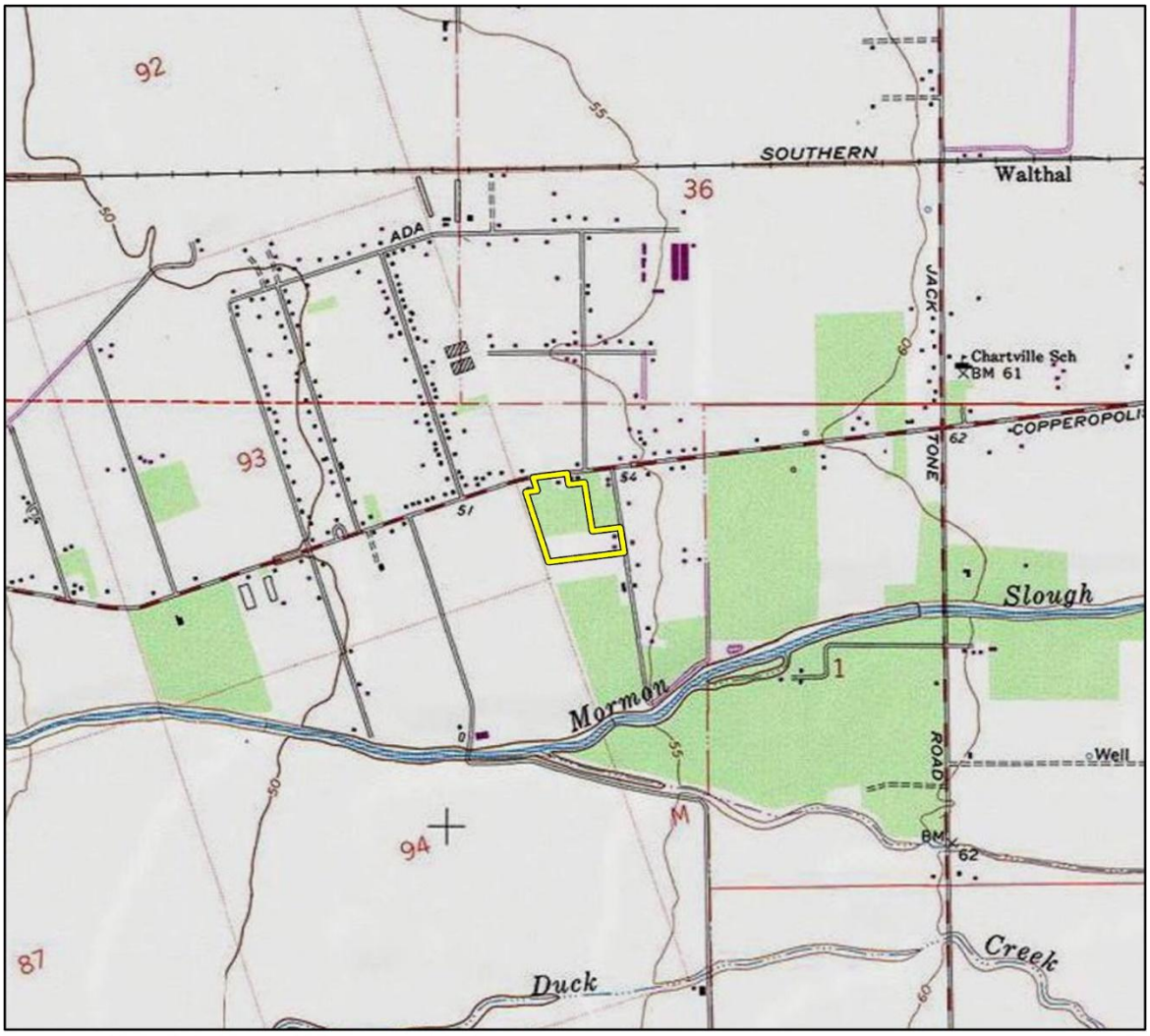
The APE is coterminous with the maximum extent of ground disturbance for the Project (Figure 2). This includes two properties: 11620 East Copperopolis Road (San Joaquin County Accessor's Parcel Numbers [APNs] 103-220-240-000 and 103-220-250-000) on the south side of East Copperopolis Road and 289 South Best Road (APN 103-220-220-000) on the west side of Best Road. The Project would construct a ground-mounted solar PV energy facility with arrays not to exceed 15 feet above the existing ground surface. An indirect APE was not established because the Project will install panels that will not be taller than the surrounding buildings and structures. There are no previously recorded historical resources adjacent to or within the surrounding area.

The APE must be considered as a three-dimensional space that includes any ground disturbance associated with construction. The belowground vertical APE, which encompasses the depth of ground disturbance anticipated for the module piers, is 12 feet below ground surface. The aboveground vertical APE is assumed to be a maximum of 15 feet aboveground surface to account for the height of the PV panels.

1.3 Personnel

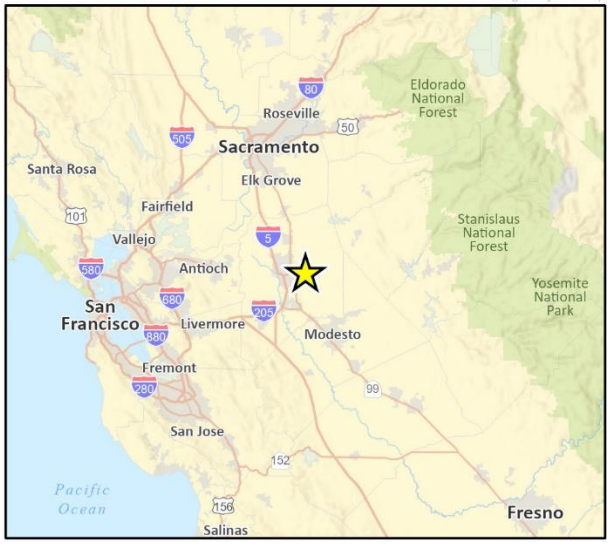
Rincon Senior Supervising Archaeologist Hannah Haas, Registered Professional Archaeologist (RPA), provided management oversight for this cultural resources study, conducted the archaeological field survey, and serves as the principal investigator for archaeological resources. Rincon Archaeologist, Laura Maldonado, MA, RPA, performed the cultural resources records search and is a contributing author to this report. Architectural Historian Ashley Losco, MHP, is a contributing author of this report. Cultural Resources Principal, Margo Nayyar reviewed this report for quality control and conducted the built environment field survey. Ms. Haas, Ms. Maldonado, Ms. Losco, and Ms. Nayyar meet the Secretary of the Interior's Professional Qualifications Standards in their respective fields for prehistoric and historic archaeology, history and architectural history (National Park Service [NPS] 1983). Geographic Information Systems Analyst Abby Robles prepared the figures found in this report. Resumes for qualified staff can be found in Appendix A.

Figure 1 Regional Location



Basemap provided by National Geographic Society, Esri and their licensors © 2025. Stockton East Quadrangle. T01N R07E S01. The topographic representation depicted in this map may not portray all of the features currently found in the vicinity today and/or features depicted in this map may have changed since the original topographic map was assembled.

25-17409 CR
CRFig 1 Proj Locn Map

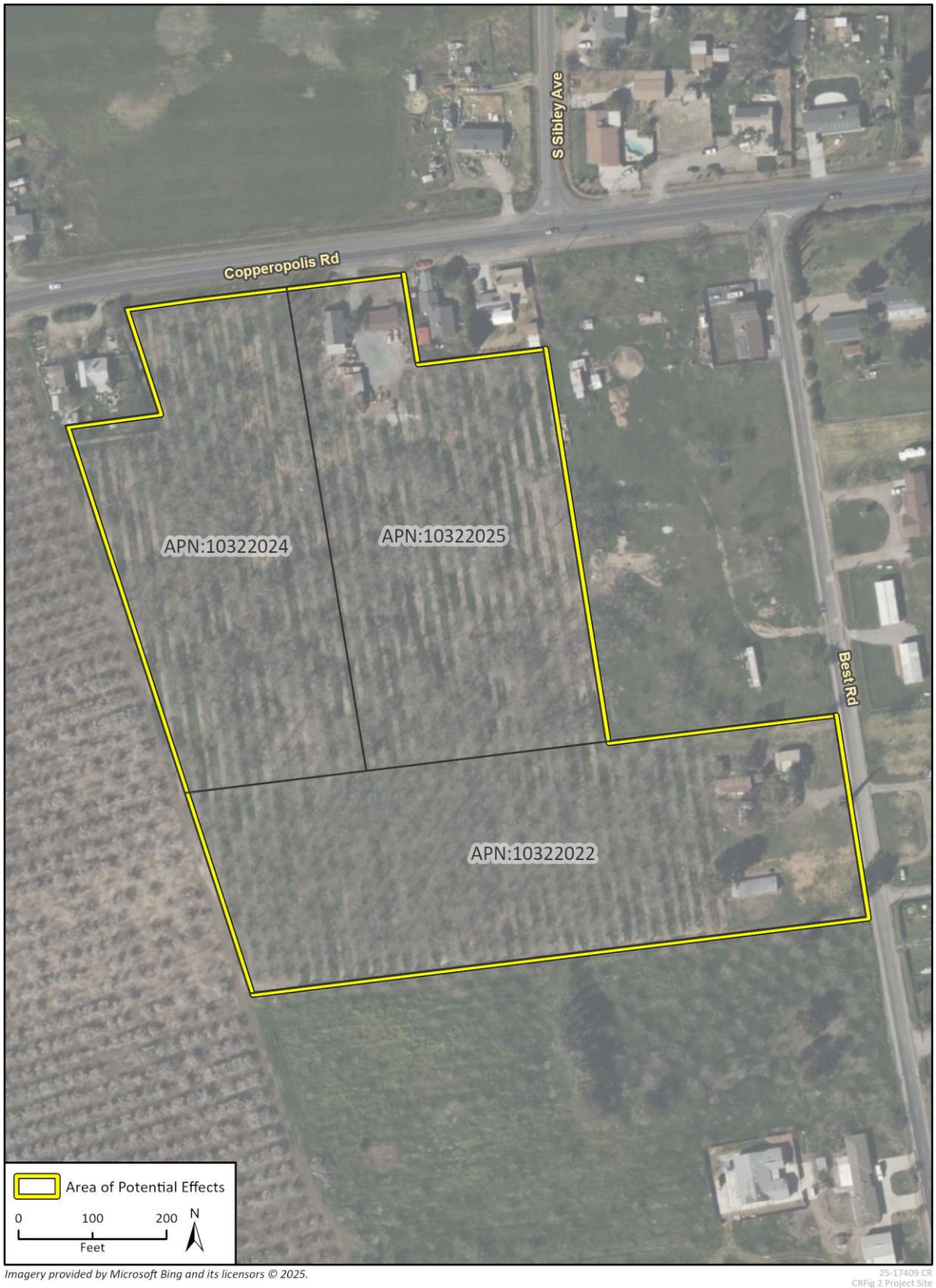


Area of Potential Effects

0 1,000 2,000 Feet

N

Figure 2 Area of Potential Effects



2 Regulatory Setting

This section includes a discussion of the applicable federal, state, and local laws, ordinances, regulations, and standards governing cultural resources, which must be adhered to before and during implementation of the project.

2.1 Federal

This project may involve the use of funds provided by the USDA. Projects that involve federal funding or permitting (i.e., have a federal nexus) must comply with the provisions of the National Historic Preservation Act of 1966 (NHPA), as amended (16 United States Code [USC] 470f). The NHPA of 1966 established a federal program for the preservation of historic properties, including built environment, archaeological, and traditional cultural resources. Towards this end, the NHPA establishes both institutions and defined processes to direct federal agencies and support state and local governments in their historic preservation programs and activities. These institutions and processes include the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers (SHPO), the NRHP, and the Section 106 review process.

2.1.1 Section 106 of the NHPA

Section 106 (16 USC 470f) requires federal agencies to account for the effects of their undertakings on historic properties, and to afford the ACHP a reasonable opportunity to comment on such undertakings. Historic properties are defined as buildings, structures, districts, sites, or objects which are included in or eligible for inclusion in the NRHP. Section 106 is implemented through 36 CFR Part 800, which outlines the process for historic preservation review, including participants, identification efforts, and the assessment and resolution of adverse effects. Per 36 CFR 800.16(y), a federal undertaking is defined as any project requiring or receiving a federal permit, license, approval, or funding. Federal agencies must take steps to determine if the undertaking would result in an adverse effect to historic properties and take measures to avoid or resolve those effects as feasible.

2.1.2 National Register of Historic Places

Authorized by Section 101 of the NHPA, the NRHP is the nation's official list of cultural resources worthy of preservation. The NRHP recognizes the quality of significance in American, state, and local history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects. Per 36 CFR Part 60.4, a property is eligible for listing in the NRHP if it meets one or more of the following criteria:

Criterion A: Is associated with events that have made a significant contribution to the broad patterns of our history

Criterion B: Is associated with the lives of persons significant in our past

Criterion C: Embodies the distinctive characteristics of a type, period, or method of installation, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction

Criterion D: Has yielded, or may be likely to yield, information important in prehistory or history

In addition to meeting at least one of the above designation criteria, resources must also retain integrity. The NPS recognizes seven aspects or qualities that, considered together, define historic integrity. To retain integrity, a property must possess several of these seven qualities—if not all—defined in the following manner:

Location: The place where the historic property was constructed or the place where the historic event occurred

Design: The combination of elements that create the form, plan, space, structure, and style of a property

Setting: The physical environment of a historic property

Materials: The physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property

Workmanship: The physical evidence of the crafts of a particular culture or people during any given period in history or prehistory

Feeling: A property's expression of the aesthetic or historic sense of a particular period of time

Association: The direct link between an important historic event or person and a historic property

Certain properties are generally considered ineligible for listing in the NRHP, including cemeteries, birthplaces, graves of historical figures, properties owned by religious institutions, relocated structures, or commemorative properties. Additionally, a property must be at least 50 years of age to be eligible for listing in the NRHP. The NPS states that 50 years is the general estimate of the time needed to develop the necessary historical perspective to evaluated significance (NPS 1997: 41). Properties which are less than 50 years must be determined to have "exceptional importance" to be considered eligible for NRHP listing.

2.2 State

2.2.1 California Environmental Quality Act

California Public Resources Code (PRC) Section 21084.1 requires lead agencies to determine if a project could have a significant impact on historical or unique archaeological resources. As defined in PRC Section 21084.1, a historical resource is a resource listed in, or determined eligible for listing in, the CRHR, a resource included in a local register of historical resources or identified in a historical resources survey pursuant to PRC Section 5024.1(g), or any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant. PRC Section 21084.1 also states resources meeting the above criteria are presumed to be historically or culturally significant unless the preponderance of evidence demonstrates otherwise. Resources listed in the NRHP are automatically listed in the CRHR, as are California Historical Landmarks 770 and above; both are therefore historical resources under CEQA. Historical resources may include eligible built environment resources and archaeological resources of the precontact or historic periods.

CEQA Guidelines Section 15064.5(c) provides further guidance on the consideration of archaeological resources. If an archaeological resource does not qualify as a historical resource, it may meet the definition of a "unique archaeological resource" as identified in PRC Section 21083.2. PRC Section 21083.2(g) defines a unique archaeological resource as an artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria: 1) it contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information, 2) has a special and particular quality such as being the oldest of its type or the best available example of its type, or 3) is directly associated with a scientifically recognized important prehistoric or historic event or person.

If an archaeological resource does not qualify as a historical or unique archaeological resource, the impacts of a project on those resources will be less than significant and need not be considered further (*CEQA Guidelines* Section 15064.5[c][4]). *CEQA Guidelines* Section 15064.5 also provides guidance for addressing the potential presence of human remains, including those discovered during the implementation of a project.

According to CEQA, an impact that results in a substantial adverse change in the significance of a historical resource is considered a significant impact on the environment. A substantial adverse change could result from physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource would be materially impaired (*CEQA Guidelines* Section 15064.5 [b][1]). Material impairment is defined as demolition or alteration in an adverse manner [of] those characteristics of a historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in, the CRHR or a local register (*CEQA Guidelines* Section 15064.5[b][2][A]).

If it can be demonstrated that a project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that resources cannot be left undisturbed, mitigation measures are required (PRC Section 21083.2[a][b]).

The requirements for mitigation measures under CEQA are outlined in CEQA Guidelines Section 15126.4(a)(1). In addition to being fully enforceable, mitigation measures must be completed within a defined time period and be roughly proportional to the impact of the project. Generally, a project which is found to comply with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings (the Standards) is considered to be mitigated below a level of significance (*CEQA Guidelines* Section 15126.4 [b][1]). For historical resources of an archaeological nature, lead agencies should also seek to avoid damaging effects where feasible. Preservation in place is the preferred manner to mitigate impacts to archaeological sites; however, data recovery through excavation may be the only option in certain instances (*CEQA Guidelines* Section 15126.4[b][3]).

California Register of Historical Resources

The CRHR was established in 1992 and codified by PRC Sections 5024.1 and Title 14 Section 4852. The CRHR is an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change (PRC 5024.1(a)). The criteria for eligibility for the CRHR are consistent with the NRHP criteria but have been modified for state use in order to include a range of historical resources that better reflect the history of California (PRC, 5024.1(b)). Unlike the NRHP however, the CRHR does not have

a defined age threshold for eligibility; rather, a resource may be eligible for the CRHR if it can be demonstrated sufficient time has passed to understand its historical or architectural significance (California Office of Historic Preservation [OHP] 2011). Furthermore, resources may still be eligible for listing in the CRHR even if they do not retain sufficient integrity for NRHP eligibility (OHP 2011). Generally, the OHP recommends resources over 45 years of age be recorded and evaluated for historical resources eligibility (OHP 1995: 2).

A properties is eligible for listing in the CRHR if it meets one of more of the following criteria:

Criterion 1: Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage

Criterion 2: Is associated with the lives of persons important to our past

Criterion 3: Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values

Criterion 4: Has yielded, or may be likely to yield, information important in prehistory or history

California Assembly Bill 52 of 2014

As of July 1, 2015, Assembly Bill (AB) 52 was enacted and expands CEQA by defining a new resource category, "tribal cultural resources". AB 52 establishes, "a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment" (PRC Section 21084.2). It further states the CEQA lead agency shall establish measures to avoid impacts that would alter the significant characteristics of a tribal cultural resource, when feasible (PRC Section 21084.3).

PRC Section 21074 (a)(1)(A) and (B) define tribal cultural resources as "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe" and that meets at least one of the following criteria, as summarized in *CEQA Guidelines* Appendix G:

1) Listed or eligible for listing in the CRHR, or in a local register of historical resources as defined in PRC Section 5020.1(k)
2) 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 PRC Section 5024.1. In applying these criteria, the lead agency shall consider the significance of the resource to a California Native American tribe.

AB 52 also establishes a formal consultation process with California Native American tribes that must be completed before a CEQA document can be certified. Under AB 52, lead agencies are required to "begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the project." California Native American tribes to be included in the process are those that have requested notice of projects within the jurisdiction of the lead agency.

2.2.2 California Health and Safety Code

Section 7050.5 of the California Health and Safety Code states that in the event of discovery or recognition of any human remains 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 remains until the County Coroner has determined if the remains are subject to the Coroner's authority. If the human remains are of Native American origin, the Coroner must notify the NAHC within 24 hours of this identification.

2.2.3 California Public Resources Code Section 5097.98

Section 5097.98 of the California PRC states that the NAHC, upon notification of the discovery of Native American human remains pursuant to Health and Safety Code Section 7050.5, shall immediately notify those persons (i.e., the Most Likely Descendant [MLD]) that it believes to be descended from the deceased. With permission of the landowner or a designated representative, the MLD may inspect the remains and any associated cultural materials and make recommendations for treatment or disposition of the remains and associated grave goods. The MLD shall provide recommendations or preferences for treatment of the remains and associated cultural materials within 48 hours of being granted access to the site.

2.3 Local

2.3.1 San Joaquin County General Plan

Although San Joaquin County does not have a historic preservation ordinance with criteria for local designation, the General Plan, which was adopted in 2016, includes goals and polices relating to cultural resources (Mintier Harnish Planning Consultants 2016). As presented in the Natural and Cultural Resources Element these include:

Goals

Goal NCR-6 – To protect San Joaquin County's valuable architectural, historical, archeological, and cultural resources.

Policies

NCR-6.1 **Protect Historical and Cultural Resources:** The County shall protect historical and cultural resources and promote expanded cultural opportunities for residents to enhance the region's quality of life and economy.

NCR-6.2 **No Destruction of Resources**: The County shall ensure that no significant architectural, historical, archeological, or cultural resources are knowingly destroyed through County action.

NCR-6.3 **Encourage Public and Private Preservation Efforts:** The County shall continue to encourage efforts, both public and private, to preserve the historical and cultural heritage of San Joaquin County and its communities and residents.

NCR-6.4 **Registration of Historic Properties**: The County shall encourage owners of eligible historic properties to apply for State and Federal registration, to participate in tax incentive programs for historical restoration, and to enter into Mills Act Contracts.

NCR-6.5 **Protect Archeological and Historical Resources:** The County shall protect significant archeological and historical resources by requiring an archeological report be prepared by a qualified cultural resource specialist prior to the issuance of any discretionary

permit or approval in areas determined to contain significant historic or prehistoric archeological artifacts that could be disturbed by project construction.

NCR-6.6 **Tribal Consultation:** The County shall consult with Native American tribes regarding proposed development projects and land use policy changes consistent with the State's Local and Tribal Intergovernmental Consultation requirements.

NCR-6.7 **Adaptive Reuse of Historic Structures**: The County shall encourage the adaptive reuse of architecturally significant or historic buildings if the original use of the structure is no longer feasible and the new use is allowed by the underlying land use designation and zoning district.

NCR-6.8 **Land Use and Development:** The County shall encourage land uses and development that retain and enhance significant historic properties and sustain historical community character.

NCR-6.9 **Educational Programs:** The County shall support educational and outreach programs that promote public awareness of and support preservation of historical and cultural resources.

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3 Natural and Cultural Setting

This section provides background information pertaining to the natural and cultural context of the APE. It places the APE in the broader natural environment that has sustained populations throughout history. This section also provides an overview of regional indigenous history, local ethnography, and post-contact history. This background information describes the distribution and type of cultural resources documented in the vicinity of the APE to inform the cultural resources sensitivity assessment.

3.1 Natural Setting

The APE lies in the Central Valley of Northern California at an approximate elevation of 23 meters (75 feet) above mean sea level. None of the surrounding area retains its natural setting, with the APE located in an agricultural field south of a residential area. The APE is bordered by Copperopolis Road to the north, Best Road to the east, and agricultural fields to the south and west. Mormon Slough is located approximately 540 meters south of the APE. Vegetation in the vicinity of the APE consists of ornamental trees, nonnative grasses, and agricultural crops.

3.2 Cultural Setting

3.2.1 Indigenous History

The APE is located in the Central Valley archaeological region, as defined by Moratto (1984). The Central Valley has been described as one of the largest intermontane basins extending 650 kilometers from the Siskiyou Mountains to the Tehachapis (Rosenthal et al. 2007). No single chronological framework covers the entirety of the Central Valley, but California prehistory is generally divided into three broad time periods: the Paleoindian period (ca. 11,550 to 8550 BCE), the Archaic Period (8550 BCE to CE 1100) and the Emergent Occupation (CE 1000- European Contact) (Fredrickson 1973, 1974) which has been updated and adjusted by Rosenthal et al. (2007) to further separate the Archaic Period into Lower (8550 BCE to 5550 BCE), Middle (5550 BCE to 550 BCE), and Upper (550 BCE to CE 1100). The prehistoric chronological sequence for the Central Valley presented below is based on Rosenthal et al. (2007) and Moratto (1984).

Paleoindian Period (11,550 to 8550 BCE)

Little is currently known about the Paleoindian period in the Central Valley. Geoarchaeological studies have demonstrated that erosion and deposition have buried or destroyed early archaeological deposits. This period is primarily represented by isolated finds, and currently, the earliest accepted date of human occupation in the Central Valley ranges from 11,550 to 9550 BCE and comes from fluted projectile points similar to Clovis points found at prehistoric sites near Tracy Lake (San Joaquin County) and the Tulare Lake Basin (Fresno, Kings, Kern, and Tulare counties). Along with fluted projectile points, concave base points have been identified along the Tulare Lake shoreline which was occupied during the Late Pleistocene (5.3 million years ago to 11,700 BCE) (Rosenthal et al. 2007).

Lower Archaic (8550 to 5550 BCE)

Climate change at the end of the Pleistocene caused significant periods of alluvial deposition beginning around 9050 BCE. These new alluvial deposits created a clear stratigraphic boundary between the Late Pleistocene and Holocene sediments. The Lower Archaic, like the Paleoindian Period, is represented mainly by limited isolated finds. However, one Lower Archaic site (CA-KER-116) has been identified in the Central Valley proper and few in the foothills surrounding the valley (Rosenthal et al. 2007).

Typical Lower Archaic artifacts include flaked stone crescents and stemmed points. The identification of projectile points and a diverse faunal assemblage at CA-KER-116 indicate hunting was an important subsistence activity. However, no milling tools or plant remains were identified at CA-KER-116; thus, plant use during the Lower Archaic remains unclear. The relationship between foothill and valley floor adaptations is largely unknown during the Lower Archaic; however, it is suggested that the foothill sites may have been seasonally used during this time. More distinct adaptations are apparent in the Middle Archaic, and it is possible that these divergent traditions first emerged in the Lower Archaic (Rosenthal et al. 2007).

Middle Archaic (5550 to 550 BCE)

The Middle Archaic began with substantial climate change to much warmer, drier conditions. Tulare Lake shrank and eventually disappeared. With this came new wetlands which created new habitats, and rising sea levels led to the creation of the Sacramento-San Joaquin Delta, creating new deposits. Fans and floodplains stabilized after an initial period of deposition in 5550 BCE. Archaeological deposits dating to the Middle Archaic are rare in the Central Valley proper due to these geomorphic changes. The Middle Archaic archaeological record has identified a pattern of organized subsistence strategies and increased residential stability. The archetypal pattern of the Middle Archaic has been identified as the Windmiller Pattern. This pattern is represented by extended burials oriented to the west and a sophisticated material culture (Rosenthal et al. 2007). Middle Archaic sites are relatively common in the foothills surrounding the Central Valley and show relatively little change from the Lower Archaic (Rosenthal et al. 2007).

During this time, the mortar and pestle became more widespread suggesting a shift toward more intensive subsistence practices and higher reliance on the acorn. Fishing technologies, such as bone gorges, hooks, and spears, also appear during the Middle Archaic suggesting a new focus on fishing, especially in the Marsh Creek area. Several other technologies become apparent during this time. Baked-clay impressions of twined basketry, simple pottery, and other baked clay objects have been found at several sites. Personal adornment items also become more frequent. Exchange with outside groups is evidenced by the presence of obsidian, shell beads and ornaments (Rosenthal et al. 2007, Moratto 1984, Burns et al. 2016). Trade also seemed to be focused on utilitarian items such as obsidian or finished obsidian tools from at least five separate sources (Moratto 1984).

Upper Archaic (550 BCE to CE 1100)

The Upper Archaic began with the onset of the Late Holocene, marked by a cooler, wetter climate. The environmental conditions of the Upper Archaic were characterized by the return of lakes that had disappeared during the Middle Archaic and a renewed fan and floodplain deposition. The Upper Archaic is better represented in the archaeological record than earlier periods. Cultural diversity was more pronounced and is marked by contrasting material cultures throughout the valley (Rosenthal et al. 2007).

During this period, numerous specialized technologies were developed such as bone tools, and implements, Olivella and Haliotis beads and ornaments, ceremonial blades, and ground-stone plummets. People living in the San Joaquin Valley region traded with neighboring groups for obsidian. Upper Archaic period economies varied by region throughout the Central Valley. Economies were primarily focused on seasonal resources such as acorns, salmon, shellfish, rabbits, and deer (Rosenthal et al. 2007).

Emergent Occupation (CE 1000 to Historic)

The stable climatic conditions of the Upper Archaic continued into the Emergent Period. There has been sporadic research in the San Joaquin Valley on this time period, and thus only the Pacheco Complex lithics on the western edge of the valley has been formally defined. After CE 1000, many of the technologies used during the Archaic disappeared to be replaced by cultural traditions used during European contact. During the Emergent Period, the bow and arrow replaced the atlatl as the preferred hunting method sometime between CE 1000 and 1300.

Increased social complexity is evidenced by increased variation in burial types and burial items and larger residential communities. Burial items such as shell beads, ornaments, and ritually "killed" mortars and pestles are often found in burials. Pottery was frequently obtained through trade with groups living in the foothills to the east. The Panoche side-notched point became important in the western side of the San Joaquin Valley (Rosenthal et al. 2007). In addition to the side-notched point, the Panoche Complex featured large circular structures, flexed burials, marine shell beads, bone awls, millingstones, and mortars and pestles (Moratto 1984).

As with the Archaic Period, Emergent Period economies varied geographically, and as seen through the archaeological record, fishing and plant harvesting increased in importance. Most Emergent residential sites contain diverse assemblages of mammal and bird remains and large amounts of fish bone. One thousand years ago, the mortar and pestle become the dominant tool type and small seeds increase in archaeological deposits over time (Rosenthal et al. 2007).

3.2.2 Ethnographic Setting

The APE is located in the traditional territory of the Penutian-speaking Northern Valley Yokuts, which includes the San Joaquin Valley (Kroeber 1925, Wallace 1978). Three geographical divisions of the Yokuts are the Northern Valley, Southern Valley, and Foothill Yokuts. The distinction between the three groups is primarily based on language dialect (Mithun 2001). The APE is located approximately seven miles southeast of the Calaveras River which is associated with the Chulamni or Chilamne Yokuts (Wallace 1978a; Bennyhoff 1977). The primary village of the Chulamni or Chilamne Yokuts was Yatchicumne (Yachik), near Stockton (Wallace 1978a).

Yokuts were split into self-governing local groups that included several villages. Each group had a chief who directed ceremonies, mediated disputes, handled punishment of those doing wrong, hosted visitors, and provided aid to the impoverished (Wallace 1978a, 1978b). Other political positions included the chief's messenger or herald (Wallace 1978a). Villages frequently included mat-covered granaries and a sweathouse (Mithun 2001, Sutton et al. 2016).

Yokuts subsistence strategy was based on a mixed economy focused on fishing, collecting, and hunting small game. Fishermen employed tule rafts and caught fish with nets, spears, basket traps, and bow and arrow. They often gathered mussels and hunted turtles in lakes, rivers, and streams. Wild seeds and roots contributed a large portion to the Yokuts diet. Tule roots were gathered, dried,

and pounded into a flour that was prepared as a mush. Tule seeds and grass and flowering herb seeds were prepared in the same way. Leaves and stems of certain plants, such as clover and fiddle-neck, were also collected. Acorns, a staple of most California Native Americans, were not readily available in the ethnographic territory of the Yokuts. Some Yokuts tribes traded for acorns with neighboring groups, such as the Salinan and Chumash to the west, the Foothill Yokuts to the east, and the Kawaiisu and Kitanemuk to the southeast (Kroeber 1925). Waterfowl was frequently hunted with snares, nets, and bow and arrow. Land mammals and birds contributed a smaller part of the Yokuts diet. Small game was occasionally taken in snares or traps or shot with bows and arrows (Wallace 1978a; Wallace 1978b; Sutton et al. 2016).

Yokuts technology depended heavily on tule. Stems of the plant served as the raw material for baskets, cradles, boats, housing, and many other items. Manos and metates were used to process food and animal hides (Barton et al. 2010, Sutton et al. 2016). Tools such as knives, projectile points, and scraping tools were made from imported lithic materials, because stone was not readily available in the Central Valley. Some tools, such as bead drills, could be made from obsidian obtained from some distance or obtained through trade (Sutton et al. 2016). Marine shells secured through trade with coastal groups were used as shell money and personal adornment items, such as Olivella beads (Sutton et al. 2016, Wallace 1978a).

3.2.3 Post-Contact Setting

Post-contact history for the state of California is generally divided into three periods: the Spanish Period (1769 to 1822), Mexican Period (1822 to 1848), and American Period (1848 to present). Although Spanish, Russian, and British explorers visited the area for brief periods between 1529 and 1769, the Spanish Period in California begins with the establishment in 1769 of a settlement at San Diego and the founding of Mission San Diego de Alcalá, the first of 21 missions constructed between 1769 and 1823. Independence from Spain in 1821 marks the beginning of the Mexican Period, and the signing of the Treaty of Guadalupe Hidalgo in 1848, ending the Mexican-American War, signals the beginning of the American Period when California became a territory of the United States.

Spanish Period (1769-1822)

Spanish explorers made sailing expeditions along the coast of California between the mid-1500s and mid-1700s. Juan Rodriguez Cabrillo in 1542 led the first European expedition to observe what was known by the Spanish as Alta (upper) California. For more than 200 years, Cabrillo and other Spanish, Portuguese, British, and Russian explorers sailed the Alta California coast and made limited inland expeditions, but they did not establish permanent settlements (Bean 1968, Rolle 2003). The Spanish crown laid claim to Alta California based on the surveys conducted by Cabríllo and Vizcaíno (Bancroft 1885, Gumprecht 1999). The first documented interaction between Spaniards and Yokuts occurred in 1772, when Captain Pedro Fages traveled to the San Joaquin Valley by way of Tejon Pass (Arkush 1993).

By the eighteenth century, Spain developed a three-pronged approach to secure its hold on the territory and counter against other foreign explorers. The Spanish established military forts known as presidios, as well as missions and pueblos (towns) throughout Alta California. The 1769 overland expedition by Captain Gaspár de Portolá marks the beginning of California's Historic Period, occurring just after the King of Spain installed the Franciscan Order to direct religious and colonization matters in assigned territories of the Americas. Construction of missions and associated

presidios was a major emphasis during the Spanish Period in California to integrate the Native American population into Christianity and communal enterprise (Milliken et al. 2009).

Although no missions were located near the APE, baptismal records indicate that Yokuts and Miwok speakers comprised a significant portion of the populations at Mission San José (founded in 1797) (Milliken et al. 2009). Having already destabilized coastal populations, the missions attempted to replenish their neophyte populations with Native groups living further inland (Sandos and Sandos 2014). Mission San José relocated Yokuts individuals from the Stockton area to the mission between 1810-1822 (Milliken et al. 2009). Many fled the missions and sought shelter in California's interior regions, including the greater Central Valley (Arkush 1993, Bennyhoff 1977). Concurrently, some Native American groups began raiding Spanish properties and seizing livestock, leading to the spread of ranching practices outside of the missions' control. By the time of Mexican independence, Native vaqueros were some of the main participants in the hide and tallow economy, and equestrian practices were well-known among the Yokuts (Zappia 2012). Despite efforts to push occupation inland, the Spanish never gained control of the Sacramento or San Joaquin Valleys (Arkush 1993).

Spain began making land grants in 1784, typically to retiring soldiers, although the grantees were only permitted to inhabit and work the land. The land titles technically remained property of the Spanish king (Livingston 1914).

Mexican Period (1822-1848)

Several factors kept growth within Alta California to a minimum, including the threat of foreign invasion, political dissatisfaction, and unrest among the indigenous population. After more than a decade of intermittent rebellion and warfare, New Spain won independence from Spain in 1821. In 1822, the Mexican legislative body in California ended isolationist policies designed to protect the Spanish monopoly on trade, and decreed California ports open to foreign merchants (Dallas 1955).

Extensive land grants were established in the interior during the Mexican Period, in part to increase the population inland from the more settled coastal areas where the Spanish had first concentrated their colonization efforts. The secularization of the missions following Mexico's independence from Spain resulted in the subdivision of former mission lands and establishment of many additional ranchos. Commonly, former soldiers and well-connected Mexican families were the recipients of these land grants, which now included the title to the land. While no ranchos were established within the vicinity of the APE, Mexican influence into California's interior was felt through military incursions and the continued coercion of the missions. From 1825 to 1828, the population of Mission San José was bolstered by the addition of neophytes from the Quenemsias, Guaypems, Cosomnes, and Chilamnes Miwok groups of the northern Delta and upper Calaveras River. In 1828, the Laquisemnes Miwoks of the lower Stanislaus River with various Yokuts groups to resist Mexican control; this uprising was ended by a Mexican military victory in June 1829 (Milliken et al. 2009).

The largest land grants in the California interior were awarded to John Sutter, a German Swiss immigrant who became a Mexican citizen. In 1839, he established a cattle ranch and farm called New Helvetia, headquartered at Sutter's Fort at the divergence of the Sacramento and American Rivers (Bean 1968). During the same period, fur trappers began to explore the area. The first American trapper to come to California, Jedidiah Smith, explored the Sierra Nevada before arriving in the Sacramento Valley in 1827, and traveled along the American and Consumnes rivers, as well as through the San Joaquin Valley.

During the supremacy of the ranchos (1834 to 1848), landowners largely focused on the cattle industry and devoted large tracts to grazing. Cattle hides became a primary Southern California export, providing a commodity to trade for goods from the east and other areas in the United States and Mexico. The number of nonnative inhabitants increased during this period because of the influx of explorers, trappers, and ranchers associated with the land grants. The rising California population contributed to the introduction and rise of diseases foreign to the Native American population, who had no associated immunities. By 1833, an epidemic of malaria reached the San Joaquin Valley, with the disease potentially spread to the region by Hudson's Bay Company fur trappers entering the area in search of beaver and otter pelts (Hoover et al. 2002, Arkush 1993).

American Period (1848- Present)

The United States went to war with Mexico in 1846. During the first year of the war, John C. Fremont traveled from Monterey to Los Angeles with reinforcements for Commodore, Stockton, and evaded Californian soldiers in Santa Barbara's Gaviota Pass by taking the route over the San Marcos grade instead (Kyle 2002). The war ended in 1848 with the Treaty of Guadalupe Hidalgo, ushering California into its American Period.

California officially became a state with the Compromise of 1850, which also designated Utah and New Mexico (with present-day Arizona) as United States territories (Waugh 2003). Horticulture and livestock, based primarily on cattle as the currency and staple of the rancho system, continued to dominate the Southern California economy through 1850s. The discovery of gold in the northern part of the state led to the Gold Rush beginning in 1848, and with the influx of people seeking gold, cattle were no longer desired mainly for their hides but also as a source of meat and other goods. The APE is located in the foothills of the Sierra Nevada, with its proximity to Calaveras River (approximately 2 miles north) and the Mother Lode placing it within an area that was heavily affected by the Gold Rush. By 1849, nearly 90,000 people had ascended upon the gold fields. Travelers to the Mother Lode sometimes passed through the "Fifteen Mile House," a stagecoach stop 15 miles from Stockton, built in the area where the community of Linden is now located (Smith 1976). By the 1850s, prospectors had rushed to stake claims along Calaveras River, with some of the most sizable immigrant ethnic groups including Chinese, Chilean, Mexican, and French miners (Chan 2000, Rohe 1996). Miwok and Yokuts populations were further destabilized by the upswell of prospectors. In 1852, a community of Muqueleme Miwok (likely intermarried and allied with Chilamne Yokuts) lived at the Calaveras River crossing of Bellota. However, violent encroachment from settlers and forced displacement led to the abandonment of Native villages along the Calaveras and Mokelumne Rivers by the turn of the century, with communities predominately moving to the Buena Vista and Ione areas of Amador County (Bennyhoff 1977).

Local History

As the flurry of the Gold Rush brought a swelling population of settlers to San Joaquin County, the county was officially established as one of the first 27 counties in the newly formed state of California in 1850. Most of San Joaquin County including the area surrounding the APE developed as an agricultural region, though the largest city in the county, Stockton, was established in 1850 by Captain Charles M. Weber (The Lewis Publishing Company 1890). The community of Linden, approximately five miles northeast of the APE, was established in 1862. In the early years of the area, the main agricultural output was grain, with a flour mill active in the area as early as 1854 (Smith 1976). The introduction of railroads through the county also encouraged the growth of the agricultural industry and orchards as the trains could move products to more markets. The Central

Pacific Railroad was constructed in the 1860s from Sacramento to Stockton and west to San Francisco, and in 1909 the Western Pacific Railroad was added to the same line as the Central Pacific Railroad (Davis 1991).

From the late nineteenth to the early twentieth century, agricultural concerns in the area were focused on irrigation, with the Calaveras River and Mormon Slough dammed and diverted for farming near Bellota (*Stockton Evening and Sunday Record* 1935, Smith 1976). When World War II began, California crops fetched a high price, allowing the surrounding area to diversify plantings and develop as an area known for beans, walnuts, and cherries, among other crops. The unincorporated areas of San Joaquin County remained rural and agricultural to this day with some residential and commercial development adjacent to cities in the county.

Since the properties were formerly agricultural properties, the following context on agriculture in San Joaquin County was excerpted from the *A Historical Context and Methodology for Evaluating Agricultural Properties in California* prepared by Agricultural HARD Team and the California Department of Transportation in 2023:

Agriculture in San Joaquin County

> The San Joaquin Valley forms the southernmost part of the Great Central Valley. The region includes all or portions of the counties of San Joaquin, Contra Costa, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and Kern. Approximately one third of the state's farmland lies in the San Joaquin Valley, and nearly 90 percent of the valley is currently under irrigation. No single river runs through the entire valley, although the San Joaquin River drains the northern portion of the valley and forms the core of the state's Delta region. Lake basins, once fed by runoff from the Sierra Nevada, formed the southern end of the valley. Early farming depended upon natural aquifers for irrigation, and on the reclamation of the Tulare and Buena Vista Lake Basins. The 1940s and 1950s saw increased irrigation water into the southern end of the valley through projects such as the CVP. Annual rainfall is highest at the northern end of the San Joaquin Valley near Sacramento, which averages around 20 inches a year, and lowest at the southern end of the valley near Bakersfield, which receives approximately 12 inches a year.
>
> The San Joaquin Valley is home to a wide variety of farming enterprises, ranging from smaller, intensively cultivated farms to large, extensive, industrial enterprises. Fruit and nuts are important crops, as are many other field crops (e.g., barley, beans, corn, hay, potatoes, sugar beets, and wheat). Vineyards are gaining importance in the region. Cotton has been among the most important field crops in the valley since its introduction in 1871. Livestock is widely distributed throughout the valley floor, including the former home to the famous Miller and Lux cattle enterprise. Dairies, poultry, and swine farms produce other products including milk, chickens, turkeys, eggs, pork, and apiary products. Grain sorghum became important in the area after 1870 as a summer grain crop.

Nut Industry in California

> Immigrants brought chestnuts to California during the Gold Rush, mostly as seed of the European chestnut, but also some chestnuts of mixed origin and grafted varieties. Hundred plus-year-old chestnut trees still exist in the Mother Lode region, such as the original Colossal tree planted by Benjamin Tonella, a Swiss Italian immigrant, in Nevada City. Century-old chestnut trees also survive in the North Coast and Central Valley regions. Most of the current chestnut production in California reflects post-World War II production. Chestnuts are typically grown on farms less than 10 ac. in size. Chestnuts are California's commercial true nut crop,

although recently small in numbers with only 155 ac. under cultivation in 2005, decreased from 600 ac. planted in chestnuts in 2000.

The most successful nuts grown commercially in California are walnuts and almonds. Post World War II era nut production also included macadamia, pistachio, and pecan. Although pecans have been grown in California since the 19th century, the first commercial orchard was established in Clovis in the mid-1970s. Today, the pecan production belt is a narrow strip that stretches from Chico and Orland south to Bakersfield. In 2020, pecans were grown primarily on 6,000 ac. of farmland located in Fresno, Tulare, and Kern counties.

Professor C. H. Dwinelle of the University of California at Berkeley first introduced the macadamia nut to California in 1877. He obtained seeds from Australia and planted several seedlings along Strawberry Creek on the Berkeley campus. In addition, two nurserymen, Ernest Braunton and Charles Knowlton, started selling seedling trees in Southern California around 1910. Macadamia trees were planted as ornamental and backyard trees for many years before World War II, particularly in the southern seven counties of the state. People who served in the Pacific Theater during World War II were exposed to macadamia nuts in Hawaii and returned from the war to search local markets for the nut. Commercial planting of macadamia began in California in 1946 in response to this heightened interest, when Robert W. Todd planted 2 ac. of seedling trees on his property on Grandview Street in Oceanside. The California Macadamia Society was formed in 1953 to guide the newly developing industry, promote their product, and conduct research. In response, the University of California Los Angles established a Subtropical Horticultural Department to better study and understand the nut. Macadamia trees thrive in high humidity, subtropical climates. Although the nut grows from San Luis Obispo south to the Mexican border, Southern California, particularly the San Diego County coastal zone, has in the neighborhood of 2,500 ac. planted in macadamias.

American traders first introduced the pistachio to California in the 19th century; the first tree was planted in Sonoma in 1881, primarily because of increased demand. In 1929 the commercial development of pistachios began when American plant scientist William E. Whitehouse spent six months in Persia (modern-day Iran) collecting seed that he brought back to California. The next year, experimental plantings were established in California. However, no standout pistachio trees emerged until 1950, because pistachio trees require at least a full seven to ten years maturing. The California variety, named Kerman for the famous carpetmaking city in Iran near the area where the trees were first cultivated, began to expand throughout the state in the 1960s. Another account suggests that the California town of Kerman in Fresno County was actually named after two land speculators who subdivided and sold lots off to start the town. In 1977, there were 1,700 ac. planted in pistachios in the state, primarily in the Central Valley. By 2005, California was the second largest producer of pistachios worldwide with over 100,000 ac. Planted. In 2020 there were 288,595 ac. planted in pistachios, primarily in Fresno, Kings, Madera, Tulare, and Kern counties, representing over 98 percent of all pistachios grown in the United States.

The walnut, although first introduced by the Spanish padres around 1769, did not flourish until the time of the early American settlers. Varieties of walnuts were often planted on homesteads as part of cultivation requirements and frequently remain as indications of the locations of homesteads that no longer exist. The first attempt at commercial production was reportedly established at Warner's Ranch in San Diego County in 1843. More than a dozen plantings existed by 1850, mainly near Los Angeles but also scattered from San Diego to Napa counties. In the Bay Area, California walnuts grew along creeks and streams. Walnut Creek, for example,

located in Contra Costa County, was named for the groves of native walnuts growing in the area.

Joseph Sexton, a horticulturist, initiated California's first commercial walnut enterprise in 1867 to 1868, when he planted a grove of English walnuts in Goleta, next to Santa Barbara. Within a few years, 65 percent of all fertile land in this region grew Sexton's English walnuts. Over the next thirty years, orchard plantings multiplied and extended as far north as Chico. In 1875, the State Agricultural Society recorded 138,673 walnut trees, with 15 counties reporting more than 1,000 trees each. The 1870s marks a watershed for walnuts in California. Until this time, walnut plantings had consisted entirely of the small, round, hard-shelled, inferior walnuts introduced by the padres. In addition to Joseph Sexton's soft-shell English walnut, Felix Gillet introduced and developed certain French varieties at Nevada City, which became the basis for the industry in central and Northern California and in Oregon. Between 1880 and 1905 superior varieties of walnuts were planted, including Placentia and Eureka, which now make up most of the Southern California production.

Between 1900 and 1930 walnut acreage increased nearly sevenfold and production increased tenfold. The California Walnut Growers' Association organized in 1912 and successfully applied the principles of cooperative effort to the solution of the problems of the industry. By 1910, the introduction of Valencia oranges and lemons along with increased urban population in Southern California, resulted in the elimination of walnut orchards in Los Angeles and Orange counties. The City of Walnut in Los Angeles County, for example, originated as part of Rancho Los Nogales ('Ranch of the Walnut Trees'), which was acquired piecemeal from Jose de la Cruz Lineras by the Vejar family beginning in 1837. Local growers in the city planted both lemon and walnut trees, with the latter being the major agricultural product until the 1930s, when a pest infestation destroyed the walnut orchards. In addition, declining yields and quality, increasingly warmer winters that caused a delay of blooming, and a pest infestation resulted in the restriction of acreage in Southern California and consistent expansion in the north. By the 1930s the commercial walnut business moved northward to Stockton where improved irrigation, better pest control, ideal climate, and rich soil were more conducive to larger yields. By this time the California walnut had virtually displaced the imported product in United States markets and had become an important export.

California emerged as the largest producer of walnuts in the world by the 1940s. The California Walnut Board was established in 1948 to represent the walnut industry and growers. Today, the Sacramento and San Joaquin valleys are the center of walnut production, producing 99 percent of the commercial United States walnut supply. On the global market, California produces two-thirds of the world's supply of walnuts. Today, almonds are California's largest drupe crop in both value and acreage. The Spanish introduced the almond tree to California in the late 1700s. The moist, cool weather of the coastal missions, however, did not provide ideal growing conditions, and trees were not successfully planted inland until the 1800s. The first attempts to grow almonds commercially in the United States occurred in New England and the Middle Atlantic and Southern states. Nevertheless, growers soon learned that the early blooming almond succumbed to late frosts or disease in areas of high humidity. California's Central Valley, with its Mediterranean climate, provided the right environmental conditions for successful almond production. In the early 1850s, plantings near Sacramento, Monterey, and Los Angeles all showed promise.

During the 1870s, through research and crossbreeding, several of today's prominent almond varieties had been developed. By the turn of the 20th century, the almond industry firmly

established itself in the Sacramento and San Joaquin valleys. The rise of almond production in California is largely the result of the California Almond Growers Exchange, now Blue Diamond. In 1909, J. P. Dargitz of Acampo near Stockton took an active lead in promoting an almond cooperative and made an appeal for a state organization. Members from nine independent almond growing associations in Antelope, Orangevale, Fair Oaks, Davis, Capay, Sutter County, Live Oak, Oakley, and San Joaquin County then met in Sacramento on18 March 1910 to discuss the formation of a statewide organization. As a result, the California Almond Growers Exchange (CAGE) formed on 7 May 1910 consisting of 230 independent growers with headquarters in Sacramento. In 1915 the CAGE built a new receiving and packaging plant that eventually grew into the largest nut processing plant in the world. In 1915 the cooperative adopted the Blue Diamond (the rarest diamond in the world) as their brand symbol, as a way to distinguish the California project from Spanish and Italian imports. As a result of their marketing efforts, government lobbying, and quality control, California's almond production increased from an annual average of 3,500 tons in the 1910s to 9,440 tons in the 1920s.

In 1931, Blue Diamond had 400 growers supplying 20 million pounds of almonds and 2,000 growers by 1940. Today, approximately 3,500 growers cooperatively own Blue Diamond Growers (established in 1980 from CAGE) and along with another 2,500 growers in California, produce the entire supply of almonds in the United States and nearly 80 percent of the worldwide production. In addition, almonds currently rank as the seventh largest U.S. food export. Today, California is the only place in North America where almonds are grown commercially, with more than 1.5 million ac. planted in the San Joaquin and Sacramento valleys, stretching 400 miles between Bakersfield and Red Bluff. In 2019 three billion pounds of almonds were produced.

4 Methods

This section presents the methods for each task completed during the preparation of this assessment.

4.1 Background and Archival Research

4.1.1 Archival Research

Rincon completed additional background and archival research in support of this report from March through April 2025. A variety of primary and secondary source materials were consulted. Sources included, but were not limited to, historical maps, aerial photographs, and written histories of the area. The following sources were utilized to develop an understanding of the APE and its context:

- *A Historical Context and Methodology for Evaluating Agricultural Properties in California* prepared by the California Department of Transportation (Caltrans) and Agricultural HARD Team in 2023
- San Joaquin County Assessor's Office
- Historical aerial photographs accessed via NETR Online
- Historical aerial photographs accessed via University of California, Santa Barbara Library FrameFinder
- Sanborn Fire Insurance Company Maps accessed through the Los Angeles County Public Library
- Historical USGS topographic maps
- San Joaquin County Building Permits Accessed via the San Joaquin County Community Development Department
- Historical newspaper clippings obtained from Newspapers.com, ProQuest Historical Newspapers.com, and the California Digital Newspaper Collection
- Various historical records via Ancestry.com
- Geologic Maps via the USGS National Geologic Map Database
- USDA Web Soil Survey
- Bureau of Land Management (BLM) General Land Office (GLO) Survey Plats

4.1.2 California Historical Resources Information System Records Search

On March 17, 2025, Rincon received California Historical Resources Information System (CHRIS) search results (Records Search File No. 13271L) from the Central California Information Center (CCalC) (Appendix B). The CCalC, located at California State University, Stanislaus, is the official state repository for cultural resources records and reports for the county in which the Project is located. The records search identifies previously recorded cultural resources, as well as previously conducted cultural resources studies in the APE and a 0.5-mile radius. Rincon also reviewed the NRHP, CRHR, California Historical Landmarks list, and the Built Environment Resources Directory. Additionally,

Rincon reviewed the Archaeological Determination of Eligibility list. Results of the records search can be found in Appendix B of this cultural resources technical report.

4.1.3 Sacred Lands File Search

Rincon contacted the NAHC on March 13, 2025, to request a search of the SLF and a contact list of Native Americans culturally affiliated with the vicinity of the APE (Appendix C). Rincon did not conduct Native American outreach for this project. It is the lead federal agency's responsibility to conduct outreach and consultation with the individuals and Tribes identified on the NAHC contact list.

4.1.4 Local Historical Group Outreach

To support compliance with Section 106 of the NHPA, Rincon initiated local historical group outreach for the Project on March 21, 2025. As part of the process of identifying cultural resources that should be considered in the development of the APE, Rincon contacted the San Joaquin County Historical Museum to request information regarding historic properties in the APE and the surrounding area (Appendix D). Follow up emails were sent on April 11, 2025. Appendix D provides documentation of Rincon's outreach efforts.

4.2 Field Survey

4.2.1 Built Environment Survey

Rincon Architectural Historian and Cultural Resources Principal Margo Nayyar conducted a built environment survey of the APE on April 3, 2025. Built environment resources in the APE, including buildings, structures and associated agriculture elements located at 11620 East Copperopolis Road and 289 South Best Road, were visually inspected. Overall condition of these resources were documented and assessed using notes and digital photographs which are maintained at the Rincon Sacramento office.

4.2.2 Archaeological Survey

Rincon Archaeologist Hannah Haas conducted a pedestrian survey of the APE on April 3, 2025. The pedestrian survey was conducted using transect intervals spaced 10 to 15 meters apart and oriented generally from east to west. Exposed ground surfaces were examined for artifacts (e.g., flaked stone tools, tool-making debris, stone milling tools, ceramics, fire-affected rock), ecofacts (marine shell and bone), soil discoloration that might indicate the presence of a cultural midden, soil depressions, and features indicative of the former presence of structures or buildings (e.g., standing exterior walls, postholes, foundations) or historical debris (e.g., metal, glass, ceramics). Ground disturbances such as burrows and drainages were also visually inspected. Survey accuracy was maintained using a handheld Global Positioning Satellite unit and a georeferenced map of the APE. Site characteristics and survey conditions were documented using field records and a digital camera. Copies of the survey notes and digital photographs are maintained at the Rincon Sacramento office.

4.3 Evaluations

Pursuant to OHP Guidelines (OHP 1995:2), properties over 45 years of age, including 11620 East Copperopolis Road and 289 South Best Road, were evaluated for listing in the NRHP and CRHR and recorded on California Department of Parks (DPR) 523 series forms. See Appendix E.

5 Findings

5.1 California Resources Information System Records Search

5.1.1 Known Cultural Resources Studies

The CHRIS records search and background research identified eight cultural resources studies within a 0.5 mile of the APE (Appendix B). Of these studies, none are fully or partially within or adjacent to the APE.

5.1.2 Known Cultural Resources

The CHRIS records search and background research identified one cultural resource within a 0.5 mile of the APE. Resources recorded in the search radius are listed in Table 1 below. No resources are recorded in or adjacent to the APE.

Table 1 Known Cultural Resources

Primary Number	Trinomial	Resource Type	Description	Recorder(s) and Year(s)	Eligibility Status	Relationship to APE
P-39-005478	CA-SJO-000378H	HP11; HP20	Historic Structure – Mormon Slough Levee	2021 (Zickler-Martin) 2022 (M. Campbell) 2023 (A. Ugan)	6Z	Outside

Source: CCalC
APE = Area of Potential Effects

5.2 Sacred Lands File Search

The NAHC responded to Rincon's SLF request on March 17, 2025, stating that the results of the SLF search were positive, meaning there are documented sacred lands in the vicinity of the APE. See Appendix C for the NAHC response, including Tribal contacts lists(s). Rincon did not conduct Native American outreach for this project. It is the lead federal agency's responsibility to conduct outreach and consultation with the individuals and Tribes identified on the NAHC contact list.

5.3 Local Historical Group Outreach

The following bullets summarize responses received from the San Joaquin County Historical Museum contacted by Rincon:

- On March 21, 2025, Phillip E. Merlo, Executive Director of San Joaquin County Historical Museum responded to Rincon via email asking if the Project intended to demolish the house on Copperopolis Road. He also noted that all letters should go to him as Board members rotate but

staff are constant. Rincon responded that the house would be demolished as part of the Project. Mr. Merlo responded that he would need to consult the organization's archival collection before commenting on the Project. He stated:

> the person who owned that house in the 1950s and 1960s, Wesley King was, prior to living there, a well-known labor organizer with the American Federation of Labor and Congress of Industrial Organizations (AFL-CIO). He was also quite involved in fighting for groundwater rights in a much publicized battle with the state in the late '60s. The house is clearly not architecturally significant, but I want to check some things about who owned the building prior to Mr. King.

- On April 11, 2025, Rincon followed-up via email with Mr. Merlo about his previous emails and notified Mr. Merlo that research identified that Mr. Merlo was referring to William King not Wesley King. Wesley King who lived at 11620 East Copperopolis Road was not a labor organizer with the AFL-CIO, though he was involved in fighting for groundwater rights. Mr. Merlo responded that he was unable to consult his archival collection for information on the property.

It should be noted that the residences will not be demolished as part of the Project as originally reported to the San Joaquin County Historical Museum. The outreach described above did not result in the identification of historic properties in the APE or its vicinity. Additional documentation related to this outreach effort is included in Appendix D.

5.4 Aerial Imagery and Historical Topographic Maps Review

Rincon completed a review of historical topographic maps and aerial imagery to ascertain the development history of the APE. A survey plat from 1864 depicts the APE as completely undeveloped with an unnamed slough running east to west in the vicinity. The area west of the APE is labeled as part of the Rancho Campo De Los Franceses (BLM 1864). Historical topographic maps from 1914 to 1954 depict the APE as undeveloped land south of the paved Copperopolis Road and north of the Mormon Slough; only four buildings are depicted in the general area including the Chartville School (NETR Online 2025, USGS 2025). Aerial imagery from 1957 shows the area developed with agricultural properties and fields, paved north-south and east-west trending roads, and the Mormon Slough to the south. The APE is shown developed with agriculture buildings and structures and agricultural fields (NETR Online 2025, UCSB 1957). Aerial imagery from 1963 shows the development of single-family residences along North Patton Avenue and South Tulsa Road; no changes are noted in the APE (NETR Online 2025). Aerials between 1967 and 1993 show several of the buildings within the APE were demolished and that the surrounding area experienced little development (NETR Online 2025, UCSB 1993). Aerials between 2002 and 2022 show the removal of additional ancillary buildings and structures within the APE and further single-family and industrial development in the surrounding area (NETR Online 2025).

5.5 Geoarchaeological Review

According to published geologic mapping, the APE is underlain by the late-Pleistocene age Modesto formation (map unit Qmub), consisting of stratified alluvium of flood basins, lower fans, and interdistributary fan areas (Delattre et al. 2023). Holocene-age alluvium and Pleistocene-age surfaces buried by Holocene alluvium are the most likely landforms to contain pre-contact subsurface archaeological resources. Since human populations increased over time, Late Holocene-

age soils are more likely to yield archeological resources than older, Early Holocene or Pleistocene-age soils.

Soil mapping indicates the APE is underlain by the Jacktone Series (California Soil Web 2025). The Jacktone series soils consists of poorly drained moderately deep hardpan formed in alluvium. These soils are typically fine smectitic clay found on basins with slopes of 0 to 2 percent. These soils are typically found within San Joaquin and southern Sacramento counties at elevations of 5 to 100 feet. The Jacktone Series is typically used for irrigated cropland to grow rice, row crops, and field crops. A typical profile for the Jacktone Series soils features clay from 0 to 28 inches (in.), clay loam from 28 to 34 in., and loam and duripan from 34 to 60 in. (California Soil Resource Lab 1997). Because of the episodic nature of alluvial sedimentation, the sudden burial of artifacts is possible and alluvial soils have an increased likelihood of containing buried archaeological deposits (Waters 1983) often identified by the presence of buried A horizons within the soil series. However, no buried A horizons are present in the Jacktone Series soils.

5.6 Archaeological Sensitivity Summary

The archival research indicates the sediments mapped at surface within the APE are not generally conducive to the natural burial and preservation of archaeological resources given they were deposited during the Pleistocene, a period that largely pre-dates human occupation of the region. The soils map indicates the APE is underlain by Jacktone Series soils, which has a soil profile with no buried A horizons. The CHRIS records search results did not identify cultural resources within the APE. The APE is located approximately 475 meters (1,558 feet) north of Mormon Slough, as shown by historical survey maps (BLM 1864). The potential for pre-contact archaeological sites has been positively correlated with proximity to freshwater sources such as creeks, rivers, and lakes (Meyer et al. 2010). The SLF search results were positive, indicating the presence of sacred lands within or in the vicinity of the APE; however, there are no known archaeological resources within the vicinity of the APE. The APE is considered to have low sensitivity for the presence of subsurface archaeological deposits given the age of geologic units, absence of buried A horizons, and absence of previously recorded resources within or in the vicinity of the APE.

5.7 Survey Results

5.7.1 Built Environmental Resources

The following section summarizes the results of all background research and fieldwork as they pertain to built environment resources. The fieldwork and background research resulted in the identification of two historic-age properties in the APE, 11620 East Copperopolis Road and 289 South Best Road (Figure 3 and Table 2). The properties were recorded and evaluated for NRHP and CRHR eligibility on DPR series forms, which are included in Appendix E and summarized below.

Table 2 Built Environment Resources

Address	APN	Description
11620 East Copperopolis Road	103-220-250-000 103-220-240-000	Former agricultural property with a single-family residence, barn, and shed

289 South Best Road	103-220-220-000	Former agricultural property with a single-family residence, water tower, barn, shed, and manufactured home

Figure 3 Built Environment Resources within the APE



11620 East Copperopolis Road

11620 East Copperopolis Road is a single-family and agricultural property on the south side of Copperopolis Road in an unincorporated area of San Joaquin County southeast of Stockton. The 8.59-acre property sited across two parcels, 103-220-250-000 and 103-220-240-000, is surrounded by single-family and agricultural properties. Located at the northern end of the property along Copperopolis Road and an unpaved driveway are three buildings: a single-family residence, barn, and storage shed, and at the southern and western ends are former agricultural fields.

The one-story, single-family residence constructed in 1920 displays a raised concrete foundation and expresses a rectangular plan (Figure 4; ParcelQuest 2025). The Craftsman-style building is capped with a front gable roof clad in composition shingles with overhanging eaves, exposed rafter ends, and decorative knee braces on the north elevation. The exterior is clad in horizontal wood board siding, and a small brick chimney sits on the ridge of the roof.

The primary (north) elevation features a central entrance with a screen door accessible by two concrete steps which lead to an enclosed, recessed porch. The northwest corner of the primary elevation was likely enclosed with vertical wood board siding at an unidentified time (Figure 5). The fenestration throughout the residence is wood frame sash windows and one replacement vinyl sash window. The rear south elevation features a covered porch addition with a brick foundation covered by a wood frame shed roof. The south elevation also features a second entrance with a metal screen door and flush wood door (Figure 6). The east elevation features a cellar entrance with two metal doors. Within the gables on the north and south elevation are wood louvered vents.

Figure 4 11620 East Copperopolis Road; facing southwest



Figure 5 Single-family residence north and west elevations; facing southeast



Figure 6 Single-family residence south and east elevations; facing northwest



The barn was constructed in 1920 east of the single-family residence and displays an L-shaped plan sited east-to-west on a concrete foundation (ParcelQuest 2025). The side gable roof is sheathed in corrugated metal sheets with a slight eave overhang, exposed rafter ends, and enclosed eaves. The exterior is clad in vertical wood board siding. The primary (south) elevation has a large plywood sliding door, a wood sash window, and a replacement aluminum framed vertical sliding sash window (Figure 7). The north elevation features four original wood frame hopper windows (Figure 8).

Figure 7 Barn south and west elevations; facing northeast



Figure 8 Barn north and east elevations; facing southwest



South of the single-family residence is an open storage shed constructed between 1968 and 1982 (NETR Online 2025). Sitting on a concrete foundation, the shed has a side gable roof clad in corrugated metal sheets (Figure 9). The north and west elevations are partially enclosed with plywood boards. The east elevation is open with three bays for storing equipment, and the south elevation is open and faces an unidentified piece of farming equipment (Figure 10). Along the north elevation of the storage shed are three small pre-built sheds dating to 2004 and 2018. Farming equipment is scattered throughout the property.

Figure 9 Storage shed east and north elevations; facing southwest



Figure 10 Storage shed south and west elevations and farming equipment; facing northeast



289 South Best Road

289 South Best Road is a single-family and agricultural property located on the west side of Best Road in an unincorporated area of San Joaquin County. Surrounded by other agricultural and single-family properties, the property has a single-family residence, water tower, manufactured home, barn, and shed which sit at the eastern end of the property along Best Road. The western end of the property is developed with agricultural fields.

Constructed between 1914 and 1952, the Craftsman-style residence has a rectangular plan sited east to west on a concrete foundation (NETR Online 2025; USGS 2025; Figure 11). The moderately-pitched, front-gable roof with exposed rafter ends is sheathed in corrugated metal sheets on the north slope and composition shingles on the south slope. The building is clad in concrete shingles over the original wood shingles which are visible on the east and west elevations. The primary (east) elevation is asymmetrical with the entrance at the southern end which is boarded closed with plywood sheets. The entrance is accessible by a porch with a concrete foundation which is in poor condition.

The windows throughout are wood double-hung sash units and one replacement aluminum vertical sliding sash unit on the north elevation. Some of the windows are missing glass panes while others are covered with screens. The west elevation features a full-width, shed-roof enclosed porch. The porch has wood-frame, fixed-paned windows and French double-doors which are boarded shut. One noted alteration is a former entrance filled in with a window on the south elevation (Figure 12).

Figure 11 East and north elevations of 289 South Best Road; facing south



Figure 12 South and west elevations of the single-family residence; facing north



West of the single-family residence is a two-story straight-box style water tower constructed circa 1932 (NETR Online 2025; Visual Observation). Capped with a flat roof and slightly overhanging eaves with exposed rafter ends, the water tower is constructed of wood framing and clad in horizontal wood siding. The east elevation has an entrance, and the north and west elevations have two square openings which are also boarded (Figure 13).

Figure 13 East and north elevations of the water tower; facing south



West of the single-family residence and water tower is a manufactured home which was added to the property between 1968 and 1982 (NETR Online 2025). Capped with a low-pitched front gable roof, the manufactured home has a rectangular plan sited east to west and is elevated off the ground. The exterior is clad in sheets of corrugated metal. The primary (south) elevation is asymmetrical with the entrance at the eastern end with a sliding glass door covered by a metal awning and accessible by wood-frame stairs. The windows throughout are aluminum framed vertical sash units. The windows on the east elevation have louvered shutters (Figure 14).

Figure 14 West and north elevations of the manufactured home; facing southeast



Southwest of the single-family residence, the barn was constructed circa 1932 (NETR Online 2025; Visual Observation). Capped with a shed roof clad in corrugated metal sheets, the wood-framed building is sited east to west sitting flush with the ground and is sheathed in vertical and horizontal wood board siding. The east and west elevations each have an entrance with double doors constructed of horizontal board siding. The north elevation has a single wood-frame window, and the south elevation has large sections of missing siding enclosed with metal wiring (Figure 15).

Figure 15 North and west elevations of the barn; facing southeast



Adjacent to the manufactured home and west of the water tower is a rectangular plan shed capped with a low-pitched front gable roof with overhanging boxed eaves (Figure 16). Constructed between 2015 and 2016, the exterior is clad in vertical board siding, and the building sits on a concrete foundation (NETR Online 2025). The primary (east) elevation is symmetrical with double doors of vertical wood boards.

Figure 16 East and north elevations of the shed; facing southwest



5.7.2 Archaeological Resources

The following section summarizes the results of the archaeological field survey.

Ground visibility was fair (approximately 60 percent) with approximately 45 percent exposure (Figure 17). The soil is a light brown to dark brown loam (Figure 18). Vegetation observed consisted of nonnative weeds, grasses, and pea cover crops (Figure 19). Roots and walnut shells are present within the APE, indicating the property may have previously functioned as a walnut orchard. Ground disturbance is evidenced by maintenance of the dirt road and presence of in-ground utilities (Figure 20). No archaeological resources were identified during the field survey.

Figure 21 Overview of APE; facing south



Figure 22 Exposed soils within APE; plan view



Figure 23 Vegetation within APE; facing east



Figure 24 In-ground utilities within APE; facing northeast



5.8 Evaluations

5.8.1 11620 East Copperopolis Road

Property History

11620 East Copperopolis Road was developed in 1920 including the single-family residence and barn (ParcelQuest 2025). Topographic maps from 1914, 1947, and 1952 do not depict the single-family residence or barn (NETR Online 2025; USGS 2025). A topographic map from 1954 confirmed the presence of the single-family residence, and a 1957 aerial and topographic map confirmed the presence of the barn (NETR Online 2025; USGS 2025). Between 1968 and 1982, the shed structure was constructed, and circa 2007 the rear porch addition was added to the residence (NETR Online 2025; Google Earth 2025).

The front porch of the residence was enclosed at and a replacement window added to the residence and barn at an unidentified time, based on visual observation. The western side of the property was utilized as an orchard since 1957 (NETR Online 2025).

Review of historical newspapers and building permits did not identify the architect or builder of the property (Newspapers.com 2025; San Joaquin County 2025).

Ownership History

One of the owners of the property identified during historical research was Wesley G. King who lived on the property from circa 1955 to 1969 (Ancestry.com 1955; *Stockton Evening and Sunday Record* 1969). Stockton City Directories from 1955 and 1957 listed his occupation as a plumber, and in 1969, King was part of a local effort to prevent California Water Services Company from impacting local water sources for farming and residential use (*Stockton Evening and Sunday Record* 1969).

The current owners, Rosemary and Vincent Belli, owned and occupied the property between 1979 and 2019 and rented the property to Edward Juarez between 2003 and 2020 (Ancestry.com 2020). Known ownership and occupancy are summarized in Table 3 below.

Table 3 11620 East Copperopolis Road Ownership/Occupancy History

Date	Property Owners/Tenants	Source
1955	Wesley King	Ancestry.com 1955
1957	Wesley King	Ancestry.com 1957
1958	Wesley G. King	*Stockton Evening and Sunday Record* 1958
1968	W.G. King	San Joaquin County 1968
1969	Wesley King	*Stockton Evening and Sunday Record* 1969
1979 - 2003	Rosemary Mary and Vincent Belli	Ancestry.com 2020
2003 - Present	Rosemary Mary and Vincent Belli	Ancestry.com 2020
2003 - 2020	Edward Juarez	ParcelQuest 2025

Architectural Style

The single-family residence at 11620 East Copperopolis Road is an example of Craftsman style of architecture, popular in the United States between 1905 and 1930 (McAlester 2015). The style was popularized by the architecture firm of Greene and Greene which practiced in Southern California and designed Craftsman style bungalows inspired by the English Arts and Crafts movement. Pattern books helped the style spread throughout the country, and it became the fashionable smaller house of the era. Craftsman architecture emphasized the importance of hand-built construction and genuine materials in response to the mass-produced architectural elements of the Victorian style of the late nineteenth century.

Character-Defining Features of the Craftsman style:

- Low-pitched gabled roof with wide enclosed eave overhang
- Exposed rafter ends, decorative beams or triangular braces
- Multiple roof planes
- Front porch with columns or piers which frequently taper to ground level
- Sash windows or tripartite / grouped windows

- Asian or Arts and Crafts Elaborations such as peaked or flared roof line, trellised porch or porte cochere roof, cottage windows, window boxes and balconies, dormers, and extra stickwork

Constructed in 1920 with the period of significance of the Craftsman style, the single-family residence at 11620 East Copperopolis Road expresses some characteristics of the style including decorative knee braces, exposed rafter ends, and a front porch. The residence is not an exceptional example of the style as it lacks architectural elaborations to set it apart from other examples such as tapered columns or piers, extra stickwork, porte cochere, or cottage windows.

Evaluation

11620 East Copperopolis Road was recorded and evaluated for listing in the NRHP and CRHR and is recommended ineligible for listing in the NRHP and CRHR due to lack of historical and architectural significance.

Constructed in 1920, 11620 East Copperopolis Road is a former agricultural property with a walnut orchard on the southern and western half of the property. According to Caltrans (2023): "there must be a direct and important connection between the property and the area of significance, established through documentation and physical evidence… There are many agricultural resources in California that may be associated with specific themes, but not all are eligible. The final assessment in the link between documentation, physical evidence, and theme relies on rarity and integrity assessments" (Agricultural HARD Team and the California Department of Transportation 2023). Research did not identify the property significantly contributed to the agricultural development of San Joaquin County. The property was one of several agricultural properties in the county: it was not the first agricultural property, it is not a rare example, it did not have the highest yields of produce, nor was it the site of a technological advancement in farming practices. Therefore, the property is recommended ineligible for listing in the NRHP and CRHR under Criteria A/1.

Research identified one historic-era owner of the property, Wesley King. Though King was part of an organization which protested the influence of the California Water Services Company in the area and on local water supplies, research did not identify that he played a significant role in this event nor was the event significant in local history. Therefore, the property is recommended ineligible for listing in the NRHP and CRHR under Criteria B/2.

The property includes a single-family residence, barn, and storage shed. The single-family residence is an example of Craftsman architecture, expressed through the decorative knee braces, front porch, and exposed rafter ends. However, this residence is not a good example of the style that is well represented throughout the region. The residence has been altered since its original date of construction including enclosure of the front porch, addition of the rear porch, and replacement of one of the windows. The ancillary buildings, including the barn and shed, lack architectural distinction and are common building types throughout the region. Additionally, research failed to identify the original architect and builder of the property, nor does the property possess high artistic value. The property is recommended ineligible for listing in the NRHP and CRHR under Criteria C/3.

The property is not likely to yield valuable information that will contribute to our understanding of human history because the property is not and never was the principal source of important information pertaining to subjects such as twentieth century agricultural properties in San Joaquin County. Therefore, the property is recommended ineligible for listing in the NRHP and CRHR under Criterion D/4.

In conclusion, 11620 East Copperopolis Road is recommended ineligible for listing in the NRHP and CRHR due to lack of historical and architectural significance and is not a historical resource as defined by CEQA Section 15064.5(a) or historic property as defined by 36 CFR 800.16(l)(1).

5.8.2 289 South Best Road

Property History

The exact date of construction was not identified during research. Based on visual observation and map research, the residence, barn, and water tower date to circa 1932. A 1914 topographic map does not depict the buildings; the buildings are first depicted on a 1952 map. A newspaper article from 1920 identified a property on Best Road with a single-family residence, barn, garage, chicken house, tank house, and a fig orchard (*Stockton Evening and Sunday Record* 1920). The property described could be the property, but based on a 1954 topographic map, three other properties were also located on Best Road (NETR Online 2025; USGS 2025).

The first documentation of the property was in a 1952 topographic map which depicted the single-family residence and the barn (NETR Online 2025; USGS 2025). A 1957 aerial depicts the single-family residence, barn, and water tower and six other non-extant buildings and structures as well as an orchard on the western side of the property (NETR Online 2025). Between 1967 and 1968, three of the non-extant buildings were removed, and between 1968 and 1982 the manufactured home was added to the property (NETR Online 2025). Between 2005 and 2009, the three remaining non-extant building were removed, and between 2015 and 2016 the shed was constructed (NETR Online 2025).

Review of historical newspapers did not identify the architect or builder of the property (Newspapers.com 2025). Building permits were not available for the property through the San Joaquin County Community Development Department in order to identify the original architect or builder (San Joaquin County 2025).

Ownership History

Research through city directories accessed through Ancestry.com and Newspapers.com only identified the current owners, Vincent and Rosemary Belli who purchased the property around 2007 (Ancestry.com 2011; Newspapers.com 2025). No historic-era owners were identified during research.

Architectural Style

The single-family residence at 289 South Best Road is an example of Craftsman style architecture, popular in the United States between 1905 and 1930 (McAlester 2015). The style was popularized by the architecture firm of Greene and Greene which practiced in Southern California and designed Craftsman style bungalows inspired by the English Arts and Crafts movement. Pattern books helped the style spread throughout the country, and it became the fashionable smaller house of the era. Craftsman architecture emphasized the importance of hand-built construction and genuine materials in response to the mass-produced architectural elements of the Victorian style of the late nineteenth century.

Character-Defining Features of the Craftsman Style:

- Low-pitched gabled roof with wide enclosed eave overhang

- Exposed rafter ends, decorative beams or triangular braces
- Multiple roof planes
- Front porch with columns or piers which frequently taper to ground level
- Sash windows or tripartite / grouped windows
- Asian or Arts and Crafts Elaborations such as peaked or flared roof line, trellised porch or porte cochere roof, cottage windows, window boxes and balconies, dormers, and extra stickwork

Though 289 South Best Road has some elements of the Craftsman style such as its small form, exposed rafter ends, wood shingle wall cladding, and ribbon windows at the rear, the residence is not an exceptional example of the style. The residence lacks architectural elaborations to set it apart from other examples such as a front porch with tapered columns, decorative knee braces, extra stickwork, porte cochere, or cottage windows.

Evaluation

289 South Best Road was recorded and evaluated for listing in the NRHP and CRHR and is recommended ineligible for listing in the NRHP and CRHR due to lack of historical and architectural significance.

Constructed circa 1932, 289 South Best Road is a former agricultural property with a walnut or fig orchard on the western half of the property. According to Caltrans (2023): “there must be a direct and important connection between the property and the area of significance, established through documentation and physical evidence.” Research did not identify the property significantly contributed to the agricultural development of San Joaquin County. The property was one of several agricultural properties in the county; it was not the first agricultural property, it did not have the highest yields of produce, nor was it the site of a technological advancement in farming practices. Therefore, the property is recommended ineligible for listing in the NRHP and CRHR under Criteria A/1.

Research did not identify any historic-era owners or occupants of the property. The only identified owners were the current owners, Vincent and Rosemary Belli. Therefore, the property is recommended ineligible for listing in the NRHP and CRHR under Criteria B/2.

The property includes a single-family residence, water tower, barn, mobile home and shed. The residence is an example of simple Craftsman architecture expressed through the exposed rafter ends, original wood shingle wall cladding, and ribbon windows. However, this residence is not a good example of the style that is well represented throughout the region. The original wood shingles are covered by contemporary concrete shingles, one of the original entrances was enclosed with a window, and several of the windows and doors are boarded or missing key features. The remaining buildings on the property including the barn, water tower, mobile home, and shed lack architectural distinction and are common building types throughout the region. Additionally, research failed to identify the original architect and builder of the property. Therefore, the property does not express a type, period or method of construction, the work of a master, or possess high artistic value. The property is recommended ineligible for listing in the NRHP and CRHR under Criteria C/3.

The property is not likely to yield valuable information that will contribute to our understanding of human history because the property is not and never was the principal source of important

information pertaining to subjects such as twentieth century agricultural properties in San Joaquin County. Therefore, the property is recommended ineligible for listing in the NRHP and CRHR under Criteria D/4.

In conclusion, 289 South Best Road is recommended ineligible for listing in the NRHP and CRHR due to lack of historical and architectural significance and is not a historical resource as defined by CEQA Section 15064.5(a) or historic property as defined by 36 CFR 800.16(l)(1).

6 Conclusions and Recommendations

The following sections present our recommended findings under Section 106 of the NHPA and CEQA.

Based on the results of a cultural resources records search, field survey, NAHC SLF search, interested parties outreach, geoarchaeological review and sensitivity assessment, and ineligible NRHP and CRHR evaluations of 11620 East Copperopolis Road and 289 South Best Road there are no historic properties within the APE as defined by 36 CFR 800.16(l)(1) or historical resources as defined by CEQA Section 15064.5(a). No archaeological resources are known within the APE, and although the SLF search yielded positive results, there is no indication that a sacred site or resource of Native American origin exists within the APE. Additionally, the geologic units and soil mapping within the APE are not conducive to the natural burial and preservation of archaeological resources; thus, the APE is considered to have low sensitivity for archaeological resources. There is no information at this time to suggest the APE contains cultural resources.

6.1.1 Section 106 of the National Historic Preservation Act

Based on the results of this study, Rincon recommends a finding of ***no historic properties affected*** under Section 106 of the NHPA for the current undertaking. Furthermore, Rincon recommends no further archaeological resources work for the undertaking based on the previous disturbance within the APE and lack of archaeological sensitivity. Best management practices are recommended in case of unanticipated discoveries. In the event of a post review discovery during ground disturbance associated with the undertaking, the procedures under 36 CFR Part 800.13 should be followed by the lead federal agency.

6.1.2 CEQA

The impact analysis included here is organized based on the cultural resources thresholds included in *CEQA Guidelines* Appendix G: Environmental Checklist Form:

A. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?
B. Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?
C. Would the project disturb any human remains, including those interred outside of dedicated cemeteries?

Threshold A broadly refers to historical resources. To more clearly differentiate between archaeological and built environment resources, we have chosen to limit analysis under Threshold A to built environment resources. Archaeological resources, including those that may be considered historical resources pursuant to Section 15064.5 and those that may be considered unique archaeological resources pursuant to Section 21083.2, are considered under Threshold B.

Historical Built Environment Resources

This study identified two built environment resources in the APE, and Rincon has recommended them ineligible for listing in the NRHP and CRHR, as discussed above; the resources therefore do not qualify as historical resources under CEQA. Based on the results of this study, Rincon recommends a finding of ***no impact to historical resources***.

Historical and Unique Archaeological Resources

This study did not identify any archaeological resources or archaeological deposits in the APE and has identified the APE as having low archaeological sensitivity. However, unanticipated discoveries during construction remain a possibility. Rincon presents the following recommended mitigation measure for unanticipated discoveries during construction. With adherence to this measure, Rincon recommends a finding of ***less than significant impact with mitigation for archaeological resources*** under CEQA.

Unanticipated Discovery of Cultural Resources

In the event that archaeological resources are unexpectedly encountered during ground-disturbing activities, work within 50 feet of the find shall halt and an archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for archaeology (National Park Service 1983) shall be contacted immediately to evaluate the resource. If the resource is determined by the qualified archaeologist to be prehistoric, then a Native American representative shall also be contacted to participate in the evaluation of the resource. If the qualified archaeologist and/or Native American representative determines it to be appropriate, archaeological testing for CRHR eligibility shall be completed. If the resource proves to be eligible for the CRHR and significant impacts to the resource cannot be avoided via project redesign, a qualified archaeologist shall prepare a data recovery plan tailored to the physical nature and characteristics of the resource, per the requirements of the California Code of Regulations (CCR) Guidelines Section 15126.4(b)(3)(C). The data recovery plan shall identify data recovery excavation methods, measurable objectives, and data thresholds to reduce any significant impacts to cultural resources related to the resource. Pursuant to the data recovery plan, the qualified archaeologist and Native American representative, as appropriate, shall recover and document the scientifically consequential information that justifies the resource's significance. The City shall review and approve the treatment plan and archaeological testing as appropriate, and the resulting documentation shall be submitted to the regional repository of the California Historical Resources Information System, per CCR Guidelines Section 15126.4(b)(3)(C).

Human Remains

No human remains are known to be present in the APE. However, the discovery of human remains is always a possibility during ground disturbing activities. If human remains are found, California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to PRC Section 5097.98. In the event of an unanticipated discovery of human remains, the County Coroner must be notified immediately. If the human remains are determined to be of Native American origin, the Coroner will notify the Native American Heritage Commission, which will determine and notify a MLD. The MLD has 48 hours from being granted site access to make recommendations for the disposition of the remains. If the MLD does not make recommendations within 48 hours, the landowner shall reinter the remains in an area of the property secure from subsequent disturbance.

With adherence to existing regulations, Rincon recommends a finding of ***less-than-significant impact to human remains*** under CEQA.

7 References

Arkush, Brooke S.

1993 "Yokuts Trade Networks and Native Culture Change in Central and Eastern California." *Ethnohistory* 40(4): 619-640. https://www.jstor.org/stable/482590 (accessed August 2025.

Agricultural HARD Team and California Department of Transportation

2023 *A Historical Context and Methodology for Evaluating Agricultural Properties in California*. https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/ser/historical-context-agricultural-properties-ca-a11y.pdf (accessed February 2025).

Ancestry.com

1955 *Stockton City Directory*. *U.S., City Directories, 1822-1995* [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc., 2011. https://www.ancestry.com/search/collections/2469/records/264415285?tid=&pid=&queryId=86dd18ea-f8c5-4153-874e-af2aa3bd32c3&_phsrc=JhD764&_phstart=successSource (accessed April 2025).

1957 *Stockton City Directory*. *U.S., City Directories, 1822-1995* [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc., 2011. https://www.ancestry.com/search/collections/2469/records/264415285?tid=&pid=&queryId=86dd18ea-f8c5-4153-874e-af2aa3bd32c3&_phsrc=JhD764&_phstart=successSource (accessed April 2025).

2011 *U.S., City Directories, 1822-1995* [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc., 2011. https://www.ancestry.com/search/collections/2469/records/264415285?tid=&pid=&queryId=86dd18ea-f8c5-4153-874e-af2aa3bd32c3&_phsrc=JhD764&_phstart=successSource (accessed March 2025).

2020 *U.S. Index to Public Records 1994-2019*. [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc. https://www.ancestry.com/search/collections/62209/records/33483283?tid=&pid=&queryId=3d9ebff3-bad4-4676-b4c6-3415b0775553&_phsrc=JhD779&_phstart=successSource (accessed April 2025).

Bancroft, Hubert How

1885 *History of California, Volume III: 1825-1840*. San Francisco, California: A.L. Bancroft & Co.

Barton, Amber, Maria Del Carmen Guzman, and Breeann Romo

2010 "The Preliminary Results of the 2008 Archaeological Investigations at the Bead Hill Site (KER-450), Buena Vista Lake, California." *SCA Proceedings*, 24: 1–-12.

Bean, Walton

1968 *California: An Interpretive History.* San Francisco, California: McGraw-Hill Book Company.

Bennyhoff, James A.

1977 *Ethnography of the Plains Miwok.* Davis, California: Center for Archaeological Research.

Bureau of Land Management

1864 *General Land Office Survey Plat.* Electronic resource, https://glorecords.blm.gov/details/survey/default.aspx?dm_id=292798&sid=pavccv3m.4ua (accessed April 2025).

Burns, Gregory R., Susan Cook Talcott, Kathryn Demps, Jason L. Edmonds, John M. Lambert, Andrew Tremayne, Jelmer W. Eerkens, and Eric J. Bartelink

1996 "Isotopic Evidence For Changing Residence Patterns through the Middle to Late Holocene in Central California." *SCA Proceedings*, Volume 26. University Of California, Davis and California State University, Chico.

California Office of Historic Preservation (OHP)

1995 *Instructions for Recording Historical Resources*. Department of Parks and Recreation, Sacramento, California.

2011 "California Register and National Register: A Comparison (for purposes of determining eligibility for the California Register)." *California Office of Historic Preservation Technical Assistance Series #6*. Sacramento, California: Department of Parks and Recreation.

California Soil Resource Lab

1997 Jacktone Series. Electronic resource, https://casoilresource.lawr.ucdavis.edu/sde/?series=jacktone#osd (accessed April 2025).

California Soil Web

2025 Soil map of APE. Electronic Resource, https://casoilresource.lawr.ucdavis.edu/gmap/, (accessed April 2025).

Chan, Sucheng

2000 "A People of Exceptional Character: Ethnic Diversity, Nativism, and Racism in the California Gold Rush." *California History* 79(2): 44–85. https://www.jstor.org/stable/25463688 (accessed March 2024).

Dallas, Sherman Forbes

1955 *The Hide and Tallow Trade in Alta California 1822-1846*. Submitted to the faculty of the Graduate School in partial fulfillment of the requirements for the degree, Doctor of Philosophy in the Department of Economics, Indiana University.

Davis, Olive

1991 *From the Ohio to the San Joaquin: A Biography of Captain William S. Moss 1796-1883*. Stockton, California: Heritage West Books.

Delattre, M.P., R.W. Graymer, V.E. Langenheim, K.L. Knudsen, T.E. Dawson, E.E. Brabb, C.M. Wentworth, and L.A. Raymond

2023 Geologic and Geophysical Maps of the Stockton 30' × 60' Quadrangle, California. Scale 1:100,000. Electronic resource, https://ngmdb.usgs.gov/Prodesc/proddesc_115248.htm (accessed April 2025).

Fredrickson, David A.

1973 Early Cultural of the North Coast Ranges, California. Ph.D. dissertation, University of California, Davis.

1974 Cultural Diversity in Early Central California: A View from the North Coast Ranges. *The Journal of California Anthropology* 1(1):41-53.

Google Earth

2025 Aerial images of the property and surrounding area. Accessed April 2025.

Gumprecht, Blake

1999 *The Los Angeles River: Its Life, Death, and Possible Rebirth*. Baltimore, Maryland: Johns Hopkins University Press.

Hoover, Mildred Brooke, Hero Eugene Rensch, Ethel Grace Rensch, and William N. Abeloe

2002 *Historic Spots in California*. Revised by Dougals E. Kyle, Fifth Edition. Standford, California: Standford University Press.

Kroeber, Alfred L.

1925 *Handbook of the Indians of California*. Bulletin 78, Bureau of American Ethnology, Smithsonian Institution. Washington, D.C.: Government Printing Office. Reprinted 1976 by New York City, New York: Dover Publications, Inc.

Kyle, Douglas E.

2002 *Historic Spots in California.* Stanford, California: Stanford University Press.

Lewis Publishing Company, The

1890 *An Illustrated History of San Joaquin County, California*. Chicago, Illinois: Barlow-Sinclair Printing Company. Library of Congress. https://www.loc.gov/item/02007476/ (accessed April 2025).

Livingston, M.M.

1914 "The Earliest Spanish Land Grants in California." *Annual Publication of the Historical Society of Southern California* 9(3): 195–199.

McAlester, Virgina Savage

2015 *A Field Guide to American Houses*. New York City, New York: Alfred A. Knopf.

Milliken, Randall, Laurence H. Shoup, and Beverly R. Ortiz

2009 "Ohlone/Costanoan Indians of the San Francisco Peninsula and their Neighbors, Yesterday and Today." *Government Documents and Publications, First Nations Era*, Volume 6. California State University, Monterey Bay.

Mintier Harnish Planning Consultants

2016 *San Joaquin County General Plan Policy Document*. December 2016. Prepared for San Joaquin County. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/Planning/General%20Plan%202035/General%20Plan%202035.pdf (Accessed April 2025).

Mithun, Marianne

2001 *The Languages of Native North America.* Reprinted. Originally published 1999. New York City, New York: Cambridge University Press.

Moratto, Michael

1984 *California Archaeology.* New York City, New York: Academic Press.

National Park Service

1983 Secretary of the Interior's Standards and Guidelines for Professional Qualifications in Archaeology and Historic Preservation. Department of the Interior.

1997 *National Register Bulletin-How to Apply the National Register Criteria for Evaluation.* https://www.nps.gov/subjects/nationalregister/upload/NRB-15_web508.pdf (Feburary 2025).

NETR Online

2025 Historic Aerials and topographic maps of the APE and surrounding area. www.historicaerials.com (accessed April 2025).

Newspapers.com

2025 Historical Newspapers including the *Stockton Evening and Sunday Record*. https://www.newspapers.com/ (accessed April 2025).

ParcelQuest

2025 Property Information accessed through the San Joaquin County Assessor for APNs 103-220-250-000 and 103-220-240-000. https://www.parcelquest.com/?gclid=EAIaIQobChMI376gto2L-QIVfcLCBB0tNwFjEAAYASAAEgLUNPD_BwE (accessed April 2025).

Rohe, Randall

1996 "Chinese River Mining in the West." *Montana the Magazine of Western History* 46(3): 14-29. https://www.jstor.org/stable/4519895 (accessed March 2025).

Rolle, Andrew

2003 *California: A History.* Sixth printing. 1963. Wheeling, Illinois: Harlan Davidson, Inc.

Rosenthal, Jeffrey S., Gregory G. White, and Mark Q. Sutton

2007 The Central Valley: A View from the Catbird's Seat. In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 147–163. AltaMira Press, New York.

San Joaquin County

1968 Community Development Department. *Scanned Pages of Historical Building Permits Prior to 1992 (Posting Books)*. San Joaquin County Building Permit # P63400. Issued to W. G. King. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/Building/Posting%20Books/1957- (accessed April 2025).

2025 Community Development Department. *Scanned Pages of Historical Building Permits Prior to 1992 (Posting Books).* https://www.sjgov.org/commdev/cgi-bin/cdyn.exe?grp=building&htm=permits_prior_1992 (accessed April 2025).

Smith, Don R. (editor)

1976 *From Stage Stop to Friendly Community, A History of Linden.* Linden, California: Scio Odd Fellows Lodge No. 102, Linden Publications, and Individual Authors. https://www.lindenhistory.org/_files/ugd/bfbc12_cd2eea7a957b457e816d5ff82f524479.pdf (accessed March 2024).

Stockton Evening and Sunday Record

1920 Advertisement. April 20, 1920. https://www.newspapers.com/image/609932555/?match=1&terms=%22copperopolis%20road%22%20%22best%20road%22 (accessed April 2025).

1935 "Old Timer Reviews Water Problems of Linden Area." June 20, 1935. https://www.newspapers.com/image/843460599/?terms=bellota&match=1 (accessed March 2024).

1958 "Board Seeks Accounting on Flood Emergency Supplies." May 17, 1958. https://www.newspapers.com/image/844829029/?match=1&terms=%22wesley%20g.%20king%22 (accessed April 2025).

1969 "Group Presses Fight on Cal Water." August 5, 1969. https://www.newspapers.com/image/845597666/?match=1&terms=%2211620%20e%20Copperopolis%22 (accessed April 2025).

Sutton, Mark Q., Jille K. Gardner, Kenneth W. Gobalet, and Nancy Valente

2016 "Archaeological Investigations at the Manifold Site (CA-KER-4220), Buena Vista Lake, Southern San Joaquin Valley, California." *Pacific Coast Archaeological Society Quarterly*, Vol. 52 (4), pp. 15-82.

United States Geological Survey (USGS)

2025 Historical topographic maps of the property and surrounding area. *TopoViewer*. https://ngmdb.usgs.gov/topoview/viewer/#4/40.01/-100.06 (accessed April 2025).

University of California Santa Barbara (UCSB)

1957 Flight ABD_1957, Frame 36T-68. July 4, 1957. Flown by Cartwright and Company. https://mil.library.ucsb.edu/ap_indexes/FrameFinder/ (accessed April 2025).

1993 Flight NAPP_2C, Frame 6351-101. May 22, 1993. https://mil.library.ucsb.edu/ap_indexes/FrameFinder/ (accessed April 2025).

Wallace, William J.

1978a "Southern Valley Yokuts." *Handbook of North American Indians, Vol. 8 California*. Edited by Robert F. Heizer, pp. 448–461., William C. Sturtevant, general editor. Washington D.C.: Smithsonian Institution.

1978b "Post-Pleistocene Archaeology, 9000 to 2000 B.C." *Handbook of North American Indians, Vol. 8 California*. Edited by Robert F. Heizer, pp. 25-36. William C. Sturtevant, general editor. Washington D.C.: Smithsonian Institution.

Waters, Michael R.

1983 "Late Holocene Lacustrine Chronology and Archaeology of Ancient Lake Cahuilla, California." *Quaternary Research* 19: 373–387.

Waugh, John C.

2003 *On the Brink of Civil War: The Compromise of 1850 and How it Changed the Course of American History*. *The American Crisis Series: Books on the Civil War Era*, No. 13. Wilmington, Delaware: A Scholarly Resources Inc. Imprint.

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Appendix A

Resumes



Margo A. Nayyar

Cultural Resources Principal

Margo is a cultural resources principal and architectural historian with experience in California, Nevada, Arizona, New Mexico, Idaho, Alaska, Texas, and Mississippi. Her experience includes built environment surveys, evaluation of historic-era resources using guidelines outlined in the National Register of Historic Places and the California Register of Historical Resources, and preparation of cultural resources technical studies pursuant to the California Environmental Quality Act (CEQA) and Section 106 of the National Historic Preservation Act (NHPA) including identification studies, finding of effect documents, memorandum of agreements, programmatic agreements, and Historic American Building Survey/Historic American Engineering Record/Historic American Landscape Survey HABS/HAER/HALS mitigation documentation. She prepares cultural resources environmental document sections for CEQA environmental documents including infill checklists, initial studies, and environmental impact reports, as well as National Environmental Policy Act (NEPA) environmental documents including environmental impact statements and environmental assessments. She also specializes in municipal preservation planning, historic preservation ordinance updates, Native American consultation, and provision of Certified Local Government training. She develops Survey 123 and Esri Collector applications for large-scale historic resources surveys, and authors National Register nomination packets. Margo meets the Secretary of the Interior's Professional Qualification Standards for history and architectural history and leads a team of archaeologists, architectural historians, and paleontologists.

Task Manager, Pacific Gas & Electric Co. - Clawiter Road ISMND, Hayward
Completed a cultural resources technical memo that included the methods and results of a PG&E MapGuide review, literature and historic map review, architectural/archaeological field survey, archaeological sensitivity analysis, historical society consultation, and Native American outreach. Findings of the report were reviewed and approved by PG&E and incorporated in the environmental document completed for the project.

Task Manager, ECORP - Kore Imperial Mine, Imperial County
Provided broad oversight of the archaeological survey efforts completed for the project.

Project Manager, Ventura County Fire Protection District - Fire Station 30, 53, and 54 NEPA/CEQA/NHPA, Ventura County
Responsible for managing the completion of the CEQA, NEPA, and Section 106 reports completed for the project. Assisted the Ventura County Fire Protection District (VCFPD) with the preparation of three categorical exclusions under the National Environmental Policy Act (NEPA), categorical exemptions under the California Environmental Quality Act (CEQA) and associated cultural resources technical studies. The project proposed to construct a radio tower at three VCFPD fire stations (stations 30, 53, and 54) to hold antennas for broadcasting and receiving a Federal Communications Commission (FCC)-licensed radio signal as part of a remote wildfire early detection network. As the project required licensing from the FCC and includes funding from the Federal Emergency Management Agency (FEMA), it required NEPA clearance.

EDUCATION

MA, Public History, California State University, Sacramento

BA, History, University of California, Santa Cruz

CERTIFICATIONS/ REGISTRATIONS

Meets the Secretary of the Interior's Professional Qualification Standards for History and Architectural History

AFFILIATIONS

Vice-Chair - City of Sacramento Historic Preservation Commission

California Preservation Foundation

Preservation Sacramento

Sacramento Modern

YEARS OF EXPERIENCE

15

EXPERIENCE

Rincon Consultants, Inc. (2024 to present)

Cultural Resources Specialist, Southwest Gas Corporation - North Shore Drive and Stanfield Cutoff Project, Big Bear
Responsible for co-authoring the cultural resources identification report completed in accordance with the US Forest Service requirements and Section 106 of the NHPA. Responsible for developing the APE, completing records searches, literature review, Native American Heritage Commission Sacred Lands File search, and historical society consultation. Twenty-two cultural resources were identified within the APE and require evaluation to the National Register. Southwest Gas proposes the North Shore Drive project as part of the overall goal to increase the gas feed into the Big Bear area by upsizing the existing system along North Shore Drive and Stanfield Cutoff.

Cultural Resources Specialist, Foundation Windpower - PMC_FWP_Turbine61716
Responsible for completing the cultural resource identification efforts required pursuant to CEQA. Authored the cultural resources checklist section and analyzed project impacts to cultural resources. The project was found to have a less than significant impact to cultural resources with mitigation incorporated.

Principal, Railpros - North Leucadia Pedestrian and Bicycle At-Grade Rail Crossing, Encinitas, California
Responsible for managing the completion of the cultural resources CEQA study required for the project. Developed the project area, conducted interested parties consultation, managed the completion of the archaeological and built environment field surveys, and evaluated a railroad segment as not eligible for listing in the California Register. The study's findings were included in the environmental document required for the project. The project improved pedestrian and bicycle crossing at various locations along a railroad.

Project Manager, City of Newport Beach - Collins Island Bridge Replacement, Newport Beach, California
Managed the completion of the cultural resources technical study completed for the project in compliance with Section 106 of the NHPA and CEQA. The study included the methods and results of a records search, literature and historic map review, historical society consultation, field survey, Native American consultation, and National Register and California Register evaluation of the Collins Island Bridge to determine if the project proposed effects/impacts to a historic properties. The bridge was recommended ineligible. Findings of the study were incorporated into the USACE 404 permit package. The project would replace the Collins Island Bridge with a new bridge.

Water

Principal, El Toro Water District - Aliso Creek Lift Station Rehabilitation Project, Laguna Woods, Orange County, California
Managed the completion of the cultural resources study required for compliance with CEQA and Section 106. The study included methods and results of a cultural resources records search through the California Historical Resources Information System (CHRIS), Native American Heritage Commission Sacred Lands File search, tribal and local interested party outreach, field survey, and evaluation of one cultural resource. The project was determined to have a finding of no effect. The project would increase pump performance to allow the lift station to operate at 4,100-gallons-per-minute design capacity, address the maintenance issues of the existing piping and equipment, simplify maintenance activities, and accommodate existing flows as well as the additional wastewater flows anticipated to be generated by the planned Village at Laguna Hills development. The Federal Emergency Management Agency was the federal lead agency with the District acting as the lead agency under CEQA.

Task Manager, City of Long Beach - Water Well and Water Treatment Plant Project, Long Beach
Managed the completion of the cultural resources study that included a CHRIS records search, literature review and historical map review, an archaeological field survey, and a buried site sensitivity analysis to determine whether the project could result in a significant adverse change to historical resources in accordance with the CEQA. Additionally, a paleontological records search was requested from the Natural History Museum of Los Angeles County (NHMLA), and a search of online and published databases was completed to identify paleontological localities. Findings were incorporated into the initial study/mitigated negative declaration (IS/MND) completed for the project.



EDUCATION

MA, Anthropology, San Diego State University

BA, Anthropology, University of California, Santa Barbara

CERTIFICATIONS/ REGISTRATIONS

Registered Professional Archaeologist
(ID #49570646)

YEARS OF EXPERIENCE

12

Hannah G. Haas, RPA

Archaeologist and Project Manager

Hannah has over twelve years of experience working in cultural resources management conducting projects in compliance with CEQA, Section 106 of the National Historic Preservation Act, and NEPA. She has experience in performing archaeological and cultural resources surveys, archaeological testing and monitoring, and the preparation of technical reports. She has worked on hundreds of projects and served as lead author of numerous cultural resources technical reports. Hannah uses her academic training and professional experience to ensure that all cultural resources components of projects are satisfactorily conducted.

SELECT PROJECT EXPERIENCE

Archaeologist, San Lorenzo Valley Water District – Swim Tank Project and Five Water Pipelines Project Initial Study-Mitigated Negative Declaration and U.S. Department of Agriculture Funding Documentation, Santa Cruz County
Hannah acted as the Senior Archaeologist for two projects for the San Lorenzo Valley Water District, conducted concurrently to maximize cost efficiency. Both were subject to Section 106 of the National Historic Preservation Act and CEQA, and included records searches, Native American and local interested parties consultation, intensive-level field surveys, and preparation of technical studies. Hannah conducted the records search, fieldwork, Native American consultation, and served as primary author of the technical reports. The projects received State Historic Preservation Officer concurrence and met its expended schedule as a result.

Archaeologist, County of Monterey – Monterey Storm Drainage System Maintenance Project, Monterey County
The Monterey Storm Drainage System Maintenance Project is intended to remedy agency concerns associated with the City completing maintenance activities without proper regulatory permits or certifications. Work locations include 35 sites throughout the City. Hannah prepared the cultural resources technical study for the project as well as the cultural resources and tribal cultural resources Initial Study-Mitigated Negative Declaration sections. Hannah also assisted with Assembly Bill 52 consultation.

Archaeologist, RMC Water and Environment – Milpitas Recycled Water Pipeline Project, Santa Clara County
Hannah conducted a cultural resources study in compliance with the State Water Resources Control Board's CEQA-Plus requirements. Tasks included conducting a cultural resources records search, Section 106 Native American consultation, and serving as primary author of CEQA-Plus format technical report.

Archaeologist, City of Pismo Beach – Central Coast Blue CEQA-Plus EIR, Pismo Beach
Hannah is serving as the task manager for a cultural resources investigation for Pismo Beach's Central Coast Blue project. The project is an indirect potable reuse project intended to develop a seawater intrusion barrier for the Santa Maria Groundwater Basin and includes an advanced treatment facility, injection wells, monitoring wells, and water distribution and irrigation pipelines. Hannah has overseen such tasks as cultural resources records searches, pedestrian and shovel test pit surveys, coordination with local Native Americans, and report preparation.

Senior Archaeologist, Therafields LLC – Therafields Hopland Rancheria Project, Mendocino County
Hannah served as the Senior Archaeologist for the Therafields Hopland Rancheria Project. Tasks included coordination with the Rancheria and the Bureau of Indian Affairs, a records search, pedestrian survey, and reporting.

Archaeologist, County of Fresno – Ashlan and Palm Intersection Improvements Project, Fresno County
Hannah recently managed cultural resources work for an intersection improvements project in Fresno County. The project is receiving Caltrans local assistance funding and required the preparation of an ASR, HRER, and HPSR.

Archaeologist, Recurrent Energy – RE Tranquility Solar Project, Southern California
Hannah lead a ten-day cultural resources survey of over 3700 acres of agricultural land in unincorporated Fresno County and prepared an ARMR-format report documenting the findings

Archaeologist, PGH Wong Engineering – California High Speed Rail Construction Package 1, Fresno to Merced Section, Fresno and Merced
Hannah manages archaeological tasks, prepares archaeological survey reports, weekly and monthly cultural resources work summary reports, and cultural resources mapping documents.

Archaeologist, Salem Engineering Group – VA Central California Healthcare System Project, Fresno County
Hannah served as primary author of cultural resources technical study, conducted Native American scoping, a cultural resources records search, and provided general oversight of fieldwork for this project in Fresno County.

Archaeologist, City of Visalia – Cultural Resources Study for the Jennings Ditch Trail Project, Visalia
Hannah served as primary author of cultural resources technical study, conducted Native American scoping, a cultural resources records search, and provided general oversight of fieldwork.

Archaeologist, City or Merced – Initial Study for the Well 3 Tank Demolition Project, Merced
Hannah conducted a cultural resources study and prepared archaeological resources sections of an initial study and EIR.

Senior Archaeologist, County of Sonoma – Rezone Sites for Housing Project Environmental Impact Report, Sonoma County
Hannah served as the Senior Archaeologist responsible for tribal consultation assistance and preparation of cultural and tribal cultural resources sections of a programmatic EIR covering Sonoma County's Housing Element Update and the rezoning of sites to add to the County's housing site inventory.

Senior Archaeologist, Mendocino Unified School District – Mendocino High School Renovation, Mendocino County
Hannah served as the Senior Archaeologist overseeing cultural and tribal cultural resources services for the Mendocino High School Renovation project, including tribal consultation assistance, Phase I and Extended Phase I archaeological investigations, and archaeological monitoring.

Senior Archaeologist, City of San José – Alum Rock Park Project, San José
Hannah served as the Senior Archaeologist and task manager for cultural resources services in support of two projects at Alum Rock Park. The projects included road and facilities repairs and are receiving funding from FEMA, and are therefore subject to Section 106 of the NHPA. Alum Rock Park is an NRHP-eligible historic district and contains multiple built environment and archaeological resources. Tasks conducted by Rincon included development of the Area of Potential Effects, conducted fieldwork and reporting, and prepared a technical report that was accepted by FEMA without comment or revision.

Cultural Resources Specialist, City of Concord – 1313 Galindo Street Project, Concord
The 1313 Galindo Street Project proposed the construction of an affordable housing development, to be partially funding by the Department of Housing and Urban Development. Hannah managed a cultural resources study in support of both CEQA and Section 106 of the NHPA review for the project. Records searches conducted for the project identified a previously recorded burial site in close proximity, necessitating Extended Phase I (XPI) testing to identify the presence or absence of remains on the project site. Hannah oversaw all work associated with the excavation, which was completed on time and in budget. No resources were identified and monitoring measures were recommended to the satisfaction of both the client and local Native American groups.



EDUCATION

MS, Historic Preservation, The University of Pennsylvania, School of Design

BA, History and Museum Studies, The Florida State University

PROFESSIONAL QUALIFICATION STANDARDS

Meets and exceeds requirements in the Secretary of the Interior's Professional Qualification Standards in Architectural History and History

YEARS OF EXPERIENCE

5

EXPERIENCE

Rincon Consultants, Inc. (2021 to present)

Urbana Preservation & Planning, LLC (2019 to 2021)

Philadelphia City Planning Commission (2018 to 2019)

Ashley V. Losco

Architectural Historian / Assistant Project Manager

Ashley is an architectural historian and assistant project manager with Rincon's cultural resources group. She has over four years of experience working in the field of historic preservation in areas such as Federal Tax Credit projects, evaluating historic properties under the California Environmental Quality Act (CEQA) and the National Historic Preservation Act (Section 106), field surveys, HABS documentation, Mills Act Applications, and local designations. Ashley is the Built Environment Oversight Manager for the California High Speed Rail Project Construction Package 1 Fresno to Bakersfield. She received her master's degree in Historic Preservation from the University of Pennsylvania in 2019 and has worked in consulting since graduation. Ashley meets and exceeds the requirements in the Secretary of the Interior's Professional Qualification Standards in Architectural History and History.

SELECT PROJECT EXPERIENCE

Built Environment Oversight, California High Speed Rail Authority – California High Speed Rail Construction Package 1, Fresno to Bakersfield
On behalf of the California High Speed Rail Authority, Ms. Losco worked as part of the Cultural Resources Construction Management Team as Built Environment Oversight. Ms. Losco managed mitigation measures for eleven built environment resources within the city of Fresno, including vibration monitoring, resource documentation through field survey and California Department of Parks and Recreation 523 Series Forms (DPR forms), and communication with the contractor, TPZP, the City of Fresno Planning Department, and the City of Fresno Historic Preservation Commission. Ms. Losco oversaw three cultural resource specialists.

Architectural Historian, RPCA Solar 14, LLC – Battle Creek Bottom Solar Project, Shasta County
Ms. Losco assisted in the preparation of a Cultural Resources Technical Report for the Battle Creek Bottom Solar Project in an unincorporated area of Shasta County. Ms. Losco recorded and evaluated a segment of the Volta to Inskip Powerline for inclusion in the NRHP and CRHR per Section 106 and CEQA guidelines. The powerline was constructed around 1917 as part of the Battle Creek Hydroelectric system, which Ms. Losco noted in the property history and historical context sections. Ms. Losco recommended the powerline ineligible for listing in the NRHP and CRHR; all research and results were included in the report and DPR forms.

Architectural Historian, 8MinuteEnergy – Sienna Solar and Storage Project, Lucerne Valley
8minutenergy retained Rincon to conduct a Phase I cultural resources study for the Sienna Solar and Storage Project located approximately 3.5 miles north of the unincorporated community of Lucerne Valley in San Bernardino County, California. As Architectural Historian, Ashley evaluated ten historic built environment resources identified within the project boundary, including one powerline, five single-family properties, and four roads. Ashley conducted historical research on the ten resources using historic aerials, newspapers, and directories to reach the conclusion that the nine of the properties were not eligible for the National Register of Historic Places (NRHP) nor the California Register of Historic Resources (CRHR) and one resource was eligible for both the NRHP and the CRHR. As part of the evaluation, she prepared California Department of Parks and Recreation Forms (DPR Forms) including physical descriptions, site development, and historical evaluations for each of the properties.

Architectural Historian, 92JT 8minute Solar Energy – Big Rock 1A Solar Farm Project, Imperial County
92JT 8minute Solar Energy retained Rincon to conduct a cultural resources assessment for the proposed Big Rock 1A Solar Farm Project in Imperial County, California in compliance with CEQA regulations. As part of the larger cultural resources assessment, Ashley evaluated the built environment resources within the 106-acre project area, all previously recorded canals, roads, and properties associated with agricultural uses in the Imperial County. Ashley evaluated the under CRHR criteria and found all of the resources ineligible for listing to the CRHR. Ashley's findings were included in the final project report and DPR form updates were prepared for each resource.

Architectural Historian, MRS Environmental – Phase II State Abandonment of Orphan Wells Project, Los Angeles
On behalf of California Department of Conservation California Geologic Energy Management Division (CalGEM), MRS Environmental retained Rincon to prepare a Historic Properties Identification and Finding of Effects Report for the Phase II State Abandonment of Orphan Wells Project in Los Angeles. In compliance with Section 106, Ms. Losco and the Cultural Resource team delineated an Area of Potential Effects (APE) around each well location, conducted archival research, a records search of the California Historical Resources Information System (CHRIS), local interested party consultation, field survey, and prepared a technical report. Ms. Losco conducted the local consultation, recorded and evaluated the well site for national, state, and local listing, and contributed to the technical report.

Architectural Historian and Assistant Project Manager, Los Angeles County Development Authority (LACDA) – Willowbrook III Project, Willowbrook
LACDA retained Rincon to prepare an environmental assessment for a multi-family residential project using funding from the US Department of Housing and Urban Development in compliance with Section 106. As part of the project, Rincon prepared a cultural resources study which included delineation of an Area of Potential Effect in coordination with LACDA and pursuant to their Programmatic Agreement (PA), a CHRIS search, Native American and interested parties consultation support, field survey of the APE, and evaluation of the property for listing in the National Register of Historic Places (NRHP). Due to the history of the APE, Rincon conducted additional interested parties consultation in order to collect more information on the site.

Architectural Historian, Metropolitan Water District (MWD) – Weymouth Master Plan Update EIR, La Verne
Rincon was retained by MWD to provide environmental support for the MWD Weymouth Master Plan Update EIR. As part of the project, Ms. Losco prepared a Historic Resource Evaluations for the Field Engineering Building, Finished Reservoir, and the Weymouth Storage Buildings at the Weymouth Water Treatment Plant in La Verne, California. Ms. Losco conducted research, provided oversight for the built environment survey, and recorded and evaluated the three buildings on DPR forms. She utilized the *Cultural Resource Treatment Plan for the Weymouth Water Treatment Plant Historic District, City of La Verne, Los Angeles County, California* prepared by MWD and Applied EarthWorks Inc. in 2016 and information provided by the client to evaluate the eligibility of the three buildings.

Architectural Historian, SALT Landscape Architects – Pacoima Wash Greenway Feasibility Study Project, Pacoima
SALT Landscape Architects retained Rincon to conduct an Environmental Constraints Study for the Pacoima Wash Greenway Feasibility Study Project in Pacoima, California. Ms. Losco and the Cultural Resources team prepared the Cultural Resources Constraints section of the study which included a CHRIS search, background research, an aerial imagery and historical topographic map review, a NAHC SLF search, and recommendations. Ms. Losco reviewed the NRHP, CRHR, BERD, and local list of resources for any historical resources within or adjacent to the project site as well as historical aerials and topographic maps. Ms. Losco provided recommendations for recording any historic resources in the area and next steps for the proposed project in regards to cultural resources.

Architectural Historian and Assistant Project Manager, Los Angeles County Development Authority (LACDA) – Santa Fe Springs Village Project, Santa Fe Springs
Rincon conducted additional environmental assessments for LACDA under one contract, including a cultural resources assessment for the Santa Fe Springs Village Project in Santa Fe Springs. As part of the project, Rincon prepared a cultural resources study which included delineation of an Area of Potential Effect in coordination with LACDA and pursuant to their Programmatic Agreement (PA), a CHRIS search, Native American and interested parties consultation support, and field survey of the APE. Ms. Losco recorded and evaluated the property for listing in the National Register of Historic Places (NRHP).



Laura Yadira Maldonado, RPA

Archaeologist

Laura is a Registered Professional Archaeologist with Rincon Consultants, Inc. Ms. Maldonado has four years of professional archaeology experience and has participated in projects spanning from Alameda, Contra Costa, Fresno, Kings, Kern, Los Angeles, Mendocino, Monterey, Riverside, Sacramento, San Benito, San Joaquin, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, and Tulare counties.

EDUCATION

MA, Anthropology, San Francisco State University

BA, Anthropology, University of California, Berkeley

CERTIFICATIONS/ REGISTRATIONS

Register of Professional Archaeologists (#5599)

Paleontology Cross-Trained

YEARS OF EXPERIENCE

4

EXPERIENCE

Rincon Consultants, Inc. (Part-time Oct. 2020-2021, Full-time Oct 2021-present)

RINCON PROJECT EXPERIENCE

Assistant Project Manager and Field Crew Member, Palmdale Water District – Palmdale Ditch Conversion Project, Palmdale, Los Angeles County
Ms. Maldonado performed as the assistant project manager for the Palmdale Ditch Conversion Project. Ms. Maldonado is the primary report author, assisted with field scheduling, and maintained project-related notes. Ms. Maldonado also performed as a field crew member during multiple survey efforts by maintaining field notes and photos and assisting with recording resources in the field. Ms. Maldonado communicated with Rincon project managers and Palmdale Water District Staff to ensure field access and properly survey the area. November 2023 to February 2024 (11 days)

Field Crew Member, SoCalGas– Line 247 Segment 2 Replacement Project (eTS 44681.01), La Goleta, Santa Barbara County
Ms. Maldonado performed as a field crew member for the Phase II excavations located at the Gaviota Coast in Santa Barbara County. Ms. Maldonado excavated two test units and screened soils to identify the presence of cultural resources. Ms. Maldonado also maintained all field forms and communicated with the Barbareño Band of Chumash Indians tribal monitor and Rincon project managers to ensure proper excavation methods. December 2023 (3 days)

Field Crew Lead, Wallace Group – Imerys Solar Project, Lompoc, Santa Barbara County
Ms. Maldonado led extended Phase I excavations located at the Imerys Minerals California Lompoc Plant. Ms. Maldonado led excavation of 18 shovel test pits to identify the presence of cultural resources and contributed to the Archaeological Resources Technical Report. Ms. Maldonado also completed all field forms, maintained notes and photos, and communicated with the Santa Ynez Band of Chumash Indians tribal monitor, Rincon project managers, and facility staff to ensure proper excavation methods. October 2023 (3 days)

Field Crew Lead, California Department of Transportation –Coastal Rail Trail Segments 10 and 11 Project, Santa Cruz County
Ms. Maldonado led extended Phase I excavations located in Capitola. Ms. Maldonado led excavations of five shovel test pits to identify the presence of cultural resources and contributed to the Extended Phase I Report. Ms. Maldonado also completed all field forms, maintained notes and photos, and communicated with the Indian Canyon Mutsun Band of Costanoan Ohlone People tribal monitor and Rincon project managers to ensure proper excavation methods. August 2023 (1 day)

Archaeologist, Cambria Community Services District – Cambria CSD Stuart Street Tanks Project, Cambria, San Luis Obispo County
Ms. Maldonado conducted the pedestrian survey of the 0.33-acre property in Cambria, San Luis Obispo County. Ms. Maldonado maintained a survey log, photos, and communicated with Rincon project managers to ensure proper survey methods. May 2024 (1 day)

Archaeologist, Santa Rita School District – Sbrana Elementary School Project, Salinas, Monterey County
Ms. Maldonado conducted the pedestrian survey of the 10-acre property in Salinas, Monterey County. Ms. Maldonado maintained a survey log, photos, and communicated with Rincon project managers to ensure proper survey methods. April 2024 (1 day)

Archaeologist, MidPen Housing Corporation – 1171 Sonora Court Project, Sunnyvale, Santa Clara County
Ms. Maldonado conducted the pedestrian survey of the 1.3-acre property in Sunnyvale, Santa Clara County. Ms. Maldonado maintained a survey log, photos, and communicated with Rincon project managers to ensure proper survey methods. February 2024 (1 day)

Archaeologist, Dublin San Ramon Services District – Reservoir 20B Project, Dublin, Alameda County
Ms. Maldonado conducted the pedestrian survey of the 12-acre property in Dublin, Alameda County. Ms. Maldonado maintained survey notes and photos and communicated with construction crews and Rincon project managers to ensure proper survey methods. Ms. Maldonado is also the primary author of the Cultural Resources Assessment Letter Report. November 2023 (1 day)

Archaeologist, Soquel Creek Water District – Moosehead Drive Main Replacement Project, Aptos, Santa Cruz County
Ms. Maldonado conducted the pedestrian survey of the 1.6-acre project area in Aptos, Santa Cruz County. Ms. Maldonado maintained survey notes and photos and communicated with Rincon project managers to ensure proper survey methods. Ms. Maldonado is also a contributing author to the Cultural Resources Technical Report. November 2023 (1 day)

Archaeologist, Heritage Ranch Community Services District – Heritage Ranch Water Resource Recovery Facility Project, Lake Nacimiento, San Luis Obispo County
Ms. Maldonado conducted the pedestrian survey of the 2,800-linear foot pipeline alignment in Lake Nacimiento, San Luis Obispo County. Ms. Maldonado maintained survey notes and photos and communicated with Rincon project managers to ensure proper survey methods. October 2023 (1 day)

Archaeologist, Circlepoint – Sabercat Trail Improvements Project, Fremont, Alameda County
Ms. Maldonado conducted the pedestrian survey of the project alignment within the 98-acre Sabercat Historical Park in Fremont, Alameda County. Ms. Maldonado maintained survey notes and photos and communicated with Rincon project managers to ensure proper survey methods. September 2023 (1 day)

Assistant Field Lead, Ecosphere Environmental Services– Sequoia National Forest Cultural Resource Surveys, Tulare County
Ms. Maldonado acted as an assistant field lead during survey efforts of the Sequoia National Forest Cultural Resource surveys. Ms. Maldonado assisted in leading a survey crew for the 21,245-acre survey. Ms. Maldonado also assisted in leading a crew to flag sensitive resource areas within the 3,900-acre Windy Fire Hazard Trees survey area. Additionally, Ms. Maldonado kept in communication with Rincon project managers and field leads, maintained daily survey notes and photos, and recorded prehistoric and historic resources. October 2022 to September 2023. (12 days)

Archaeologist, City of Monterey – 2 Upper Ragsdale Drive Project, Monterey, Monterey County
Ms. Maldonado conducted the pedestrian survey of the 21.2-acre property in Monterey. Ms. Maldonado maintained survey notes and photos and communicated with Rincon project managers to ensure proper survey methods. Ms. Maldonado is also the primary author of the Cultural Resources Memorandum. June 2023 (1 day)

Archaeologist, City of Seaside – Fire Station No. 2 Project, Seaside, Monterey County
Ms. Maldonado conducted the pedestrian survey of the 5.9-acre property in Seaside, Monterey County. Ms. Maldonado maintained survey notes and photos and communicated with Rincon project managers to ensure proper survey methods. Ms. Maldonado is also the primary author of the Cultural Resources Assessment.

Appendix B

California Historical Resources Information System Search Results

CENTRAL CALIFORNIA INFORMATION CENTER

California Historical Resources Information System
Department of Anthropology – California State University, Stanislaus
One University Circle, Turlock, California 95382
(209) 667-3307

Alpine, Calaveras, Mariposa, Merced, Mono, San Joaquin, Stanislaus & Tuolumne Counties

Date: 3/17/2025

Records Search File No.: 13271L
Project: Copperopolis Road Solar Development, Rincon Project #25-17409

Laura Maldonado
Rincon Consultants, Inc.
180 N. Ashwood Avenue
Ventura, CA 93003
805-644-4455

Invoice to: ap@rinconconsultants.com

lmadonaldo@rinconconsultants.com

The Central California Information Center received your record search request for the project area referenced above, located on the Stockton East 7.5' quadrangle in San Joaquin County. The following reflects the results of the records search for the project study area and radius:

As per data currently available at the CCaIC, the locations of resources/reports are provided in the following format: ☐ Custom GIS maps ☒ GIS Data/shape files

Summary Data:

Resources within the project area:	None formally reported to the Information Center.
Resources within the 1/2-mile radius:	1: P-39-005478
Reports within the project area:	None formally reported to the Information Center.
Reports within the 1/2-mile radius:	8: SJ-01432, 3131, 6507, 6648, 6723, 6724, 7073, 8284

Resource Database Printout (list): ☒ enclosed ☐ not requested ☐ nothing listed

Resource Database Printout (details): ☐ enclosed ☒ not requested ☐ nothing listed

Resource Digital Database Records: ☐ enclosed ☒ not requested ☐ nothing listed

Report Database Printout (list): ☒ enclosed ☐ not requested ☐ nothing listed

Report Database Printout (details): ☐ enclosed ☒ not requested ☐ nothing listed

Report Digital Database Records: ☐ enclosed ☒ not requested ☐ nothing listed

Resource Record Copies: ☒ enclosed ☐ not requested ☐ nothing listed

Report Copies: ☐ enclosed ☒ not requested ☐ nothing listed

OHP Historic Properties Directory: New Excel File: Built Environment Resource Directory (BERD)
Dated 9/23/2022: NOTE: Not all resources listed in the BERD are mapped in GIS, nor do we have records on file for; if you identify additional resources in the BERD that you need copies of, contact the IC.
☐ enclosed ☐ not requested ☒ nothing listed

Archaeological Resource Directory (ARD excerpt): ☐ enclosed ☐ not requested ☒ nothing listed

CA Inventory of Historic Resources (1976): ☐ enclosed ☒ not requested ☐ nothing listed

Caltrans Bridge Survey: ☐ enclosed ☒ not requested ☐ nothing listed

Ethnographic Information: ☐ enclosed ☒ not requested ☐ nothing listed

Historical Literature: ☐ enclosed ☒ not requested ☐ nothing listed

Historical Maps: ☐ enclosed ☒ not requested ☐ nothing listed

See also: http://ngmdb.usgs.gov>topoview

Local Inventories: ☐ enclosed ☒ not requested ☐ nothing listed

GLO and/or Rancho Plat Maps: ☐ enclosed ☒ not requested ☐ nothing listed

See also: https://glorecords.blm.gov

Shipwreck Inventory: ☒ not available at CaCIC; please go to http://shipwrecks.slc.ca.gov/ShipwrecksDatabase/Shipwrecks_Database.asp

Soil Survey Maps: ☒ not available at CCaIC; please go to http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Thank you for using the California Historical Resources Information System (CHRIS). **Note:** Billing will be transmitted separately via email by our Financial Services office* ($240.45), payable within 60 days of receipt of the invoice.

If you wish to include payment by Credit Card, you must wait to receive the official invoice from Financial

Services so that you can reference the CMP # (Invoice Number), and then contact the link below:

https://commerce.cashnet.com/ANTHROPOLOGY

Sincerely,

E. A. Greathouse

E. A. Greathouse, Coordinator
Central California Information Center
California Historical Resources Information System

* Invoice Request sent to: ARBilling@csustan.edu, CSU Stanislaus Financial Services

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SJ-01432	NADB-R - 1366192	1989	Gilbert, C. J.	Draft Environmental Assessment Calaveras River Reconnaissance Study for Flood Control	US Army Corps of Engineers, Sacramento District	05-000231, 05-000340, 05-000357, 05-000386, 05-000387, 05-000388, 05-000411, 05-001095, 05-001096, 05-001116, 05-001175, 05-001178, 05-001200, 05-001392, 05-001393, 05-001401, 05-001402, 39-000145, 39-000154, 39-000155, 39-000234
SJ-01432		1989	Gilbert, Carlys J.	Draft - Calaveras River, California: Cultural Resources Overview	Corps of Engineers	
SJ-03131	NADB-R - 1363281	1997	Busby, C. I., S. Guedon, and M. Tannam	Cultural Resources Assessment: Bear Creek, South Paddy Creek, Stockton Diverting Canal, Mormon Slough and Potter Creek A, San Joaquin Area Flood Control Restoration Plan, San Joaquin County, California. Final Report.	Basin Research Associates, Inc. (for EIP Associates)	39-000155
SJ-06507	NADB-R - 1366739	2007	URS Corporation	Cultural Resources Report for Geotechnical Evaluations of the San Joaquin Area Flood Control Agency Project Levees	URS Corporation; for DWR	39-000220, 39-004639, 39-004640
SJ-06648	NADB-R - 1366891	2008	Schmid, T. A. and J. K. Offerman	Department of Water Resources, Archaeological Survey Report for San Joaquin Flood Protection Critical Levee Repairs Project: San Joaquin River Mile (RM) 42.3, Mormon Slough Site 33R, and Paradise Cut.	Schmid and Offerman; for Dept. of Water Resources	
SJ-06723	NADB-R - 1367019	2008	URS Corporation	Technical Report, Final: Cultural Resources Survey Report for the Urban Levee Project	URS Corporation; for Department of Water Resources	
SJ-06724	NADB-R - 1367026	2008	URS Corporation	Technical Report, Final: Cultural Resources Baseline Literature Review for the Urban Levee Project	URS Corporation; for Department of Water Resources	39-002513
SJ-07073	NADB-R - 1367379	2009	Harrington, L.	An Archaeological Evaluation of the Department of Water Resources Geotechnical Levee Investigation Stockton Diverting Canal 6.7 Mile Linear Survey Stockton, California	Parus Consulting, Inc. for Kleinfelder West, Inc.	
SJ-08284		2011	AECOM	Cultural Resources Inventory Report for the Central Valley Independent Network Fiber Optic Communications Network Project, California (Calaveras, Merced, San Joaquin, Stanislaus and Tuolumne Counties in the CCaIC Area of Responsibility)	AECOM; for Central Valley Independent Network	

Resource List

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-39-005478	CA-SJO-000378H	Resource Name - Mormon Slough Levees; Mormon Slough North Levee	Structure	Historic	HP11; HP20	2021 (Zickler-Martin, ECORP Consulting, Inc.); 2022 (M. Campbell, Dokken Engineering); 2023 (Andrew Ugan, USACE)	SJ-09451, SJ-09486, SJ-09900

Appendix C

Native American Heritage Commission Sacred Lands File Search Results

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Reginald Pagaling
Chumash

VICE-CHAIRPERSON
Buffy McQuillen
Yokayo Pomo, Yuki, Nomlaki

SECRETARY
Sara Dutschke
Miwok

PARLIAMENTARIAN
Wayne Nelson
Luiseño

COMMISSIONER
Isaac Bojorquez
Ohlone-Costanoan

COMMISSIONER
Stanley Rodriguez
Kumeyaay

COMMISSIONER
Reid Milanovich
Cahuilla

COMMISSIONER
Bennae Calac
Pauma-Yuima Band of Luiseño Indians

COMMISSIONER
Vacant

ACTING EXECUTIVE SECRETARY
Steven Quinn

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710

March 17, 2025

Laura Maldonado
Rincon Consultants, Inc.

Via Email to: lmaldonado@rinconconsultants.com

Re: Copperopolis Road Solar Development Project, San Joaquin County

To Whom It May Concern:

As requested, a record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed based on information submitted for the above referenced project. The results were positive. Please contact the tribes on the attached list for more information. Please note that tribes do not always record their sacred sites in the SLF, nor are they required to do so. As such, a SLF search is not a substitute for consultation with all tribes that are traditionally and culturally affiliated with a project's geographic area.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. Please contact all of those listed; if they cannot supply information, they may recommend others with specific knowledge. If within two weeks of notification, a response has not been received, the Commission requests that you follow-up with a telephone call or email to ensure that the project information was received.

If you receive notification of a change of address or phone number from a tribe, please notify the NAHC so that we can assure that our lists contain current information.

In addition to engaging in tribal consultation, you should consult the appropriate regional California Historical Research Information System (CHRIS) archaeological Information Center to determine whether it has information regarding the presence of recorded archaeological sites within the project area.

If you have any questions or need additional information, please contact me at Pricilla.Torres-Fuentes@nahc.ca.gov .

Sincerely,

Pricilla Torres-Fuentes

Pricilla Torres-Fuentes
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
San Joaquin County
3/18/2025

County	Tribe Name	Fed (F) Non-Fed (N)	Contact Person	Contact Address	Phone #	Fax #	Email Address	Cultural Affiliation	Counties	Last Updated
San Joaquin	Amah Mutsun Tribal Band	N	Valentin Lopez, Chairperson	P.O. Box 5272 Galt, CA, 95632	(916) 743-5833		vjltestingcenter@aol.com	Costanoan Northern Valley Yokut	Alameda,Calaveras,Contra Costa,Fresno,Madera,Mariposa,Merced,Monterey,San Benito,San Francisco,San Joaquin,San Mateo,Santa Clara,Santa Cruz,Stanislaus	7/20/2023
	Amah Mutsun Tribal Band	N	Ed Ketchum, Vice-Chairperson		(530) 578-3864		aerieways@aol.com	Costanoan Northern Valley Yokut	Alameda,Calaveras,Contra Costa,Fresno,Madera,Mariposa,Merced,Monterey,San Benito,San Francisco,San Joaquin,San Mateo,Santa Clara,Santa Cruz,Stanislaus	7/20/2023
	Muwekma Ohlone Tribe of the SF Bay Area	N	Richard Massiatt, Councilmember/MLD Tribal Rep.	1169 S. Main Street, Ste. 336 Manteca, CA, 95377	(209) 321-0372		rmassiatt@muwekma.org	Costanoan	Alameda,Contra Costa,Marin,Merced,Napa,Sacramento,San Francisco,San Joaquin,San Mateo,Santa Clara,Santa Cruz,Solano,Sonoma,Stanislaus	3/28/2024
	Muwekma Ohlone Tribe of the SF Bay Area	N	Charlene Nijmeh, Chairperson	1169 S. Main Street, Ste. 336 Manteca, CA, 95377	(408) 464-2892		cnijmeh@muwekma.org	Costanoan	Alameda,Contra Costa,Marin,Merced,Napa,Sacramento,San Francisco,San Joaquin,San Mateo,Santa Clara,Santa Cruz,Solano,Sonoma,Stanislaus	3/28/2024
	Northern Valley Yokut / Ohlone Tribe	N	Katherine Perez, Chairperson	P.O. Box 717 Linden, CA, 95236	(209) 649-8972		canutes@verizon.net	Costanoan Northern Valley Yokut	Alameda,Calaveras,Contra Costa,Fresno,Madera,Mariposa,Merced,Sacramento,San Benito,San Joaquin,Santa Clara,Solano,Stanislaus	4/30/2024
	Northern Valley Yokut / Ohlone Tribe	N	Timothy Perez, Tribal Compliance Officer	P.O. Box 717 Linden, CA, 95236	(209) 662-2788		huskanam@gmail.com	Costanoan Northern Valley Yokut	Alameda,Calaveras,Contra Costa,Fresno,Madera,Mariposa,Merced,Sacramento,San Benito,San Joaquin,Santa Clara,Solano,Stanislaus	11/21/2023
	Tule River Indian Tribe	F	Neil Peyron, Chairperson	P.O. Box 589 Porterville, CA, 93258	(559) 781-4271	(559) 781-4610	neil.peyron@tulerivertribe-nsn.gov	Yokut	Alameda,Amador,Calaveras,Contra Costa,Fresno,Inyo,Kern,Kings,Madera,Mariposa,Merced,Monterey,Sacramento,San Benito,San Joaquin,San Luis Obispo,Stanislaus,Tulare,Tuolumne	
	Tule River Indian Tribe	F	Kerri Vera, Environmental Department	P. O. Box 589 Porterville, CA, 93258	(559) 783-8892	(559) 783-8932	kerri.vera@tulerivertribe-nsn.gov	Yokut	Alameda,Amador,Calaveras,Contra Costa,Fresno,Inyo,Kern,Kings,Madera,Mariposa,Merced,Monterey,Sacramento,San Benito,San Joaquin,San Luis Obispo,Stanislaus,Tulare,Tuolumne	7/22/2016
	Wilton Rancheria	F	Steven Hutchason, Tribal Historic Preservation Officer	9728 Kent Street Elk Grove, CA, 95624	(916) 683-6000		shutchason@wiltonrancheria-nsn.gov	Nisenan Miwok	Alameda,Alpine,Amador,Contra Costa,El Dorado,Mono,Nevada,Placer,Sacramento, San Joaquin,Solano,Stanislaus,Sutter,Yolo,Yuba	2/12/2025
	Wilton Rancheria	F	Michelle St. Clair, Executive Director of Cultural Preservation	9728 Kent Street Elk Grove, CA, 95624	(916) 683-6000		mstclair@wiltonrancheria-nsn.gov	Nisenan Miwok	Alameda,Alpine,Amador,Contra Costa,El Dorado,Mono,Nevada,Placer,Sacramento, San Joaquin,Solano,Stanislaus,Sutter,Yolo,Yuba	2/12/2025
	Wilton Rancheria	F	Cultural Preservation Department,	9728 Kent Street Elk Grove, CA, 95624	(916) 313-4493		cpd@wiltonrancheria-nsn.gov	Nisenan Miwok	Alameda,Alpine,Amador,Contra Costa,El Dorado,Mono,Nevada,Placer,Sacramento,San Joaquin,Solano,Stanislaus,Sutter,Yolo,Yuba	2/12/2025
	Wuksachi Indian Tribe/Eshom Valley Band	N	Kenneth Woodrow, Chairperson	1179 Rock Haven Ct. Salinas, CA, 93906	(831) 443-9702		kwood8934@aol.com	Foothill Yokut Mono	Alameda,Calaveras,ContraCosta,Fresno,Inyo,Kings,Madera,Marin,Mariposa,Merced,Mono,Monterey,San Benito,San Francisco,San Joaquin,San Mateo,Santa Clara,Santa Cruz,Stanislaus,Tulare,Tuolumne	6/19/2023

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Copperopolis Road Solar Development Project, San Joaquin County.

Record: PROJ-2025-001410
Report Type: List of Tribes
Counties: San Joaquin
NAHC Group: All

Appendix D

Local Interested Party Consultation

Table 1 Local Interested Party Consultation Tracking

Contact	Outreach Efforts	Response to Outreach Efforts
San Joaquin County Historical Museum Linda Derivi, President P.O. Box 30 Lodi, California 95241-0030 Phone: 209-331-2055 Email: info@sanjoaquinhistory.org	**3/21/2025** – Letter sent via email **4/11/2025** – Follow-up email	**3/21/2025** – Via email, Phillip E. Merlo, Executive Director, responded to Rincon's email asking if the project intended to demolish the house on Copperopolis Road. He also noted that all letters should go to him as Board members rotate but staff are constant. Rincon responded that the house would be demolished as part of the project. Mr. Merlo responded that he would need to consult the organization's archival collection before commenting on the project. He stated "the person who owned that house in the 1950s and 1960s, Wesley King was, prior to living there, a well-known labor organizer with the AFL-CIO. He was also quite involved in fighting for groundwater rights in a much-publicized battle with the state in the late '60s. The house is clearly not architecturally significant, but I want to check some things about who owned the building prior to Mr. King." **4/11/2025** – Mr. Merlo responded to Rincon's follow-up email that he was unable to consult his archival collection for information on the property. Rincon responded notifying Mr. Merlo that research identified that Mr. Merlo was referring to William King not Wesley King. Wesley King, who lived at 11620 East Copperopolis Road, was not a labor organizer with the AFL-CIO, though he was involved in fighting for groundwater rights.

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Rincon Consultants, Inc.
4825 J Street, Suite 200
Sacramento, California 95819
916-706-1374

Date: March 21, 2025
Project No: 25-17409

Linda Derivi, President
San Joaquin County Historical Museum
P.O. Box 30
Lodi, California 95241-0030
Via email: info@sanjoaquinhistory.org

Subject: Copperopolis Road Solar Development Project, San Joaquin County, California

Dear Ms. Derivi:

Rincon Consultants, Inc. (Rincon) has been retained to perform a Cultural Resources Study for the Copperopolis Road Solar Development Project, located on three parcels totaling approximately 14.2 gross acres in San Joaquin County, California (Assessor's Parcel Numbers 165-13-051, 165-13-052, 165-13-053, and 165-13-054). The project would demolish two extant single-family residential buildings and associated agricultural structures on the site. The project is subject to the California Environmental Quality Act (CEQA).

As a component of the cultural resources study, Rincon is consulting interested parties to request information on potential or known historical resources or other cultural resources in the project area or vicinity. If you or your organization have any knowledge of, or specific concerns regarding historical resources in the project area, please respond by telephone at 619-841-2116 or by email to alosco@rinconconsultants.com. Thank you for your assistance.

Sincerely,
Rincon Consultants, Inc.

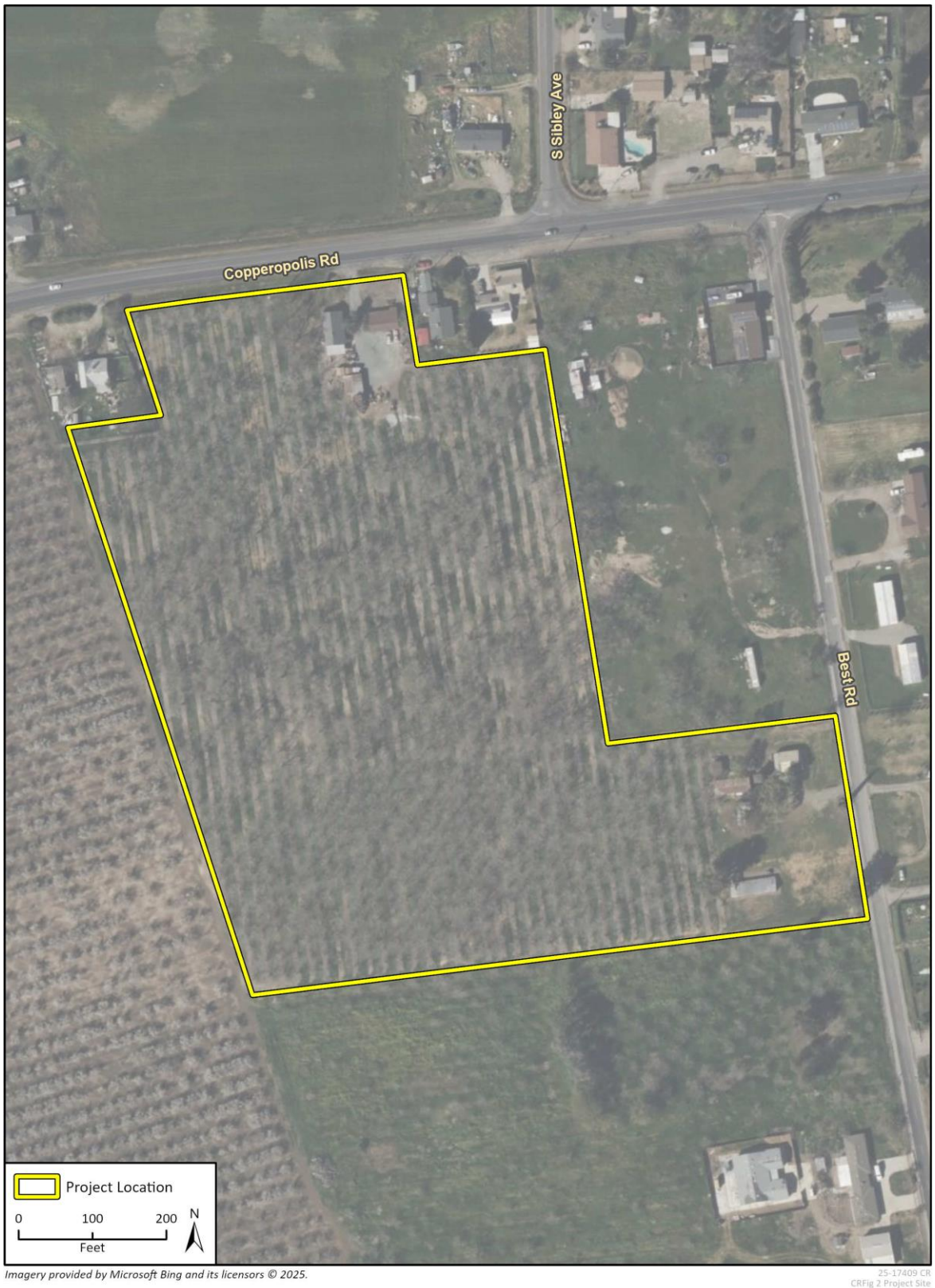
Ashley Losco

Ashley Losco, MHP
Architectural Historian

Attachments

Figure 1 Project Location Map

Figure 1 Project Location Map



Imagery provided by Microsoft Bing and its licensors © 2025.

25-17409 CR
CRFig 2 Project Site

Outlook

Re: [EXT] Re: Copperopolis Road Solar Development Project Local Consultation

From Ashley Losco <alosco@rinconconsultants.com>
Date Fri 4/11/2025 2:32 PM
To Phillip Merlo <p.merlo@sanjoaquinhistory.org>; Info SJHSM <Info@sanjoaquinhistory.org>

Hi Phillip,

I'm sorry the last few weeks have been bad. We'll be working on the report for another two weeks, so if you find time, please let me know. At the end of the two weeks, I'll close out consultation, but you can always reach out after, and we can update the information you provided.

I did some initial research on Wesley King and based on the research he was associated with the water rights event but not the AFL-CIO. I did find a William King who was a resident of the county and was a worker's activist and part of AFL-CIO. See the links below.

- https://farmworkermovement-csun.org/william_king/
- https://digital-collections.csun.edu/digital/collection/FMC/id/4384/

Thanks,
Ashley

Ashley Losco, Architectural Historian/Assistant Project Manager
(*She/Her/Hers*)
805-644-4455 Main | 619-841-2116 Direct
alosco@rinconconsultants.com

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Out of Office Alert: April 18 and April 25-28

From: Phillip Merlo
Sent: Friday, April 11, 2025 2:22 PM
To: Ashley Losco; Info SJHSM
Subject: Re: [EXT] Re: Copperopolis Road Solar Development Project Local Consultation

CAUTION: This email originated from outside of Rincon Consultants. Be cautious before clicking on any links, or opening any attachments, until you are confident that the content is safe .

Ashley,

Unfortunately the last few weeks have been hellacious at the museum, and I haven't had any time to work on this.

Best,
Phillip

Photo

Phillip E. Merlo
Executive Director
San Joaquin County Historical Museum

phone-icon (209) 331-2055
phone-icon 11793 N. Micke Grove Road, Lodi, CA 95240
phone-icon **www.sanjoaquinhistory.org**

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The San Joaquin County Historical Society & Museum engages and inspires people and communities by preserving and showcasing the agricultural innovation, ingenuity, and diverse histories of our county.

From: Ashley Losco <alosco@rinconconsultants.com>
Sent: Friday, April 11, 2025 10:52 AM
To: Phillip Merlo <p.merlo@sanjoaquinhistory.org>; Info SJHSM <Info@sanjoaquinhistory.org>
Subject: Re: [EXT] Re: Copperopolis Road Solar Development Project Local Consultation

Hi Phillip,

Hope all is well. I'm just following up with my last email about the Copperopolis Road Solar Development Project. Were you able to find any information on the owners prior to Mr. King? Thank you again for your support.

Best,
Ashley

Ashley Losco, Architectural Historian/Assistant Project Manager
(*She/Her/Hers*)
805-644-4455 Main | 619-841-2116 Direct
alosco@rinconconsultants.com

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*Permanently working from Eastern Standard Time. Please take into consideration when responding to emails and requests. Thank you
Out of Office Alert: April 18 and April 25-28

From: Phillip Merlo
Sent: Friday, March 21, 2025 6:27 PM
To: Ashley Losco; Info SJHSM
Subject: Re: [EXT] Re: Copperopolis Road Solar Development Project Local Consultation

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I will need to consult our organization's archival collections to review historic plat maps and some other data before I can really comment on whether the house has any historic significance. I know that the person who owned that house in the 1950s and 1960s, Wesley King was, prior to living there, a well-known labor organizer with the AFL-CIO. He was also quite involved in fighting for groundwater rights in a much-publicized battle with the state in the late '60s. The house is clearly not architecturally significant, but I want to check some things about who owned the building prior to Mr. King.

Photo

Phillip E. Merlo
Executive Director
San Joaquin County Historical Museum

phone-icon (209) 331-2055
phone-icon 11793 N. Micke Grove Road, Lodi, CA 95240
phone-icon **www.sanjoaquinhistory.org**

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The San Joaquin County Historical Society & Museum engages and inspires people and communities by preserving and showcasing the agricultural innovation, ingenuity, and diverse histories of our county.

From: Ashley Losco <alosco@rinconconsultants.com>
Sent: Friday, March 21, 2025 2:30 PM
To: Phillip Merlo <p.merlo@sanjoaquinhistory.org>; Info SJHSM <Info@sanjoaquinhistory.org>
Subject: Re: [EXT] Re: Copperopolis Road Solar Development Project Local Consultation

Hi Phillip,

Yes, it would be as part of the project. Do you have any concerns about the house, and/or historical information on the house you could provide? We're still in the process of evaluating the two properties, so any information would be helpful.

Thank you,
Ashley

From: Phillip Merlo
Sent: Friday, March 21, 2025 5:24 PM
To: Ashley Losco; Info SJHSM
Subject: Re: [EXT] Re: Copperopolis Road Solar Development Project Local Consultation

CAUTION: This email originated from outside of Rincon Consultants. Be cautious before clicking on any links, or opening any attachments, until you are confident that the content is safe .

Ashley,

Yes. The house on the left. So that house would be demo'd?

Best,
Phillip

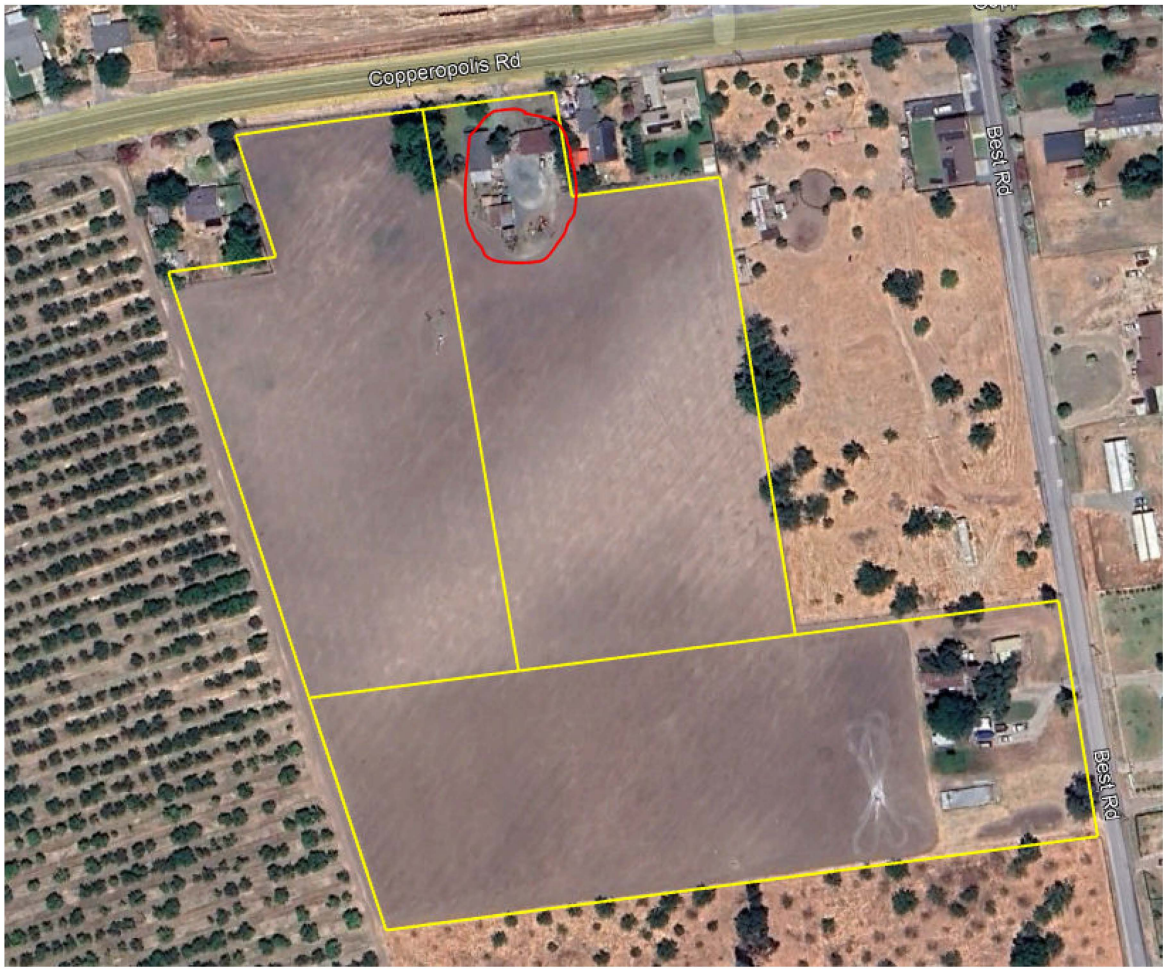
Phillip E. Merlo
Executive Director
San Joaquin County Historical Museum

From: Ashley Losco <alosco@rinconconsultants.com>
Sent: Friday, March 21, 2025 2:11 PM
To: Phillip Merlo <p.merlo@sanjoaquinhistory.org>; Info SJHSM <Info@sanjoaquinhistory.org>
Subject: Re: [EXT] Re: Copperopolis Road Solar Development Project Local Consultation

Hi Phillip,

Thank you for letting me know! I will take note of that for future communication.

The project proposes to demolish the house and ancillary structures at 11620 E. Copperopolis Rd. 95215 (APN 103-220-250-000). Is this the property you are referring to? I included an aerial with the Copperopolis Road property circled in red.



Thanks,
Ashley

From: Phillip Merlo
Sent: Friday, March 21, 2025 5:03 PM
To: Ashley Losco; Info SJHSM
Subject: [EXT] Re: Copperopolis Road Solar Development Project Local Consultation

CAUTION: This email originated from outside of Rincon Consultants. Be cautious before clicking on any links, or opening any attachments, until you are confident that the content is safe .

Good Afternoon Ashley,

Does the project intend to demolish the old house on Copperopolis Road? In the future, Rincon should address letters to me - our Board rotates but the staff is fairly constant.

Best,
Phillip

Photo

Phillip E. Merlo
Executive Director
San Joaquin County Historical Museum

phone-icon (209) 331-2055
phone-icon 11793 N. Micke Grove Road, Lodi, CA 95240
phone-icon **www.sanjoaquinhistory.org**

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The San Joaquin County Historical Society & Museum engages and inspires people and communities by preserving and showcasing the agricultural innovation, ingenuity, and diverse histories of our county.

From: Ashley Losco <alosco@rinconconsultants.com>
Sent: Friday, March 21, 2025 10:29 AM
To: Info SJHSM <Info@sanjoaquinhistory.org>
Subject: Copperopolis Road Solar Development Project Local Consultation

Dear Ms. Derivi,

Rincon was retained to conduct local consultation for the Copperopolis Road Solar Development Project. Attached you will find a letter describing the project and maps of its location. We are reaching out for any information on potential historical resources within or adjacent to the project site or any information you can provide.

Thank you

Best,

Ashley Losco, Architectural Historian/Assistant Project Manager
(*She/Her/Hers*)
805-644-4455 Main | 619-841-2116 Direct
alosco@rinconconsultants.com

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Out of Office Alert: March 28 – April 1, 2025

Appendix E

California Department of Parks and Recreation 523 Series Forms

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

 ***Resource Name or #:** 11620 East Copperopolis Road

P1. Other Identifier: N/A

*__P2.__ **Location:** ☒ **Unrestricted**

***a. County** San Joaquin **and**

***b. USGS 7.5' Quad** *Stockton East, Calif.* **Date** 1987 **T**01N; **R** 07E; **S** 01

c. Address 11620 East Copperopolis Road City Stockton Zip 95215

d. UTM: Zone 10S , 661360.54 mE/ 4203856.29 mN

e. Other Locational Data: San Joaquin County Assessor's Parcel Numbers 103-220-250-000 and 103-220-240-000

***P3a. Description:** 11620 East Copperopolis Road is a single-family and agricultural property (subject property) on the south side of Copperopolis Road in an unincorporated area of San Joaquin County southeast of Stockton. The 8.59-acre property sited across two parcels, 103-220-250-000 and 103-220-240-000, is surrounded by single-family and agricultural properties. Located at the northern end of the property along Copperopolis Road and an unpaved driveway are three buildings: a single-family residence, barn, and storage shed, and at the southern and western ends are former agricultural fields.

See Continuation Sheet.

***P3b. Resource Attributes:** HP2. Single Family Property; HP33. Farm/ Ranch

***P4. Resources Present:** ☒ Building

P5a. Photograph or Drawing



P5b. Description of Photo:
Photo 1: 11620 East Copperopolis Road; facing southwest.

P6. Date Constructed/Age and Source: ☒ Historic
1920 (ParcelQuest 2025)

***P7. Owner and Address:**
Vincent and Rosemary Belli
5721 North Cox Road
Linden, California 95236

***P8. Recorded by:**
Margo Nayyar
Rincon Consultants, Inc.
4825 J Street
Sacramento, California 95819

***P9. Date Recorded:** 4/3/2025

***P10. Survey Type:** Intensive

***P11. Report Citation**: Losco, A., L. Maldonado, H. Haas, M. Nayyar, and N. Jordan. 2025 *Copperopolis Road Solar Development Project, San Joaquin County, California*. Rincon Consultants Project No. 25-17409. Report on file at the Central California Information Center, California State University, Stanislaus.

***Attachments:** ☒Location Map ☒Continuation Sheet ☒Building, Structure, and Object Record

B1. Historic Name: N/A
B2. Common Name: N/A
B3. Original Use: Single-family residence and farm
B4. Present Use: Single-family residence and farm
***B5. Architectural Style:** Craftsman
***B6. Construction History:**

- 1920 – Development of single-family residence and barn (ParcelQuest 2025)
- Between 1968 and 1982 – Construction of storage shed (NETR Online 2025; USGS 2025)
- Circa 2007 – Rear porch added to the residence (Google Earth 2025)
- Enclosure of front porch at an unidentified time. Replacement of a window at the residence and a window at the barn at unidentified times.

***B7. Moved?** ☒**No**

***B8. Related Features:** N/A

B9a. Architect: Unknown b. Builder: Unknown
***B10. Significance: Theme** Agricultural Development in San Joaquin County **Area:** San Joaquin County
Period of Significance 1920 **Property Type** Agricultural **Applicable Criteria** N/A

Historical Context

San Joaquin County

As the flurry of the Gold Rush brought a swelling population of settlers to San Joaquin County, the county was officially established as one of the first 27 counties in the newly formed state of California in 1850. Most of San Joaquin County including the area surrounding the project site developed as an agricultural region, though the largest city in the county, Stockton, was established in 1850 by Captain Charles M. Weber (The Lewis Publishing Company 1890). The community of Linden, approximately five miles northeast of the project site, was established in 1862. In the early years of the area, the main agricultural output was grain, with a flour mill active in the area as early as 1854 (Smith 1976). The introduction of railroads through the county also encouraged the growth of the agricultural industry and orchards as the trains could move products to more markets. The Central Pacific Railroad was constructed in the 1860s from Sacramento to Stockton and west to San Francisco, and in 1909 the Western Pacific Railroad was added to the same line as the Central Pacific Railroad (Davis 1991).

From the late nineteenth to the early twentieth century, agricultural concerns in the area were focused on irrigation, with the Calaveras River and Mormon Slough dammed and diverted for farming near Bellota (*Stockton Evening and Sunday Record* 1935; Smith 1976). When World War II began, California crops fetched a high price, allowing the surrounding area to diversify plantings and develop as an area known for beans, walnuts, and cherries, among other crops. The unincorporated areas of San Joaquin County remained rural and agricultural to this day with some residential and commercial development adjacent to cities in the county. *Continued on the Continuation Sheet.*

B11. Additional Resource Attributes: N/A

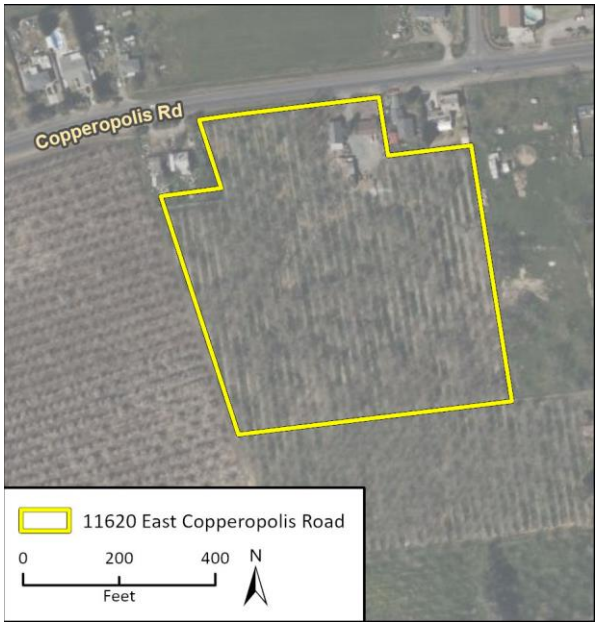
***B12. References:** *See Continuation Sheet.*

B13. Remarks: N/A

***B14. Evaluator:** Ashley Losco, Rincon Consultants, Inc.

***Date of Evaluation:** 4/9/2025

(This space reserved for official comments.)

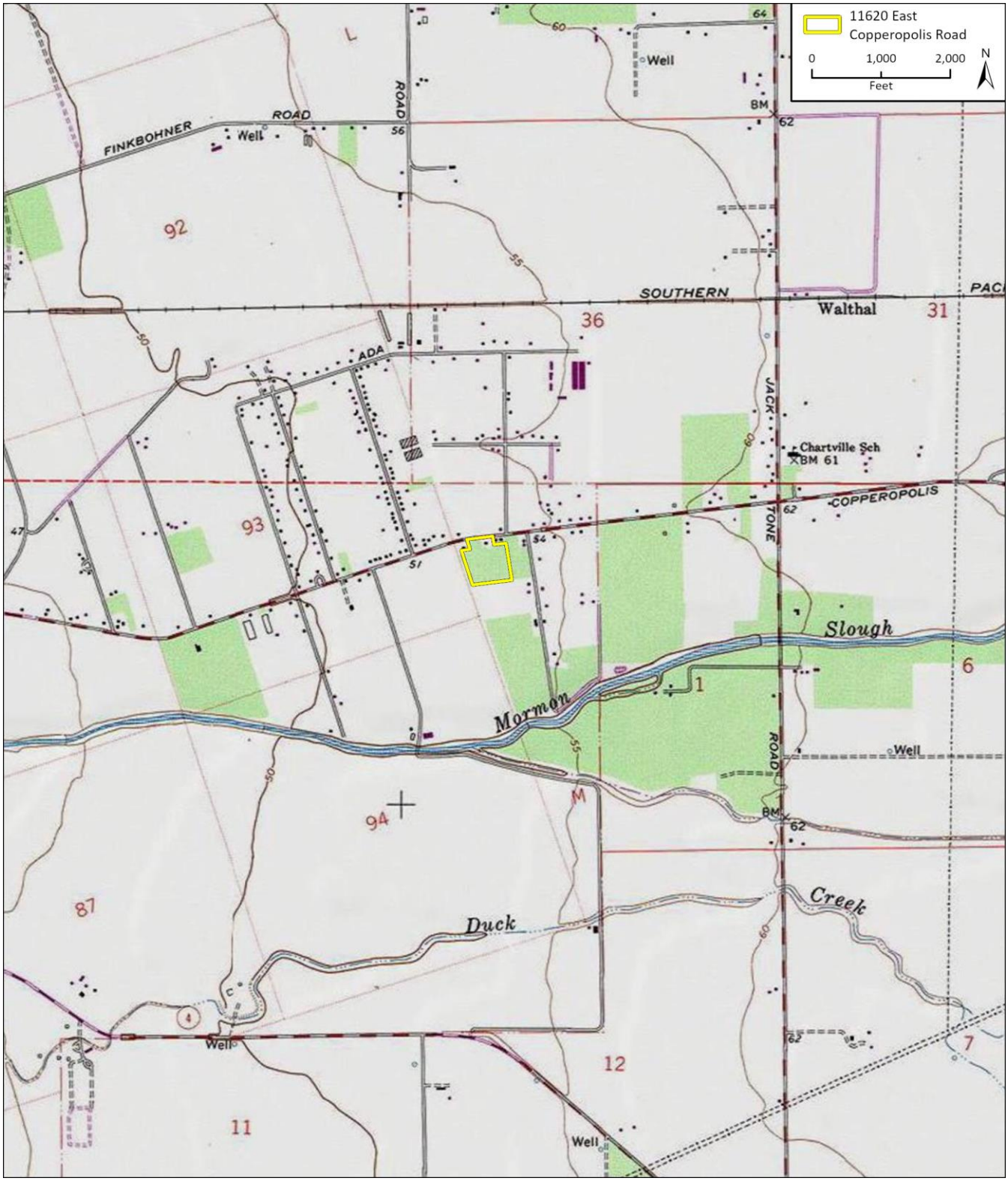


State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #
HRI#
Trinomial

Page 3 **of** 10 ***Resource Name or #** 11620 East Copperopolis Road
***Map Name:** *Stockton East, Calif.* ***Scale:** 1:24,000 ***Date of map:** 1987



* Required information

***P3a. Description (Continued from Page 1):**
The one-story, single-family residence constructed in 1920 displays a raised concrete foundation and expresses a rectangular plan (Photo 1; ParcelQuest 2025). The Craftsman-style building is capped with a front gable roof clad in composition shingles with overhanging eaves, exposed rafter ends, and decorative knee braces on the north elevation. The exterior is clad in horizontal wood board siding, and a small brick chimney sits on the ridge of the roof.

The primary (north) elevation features a central entrance with a screen door accessible by two concrete steps which lead to an enclosed, recessed porch. The northwest corner of the primary elevation was likely enclosed with vertical wood board siding at an unidentified time (Photo 2). The fenestration throughout the residence is wood frame sash windows and one replacement vinyl sash window. The rear south elevation features a covered porch addition with a brick foundation covered by a wood frame shed roof. The south elevation also features a second entrance with a metal screen door and flush wood door (Photo 3). The east elevation features a cellar entrance with two metal doors. Within the gables on the north and south elevation are wood louvered vents.


Photo 2: Single-family residence north and west elevations; facing southeast.


Photo 3: Single-family residence south and east elevations; facing northwest.

The barn was constructed in 1920 east of the single-family residence and displays an L-shaped plan sited east-to-west on a concrete foundation (ParcelQuest 2025). The side gable roof is sheathed in corrugated metal sheets with a slight eave overhang, exposed rafter ends, and enclosed eaves. The exterior is clad in vertical wood board siding. The primary (south) elevation has a large plywood sliding door, a wood sash window, and a replacement aluminum framed vertical sliding sash window (Photo 4). The north elevation features four original wood frame hopper windows (Photo 5).


Photo 4: Barn south and west elevations; facing northeast.


Photo 5: Barn north and east elevations; facing southwest.

South of the single-family residence is an open storage shed constructed between 1968 and 1982 (NETR Online 2025). Sitting on a concrete foundation, the shed has a side gable roof clad in corrugated metal sheets (Photo 6). The north and west elevations are partially enclosed with plywood boards. The east elevation is open with three bays for storing equipment, and the south elevation is open and faces an unidentified piece of farming equipment (Photo 7). Along the north elevation of the storage shed are three small pre-built sheds dating to 2004 and 2018. Farming equipment is scattered throughout the property.



Photo 6: Storage shed east and north elevations; facing southwest.



Photo 7: Storage shed south and west elevations and farming equipment; facing northeast.

***B10. Significance (Continued from Page 3):**
Since the property was formerly an active walnut orchard, the following context on agriculture in San Joaquin County was excerpted from the *A Historical Context and Methodology for Evaluating Agricultural Properties in California* (Agricultural HARD Team and the California Department of Transportation 2023):

Agriculture in San Joaquin County

The San Joaquin Valley forms the southernmost part of the Great Central Valley. The region includes all or portions of the counties of San Joaquin, Contra Costa, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and Kern. Approximately one third of the state's farmland lies in the San Joaquin Valley, and nearly 90 percent of the valley is currently under irrigation. No single river runs through the entire valley, although the San Joaquin River drains the northern portion of the valley and forms the core of the state's Delta region. Lake basins, once fed by runoff from the Sierra Nevada, formed the southern end of the valley. Early farming depended upon natural aquifers for irrigation, and on the reclamation of the Tulare and Buena Vista Lake Basins. The 1940s and 1950s saw increased irrigation water into the southern end of the valley through projects such as the CVP. Annual rainfall is highest at the northern end of the San Joaquin Valley near Sacramento, which averages around 20 inches a year, and lowest at the southern end of the valley near Bakersfield, which receives approximately 12 inches a year.

The San Joaquin Valley is home to a wide variety of farming enterprises, ranging from smaller, intensively cultivated farms to large, extensive, industrial enterprises. Fruit and nuts are important crops, as are many other field crops (e.g., barley, beans, corn, hay, potatoes, sugar beets, and wheat). Vineyards are gaining importance in the region. Cotton has been among the most important field crops in the valley since its introduction in 1871. Livestock is widely distributed throughout the valley floor, including the former home to the famous Miller and Lux cattle enterprise. Dairies, poultry, and swine farms produce other products including milk, chickens, turkeys, eggs, pork, and apiary products. Grain sorghum became important in the area after 1870 as a summer grain crop.

Nut Industry in California

Immigrants brought chestnuts to California during the Gold Rush, mostly as seed of the European chestnut, but also some chestnuts of mixed origin and grafted varieties. Hundred plus-year-old chestnut trees still exist in the Mother Lode region, such as the original Colossal tree planted by Benjamin Tonella, a Swiss Italian immigrant, in Nevada City. Century-old chestnut trees also survive in the North Coast and Central Valley regions. Most of the current chestnut production in California reflects post-World War II production. Chestnuts are typically grown on farms less than 10 ac. in size. Chestnuts are California's commercial true nut crop, although recently small in numbers with only 155 ac. under cultivation in 2005,

decreased from 600 ac. planted in chestnuts in 2000.

The most successful nuts grown commercially in California are walnuts and almonds. Post World War II era nut production also included macadamia, pistachio, and pecan. Although pecans have been grown in California since the 19th century, the first commercial orchard was established in Clovis in the mid-1970s. Today, the pecan production belt is a narrow strip that stretches from Chico and Orland south to Bakersfield. In 2020, pecans were grown primarily on 6,000 ac. of farmland located in Fresno, Tulare, and Kern counties.

Professor C. H. Dwinelle of the University of California at Berkeley first introduced the macadamia nut to California in 1877. He obtained seeds from Australia and planted several seedlings along Strawberry Creek on the Berkeley campus. In addition, two nurserymen, Ernest Braunton and Charles Knowlton, started selling seedling trees in Southern California around 1910. Macadamia trees were planted as ornamental and backyard trees for many years before World War II, particularly in the southern seven counties of the state. People who served in the Pacific Theater during World War II were exposed to macadamia nuts in Hawaii and returned from the war to search local markets for the nut. Commercial planting of macadamia began in California in 1946 in response to this heightened interest, when Robert W. Todd planted 2 ac. of seedling trees on his property on Grandview Street in Oceanside. The California Macadamia Society was formed in 1953 to guide the newly developing industry, promote their product, and conduct research. In response, the University of California Los Angles established a Subtropical Horticultural Department to better study and understand the nut. Macadamia trees thrive in high humidity, subtropical climates. Although the nut grows from San Luis Obispo south to the Mexican border, Southern California, particularly the San Diego County coastal zone, has in the neighborhood of 2,500 ac. planted in macadamias.

American traders first introduced the pistachio to California in the 19th century; the first tree was planted in Sonoma in 1881, primarily because of increased demand. In 1929 the commercial development of pistachios began when American plant scientist William E. Whitehouse spent six months in Persia (modern-day Iran) collecting seed that he brought back to California. The next year, experimental plantings were established in California. However, no standout pistachio trees emerged until 1950, because pistachio trees require at least a full seven to ten years maturing. The California variety, named Kerman for the famous carpetmaking city in Iran near the area where the trees were first cultivated, began to expand throughout the state in the 1960s. Another account suggests that the California town of Kerman in Fresno County was actually named after two land speculators who subdivided and sold lots off to start the town. In 1977, there were 1,700 ac. planted in pistachios in the state, primarily in the Central Valley. By 2005, California was the second largest producer of pistachios worldwide with over 100,000 ac. Planted. In 2020 there were 288,595 ac. planted in pistachios, primarily in Fresno, Kings, Madera, Tulare, and Kern counties, representing over 98 percent of all pistachios grown in the United States.

The walnut, although first introduced by the Spanish padres around 1769, did not flourish until the time of the early American settlers. Varieties of walnuts were often planted on homesteads as part of cultivation requirements and frequently remain as indications of the locations of homesteads that no longer exist. The first attempt at commercial production was reportedly established at Warner's Ranch in San Diego County in 1843. More than a dozen plantings existed by 1850, mainly near Los Angeles but also scattered from San Diego to Napa counties. In the Bay Area, California walnuts grew along creeks and streams. Walnut Creek, for example, located in Contra Costa County, was named for the groves of native walnuts growing in the area.

Joseph Sexton, a horticulturist, initiated California's first commercial walnut enterprise in 1867 to 1868, when he planted a grove of English walnuts in Goleta, next to Santa Barbara. Within a few years, 65 percent of all fertile land in this region grew Sexton's English walnuts. Over the next thirty years, orchard plantings multiplied and extended as far north as Chico. In 1875, the State Agricultural Society recorded 138,673 walnut trees, with 15 counties reporting more than 1,000 trees each. The 1870s marks a watershed for walnuts in California. Until this time, walnut plantings had consisted entirely of the small, round, hard-shelled, inferior walnuts introduced by the padres. In addition to Joseph Sexton's soft-shell English walnut, Felix Gillet introduced and developed certain French varieties at Nevada City, which became the basis for the industry in central and Northern California and in Oregon. Between 1880 and 1905 superior varieties of walnuts were planted, including Placentia and Eureka, which now make up most of the Southern California production.

Between 1900 and 1930 walnut acreage increased nearly sevenfold and production increased tenfold. The California Walnut Growers' Association organized in 1912 and successfully applied the principles of cooperative effort to the solution of the problems of the industry. By 1910, the introduction of Valencia oranges and lemons along with increased urban population in Southern California, resulted in the elimination of walnut orchards in Los Angeles and Orange counties. The City of Walnut in Los Angeles County, for example, originated as part of Rancho Los Nogales ('Ranch of the Walnut

Trees'), which was acquired piecemeal from Jose de la Cruz Lineras by the Vejar family beginning in 1837. Local growers in the city planted both lemon and walnut trees, with the latter being the major agricultural product until the 1930s, when a pest infestation destroyed the walnut orchards. In addition, declining yields and quality, increasingly warmer winters that caused a delay of blooming, and a pest infestation resulted in the restriction of acreage in Southern California and consistent expansion in the north. By the 1930s the commercial walnut business moved northward to Stockton where improved irrigation, better pest control, ideal climate, and rich soil were more conducive to larger yields. By this time the California walnut had virtually displaced the imported product in United States markets and had become an important export.

California emerged as the largest producer of walnuts in the world by the 1940s. The California Walnut Board was established in 1948 to represent the walnut industry and growers. Today, the Sacramento and San Joaquin valleys are the center of walnut production, producing 99 percent of the commercial United States walnut supply. On the global market, California produces two-thirds of the world's supply of walnuts. Today, almonds are California's largest drupe crop in both value and acreage. The Spanish introduced the almond tree to California in the late 1700s. The moist, cool weather of the coastal missions, however, did not provide ideal growing conditions, and trees were not successfully planted inland until the 1800s. The first attempts to grow almonds commercially in the United States occurred in New England and the Middle Atlantic and Southern states. Nevertheless, growers soon learned that the early blooming almond succumbed to late frosts or disease in areas of high humidity. California's Central Valley, with its Mediterranean climate, provided the right environmental conditions for successful almond production. In the early 1850s, plantings near Sacramento, Monterey, and Los Angeles all showed promise.

During the 1870s, through research and crossbreeding, several of today's prominent almond varieties had been developed. By the turn of the 20th century, the almond industry firmly established itself in the Sacramento and San Joaquin valleys. The rise of almond production in California is largely the result of the California Almond Growers Exchange, now Blue Diamond. In 1909, J. P. Dargitz of Acampo near Stockton took an active lead in promoting an almond cooperative and made an appeal for a state organization. Members from nine independent almond growing associations in Antelope, Orangevale, Fair Oaks, Davis, Capay, Sutter County, Live Oak, Oakley, and San Joaquin County then met in Sacramento on18 March 1910 to discuss the formation of a statewide organization. As a result, the California Almond Growers Exchange (CAGE) formed on 7 May 1910 consisting of 230 independent growers with headquarters in Sacramento. In 1915 the CAGE built a new receiving and packaging plant that eventually grew into the largest nut processing plant in the world. In 1915 the cooperative adopted the Blue Diamond (the rarest diamond in the world) as their brand symbol, as a way to distinguish the California project from Spanish and Italian imports. As a result of their marketing efforts, government lobbying, and quality control, California's almond production increased from an annual average of 3,500 tons in the 1910s to 9,440 tons in the 1920s.

In 1931, Blue Diamond had 400 growers supplying 20 million pounds of almonds and 2,000 growers by 1940. Today, approximately 3,500 growers cooperatively own Blue Diamond Growers (established in 1980 from CAGE) and along with another 2,500 growers in California, produce the entire supply of almonds in the United States and nearly 80 percent of the worldwide production. In addition, almonds currently rank as the seventh largest U.S. food export. Today, California is the only place in North America where almonds are grown commercially, with more than 1.5 million ac. planted in the San Joaquin and Sacramento valleys, stretching 400 miles between Bakersfield and Red Bluff. In 2019 three billion pounds of almonds were produced.

Property Development History

11620 East Copperopolis Road was developed in 1920 including the single-family residence and barn (ParcelQuest 2025). Topographic maps from 1914, 1947, and 1952 do not depict the single-family residence or barn (NETR Online 2025; USGS 2025). A topographic map from 1954 confirmed the presence of the single-family residence, and a 1957 aerial and topographic map confirmed the presence of the barn (NETR Online 2025; USGS 2025). Between 1968 and 1982, the shed structure was constructed, and circa 2007 the rear porch addition was added to the residence (NETR Online 2025; Google Earth 2025).

The front porch of the residence was enclosed at and a replacement window added to the residence and barn at an unidentified time, based on visual observation. The western side of the property was utilized as an orchard since 1957 (NETR Online 2025).

Review of historical newspapers and building permits did not identify the architect or builder of the property (Newspapers.com 2025; San Joaquin County 2025).

Ownership History

One of the owners of the subject property identified during historical research was Wesley G. King who lived on the property from circa 1955 to 1969 (Ancestry.com 1955; *Stockton Evening and Sunday Record* 1969). Stockton City Directories from 1955 and 1957 listed his occupation as a plumber, and in 1969, King was part of a local effort to prevent California Water Services Company from impacting local water sources for farming and residential use (*Stockton Evening and Sunday Record* 1969).

The current owners, Rosemary and Vincent Belli, owned and occupied the property between 1979 and 2019 and rented the property to Edward Juarez between 2003 and 2020 (Ancestry.com 2020). Known ownership and occupancy are summarized in Table 1 below.

Table 1. Ownership and Occupancy History of 11620 East Copperopolis Road.

Date	Name	Owner / Occupant	Source
1955	Wesley King	Owner and Occupant	Ancestry.com 1955
1957	Wesley King	Owner and Occupant	Ancestry.com 1957
1958	Wesley G. King	Owner and Occupant	*Stockton Evening and Sunday Record* 1958
1968	W.G. King	Owner and Occupant	San Joaquin County 1968
1969	Wesley King	Owner and Occupant	*Stockton Evening and Sunday Record* 1969
1979 - 2003	Rosemary Mary and Vincent Belli	Owner and Occupant	Ancestry.com 2020
2003 - Present	Rosemary Mary and Vincent Belli	Owner	Ancestry.com 2020
2003 - 2020	Edward Juarez	Occupant	ParcelQuest 2025

Architectural Style

The single-family residence at 11620 East Copperopolis Road is an example of Craftsman style of architecture, popular in the United States between 1905 and 1930 (McAlester 2015). The style was popularized by the architecture firm of Greene and Greene which practiced in Southern California and designed Craftsman style bungalows inspired by the English Arts and Crafts movement. Pattern books helped the style spread throughout the country, and it became the fashionable smaller house of the era. Craftsman architecture emphasized the importance of hand-built construction and genuine materials in response to the mass-produced architectural elements of the Victorian style of the late nineteenth century.

Character-Defining Features of the Craftsman Style:

- Low-pitched gabled roof with wide enclosed eave overhang
- Exposed rafter ends, decorative beams or triangular braces
- Multiple roof planes
- Front porch with columns or piers which frequently taper to ground level
- Sash windows or tripartite / grouped windows
- Asian or Arts and Crafts Elaborations such as peaked or flared roof line, trellised porch or porte cochere roof, cottage windows, window boxes and balconies, dormers, and extra stickwork

Constructed in 1920 with the period of significance of the Craftsman style, the single-family residence at 11620 East Copperopolis Road expresses some characteristics of the style including decorative knee braces, exposed rafter ends, and a front porch. The residence is not an exceptional example of the style as it lacks architectural elaborations to set it apart from other examples such as tapered columns or piers, extra stickwork, porte cochere, or cottage windows.

Historical Resources Evaluation

11620 East Copperopolis Road was recorded and evaluated for listing in the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) and is recommended ineligible for listing in the NRHP and CRHR due to lack of historical and architectural significance.

Constructed in 1920, 11620 East Copperopolis Road is a former agricultural property with a walnut orchard on the southern and western half of the property. According to Caltrans (2023): "there must be a direct and important connection between the property and the area of significance, established through documentation and physical evidence… There are many agricultural resources in California that may be associated with specific theme, but not all are eligible. The final assessment in the link between documentation, physical evidence, and theme relies on rarity and integrity assessments" (Agricultural HARD Team and the California Department of Transportation 2023). Research did not identify the property significantly contributed to the agricultural development of San Joaquin County. The subject property was one of several agricultural properties in the county: it was not the first agricultural property, it is not a rare example, it did not have the highest yields of produce, nor was it the site of a technological advancement in farming practices. Therefore, the subject property is recommended ineligible for listing in the NRHP and CRHR under Criteria A/1.

Research identified one historic-era owner of the subject property, Wesley King. Though King was part of an organization which protested the influence of the California Water Services Company in the area and on local water supplies, research did not identify that he played a significant role in this event nor was the event significant in local history. Therefore, the property is recommended ineligible for listing in the NRHP and CRHR under Criteria B/2.

The subject property includes a single-family residence, barn, and storage shed. The single-family residence is an example of Craftsman architecture, expressed through the decorative knee braces, front porch, and exposed rafter ends. However, this residence is not a good example of the style that is well represented throughout the region. The residence has been altered since its original date of construction including enclosure of the front porch, addition of the rear porch, and replacement of one of the windows. The ancillary buildings, including the barn and shed, lack architectural distinction and are common building types throughout the region. Additionally, research failed to identify the original architect and builder of the property, nor does the property possess high artistic value. The subject property is recommended ineligible for listing in the NRHP and CRHR under Criteria C/3.

The property is not likely to yield valuable information that will contribute to our understanding of human history because the property is not and never was the principal source of important information pertaining to subjects such as twentieth century agricultural properties in San Joaquin County. Therefore, the subject property is recommended ineligible for listing in the NRHP and CRHR under Criterion D/4.

In conclusion, 11620 East Copperopolis Road is recommended ineligible for listing in the NRHP and CRHR due to lack of historical and architectural significance, and is not a historical resource as defined by CEQA Section 15064.5(a) or historic property as defined by 36 CFR 800.16(l)(1).

***B12. References (Continued from Page 3):**

Agricultural HARD Team and California Department of Transportation
2023. *A Historical Context and Methodology for Evaluating Agricultural Properties in California.* https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/ser/historical-context-agricultural-properties-ca-a11y.pdf (accessed April 2025).

Ancestry.com
1955. *Stockton City Directory*. *U.S., City Directories, 1822-1995* [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc., 2011. https://www.ancestry.com/search/collections/2469/records/264415285?tid=&pid=&queryId=86dd18ea-f8c5-4153-874e-af2aa3bd32c3&_phsrc=JhD764&_phstart=successSource (accessed April 2025).

1957. *Stockton City Directory*. *U.S., City Directories, 1822-1995* [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc., 2011. https://www.ancestry.com/search/collections/2469/records/264415285?tid=&pid=&queryId=86dd18ea-f8c5-4153-874e-af2aa3bd32c3&_phsrc=JhD764&_phstart=successSource (accessed April 2025).

2020a. *U.S. Index to Public Records 1994-2019*. [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc. https://www.ancestry.com/search/collections/62209/records/33483283?tid=&pid=&queryId=3d9ebff3-bad4-4676-b4c6-

3415b0775553&_phsrc=JhD779&_phstart=successSource (accessed April 2025).

2020b. *U.S. Index to Public Records 1983-2020*. [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc. https://www.ancestry.com/search/collections/62209/records/10246245?tid=&pid=&queryId=65866e94-f7a9-4685-81d1-3ff004118f6d&_phsrc=JhD777&_phstart=successSource (accessed April 2025).

Davis, Olive
1991. *From the Ohio to the San Joaquin: A Biography of Captain William S. Moss 1796-1883*. Stockton, California: Heritage West Books.

Google Earth Professional
2025. Aerial images of the subject property and surrounding area. Accessed April 2025.

Lewis Publishing Company, The
1890. *An Illustrated History of San Joaquin County, California*. Chicago, Illinois: Barlow-Sinclair Printing Company. Library of Congress. https://www.loc.gov/item/02007476/ (accessed April 2025).

McAlester, Virgina Savage
2015. *A Field Guide to American Houses*. New York, New York: Alfred A. Knopf.

NETR Online
2025. Historical aerials and topographic maps of the subject property and surrounding area 1954, 1957, 1968 and 1982. www.historicaerials.com (accessed April 2025).

Newspapers.com
2025. Historical Newspapers including the *Stockton Evening and Sunday Record*. https://www.newspapers.com/ (accessed April 2025).

ParcelQuest
2025. Property Information accessed through the San Joaquin County Assessor for APNs 103-220-250-000 and 103-220-240-000. https://www.parcelquest.com/?gclid=EAIaIQobChMI376gto2L-QIVfcLCBB0tNwFjEAAYASAAEgLUNPD_BwE (accessed April 2025).

San Joaquin County
1968. Community Development Department. *Scanned Pages of Historical Building Permits Prior to 1992 (Posting Books)*. San Joaquin County Building Permit # P63400. Issued to W. G. King. https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/Building/Posting%20Books/1957-.

Smith, Don R. (editor)
1976. *From Stage Stop to Friendly Community, A History of Linden.* Scio Odd Fellows Lodge No. 102, Linden Publications and Individual Authors. https://www.lindenhistory.org/_files/ugd/bfbc12_cd2eea7a957b457e816d5ff82f524479.pdf (accessed March 2025).

Stockton Evening and Sunday Record
1935. "Old Timer Reviews Water Problems of Linden Area." June 20, 1935. https://www.newspapers.com/image/843460599/?terms=bellota&match=1 (accessed March 2025).

1958. "Board Seeks Accounting on Flood Emergency Supplies." May 17, 1958. https://www.newspapers.com/image/844829029/?match=1&terms=%22wesley%20g.%20king%22 (accessed April 2025).

1969. "Group Presses Fight on Cal Water." August 5, 1969. https://www.newspapers.com/image/845597666/?match=1&terms=%2211620%20e%20Copperopolis%22 (accessed April 2025).

United States Geological Survey (USGS)
2025. Historical topographic maps of the subject property and surrounding area. *TopoViewer*. https://ngmdb.usgs.gov/topoview/viewer/#4/40.01/-100.06 (accessed April 2025).

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

 ***Resource Name or #:** 289 South Best Road

P1. Other Identifier: N/A

*__P2.__ **Location:** ☒ **Unrestricted**

***a. County** San Joaquin **and**

***b. USGS 7.5' Quad** *Stockton East, Calif.* **Date** 1987 **T**01N; **R** 07E; **S** 01

c. Address 289 South Best Road City Stockton Zip 95215

d. UTM: Zone 10S , 661409.24 mE/ 4203708.50 mN

e. Other Locational Data: San Joaquin County Assessor's Parcel Number 103-220-220-000

***P3a. Description:** 289 South Best Road is a single-family and agricultural property (subject property) located on the west side of Best Road in an unincorporated area of San Joaquin County. Surrounded by other agricultural and single-family properties, the property has a single-family residence, water tower, manufactured home, barn, and shed which sit at the eastern end of the property along Best Road. The western end of the property is developed with agricultural fields.

Constructed between 1914 and 1952, the Craftsman-style residence has a rectangular plan sited east to west on a concrete foundation (NETR Online 2025; USGS 2025; Photo 1). The moderately-pitched, front-gable roof with exposed rafter ends is sheathed in corrugated metal sheets on the north slope and composition shingles on the south slope. The building is clad in concrete shingles over the original wood shingles which are visible on the east and west elevations. The primary (east) elevation is asymmetrical with the entrance at the southern end which is boarded closed with plywood sheets. The entrance is accessible by a porch with a concrete foundation which is in poor condition. *See Continuation Sheet.*

***P3b. Resource Attributes:** HP2. Single Family Property; HP33. Farm/ Ranch

***P4. Resources Present:** ☒ Building

P5a. Photograph or Drawing



P5b. Description of Photo:
Photo 1: East and north elevations of 289 South Best Road; facing south.

P6. Date Constructed/Age and Source:
☒ Historic
Circa 1932 (NETR Online 2025; USGS 2025)

***P7. Owner and Address:**
Vincent and Rosemary Belli
5721 North Cox Road
Linden, California 95236

***P8. Recorded by:**
Margo Nayyar
Rincon Consultants, Inc.
4825 J Street
Sacramento, California 95819

***P9. Date Recorded:** 4/3/2025

***P10. Survey Type:** Intensive

***P11. Report Citation**: Losco A., L. Maldonado, H. Haas, M. Nayyar, and N. Jordan. 2025 *Copperopolis Road Solar Development Project, San Joaquin County, California*. Rincon Consultants Project No. 25-17409. Report on file at the Central California Information Center, California State University, Stanislaus.

***Attachments:** ☒Location Map ☒Continuation Sheet ☒Building, Structure, and Object Record

B1. Historic Name: N/A
B2. Common Name: N/A
B3. Original Use: Single-family residence and farm
B4. Present Use: Single-family residence and farm
***B5. Architectural Style:** Craftsman
***B6. Construction History:**

- Between 1914 and 1952 – construction of the single-family residence, water tower, and the barn (NETR Online 2025; Visual Observation)
- Between 1952 and 1957 – construction of six additional ancillary buildings (NETR Online 2025)
- Between 1967 and 1968 – three ancillary buildings removed (NETR Online 2025)
- Between 1968 and 1982 – manufactured home added to the property (NETR Online 2025)
- Between 2005 and 2009 – three ancillary buildings removed (NETR Online 2025)
- Between 2015 and 2016 – shed constructed (NETR Online 2025)

***B7. Moved?** ☒**Unknown** **Date:** N/A **Original Location:** N/A

***B8. Related Features:** N/A

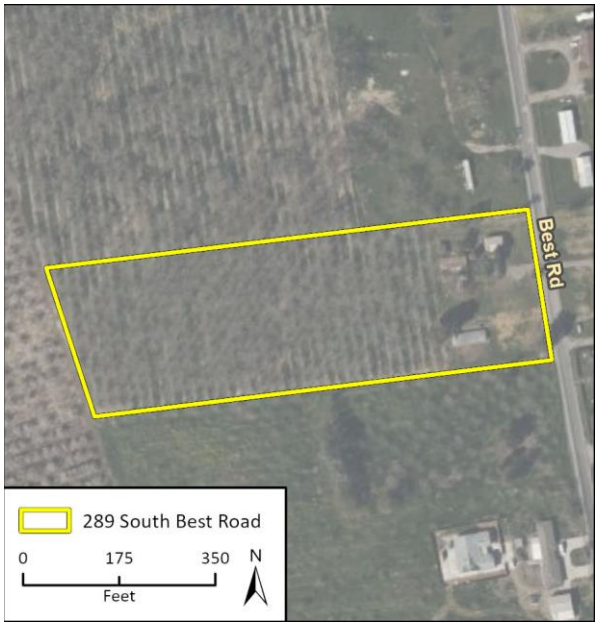
B9a. Architect: Unknown b. Builder: Unknown
***B10. Significance:** **Theme** Agricultural Development of San Joaquin County **Area:** San Joaquin County
Period of Significance circa 1932 **Property Type** Agricultural **Applicable Criteria** N/A

Historical Context

San Joaquin County

As the flurry of the Gold Rush brought a swelling population of settlers to San Joaquin County, the county was officially established as one of the first 27 counties in the newly formed state of California in 1850. Most of San Joaquin County including the area surrounding the project site developed as an agricultural region, though the largest city in the county, Stockton, was established in 1850 by Captain Charles M. Weber (The Lewis Publishing Company 1890). The community of Linden, approximately five miles northeast of the project site, was established in 1862. In the early years of the area, the main agricultural output was grain, with a flour mill active in the area as early as 1854 (Smith 1976). The introduction of railroads through the county also encouraged the growth of the agricultural industry and orchards as the trains could move products to more markets. The Central Pacific Railroad was constructed in the 1860s from Sacramento to Stockton and west to San Francisco, and in 1909 the Western Pacific Railroad was added to the same line as the Central Pacific Railroad (Davis 1991).

From the late nineteenth to the early twentieth century, agricultural concerns in the area were focused on irrigation, with the Calaveras River and Mormon Slough dammed and diverted for farming near Bellota (*Stockton Evening and Sunday Record* 1935, Smith 1976). When World War II began, California crops fetched a high price, allowing the surrounding area to diversify plantings and develop as an area known for beans, walnuts, and cherries, among other crops. The unincorporated areas of San Joaquin County remained rural and agricultural to this day with some residential and commercial development adjacent to cities in the county. *Continued on the Continuation Sheet.*



B11. Additional Resource Attributes: N/A

***B12. References:** *See Continuation Sheet.*

B13. Remarks: N/A
***B14. Evaluator:** Ashley Losco, Rincon Consultants, Inc.
***Date of Evaluation:** 4/9/2025

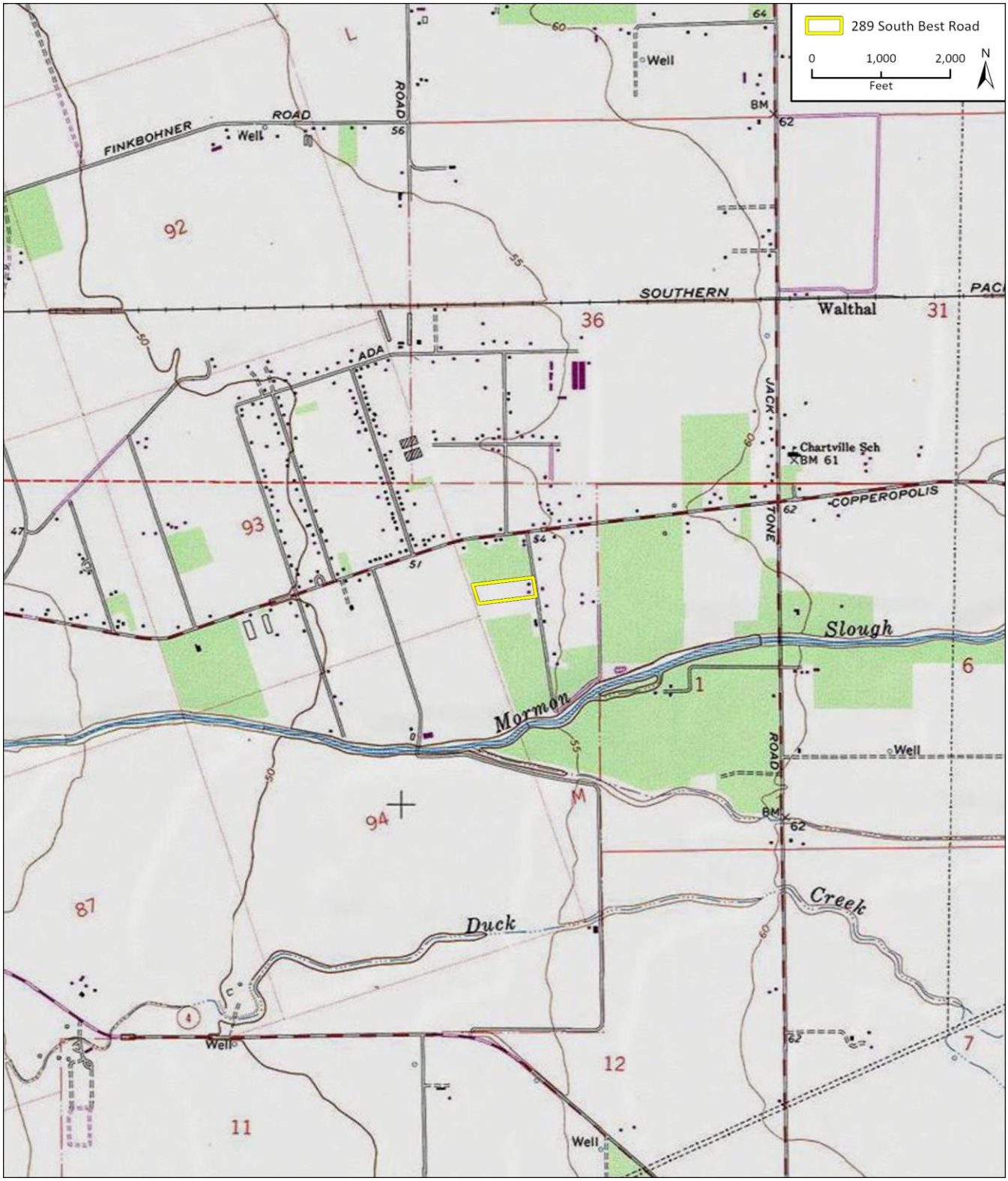
(This space reserved for official comments.)

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #
HRI#
Trinomial

Page 3 **of** 11 ***Resource Name or #** 289 South Best Road
***Map Name:** *Stockton East, Calif.* ***Scale:** 1:24,000 ***Date of map:** 1987



* Required information

***P3a. Description (Continued from Page 1):**
The windows throughout are wood double-hung sash units and one replacement aluminum vertical sliding sash unit on the north elevation. Some of the windows are missing glass panes while others are covered with screens. The west elevation features a full-width, shed-roof enclosed porch. The porch has wood-frame, fixed-paned windows and French double-doors which are boarded shut. One noted alteration is a former entrance filled in with a window on the south elevation (Photo 2).


Photo 2: South and west elevations of the single-family residence; facing north.

West of the single-family residence is a two-story straight-box style water tower constructed circa 1932 (NETR Online 2025; Visual Observation). Capped with a flat roof and slightly overhanging eaves with exposed rafter ends, the water tower is constructed of wood framing and clad in horizontal wood siding (Photo 3). The east elevation has an entrance, and the north and west elevations have two square openings which are also boarded (Photo 4).


Photo 3: East and north elevations of the water tower; facing south.


Photo 4: North and west elevations of the water tower; facing southeast.

West of the single-family residence and water tower is a manufactured home which was added to the property between 1968 and 1982 (NETR Online 2025; Photo 5). Capped with a low-pitched front gable roof, the manufactured home has a rectangular plan sited east to west and is elevated off the ground. The exterior is clad in sheets of corrugated metal. The primary (south) elevation is asymmetrical with the entrance at the eastern end with a sliding glass door covered by a metal awning and accessible by wood-frame stairs. The windows throughout are aluminum framed vertical sash units. The windows on the east elevation have louvered shutters (Photo 6).



Photo 5: West and north elevations of the manufactured home; facing southeast.



Photo 6: East and south elevations of the manufactured home; facing northwest.

Southwest of the single-family residence, the barn was constructed circa 1932 (NETR Online 2025; Visual Observation). (Photo 7). Capped with a shed roof clad in corrugated metal sheets, the wood-framed building is sited east to west sitting flush with the ground and is sheathed in vertical and horizontal wood board siding. The east and west elevations each have an entrance with double doors constructed of horizontal board siding. The north elevation has a single wood-frame window, and the south elevation has large sections of missing siding enclosed with metal wiring (Photo 8).



Photo 7: North and west elevations of the barn; facing southeast.



Photo 8: South and east elevations of the barn; facing northwest.

Adjacent to the manufactured home and west of the water tower is a rectangular plan shed capped with a low-pitched front gable roof with overhanging boxed eaves (Photo 9). Constructed between 2015 and 2016, the exterior is clad in vertical board siding, and the building sits on a concrete foundation (NETR Online 2025). The primary (east) elevation is symmetrical with double doors of vertical wood boards (Photo 10).



Photo 9: West and south elevations of the shed; facing northeast.



Photo 10: East and north elevations of the shed; facing southwest.

***B10. Significance (Continued from Page 3):**

Since the property was formerly an active walnut orchard, the following context on agriculture in San Joaquin County was excerpted from the *A Historical Context and Methodology for Evaluating Agricultural Properties in California* (Agricultural HARD Team and California Department of Transportation 2023).

Agriculture in San Joaquin County

The San Joaquin Valley forms the southernmost part of the Great Central Valley. The region includes all or portions of the counties of San Joaquin, Contra Costa, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and Kern. Approximately one third of the state's farmland lies in the San Joaquin Valley, and nearly 90 percent of the valley is currently under irrigation. No single river runs through the entire valley, although the San Joaquin River drains the northern portion of the valley and forms the core of the state's Delta region. Lake basins, once fed by runoff from the Sierra Nevada, formed the southern end of the valley. Early farming depended upon natural aquifers for irrigation, and on the reclamation of the Tulare and Buena Vista Lake Basins. The 1940s and 1950s saw increased irrigation water into the southern end of the valley through projects such as the CVP. Annual rainfall is highest at the northern end of the San Joaquin Valley near Sacramento, which averages around 20 inches a year, and lowest at the southern end of the valley near Bakersfield, which receives approximately 12 inches a year.

The San Joaquin Valley is home to a wide variety of farming enterprises, ranging from smaller, intensively cultivated farms to large, extensive, industrial enterprises. Fruit and nuts are important crops, as are many other field crops (e.g., barley, beans, corn, hay, potatoes, sugar beets, and wheat). Vineyards are gaining importance in the region. Cotton has been among the most important field crops in the valley since its introduction in 1871. Livestock is widely distributed throughout the valley floor, including the former home to the famous Miller and Lux cattle enterprise. Dairies, poultry, and swine farms produce other products including milk, chickens, turkeys, eggs, pork, and apiary products. Grain sorghum became important in the area after 1870 as a summer grain crop.

Nut Industry in California

Immigrants brought chestnuts to California during the Gold Rush, mostly as seed of the European chestnut, but also some chestnuts of mixed origin and grafted varieties. Hundred plus-year-old chestnut trees still exist in the Mother Lode region, such as the original Colossal tree planted by Benjamin Tonella, a Swiss Italian immigrant, in Nevada City. Century-old chestnut trees also survive in the North Coast and Central Valley regions. Most of the current chestnut production in California reflects post-World War II production. Chestnuts are typically grown on farms less than 10 ac. in size. Chestnuts are California's commercial true nut crop, although recently small in numbers with only 155 ac. under cultivation in 2005, decreased from 600 ac. planted in chestnuts in

2000.

The most successful nuts grown commercially in California are walnuts and almonds. Post World War II era nut production also included macadamia, pistachio, and pecan. Although pecans have been grown in California since the 19th century, the first commercial orchard was established in Clovis in the mid-1970s. Today, the pecan production belt is a narrow strip that stretches from Chico and Orland south to Bakersfield. In 2020, pecans were grown primarily on 6,000 ac. of farmland located in Fresno, Tulare, and Kern counties.

Professor C. H. Dwinelle of the University of California at Berkeley first introduced the macadamia nut to California in 1877. He obtained seeds from Australia and planted several seedlings along Strawberry Creek on the Berkeley campus. In addition, two nurserymen, Ernest Braunton and Charles Knowlton, started selling seedling trees in Southern California around 1910. Macadamia trees were planted as ornamental and backyard trees for many years before World War II, particularly in the southern seven counties of the state. People who served in the Pacific Theater during World War II were exposed to macadamia nuts in Hawaii and returned from the war to search local markets for the nut. Commercial planting of macadamia began in California in 1946 in response to this heightened interest, when Robert W. Todd planted 2 ac. of seedling trees on his property on Grandview Street in Oceanside. The California Macadamia Society was formed in 1953 to guide the newly developing industry, promote their product, and conduct research. In response, the University of California Los Angles established a Subtropical Horticultural Department to better study and understand the nut. Macadamia trees thrive in high humidity, subtropical climates. Although the nut grows from San Luis Obispo south to the Mexican border, Southern California, particularly the San Diego County coastal zone, has in the neighborhood of 2,500 ac. planted in macadamias.

American traders first introduced the pistachio to California in the 19th century; the first tree was planted in Sonoma in 1881, primarily because of increased demand. In 1929 the commercial development of pistachios began when American plant scientist William E. Whitehouse spent six months in Persia (modern-day Iran) collecting seed that he brought back to California. The next year, experimental plantings were established in California. However, no standout pistachio trees emerged until 1950, because pistachio trees require at least a full seven to ten years maturing. The California variety, named Kerman for the famous carpetmaking city in Iran near the area where the trees were first cultivated, began to expand throughout the state in the 1960s. Another account suggests that the California town of Kerman in Fresno County was actually named after two land speculators who subdivided and sold lots off to start the town. In 1977, there were 1,700 ac. planted in pistachios in the state, primarily in the Central Valley. By 2005, California was the second largest producer of pistachios worldwide with over 100,000 ac. Planted. In 2020 there were 288,595 ac. planted in pistachios, primarily in Fresno, Kings, Madera, Tulare, and Kern counties, representing over 98 percent of all pistachios grown in the United States.

The walnut, although first introduced by the Spanish padres around 1769, did not flourish until the time of the early American settlers. Varieties of walnuts were often planted on homesteads as part of cultivation requirements and frequently remain as indications of the locations of homesteads that no longer exist. The first attempt at commercial production was reportedly established at Warner's Ranch in San Diego County in 1843. More than a dozen plantings existed by 1850, mainly near Los Angeles but also scattered from San Diego to Napa counties. In the Bay Area, California walnuts grew along creeks and streams. Walnut Creek, for example, located in Contra Costa County, was named for the groves of native walnuts growing in the area.

Joseph Sexton, a horticulturist, initiated California's first commercial walnut enterprise in 1867 to 1868, when he planted a grove of English walnuts in Goleta, next to Santa Barbara. Within a few years, 65 percent of all fertile land in this region grew Sexton's English walnuts. Over the next thirty years, orchard plantings multiplied and extended as far north as Chico. In 1875, the State Agricultural Society recorded 138,673 walnut trees, with 15 counties reporting more than 1,000 trees each. The 1870s marks a watershed for walnuts in California. Until this time, walnut plantings had consisted entirely of the small, round, hard-shelled, inferior walnuts introduced by the padres. In addition to Joseph Sexton's soft-shell English walnut, Felix Gillet introduced and developed certain French varieties at Nevada City, which became the basis for the industry in central and Northern California and in Oregon. Between 1880 and 1905 superior varieties of walnuts were planted, including Placentia and Eureka, which now make up most of the Southern California production.

Between 1900 and 1930 walnut acreage increased nearly sevenfold and production increased tenfold. The California Walnut Growers' Association organized in 1912 and successfully applied the principles of cooperative effort to the solution of the problems of the industry. By 1910, the introduction of Valencia oranges and lemons along with increased urban population in Southern California, resulted in the elimination of walnut orchards in Los Angeles and Orange counties. The City of Walnut in Los Angeles County, for example, originated as part of Rancho Los Nogales ('Ranch of the Walnut Trees'), which was acquired piecemeal from Jose de la Cruz Lineras by the Vejar family beginning in 1837. Local growers in the city planted both lemon and walnut trees, with the latter being the major agricultural product until the 1930s, when a pest infestation destroyed the walnut orchards. In

addition, declining yields and quality, increasingly warmer winters that caused a delay of blooming, and a pest infestation resulted in the restriction of acreage in Southern California and consistent expansion in the north. By the 1930s the commercial walnut business moved northward to Stockton where improved irrigation, better pest control, ideal climate, and rich soil were more conducive to larger yields. By this time the California walnut had virtually displaced the imported product in United States markets and had become an important export.

California emerged as the largest producer of walnuts in the world by the 1940s. The California Walnut Board was established in 1948 to represent the walnut industry and growers. Today, the Sacramento and San Joaquin valleys are the center of walnut production, producing 99 percent of the commercial United States walnut supply. On the global market, California produces two-thirds of the world's supply of walnuts. Today, almonds are California's largest drupe crop in both value and acreage. The Spanish introduced the almond tree to California in the late 1700s. The moist, cool weather of the coastal missions, however, did not provide ideal growing conditions, and trees were not successfully planted inland until the 1800s. The first attempts to grow almonds commercially in the United States occurred in New England and the Middle Atlantic and Southern states. Nevertheless, growers soon learned that the early blooming almond succumbed to late frosts or disease in areas of high humidity. California's Central Valley, with its Mediterranean climate, provided the right environmental conditions for successful almond production. In the early 1850s, plantings near Sacramento, Monterey, and Los Angeles all showed promise.

During the 1870s, through research and crossbreeding, several of today's prominent almond varieties had been developed. By the turn of the 20th century, the almond industry firmly established itself in the Sacramento and San Joaquin valleys. The rise of almond production in California is largely the result of the California Almond Growers Exchange, now Blue Diamond. In 1909, J. P. Dargitz of Acampo near Stockton took an active lead in promoting an almond cooperative and made an appeal for a state organization. Members from nine independent almond growing associations in Antelope, Orangevale, Fair Oaks, Davis, Capay, Sutter County, Live Oak, Oakley, and San Joaquin County then met in Sacramento on18 March 1910 to discuss the formation of a statewide organization. As a result, the California Almond Growers Exchange (CAGE) formed on 7 May 1910 consisting of 230 independent growers with headquarters in Sacramento. In 1915 the CAGE built a new receiving and packaging plant that eventually grew into the largest nut processing plant in the world. In 1915 the cooperative adopted the Blue Diamond (the rarest diamond in the world) as their brand symbol, as a way to distinguish the California project from Spanish and Italian imports. As a result of their marketing efforts, government lobbying, and quality control, California's almond production increased from an annual average of 3,500 tons in the 1910s to 9,440 tons in the 1920s.

In 1931, Blue Diamond had 400 growers supplying 20 million pounds of almonds and 2,000 growers by 1940. Today, approximately 3,500 growers cooperatively own Blue Diamond Growers (established in 1980 from CAGE) and along with another 2,500 growers in California, produce the entire supply of almonds in the United States and nearly 80 percent of the worldwide production. In addition, almonds currently rank as the seventh largest U.S. food export. Today, California is the only place in North America where almonds are grown commercially, with more than 1.5 million ac. planted in the San Joaquin and Sacramento valleys, stretching 400 miles between Bakersfield and Red Bluff. In 2019 three billion pounds of almonds were produced.

Property Development History

The exact date of construction was not identified during research. Based on visual observation and map research, the residence, barn, and water tower date to circa 1932. A 1914 topographic map does not depict the buildings; the buildings are first depicted on a 1952 map. A newspaper article from 1920 identified a property on Best Road with a single-family residence, barn, garage, chicken house, tank house, and a fig orchard (*Stockton Evening and Sunday Record* 1920). The property described could be the subject property, but based on a 1954 topographic map, three other properties were also located on Best Road (NETR Online 2025; USGS 2025).

The first documentation of the property was in a 1952 topographic map which depicted the single-family residence and the barn (NETR Online 2025; USGS 2025). A 1957 aerial depicts the single-family residence, barn, and water tower and six other non-extant buildings and structures as well as an orchard on the western side of the property (NETR Online 2025). Between 1967 and 1968, three of the non-extant buildings were removed, and between 1968 and 1982 the manufactured home was added to the property (NETR Online 2025). Between 2005 and 2009, the three remaining non-extant building were removed, and between 2015 and 2016 the shed was constructed (NETR Online 2025).

Review of historical newspapers did not identify the architect or builder of the property (Newspapers.com 2025). Building permits were not available for the property through the San Joquin County Community Development Department in order to identify the original architect or builder (San Joaquin County 2025).

Ownership History

Research through city directories accessed through Ancestry.com and Newspapers.com only identified the current owners, Vincent and Rosemary Belli who purchased the property around 2007 (Ancestry.com 2011; Newspapers.com 2025). No historic-era owners were identified during research.

Architectural Style

The single-family residence at 289 South Best Road is an example of Craftsman style architecture, popular in the United States between 1905 and 1930 (McAlester 2015). The style was popularized by the architecture firm of Greene and Greene which practiced in Southern California and designed Craftsman style bungalows inspired by the English Arts and Crafts movement. Pattern books helped the style spread throughout the country, and it became the fashionable smaller house of the era. Craftsman architecture emphasized the importance of hand-built construction and genuine materials in response to the mass-produced architectural elements of the Victorian style of the late nineteenth century.

Character-Defining Features of the Craftsman Style:

- Low-pitched gabled roof with wide enclosed eave overhang
- Exposed rafter ends, decorative beams or triangular braces
- Multiple roof planes
- Front porch with columns or piers which frequently taper to ground level
- Sash windows or tripartite / grouped windows
- Asian or Arts and Crafts Elaborations such as peaked or flared roof line, trellised porch or porte cochere roof, cottage windows, window boxes and balconies, dormers, and extra stickwork

Though 289 South Best Road has some elements of the Craftsman style such as its small form, exposed rafter ends, wood shingle wall cladding, and ribbon windows at the rear, the residence is not an exceptional example of the style. The residence lacks architectural elaborations to set it apart from other examples such as a front porch with tapered columns, decorative knee braces, extra stickwork, porte cochere, or cottage windows.

Historical Resources Evaluation

289 South Best Road was recorded and evaluated for listing in the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) and is recommended ineligible for listing in the NRHP and CRHR due to lack of historical and architectural significance.

Constructed circa 1932, 289 South Best Road is a former agricultural property with a walnut or fig orchard on the western half of the property. According to Caltrans (2023): "there must be a direct and important connection between the property and the area of significance, established through documentation and physical evidence." Research did not identify the subject property significantly contributed to the agricultural development of San Joaquin County. The subject property was one of several agricultural properties in the county; it was not the first agricultural property, it did not have the highest yields of produce, nor was it the site of a technological advancement in farming practices. Therefore, the subject property is recommended ineligible for listing in the NRHP and CRHR under Criteria A/1.

Research did not identify any historic-era owners or occupants of the subject property. The only identified owners were the current owners, Vincent and Rosemary Belli. Therefore, the property is recommended ineligible for listing in the NRHP and CRHR under Criteria B/2.

The subject property includes a single-family residence, water tower, barn, mobile home and shed. The residence is an example of simple Craftsman architecture expressed through the exposed rafter ends, original wood shingle wall cladding, and ribbon windows. However, this residence is not a good example of the style that is well represented throughout the region. The original wood shingles are covered by contemporary concrete shingles, one of the original entrances was enclosed with a window, and several of the windows and doors are boarded or missing key features. The remaining buildings on the property including the barn, water tower, mobile home, and shed lack architectural distinction and are common building types throughout the region. Additionally, research failed to identify the original architect and builder of the property. Therefore, the subject property does not express a type, period or method of construction, the work of a master, or possess high artistic value. The subject property is recommended ineligible for listing in the NRHP and CRHR under Criteria C/3.

The property is not likely to yield valuable information that will contribute to our understanding of human history because the property is

not and never was the principal source of important information pertaining to subjects such as twentieth century agricultural properties in San Joaquin County. Therefore, the subject property is recommended ineligible for listing in the NRHP and CRHR under Criteria D/4.

In conclusion, 289 South Best Road is recommended ineligible for listing in the NRHP and CRHR due to lack of historical and architectural significance, and is not a historical resource as defined by CEQA Section 15064.5(a) or historic property as defined by 36 CFR 800.16(l)(1).

***B12. References (Continued from Page 3):**

Agricultural HARD Team and California Department of Transportation
2023. *A Historical Context and Methodology for Evaluating Agricultural Properties in California.* https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/ser/historical-context-agricultural-properties-ca-a11y.pdf (accessed February 2025).

Ancestry.com
2011. *U.S., City Directories, 1822-1995* [database on-line]. Lehi, UT, USA: Ancestry.com Operations, Inc., 2011. https://www.ancestry.com/search/collections/2469/records/264415285?tid=&pid=&queryId=86dd18ea-f8c5-4153-874e-af2aa3bd32c3&_phsrc=JhD764&_phstart=successSource (accessed March 2025).

Davis, Olive
1991. *From the Ohio to the San Joaquin: A Biography of Captain William S. Moss 1796-1883*. Stockton, California: Heritage West Books.

Lewis Publishing Company, The
1890. *An Illustrated History of San Joaquin County, California*. Chicago, Illinois: Barlow-Sinclair Printing Company. Library of Congress. https://www.loc.gov/item/02007476/ (accessed April 2025).

McAlester, Virgina Savage
2015. *A Field Guide to American Houses*. New York, New York: Alfred A. Knopf.

NETR Online
2025. Historic topographic maps and aerials from 1914, 1954, 1957, 1968, 1968, 1982, 2005, and 2009. www.historicaerials.com (accessed April 2025).

Newspapers.com
2025. Historical Newspapers including the *Stockton Evening and Sunday Record*. https://www.newspapers.com/ (accessed April 2025).

San Joaquin County
2025. Community Development Department. *Scanned Pages of Historical Building Permits Prior to 1992 (Posting Books).* https://www.sjgov.org/commdev/cgi-bin/cdyn.exe?grp=building&htm=permits_prior_1992 (accessed April 2025).

Smith, Don R. (editor)
1976. *From Stage Stop to Friendly Community, A History of Linden.* Scio Odd Fellows Lodge No. 102, Linden Publications and Individual Authors. https://www.lindenhistory.org/_files/ugd/bfbc12_cd2eea7a957b457e816d5ff82f524479.pdf (accessed March 2025).

Stockton Evening and Sunday Record
1920. Advertisement. April 20, 1920. https://www.newspapers.com/image/609932555/?match=1&terms=%22copperopolis%20road%22%20%22best%20road%22 (accessed April 2025).

1935. "Old Timer Reviews Water Problems of Linden Area." June 20, 1935. https://www.newspapers.com/image/843460599/?terms=bellota&match=1 (accessed March 2025).

United States Geological Survey (USGS)
2025. Historical topographic maps of the subject property and surrounding area. *TopoViewer*. https://ngmdb.usgs.gov/topoview/viewer/#4/40.01/-100.06 (accessed April 2025).

Appendix D

Geotechnical Report

ANS

April 13, 2025

GEOTECHNICAL REPORT

Copperopolis Road Solar Project

San Joaquin County, California

Prepared for:
Renewable Properties

Submitted by:
Jordan Craft

Issue and Revision Record

Issue	Date	Author	Approver	Description of Revision
1.0	30 January 2026	J. Craft	Onur Kacar	Draft Submission for Comments
1.1	15 March 2026	J. Craft	Onur Kacar	Final Geotechnical Report
2.0	13 April 2026	J. Craft	Onur Kacar	Final Report. Addresses comments on 2025 California Building Code references. Primary updates to the Seismic Considerations Section.

DISCLAIMER

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Onur Kacar
Chief Engineer
CA PE No. 85382

Jordan Craft
Geologist II

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Attachments

Attachment A – Investigation Location Maps
Attachment B – Soil Boring Logs
Attachment C – Laboratory Test Results
Attachment D – Electrical Resistivity Test Results
Attachment E – Seismic Hazard Site Classification
Attachment F– NRCS Soil Survey

Executive Summary

ANS is pleased to provide this Geotechnical Report (Report) to Renewable Properties, LLC (Renewable Properties) to summarize the results of our geotechnical investigation program in support of the proposed Copperopolis Road Solar project located in Linden, San Joaquin County, California. ANS has summarized, at a very high level, some of the critical geotechnical items and observations which may impact project design and construction within this Section from our observations during the completion of our geotechnical investigation at the project site.

1. ANS advanced a total of six (6) soil borings across the proposed array area from January 5th to January 6th, 2026. ANS utilized Hollow Stem Auger (HSA) drilling method to advance the borings to the planned termination depth of 20 feet below ground surface (BGS). None of the boreholes encountered auger refusal.

2. ANS also completed two (2) electrical resistivity tests (ERT) on November 10, 2025, with test locations being evenly distributed across the project area. Results of in-situ electrical resistivity testing yielded results as low as 287 ohm-cm and as high as 939 ohm-cm.

3. The overburden material observed on site generally included medium stiff to very stiff clay in the upper three (3) feet below grade, then very stiff to hard silt with varying amounts of sand from three (3) to 20 feet below ground surface. Encountered subsurface conditions are summarized in **Section 3**.

4. ANS completed various laboratory tests including thermal resistivity, laboratory corrosivity testing, and soil index testing. Laboratory results are summarized in **Section 4**.

5. Groundwater was not observed in any of the soil borings at the time of our field investigation. Well completion reports provided by the California Department of Water Resources indicate that depth to groundwater in the site vicinity is greater than 100 feet BGS. While static depth to groundwater may be deeper than 20 feet BGS, groundwater fluctuates seasonally and it is possible that buoyant conditions could still occur for slabs and other equipment which are located at/on-grade.

6. Based on corrosivity lab testing and field soil resistivity measurements, the in-situ soil conditions generally indicate soils can be considered “very corrosive to ferrous materials. It is anticipated that appropriate protective measures for buried steel such as standard galvanic coating or sacrificial steel will be employed to manage this corrosion, which is typical of PV projects.

7. It is recommended that shallow foundations are over-excavated and backfilled with a minimum of 12 inches of properly compacted structural fill over geotextile separation fabric, founded at least six (6) inches below grade. Shallow foundation design and construction recommendations are provided in **Section 6** and **Section 7**, respectively.

1. Detailed Scope Description

ANS is pleased to provide this Geotechnical Report to Renewable Properties, LLC (Renewable Properties) to summarize the results of our geotechnical investigation program in support of the proposed Copperopolis Road Solar project located in San Joaquin County, California. ANS, in agreement with Renewable Properties, developed and implemented a geotechnical investigation program intended to provide information to support the design and construction of the proposed solar facility.

It is our understanding that the Copperopolis Road Solar project is expected to encompass roughly 8.9 fenced-in, buildable acres for the development of a photovoltaic (PV) facility. The project has an associated system size of 2.43 MWdc.

ANS's geotechnical investigation program included soil borings and in-situ electrical resistivity testing across solar arrays, as well as an engineering evaluation to provide foundation recommendations and constructability information for the proposed development. Our work also included soil index testing, laboratory thermal resistivity testing for grounding and in-ground electrical cable design, and corrosion testing for buried steel and concrete corrosion considerations. An as-completed Investigation Location Plan is provided within **Attachment A**.

1.1. REFERENCE FILES

Prior to commencing our geotechnical investigation, ANS was provided with multiple project files from Renewable Properties detailing the planned development. The referenced files are listed below:

- 000 RP Geotech SOW Template rev9 231002.pdf
- RPCA Copperopolis – Site Location.kmz
- RPCA Copperopolis Layout + SLD rev10 8.14.25.pdf

1.2. PROJECT UNDERSTANDING

ANS understands that the proposed solar development will include a solar photovoltaic (PV) system, an underground cable collection system, supporting structures and equipment, and the development of unpaved, aggregate access roadways. We understand the project footprint is within a parcel bounded by Copperopolis Road and residential buildings to the north, Best Road and residential buildings to the east, private property with residential buildings to the south, and agricultural farmland to the west. ANS assumes the project design life to be 30 years.

ANS's scope of work was completed based on our approved proposal dated 28 October 2025 and our recommendations herein are specific and based on our understanding of the project and communications with Renewable Properties, LLC. Should the configuration of the system differ from our stated understanding, it is imperative that ANS is contacted to review, confirm, and/or update our recommendations to reflect the planned development. For example, should the location of access roadways, expected traffic volumes and loading, assumed facility design life, or other site condition change, our recommendations will need to be updated.

2. Methodology

2.1. SOIL BORING EXPLORATIONS

ANS advanced six (6) soil borings at select locations across the project area on January 5th and January 6th, 2026. The soil boring locations are depicted in the Investigation Location Plan, provided as **Attachment A**.

All six (6) soil borings were advanced to the target depth of 20 feet below ground surface (BGS). Auger refusal was not encountered, and neither was shallow groundwater. A Diedrich D-50 truck drill rig was used to collect soil samples using the Standard Penetration Test (SPT) Method using hollow-stem augers in accordance with ASTM Standard D1586. ANS logs of borings report "field recorded" SPT-N values. Soil samples were collected continuously within the upper 10.5 feet at each location, then at 13 feet below ground surface (BGS) and in five-foot intervals thereafter to the termination depth. Soil boring locations, confirmed by Renewable Properties, were located at relatively evenly spread locations throughout the project's buildable area. All soil borings were overseen and logged by an ANS representative under the direction of a Professional Engineer licensed in the State of California. Typed soil boring logs are presented in **Attachment B**.

At select soil boring locations, auger cuttings were collected between 1.5 and five (5) feet below grade with the purpose of obtaining bulk soil samples for laboratory thermal resistivity testing (TRT), and auger cuttings were collected between one (1) and four (4) feet below grade for corrosivity testing. Upon completion, each borehole was backfilled to its existing grade with neat cement using the stage-up tremie grouting method under the supervision of a county health inspector per San Joaquin County 9-601.020.

2.2. ELECTRICAL RESISTIVITY TESTING

As part of our field investigation program, on November 10th, 2025, ANS performed field Electrical Resistivity Testing (ERT) at two (2) locations within the project site as shown in the Investigation Location Plan, provided within **Attachment A**. The in-situ soil resistivity measurements were obtained by utilizing the Wenner 4-Pin Method in accordance with ASTM G57 and IEEE Standard 81. Two (2) mutually perpendicular traverses were collected at each array area location utilizing electrode "a"-spacings of 5, 10, 20, and 50 feet. Complete test results are presented as **Attachment D**.

3. Geology, Surface, and Subsurface Conditions

ANS conducted a desktop review of surficial and bedrock geology maps and reports made available by the United States Geological Survey (USGS), the California Geological Survey (CGS), and other publicly available resources. ANS's review is summarized herein, along with our observations during our field investigation, including both surficial and bedrock geology. A geologic map of the site vicinity is provided in **Attachment A**.

3.1. OBSERVED SITE CONDITIONS

The site consists of flat, cleared and tilled land historically used for orchard farming. Travelling to site involves traversing east on CA-4 from I-5 or east on CA-26 from CA-99 for approximately 5 miles, following directions for Copperopolis Road, where the site is easily accessible from the south side of the road. During the implementation of our field investigation, recent heavy rains caused the freshly tilled clayey soil to be too soft and saturated for wheeled vehicle access on site. However, all test locations were still easily accessible by tracked vehicles and on foot. As-tested coordinates are provided within **Attachment A**.

3.2. HISTORIC AND TOPOGRAPHIC SETTING

Based on Google Earth Imagery, this land was historically used for orchard farming up until 2024. By spring of 2025, all orchard trees had been cleared and replaced with green vegetation (native or planted) that covered the site through fall of 2025. Between October 2025 and January 2026, the site has remained clear of vegetation. General topography is flat to gently sloping with a maximum slope of 8% and an average slope of 2%.

3.3. BEDROCK GEOLOGY

ANS reviewed geologic maps made available by the United States Geological Survey (USGS), California Geological Survey (CGS), and California Department of Water Resources (DWR), which indicated that the project area is mapped within the Pleistocene-aged Modesto Formation of the Great Valley (or "Central Valley") geomorphic province. The Great Valley geomorphic province is a structural basin and lowland region that is approximately 400 miles long and 50 miles wide, encompassing both the Sacramento Valley (north) and San Joaquin Valley (south) of central California.

During the Mesozoic and early Cenozoic eras, both valleys accumulated thick deposits of deep marine turbidites interbedded with marine sandstone, siltstone, and conglomerate known as the Great Valley Sequence. When continental sediments began to accumulate in Sacramento Valley, San Joaquin Valley remained under deep water. Marine sediments continued to accumulate in this region into the late Paleogene, until a widespread regression marked the transition to a fluvial depositional environment.

The Miocene-aged Valley Springs Formation and Pliocene-aged Mehrten Formation deposited non-marine clayey sandstones and andesitic sandstone that are estimated to be between 900 feet below grade and 500 feet below grade within the subsurface of the project area. Unconformably overlying the Mehrten Formation is the Pliocene-aged Laguna Formation. The Laguna Formation is described as a pebble to cobble conglomerate, arkosic sandstone, and siltstone. This unit is estimated to be between 500 and 100 feet below grade within the subsurface of the project area.

In the upper 100 feet of the subsurface are two (2) Pleistocene-aged terrace deposits, the Riverbank Formation and the Modesto Formation. The Modesto Formation is approximately 0.14 to 0.42 million years old, and the Riverbank Formation is approximately 0.13 to 0.45 million years old. The Modesto and Riverbank terraces were formed by the fluvial systems that exist today as material eroded from the surrounding mountain ranges and deposited in wide alluvial fans. The Modesto and Riverbank formations are lithologically similar and only distinguishable by superpositional relationships, where Modesto overlies Riverbank, and their relative degree of soil profile development. While preliminary geologic mapping of the site vicinity by the California Geological Survey indicates that the project area is comprised of the Modesto Formation, we assume that both formations would be encountered within the upper 100 feet of the subsurface. A geologic map of the site vicinity is provided in **Attachment A**.

3.4. SURFICIAL GEOLOGY

ANS reviewed geologic maps made available by the California Geological Survey, which indicate that the project area is mapped within the Pleistocene-aged Modesto Formation. The Modesto Formation consists of tan to light-gray unconsolidated, unweathered gravel, sand, silt, and clay and thickness of this formation ranges from less than 10 feet to nearly 200 feet (Helley and Harwood 1985). Delarttre et al. (2023) distinguishes four (4) subunits within the Modesto Formation based on geomorphic relationships and soil development. The project area is mapped within the "upper member, fine-grained" subunit of the Modesto Formation (Qmub) which is described as "commonly stratified alluvium of flood basins, lower fans, and interdistributary fan areas." Mapped within the site vicinity is the stratigraphically younger "upper member, undivided" subunit (Qmu) which is described as

"alluvium associated with lower (younger) terraces and younger fans." The Modesto Formation overlies the lithologically similar Pleistocene-aged Riverbank Formation. Based on our limited geotechnical investigation, depth to the Riverbank Formation is between 20 and 100 feet below ground surface (BGS).

The Riverbank Formation is generally described as dark brown to red semi-consolidated to unconsolidated gravel, sand, silt, and minor clay. The thickness of the formation ranges between less than one (1) foot and more than 200 feet, depending on the location (Helley and Harwood 1985). The Riverbank Formation overlies the Laguna Formation.

ANS reviewed surficial soil mapping available from the Natural Resource Conservation Service (NRCS) Web Soil Survey application. The NRCS survey was initially created for agricultural purposes and is generally limited to the upper five (5) to six (6) feet BGS; however, the resource provides generalized information pertaining to the soil chemistry and properties. The NRCS mapping identifies the project area to be comprised of the Jacktone clay soil series, which is derived from alluvium of mixed rock sources. The Jackston clay series is generally comprised of clay from approximately 0 to 3 feet below grade and stratified sandy loam to clay loam from approximately 3 to 5 feet below grade. The NRCS describes an indurated soil layer at 3 feet below grade, cemented soils at approximately 5 feet below grade and identifies the depth to a duripan layer (hardened soil layer cemented by silica) to be between 1.5 and 3.3 feet below grade. An NRCS soil report is provided as **Attachment F**.

3.5. OBSERVED SUBSURFACE CONDITIONS

ANS has provided the generalized subsurface conditions within **Table 1** based on observations during our geotechnical investigation program. The mapped soil formations identified within our desktop review are generally consistent with the findings of our field investigations. Soil boring logs have been provided as **Attachment B** and should be reviewed for specific soil condition observations.

TABLE 1: GENERALIZED SUBSURFACE PROFILE

Stratum	Avg. Depth	Material (USCS Classification)	Avg. Consistency/ Density	Description
---	0 ~ 0.5	Topsoil	---	A layer of surficial topsoil was observed at all soil boring locations during our investigation. Depth to topsoil was documented to range from one (1) to six (6) inches below grade, however topsoil may extend to greater depths throughout the project boundary.
I	0.5 ~ 3	Clay (CL)	Medium Stiff to Stiff	Throughout this layer, dark brown, medium stiff to stiff clay was generally encountered with varying amounts of silt and sand. Standard Penetration N-values ranged between 5 and 24 bpf.
II	3 ~ 4.5	Clay (CL)	Very Stiff	Brown to brownish yellow very stiff clay was generally encountered with varying amounts of silt and trace fine sand. Standard Penetration N-values ranged between 9 and 46 bpf.
III	4.5 ~ 19.5	Clay (CL)	Very Stiff to Hard	Brown to brownish yellow very stiff to hard clay was encountered with varying amounts of silt and medium to fine sand. In B-06, clayey medium to fine sand encountered from 13 to 19.5 feet BGS. Standard Penetration N-values ranged from 17 to >50 bpf

3.6. GROUNDWATER

At the time of our investigation program, groundwater was not observed in any of the six (6) borings performed on site. ANS reviewed publicly available well log data made accessible by the California Department of Water Resources which indicates that depth to groundwater is greater than 100 feet below ground surface (BGS) within the site vicinity. It is possible that seasonal conditions may cause the groundwater table to fluctuate as depth to groundwater is ephemeral and may be influenced by precipitation, temperature, or seasonal variations. Perched water may be present in soils during wet seasons in areas where a low-permeability layer exists above a high-permeability layer, causing water to accumulate and form a saturated zone that is isolated from the main water table.

4. Laboratory Results

Representative soil samples were collected during our investigation and submitted to ANS's in-house materials testing laboratory. Soil samples will be retained for a period of two (2) months following the initial submission of this Report.

4.1. SOIL INDEX TESTING

A summary of the index laboratory test results has been provided within **Table 2** and **Table 3**. As-received laboratory test results are included within **Attachment C**.

TABLE 2: SOIL INDEX TESTING SUMMARY (SIEVE ANALYSIS, ASTM D6913)

Location ID	Sample ID	Depth (ft)	% Gravel	% Sand	% Fines	% Moisture
B-05	S-05	6 – 7.5	0.5	17.7	81.8	21.3
B-06	S-08	13 – 14.5	0.1	56.4	43.5	13.0

TABLE 3: SOIL INDEX TESTING SUMMARY (ATTERBERG LIMITS, ASTM D4318)

Boring ID	Sample ID	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	% Moisture
B-01	S-03	3 – 4.5	37	20	17	22.2
B-02	S-04	4.5 – 6	38	20	18	21.8
B-03	S-02	1.5 – 3	46	22	24	42.0
B-04	S-01	0 – 1.5	45	22	23	29.8

4.2. THERMAL RESISTIVITY TESTING

ANS collected bulk samples from four (4) locations within the project area from 1.5 to five (5) feet below grade for laboratory testing of Thermal Resistivity. Soils were collected in a five-gallon bucket and delivered to ANS's in-house laboratory for testing. The soil was compacted to 90 and 95 percent of its Modified Proctor Density (ASTM1557) in accordance with IEEE Standard 442-2017 and ASTM D5334 standards. Results of the thermal testing are summarized within **Table 4**. Complete, as-received results are provided within **Attachment C**.

TABLE 4: THERMAL RESISTIVITY TESTING SUMMARY (ASTM D5334)

Boring ID	Material Type	Thermal Resistivity Values at Various Moisture Contents						As Received Moisture Content (%)	Max. Dry Density (pcf)
		% water	% water	% water	% water	% water	% water		
		(°C-cm/W)	(°C-cm/W)	(°C-cm/W)	(°C-cm/W)	(°C-cm/W)	(°C-cm/W)		
B-01	Clay	0.0	4.8	9.5	14.3	19.0	28.4	28.4	100.2
		182.4	**145.7**	**107.1**	**94.2**	**85.5**	**79.5**		
B-02	Clay	0.0	4.7	9.4	14.1	18.8	23.8	23.8	101.4
		190.6	**149.1**	**113.4**	**98.7**	**88.3**	**84.2**		
B-04	Clay	0.0	5.5	10.9	16.4	21.8	32.5	32.5	92.9
		226.7	**175.9**	**122.2**	**104.5**	**93.9**	**87.3**		
B-06	Clay	0.0	4.2	8.4	12.6	16.8	25.7	25.7	104.5
		216.3	**170.0**	**130.8**	**112.5**	**99.7**	**89.7**		

4.3. CORROSIVITY TESTING

ANS collected bulk samples from one (1) to four (4) feet below grade for laboratory corrosivity testing at two (2) locations (B-03 and B-05) within the project area. The results of the testing, completed by ANS, are summarized within **Table 5** and detailed within **Attachment C**.

TABLE 5: CORROSIVITY TESTING SUMMARY

Boring ID	pH	Sulfate (mg/kg)	Chloride (mg/kg)	Redox Potential (average) (mV)	Soil Box (Calculated Resistivity) (Ω-cm)
B-03	7.7	<15	93	147	1,530
B-05	7.4	30	105	154	1,130

5. Seismic Considerations

5.1. SEISMIC SOURCES

In California, the primary seismic hazards are associated with shallow crustal earthquakes, and the predominant seismic source is the San Andreas Fault Zone. The San Andreas Fault Zone is a system of northwest-trending, dextral strike-slip faults where the Pacific Plate and North American plate slide horizontally past each other along a transform boundary. The estimated slip rate of the San Andreas fault is greater than 0.20 inches (0.5 cm) per year with historic (late Holocene) fault creep and slip rates as high as 1.34 inches (3.39 cm) per year (Sieh and Jahns, 1984). The San Andreas fault is located approximately 90 miles west of the project boundary and is thus a primary focus in determining seismic activity within the region.

Based on the 2023 National Seismic Hazard Map (NSHM) disaggregation analysis, the primary seismic sources affecting the project site are the West Tracy Fault and San Andreas Fault. Secondary seismic sources include the Calaveras Fault, Mount Diablo Thrust–South, and the Greenville Fault Zone, with varying contributions at short and long periods.

The West Tracy Fault is a southwest-dipping reverse fault located approximately 22 miles southwest of the project area. The West Tracy Fault has an estimated long-term average slip rate of about 0.008 inches (0.02 cm) to 0.01 inches (0.03 cm) per year (Unruh and Hitchcock, 2015). A disaggregation analysis (**Attachment E**) performed using the NSHM (2023), based on a 2% probability of exceedance in 50 years (equivalent to a 2,475-year return

period), indicates a Mode earthquake scenario characterized by a Moment Magnitude (Mw) of 5.3 occurring at approximately 6.5 miles (10.48 kilometers). This scenario represents the predominant earthquake source within the West Tracy Fault system.

ANS also reviewed other Quaternary fault zones within a 50-mile radius of the project site including Clayton, Great Valley, and Las Positas. These fault zones are considered to have negligible potential impact on the site. Based on the information from the USGS Earthquake Hazards Program, since 1881, a total of eight (8) seismic events with a Moment Magnitude (Mw) greater than 5.0 have been recorded within 50 miles of the project boundary.

- In 1881, a Mw6.3 earthquake occurred near of Modesto, which is approximately 47 miles southwest of the project site
- In 1889, a Mw6.0 earthquake occurred near Antioch, which is approximately 36 miles northwest of the project site
- In 1892, a Mw5.6 earthquake occurred near Dixon, which is approximately 45 miles northwest of the project site
- In 1902, a Mw5.4 earthquake occurred near Elmira, which is approximately 46 miles northwest of the proejct site
- In 1980, three (3) earthquakes occurred near Livermore, which is approximately 35 miles southwest of the project site. On January 24, a Mw5.8 earthquake and a Mw5.1 earthquake occurred. On January 27, a Mw5.4 aftershock earthquake occurred. Numerous aftershocks less than a Mw5.0 were recorded, and the seismic event was later named “The 1980 Livermore Earthquake.”
- In 1986, a Mw5.7 earthquake occurred near East Foothills, which is approximately 45 miles southwest of the project site

5.2. SITE CLASSIFICATIONS

The current California Building Code (2025 Edition) adopts the 2024 International Building Code (IBC) and ASCE 7-22. Per ASCE 7-22, structures must be designed based on the applicable Seismic Design Category and corresponding Site Class. In accordance with Chapter 20 of ASCE 7-22, the Site Class should be determined based on the average shear wave velocity (Vs_{30}) within the upper 100 feet (30 meters) of the soil profile. This velocity can be determined from direct measurements or estimated using empirical correlations based on SPT N-values, Cone Penetration Test (CPT) tip resistances, or undrained shear strength. Based on data obtained from our subsurface investigation and our familiarity with local geologic conditions, the site has been classified as Site Class DE, with the Vs_{30} value estimated using empirical correlations from SPT N-values.

Assuming Risk Category II and utilizing the online ASCE Hazard Tool (**Attachment E**) which is based on risk-targeted maximum considered earthquake (MCE_R) ground motion parameter maps (ASCE 7-22), the proposed project is assigned to Seismic Design Category D. The Risk Category should be confirmed with the Structural EOR as the design progresses. The following response acceleration parameters, S_{DS} and S_{D1} obtained from the ASCE Hazard Tool, should be used for structural design:

- 0.2 second spectral response acceleration, S_S= 0.73 g
- 1 second spectral response acceleration, S_1= 0.25 g
- Maximum spectral acceleration for short periods, S_{MS}= 1.17 g
- Maximum spectral acceleration for a 1-second period, S_{M1}= 0.85 g
- 5% damped design spectral acceleration at short periods, S_{DS}= 0.78 g
- 5% damped design spectral acceleration at 1-second period, S_{D1}= 0.57 g
- Peak Ground Acceleration Adjusted for Site Effects PGA_M= 0.37 g
- Seismic Design Category SDC= D

5.3. PRELIMINARY SEISMIC EVALUATION

While the 2025 California Building Code and ASCE 7-22 do not provide specific methodologies for liquefaction susceptibility screening, we have reviewed the screen criteria provided in the Liquefaction Evaluation Module of 2026 Caltrans Geotechnical Manual (GM). These criteria consider factors including groundwater table, age of soil, soil type, in-situ soil density, peak ground acceleration (PGA) and earthquake moment magnitude. Based on these screening factors, the subsurface soils encountered in borings are not considered susceptible to liquefaction. Therefore, special geotechnical seismic considerations for the foundation designs are not required.

ANS also performed a preliminary evaluation for other seismic hazards. We conclude that the seismic induced settlement is expected to be negligible due to the low potential of liquefaction. The potential for seismically induced slope instability is considered low due to the flat topographic setting of the site. Since soil liquefaction at the project area is unlikely, the potential for both lateral spreading and lateral flow is also considered low. The probability of a fault displacement within the project boundary is considered low because no active faults or potentially active faults are mapped within the project boundary.

6. Foundation Design Considerations

ANS anticipates that, as typical with solar farm construction, embedded posts, such as W6x9 H-piles, will be used to support the proposed solar panels. Conventional shallow foundations such as sonotubes, spread footings, or systems may also be utilized for equipment pads and associated support structures.

6.1. CORROSION CONSIDERATION

6.1.1. BURIED STEEL

Given the available testing results measuring the soil pH level, sulfate and chloride concentrations, resistivity, and redox potential summarized in **Section 4.3** **(Table 5),** in consideration with the soil and moisture conditions observed, the in-situ soil conditions generally indicate soils that may be considered, **"very corrosive"**. Therefore, it is anticipated that scarified steel thickness or hot dipped galvanized steel with a minimum zinc coating thickness in accordance with ASTM A123 should be specified to provide allowance for corrosion loss over the project design life. For structural steel shapes, a minimum zinc coating thickness typically ranges from 3-mil to 5-mil depending on the steel section size as specified by ASTM A123. For example, a W6x9 shall contain a minimum zinc coating grade of 75 micrometers, or a 3-mil thick coating.

Steel section loss in piles decreases the structural load carrying capacity of the member as well as increases the member deflections. Therefore, it is recommended that the final structural design considers the useful life of galvanized (zinc) coating, followed by the anticipated loss of steel due to corrosion to ensure the structural integrity is maintained throughout the service life. Thicker pile sections, increased zinc coating thickness, or other corrosion protection measures may be necessary to accommodate any reduction in structural capacity. For example, it is possible that a W6x12 pile with a standard zinc coating thickness could corrode to W6x9-equivalent section throughout the service life depending on the corrosion-related soil properties.

ANS conducted a site-specific corrosion evaluation which consisted of reviewing the subsurface profile (soil type), in-situ moisture content, field and/or laboratory tested electrical resistivity. The purpose of our evaluation is to estimate the rate of corrosion of zinc coating and bare steel resulting from exposure to the surrounding environment, and the potential steel loss of the member sections. Below are the summarized results for soil (below grade) and atmospheric (above grade) corrosion for a 30-year design service life.

Soil Corrosion:

- **Soil corrosion induced loss of zinc (per side):**
  - **3 mil coating:** 0.566 mil/year (depletion of zinc occurs in 5.3 years)
  - **5 mil coating:** 0.333 mil/year (depletion of zinc occurs in 15.0 years)
- **Bare steel loss due to soil corrosion *after* loss of zinc (per side)**: 1.816 mil/year
  - **With 0 mil coating:** 54.5 mil (at the end of 30 years of design life)
  - **With 3 mil coating:** 44.9 mil (depletion of bare steel occurs over 24.7 years)
  - **With 5 mil coating:** 27.2 mil (depletion of bare steel occurs over 15.0 years)

If desired, a more detailed corrosion evaluation report can be developed by ANS, or others, to interpret the soil corrosivity test results and estimate the rate of corrosion for zinc and bare steel resulting from exposure to the surrounding environment. This detailed corrosion evaluation may be provided to a foundation or structural engineer to incorporate the test results into the design and selection of pile foundations, or other buried steel across the site.

6.1.2. BURIED CONCRETE

Corrosive soils can have a significant impact on below-grade concrete foundations by potentially damaging or weakening the concrete. One of the primary forms of concrete deterioration due to exposure to corrosive soils is sulfate attack. Sulfate attack is a common form of concrete deterioration which occurs when concrete comes in contact with water or soil containing sulfates. Sulfates are typically found in some soils, in seawater, and in wastewater treatment plants. The principal factors which affect the rate and severity of sulfate attack are permeability of concrete, concentration of sulfates, tricalcium aluminate (C_3A) content, and calcium hydroxide content. When sulfates react with C_3A, it will form ettringite which will expand and create internal tension within the concrete that eventually leads to cracking. Therefore, a low C_3A content is one of the main considerations when selecting cement for sulfate resistance. For example, for severe sulfate exposures, Type V cement with a maximum C_3A content of 5% is specified in Table 19.3.1.1 of the ACI Building Code (ACI 318-14).

Recommended concrete properties, including cement type, to resist sulfate attack are based on the site-specific sulfate exposure class, as per ACI 318-19, Table 19.3.1.1. The severity of the exposure of concrete to sulfate is divided into four classes (S0 through S3) depending on the water-soluble sulfate in soil (percent by mass) or dissolved sulfates in water (ppm). The sulfate exposure class limits are given in **Table 6** below.

TABLE 6: SULFATE EXPOSURE CLASSIFICATION FROM ACI318-14 TABLE 19.3.1.1

Sulfate Exposure Class	Water-Soluble Sulfate (SO42) in soil, percent by mass	Dissolved Sulfate (SO42) in groundwater, ppm
S0	$SO_4^2 < .10$	$SO_4^2 < 150$
S1	$.10 \leq SO_4^2 < .20$	$150 \leq SO_4^2 < 1{,}500$ or seawater
S2	$.20 \leq SO_4^2 \leq 2.00$	$1{,}500 \leq SO_4^2 \leq 10{,}000$
S3	$SO_4^2 > 2.00$	$SO_4^2 > 10{,}000$

As shown in **Section 4.3** (**Table 5**), the results of laboratory corrosion testing indicate the water-soluble sulfate concentration within the upper three feet of soils generally ranges from less than 15 to 30 mg/kg (or 0.0015 to .0030 percent by mass). Based on the results of this testing, the site soils appear to have a sulfate exposure class of **S0**, which corresponds to **negligible** sulfate exposure. ANS recommends that concrete adheres to the requirements of ACI 318-14, Table 19.3.1.1 for concrete properties including maximum water-cement ratio, minimum compressive strength (psi), and cement type for the site-specific sulfate exposure class. For sulfate exposure class **S0**, external sulfate attack is likely not a concern and there are no recommended restrictions on cement type.

6.2. FROST CONSIDERATIONS

Climate data provided by the National Oceanic and Atmospheric Administration (NOAA) indicates that the project area will experience on average two (2) freezing season days annually, typically from a few nocturnal hours of freezing temperatures in the fall or winter. San Joaquin County is classified as a Mediterranean climate which is characterized by hot summers and mild winters, and the mean annual temperature in Stockton, CA is 61.5 degrees Fahrenheit. According to the San Joaquin County Community Development Department, there is no measurable frost depth for the region (0 inches below grade), and therefore frost is of negligible concern.

6.3. SOIL SHRINK AND SWELL POTENTIAL

Shrinkage and swelling of soils refer to the volumetric change (decrease and increase) exhibited in primarily fine-grained soils due to a change in moisture conditions. The extent of shrinking and swelling is largely influenced by the type and amount of clay present in the native near-surface soils. Higher-risk soils generally include fine-grained material with a high clay content, greater than 50 percent by weight, and liquid limits of 50 percent or higher (fat clays).

The Swelling Clays Map of the Conterminous United States (Olive, 1989) maps the project site as having generally less than 50 percent clay with moderate to slight swelling potential. Based on laboratory testing on selected samples, native soils generally consist of medium plasticity clays, indicating a low risk of expansive soils.

6.4. RECOMMENDED PARAMETERS FOR PV ARRAY PILE DESIGN

Based on our interpretation of the subsurface conditions observed within our limited investigation program, and the laboratory testing results, ANS recommends that the soil parameters in **Table 7** be considered for axial and lateral preliminary driven pile designs within array areas only. Other foundation types, such as slab-on-grade and shallow foundations are provided in **Section 6.5**. Since a pile load testing program was not implemented, the factor of safety for side resistance and end bearing is taken as 2 and 3, respectively. ANS recommends a pile load testing program prior to final design to confirm the parameters presented herein.

TABLE 7: RECOMMENDED PRELIMINARY SOIL (LPILE) PARAMETERS FOR PILE DESIGN

Depth [ft]	Material Type	Total Unit Weight (pcf)	Internal Friction Angle	Cohesion (psf)	Soil Modulus (pci)	Soil Strain (E_{50})	Allowable End Bearing[1, 2] [lb/ft^2]	Allowable Side Resistance[1, 2] [lb/ft^2]
0 – 1	Stiff Clay w/o Free Water	100	--	750	--	0.010	--	--
1 – 3	Stiff Clay w/o Free Water	100	--	1,250	--	0.008	2,000	350
3 – 4.5	Stiff Clay w/o Free Water	115	--	2,500	--	0.006	3,500	500
4.5 – 20	Stiff Clay w/o Free Water	120	--	3,000	--	0.005	4,500	700

1. These recommendations consider a minimum factor of safety of 3.0 for end-bearing and 2.0 for side resistance conditions.
2. Alpha and beta methods approach was utilized for axial capacities
3. Allowable end bearing values are recommended based on strain compatibility with mobilized allowable side resistances

The unit weights in **Table 7** assume that no groundwater is present within the pile embedment depth, as no groundwater was encountered in any soil borings during ANS's field investigation. An effective unit weight value (62.4 pcf) subtracted from the total unit weight values as prescribed in **Table 7** should be considered for soil layers below the groundwater table, if encountered during a future investigation or construction.

ANS recommends that allowable side resistance within the upper **12 inches** (**1 foot**) be neglected due to potential surficial disturbance. The results in **Table 7** are conclusions justified by a limited geotechnical investigation program conducted in January of 2026. These LPILE parameters should not be relied upon for other site foundation designs. It is our recommendation that a verification load testing program and detailed structural calculations, using the intended pile sections and design loads, be performed prior to construction to confirm these recommendations.

ANS further notes that the parameters provided in **Table 7** are considering direct embedment of piles using conventional installation techniques. Should pre-drilling be completed, or ground screws be used, **Table 7** should not be used since the diameter of pre-drilling, pre-drilled hole backfill, and ground contact/socket resistance of the pile or screw against the hole will influence the design recommendations. Recommended design parameters for pre-drilled and installed piles or ground screws should be determined using field-scale testing, using the means-and-methods planned during construction, to simulate the performance of those piles and provide design guidance for the alternate means of installation.

6.5. RECOMMENDED SOIL PARAMETERS – SHALLOW FOUNDATIONS

It is anticipated that slabs, footings, and other shallow foundations will be used to support lightly loaded structures proposed as part of the PV development. ANS has provided recommendations in **Table 8** for these types of structures. In preparing the recommended soil parameters for shallow foundation design, it is assumed that some tolerance to settlement is allowable (up to one-inch total).

TABLE 8: RECOMMENDED SOIL PARAMETERS FOR SHALLOW FOUNDATIONS

Depth (ft)	Material	Max. Allowable Bearing Pressure (psf)		Vertical Subgrade Modulus (PCI)*	Soil / Concrete Friction Factor
		Strip Footings / Grade Beams	Isolated Square / Circular Footings		
1 to 2	Structural Fill[1] over native Clay	1,250	1,500	35	0.3
2 to 3	Structural Fill[1] over native Clay & Silt	1,750	2,250	45	0.3

1. Minimum 12-inch
2. For 1x1 plate

The recommended parameters in **Table 8** assume that shallow foundations are over-excavated and brought back to foundation bearing elevation with a minimum of 12 inches of compacted structural fill with a foundation embedment depth of at least 6 inches below grade. If native subgrade material is unsuitable, ANS recommends an additional over-excavation of 12 inches, the placement of the geotextile separation fabric, and the controlled placement of lifts of structural fill (as specified in **Table 10**) or crushed stone, Structural fill or crushed stone should be placed in loose lifts not exceeding 12-inches if using large equipment, or 8-inches if using hand-operated tools such as jumping jacks, tamping plates, or similar equipment and should be compacted to at least 95% of its Modified Proctor Density (ASTM D1577).

Should the maximum allowable bearing capacity be lower than necessary, ANS recommends additional over-excavating and replacement of native material using 12-inches of compacted crushed stone or structural fill placed and prepared as noted above. For each additional 12-inches of over-excavation and replacement with compacted crushed stone or structural fill below grade, an increase of 250 psf can be achieved.

The capacities and parameters noted in **Table 8** are based on foundation considerations and assumptions detailed in **Section 7.3.** The above recommendations in **Table 8** are based on isolated spread footings with dimensions producing less than 100 square feet.

6.5.1. MAT FOUNDATIONS

Mat Foundations (100 square feet or larger) should be founded at least 6 inches below grade and be over excavated and backfilled with a minimum of 12 inches of compacted fill as indicated in **Section 7.3.** Recommended soil parameters for mat foundations can be found in **Table 9** below. Allowable bearing capacities as presented are applicable to foundation elements bearing on compacted fill placed on native, undisturbed soil.

TABLE 9: RECOMMENDED SOIL PARAMETERS FOR MAT FOUNDATIONS

Depth (ft)	Material	Max. Allowable Bearing Pressure (psf)		Vertical Subgrade Modulus (PCI)*	Soil / Concrete Friction Factor
		100 to 500 sq. ft.	>500 sq. ft.		
1 to 2	Structural Fill* over native Clay	1,000	850	35	0.3
2 to 3	Structural Fill* over native Clay	1,600	1,350	45	0.3

1. Minimum 12-inch
2. For 1x1 plate

Rigid mat foundations placed on properly compacted fill for a maximum allowable bearing capacity indicated above may experience a maximum settlement of two (2) inches. Adequate construction joints and reinforcement, as determined by the Structural Engineer, should be provided to reduce the potential for cracking of the floor slab due to differential movement. It is important to note that vertical subgrade modulus in **Table 8** and **Table 9** is based on a 1' x 1' plate. Adjustments will need to be made by the Structural Engineer to account for the actual foundation size, as the modulus of subgrade reaction varies with the size of the foundation.

Lastly, sliding resistance of any shallow foundations will be largely provided by the friction between the concrete foundation and the underlying subgrade soils. Although the concrete foundation will be separated from the native soil by a compacted structural fill layer, we have conservatively considered direct contact with native fine-grained soils for purposes of obtaining a design value. The base friction coefficient for the foundation on native soils is provided in the above tables. The strains required to mobilize base friction are not compatible with the strains required to mobilize passive resistance. Therefore, we recommend that passive earth pressure be ignored.

The bearing capacity and settlement estimations discussed herein for mat foundations are based on typical embedment depths and mat foundation geometry.

7. Construction Recommendations

7.1. EXCAVATION

Depending on proposed foundation configurations, degree of earthwork, and depth of utilities, some excavations may extend deeper than four (4) feet below grade. Temporary excavations deeper than four (4) feet should be shored or sloped and benched, in accordance with OSHA regulations, to ensure safe working conditions within the excavations. For benching purposes, overburden clays may be considered as “Type A” material and should be sloped no steeper than 3/4H:1V (horizontal to vertical). Clayey and silty sand, “Type B”, should be limited to 1H:1V or flatter. “Type C”, flowing (non-cohesive) sands, should utilize 1.5H:1V or shallower. All OSHA soil classifications should be field determined by the contractor’s “competent person” prior to excavation. Any proposed shoring

systems should be designed by the contractor's "competent person", be certified by a Professional Engineer licensed in the State of California and should be submitted to the engineer for review.

Within our geotechnical investigation, no refusal was encountered, however hard soils were documented as shallow as 3 feet below grade. As such, the contractor should be prepared for the possibility of relatively difficult excavations due to hard or very dense material. Although not observed during our investigation, the contractor should be prepared for the possibility of cobbles or boulders within excavations and earthwork activities. ANS notes that pre-drilling for post locations, if required and identified during subsequent pull-out testing at the site, should also be considered and is further discussed in **Section 7.6**.

7.2. DEWATERING

At the time of our geotechnical field investigation, groundwater was not observed within any of the conducted soil borings. However, it should be noted that groundwater conditions are ephemeral and fluctuate due to seasonal and climate influences. Rainfall may accumulate water on site due to the fine-grained nature of native soils and as such, dewatering may be necessary for shallow excavations. The contractor should be prepared to manage groundwater, perched water, and/or infiltrated stormwater as needed using localized sump-and-pump, wellpoint, or similar techniques to allow for concrete foundation construction in-the-dry. Water discharge should be managed in compliance with applicable state and local regulations. Furthermore, based on the season and time of construction, precipitation may cause wetter soil conditions which need to be considered and managed. The contractor should take these conditions into consideration, including the need for additional access stone and/or cement or lime for the stabilization of these conditions.

7.3. SUBGRADE PREPARATION AND COMPACTION

Prior to installation of shallow concrete foundations, ANS recommends over-excavating the subgrade by at least twelve (12) inches, lining the exposed material with a geotextile separation fabric, and bringing the subgrade back-up to the design foundation elevation with compacted structural fill as specified in **Table 10**.

Native material beneath the separation fabric should be inspected for unsatisfactory conditions such as standing water, unsuitable soil, organics, protruding cobbles or boulders, or deleterious materials. Should any unsatisfactory conditions exist within the native subgrade, the excavation should be undercut an additional 12 inches prior to placement of the geotextile separation fabric.

If crushed stone or structural fill is used as the backfill material type, a permanent positive drainage and moisture barriers such as geomembranes must be placed between the backfill material and the native cohesive soils to reduce moisture fluctuations within the underlying native material. Soils that are observed to rut or deflect excessively under the moving load should be undercut and replaced with properly compacted fill materials. A geotechnical engineer or a competent geoprofessional should witness the proof-rolling and undercutting activities. It is advisable to perform the earthwork activities during a period of dry weather. The final desired grade will depend on finished elevation and the depth of any subgrade modifications as discussed in the following sections.

TABLE 10: RECOMMENDED SPECIFICATION OF STRUCTURAL FILL

Sieve Size	Percent Passing
2-inch	100
1 ½-inch	60 – 100
No. 4	30 – 60
No. 200	0 – 10

Max. Liquid Limit	Max. Plasticity Index
30	10

Should structural fill material not be available, in accordance with the specifications highlighted in **Table 10**, ANS should be contacted to evaluate alternate materials. Structural fill should be placed in loose lifts not exceeding 12-inches if using large equipment, or 8-inches if using hand-operated tools such as jumping jacks, tamping plates, or similar equipment. Structural fill should be placed within two (2) percent of its optimum moisture content and be compacted to at least 95 percent of its Modified Proctor Density (ASTM D1557). The subgrade preparation (over-excavation, fabric, and structural fill) should horizontal extend at least 0.5 times the compacted vertical structural fill thickness beyond each edge of the foundation. For example, a 24-inch over-excavation and compacted structural fill thickness should extend at least 12 inches laterally beyond each foundation edge.

After the excavation and preparing the subgrade with structural fill, concrete should be placed as quickly as possible to avoid exposure of the subgrade to wetting and drying. Surface run-off water should be drained away from the excavations and not be allowed to pond. If possible, the foundation concrete should be placed during the same day the excavation is made. If it is required that footing or grade beam excavations be left open for more than one day, they should be protected to reduce evaporation or entry of moisture.

7.4. BACKFILLING AND COMPACTION

7.4.1. RE-USE OF NATIVE SOILS

ANS notes that any native soils with considerable fine-grained content (more than 20 percent) may be difficult to handle, place, and compact without proper moisture conditioning and protection. ANS recommends the following measures be considered to reduce the adverse impacts of moisture-sensitive soils:

- Positive measures should be implemented and maintained to intercept and direct surface water away from moisture-sensitive subgrade surfaces.
- Subgrade surfaces should be sloped and, as appropriate, seal-rolled to facilitate proper drainage. Surfaces should be properly prepared in anticipation of inclement weather. Moisture should not be allowed to collect on subgrade surfaces.
- To the extent practical, the limits of exposed subgrade soils should be minimized.
- Construction traffic should be limited to properly constructed haul roads.
- Disturbed soils should be removed and replaced with compacted controlled fill material.
- In place moisture contents should be maintained with two percent wet/dry of the optimum moisture content as determined by the Standard Proctor Test (ASTM D698).

These soils may be re-used across the project area for fill in landscaped areas; however, it should not be used immediately below foundations or load-bearing structures where typically imported aggregate based structural fill or general backfill are used, respectively. Native material used as backfill for cable trenches should be handled and placed at a moisture content at or above its optimum value to ensure representative thermal properties are maintained. Collection trench backfill material shall be free of organics, angular rock fragments and meet gradation criteria per Electrical/Collection specifications.

Native soils may also be used in required “fill” areas within the PV array provided that the material is placed and compacted consistent with the “general backfill” recommendations described herein.

7.4.2. GENERAL BACKFILL

In areas around and above installed foundations, large utilities, and other buried site features, ANS recommends well-graded granular soils with less than 20 percent fine-grained content may be used as general backfill. Native soils meeting these criteria, if and where present, may also be used. General backfill material should be screened of any cobbles, boulders, and any particles larger than 3 inches in diameter, and should not be used beneath any load-bearing structures. General backfill should be placed in loose lift thicknesses not exceeding 12 inches and be compacted to at least 95 percent of its Standard Proctor (ASTM D698). Soil used as backfill should be free of excessive moisture, organics, and deleterious material.

In fill areas directly beneath shallow foundations and load-bearing structures, ANS recommends structural fill as described in **Section 7.3** and **Table 10.**

7.4.3. COMPACTION TESTING

Compaction testing should be performed at each discrete equipment foundation location for each compacted lift at a minimum of one test per 2,500 square feet. For linear sections such as trenches, the contractor and/or the owner's representative should perform a visual trench bottom inspection along the length of the trench to confirm no angular, sharp, deleterious, frozen, trash, organic material, or standing water exists at the bottom of trench. For backfilling and compaction of trenches, a minimum of one compaction test per 500 linear feet and minimum one per lift, should be performed. In all cases, the subgrade should be maintained, covered, or protected if concrete is not immediately placed. Excessively wet or dry material should be removed or improved prior to the placement of foundations.

7.5. ACCESS ROADS

ANS understands that, as part of the work, access roads will be constructed to provide access for heavy equipment such as a main power transformer, poles, and other ancillary structures, as well as long-term access for site maintenance purposes. It is expected that new, unpaved paths will be constructed of aggregate material placed on native, compacted and proof-rolled subgrade stripped of topsoil and other organic material.

During construction, the delivery and movement of heavier loads such as transformers, inverters, delivery of steel and concrete, and transportation of cabling is expected. Construction loads and vehicles are larger and heavier than the expected vehicles during long-term operation; however, the duration of these activities will be much shorter considering the access road life. Designing for short-duration, construction-phase access road would require increased thickness of aggregate, the use of geogrid, or other soil improvement, it is expected that the site subcontractor will be able to maintain serviceable access roads throughout construction and at turn-over of the facility by backfilling ruts greater than one-inch, back-blading and re-compacting loose and rutted areas, re-shaping roads to promote drainage and safe passage of traffic, and other improvements.

ANS has performed an evaluation of the required access road thickness based on infrequent emergency access for firefighting vehicles as well as occasional light vehicular traffic. Our preliminary road evaluation for a post-construction access road using AASHTO 93 method assumed the following:

TABLE 11: POST CONSTRUCTION ACCESS ROAD DESIGN CONSIDERATIONS (AASHTO 93 METHOD)

Design Consideration	Design Assumption
Equivalent Single-Axle Loads (ESALs)	3,000 / 10,000
Design Allowable Rut Depth	2-inch
Service Life	30 years
Subgrade Soil	Proof-rolled stiff clay
Assumed Min. Design Subgrade CBR	2% (following proof-roll and compaction)

ANS recommends that road base material (flexible base) consists of clean, crushed stone or road base material with particle size distribution as presented in **Table 12** (Louw et al., 2024).

TABLE 12: RECOMMENDED GRADATION OF CRUSHED STONE (CALTRANS CLASS 2 AGGREGATE BASE)

Sieve Size	Percent Passing
1”	100
3/4”	90 – 100
No. 4	35 – 60
No. 30	5 – 35
No. 200	0 – 12

Given the required thickness of a conventional, stone-only access road, we understand the owner may desire a more cost-efficient design. The use of a woven geotextile fabric (such as Mirafi HP270) can help reduce the aggregate thickness, followed by the use of a triaxial geogrid (such as Tensar TX7), or cement-treated base. The access road thickness for each alternative is described in **Table 13**.

TABLE 13: RECOMMENDED AGGREGATE THICKNESS FOR PERMANENT SITE ACCESS ROADS

Aggregate Construction Option	Auxiliary Access Road Cross Section (3,000 ESAL)	Heavy Haul Access Road Thickness (10,000 ESAL)
Aggregate on prepared native soil	9 inches of Crushed Stone over Native Material	12 inches of Crushed Stone over Native Material
Aggregate with geotextile fabric	6 inches of Crushed Stone over HP270 woven geotextile	9 inches of Crushed Stone over HP270 woven geotextile
Aggregate with class II geogrid and geotextile fabric	4 inches of Crushed Stone over Class II geogrid	4 inches of Crushed Stone over Class II geogrid
Aggregate over Chemically Stabilized Subgrade	6 inches of treatment depth, 6-8% cement by weight + 4 inches Crushed Stone for wearing course	6 inches of treatment depth, 6-8% cement by weight + 4 inches Crushed Stone for wearing course

It is recommended that a woven geotextile fabric be placed atop the clay subgrade and beneath any geogrid to provide separation and avoid the stone aggregate to be blinded with fines. The geogrid should be placed in accordance with manufacturer’s recommendations such as three-foot overlap, fastening or tying overlapping areas, and material storage and handling.

The subgrade should be shaped and sloped with a 4% crown to promote positive drainage into collector ditches or away from the access road to minimize saturating and weakening the subgrade, as well as blinding the stone with fines. The prepared subgrade should be confirmed to maintain a minimum CBR value of **2%.** Depending on field conditions at the time of construction, this may require scarifying the native subgrade soil by several inches, moisture-conditioning the soil, then backfilling and re-compacting the soil to achieve the required performance.

Field CBR testing, or plate load testing should be completed during construction to confirm the subbase compaction has been met. To increase productivity during construction, a test section may also be created prior to the start of production work to determine field CBR of various compaction methods and passes, and dynamic cone penetrometer (DCP) tool be used to correlate the approximate resistance correlating to the required CBR. This will allow for rapid evaluation and confirmation of field proof-rolling of subgrade. Alternatively, material subgrade material can be evaluated using target compaction as per Standard Proctor Maximum Dry Density.

The exposed subgrade should then be scarified, moisture conditioned and compacted such that a minimum 12-inches thick subgrade is compacted to at least 98% Standard Proctor Maximum Dry Density (ASTM D698), and

within two percentage points of optimum moisture content. Prepared subgrade shall be proof rolled to assess the presence of soft areas and the need for remedial measures, if any. Proof-roll test should be performed with at least two passes using a fully loaded water truck or similar equipment. The maximum deflection or pumping should be less than one inch. In areas where excessive pumping of the subgrade is observed, removal of unsuitable soils and re-compaction and/or replacement with suitable import fill or structural fill may be required. Similarly, crushed stone should be placed in loose lifts not exceeding twelve (12) inches in height and be compacted to at least 95 percent of its Modified Proctor Density (ASTM D1557).

Temporary construction roads may also be left in place as permanent access roads, where appropriate. These re-purposed roadways should be back-bladed post-construction and graded to an even, level surface with maximum permissible longitudinal and cross slopes in accordance with the site's civil design criteria. Per the International Fire Code, permanent and temporary access roads, haul roads, and fire apparatus access roads, shall not exceed a maximum grade of 10 percent for greater than 1,000 feet, or greater than 8% for longer lengths. Roads should not exceed a maximum cross-slope of 2 percent across roads. The Civil Engineer of Record may also place water drainage features to promote drainage away from roadways.

Similar to permanent and long-duration access roads, it is expected that aggregate-surfaced access roads will require ongoing maintenance during construction and over the life of the permanent facility to keep them in a serviceable condition, regardless of the aggregate thickness and subgrade preparation. It is not practical to design an aggregate section of adequate thickness that prevents ongoing maintenance. Ruts, depressions, and soft subgrade should be repaired as needed to facilitate traffic. Throughout the operational life of the project, additional aggregate may be placed in ruts and depressions, or the entire aggregate section and soft subgrade may be removed and replaced with a new aggregate section.

If chemical stabilization is performed, the contractor should perform any necessary due diligence to confirm their design, means, and methods. The subgrade should be verified below the treatment depth to evaluate the CBR value of the subgrade prior to treatment. In addition, the recommended chemical stabilization application rate should be taken as an assumed average. The actual application rate should be determined by the contractor and may vary based on the tested and desired subgrade CBR along the proposed roadway, the treatment depth required, and the moisture content. The application rate and treatment depth should be evaluated by performing several test strips at the project site prior to the start of construction and testing the test strips in the field using a dynamic cone penetrometer or plate load test to confirm the CBR. Then, once the application rate and depth are evaluated, verification and calibration testing should be performed using the dynamic cone penetrometer at intervals of no less than 500-linear feet along the access roadway.

7.6. PILE INSTALLATION CONSIDERATIONS

ANS anticipates that, as typical with solar farm construction, solar panels may be supported by driven steel wide-flanged piles or screw-type piles torqued to their final embedment depths. Wide-flanged piles are typically installed via direct-push, vibration, and/or percussive hammer methods.

Pile load testing was not in ANS's scope; therefore, pile drivability could not be directly assessed as part of our field investigation. Limited soil boring investigations were completed at the project site, which did not encounter any auger or split spoon refusals indicative of shallow weathered rock, cobbles or boulders; however, very hard clays were encountered within anticipated pile embedment depths. It is possible that stiff and dry clay at the site may create drivability concerns, in which case pre-drilling a smaller-diameter pilot hole may be preferred or necessary. This information is based on the results of the limited field investigation and without any pile load testing program and not intended to convey a recommendation on the potential for pre-drilling.

Should predrilling be necessary during remediation, long drive times, or to clear localized obstructions, ANS recommends that pre-drilled holes be completed to a diameter smaller than the diagonal dimension of the proposed pile section to ensure a tight fit once the pile is driven to its targeted depth. For example, an under-sized, four-inch diameter hole may be drilled and utilized for a W6x9 section (approx. 7.1-inch diagonal measurement). For all other pile sizes, we recommend a minimum pre-drill diameter of 55 to 60% of the pile "diameter". The contractor should be aware, however, that heavier sections (ie. W6x12 or W6x15) may have limiting "bending" capacity in its flanges and therefore require a hole of a slightly larger proportion. Once pre-drilled, the hole should be backfilled with granular, native cuttings and/or imported sand backfill. Backfill material should be placed in 12-inch layers and compacted in lifts, to ensure proper soil properties are maintained for lateral and axial capacity.

8. Limitations

ANS notes that the findings and recommendations presented within this Geotechnical Report are based on our investigation programs conducted in January 2026, and our engineering judgment. This report is intended to support final design; however, it is important to recognize that geotechnical conditions can vary across a site. The recommendations herein are based on the conditions observed at the specific locations where field investigations and laboratory testing were performed.

While this report is considered final, should actual subsurface conditions encountered during construction differ from those described or inferred in this report, ANS must be notified to review the conditions and, if necessary, revise our recommendations accordingly. The validity of our recommendations is contingent on the assumption that subsurface conditions are generally consistent with those encountered during our investigation. Use of this report beyond the locations investigated, without additional confirmation, may carry risk.

We have prepared this report with understanding that an adequate program of tests and observations will be performed during the construction phase in order to evaluate compliance with our recommendations. If actual site subsurface conditions differ from the inferred conditions on which ANS has based our confirmation-dependent recommendations, ANS will need to modify our confirmation-dependent recommendations to develop final recommendations.

9. References

Bryant, W.A., and Lundberg, M., compilers, 2002, Fault number 1e, San Andreas fault zone, Creeping section, in Quaternary fault and fold database of the United States: U.S. Geological Survey website, https://earthquakes.usgs.gov/hazards/qfaults [Accessed 01/27/2026 10:05 AM]

California Department of Transportation. (2026, January). *Liquefaction evaluation* (Geotechnical Manual module). https://dot.ca.gov/-/media/dot-media/programs/engineering/documents/geotechnical-services/202601-gm-liquefactionevaluation-a11y.pdf

California Geological Survey (CGS). (2010). *Fault Activity Map of California: Pre-Quaternary and Quaternary Faults* California Department of Conservation GIS dataset. https://www.conservation.ca.gov/cgs/publications/fam

Delattre, M. P., Graymer, R. W., Langenheim, V. E., Knudsen, K. L., Dawson, T. E., Brabb, E. E., Wentworth, C. M., & Raymond, L. A. (2023). *Geologic and geophysical maps of the Stockton 30′ × 60′ quadrangle, California* (Regional Geologic Map No. 5; scale 1:100,000). California Geological Survey. https://pubs.usgs.gov/publication/70248708

Sieh, K. E., & Jahns, R. H. (1984). *Holocene activity of the San Andreas fault at Wallace Creek, California*. Geological Society of America Bulletin, 95(8), 883–896. https://doi.org/10.1130/0016-7606(1984)95<883:HAOTSA>2.0.CO;2

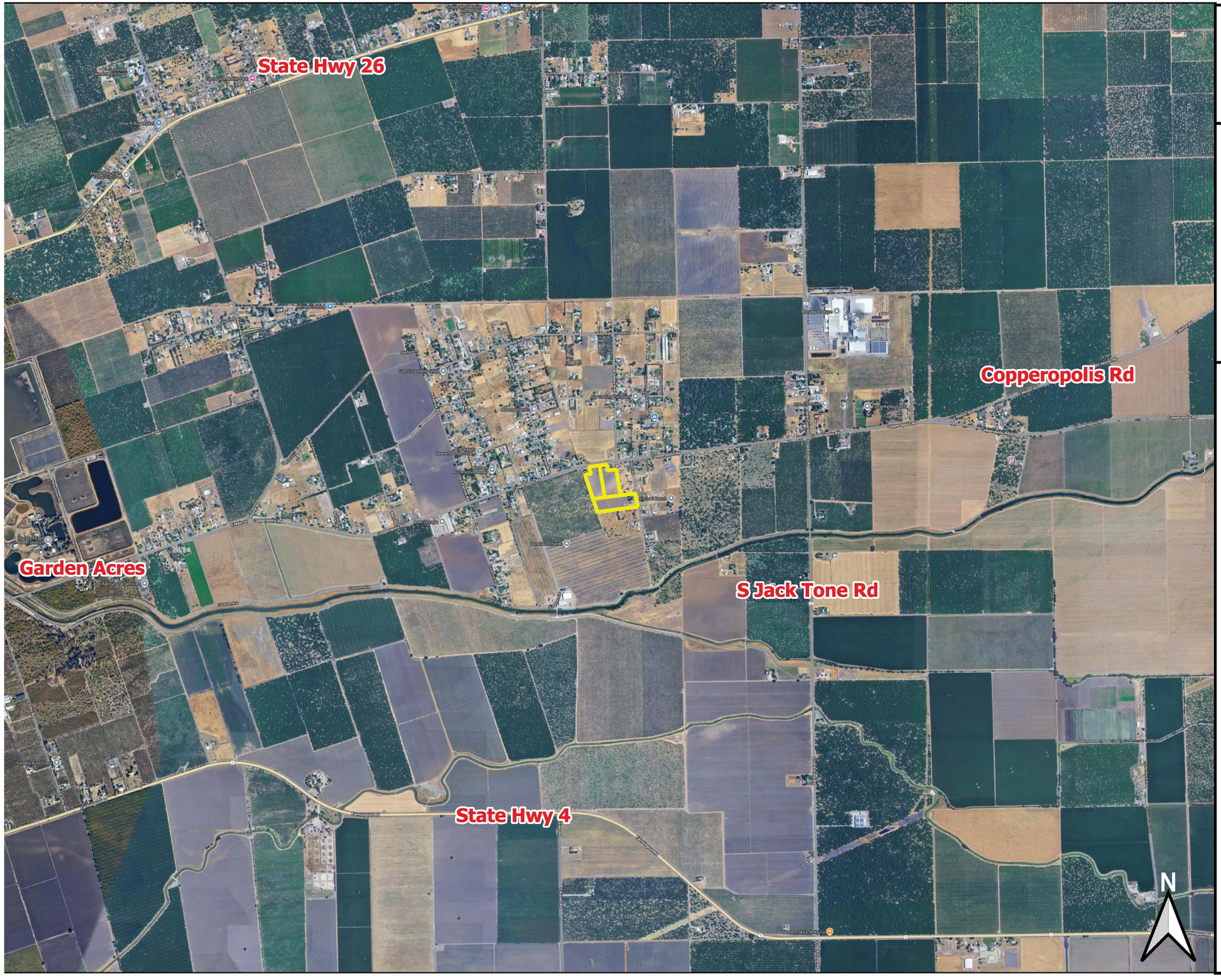
U.S. Geological Survey. (2023). National Seismic Hazard Model for the Conterminous United States (NSHM CONUS 2023). https://earthquake.usgs.gov/nshmp/

Unruh, J. R., & Hitchcock, C. S. (2015). Detailed mapping and analysis of fold deformation above the west Tracy fault, Southern San Joaquin-Sacramento Delta, Northern California. US Geological Survey NEHRP Final Report G14AP0069, 46.

ANS

ATTACHMENT A

Investigation Location Maps



ANS

Client:

RENEWABLE PROPERTIES

SITE PROXIMITY MAP

RENEWABLE PROPERTIES
COPPEROPOLIS ROAD SOLAR
LINDEN, CALIFORNIA

Legend

Site Boundary

0 2,000 4,000 ft

Absolute Scale: 1 inch = 2,000 feet
Scale at 11" x 17" AS SHOWN

Prepared by: Samantha Supan
Date: November 19, 2025
Drawing Number: Site Prox Rev.0



A N S

INVESTIGATION LOCATION PLAN
ATTACHMENT A

RENEWABLE PROPERTIES

RENEWABLE PROPERTIES
COPPEROPOLIS ROAD SOLAR PROJECT
LINDEN, SAN JOAQUIN COUNTY, CA

Legend

- Array Area Boundary
- Electrical Resistivity Test (ERT) Location
- Soil Boring Location

0 150 300 ft

Absolute Scale: 1 inch = 150 feet
Scale at 11" x 17" AS SHOWN

Prepared by: Quinn Connolly
Date: January 21, 2026
Drawing Number: ILP-1 Rev.0

ANS

ELEVATION MAP
ATTACHMENT A

RENEWABLE PROPERTIES

RENEWABLE PROPERTIES
COPPEROPOLIS ROAD SOLAR PROJECT
LINDEN, SAN JOAQUIN COUNTY, CA

Legend

- Project Boundary

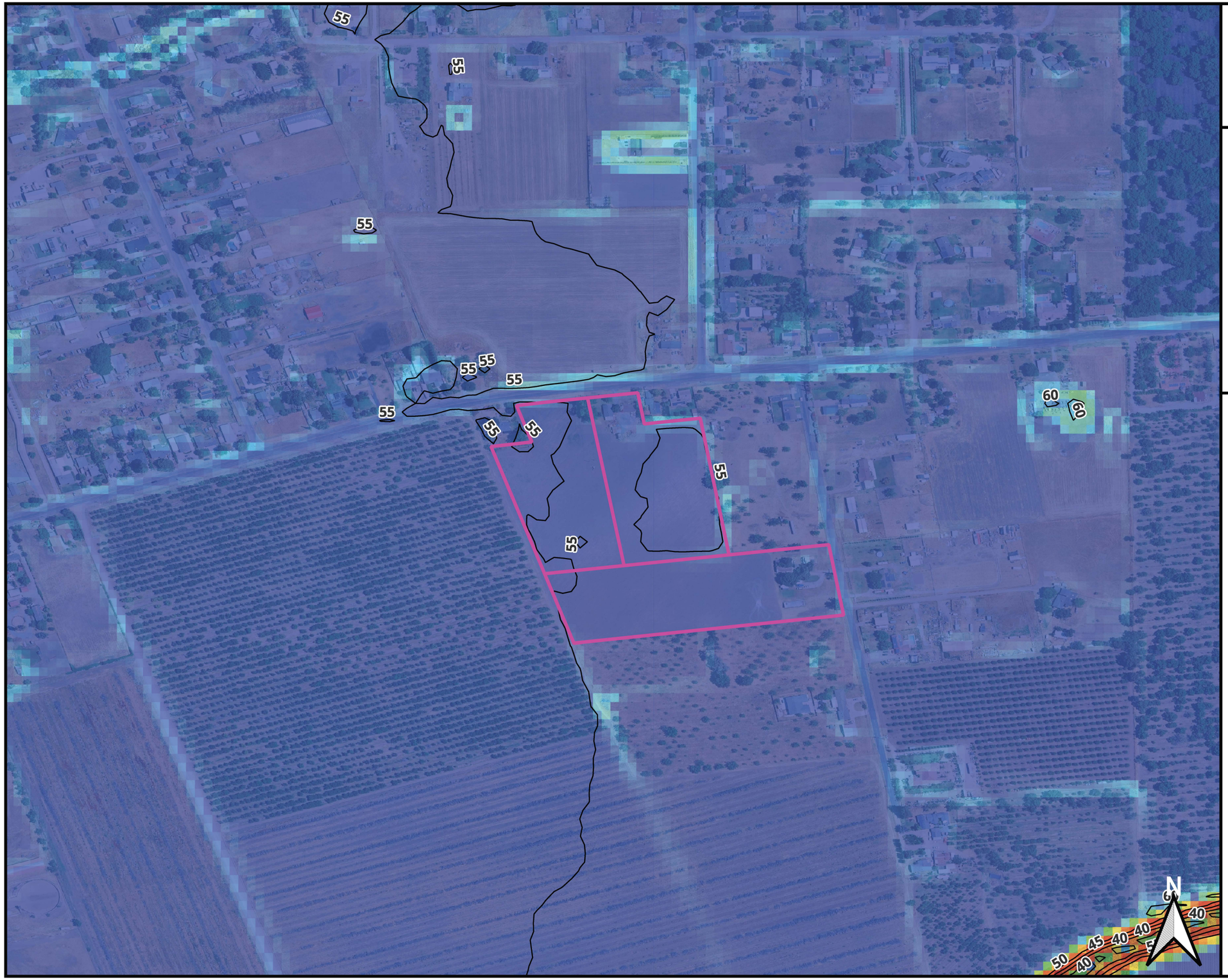
Elevation (ft)

- 50
- 52
- 54
- 56
- 58
- 60
- Elevation Contour (5-foot Interval)

0 300 600 ft

Absolute Scale: 1 inch = 300 feet
Scale at 11" x 17" AS SHOWN

Prepared By: Sanjay Nanda
Date: January, 13, 2026
Drawing Number: EM-1 Rev.0
Source: USGS TNM Download v2



A N S

SLOPE MAP
ATTACHMENT A

RENEWABLE PROPERTIES

RENEWABLE PROPERTIES
COPPEROPOLIS ROAD SOLAR PROJECT
LINDEN, SAN JOAQUIN COUNTY, CA

Legend

- Project Boundary

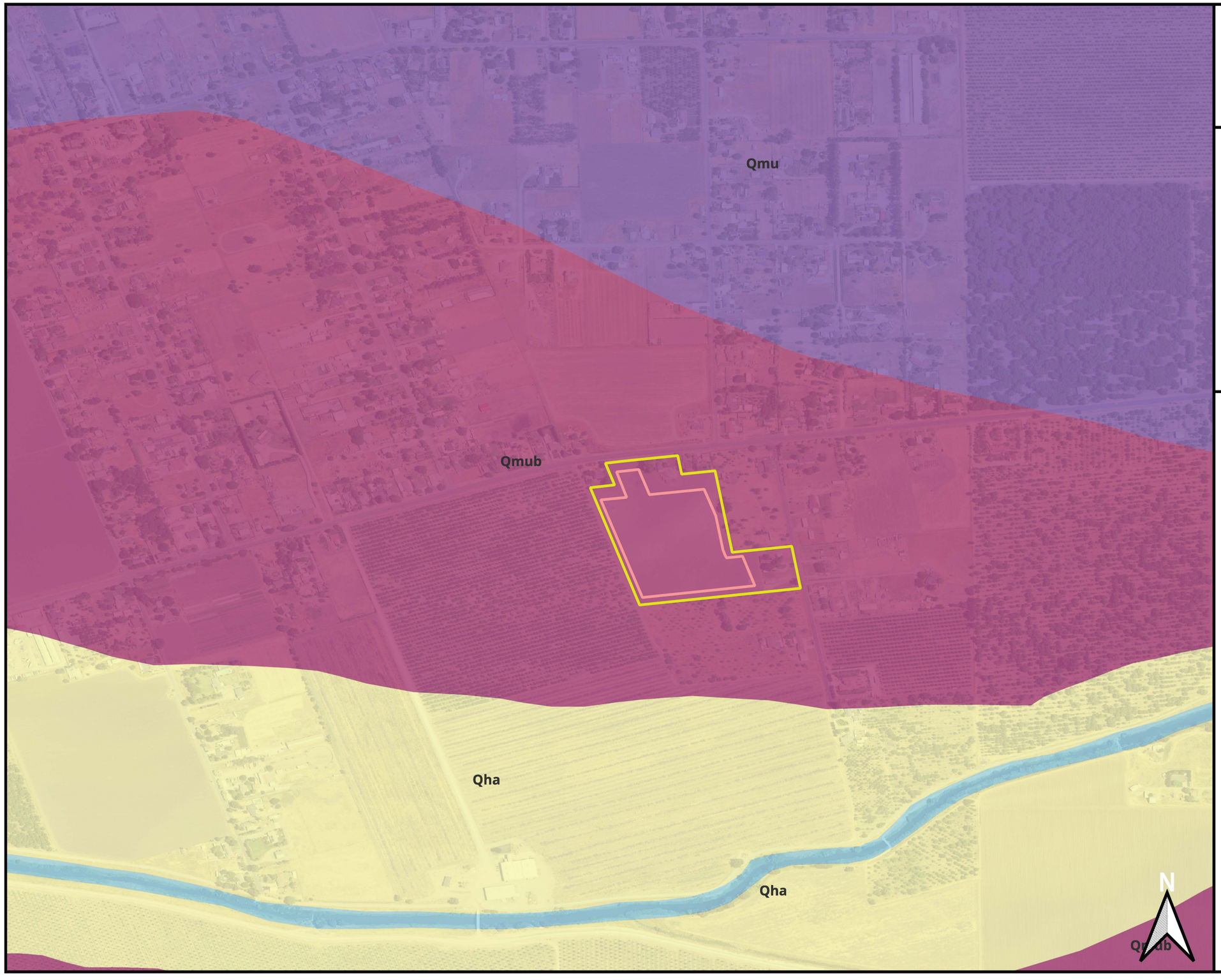
Percent Slope

- 0 - 3
- 3 - 8
- 8 - 15
- 15 - 25
- 25 - 35
- > 35
- Elevation Contour (5-foot Interval)

0 300 600 ft

Absolute Scale: 1 inch = 300 feet
Scale at 11" x 17" AS SHOWN

Prepared By: Sanjay Nanda
Date: January, 13, 2026
Drawing Number: SM-1 Rev.0
Source: USGS TNM Download v2



ANS

GEOLOGIC MAP
ATTACHMENT A

RENEWABLE PROPERTIES

RENEWABLE PROPERTIES
COPPEROPOLIS ROAD SOLAR
SAN JOAQUIN COUNTY, CA

Legend

- Array Boundary
- Project Boundary

Map Units

- Qha - Alluvium
- Qmu - Modesto Formation, upper member, undivided
- Qmub - Modesto Formation, upper member, fine-grained
- water

0 500 1,000 ft

Absolute Scale: 1 inch = 500 feet
Scale at 11" x 17" AS SHOWN

Prepared By: Jordan Craft
Date: January, 25, 2026
Drawing Number: SG-1 Rev.0
Source: Delattre et al., 2023

ANS

ATTACHMENT B

Soil Boring Logs

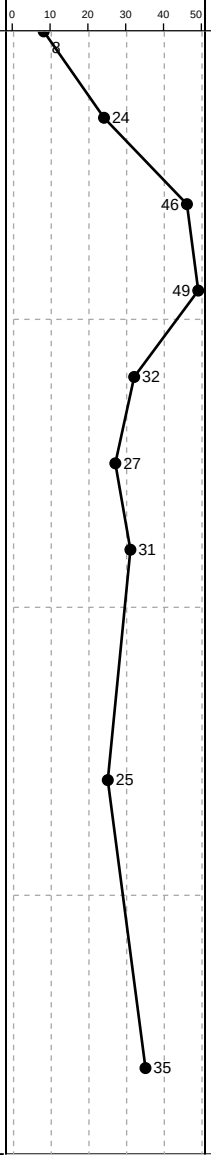
SOIL BORING

B-01

Client:	Renewable Properties	**Drilling Firm:**	GeoServ, Inc	**Coordinates:**	37.968321°, -121.163936°
Project:	Copperopolis Road Solar	**Drill Crew:**	John V.A. & Graham H.	**H. Datum:**	WGS84
Location:	Stockton, CA	**Boring Start:**	01/05/2026	**Elevation:**	68.5 ft
Inspector:	Jordan Craft	**Boring End:**	01/05/2026	**Vert. Datum:**	NAD83

Rig Type/Model:	Diedrich D-50 Turbo	**Sampler Type:**	SPT	**Casing Type:**	Hollow Stem
Drill Method:	Hollow Stem Auger	**Sampler I.D.:**	1.375 in	**Casing:**	ft
Drilling Fluid:	None	**Hammer:**	Auto / 140 lbs / 30"	**Casing I.D.:**	-

Depth (ft)	Sample Graphic	Sample ID	Recovery (in)	Blow Counts	Uncorrected N-Value	USCS	Graphic Log	Visual Classification	Pocket Pen (tsf)	Torvane (tsf)	Drilling Notes
		S-01	12	2 3 5	8			2" - TOPSOIL Medium stiff, brown to gray CLAY, some Silt, dry (CL)	2.0	0.3	Trace organics observed from 0 to 1.5 feet BGS. Iron staining observed from approximately 0 to 3 feet BGS.
		S-02	12	2 4 20	24			Very stiff, dark brown to light brown CLAY, some Silt, little fine Sand, dry (CL)	1.5	0.1	
		S-03	14	12 23 23	46			Hard, light brown to dark brown CLAY, some Silt, little medium to fine Sand, dry (CL)	3.0	0	
5		S-04	16	11 22 27	49			Hard, light brown to brown CLAY, little coarse to fine Sand, trace Silt, dry (CL)	3.75	0.15	
		S-05	15	7 14 18	32			Hard, light brown to brown CLAY, little coarse to fine Sand, trace Silt, dry (CL)	3.0	0.1	
		S-06	15	6 11 16	27			Hard, light brown to brown CLAY, little coarse to fine Sand, little Silt, dry (CL)	3.25	0.15	
10		S-07	15	5 13 18	31	CL		Hard, light brown to brown CLAY, little coarse to fine Sand, little Silt, dry (CL)	4.0	0.2	
		S-08	18	6 10 15	25			Very stiff, light brown to brown CLAY, some Silt, trace medium to fine Sand, dry (CL)	2.75	0.2	
15		S-09	14	6 15 20	35			Hard, light brown CLAY, some Silt, trace medium to fine Sand, dry (CL)	3.5	0.15	



End of Soil Boring at 19.5 feet BGS.
Borehole backfilled with neat cement.

Graphics Legend

- CL
- 2" - Topsoil
- SPT - Standard Penetration Test

Water Levels

- No groundwater encountered.
- -

SOIL BORING

B-02

Client:	Renewable Properties	**Drilling Firm:**	GeoServ, Inc	**Coordinates:**	37.967611°, -121.163976°
Project:	Copperopolis Road Solar	**Drill Crew:**	John V.A. & Graham H.	**H. Datum:**	WGS84
Location:	Stockton, CA	**Boring Start:**	01/05/2026	**Elevation:**	67.2 ft
Inspector:	Jordan Craft	**Boring End:**	01/05/2026	**Vert. Datum:**	NAD83

Rig Type/Model:	Diedrich D-50 Turbo	**Sampler Type:**	SPT	**Casing Type:**	Hollow Stem
Drill Method:	Hollow Stem Auger	**Sampler I.D.:**	1.375 in	**Casing:**	ft
Drilling Fluid:	None	**Hammer:**	Auto / 140 lbs / 30"	**Casing I.D.:**	-

Depth (ft)	Sample Graphic	Sample ID	Recovery (in)	Blow Counts	Uncorrected N-Value	USCS	Graphic Log	Visual Classification	Pocket Pen (tsf)	Torvane (tsf)	N-Value	Drilling Notes
		S-01	11	2 3 5	8			4" - TOPSOIL	1.0	0.3	8	
								Medium stiff, brown to dark brown CLAY, trace Silt, dry (CL)				
		S-02	9	1 3 5	8			Medium stiff, brown to dark brown CLAY, trace Silt, dry (CL)	2.5	0.25	8	
		S-03	12	4 11 10	21			Very stiff, brown to brownish yellow CLAY, dry (CL)	1.0	0.05	21	
5		S-04	16	7 19 31	50			Hard, light brown to brownish yellow CLAY, little Silt, trace fine Sand, dry (CL)	3.25	0	50	
		S-05	16	7 18 30	48			Hard, light brown CLAY, trace fine Sand, trace Silt, dry (CL)	2.5	0.05	48	
		S-06	14	4 15 27	42			Hard, light brown CLAY, trace fine Sand, trace Silt, dry (CL)	3.75	0.05	42	
10		S-07	17	5 10 10	20	CL		Very stiff, light brown CLAY, trace fine Sand, trace Silt, dry (CL)	1.0	0	20	
		S-08	14	5 8 12	20			Very stiff, light brown to brown CLAY, some Silt, trace fine Sand, dry (CL)	2.0	0.05	20	
15		S-09	18	7 22 36	>50			Hard, light brown CLAY, some Silt, trace fine Sand, dry (CL)	4.0	0.15	>> 58	
								End of Soil Boring at 19.5 feet BGS. Borehole backfilled with neat cement.				

Graphics Legend

CL

4" - Topsoil

SPT - Standard Penetration Test

Water Levels

No groundwater encountered.

-

SOIL BORING

B-03

Client:	Renewable Properties	**Drilling Firm:**	GeoServ, Inc	**Coordinates:**	37.967753°, -121.162875°
Project:	Copperopolis Road Solar	**Drill Crew:**	John V.A. & Graham H.	**H. Datum:**	WGS84
Location:	Stockton, CA	**Boring Start:**	01/05/2026	**Elevation:**	60.2 ft
Inspector:	Jordan Craft	**Boring End:**	01/05/2026	**Vert. Datum:**	NAD83

Rig Type/Model:	Diedrich D-50 Turbo	**Sampler Type:**	SPT	**Casing Type:**	Hollow Stem
Drill Method:	Hollow Stem Auger	**Sampler I.D.:**	1.375 in	**Casing:**	ft
Drilling Fluid:	None	**Hammer:**	Auto / 140 lbs / 30"	**Casing I.D.:**	-

Depth (ft)	Sample Graphic	Sample ID	Recovery (in)	Blow Counts	Uncorrected N-Value	USCS	Graphic Log	Visual Classification	Pocket Pen (tsf)	Torvane (tsf)	N-Value	Drilling Notes
		S-01	13	1 2 3	5			2" - TOPSOIL Medium stiff, dark brown CLAY, trace Silt, dry (CL)	0.5	0.15	5	
		S-02	18	3 6 9	15			Stiff, dark brown CLAY, trace Silt, dry (CL)	1.75	0.1	15	
		S-03	17	5 9 14	23			Very stiff, dark brown to brown CLAY, some Silt, dry (CL)	2.0	0.1	23	
5		S-04	18	5 14 22	36			Hard, dark brown to brown CLAY, some Silt, trace fine Sand, dry (CL)	3.5	0.1	36	
		S-05	12	5 10 14	24			Very stiff, brown to light brown CLAY, little coarse to fine Sand, trace Silt, dry (CL)	3.0	0.05	24	
		S-06	11	5 16 12	28			Very stiff, light brown to brown CLAY, dry (CL)	2.25	0.1	28	
10		S-07	14	4 8 12	20	CL		Very stiff, brown to light brown CLAY, trace fine Sand, trace Silt, dry (CL)	4.0	0.15	20	Calcite deposits present from approximately 9 to 19.5 feet BGS.
		S-08	16	5 11 18	29			Very stiff, brown to brownish yellow CLAY, little Silt, trace fine Sand, dry (CL)	2.75	0.25	29	
15		S-09	16	6 28 50/5.5"	>50			Hard, light brown to brown CLAY, some Silt, trace medium to fine Sand, dry (CL)	4.5	0	>> 78	

End of Soil Boring at 19.5 feet BGS.
Borehole backfilled with neat cement.

Graphics Legend

- 2" - Topsoil
- CL
- SPT - Standard Penetration Test

Water Levels

- No groundwater encountered.
- -

SOIL BORING

B-04

Client:	Renewable Properties	**Drilling Firm:**	GeoServ, Inc	**Coordinates:**	37.967167°, -121.163100°
Project:	Copperopolis Road Solar	**Drill Crew:**	James & John V.A.	**H. Datum:**	WGS84
Location:	Stockton, CA	**Boring Start:**	01/06/2026	**Elevation:**	59.7 ft
Inspector:	Jordan Craft	**Boring End:**	01/06/2026	**Vert. Datum:**	NAD83

Rig Type/Model:	Diedrich D-50 Turbo	**Sampler Type:**	SPT	**Casing Type:**	Hollow Stem
Drill Method:	Hollow Stem Auger	**Sampler I.D.:**	1.375 in	**Casing:**	ft
Drilling Fluid:	None	**Hammer:**	Auto / 140 lbs / 30"	**Casing I.D.:**	-

Depth (ft)	Sample Graphic	Sample ID	Recovery (in)	Blow Counts	Uncorrected N-Value	USCS	Graphic Log	Visual Classification	Pocket Pen (tsf)	Torvane (tsf)	N-Value	Drilling Notes
		S-01	14	3 5 7	12			1" - TOPSOIL Stiff, dark brown to dark gray CLAY, little Silt, dry (CL)	2.5	0.2	12	
		S-02	12	3 6 9	15			Stiff, dark brown to brownish yellow CLAY, some Silt, dry (CL)	3.25	0.3	15	
		S-03	15	4 7 12	19			Very stiff, brown to brownish yellow CLAY, little Silt, trace fine Sand, dry (CL)	3.5	0.15	19	
5		S-04	17	8 14 19	33			Hard, brown to brownish yellow CLAY, little Silt, trace fine Sand, dry (CL)	4.5	0.15	33	Calcite deposits observed from approximately 4.5 to 14.5 feet BGS.
		S-05	14	9 23 29	>50			Hard, brown CLAY, trace fine Sand, trace Silt, dry (CL)	4.5	0.1	>> 52	
		S-06	17	8 17 25	42			Hard, brown CLAY, some Silt, trace fine Sand, dry (CL)	4.5	0.1	42	
10		S-07	14	6 16 17	33	CL		Hard, brown CLAY, some Silt, little fine Sand, dry (CL)	4.5	0.05	33	Manganese deposits observed from approximately 9 to 14.5 feet BGS.
		S-08	15	4 7 10	17			Very stiff, brown CLAY, some Silt, trace medium to fine Sand, dry (CL)	1.5	0.05	17	
15		S-09	16	6 15 27	42			Hard, brown to brownish yellow CLAY, some Silt, trace fine Sand, dry (CL)	3.75	0.05	42	

End of Soil Boring at 19.5 feet BGS.
Borehole backfilled with neat cement.

Graphics Legend

1" - Topsoil

CL

SPT - Standard Penetration Test

Water Levels

No groundwater encountered.

-

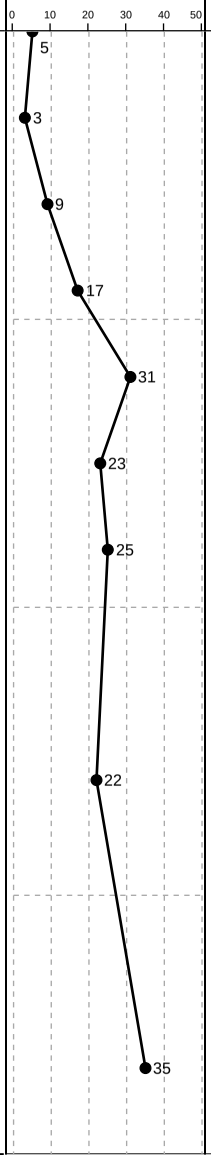
SOIL BORING

B-05

Client:	Renewable Properties	**Drilling Firm:**	GeoServ, Inc	**Coordinates:**	37.966651°, -121.163571°
Project:	Copperopolis Road Solar	**Drill Crew:**	James & John V.A.	**H. Datum:**	WGS84
Location:	Stockton, CA	**Boring Start:**	01/06/2026	**Elevation:**	57.9 ft
Inspector:	Jordan Craft	**Boring End:**	01/06/2026	**Vert. Datum:**	NAD83

Rig Type/Model:	Diedrich D-50 Turbo	**Sampler Type:**	SPT	**Casing Type:**	Hollow Stem
Drill Method:	Hollow Stem Auger	**Sampler I.D.:**	1.375 in	**Casing:**	ft
Drilling Fluid:	None	**Hammer:**	Auto / 140 lbs / 30"	**Casing I.D.:**	-

Depth (ft)	Sample ID	Recovery (in)	Blow Counts	Uncorrected N-Value	USCS	Visual Classification	Pocket Pen (tsf)	Torvane (tsf)	Drilling Notes
	S-01	6	1 3 2	5		6" - TOPSOIL	1.5	0.15	Organic material present from approximately 0 to 3.25 feet BGS.
					CL	Medium stiff, dark brown CLAY, little Silt, trace fine Sand, dry (CL)			
	S-02	5	2 1 2	3		Soft, dark brown CLAY, little Silt, trace fine Sand, dry (CL)	0.5	0.05	
	S-03	9	1 3 6	9		Stiff, dark brown CLAY, little Silt, trace fine Sand, dry (CL)	0.75	0.1	
5	S-04	14	3 7 10	17		Stiff, brown to light brown CLAY, trace medium to fine Sand, dry (CL)	3.75	0.1	
						Very stiff, dark brown to brown CLAY, some Silt, trace fine Sand, dry (CL)			
	S-05	15	4 12 19	31		Hard, brown to light brown CLAY, little coarse to fine Sand, trace Silt, trace fine Gravel, dry (CL)	4.5	0.05	
	S-06	15	4 10 13	23		Very stiff, brown to light brown CLAY, trace coarse to fine Sand, dry (CL)	3.0	0.2	Manganese deposits observed from approximately 7.5 to 19.5 feet BGS.
10	S-07	16	5 10 15	25		Very stiff, brown to light brown CLAY, trace fine Sand, dry (CL)	3.5	0.15	
	S-08	18	5 9 13	22		Very stiff, brown to gray CLAY, some Silt, trace fine Sand, dry (CL)	3.5	0.25	
15									
	S-09	18	7 14 21	35		Hard, brown to yellowish red CLAY, some Silt, trace fine Sand, dry (CL)	4.5	0.3	



End of Soil Boring at 19.5 feet BGS.
Borehole backfilled with neat cement.

Graphics Legend

- CL
- 6" - Topsoil
- SPT - Standard Penetration Test

Water Levels

- No groundwater encountered.
- -

SOIL BORING

B-06

Client:	Renewable Properties	**Drilling Firm:**	GeoServ, Inc	**Coordinates:**	37.966775°, -121.162142°
Project:	Copperopolis Road Solar	**Drill Crew:**	James & John V.A.	**H. Datum:**	WGS84
Location:	Stockton, CA	**Boring Start:**	01/06/2026	**Elevation:**	56.8 ft
Inspector:	Jordan Craft	**Boring End:**	01/06/2026	**Vert. Datum:**	NAD83

Rig Type/Model:	Diedrich D-50 Turbo	**Sampler Type:**	SPT	**Casing Type:**	Hollow Stem
Drill Method:	Hollow Stem Auger	**Sampler I.D.:**	1.375 in	**Casing:**	ft
Drilling Fluid:	None	**Hammer:**	Auto / 140 lbs / 30"	**Casing I.D.:**	-

Depth (ft)	Sample Graphic	Sample ID	Recovery (in)	Blow Counts	Uncorrected N-Value	USCS	Graphic Log	Visual Classification	Pocket Pen (tsf)	Torvane (tsf)	N-Value	Drilling Notes
		S-01	4	1 2 3	5			4" - TOPSOIL Medium stiff, dark brown CLAY, trace Silt, dry (CL)	0	0	5	
		S-02	12	2 4 5	9			Stiff, dark brown CLAY, trace Silt, dry (CL)	3.5	0.1	9	
		S-03	14	5 9 14	23			Very stiff, dark brown to light brown CLAY, some Silt, trace fine Sand, dry (CL)	4.5	0.15	23	Calcite deposits observed from approximately 3 to 9 feet BGS.
5		S-04	10	4 12 12	24			Very stiff, dark brown to brownish yellow CLAY, little medium to fine Sand, little Silt, dry (CL)	3.5	0.05	24	
		S-05	14	6 15 23	38	CL		Hard, brown to brownish yellow CLAY, trace fine Sand, dry (CL)	2.75	0.15	38	
		S-06	14	6 19 21	40			Hard, brown to light brown CLAY, trace fine Sand, trace Silt, dry (CL)	3.5	0.1	40	
10		S-07	11	8 26 17	43			Hard, light brown to gray CLAY, little fine Sand, dry (CL)	2.0	0.05	43	Caliche material present from approximately 9 to 14.5 feet BGS.
		S-08	13	8 18 16	34			Dense, brown to brownish yellow Clayey fine SAND, trace fine Gravel, dry (SM)	2.0	0	34	
15						SM						
		S-09	12	4 8 12	20			Medium dense, brown fine SAND, trace fine Gravel, dry (SM)	3.0	0.1	20	

End of Soil Boring at 19.5 feet BGS.
Borehole backfilled with neat cement.

Graphics Legend

- 4" - Topsoil
- CL
- SM
- SPT - Standard Penetration Test

Water Levels

- No groundwater encountered.
- -

ANS

ATTACHMENT C

Laboratory Test Results

ANS

Moisture Content Analysis Results

Laboratory Determination of Water (Moisture) Content of Soil and Rock (ASTM D2216)

Client Name:	Renewable Properties	LAB IRN:	26-TX-010
Project Name:	Copperopolis Road Solar, San Joaquin County,CA	Date:	1/22/2026

Sample ID	B-01, S-3	B-02, S-4	B-03, S-2	B-04, S-1	B-05, S-5
Depth	3'-4.5'	4.5'-6'	1.5'-3'	0'-1.5'	6'-7.5'
Wet soil + Tare (g)	308.4	260.2	251.2	268.9	690.0
Dry soil + Tare (g)	255.1	216.4	181.4	210.6	602.0
Wt. of Tare (g)	15.1	15.2	15.1	15.1	189.7
Moisture Content	**22.2%**	**21.8%**	**42.0%**	**29.8%**	**21.3%**

Sample ID	B-06, S-8
Depth	13'-14.5
Wet soil + Tare (g)	768.8
Dry soil + Tare (g)	701.9
Wt. of Tare (g)	186.1
Moisture Content	**13.0%**

Tested By:	JE	Checked By:	MF

Laboratory Determination of Water (Moisture) Content of Soil and Rock (ASTM D2216)

Client Name:	Renewable Properties	LAB IRN:	26-TX-011
Project Name:	Copperopolis Road Solar, San Joaquin County, CA	Date:	1/22/2026

Sample ID	B-03, CORR-01	B-05, CORR-02	B-01, TRT-01	B-02, TRT-02	B-04, TRT-03
Depth	1'-4'	1'-4'	1.5'-5'	1.5'-5'	1.5'-5'
Wet soil + Tare (g)	206.8	242.3	225.2	215.6	264.9
Dry soil + Tare (g)	151.8	191.8	178.7	177.0	203.5
Wt. of Tare (g)	14.8	15.0	14.7	14.8	14.9
Moisture Content	**40.1%**	**28.6%**	**28.4%**	**23.8%**	**32.5%**

Sample ID	B-06, TRT-04
Depth	1.5'-5'
Wet soil + Tare (g)	242.1
Dry soil + Tare (g)	195.6
Wt. of Tare (g)	15.0
Moisture Content	**25.7%**

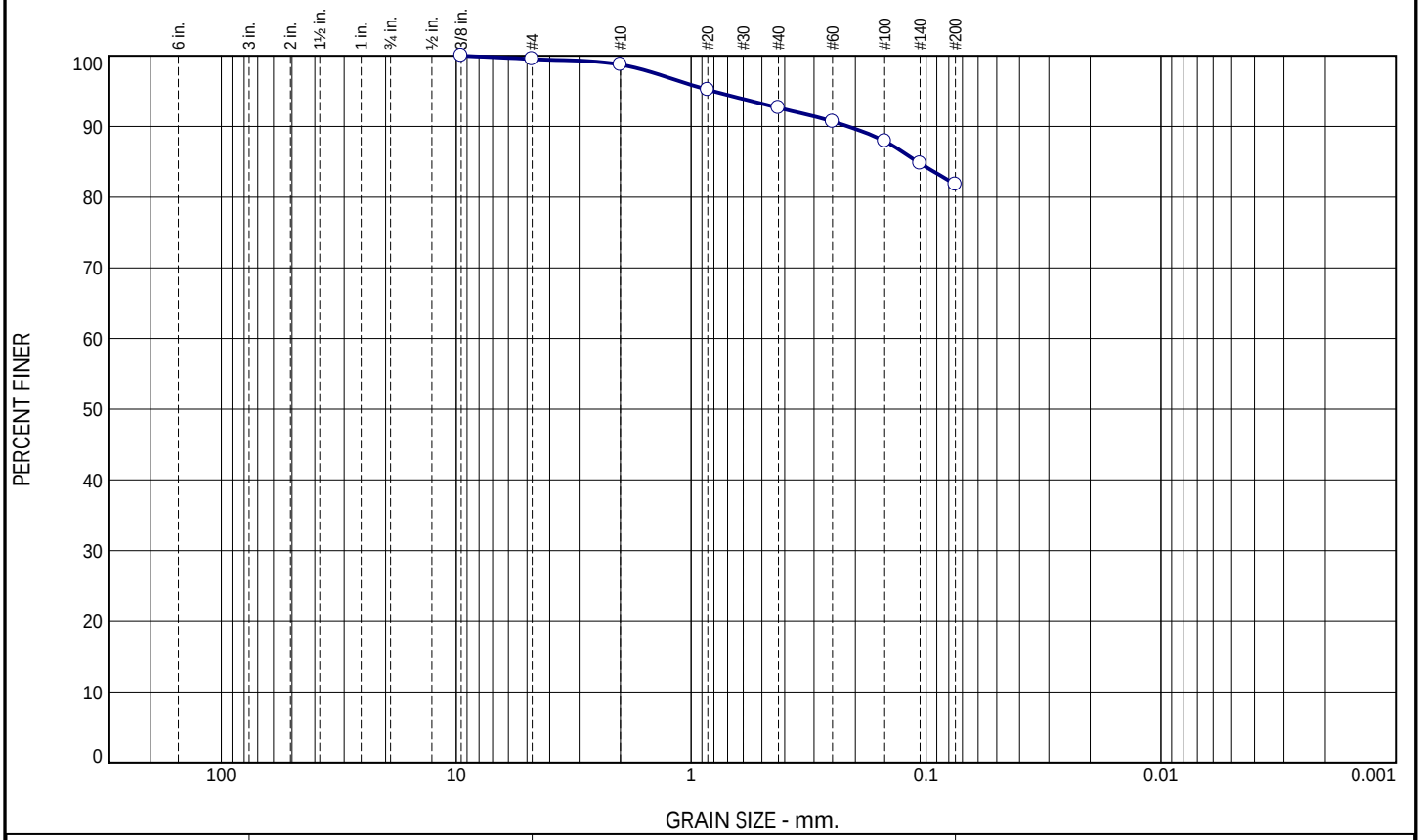
Tested By:	JE	Checked By:	MF

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Particle Size Distribution Results

PARTICLE SIZE DISTRIBUTION REPORT

ASTM D6913



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.5	0.8	6.1	10.8	81.8	

Test Results (ASTM D6913)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
0.375"	100.0			
#4	99.5			
#10	98.7			
#20	95.2			96.4
#40	92.6			93.8
#60	90.7			91.9
#100	87.9			89.0
#140	84.8			85.9
#200	81.8			82.9

* (no specification provided)

Material Description

Grayish Brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.2147 D_{85}= 0.1086 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Test Remarks

Sample Number: B-05, S-5 Depth: 6'-7.5'

Sample Date: 1/22/2026

ANS

Client: Renewable Properties

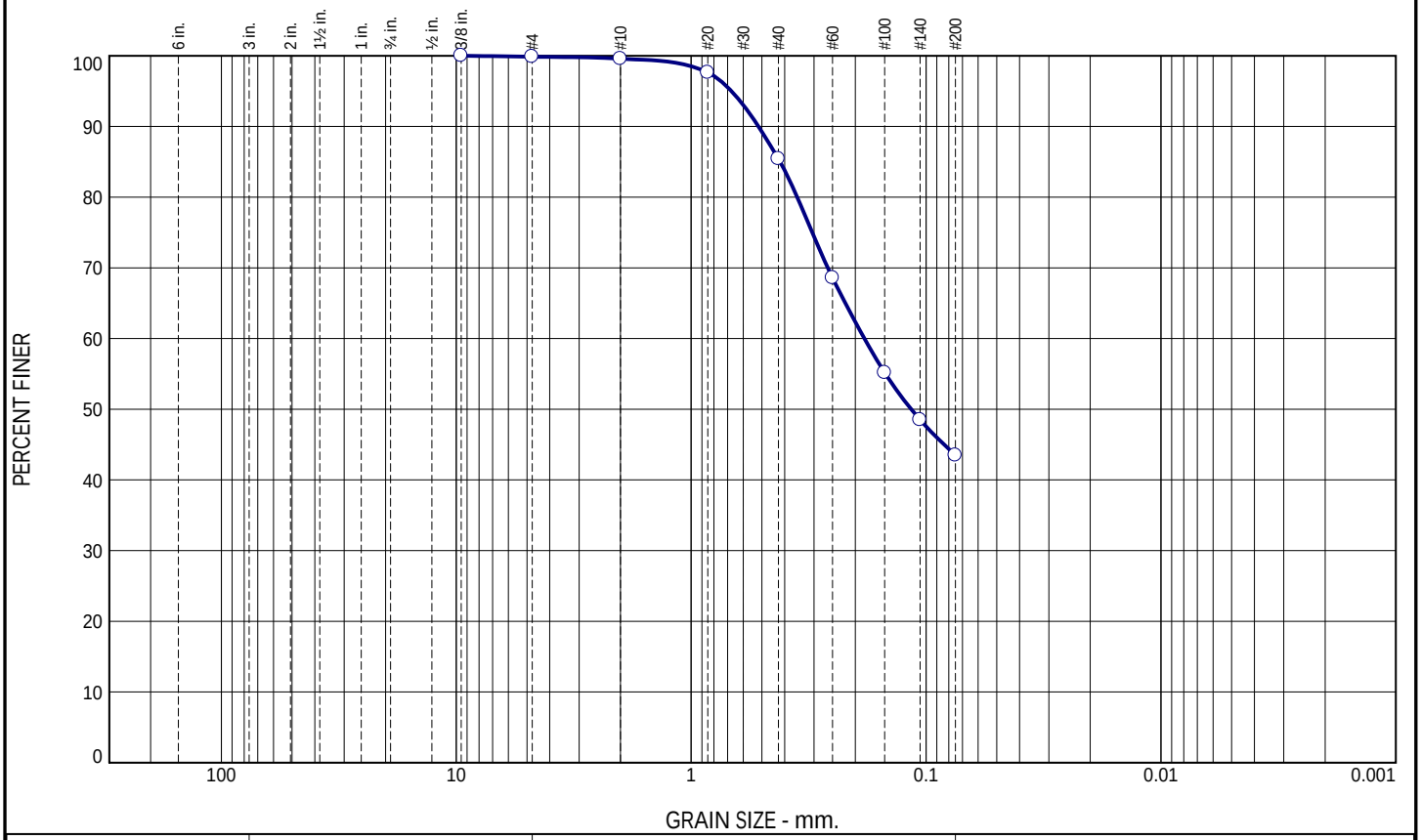
Project: Copperopolis Road Solar, San Joaquin County, CA

Project No: IRN 26-TX-010 Figure

Tested By: TP Checked By: MF

PARTICLE SIZE DISTRIBUTION REPORT

ASTM D6913



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.3	14.2	41.9	43.5	

Test Results (ASTM D6913)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
0.375"	100.0			
#4	99.9			
#10	99.6			
#20	97.6			98.0
#40	85.4			85.8
#60	68.6			68.9
#100	55.2			55.4
#140	48.5			48.7
#200	43.5			43.6

* (no specification provided)

Material Description

Olive Brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.5169 D_{85}= 0.4182 D_{60}= 0.1830
D_{50}= 0.1156 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Test Remarks

Sample Number: B-06, S-8 Depth: 13'-14.5'

Sample Date: 1/22/2026

ANS

Client: Renewable Properties
Project: Copperopolis Road Solar, San Joaquin County, CA

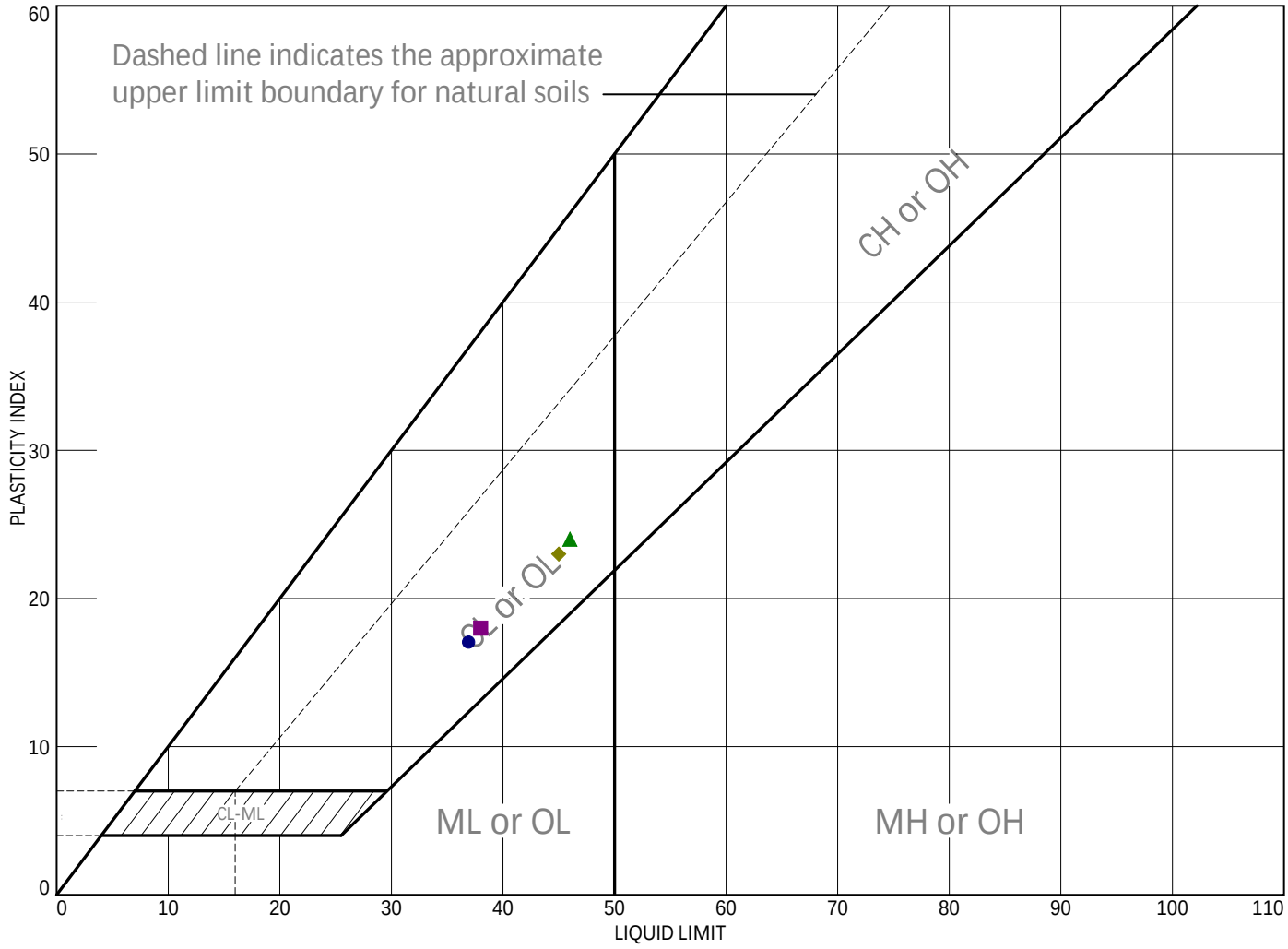
Project No: IRN 26-TX-010 Figure

Tested By: TP Checked By: MF

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Atterberg Limit Results

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D4318)



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown Clay & Silt, little cmf Sand (Visual)	37	20	17			
■	Brown Clay & Silt, little cmf Sand (Visual)	38	20	18			
▲	Dark Brown Clay & Silt, trace cmf Sand (Visual)	46	22	24			
◆	Grayish Brown Clay & Silt, trace cmf Sand (Visual)	45	22	23			

Project No. IRN 26-TX-010 Client: Renewable Properties

Project: Copperopolis Road Solar, San Joaquin County, CA

●Depth: 3'-4.5' Sample Number: B-01, S-3
■Depth: 4.5'-6' Sample Number: B-02, S-4
▲Depth: 1.5'-3' Sample Number: B-03, S-2
◆Depth: 0'-1.5' Sample Number: B-04, S-1

Remarks:

●ASTM D4318 - Sample Air-Dried, LL Device: Manual, PL Rolling Method: Hand-Rolled, Grooving Tool: Metal 1/22/2026

ANS

Figure

Tested By: JE Checked By: MF

ANS

Thermal Resistivity Test Results

Determination of Thermal Conductivity of Soil and Rock by Thermal Needle Probe (ASTM D5334)

Client Name:	Renewable Properties	LAB IRN:	26-TX-011
Project Name:	Copperopolis Road Solar, San Joaquin County, CA	Date:	1/26/2026

Sample ID: B-01, TRT-01, 1.5'-5'

Description: Brown Clay & Silt, trace cmf Sand (Visual)

Specimen type: Reconstituted (90% D1557) Recompaction Dry Density: 90.2 PCF

In-Situ Moisture: 28.4 % Optimum Moisture: 19.0 %

S.No.	Moisture (%)		Thermal Conductivity (W/m-K)	Thermal Resistivity (°C-cm/W)
1	Dry	0.0	0.5482	182.4
2	¼ OMC	4.8	0.6865	145.7
3	½ OMC	9.5	0.9334	107.1
4	¾ OMC	14.3	1.0618	94.2
5	OMC	19.0	1.1696	85.5
6	In-Situ	28.4	1.2584	79.5

Remarks:

1. Needle size: 1.9 mm diameter × 100 mm length
2. Thermal grease used: High-density polysynthetics silver thermal compound
3. Tested under controlled room temperature conditions (20°C to 22°C).

Tested By:	RD	Checked By:	MF

Thermal Dryout Curve (ASTM D5334)

Client Name:	Renewable Properties	LAB IRN:	26-TX-011
Project Name:	Copperopolis Road Solar, San Joaquin County, CA	Date:	1/26/2026

Sample ID: B-01, TRT-01, 1.5'-5'

Description: Brown Clay & Silt, trace cmf Sand (Visual)

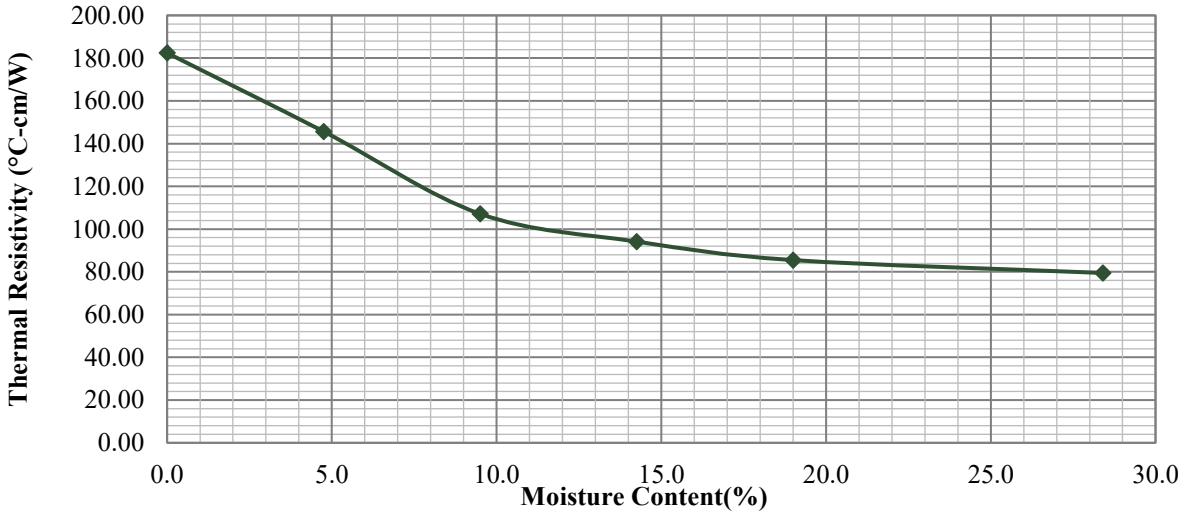
Specimen type: Reconstituted (90% D1557)

Recompaction Dry Density: 90.2 PCF

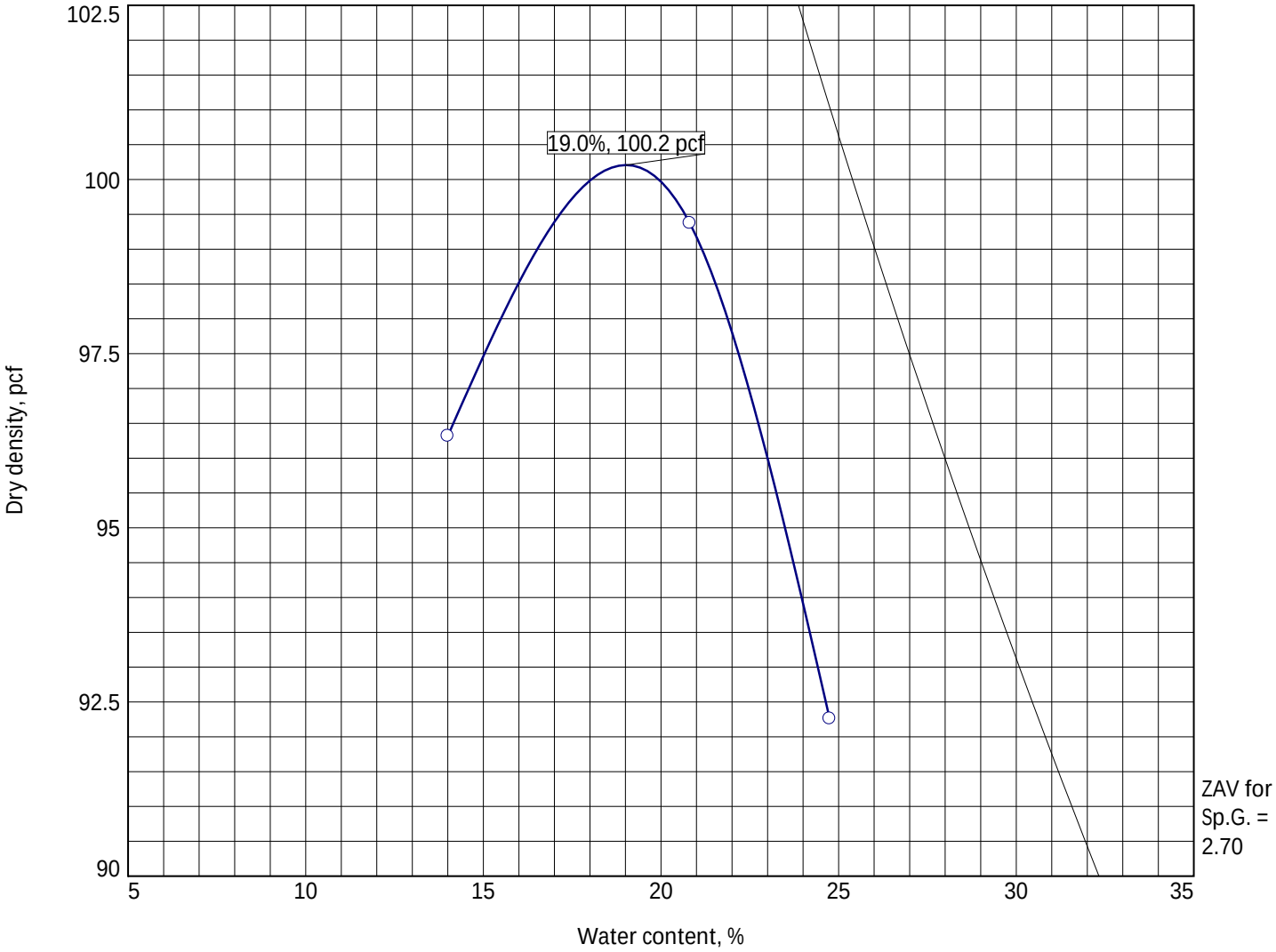
In-Situ Moisture: 28.4 %

Optimum Moisture: 19.0 %

Thermal Dry-out Curve



COMPACTION TEST REPORT



Test specification: ASTM D 1557-12 Method B Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
1.5'-5'				2.7			0	

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 100.2 pcf Optimum moisture = 19.0 %	Brown Clay & Silt, trace cmf Sand (Visual)

Project No. IRN 26-TX-011 Client: Renewable Properties

Project: Copperopolis Road Solar, San Joaquin County, CA

Date: 1/21/2026

○ Sample Number: B-01, TRT-01

Remarks:
SG Assumed

A N S

Figure

Tested By: TP Checked By: MF

Determination of Thermal Conductivity of Soil and Rock by Thermal Needle Probe (ASTM D5334)

Client Name:	Renewable Properties	LAB IRN:	26-TX-011
Project Name:	Copperopolis Road Solar, San Joaquin County, CA	Date:	1/26/2026

Sample ID: B-02, TRT-02, 1.5'-5'

Description: Brown Clay & Silt, trace cmf Sand (Visual)

Specimen type: Reconstituted (95% D1557) Recompaction Dry Density: 96.3 PCF

In-Situ Moisture: 23.8 % Optimum Moisture: 18.8 %

S.No.	Moisture (%)		Thermal Conductivity (W/m-K)	Thermal Resistivity (°C-cm/W)
1	Dry	0.0	0.5246	190.6
2	¼ OMC	4.7	0.6709	149.1
3	½ OMC	9.4	0.8821	113.4
4	¾ OMC	14.1	1.0127	98.7
5	OMC	18.8	1.1325	88.3
6	In-Situ	23.8	1.1881	84.2

Remarks:

1. Needle size: 1.9 mm diameter × 100 mm length
2. Thermal grease used: High-density polysynthetics silver thermal compound
3. Tested under controlled room temperature conditions (20°C to 22°C).

Tested By:	RD	Checked By:	MF

Thermal Dryout Curve (ASTM D5334)

Client Name:	Renewable Properties	LAB IRN:	26-TX-011
Project Name:	Copperopolis Road Solar, San Joaquin County, CA	Date:	1/26/2026

Sample ID: B-02, TRT-02, 1.5'-5'

Description: Brown Clay & Silt, trace cmf Sand (Visual)

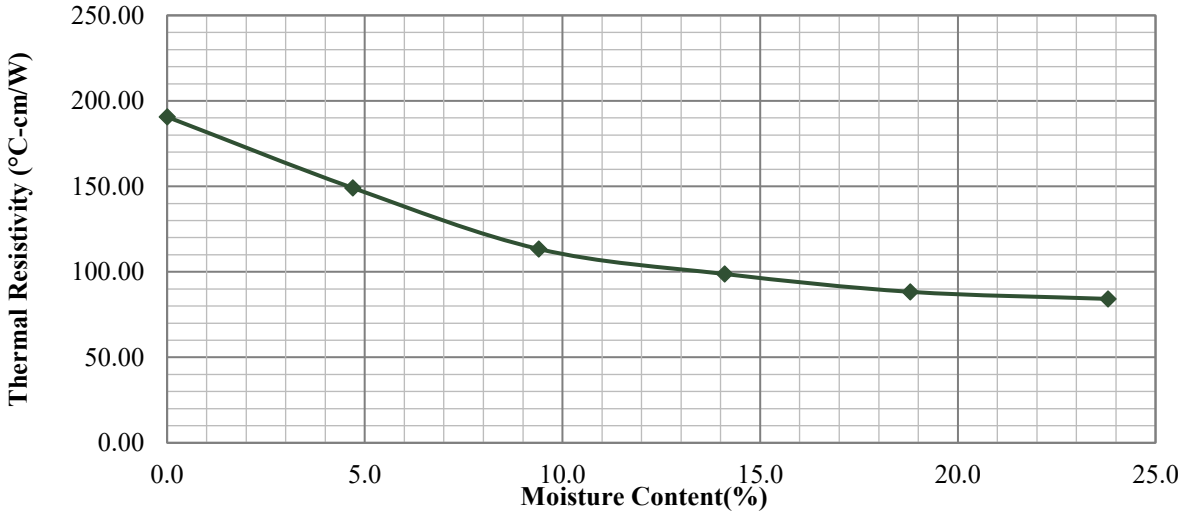
Specimen type: Reconstituted (95% D1557)

Recompaction Dry Density: 96.3 PCF

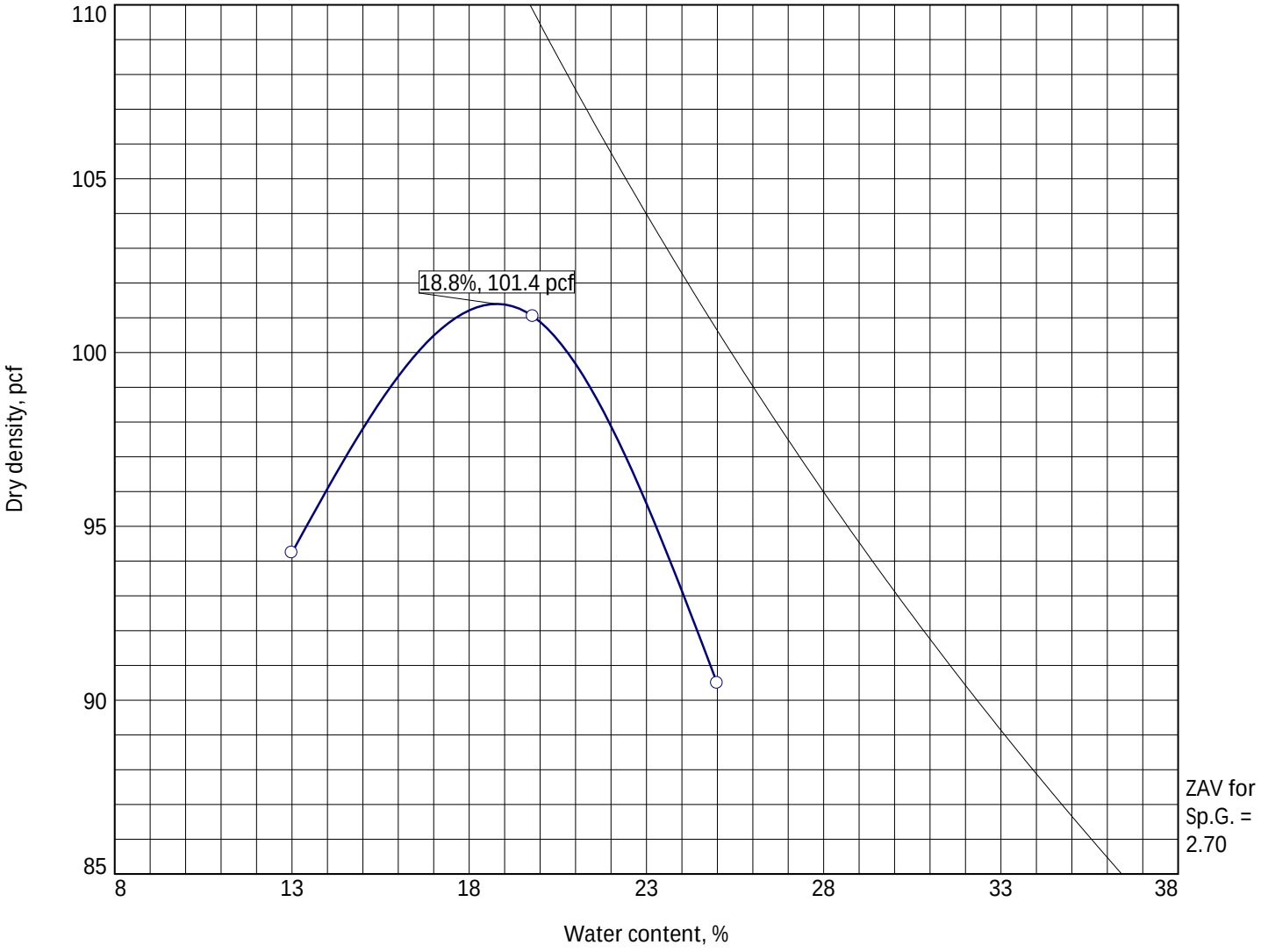
In-Situ Moisture: 23.8 %

Optimum Moisture: 18.8 %

Thermal Dry-out Curve



COMPACTION TEST REPORT



Test specification: ASTM D 1557-12 Method B Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
1.5'-5'				2.7			0	

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 101.4 pcf Optimum moisture = 18.8 %	Brown Clay & Silt, trace cmf Sand (Visual)

Project No. IRN 26-TX-011 Client: Renewable Properties

Project: Copperopolis Road Solar, San Joaquin County, CA

Date: 1/21/2026

○ Sample Number: B-02, TRT-02

Remarks:
SG Assumed

A N S

Figure

Tested By: RD

Checked By: MF

Determination of Thermal Conductivity of Soil and Rock by Thermal Needle Probe (ASTM D5334)

Client Name:	Renewable Properties	LAB IRN:	26-TX-011
Project Name:	Copperopolis Road Solar, San Joaquin County, CA	Date:	1/26/2026

Sample ID: B-04, TRT-03, 1.5'-5'

Description: Brown Clay & Silt, trace cmf Sand (Visual)

Specimen type: Reconstituted (90% D1557) Recompaction Dry Density: 83.6 PCF

In-Situ Moisture: 32.5 % Optimum Moisture: 21.8 %

S.No.	Moisture (%)		Thermal Conductivity (W/m-K)	Thermal Resistivity (°C-cm/W)
1	Dry	0.0	0.4412	226.7
2	¼ OMC	5.5	0.5685	175.9
3	½ OMC	10.9	0.8184	122.2
4	¾ OMC	16.4	0.9569	104.5
5	OMC	21.8	1.0652	93.9
6	In-Situ	32.5	1.1457	87.3

Remarks:

1. Needle size: 1.9 mm diameter × 100 mm length
2. Thermal grease used: High-density polysynthetics silver thermal compound
3. Tested under controlled room temperature conditions (20°C to 22°C).

Tested By:	RD	Checked By:	MF

Thermal Dryout Curve (ASTM D5334)

Client Name:	Renewable Properties	LAB IRN:	26-TX-011
Project Name:	Copperopolis Road Solar, San Joaquin County, CA	Date:	1/26/2026

Sample ID: B-04, TRT-03, 1.5'-5'

Description: Brown Clay & Silt, trace cmf Sand (Visual)

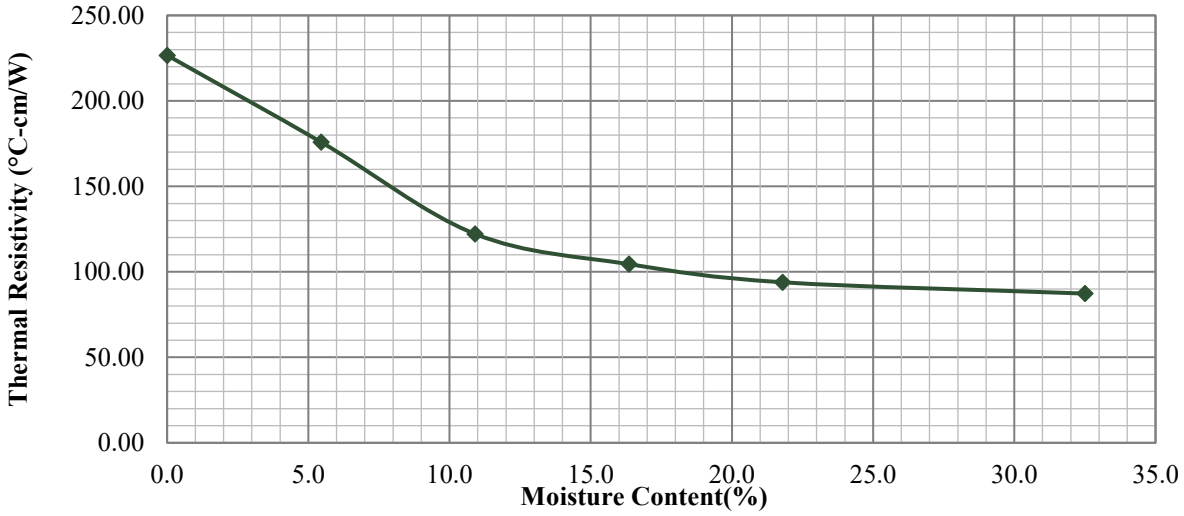
Specimen type: Reconstituted (90% D1557)

Recompaction Dry Density: 83.6 PCF

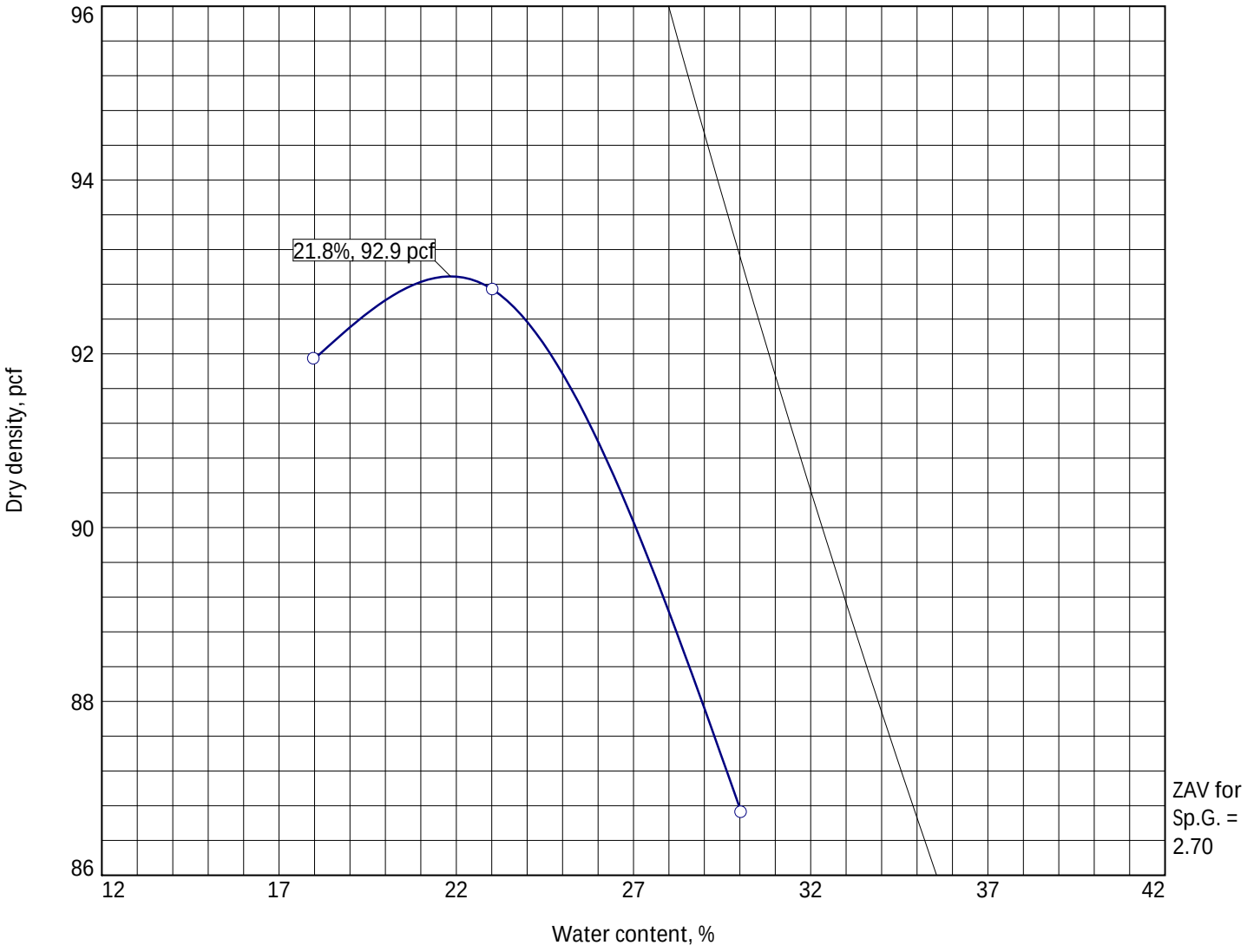
In-Situ Moisture: 32.5 %

Optimum Moisture: 21.8 %

Thermal Dry-out Curve



COMPACTION TEST REPORT



Test specification: ASTM D 1557-12 Method B Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
1.5'-5'				2.7			0	

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 92.9 pcf Optimum moisture = 21.8 %	Brown Clay & Silt, trace cmf Sand (Visual)

Project No. IRN 26-TX-011 Client: Renewable Properties

Project: Copperopolis Road Solar, San Joaquin County, CA

Date: 1/22/2026

○ Sample Number: B-04, TRT-03

Remarks:
SG Assumed

A N S

Figure

Tested By: JE Checked By: MF

Determination of Thermal Conductivity of Soil and Rock by Thermal Needle Probe (ASTM D5334)

Client Name:	Renewable Properties	LAB IRN:	26-TX-011
Project Name:	Copperopolis Road Solar, San Joaquin County, CA	Date:	1/26/2026

Sample ID: B-06, TRT-04, 1.5'-5'

Description: Brown Clay & Silt, trace cmf Sand (Visual)

Specimen type: Reconstituted (95% D1557) Recompaction Dry Density: 99.3 PCF

In-Situ Moisture: 25.7 % Optimum Moisture: 16.8 %

S.No.	Moisture (%)		Thermal Conductivity (W/m-K)	Thermal Resistivity (°C-cm/W)
1	Dry	0.0	0.4624	216.3
2	¼ OMC	4.2	0.5882	170.0
3	½ OMC	8.4	0.7648	130.8
4	¾ OMC	12.6	0.8890	112.5
5	OMC	16.8	1.0028	99.7
6	In-Situ	25.7	1.1154	89.7

Remarks:

1. Needle size: 1.9 mm diameter × 100 mm length
2. Thermal grease used: High-density polysynthetics silver thermal compound
3. Tested under controlled room temperature conditions (20°C to 22°C).

Tested By:	RD	Checked By:	MF

Thermal Dryout Curve (ASTM D5334)

Client Name:	Renewable Properties	LAB IRN:	26-TX-011
Project Name:	Copperopolis Road Solar, San Joaquin County, CA	Date:	1/26/2026

Sample ID: B-06, TRT-04, 1.5'-5'

Description: Brown Clay & Silt, trace cmf Sand (Visual)

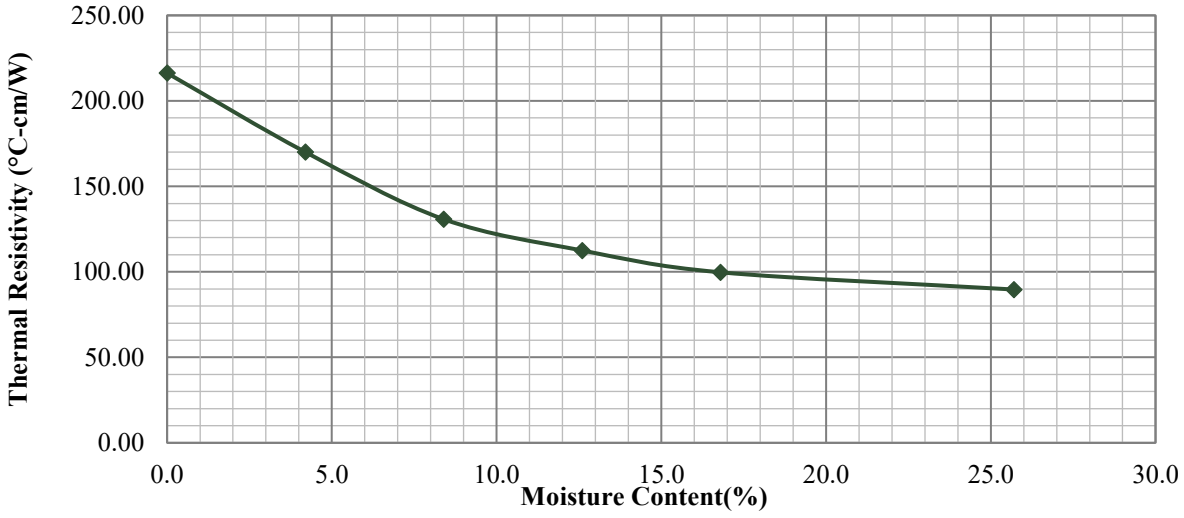
Specimen type: Reconstituted (95% D1557)

Recompaction Dry Density: 99.3 PCF

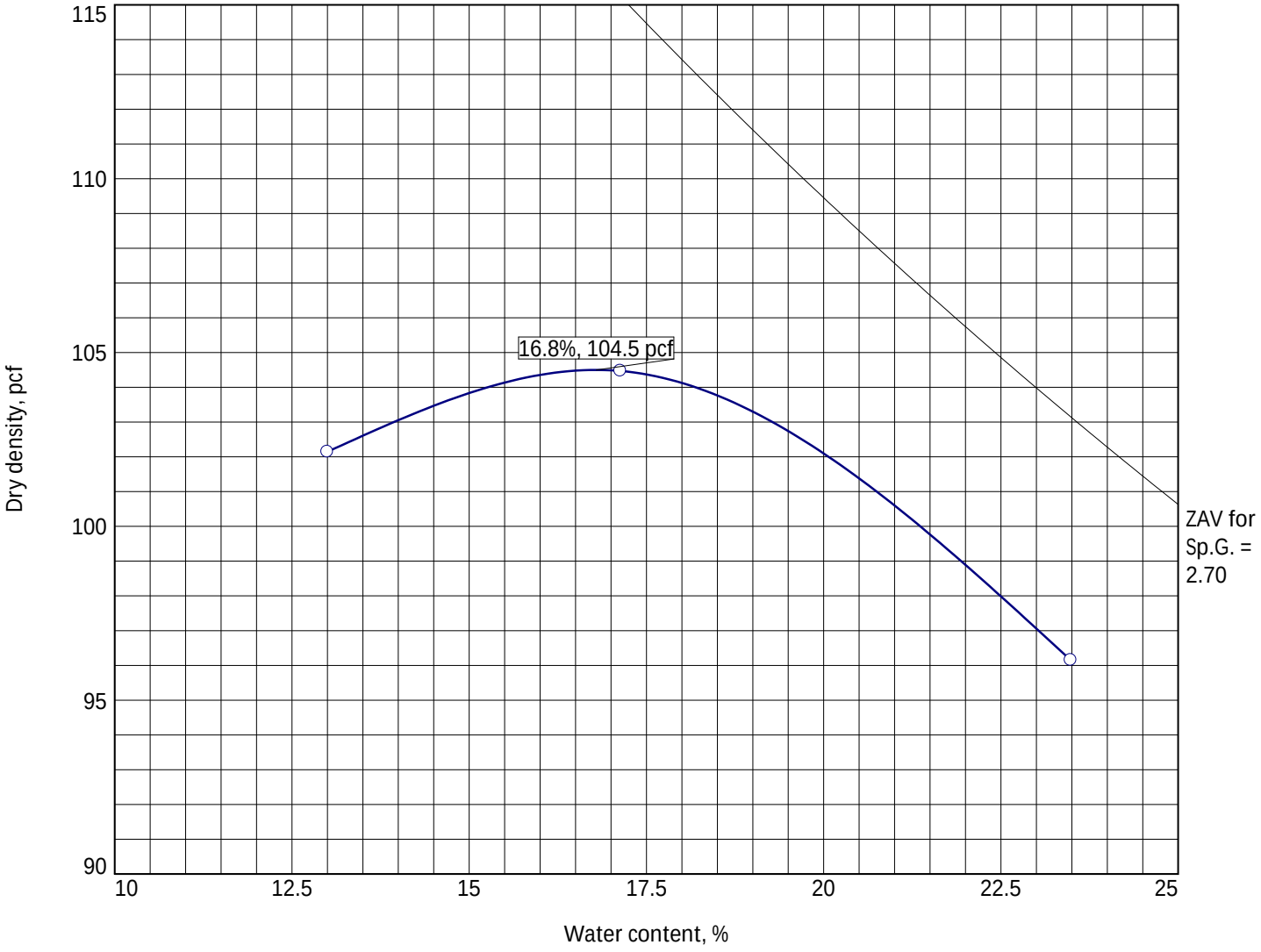
In-Situ Moisture: 25.7 %

Optimum Moisture: 16.8 %

Thermal Dry-out Curve



COMPACTION TEST REPORT



Test specification: ASTM D 1557-12 Method B Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
1.5'-5'				2.7			0	

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 104.5 pcf Optimum moisture = 16.8 %	Brown Clay & Silt, trace cmf Sand (Visual)

Project No. IRN 26-TX-011 Client: Renewable Properties
Project: Copperopolis Road Solar, San Joaquin County, CA
Date: 1/22/2026
○ Sample Number: B-06, TRT-04

Remarks:
SG Assumed

A N S

Figure

Tested By: JE Checked By: MF

Corrosivity Suite Results

Corrosivity Testing of Soil

Client Name:	Renewable Properties	LAB IRN:	26-TX-011
Project Name:	Copperopolis Road Solar, San Joaquin County, CA	Date:	1/22/2026

S.No.	Sample	Depth	Soil Resistivity (ohm-cm)	pH of Soil	Sulfate Content (mg/kg)	Chloride Content (mg/kg)	Oxidation-Reduction Pot. (mV)
		Natural Moisture	ASTM G187	ASTM G51	ASTM C1580	AASHTO T291	ASTM G200
1	B-03 CORR-01	1'-4'	1,530	7.7	<15	93	147
		40.1%		Brown C&S, trace cmf Sand (Vis.)			
2	B-05 CORR-02	1'-4'	1,130	7.4	30	105	154
		28.6%		Brown C&S, trace cmf Sand (Vis.)			

Remarks:

1. Turbidimetric procedure used for ASTM C1580.
2. Mohr's procedure with Silver Nitrate used for AASHTO T291.
3. Miller 400D Resistance Meter used for Resistivity testing, Multiplication factor = 1.
4. As per ASTM G187, gravel and small stones removed from sample.
5. Tests conducted under standard laboratory conditions of temperature (72°F) and humidity.

Tested By:	JE	Checked By:	MF

ATTACHMENT D

Electrical Resistivity Test Results

Soil Resistivity Results

Client:	Renewable Properties	Date:	11/10/2025
Project Name:	Copperopolis Road Solar	Weather:	Sunny
Project Location:	San Joaquin County, California	Temperature:	75°F
Equipment:	L and R Instruments Mini Res		
Test Method:	Wenner 4 Electrode Array		

Array		Data	Array spacing (ft)			
			5.00	10.00	20.00	50.00
ERT-01	N-S	Measured Resistance (Ω)	0.98	0.34	0.12	0.04
		Apparent Resistivity (Ω-m)	9.39	6.49	4.71	3.64
	E-W	Measured Resistance (Ω)	0.68	0.36	0.12	0.04
		Apparent Resistivity (Ω-m)	6.53	6.91	4.48	3.45
ERT-02	N-S	Measured Resistance (Ω)	0.44	0.17	0.08	0.04
		Apparent Resistivity (Ω-m)	4.24	3.22	2.91	3.54
	E-W	Measured Resistance (Ω)	0.53	0.19	0.08	0.04
		Apparent Resistivity (Ω-m)	5.03	3.60	2.87	3.64
		Site Average (Ω)	0.66	0.26	0.10	0.04
		Site Average (Ω-m)	6.30	5.06	3.74	3.57

ANS

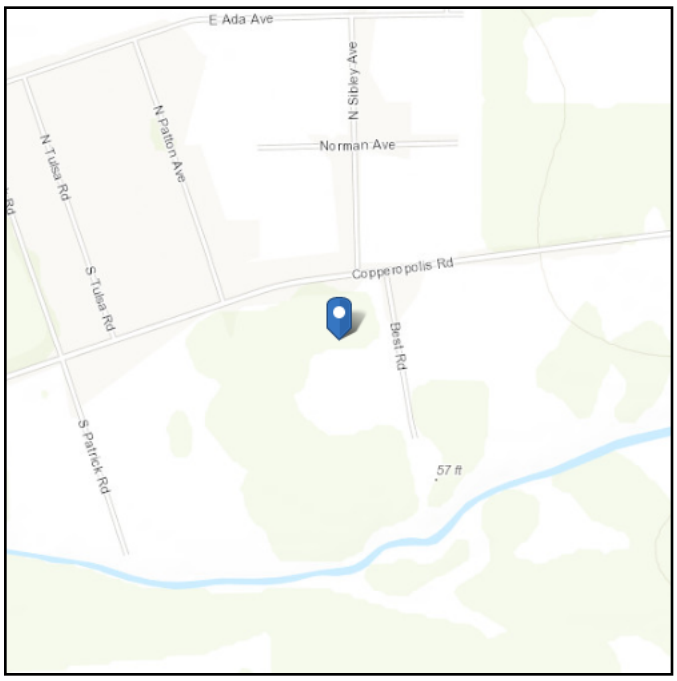
ATTACHMENT E

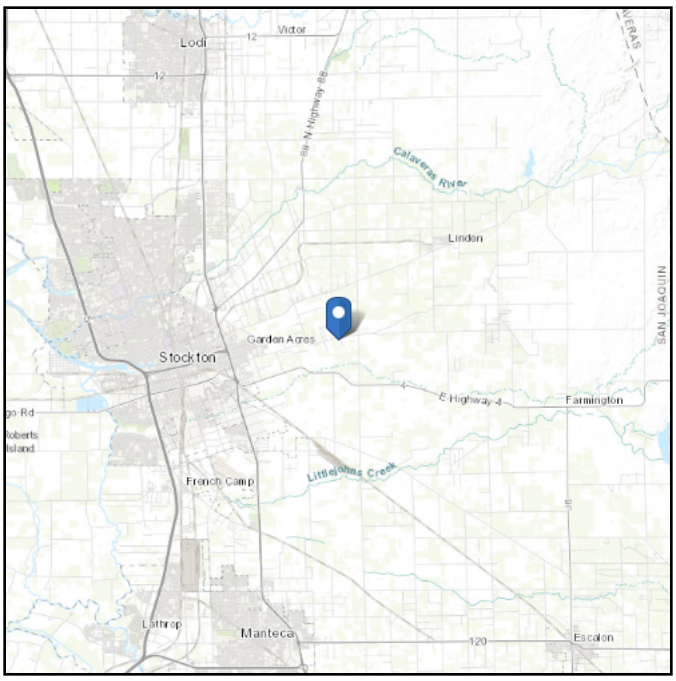
Seismic Hazard Site Classification

ASCE Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-22	**Latitude:**	37.96719
Risk Category:	II	**Longitude:**	-121.1631
Soil Class:	DE	**Elevation:**	54.985865401279916 ft (NAVD 88)





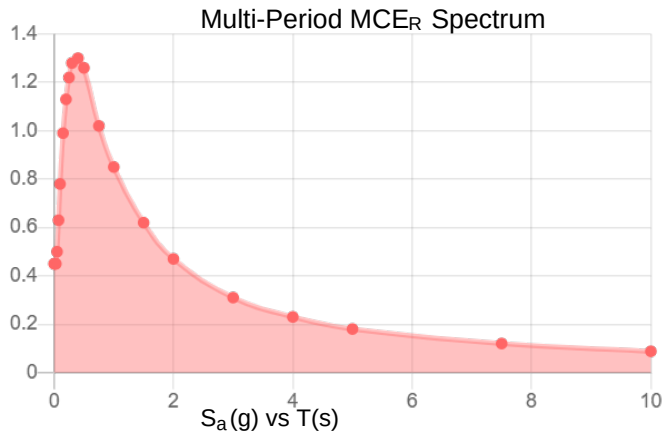
Seismic

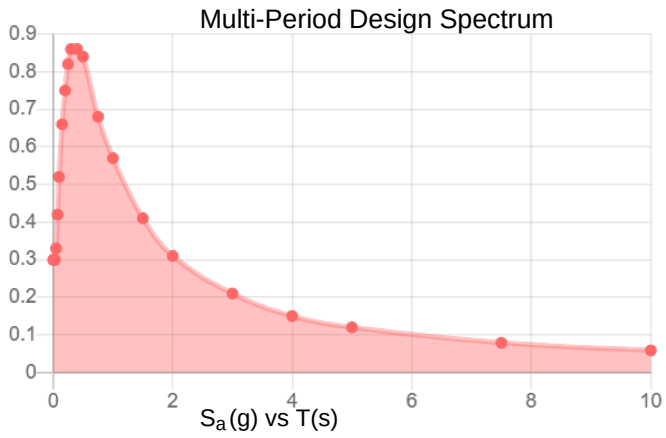
Site Soil Class: DE

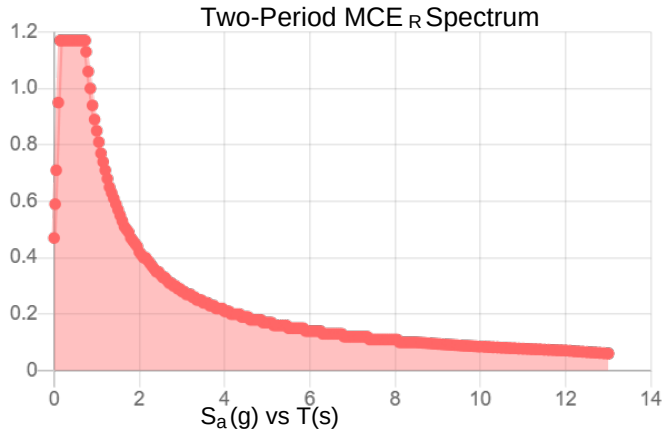
Results:

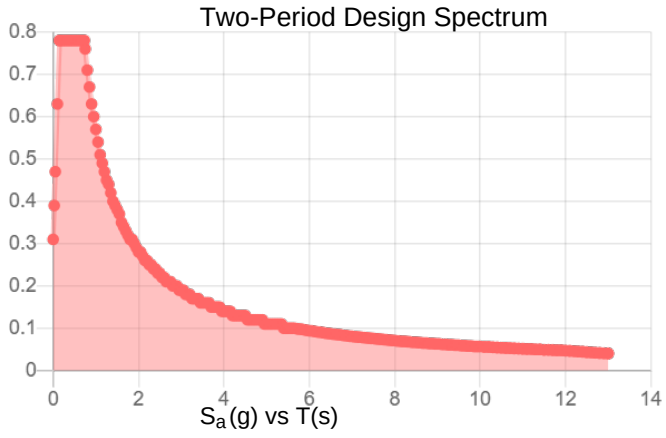
PGA_M :	0.37	T_L :	12
S_{MS} :	1.17	S_S :	0.73
S_{M1} :	0.85	S_1 :	0.25
S_{DS} :	0.78	V_{S30} :	185
S_{D1} :	0.57		

Seismic Design Category: D









MCER Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

Design Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

Data Accessed: **Mon Apr 06 2026**

Date Source:
USGS Seismic Design Maps based on ASCE/SEI 7-22 and ASCE/SEI 7-22 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-22 Ch. 21 are available from USGS.

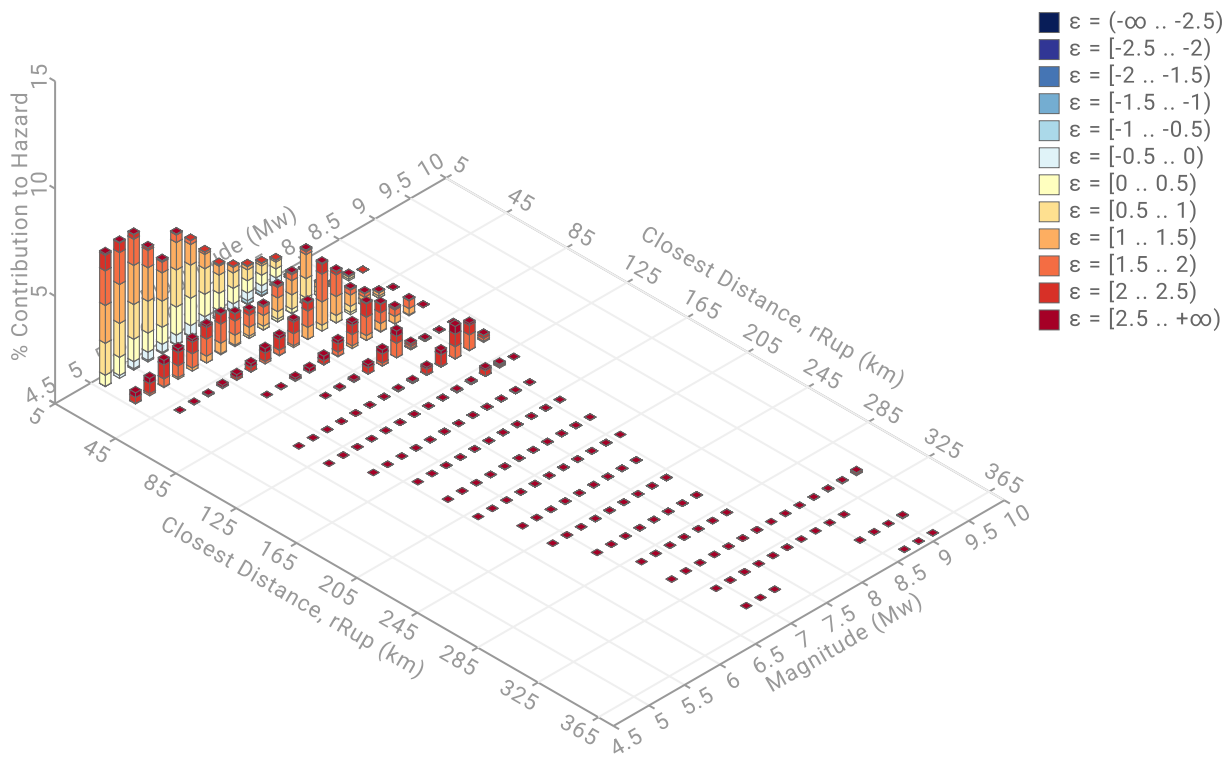
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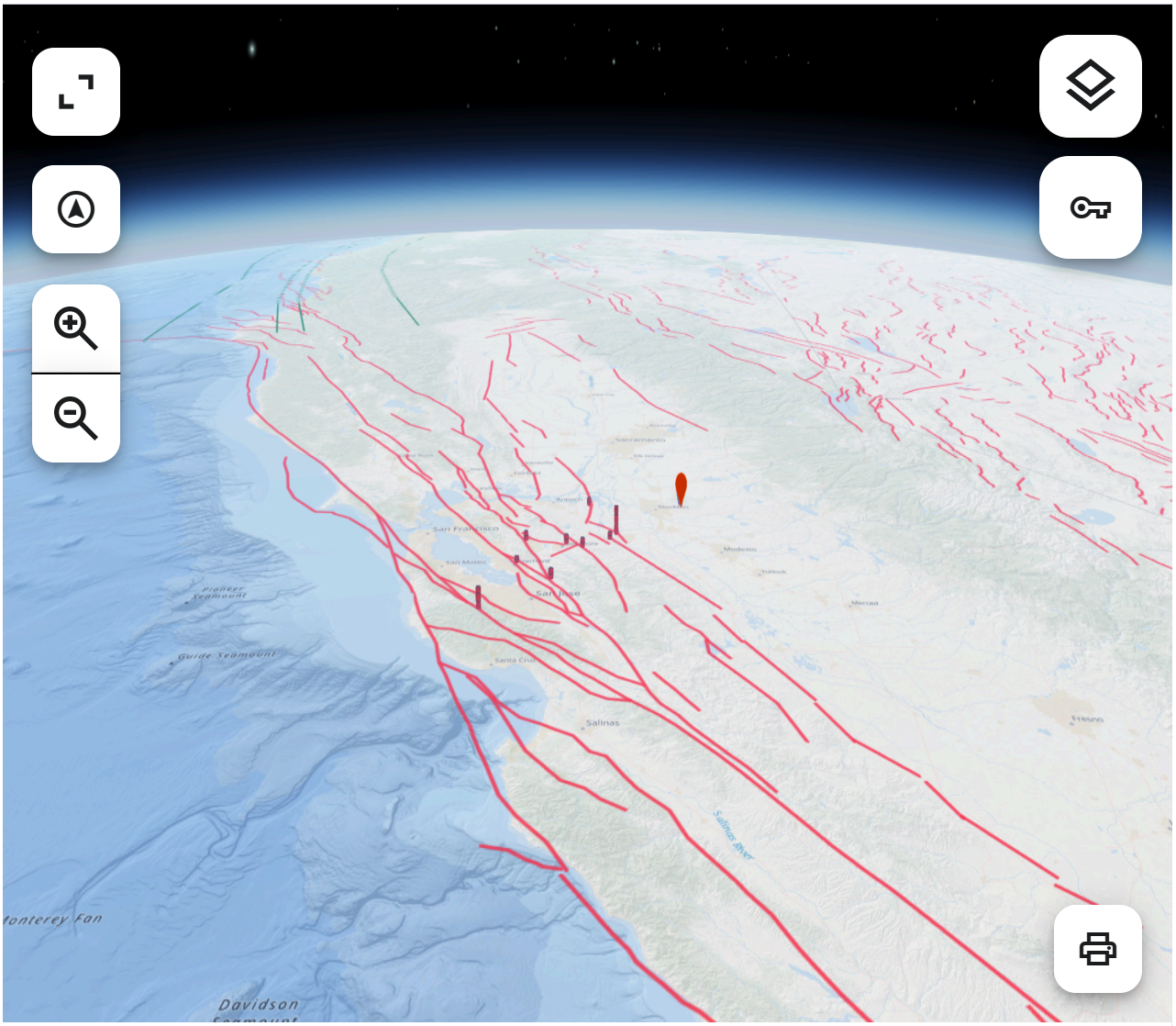
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Disaggregation Report

Disaggregation



Geographical Disaggregation



Parameter Summary

Model: NSHM Conterminous U.S. 2023

Latitude: 37.96719 °

Longitude: -121.1631 °

Site Class: DE (Vs30 185)

Intensity Measure Type: PGA

Return Period: 2475 (2% in 50)

Component: Total

Disaggregation Summary: Total

Disaggregation targets

Return period : 2475 yrs

Exceedance rate : 4.040e-4 yr^{-1}

PGA ground motion : 3.851e-1 g

Recovered targets

Return period : 2411.2918 yrs

Exceedance rate : 4.147e-4 yr^{-1}

Totals

Binned : 100 %

Residual : 0 %

Trace : 0.35 %

Mean (over all sources)

m : 6.5

r : 32.17 km

ε_0 : 1.28 σ

Mode (largest m-r bin)

m : 5.3

r : 10.48 km

ε_0 : 1.16 σ

Contribution : 6.32 %

Mode (largest m-r-ε_0 bin)

m : 5.5

r : 12.19 km

ε_0 : 1.24 σ

Contribution : 1.82 %

Discretization

r : min = 0.0, max = 1000.0, Δ = 20.0 km

m : min = 4.4, max = 9.4, Δ = 0.2

ε : min = -3.0, max = 3.0, Δ = 0.5 σ

Epsilon keys

ε0 : [-∞ .. -2.5)

ε1 : [-2.5 .. -2.0)

ε2 : [-2.0 .. -1.5)

ε3 : [-1.5 .. -1.0)

ε4 : [-1.0 .. -0.5)

ε5 : [-0.5 .. 0.0)

ε6 : [0.0 .. 0.5)

ε7 : [0.5 .. 1.0)

ε8 : [1.0 .. 1.5)

ε9 : [1.5 .. 2.0)

ε10 : [2.0 .. 2.5)

ε11 : [2.5 .. +∞]

Disaggregation Contributions: Total

Source Set ↳ Source	Type	r	m	ε_0	lon	lat	az	%
WUS Branch Average (opt)	Grid							71.04
PointSourceFinite: -121.163, 38.044		8.78	5.79	0.72	121.163°W	38.044°N	0.00	1.81
PointSourceFinite: -121.163, 38.053		9.49	5.82	0.78	121.163°W	38.053°N	0.00	1.75
PointSourceFinite: -121.163, 38.026		7.41	5.74	0.58	121.163°W	38.026°N	0.00	1.65
PointSourceFinite: -121.163, 38.044		9.92	5.80	0.76	121.163°W	38.044°N	0.00	1.65
PointSourceFinite: -121.163, 38.053		10.65	5.83	0.82	121.163°W	38.053°N	0.00	1.59
PointSourceFinite: -121.163, 38.017		6.77	5.71	0.51	121.163°W	38.017°N	0.00	1.59
PointSourceFinite: -121.163, 38.062		10.13	5.88	0.90	121.163°W	38.062°N	0.00	1.52
PointSourceFinite: -121.163, 38.035		8.08	5.77	0.65	121.163°W	38.035°N	0.00	1.51
PointSourceFinite: -121.163, 38.026		8.52	5.75	0.62	121.163°W	38.026°N	0.00	1.51
PointSourceFinite: -121.163, 38.017		7.85	5.72	0.56	121.163°W	38.017°N	0.00	1.45
PointSourceFinite: -121.163, 38.071		10.86	5.91	0.96	121.163°W	38.071°N	0.00	1.41
PointSourceFinite: -121.163, 38.008		6.18	5.69	0.45	121.163°W	38.008°N	0.00	1.41
PointSourceFinite: -121.163, 38.035		9.21	5.78	0.69	121.163°W	38.035°N	0.00	1.38
PointSourceFinite: -121.163, 38.062		11.35	5.89	0.94	121.163°W	38.062°N	0.00	1.37
PointSourceFinite: -121.163, 38.080		11.60	5.94	1.01	121.163°W	38.080°N	0.00	1.35
PointSourceFinite: -121.163, 38.089		12.35	5.97	1.06	121.163°W	38.089°N	0.00	1.33
PointSourceFinite: -121.163, 38.008		7.20	5.70	0.49	121.163°W	38.008°N	0.00	1.31
PointSourceFinite: -121.163, 38.071		12.09	5.92	0.99	121.163°W	38.071°N	0.00	1.28
PointSourceFinite: -121.163, 37.999		5.65	5.67	0.38	121.163°W	37.999°N	0.00	1.23
PointSourceFinite: -121.163, 38.080		12.84	5.95	1.04	121.163°W	38.080°N	0.00	1.22
PointSourceFinite: -121.163, 38.089		13.59	5.98	1.09	121.163°W	38.089°N	0.00	1.21
PointSourceFinite: -121.163, 38.098		13.10	6.00	1.11	121.163°W	38.098°N	0.00	1.2
PointSourceFinite: -121.163, 38.107		13.85	6.03	1.15	121.163°W	38.107°N	0.00	1.16
PointSourceFinite: -121.163, 37.999		6.58	5.68	0.42	121.163°W	37.999°N	0.00	1.14
PointSourceFinite: -121.163, 38.098		14.35	6.01	1.13	121.163°W	38.098°N	0.00	1.09
PointSourceFinite: -121.163, 38.116		14.62	6.06	1.20	121.163°W	38.116°N	0.00	1.08
PointSourceFinite: -121.163, 38.107		15.10	6.05	1.18	121.163°W	38.107°N	0.00	1.05
PointSourceFinite: -121.163, 38.125		15.37	6.09	1.24	121.163°W	38.125°N	0.00	1.02
PointSourceFinite: -121.163, 38.134		16.12	6.12	1.28	121.163°W	38.134°N	0.00	1.01
WUS Branch Average	FaultSystem							28.68
West Tracy (1)		36.67	7.38	1.23	121.499°W	37.771°N	233.63	4.34
San Andreas (Peninsula) (2)		113.57	7.95	2.15	122.114°W	37.278°N	227.83	3.4
Calaveras (center) (9)		78.82	7.56	1.96	121.805°W	37.461°N	225.31	2.21
Calaveras (north) (4)		72.65	7.59	1.84	121.935°W	37.724°N	248.50	2.07
Mount Diablo (south) (0)		49.60	7.22	1.74	121.741°W	37.700°N	239.84	1.98
Greenville (north) (3)		54.58	7.35	1.71	121.663°W	37.677°N	233.81	1.96
Great Valley 7 (Orestimba) (0)		42.26	7.19	1.47	121.530°W	37.730°N	230.88	1.65
Great Valley 6 (Midland) (6)		41.26	7.42	1.30	121.632°W	37.995°N	274.50	1.65
Hayward (south) (3)		82.37	7.36	2.21	121.968°W	37.569°N	238.23	1.45

Application Metadata

Application: Disaggregation
URL: https://earthquake.usgs.gov/nshmp/hazard/disagg

Repository: nshmp-apps
Version: 21.5.5
URL: https://code.usgs.gov/ghsc/nshmp/nshmp-apps

Repository : nshmp-haz
Version: 2.8.2
URL: https://code.usgs.gov/ghsc/nshmp/nshmp-haz

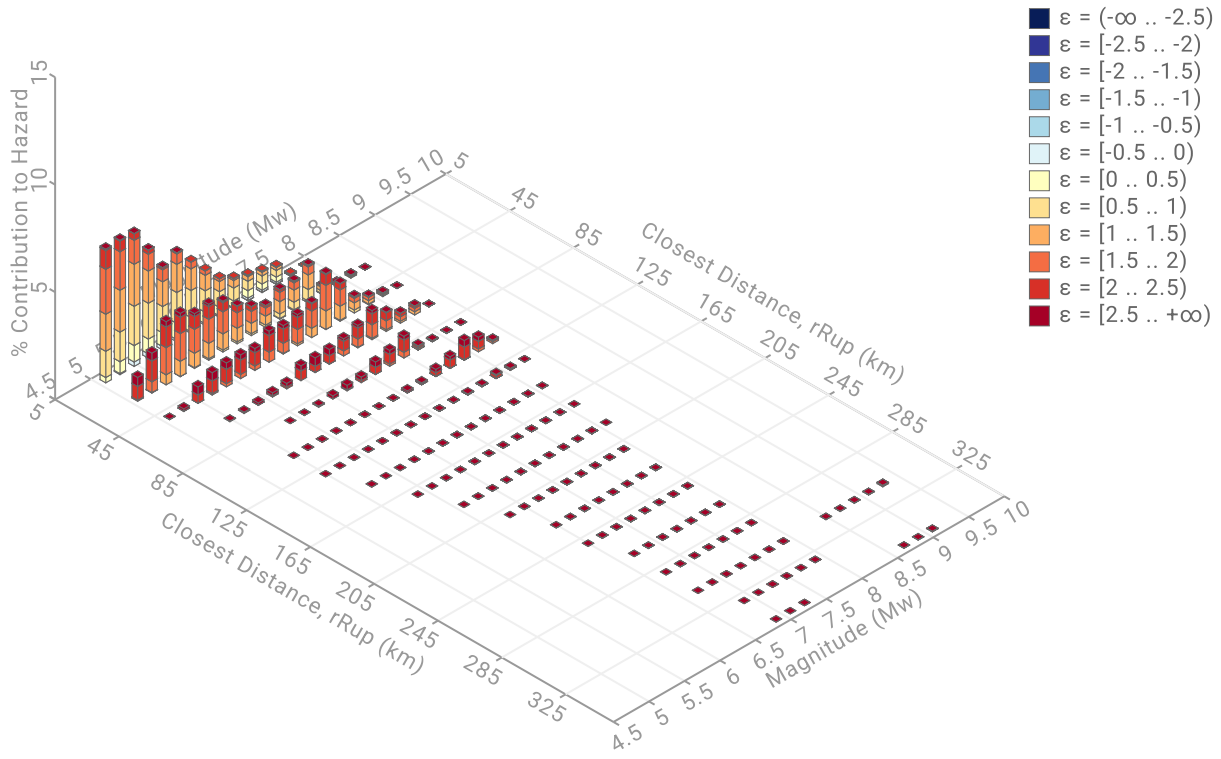
Repository : nshmp-lib
Version: 1.7.15
URL: https://code.usgs.gov/ghsc/nshmp/nshmp-lib

Repository : nshm-conus
Version: 6.1.3
URL: https://code.usgs.gov/ghsc/nshmp/nshms/nshm-conus.git

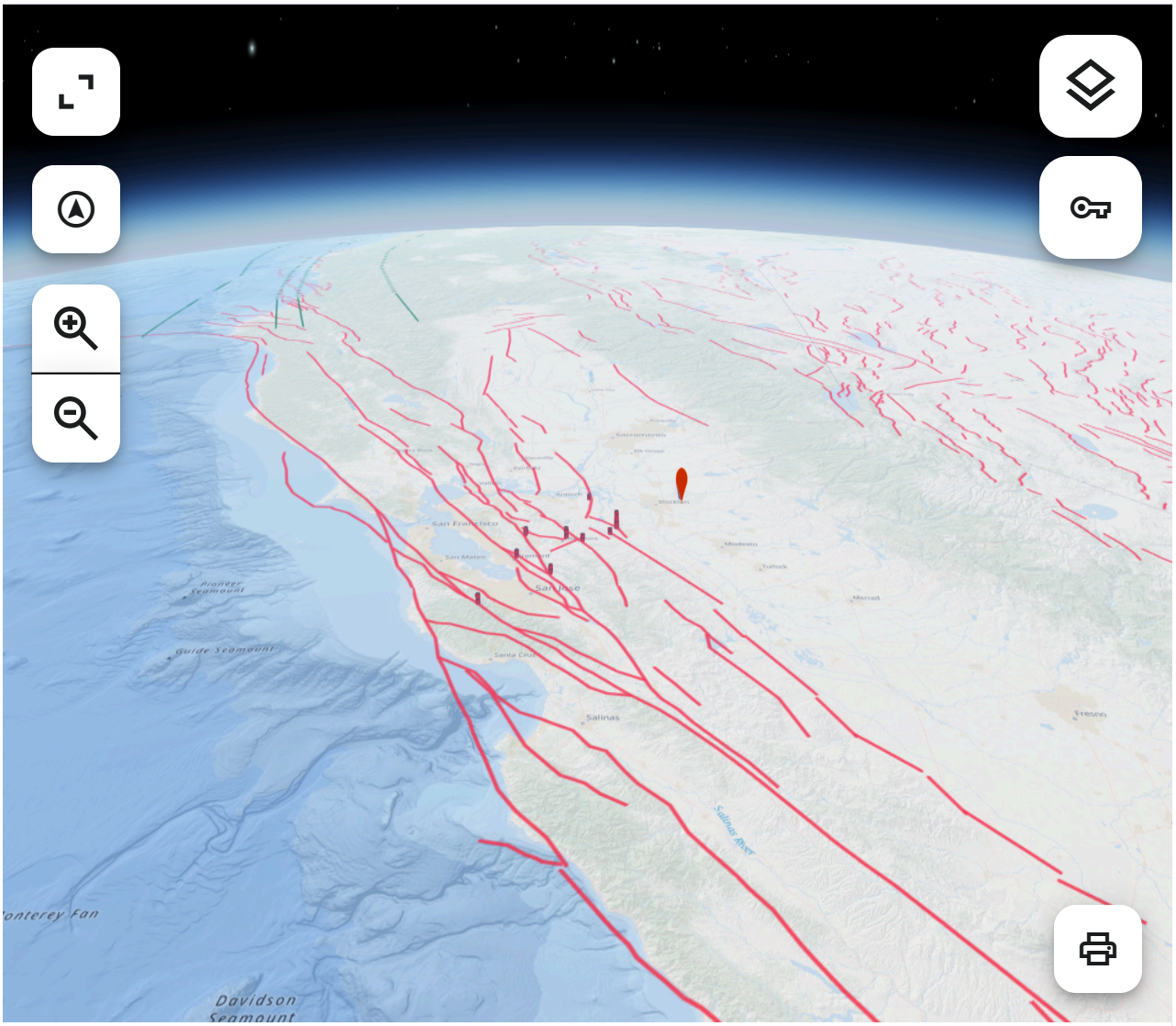
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Disaggregation Report

Disaggregation



Geographical Disaggregation



Parameter Summary

Model: NSHM Conterminous U.S. 2023

Latitude: 37.96719 °

Longitude: -121.1631 °

Site Class: DE (Vs30 185)

Intensity Measure Type: 0.1 s

Return Period: 2475 (2% in 50)

Component: Total

Disaggregation Summary: Total

Disaggregation targets

Return period : 2475 yrs

Exceedance rate : 4.040e-4 yr^{-1}

0.1 s SA ground motion : 6.677e-1 g

Recovered targets

Return period : 2460.134 yrs

Exceedance rate : 4.065e-4 yr^{-1}

Totals

Binned : 100 %

Residual : 0 %

Trace : 0.29 %

Mean (over all sources)

m : 6.32

r : 32.67 km

ε_0 : 1.54 σ

Mode (largest m-r bin)

m : 5.3

r : 11.25 km

ε_0 : 1.27 σ

Contribution : 6.25 %

Mode (largest m-r-ε_0 bin)

m : 5.1

r : 12.53 km

ε_0 : 1.74 σ

Contribution : 2.09 %

Discretization

r : min = 0.0, max = 1000.0, Δ = 20.0 km

m : min = 4.4, max = 9.4, Δ = 0.2

ε : min = -3.0, max = 3.0, Δ = 0.5 σ

Epsilon keys

ε0 : [-∞ .. -2.5)

ε1 : [-2.5 .. -2.0)

ε2 : [-2.0 .. -1.5)

ε3 : [-1.5 .. -1.0)

ε4 : [-1.0 .. -0.5)

ε5 : [-0.5 .. 0.0)

ε6 : [0.0 .. 0.5)

ε7 : [0.5 .. 1.0)

ε8 : [1.0 .. 1.5)

ε9 : [1.5 .. 2.0)

ε10 : [2.0 .. 2.5)

ε11 : [2.5 .. +∞]

Disaggregation Contributions: Total

Source Set ↳ Source	Type	r	m	ε_0	lon	lat	az	%
WUS Branch Average (opt)	Grid							74.87
PointSourceFinite: -121.163, 38.044		9.01	5.71	0.91	121.163°W	38.044°N	0.00	1.47
PointSourceFinite: -121.163, 38.053		9.78	5.73	0.97	121.163°W	38.053°N	0.00	1.46
PointSourceFinite: -121.163, 38.044		10.04	5.72	0.93	121.163°W	38.044°N	0.00	1.39
PointSourceFinite: -121.163, 38.053		10.80	5.74	0.99	121.163°W	38.053°N	0.00	1.37
PointSourceFinite: -121.163, 38.062		10.48	5.77	1.09	121.163°W	38.062°N	0.00	1.29
PointSourceFinite: -121.163, 38.026		7.56	5.67	0.80	121.163°W	38.026°N	0.00	1.29
PointSourceFinite: -121.163, 38.071		11.27	5.79	1.14	121.163°W	38.071°N	0.00	1.24
PointSourceFinite: -121.163, 38.089		12.89	5.83	1.23	121.163°W	38.089°N	0.00	1.23
PointSourceFinite: -121.163, 38.017		6.90	5.66	0.74	121.163°W	38.017°N	0.00	1.21
PointSourceFinite: -121.163, 38.026		8.59	5.68	0.82	121.163°W	38.026°N	0.00	1.21
PointSourceFinite: -121.163, 38.080		12.07	5.81	1.19	121.163°W	38.080°N	0.00	1.21
PointSourceFinite: -121.163, 38.062		11.54	5.78	1.11	121.163°W	38.062°N	0.00	1.21
PointSourceFinite: -121.163, 38.035		8.27	5.69	0.86	121.163°W	38.035°N	0.00	1.21
PointSourceFinite: -121.163, 38.071		12.33	5.80	1.15	121.163°W	38.071°N	0.00	1.16
PointSourceFinite: -121.163, 38.089		13.93	5.84	1.24	121.163°W	38.089°N	0.00	1.15
PointSourceFinite: -121.163, 38.017		7.89	5.66	0.76	121.163°W	38.017°N	0.00	1.14
PointSourceFinite: -121.163, 38.035		9.30	5.70	0.88	121.163°W	38.035°N	0.00	1.13
PointSourceFinite: -121.163, 38.080		13.12	5.82	1.20	121.163°W	38.080°N	0.00	1.13
PointSourceFinite: -121.163, 38.098		13.71	5.85	1.28	121.163°W	38.098°N	0.00	1.13
PointSourceFinite: -121.163, 38.107		14.53	5.87	1.32	121.163°W	38.107°N	0.00	1.12
PointSourceFinite: -121.163, 38.116		15.37	5.89	1.36	121.163°W	38.116°N	0.00	1.08
PointSourceFinite: -121.163, 38.098		14.74	5.86	1.28	121.163°W	38.098°N	0.00	1.06
PointSourceFinite: -121.163, 38.008		6.28	5.64	0.68	121.163°W	38.008°N	0.00	1.06
PointSourceFinite: -121.163, 38.134		17.04	5.93	1.43	121.163°W	38.134°N	0.00	1.06
PointSourceFinite: -121.163, 38.107		15.55	5.88	1.32	121.163°W	38.107°N	0.00	1.05
PointSourceFinite: -121.163, 38.125		16.20	5.91	1.39	121.163°W	38.125°N	0.00	1.04
PointSourceFinite: -121.163, 38.116		16.38	5.90	1.36	121.163°W	38.116°N	0.00	1.01
PointSourceFinite: -121.163, 38.008		7.23	5.65	0.70	121.163°W	38.008°N	0.00	1.01
WUS Branch Average	FaultSystem							24.97
West Tracy (1)		36.67	7.30	1.45	121.499°W	37.771°N	233.63	3.31
San Andreas (Peninsula) (2)		113.57	7.92	2.33	122.114°W	37.278°N	227.83	2.08
Mount Diablo (south) (0)		49.60	7.11	1.84	121.741°W	37.700°N	239.84	1.96
Calaveras (center) (9)		78.82	7.44	2.16	121.805°W	37.461°N	225.31	1.87
Calaveras (north) (4)		72.65	7.42	2.08	121.935°W	37.724°N	248.50	1.75
Greenville (north) (3)		54.58	7.26	1.85	121.663°W	37.677°N	233.81	1.74
Hayward (south) (3)		82.37	7.23	2.33	121.968°W	37.569°N	238.23	1.6
Great Valley 7 (Orestimba) (0)		42.26	7.10	1.65	121.530°W	37.730°N	230.88	1.38
Great Valley 6 (Midland) (6)		41.26	7.34	1.53	121.632°W	37.995°N	274.50	1.26

Application Metadata

Application: Disaggregation
URL: https://earthquake.usgs.gov/nshmp/hazard/disagg

Repository: nshmp-apps
Version: 21.5.5
URL: https://code.usgs.gov/ghsc/nshmp/nshmp-apps

Repository : nshmp-haz
Version: 2.8.2
URL: https://code.usgs.gov/ghsc/nshmp/nshmp-haz

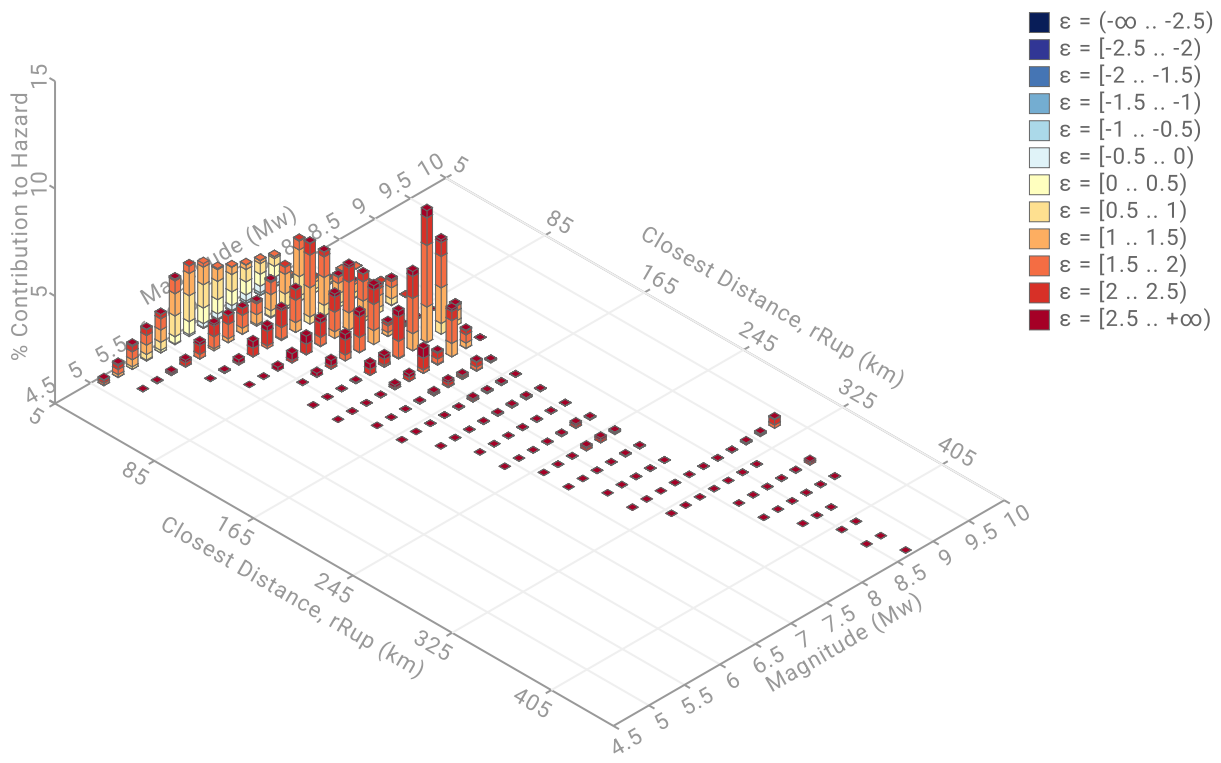
Repository : nshmp-lib
Version: 1.7.15
URL: https://code.usgs.gov/ghsc/nshmp/nshmp-lib

Repository : nshm-conus
Version: 6.1.3
URL: https://code.usgs.gov/ghsc/nshmp/nshms/nshm-conus.git

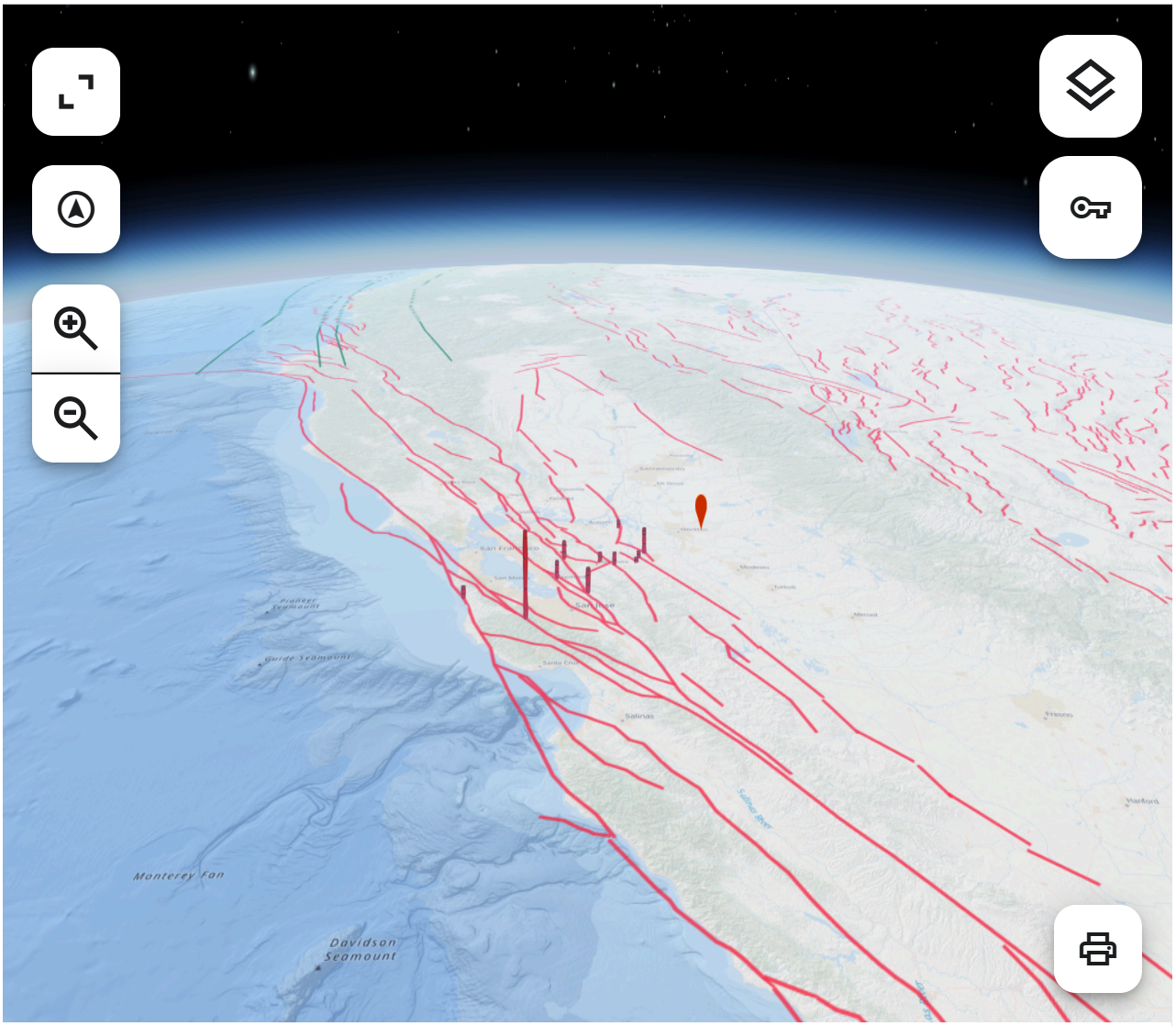
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Disaggregation Report

Disaggregation



Geographical Disaggregation



Parameter Summary

Model: NSHM Conterminous U.S. 2023

Latitude: 37.96719 °

Longitude: -121.1631 °

Site Class: DE (Vs30 185)

Intensity Measure Type: 1.0 s

Return Period: 2475 (2% in 50)

Component: Total

Disaggregation Summary: Total

Disaggregation targets

Return period : 2475 yrs

Exceedance rate : 4.040e-4 yr^{-1}

1.0 s SA ground motion : 7.377e-1 g

Recovered targets

Return period : 2468.5139 yrs

Exceedance rate : 4.051e-4 yr^{-1}

Totals

Binned : 100 %

Residual : 0 %

Trace : 0.43 %

Mean (over all sources)

m : 7.23

r : 65.56 km

ε_0 : 1.54 σ

Mode (largest m-r bin)

m : 7.93

r : 113.27 km

ε_0 : 1.71 σ

Contribution : 6.13 %

Mode (largest m-r-ε_0 bin)

m : 7.93

r : 113.28 km

ε_0 : 1.68 σ

Contribution : 2.87 %

Discretization

r : min = 0.0, max = 1000.0, Δ = 20.0 km

m : min = 4.4, max = 9.4, Δ = 0.2

ε : min = -3.0, max = 3.0, Δ = 0.5 σ

Epsilon keys

ε0 : [-∞ .. -2.5)

ε1 : [-2.5 .. -2.0)

ε2 : [-2.0 .. -1.5)

ε3 : [-1.5 .. -1.0)

ε4 : [-1.0 .. -0.5)

ε5 : [-0.5 .. 0.0)

ε6 : [0.0 .. 0.5)

ε7 : [0.5 .. 1.0)

ε8 : [1.0 .. 1.5)

ε9 : [1.5 .. 2.0)

ε10 : [2.0 .. 2.5)

ε11 : [2.5 .. +∞]

Disaggregation Contributions: Total

Source Set ↳ Source	Type	r	m	ε_0	lon	lat	az	%
WUS Branch Average	FaultSystem							59.37
San Andreas (Peninsula) (2)		113.57	7.91	1.73	122.114°W	37.278°N	227.83	14.39
West Tracy (1)		36.67	7.39	1.25	121.499°W	37.771°N	233.63	4.76
Calaveras (center) (9)		78.82	7.54	1.79	121.805°W	37.461°N	225.31	4.29
Calaveras (north) (4)		72.65	7.57	1.70	121.935°W	37.724°N	248.50	3.48
Hayward (south) (3)		82.37	7.33	2.04	121.968°W	37.569°N	238.23	3.31
Greenville (north) (3)		54.58	7.36	1.68	121.663°W	37.677°N	233.81	2.49
Mount Diablo (south) (0)		49.60	7.22	1.74	121.741°W	37.700°N	239.84	2.37
San Gregorio (north) (10)		127.66	7.92	1.81	122.442°W	37.425°N	242.22	2.18
Great Valley 6 (Midland) (6)		41.26	7.43	1.30	121.632°W	37.995°N	274.50	1.89
Great Valley 7 (Orestimba) (0)		42.26	7.22	1.49	121.530°W	37.730°N	230.88	1.75
Midway (1)		45.35	7.43	1.47	121.546°W	37.694°N	228.09	1.14
WUS Branch Average (opt)	Grid							39.7

Application Metadata

Application: Disaggregation
URL: https://earthquake.usgs.gov/nshmp/hazard/disagg

Repository: nshmp-apps
Version: 21.5.5
URL: https://code.usgs.gov/ghsc/nshmp/nshmp-apps

Repository : nshmp-haz
Version: 2.8.2
URL: https://code.usgs.gov/ghsc/nshmp/nshmp-haz

Repository : nshmp-lib
Version: 1.7.15
URL: https://code.usgs.gov/ghsc/nshmp/nshmp-lib

Repository : nshm-conus
Version: 6.1.3
URL: https://code.usgs.gov/ghsc/nshmp/nshms/nshm-conus.git

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ANS

ATTACHMENT F

NRCS Soil Survey

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for San Joaquin County, California

Copperopolis Array Area



January 28, 2026

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

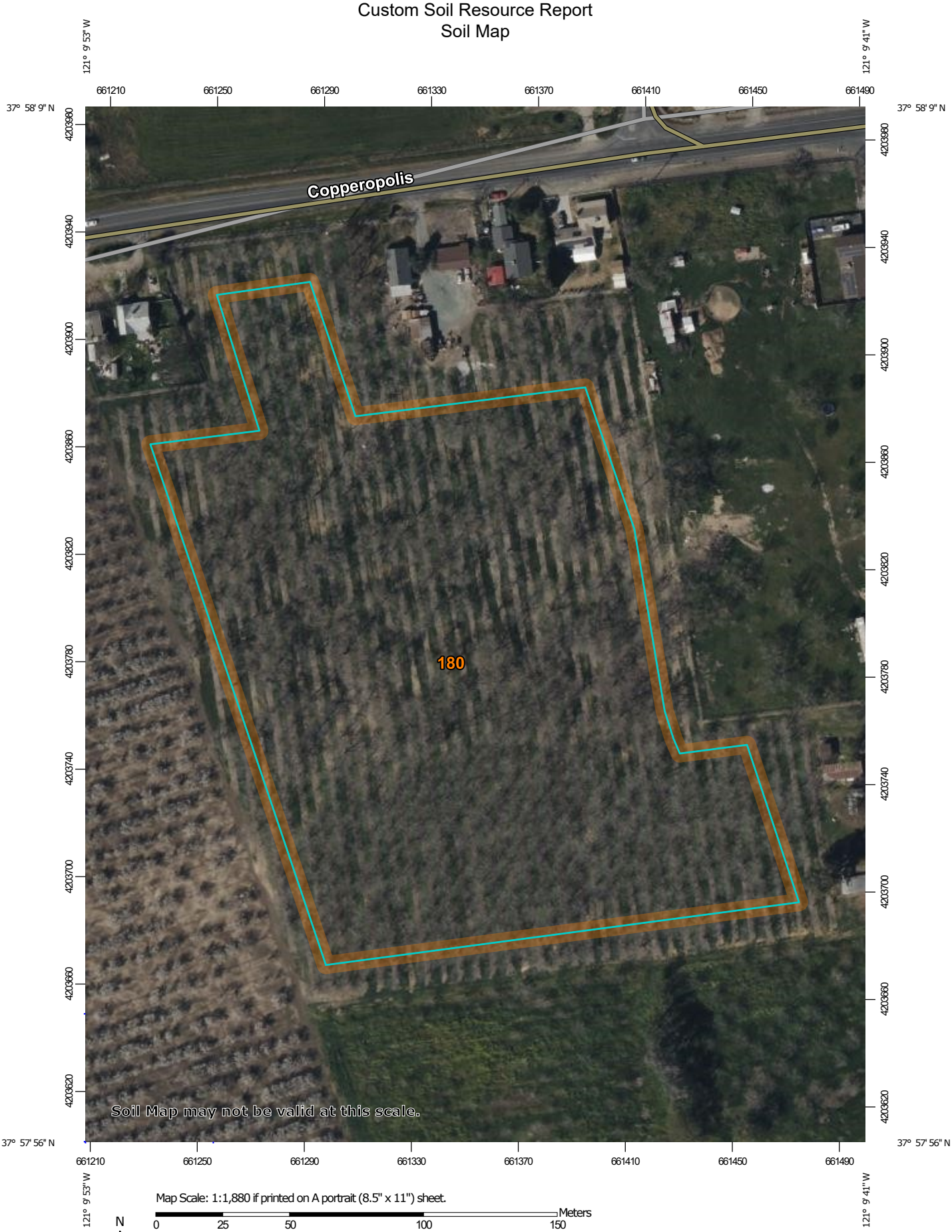
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:1,880 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Joaquin County, California
Survey Area Data: Version 19, Sep 9, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 9, 2022—Mar 11, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
180	Jacktone clay, 0 to 2 percent slopes	8.7	100.0%
Totals for Area of Interest		**8.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

San Joaquin County, California

180—Jacktone clay, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hhtk
Landscape: Valleys
Elevation: 0 to 100 feet
Mean annual precipitation: 14 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 270 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Jacktone and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Jacktone

Setting

Landscape: Valleys
Landform: Basin floors
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed rock sources

Typical profile

A - 0 to 22 inches: clay
Bk - 22 to 34 inches: clay
2Bkqm - 34 to 37 inches: indurated
2Bk - 37 to 46 inches: stratified sandy loam to clay loam
3Bkq - 46 to 60 inches: cemented

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: D
Ecological site: R017XY902CA - Duripan Vernal Pools
Hydric soil rating: Yes

Minor Components

Archerdale

Percent of map unit: 4 percent
Landscape: Valleys
Landform: Low fan remnants
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Unnamed, mod coarse tex overwash

Percent of map unit: 3 percent
Landscape: Valleys
Landform: Basin floors
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Hollenbeck

Percent of map unit: 3 percent
Landscape: Valleys
Landform: Basin floors
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Stockton

Percent of map unit: 3 percent
Landscape: Valleys
Landform: Basin floors
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Unnamed, saline-sodic

Percent of map unit: 2 percent
Landscape: Valleys
Landform: Basin floors
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Building Site Development

Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

Corrosion of Concrete

ENG

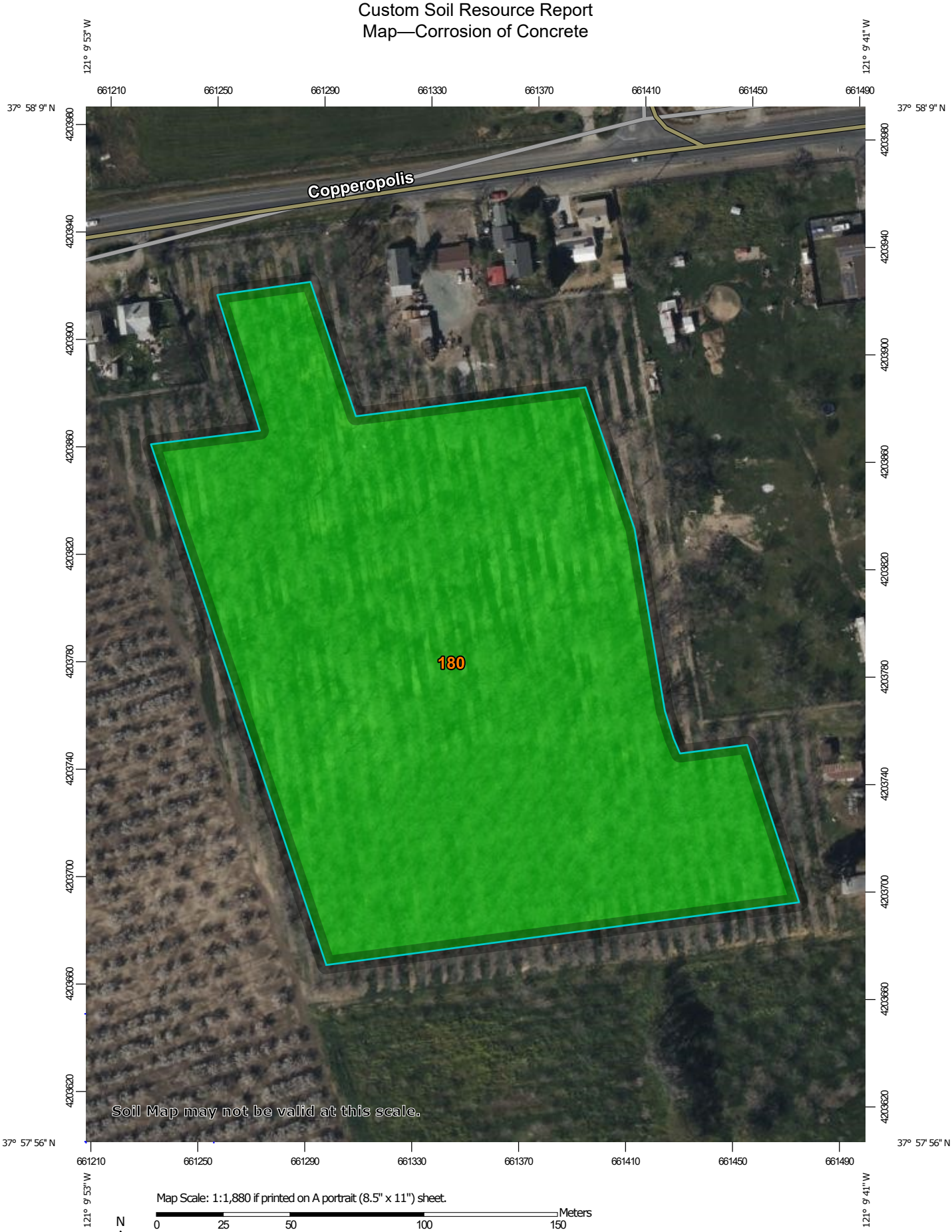
Engineering

AGR

Agronomy

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens concrete. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the concrete in installations that are entirely within one kind of soil or within one soil layer.

The risk of corrosion is expressed as "low," "moderate," or "high."



Map Scale: 1:1,880 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 25 50 100 150

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- High
- Moderate
- Low
- Not rated or not available

Soil Rating Lines
- High
- Moderate
- Low
- Not rated or not available

Soil Rating Points
- High
- Moderate
- Low
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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Table—Corrosion of Concrete

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
180	Jacktone clay, 0 to 2 percent slopes	Low	8.7	100.0%
Totals for Area of Interest			**8.7**	**100.0%**

Rating Options—Corrosion of Concrete

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Corrosion of Steel

ENG

Engineering

AGR

Agronomy

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel in installations that are entirely within one kind of soil or within one soil layer.

The risk of corrosion is expressed as "low," "moderate," or "high."



Map Scale: 1:1,880 if printed on A portrait (8.5" x 11") sheet.

N

0 25 50 100 150 Meters

0 50 100 200 300 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- High
- Moderate
- Low
- Not rated or not available

Soil Rating Lines
- High
- Moderate
- Low
- Not rated or not available

Soil Rating Points
- High
- Moderate
- Low
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Table—Corrosion of Steel

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
180	Jacktone clay, 0 to 2 percent slopes	High	8.7	100.0%
Totals for Area of Interest			**8.7**	**100.0%**

Rating Options—Corrosion of Steel

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Land Management

Land management interpretations are tools designed to guide the user in evaluating existing conditions in planning and predicting the soil response to various land management practices, for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture, and rangeland. Example interpretations include suitability for a variety of irrigation practices, log landings, haul roads and major skid trails, equipment operability, site preparation, suitability for hand and mechanical planting, potential erosion hazard associated with various practices, and ratings for fencing and waterline installation.

Erosion Hazard (Off-Road, Off-Trail)

The ratings in this interpretation indicate the hazard of soil loss from off-road and off-trail areas after disturbance activities that expose the soil surface. The ratings are based on slope, soil erosion factor K, and an index of rainfall erosivity (R). The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance.

The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," "severe," or "very severe." A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations

between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Erosion Hazard (Off-Road, Off-Trail)



Map Scale: 1:1,880 if printed on A portrait (8.5" x 11") sheet.

N

0 25 50 100 150 Meters

0 50 100 200 300 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Soil Rating Lines
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Soil Rating Points
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Tables—Erosion Hazard (Off-Road, Off-Trail)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
180	Jacktone clay, 0 to 2 percent slopes	Slight	Jacktone (85%)		8.7	100.0%
Totals for Area of Interest					**8.7**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Slight	8.7	100.0%
Totals for Area of Interest	**8.7**	**100.0%**

Rating Options—Erosion Hazard (Off-Road, Off-Trail)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Erosion Hazard (Road, Trail)

FOR - Forestry

The ratings in this interpretation indicate the hazard of soil loss from unsurfaced roads and trails. The ratings are based on soil erosion factor K, slope, and content of rock fragments.

The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," or "severe." A rating of "slight" indicates that little or no erosion is likely; "moderate" indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and "severe" indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is

shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Erosion Hazard (Road, Trail)



Map Scale: 1:1,880 if printed on A portrait (8.5" x 11") sheet.

N

0 25 50 100 150 Meters

0 50 100 200 300 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Soil Rating Lines
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Soil Rating Points
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Tables—Erosion Hazard (Road, Trail)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
180	Jacktone clay, 0 to 2 percent slopes	Erosion hazard slight	Jacktone (85%)		8.7	100.0%
Totals for Area of Interest					**8.7**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Erosion hazard slight	8.7	100.0%
Totals for Area of Interest	**8.7**	**100.0%**

Rating Options—Erosion Hazard (Road, Trail)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Depth to Bedrock

The term bedrock in soil survey refers to a continuous root and water restrictive layer of rock that occurs within the soil profile.

There are many types of restrictions that can occur within the soil profile but this theme only includes the three restrictions that use the term bedrock. These are:

1) Lithic Bedrock

2) Paralithic Bedrock

3) Densic Bedrock

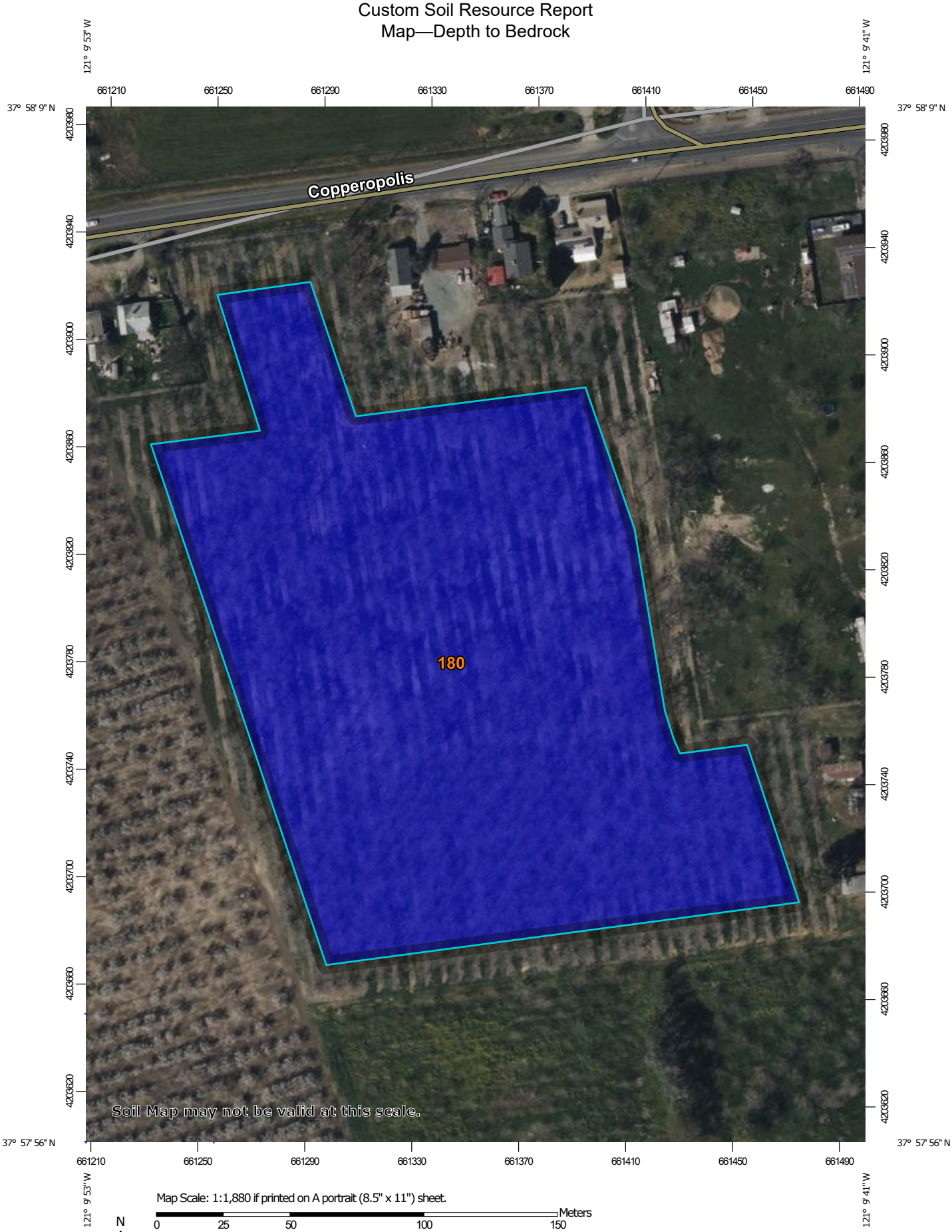
Lithic bedrock and paralithic bedrock are comprised of igneous, metamorphic, and sedimentary rocks, which are coherent and consolidated into rock through pressure, heat, cementation, or fusion. Lithic bedrock represents the hardest type of bedrock, with a hardness of strongly coherent to indurated. Paralithic bedrock has a hardness of extremely weakly coherent to moderately coherent. It can occur as a thin layer of weathered bedrock above harder lithic bedrock. Paralithic bedrock can also be much thicker, extending well below the soil profile.

Densic bedrock represents a unique kind of bedrock recognized within the soil survey. It is non-coherent and consolidated, dense root restrictive material, formed by pressure, heat, and dewatering of earth materials or sediments. Densic bedrock differs from densic materials, which formed under the compaction of glaciers, mudflows, and or human-caused compaction.

If more than one type of bedrock is described for an individual soil type, the depth to the shallowest one is given. If no bedrock is described in a map unit, it is represented by the "greater than 200" depth class.

Depth to bedrock is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Depth to Bedrock



Map Scale: 1:1,880 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Lines

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Points

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Survey Area Data: Version 19, Sep 9, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 9, 2022—Mar 11, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Depth to Bedrock

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
180	Jacktone clay, 0 to 2 percent slopes	>200	8.7	100.0%
Totals for Area of Interest			**8.7**	**100.0%**

Rating Options—Depth to Bedrock

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Appendix E

Noise Modeling Results

Appendix E1

Roadway Construction Noise Model (RCNM) Results

Construction Noise

Distance	Noise Level @ 50 ft	Single Family Res - 11510 Copper
		25
Site Preparation	78	84.021
Building Construction	94	100.021
Paving	73	79.021
Staging	76	82.021

Construction Vibration

Distance	Vibration @ 25 ft	SFR to north
		35
Vibratory Roller	0.21	0.127
Hoe Ram	0.089	0.054
Large Bulldozer	0.089	0.054
Loaded Trucks	0.076	0.046
Small Bulldozer	0.003	0.002
Distance	Vibration @ 25 ft	SFR to north
		55
Impact Pile Driver	1.518	0.465

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 06/29/2026
Case Description: Site Preparation

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site Preparation	Residential	65.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Front End Loader	No	40		79.1	50.0	0.0
Front End Loader	No	40		79.1	50.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	79.1	78.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 06/26/2026
Case Description: Building Construction

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Building Construction	Residential	65.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Impact Pile Driver	Yes	20		101.3	50.0	0.0
Man Lift	No	20		74.7	50.0	0.0
Backhoe	No	40		77.6	50.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Impact Pile Driver	101.3	94.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	74.7	67.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	101.3	94.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 06/26/2026
Case Description: Paving

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Paving	Residential	65.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Roller	No	20		80.0	50.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Roller	80.0	73.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	80.0	73.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 06/26/2026
Case Description: Staging

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Staging	Residential	65.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Pickup Truck	No	40		75.0	50.0	0.0
Pickup Truck	No	40		75.0	50.0	0.0
Pickup Truck	No	40		75.0	50.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Pickup Truck	75.0	71.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	75.0	71.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	75.0	71.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	75.0	75.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Appendix E2

Operational Equipment Specifications

CPS SCH Series Grid-Tied PV Inverter

SCH350KTL-DO/US-800

Installation and Operation Manual - Rev 2.2



CHINT POWER SYSTEMS AMERICA CO.

Revision 2.2 – June 2026

Environment	
Enclosure protection degree	NEMA 4X
Cooling method	Variable speed cooling fans
Operating temperature range[3]	-22°F to 140°F / -30°C to 60°C (derate from 113°F / 45°C)
Non-operating temperature range	-40°F to 158°F / -40°C to 70°C
Operating humidity	0-100%
Operating altitude	13123.4 ft / 4000 m
Audible noise	≤ 82 dBA @ 1 m and 77°F (25°C)
Display and Communication	
User interface and display	LED indicators, Bluetooth, and CPS Connect Pro app
Inverter communication	Modbus RS485 / PLC[3]
Modbus data mapping	CPS
Remote diagnostics / firmware upgrade functions	Standard / (with FlexOM gateway)
Mechanical	
Dimensions (H × W × D)	31.9 × 41.6 × 15.75 in (810 × 1057 × 400 mm)
Weight	315.3 lb (143 kg)
Mounting / installation angle	75-90 degrees from horizontal (vertical or angled)
AC termination	M12 lug type terminal block (wire range: 4/0 AWG – 750 kcmil AL/CU)
DC termination	Screw clamp terminal (wire range #14-#8 and #6-#4 AWG CU)[4]
Safety	
Certifications and standards	UL1741-SA/SB Ed. 3, CSA-C22.2 NO.107.1-16, IEEE 1547-2018, FCC Part 15, UL 1998, IEEE 2030.5
Selectable grid standard	IEEE 1547-2018, CA Rule 21, ISO-NE, HECO
Smart-grid features	Volt-RideThru, Freq-RideThru, Ramp-Rate, Specified-PF, Volt-VAR, Freq-Watt, Volt-Watt
Protection Functions	
Insulation resistance monitoring	Yes
Onboard fault oscillography	Yes
PV MPPT current monitoring	Yes
Residual current monitoring	Yes
Output short-circuit protection	Yes
Output overvoltage protection	Yes
Warranty	
Standard	5 years
Extended terms	10, 15, and 20 years

1) The output voltage and frequency ranges may differ according to the specific grid standard.

2) Consumption may be higher when PID or reactive power at night functions are enabled.

3) CPS AC-PLC Kit required for AC-PLC communication.

4) One threaded hole per MPPT for connecting #6-#4 AWG CU.