Appendix K

Cultural and Historic Resources

1. Non-Confidential Class III Cultural Resource Inventory, July 2018
2. Non-Confidential Addendum 2 to the Class III Cultural Resource Inventory for the Crimson Solar Project. APE modification, additional 15-acre survey at tie-in to Colorado River Substation, December 2018
3. Non-Confidential Assessment of Indirect Effects to Culturally Sensitive Locations for the RE Crimson Solar Project

K.1 Non-Confidential Class III Cultural Resource Inventory, July 2018

NON-CONFIDENTIAL

Class III Cultural Resource Inventory for the Crimson Solar Project, Riverside County, California

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MANAGEMENT SUMMARY

This report documents the results of a Class III cultural resource survey for the Crimson Solar Project (Project), a utility-scale photovoltaic solar energy generation and storage project in eastern Riverside County, California. Sonoran West Holdings, LLC, a wholly owned subsidiary of Recurrent Energy, LLC, proposes to build and operate the project, which is approximately 13 miles west of Blythe, just north of Mule Mountain and just south of Interstate 10, on public land administered by the Department of Interior, Bureau of Land Management (BLM).

The proposed Project area (i.e., the Permitting Boundary) is 2,489 acres, including a 2,465-acre solar field development area with approximately 1,859 acres of solar panels (array blocks) and 24 acres for linear facilities including access/perimeter roads. The Area of Potential Effects (APE) includes a slight buffer around the proposed project footprint and covers 3,089.75 acres. Applied EarthWorks, Inc. (Æ) completed a Class III cultural resource survey to satisfy BLM requirements under Section 106 of the National Historic Preservation Act and the Desert Renewable Energy Conservation Plan Programmatic Agreement. Æ conducted the survey under the terms of BLM Cultural Resources Use Permit CA-15-29 and Fieldwork Authorization #66.66 17-16.1 issued by the Palm Springs-South Coast Field Office.

This report summarizes the results of the Class I literature and records search and the Class III intensive field survey. The Class I inventory included an archaeological records and literature search at the Eastern Information Center of the California Historical Resources Information System; a review of existing publications, maps, and technical reports relevant to the Project; and consultation with the BLM regarding known cultural resources and potential Traditional Cultural Properties within the APE. Æ conducted the intensive field survey between July 24 and November 21, 2017. Æ cultural resource specialists, accompanied by tribal monitors, surveyed a 3,484.85-acre area encompassing the 3,089.75-acre APE and identified 350 archaeological and historical sites. Of these, 167 are archaeological sites (82 prehistoric, 58 historical, and 27 with both components), while 183 are isolated finds.

Using surface indicators and contextual information gathered from other studies in the region, Æ provided National Register of Historic Places (NRHP) eligibility recommendations for the cultural resources within the direct APE. Æ recommends that three of the 167 archaeological sites within the APE are significant and eligible for listing in the NRHP. Æ recommends subsurface testing at nine additional sites to evaluate their significance and integrity. Æ is currently preparing a formal Phase II testing and evaluation plan that will be presented in a separate document. The remaining 155 sites are considered ineligible for listing in the NRHP. Isolated artifacts by convention are not considered significant resources eligible for listing in the National Register due to their lack of context and association; thus, none of the isolated finds are recommended eligible for inclusion in the NRHP.

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INTRODUCTION

1.1 PROJECT OVERVIEW

Sonoran West Holdings, LLC, a wholly owned subsidiary of Recurrent Energy, LLC (RE), proposes to build and operate the RE Crimson Solar Project (Project), a utility-scale photovoltaic (PV) solar energy generation and storage project in eastern Riverside County, California (Figure 1-1). The Project would be approximately 13 miles west of Blythe, just north of Mule Mountain and just south of Interstate 10 (I-10), on federal land administered by the Department of Interior, Bureau of Land Management (BLM). It lies in the Chuckwalla Valley, in the Riverside East Solar Energy Zone (SEZ) and within the Desert Renewable Energy Conservation Plan (DRECP) Development Focus Area (DFA) as presented in the Final Environmental Impact Statement (EIS) and approved in the Record of Decision (ROD) and associated Land Use Plan Amendment (LUPA) in September 2016 (http://www.drecp.org/; BLM 2016). The Project site is also within the California Desert Conservation Area (CDCA) planning area.

The Project would generate up to 350 megawatts (MW) of renewable energy using PV technology, with up to 350 MW of integrated energy storage capacity. It would interconnect to the regional electrical grid at the Southern California Edison Company (SCE) 230-kilovolt (kV) Colorado River Substation (CRS). The total area for the Project (i.e., the Permitting Boundary) is 2,489 acres, including a 2,465-acre solar field development area with approximately 1,859 acres of solar panels (array blocks) and 24 acres for linear facilities including access/perimeter roads with a 30- to 60-foot-wide corridor and generation tie line (gen-tie) and powerline corridors at 150 foot intervals.

The Project site is surrounded primarily by BLM-managed lands and some private parcels. It sits at the northern foot of the Mule Mountain Area of Critical Environmental Concern (ACEC), which is an important cultural resource for local Native American Tribes. SCE's high-voltage transmission line and CRS are directly north of the Project site, and I-10 is north of and parallel to those facilities.

Access to the Project site would be provided via the existing paved Wiley's Well Road and Powerline Road that lead from I-10 south to the CRS. The Project's on-site roadway system would include a perimeter road, access roads, and internal roads. These roads would be surfaced with gravel, compacted dirt, or another commercially available surface and would accommodate the Project operations and maintenance (O&M) activities.

Several other solar energy projects have been proposed and some implemented in recent years in the Chuckwalla Valley/Palo Verde Valley region in eastern Riverside County (Figure 1-2). In 2012, BrightSource Energy, Inc. began the process of applying for a certification to construct the Sonoran West Solar Electric Generating Facility in the approximate footprint of the current

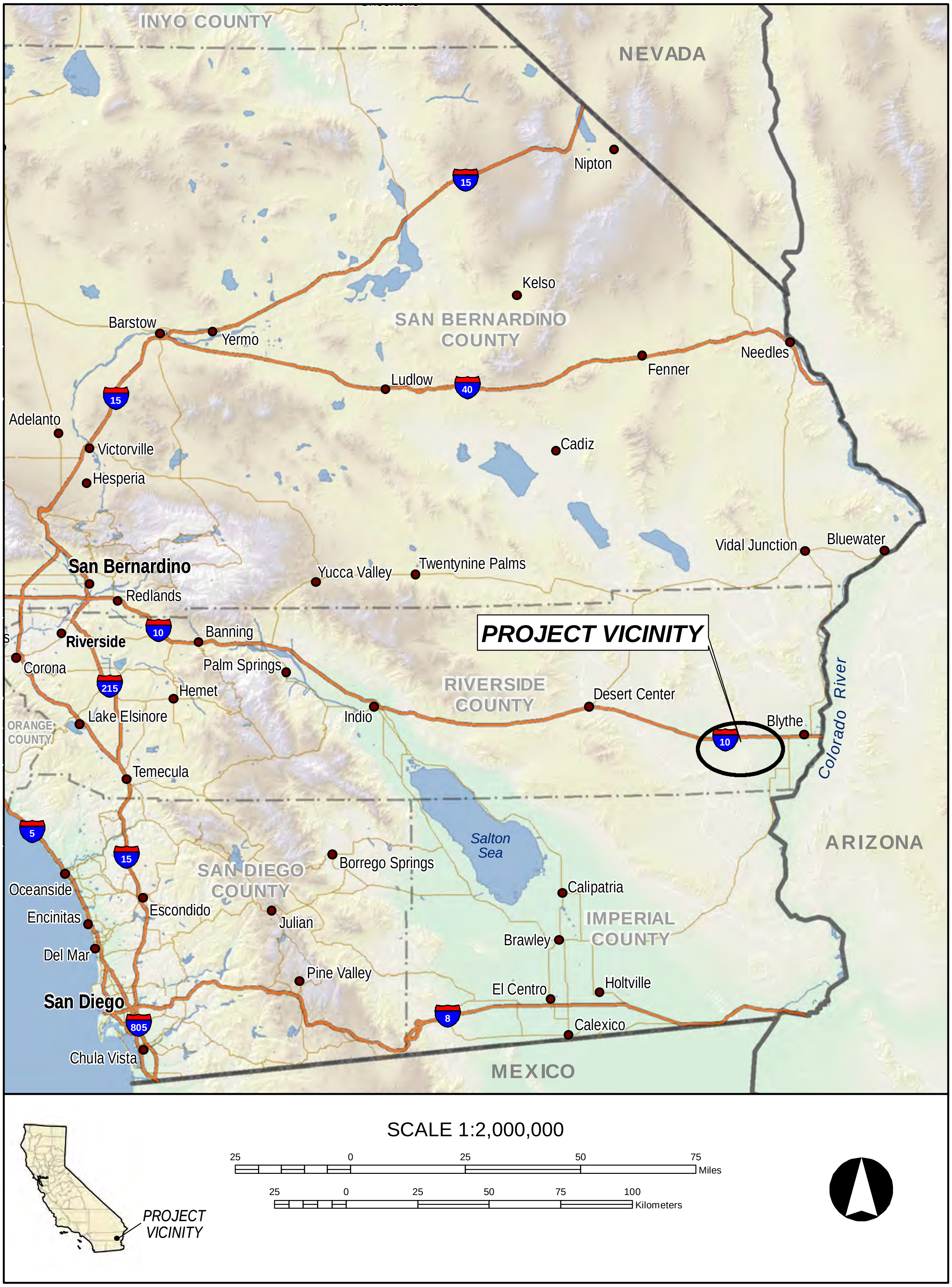


Figure 1-1 Project vicinity map.

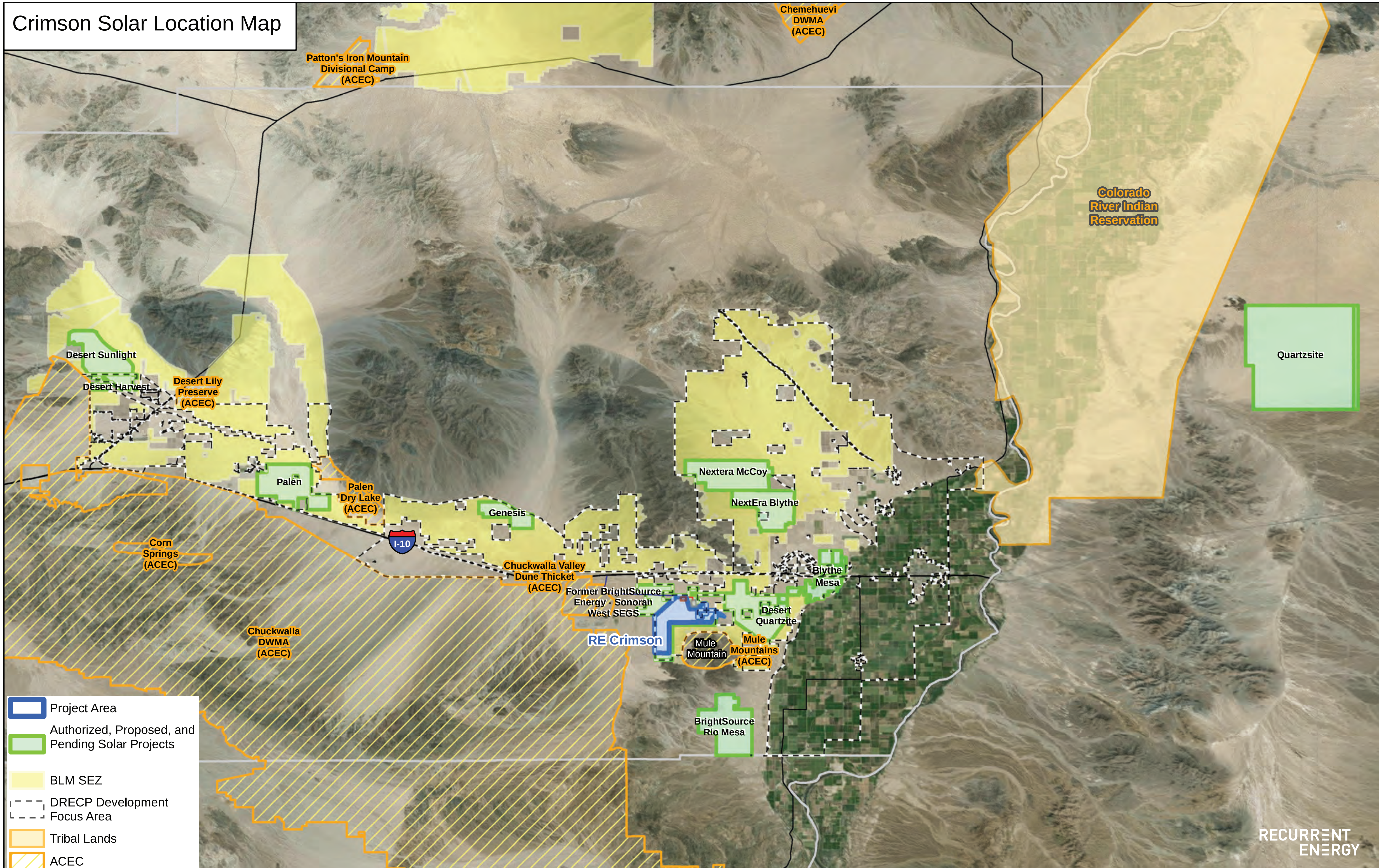


Figure 1-2 **Crimson Project area in relation to other solar energy projects (adapted from Recurrent Energy 2016).**

Crimson Project proposal. That effort was suspended the following year. Immediately east of the Crimson Project site is First Solar's proposed Desert Quartzite project. Northeast of the Desert Quartzite project is RRG Renewables' recently approved Blythe Mesa Solar Power Project. Farther north are NextEra's Blythe and McCoy project areas, while BrightSource's former Rio Mesa project lies to the south on the eastern flanks of the Mule Mountains. Farther west in the SEZ are the Genesis, Palen, Desert Harvest, and Desert Sunlight projects. These projects' environmental studies have provided important context for understanding the purpose, environmental and cultural setting, and archaeological and historical resources of the Crimson Project.

1.2 SCOPE AND PURPOSE OF INVESTIGATION

The purpose of the current study is to complete a Class III cultural resource inventory and evaluation of the Crimson Project Area of Potential Effects (APE) in satisfaction of BLM requirements under Section 106 of the National Historic Preservation Act (NHPA) and the DRECP Programmatic Agreement (PA). Applied EarthWorks, Inc. (Æ) completed a Class III survey of the APE, which includes a slight buffer around the proposed Project footprint and covers 3,089.75 acres, to verify and update records for known archaeological and historical sites and identify and record previously unknown resources. Æ conducted the survey under the terms of BLM Cultural Resources Use Permit CA-15-29 and Fieldwork Authorization #66.66 17-16.1 issued by the Palm Springs-South Coast Field Office. Prior to completion of the Class III survey, several other cultural resource documents were produced for the RE Crimson Solar Project to meet the stipulations of the DRECP PA. These include a Class I overview and literature review (Mirro and Clark 2016), a Work Plan and Research Design to guide further cultural resource investigations (Applied EarthWorks 2017a, 2017b), and an ethnographic and ethnohistoric literature review (Earle 2017).

As noted in Section 1.1, several other solar energy projects in the Chuckwalla Valley/Palo Verde Valley region of eastern Riverside County have provided background information used during cultural resource investigations for the Crimson Project. The various levels of cultural review performed for these other projects are described in the Class I overview for the RE Crimson Solar Project (Mirro and Clark 2016). These prior studies include Class I overviews (Contreras et al. 2013; Rawson 2011), Class II and Class III surveys (Akyüz 2012; Bagwell et al. 2012; Chambers Group and Applied EarthWorks 2012; Chandler et al. 2011; ECORP 2010; Farmer et al. 2009; Keller 2010; Lerch et al. 2016; Nixon 2013; Power Engineers 2013a, 2013b; SWCA 2011; Tennyson and Apple 2009; Tennyson et al. 2013; URS 2011), geoarchaeological assessments (Nials 2013), indirect effects assessments (Hanes 2018; Smallwood et al. 2012), and ethnographic literature reviews (AECOM 2013; Earle 2017; Gates 2012; Halmo 2003; URS 2012).

All resources identified during Æ's Class III intensive field survey were documented on State of California Department of Parks and Recreation cultural resource records (DPR-523 series) and were evaluated, based on surface indicators only, against the criteria of eligibility for listing on the National Register of Historic Places (NRHP). The resource evaluations presented herein take into account contextual information gathered by other studies conducted in the region. This report provides recommendations regarding site significance and eligibility for listing on the

NRHP. For some resources, surface indicators were not sufficient to assess site significance. In those cases additional subsurface investigations will be required.

This report satisfies the Class III inventory requirements of the Work Plan and will facilitate BLM's consultation with the California State Historic Preservation Officer (SHPO), Advisory Council on Historic Preservation (ACHP), and Native American tribes. It is also intended to assist the BLM and California Department of Fish and Wildlife (CDFW) in preparation of their respective National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) reviews and ensure timely public review of the associated Environmental Impact Statement and Environmental Impact Report (EIS/EIR). This report provides the information needed to prepare the cultural resource impacts analyses and relevant sections of the Draft EIS/EIR. The resource evaluations presented herein are, however, preliminary and subject to further site investigation and consultation with the BLM, CDFW, and the tribes which chose to participate in the federal and state consultation processes.

1.3 PROJECT LOCATION AND DESCRIPTION

The proposed Project covers portions of Sections 1, 2, 11, 12, 13, 24, and 25 within Township 7 South, Range 20 East, and portions of Sections 6, 7, 8, 17, and 18 within Township 7 South, Range 21 East, San Bernardino Baseline and Meridian (Figures 1-3 and 1-4). The Project site lies at the east edge of the Chuckwalla Valley on a broad alluvial fan that includes many braided washes and channels. These converge into a primary channel flowing into a playa lake northwest of the Project site. The Project is not sited within the adjacent Section 368 Federal Energy Corridor pursuant to the West-wide Energy Corridor Final Programmatic Environmental Impact Statement (PEIS), except for a short gen-tie line that would interconnect the Project to the CRS.

An estimated 2 million solar panels would be arranged on the site in the form of solar arrays. Steel piles (cylindrical pipes, H-beams, or similar structures) supporting the PV modules would be driven into the soil using pneumatic techniques, such as a hydraulic attachment on the boom of a backhoe tractor. The arrays are laid out primarily in 2-MW increments; each 2-MW increment would include an inverter-transformer station erected on a concrete pad or steel skid and would be centrally located within the PV module arrays. Each inverter-transformer station would contain up to four inverters, a transformer, a battery enclosure, and a switchboard. Underground cables would be installed to convey the direct current (DC) electricity from the panels to the inverters to convert the DC to alternating current (AC). Between 300 and 500 wooden poles would be installed across the entire site to convey energy to a central substation, which would transform voltage from 34.5 kV to 230 kV. Energy storage may be achieved by either a battery or flywheel system capable of storing up to 350 MW of electricity. The storage system would consist of banks of batteries or flywheels housed in indoor electrical enclosures within the Project energy storage facilities.

RE has prepared a Plan of Development (POD) as part of the SF299 application process for a right-of-way (ROW) grant from the BLM. The POD includes a traditional PV design, as well as consideration of several potential low environmental impact design (LEID) elements. The traditional PV design approach consists of desert tortoise exclusion fencing, a mow and roll approach to site preparation, compacted roads, and trenching for electrical lines; however, the

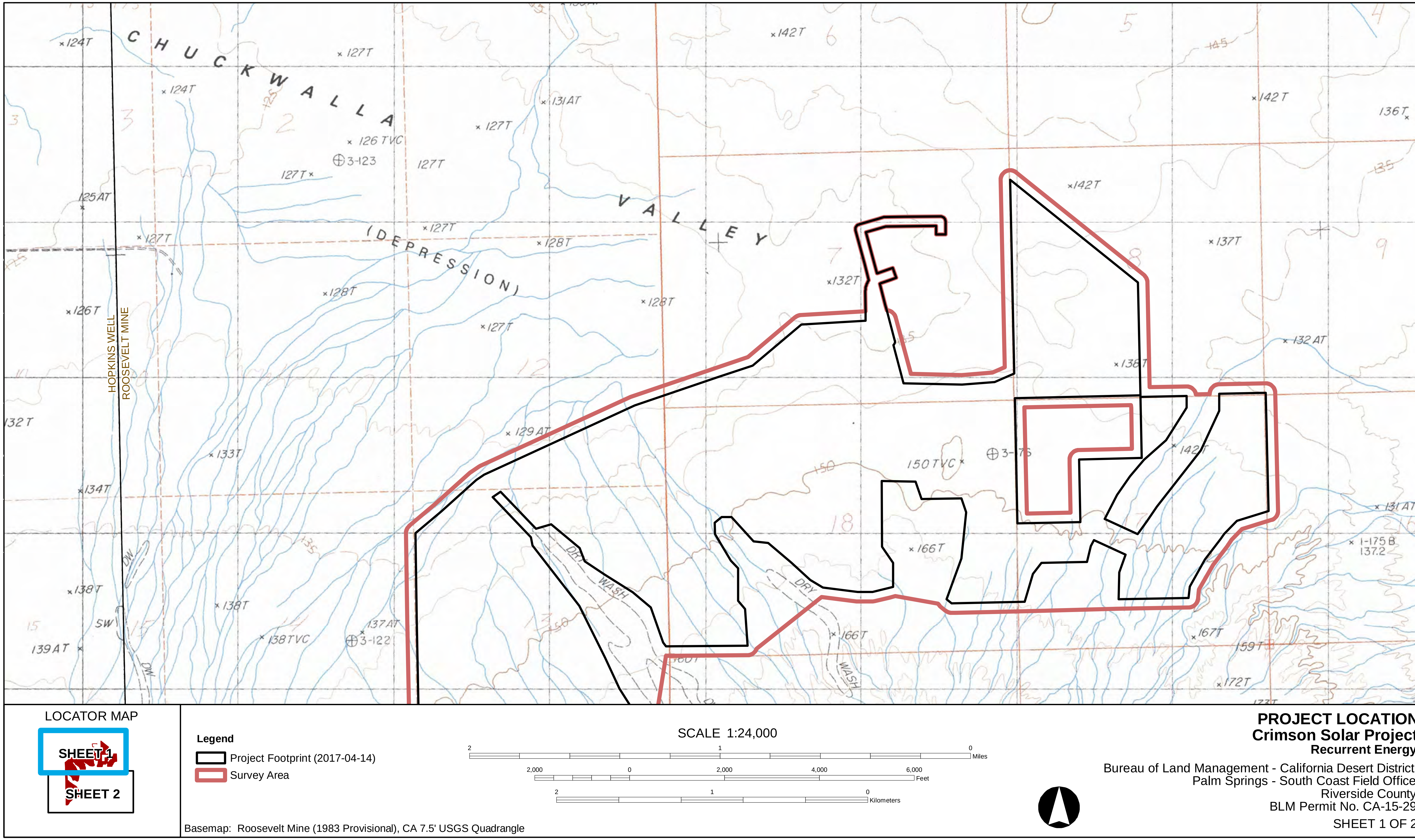
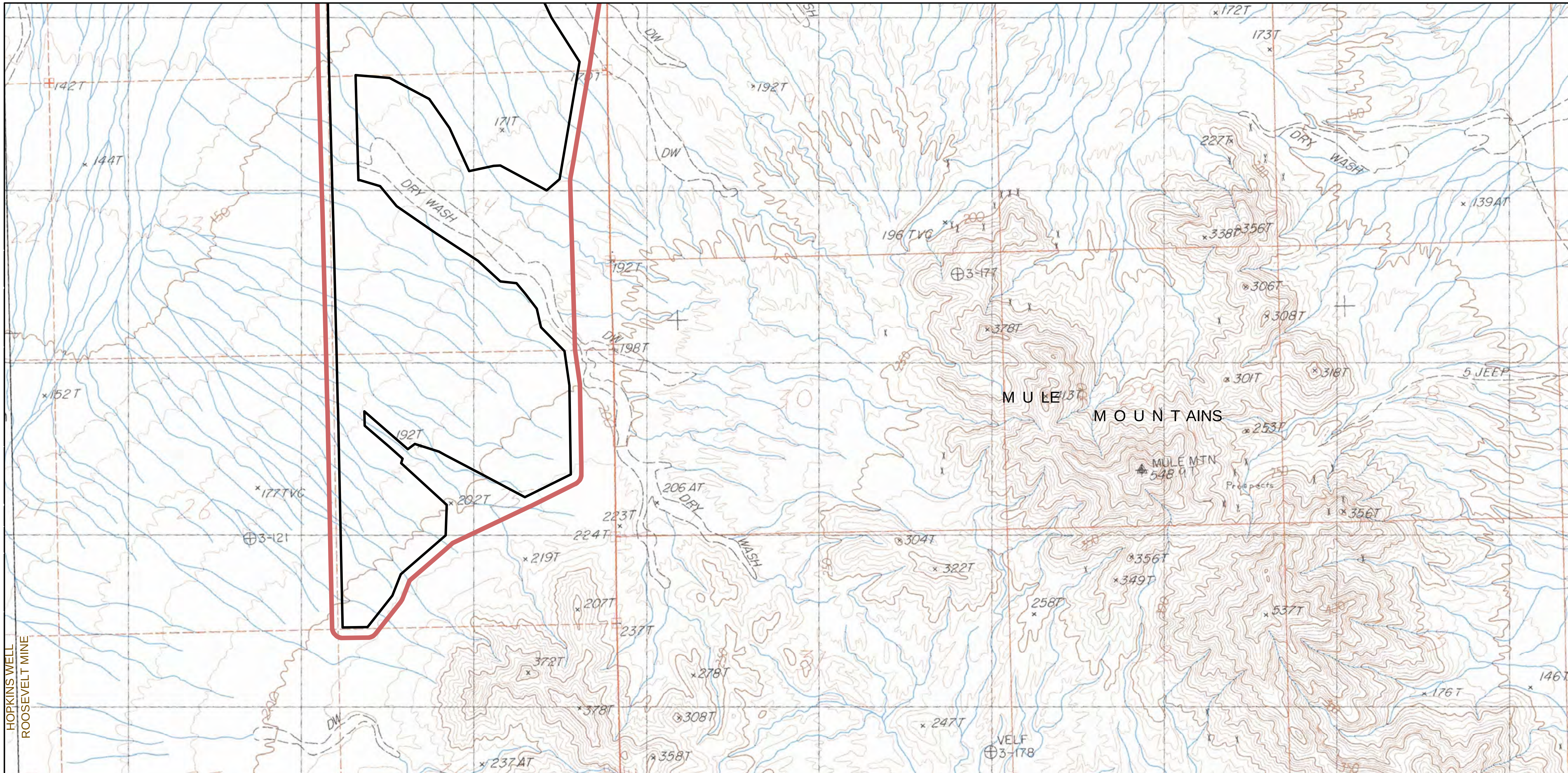


Figure 1-3 Project location on U.S. Geologic Survey Roosevelt Mine 7.5' topographic quadrangle (Sheet 1 of 2).



LOCATOR MAP

SHEET 1

SHEET 2

Legend

Project Footprint (2017-04-14)

Survey Area

SCALE 1:24,000

2 1 0 Miles

2,000 0 2,000 4,000 6,000 Feet

2 1 0 Kilometers

Basemap: Roosevelt Mine (1983 Provisional), CA 7.5' USGS Quadrangle

PROJECT LOCATION
Crimson Solar Project
Recurrent Energy

Bureau of Land Management - California Desert District
Palm Springs - South Coast Field Office
Riverside County
BLM Permit No. CA-15-29

SHEET 2 OF 2

Figure 1-4 Project location on U.S. Geologic Survey Roosevelt Mine 7.5' topographic quadrangle (Sheet 2 of 2).

applicant has also been actively investigating alternative LEID elements and the potential for those to reduce Project impacts. Potential LEID changes include:

- Using wildlife-friendly fencing during operations to allow desert tortoise, kit fox, and other wildlife access to the Project site.
- Minimizing grading during site preparation and maintaining more on-site vegetation to facilitate post-construction residual habitat value and post-operations/site reclamation success.
- Avoiding or limiting trenching by placing electrical wiring above ground.
- Placing transformer/inverter groups on elevated support structures in lieu of cement foundations.

The LEID elements would further minimize grading, trenching, and vegetation removal beyond traditional design approaches for PV projects with the objective of reducing overall long-term impacts for the Project. Although the incorporation of LEID elements could result in slight modifications to the panel block locations due to topographic constraints, the Permitting Boundary or limits of development would be the same with LEID elements incorporated and the construction and operation of the two design options would be similar.

1.4 REGULATORY CONTEXT

Numerous federal, state, and local laws, ordinances, regulations, and standards (LORS) govern the management of cultural resources, which are defined as buildings, structures, sites, objects, districts, areas, places, records, manuscripts, or similar properties which may hold important cultural values.

Federal LORS

<u>Antiquities Act of 1906, Title 54 U.S. Code (USC) Sections 320301-320303</u>. This act requires permits for the conduct of archaeological investigations and establishes criminal penalties for unauthorized destruction or appropriation of “any historic or prehistoric ruin or monument, or any object of antiquity” on federal land.

<u>National Historic Preservation Act of 1966, as amended (NHPA), 54 USC Section 300101 et seq</u>. The NHPA established federal policy to foster productive harmony between modern society and historic resources; provide preservation leadership; administer historic resources in a spirit of stewardship; and assist preservation efforts of state and local governments, Tribes, and the public. The NHPA established today’s historic preservation infrastructure, including the NRHP, SHPOs, Advisory Council on Historic Preservation (ACHP), and Section 106 review process. Section 106 requires the heads of federal agencies to take into account the effects of their undertakings on historic properties (resources included or eligible for inclusion in the NRHP). It also gives the ACHP and SHPO an opportunity to comment on the undertaking. Because the Crimson Project will require discretionary approval by the BLM and has the potential to affect historic properties, it is considered a federal undertaking per 36 Code of Federal Regulations (CFR) 800.16(y) and is thus subject to the requirements of Section 106.

<u>Archaeological Resources Protection Act of 1979 (ARPA), 16 USC Section 470aa–470mm</u>. ARPA provides protection of archaeological resources from vandalism and unauthorized

collecting on federal land. It requires permits for the excavation or removal of archaeological remains and substantially increased the penalties for violations. It also established curation standards. Cultural resources investigations for the Crimson Project have been carried out under the terms of an ARPA permit (CA-15-29) issued to Æ by the BLM.

Executive Order 11593 of May 13, 1971; 36 Federal Register (FR) 8921. This executive order focuses on the protection and enhancement of the cultural environment. It outlines responsibilities of the federal agencies and Secretary of the Interior with regard to cultural resources.

Executive Order 13175 of November 6, 2000: 36 FR Vol. 65, No. 218. This executive order requires federal agencies to establish protocols for consultation with federally recognized Native American tribes.

Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines, 48 FR 44716–42. The Secretary of the Interior established professional qualification standards for archaeological and historic preservation professionals, and provided guidelines for the conduct of archaeological and historical investigations, significance evaluations, and preparation of technical reports.

Federal Land Policy Management Act of 1976 (FLPMA), 43 USC Section 1701 et seq. FLPMA declares that it is the policy of the United States that public lands be managed so as to protect historical and archaeological resources, and that the Secretary of Interior shall establish rules and regulations regarding resource protection on public lands.

Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), 25 USC 3001–3013. NAGPRA provides for the protection of Native American graves, funerary objects, and "objects of cultural patrimony" on federal land, and establishes the procedures for determining ownership of Native American human remains, funerary objects, and other sacred objects under federal jurisdiction. Prior to construction of the current Project, the BLM will develop a NAGPRA Plan of Action outlining notification procedures and steps to be taken in the event of the inadvertent discovery of NAGPRA-related items.

American Indian Religious Freedom Act of 1996 (AIRFA), Title 2 USC Section 1996. This measure establishes a national policy to protect the right of Native Americans and other indigenous groups to practice their traditional religions. Federal agencies issuing permits for the Project will be required to comply with this act if Native Americans identify issues regarding their right to exercise traditional religious practices.

State LORS

The California Environmental Quality Act of 1970 (CEQA), Public Resources Code (PRC) Division 13, Section 21000 et seq. CEQA declares that "a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment." Historical resources not listed in the California Register of Historical Resources (CRHR) or other local lists may still be considered historical resources at the discretion of the lead agency on the project.

Under CEQA, the lead agency is responsible for determining whether a project may have a significant effect on historical and archaeological resources. Section 15064.5 of the CEQA Guidelines define “historical resources” as:

- Resource(s) listed or eligible for listing on the CRHR;
- resource(s) listed in either the NRHP or in a “local register of historical resources,” unless “the preponderance of evidence demonstrates that it is not historically or culturally significant;”
- resources identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the PRC; or
- any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, education, social, political, military, or cultural annals of California, provided the lead agency’s determination is supported by substantial evidence in light of the whole record.

PRC Section 21083.2 states that if the lead agency determines that the project may have a significant effect on “unique” archaeological resources, an environmental impact report shall address these resources. A unique archaeological resource is 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 one of the following criteria: (1) contains information needed to answer important 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 or best example of its type; or (3) is directly associated with a scientifically recognized important prehistoric or historic event or person.

When an initial study identifies the existence of, or the probable likelihood of, Native American human remains on non-federally owned lands, a CEQA lead agency shall work with the appropriate Native Americans as identified by the Native American Heritage Commission (NAHC). The applicant may develop an agreement for treating or disposing of, with appropriate dignity, the human remains and any items associated with Native American burials, with the appropriate Native Americans as identified by the NAHC (14 California Code of Regulations [CCR] Section 15064.5[d]).

CEQA Guidelines, CCR Title 14, Section 15126.4. This section states that where several measures are available to mitigate an impact, each should be discussed, and the basis for selecting a particular measure should be identified. Formulation of mitigation measures should not be deferred until some future time. Measures should specify performance standards that would mitigate the significant effect of a project, and that may be accomplished in more than one specified way. The preferred mitigation of impacts on archaeological sites is avoidance and preservation in place.

This section also states that treatment of historical resources in a manner consistent with Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings shall be considered mitigation to a level of less-than-significant impact.

PRC Section 5024.1. This section establishes the CRHR. A resource may be listed as a historical resource in the CRHR if it meets NRHP criteria or the following state criteria: (1) is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage; (2) is associated with the lives of persons important in our past; (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; or (4) has yielded, or may be likely to yield, information important in prehistory or history.

PRC Section 5097.98. This section discusses the procedures to be followed upon the discovery of Native American human remains. The NAHC, upon notification of the discovery of human remains by the County Coroner, is required to notify those persons it believes to be most likely descended from the deceased Native American. It enables the descendant to inspect the site of the discovery of the Native American human remains and to recommend to the land owner (or person responsible for the excavation) means of treating, with dignity, the human remains and any associated grave goods.

PRC Sections 5097.99 and 5097.991. These sections establish that it is a felony to obtain or possess Native American artifacts or human remains taken from a grave or cairn, and sets penalties for these actions. They also mandate that it is the policy of the state to repatriate Native American remains and associated grave goods.

Assembly Bill (AB) 2641. This section provides procedures for private landowners to follow upon discovering Native American human remains. Landowners are encouraged to consider culturally appropriate measures if they discover Native American human remains as set forth in California PRC 5097.98. AB 2641 further clarifies how the landowner should protect the site both immediately after discovery and into the future.

AB 52. This section requires that CEQA lead agencies consult with Native American tribes traditionally and culturally affiliated with the geographic area in which a project is proposed if the tribes request consultation. Consultation under AB 52 only applies to projects that file a notice of preparation of an EIR or notice of negative declaration or mitigated negative declaration after July 1, 2015.

Health and Safety Code Section 7050.5. This code establishes that any person who knowingly mutilates, disinters, wantonly disturbs, or willfully removes any human remains in or from any location without authority of the law is guilty of a misdemeanor. It further defines procedures for the discovery and treatment of Native American remains.

Health and Safety Code Sections 8010–8011. This code is intended to provide consistent state policy to ensure that all California Native American human remains and cultural materials are treated with dignity and respect. The code extends policy coverage to non-federally recognized tribes, as well as federally recognized groups.

Local LORS

Riverside County General Plan, Chapter 5 (Multipurpose Open Space Element), Open Space Policies 19.1–19.5. This portion of the General Plan outlines policies intended to promote the preservation of cultural resources (both prehistoric and historic) in Riverside County. Policies within this chapter discuss Native American consultation through a Cultural Resources Program, the need for a review of proposed development for compliance with the Cultural Resources Program, prioritize the preservation of resources in place (when feasible), and respect and sensitivity for human remains from prehistoric and historic time periods.

The Cultural Resources Program would include: "application of the Cultural Resources Program to projects subject to environmental review; government-to-government consultation; application processing requirements; information database(s); confidentiality of site locations; content and review of technical studies; professional consultant qualifications and requirements; site monitoring; examples of preservation and mitigation techniques and methods; curation and the descendant community consultation requirements of local, state and federal law" (Riverside General Plan 2015).

1.5 AREA OF POTENTIAL EFFECTS

As defined at 36 CFR 800.16(d), the 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, if any such properties exist." The BLM has defined the APE for the current undertaking based on the submitted Project design, an assessment of the local terrain characteristics, factors considered in establishing an APE for previously proposed solar energy projects nearby, and information provided by Native American groups. In a letter dated July 28, 2016, the BLM formally defined the APE to assess both direct and indirect cultural resource impacts. The APE for direct effects (Project APE), as originally proposed, encompassed 3,255.7 acres and included the original footprint of the PV solar facility along with a 200-foot-wide buffer. In addition, it included a 3,980-foot-long gen-tie and a 1,285-foot-long access road, both of which are centered on a 200-foot-wide ROW corridor. Since July 2016, the Applicant has reduced the Project footprint, thereby reducing the Project APE to 2,881 acres. An updated letter was sent to the California SHPO in February 2017 to reflect the updated Project APE and acreage. The Project APE may be refined further in coordination with the applicable agencies as permitting and development proceed.

The APE for indirect effects (indirect APE) is dictated largely by the low-profile nature of the facility design and the local terrain features surrounding the Project site. The maximum height of the solar panels will be 12 feet with the maximum height of the gen-tie and substation dead-end towers up to 150 feet. The indirect APE extends as much as 5 miles to the west, north, and northeast from the Project footprint. Mountainous terrain to the south limits the extent of the indirect APE, but it includes the entirety of the area between the Project APE and boundary of the Mule Mountains ACEC. The direct and indirect APE are shown in Figures 1-5 and 1-6. In a letter dated September 14, 2016, the SHPO, pursuant to 36 CFR § 800.4(a)(1), found the APE to be appropriate and sufficient for this undertaking. The updated APE, as reflected by the February 2017 letter to the SHPO, did not significantly alter the APE for indirect effects.

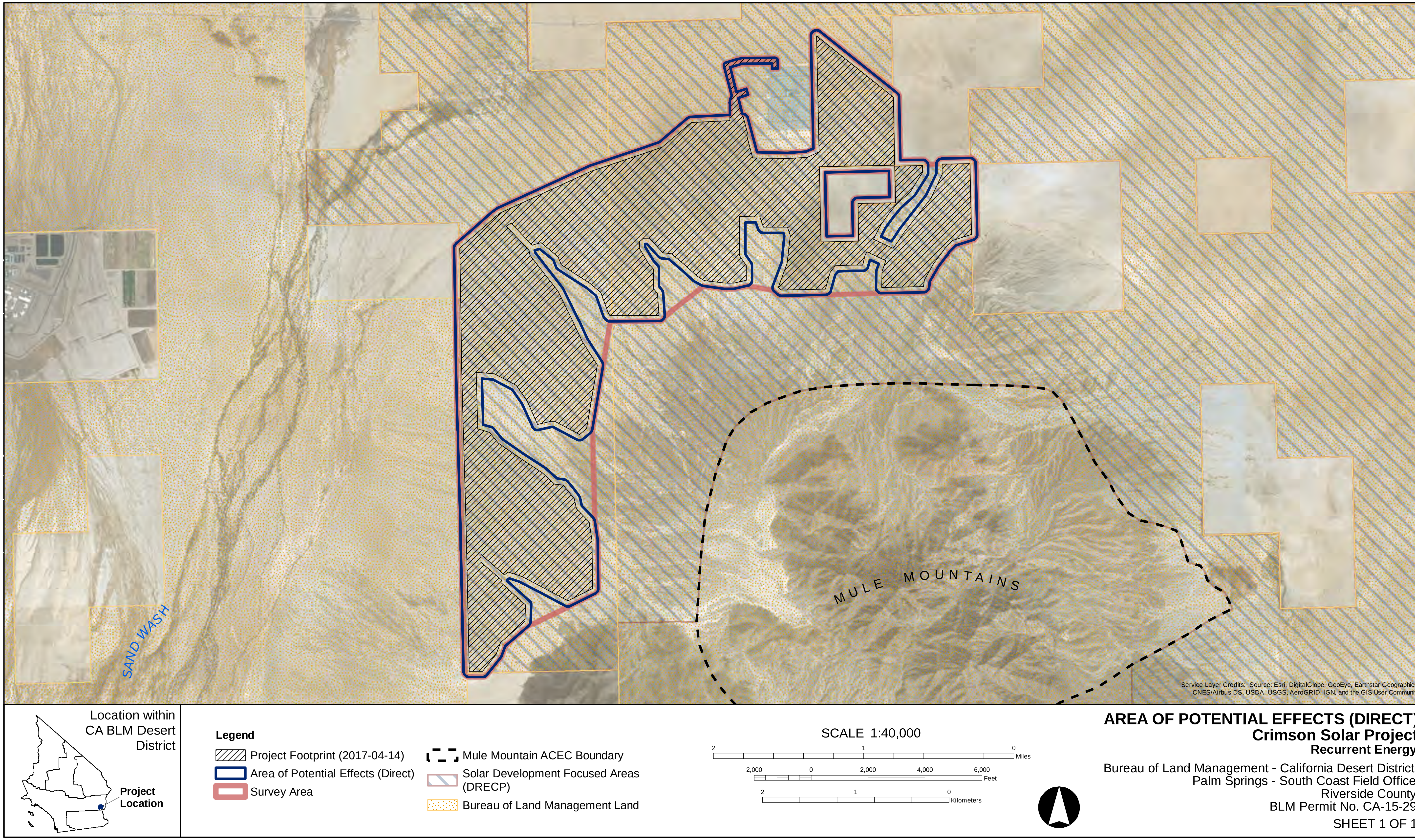


Figure 1-5 Crimson Solar Project direct APE.

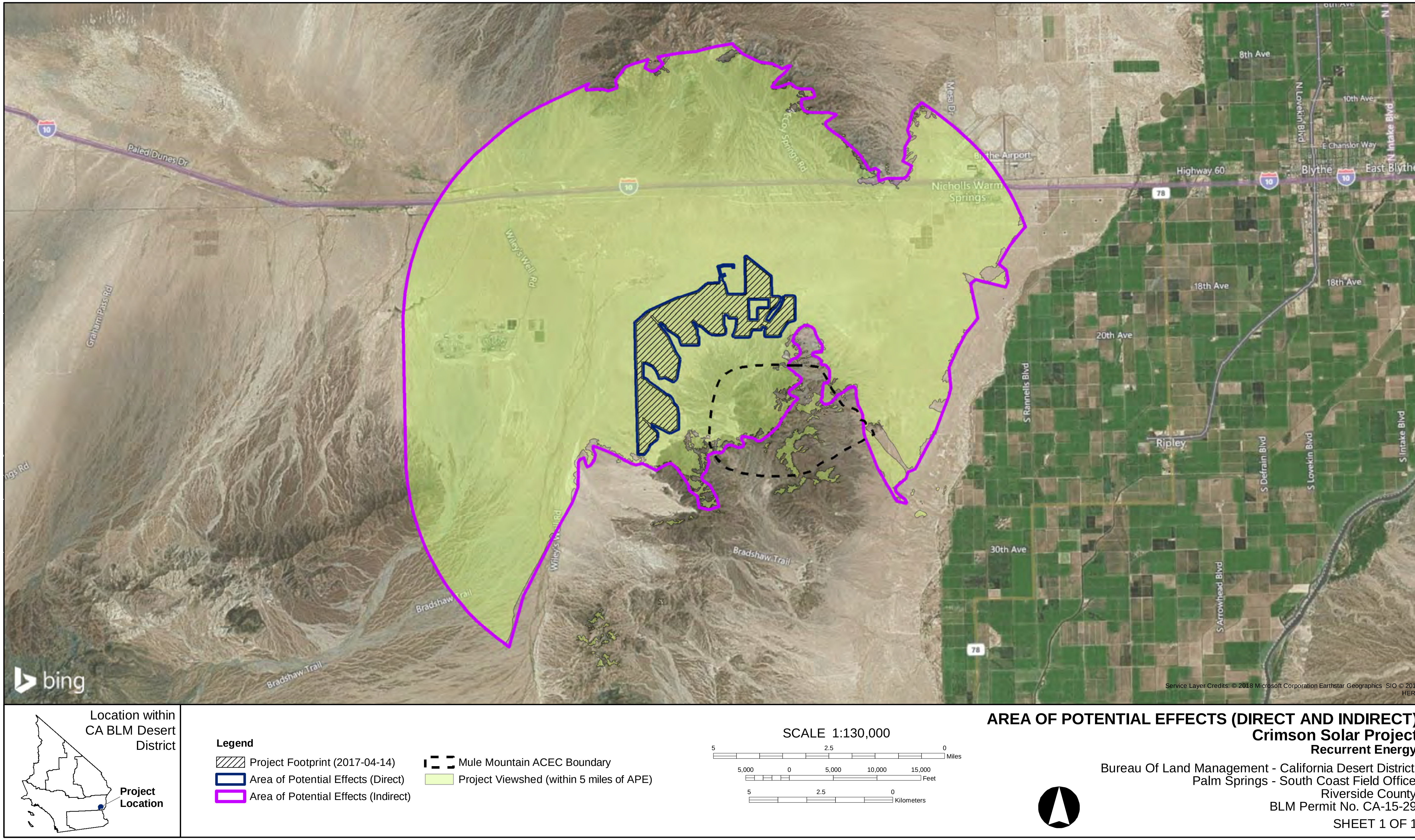


Figure 1-6 Crimson Solar Project indirect APE.

1.6 REPORT ORGANIZATION

This report documents the results of the Class III cultural resource inventory for the proposed RE Crimson Solar Project. This introductory chapter has introduced and described the Project and its location, explained the scope and purpose of the cultural resource investigation, outlined the regulatory context, and defined the direct and indirect APE. Chapter 2 describes the natural and cultural setting of the Project area and surrounding region, provides prehistoric, historic, and ethnographic contexts, and details local archaeological and historical site types and research themes. Chapter 3 presents the results of the cultural resource literature and records search conducted at the Eastern Information Center of the California Historical Resource Information System, housed at the University of California, Riverside. Methods employed during the field survey and resource evaluations are outlined in Chapter 4. The inventory results are contained in Chapter 5, while Chapter 6 offers management recommendations. Bibliographic references are cited in Chapter 7. Résumés of Project personnel, an archaeological and historical site atlas, as well as cultural resource records for sites and isolates newly discovered and revisited and updated during the survey are provided in Appendices A–D. Documents associated with Native American consultation are provided in Appendix E. A comprehensive summary of all the previously recorded and newly identified cultural resource sites and isolates within the APE is provided in Appendix F.

2
NATURAL AND CULTURAL CONTEXT

2.1 ENVIRONMENTAL SETTING

2.1.1 Physiography and Geology

The Project area is bordered by the Mule Mountains to the southwest, the Palo Verde Valley to the southeast, McCoy Wash and the foothills of the McCoy Mountains to the north and northeast, and the eastern extent of the Chuckwalla Valley to the west.

The area is entirely within the northeastern extreme of the Colorado Desert Province, which is a subdivision of the larger Sonoran Desert (Figure 2-1). Most of the land surface in this low-lying desert basin is comprised of Quaternary alluvial deposits, either derived from the local mountain ranges or transported into the area by the Colorado River, which is approximately 15 miles east of the Project area (Stone 2006).

Figure 2-1 Overview of the Project Area, with Mule Mountains in the background.

The physiography of the region features weathered mountain ranges, isolated knolls and ridges, steep topography leading to broad alluvial plains and fans, dry lake beds and stabilized and active sand dunes (DeCarlo et al. 2010; Enright and Mirro 2011; McCarthy 1982; McDougall et al. 2006, 2016; Tennyson 2017). Volcanic, igneous, and metamorphic bedrock of basalt, granite, rhyolite, andesite, quartz, quartzite, schist, and gneiss provide the primary sources of the secondary cobble deposits found on the alluvial fans and desert pavement surfaces on portions of the valley floor. These fan deposits and pavement surfaces, within which the APE is specifically situated, also contain cryptocrystalline lithic materials suitable for the manufacture of flaked stone tools (Enright and Mirro 2011; Jennings 1967; McDougall et al. 2006, 2016; Tennyson 2017).

Alluvial deposits in the central portion of the Chuckwalla Valley are primarily of Holocene age, while those adjacent to the mountain ranges are Pleistocene age. The Pleistocene deposits form smooth, varnished pavements, whereas the Holocene deposits form rougher surfaces that preserve relict depositional bars and channels (Stone 2006). The youngest locally derived alluvium develops from the modern washes, which are commonly incised many meters into the older alluvial fans (Stone 2006). Several older Quaternary units, composed largely or entirely of alluvium deposited by the Colorado River when it flowed across the area at much higher elevations, are present on the Palo Verde Mesa in the vicinity of the Mule Mountains and along the Colorado River floodplain. Various episodes of sediment deposition during earlier Holocene times are also evident along the modern floodplain of the Colorado River. Other Holocene deposits in the area include windblown sands and lacustrine deposits.

2.1.2 McCoy and Mule Mountains

The McCoy and Mule mountains exhibit typical basin and range topography, characterized by narrow faulted mountain chains separated by subsiding flat alluvial basins (Peterson 1980). The pattern continues north into the Mojave Desert Province, consisting of structurally complex rocks ranging in age from Proterozoic to Miocene. Proterozoic gneiss and granite are overlain by Paleozoic to Early Jurassic metasedimentary rocks (mostly marble, quartzite, and schist). These rocks are overlain by metamorphosed Jurassic volcanic rocks and are intruded by Jurassic plutonic rocks that represent part of a regionally extensive northwest-trending magmatic arc. The overlying McCoy Mountains Formation, a thick sequence of weakly metamorphosed sandstone and conglomerate of Jurassic and Cretaceous age, accumulated in a rapidly subsiding depositional basin south of an east-trending belt of deformation and east of the north-trending Cretaceous Cordilleran magmatic arc. The McCoy Mountains Formation and older rocks were deformed, metamorphosed, and locally intruded by plutonic rocks in the Late Cretaceous. A small outcrop of the Bouse Formation occurs along the northern front of the Mule Mountains as remnant terraces elevated above the Mule Mountains alluvial fan piedmont (Metzger 1968; Stone 1990).

2.1.3 McCoy Wash

McCoy Wash is situated in a valley southwest of the Big Maria Mountains, southeast of the Little Maria Mountains and northeast of the McCoy Mountains (Jennings 1967; Stone 2006). The surrounding mountains reach as much as 3,000 feet above the valley floor, and approximately 3,350 feet above mean sea level (amsl) (Metzger et al. 1973). McCoy Wash Quaternary Alluvium consists of unconsolidated angular to subangular gravelly sands derived from the surrounding higher elevations. These sediments are coarser grained toward the flanks of the surrounding mountains and become more fine-grained, grading toward distal alluvial sand and gravel (Stone 2006).

2.1.4 Palo Verde Valley

The Palo Verde Valley is a lush, flat valley floor created by the continuous flooding of the Colorado River between the Palo Verde Mesa to the west, the Big Maria Mountains to the north, and the Dome Rock Mountains to the east (Blythe Chamber of Commerce 2016). The area is dominated by the north-trending depression known as the Colorado River Trough, formed by flooding of the Colorado River, regional faulting, down warping, and sediment filling. Quaternary alluvium composed of recent floodplain sand, silt, and clay deposited primarily by the Colorado River underlie the area. Geologic structures in the region include pre-Tertiary volcanic and sedimentary bedrock, an area of unconformity, and middle Miocene Fanglomerate overlain by the basal limestone, interbedded clays, silts, sands, and tufa of the Bouse Formation (Blythe Chamber of Commerce 2016).

Flooding has left alluvial soil rich in nutrients and accessible to a supply of water for irrigation. The relatively slight changes in elevation and natural conditions between mesa and valley account for considerably distinct environmental and development characteristics. The alluvial deposits range in age from Pliocene to Holocene, vary in thickness from 160 to 600 feet, and are primarily composed of sand, silt, and clay with gravel lenses.

2.1.5 Chuckwalla Valley

Chuckwalla Valley is a broad, enclosed tectonic basin or bolson, an alluvium-filled internally drained structural depression with outlets blocked by alluvial divides (Peterson 1980). The valley contains low, unstable sand dunes, areas of sheetwash interspersed with broad washes and small playas, and hard Holocene lag surfaces combined with argillic horizons and cemented Pleistocene non-marine deposits (DeCarlo et al. 2010; McCarthy 1982). These deposits create exposed Pleistocene terraces that contain tool stone-quality cobbles. Sediments, where present, consist of modern dune sands with little to no soil development. The valley is filled with 1,200–3,000 feet of Pliocene to Quaternary-age deposits divided into the Pliocene-aged Bouse Formation, Pleistocene-aged Pinto Formation, and Pleistocene and Quaternary-aged alluvium (Department of Water Resources 2003).

2.1.6 Palo Verde Mesa

The APE is west of the Palo Verde Mesa, a relict Pleistocene basin rising some 75 feet above the Palo Verde Valley plain, and typically characterized by a very thick deposit of stratified clays, silts, and sands intermixed with minor gravels. Elevations along the Mesa vary from approximately 335 feet amsl in the center to over 400 feet amsl near the Mule Mountains. Fluvial erosion and deposition are the main geomorphic processes in the area. The Palo Verde Basin, encompassing the Palo Verde Mesa and Palo Verde Valley to the east, consists of a structural basin filled with alluvium that ranges in depth from a few feet at the margins (near the mountains) to more than 1,500 feet (Department of Water Resources 1978; Metzger et al. 1973).

Alluvial deposits within the basin are the result of episodic erosion and deposition along the Colorado River floodplain, as well as outwash of debris from adjacent bedrock. The Palo Verde Valley contains younger alluvium, while older alluvium crops out along the Palo Verde Mesa.

Surface deposits consist of tan to light gray, coarse sands and gravels overlying light reddish-brown, fine clays and silts.

Desert pavement, a surface formation comprising the coarse fraction of underlying alluvium, varies from poor- to moderately-developed throughout the Project area. These formations contain a range of siliceous cobbles, including tool stone-quality cherts, chalcedonies and quartzites. In addition to desert pavements, the surface morphology of the Project area is interspersed with braided drainages, sand dunes and hummocks, and minor bar and swale morphology in younger fan units dissected by gullies. Several prominent washes emerge from the Mule Mountains, actively depositing sediment in the Chuckwalla and Palo Verde Valleys (Department of Water Resources 1978; Metzger et al. 1973; Ritter et al. 2006).

2.1.7 Climate and Hydrology

Conditions within the Colorado Desert are among the hottest in the United States. Average daily temperatures typically range from 40 degrees Fahrenheit in the winter to 105 degrees Fahrenheit in the summer, although summer temperatures can exceed 120 degrees Fahrenheit. A high of 127 degrees Fahrenheit was recorded at the Gold Rock Ranch station approximately 15 miles northwest of Yuma, Arizona. This region also experiences rapid heat loss at night, resulting in a daily temperature variance of as much as 30 degrees Fahrenheit. Annual rainfall within the Colorado Desert is among the lowest in the Sonoran Desert, averaging less than 2 inches per year in the Salton Trough and between 2 and 4 inches along the Colorado River (Crosswhite and Crosswhite 1982), although recent summer monsoons have been known to produce more than twice the average yearly precipitation in a single event.

The perennial water sources nearest the APE are the Colorado River, approximately 11 miles to the east, and the Salton Sea, approximately 54 miles to the southwest. Native fish in the main channel of the Colorado River are limited, consisting primarily of Colorado pikeminnow, razorback sucker, and bonytail chub. Woundfin and flannelmouth sucker, although rare, are also native to the stretch of river below Boulder Dam. Nonnative species now found in the river include largemouth and smallmouth bass, striped bass, lesser sunfishes, cichlids, mosquitofish, and flathead catfish (Minckley and Brown 1994). Fish within the Salton Sea include native razorback sucker and bonytail chub as well as several species of sport fish. The desert pupfish, now an endangered species, is also found in the Salton Sea.

2.1.8 Flora and Fauna

Vegetation communities of the Colorado Desert include creosote bush scrub, alkali sink, desert dry wash, mixed scrub, desert saltbush, sandy soil grasslands, and desert dunes. The vegetation community of the APE is sparse creosote bush scrub, and the dominant vegetation on the sandy flats and slopes as well as the desert pavement terraces is creosote bush, white bursage, brittlebush, and saltbush. The seasonal washes consist of blue palo verde, ironwood, catclaw acacia, smoke tree, mesquite, and the invasive tamarisk. Sand dune vegetation includes buckwheat, croton, big galleta, desert lily, annuals, and forbs.

Regional fauna includes bighorn sheep, mule deer, white-tailed deer, collared peccary, coyote, raccoon, desert cottontail, black-tailed jackrabbit, and a variety of burrowing mammals such as round-tailed ground squirrel, white-tailed antelope squirrel, kangaroo rat, and desert pocket mouse. Reptiles include fringe-toed lizard, collared lizard, flat-tailed horned lizard desert tortoise, chuckwalla, and desert iguana. Snakes in the region include banded sand snake, sidewinder, rosy boa, and western diamondback. Birds include thrasher, dove, prairie falcon, red-tailed hawk, Gambel's quail, and greater roadrunner.

2.2 PREHISTORIC CONTEXT

The area in and around the APE is near the boundary between the floristically and climatically distinct Colorado and Mojave deserts. Together with its position along a known prehistoric and historic travel corridor, and its proximity to the tenaja at the Mule Tank site, suggests that the APE may have been used at various times by groups whose home ranges included portions of the Mojave Desert, the interior Colorado Desert, and the Colorado River, as well as possibly by travelers from more distant locales such as the Peninsular Ranges or the Southwest. It is possible, therefore, that the area's archaeological record may also reflect affinities with any of these regions. In view of these various influences, the prehistoric context presented here draws on current knowledge from both the Mojave and Colorado Desert regions.

2.2.1 Paleoindian Period

While a variety of claims have been made for an "early man" presence in the California deserts, these are considered speculative (Schaefer 1996; Sutton et al. 2007) and the earliest conventionally accepted human occupation of the region continues to be represented by the distinctive fluted point of the Clovis culture. Thought to date between about 13,200 and 12,700 calibrated years (cal) before present (B.P.), fluted points are most common along the shorelines of Pleistocene lakes in the northern Mojave Desert and San Joaquin Valley (Byerly and Robinson 2015; Dillon 2002; Rondeau 2009; Rondeau et al. 2007) and likely reflect an early focus on lacustrine settings and the resources (including large game) associated with them. Isolated specimens also have been found throughout California, including one at Pinto Basin about 75 miles (120 kilometers) northwest of the APE (Campbell and Campbell 1935) and one fragment near McCoy Spring in the northern Chuckwalla Valley (Rondeau 2012). These latter specimens suggest a sparse and highly mobile Pleistocene population in the southern Mojave and northern Colorado deserts.

While Clovis appears to represent an adaptation to full Pleistocene conditions, the transition to the Holocene was marked by adjustments to the rapidly changing environments in the California deserts. Pluvial lakes, for example, were rapidly retreating, as indicated by the final desiccation of Lake Mojave by around 8700 B.P. (Wells et al. 2003), and desert plant communities began to assume their modern form. Sutton et al. (2007) suggest that human land-use strategies at this time may have been geared to monitor and exploit a wide variety of productive resource patches emerging at this time; these patches would certainly have included the remaining lakes and marshes, but also streamside and upland settings as well.

The cultural complexes representing this interval (circa 10,000–8000 B.P.) include San Dieguito in the Colorado Desert and the related Lake Mojave in the Mojave Desert. Both of these are characterized by stemmed projectile points (Lake Mojave and Silver Lake), crescentics, abundant bifaces, a variety of well-made scrapers, and other flake tools. Milling equipment is uncommon and tends to reflect only light use, which has led to the assumption that plant foods were less important than in later periods (Sutton et al. 2007). Until recently few Early Holocene sites had been located in the Colorado Desert (Schaefer and Laylander 2007). With the advent of larger block surveys for renewable energy projects, however, more resources from this period are coming to light (AECOM 2016; Farmer et al. 2012). Considering the robust early Holocene record of the Mojave Desert, where Lake Mojave artifacts are found in a wide variety of settings (Grayson 2011), it is likely that the Late Paleoindian occupation of the region is more robust than previously thought.

2.2.2 Archaic Period

The Archaic Period (circa 7000–1500 B.P.) encompasses the interval between the relatively cool/wet conditions of the early Holocene and the appearance of the assemblages that are characteristic of the Late Prehistoric. This period saw the emergence of several distinctive regional complexes and appears to reflect cultural adaptation to the middle and late Holocene desert environment (Warren 1984). Regional populations were generally expanding, leading to a diversification and intensification of subsistence strategies as well as establishment of regional trade networks. Ground stone tools, rare or absent during Paleoindian times, became both widespread and abundant in the desert, reflecting increasing reliance on seeds and other plant resources. As with Paleoindian sites, few Archaic sites had been identified in the Colorado Desert prior to the advent of utility-scale solar energy projects (Schaefer 1996; Schaefer and Laylander 2007). Investigations over the past 10 years have revealed more substantial Archaic land use, as evidenced by Pinto points, heavily repatinated basalt tools, and rock art without associated ceramics (AECOM 2016; Kline p.c. 2018).

In the southern California deserts, the best known regional cultural complexes of the Archaic are Pinto, Elko, and Amargosa, each defined by recognizably distinct projectile point types. The earlier complexes, Pinto and Amargosa I in the Mojave Desert, are both marked by Pinto Series projectile points, named for sites in the Pinto Basin northwest of the APE. Ford Dry Lake, at the lower end of the Pinto Basin watershed, evinces very similar assemblages (Kline p.c. 2018). Warren (1991) argues for general continuity between the Lake Mojave and Pinto complexes, suggesting that Pinto groups initially focused on hunting but adapted to increasingly arid middle Holocene conditions by broadening diets and decreasing their reliance on artiodactyls. Indeed, recent data from Pinto components in the Mojave Desert suggest some technological parallels, but with some apparent reduction in mobility ranges (Sutton et al. 2007). The major innovation at this time seems to be a widespread increase in the use of ground stone implements, which at some locations are better represented in Pinto components than perhaps at any other time during the Holocene (Grayson 2011; Sutton et al. 2007).

Recent research cited by Sutton et al. (2007) suggests that the Pinto Complex may have actually appeared during the early Holocene, partially concurrent with Lake Mojave materials. If so, the intensive plant food processing may have taken place by about 9000 B.P., a timing more in line with the appearance of similar plant-intensive adaptations (i.e., the Milling Stone Pattern) along the California coast (Sutton and Gardner 2010). The appearance of Pinto points in the Mojave Desert before the transition to hyper-arid middle Holocene conditions is therefore relevant to Warren’s hypothesis that the increasing Pinto emphasis on plant foods was a response to the depression of artiodactyl populations brought on by environmental deterioration. Deteriorating climatic conditions notwithstanding, desert settings may have been more tolerable during the winter months when seasonal and monsoonal precipitation would have filled tenajas and other water sources and permitted seasonal harvesting of select plant resources.

The latest Archaic manifestations in the region are represented in the Mojave Desert by the Gypsum Complex and in the Colorado Desert by Amargosa II. These complexes appeared during what appears to have been a period of generally cooler and wetter conditions during the initial portion of the late Holocene. Site distributions in the Mojave Desert may reflect this amelioration of climate in that sites are more numerous but tend to be smaller and appear in a wider variety of settings, suggesting that populations were less tethered to available water. This interval is marked by the appearance of pressure-flaked Gypsum, Elko, and Humboldt projectile points, while ground stone assemblages become increasingly formalized and mortars and pestles appear at some locations. In addition to the projectile points, flaked stone tools include a diverse array of choppers, scrapers, and other tools. In Arizona, Amargosa III is marked by increasing frequencies of ground stone and the introduction of long triangular-bladed and corner-notched projectile points. In the Colorado Desert, however, Amargosa III is not sufficiently well expressed to draw a distinction between Amargosa II and III.

In the vicinity of the APE, direct evidence for Archaic use or occupation is generally limited to occasional isolated projectile points; Archaic occupation at specific sites is inferred but often speculative. At CA-RIV-1383 and -1814, Carrico et al. (1982:156) reported limited evidence for a possible "occupation during San Dieguito/Amargosa periods." At CA-RIV-1383, a major campsite with evidence for occupation after 1500 B.P., a radiocarbon date of about 7000 B.P. was obtained on charcoal from a somewhat questionable context. Also cited as possible evidence of Archaic or earlier occupation at CA-RIV-1383 were rock rings with highly patinated stones embedded in the pavement and highly patinated lithic artifacts (Carrico et al. 1982:156). An Amargosa-style projectile point was recovered at CA-RIV-1814, a large quarry site with less definitive evidence of Late Prehistoric occupation (Singer 1984:10). According to Singer (1984:39), artifacts from various sites in Chuckwalla Valley "show a succession of forms and styles, as do the sites themselves. The region may have been densely settled during Playa/San Dieguito times, but only sporadically visited or inhabited during Pinto/Gypsum times, and then reoccupied by later Yuman and Shoshonean peoples (Chemehuevi and Cahuilla)."

2.2.3 Late Prehistoric/Protohistoric Period

The Late Prehistoric and Protohistoric periods are represented in this region by the Patayan Complex, a distinctive artifact assemblage, economic system, and settlement pattern dating from approximately 1500 B.P. until American expansion into the area at the turn of the nineteenth century. The Protohistoric period encompasses a protracted 300-year period of sporadic European exploration and colonization that had little effect on aboriginal lifeways in the southern California deserts. Paddle and anvil pottery was introduced to the region after 1500 B.P., either from Mexico or from ancestral Puebloan groups of the U.S. Southwest (Rogers 1945; Schaefer 2003; Schroeder 1975, 1979). Floodplain horticulture featuring maize, beans, squash, and other crops was similarly introduced from the south and east. Arable land along the lower Colorado River flood plain came under cultivation, as did the banks of the New and Alamo rivers in Imperial Valley. The Colorado Desert lay on the prehistoric frontier of the westward expansion of agriculturally based subsistence systems.

Bow-and-arrow technology was also introduced at this time, possibly from desert hunter-gatherer groups moving in from the west and north. Smaller arrow-sized projectile points of the Cottonwood and Desert series are common. The Cottonwood series likely predates the Desert Side-notched type, and probably predates the introduction of pottery manufacture in the region. Concomitant with these dramatic subsistence and technology changes were several apparently related ceremonial and religious changes. During the Late Prehistoric period, burial practices shifted from inhumations to cremations and partial cremations. Artistic expression on rock (petroglyphs) and land (intaglios) flourishes in association with expanding trade and trail networks and increasingly elaborate kinship systems tying together extensive territories (McGuire and Schiffer 1982). Warfare likely also increased at this time.

Based on limited data, it appears that, like most of the Colorado Desert, most archaeological components in and around the APE date to the Late Prehistoric and Protohistoric periods. For example, Ritter (1981:9) notes a Rose Spring (Rosegate) projectile point and Tizon brownware and Parker series pottery at CA-RIV-1515 along the Palen Dry Lake bed, estimating occupation of the site from 1450 to 950–750 B.P. A number of sites near the Ford Dry Lake playa margin also contain ceramics, indicating relatively late occupations. Additionally, most of the earth art and rock art sites, as well as many trails and ceremonial sites, are thought to date to the Late Prehistoric period (Altschul and Ezzo 1994; Hedges 1982; McCarthy 1982; Schaefer 1994; Whitley 1996). Use of many of these ceremonial features continued after European contact and even into the present day.

Additional clues to Late Prehistoric use of the area also may be found in debitage profiles of local sites. For example, a detailed study of sites in the McCoy Valley (Flenniken and Spencer 2001) suggests that most lithic reduction was directed at the production of relatively small, thin flakes suitable for the creation of arrow-sized projectile points. Comparable findings are reported by Singer (1984), who notes a similar reduction technology at CA-RIV-1819, a site at the foot of the nearby Mule Mountains. The raw material source at the site is a cobble (river gravel) deposit, resulting in a reduction trajectory oriented toward the production of relatively small, thin flakes for use as small flake tools or as blanks for manufacture of arrow-sized projectile points.

There is a clear correspondence between the geographical distribution of archaeologically recognizable Patayan cultural materials and the historically documented territories of Yuman-speaking people: the Quechan, Mohave, Cocopah, Paipai, Yavapai, Havasupai, and others. Thus, the Patayan Complex is often taken to be directly ancestral to the ethnographic Yuman cultures of the region. Nevertheless, Schaefer (1994:66) states that non-Yuman groups, such as the Cahuilla and the Chemehuevi, were also active participants in this cultural complex, adding that "[t]he prehistoric Patayan world was multicultural and intercultural, representing many dynamic adaptive strategies and social systems, but sharing common elements of technology, material culture, and ideology."

2.3 ETHNOHISTORIC CONTEXT

Most groups living in this vicinity when the Spanish first made forays into the area spoke languages in the Yuman family of the Hokan language stock. These include the Halchidhoma, Mohave, and Quechan. There is archaeological evidence that ancestors of the Yuman-speaking groups have been in the area for some time; however, these were not the only people who would have used this area. Ethnographic information indicates that several other Native American groups, such as the Cahuilla and Chemehuevi, at least traversed the APE (e.g., Bean 1978; Kelly and Fowler 1986; Laird 1976). These are Uto-Aztecan speakers; the Chemehuevi speak a language of the Numic branch and the Cahuilla are Takic-speakers. The final desiccation of Lake Cahuilla is thought to have caused major disruptions for populations living in the Colorado Desert, perhaps contributing to the persistent warfare reported along the lower Colorado and Gila rivers (Aschmann 1973; Castetter and Bell 1951; Schaefer 1994; Stone 1981; Weide 1976; White 1974).

2.3.1 Quechan

According to Quechan oral tradition, their territorial range extended along the Colorado River from Blythe in the north to Mexico in the south. At the time of sustained European contact in the seventeenth century, the Quechan people numbered in the thousands. The largest concentration traditionally lived at the confluence of the Colorado and Gila rivers, although they were strangely not reported in that area in 1540, when the Alarcón and Diaz expeditions reached the confluence (Forbes 1965; Forde 1931). Nevertheless, in the following century, large Quechan villages existed in the area.

The Quechan economy was based on a combination of horticulture, fishing, and gathering. During the winter and spring, Quechan groups lived in seasonal villages on terraces above the river floodplain. After the spring floods receded, small family groups would disperse to their agricultural plots along the river to plant crops. After the harvest in the fall, the Quechan would gather again in the large villages on the terraces, where stored agricultural foods, fishing, and limited gathering allowed them to live together through the winter (Bee 1983; Forde 1931). In all times but during high flooding, fishing in the Colorado River provided an important source of protein.

Numerous named villages were located along the terraces above the lower Colorado River flood zone. The village known as *Avi Kwotapai* was on the west side of the Colorado River between Blythe and the Palo Verde Valley, and *Xenu mala vax* was on the east side of the river near present-day Ehrenberg (Bee 1982). Quechan and other Yuman-speaking groups traversed well-traveled trail networks that extended along the Colorado River between peaks and other significant landscape features (see discussions in Cleland and Apple [2003]). Primary ethnographic sources for the Quechan include Bee (1983), Castetter and Bell (1951), and Forde (1931).

2.3.2 Halchidhoma

Although no longer in the area, the Halchidhoma (also known as the Panya) are a Yuman-speaking people who, until about 1825, lived along the Colorado River between the present-day cities of Blythe and Needles. The Halchidhoma were known to travel and trade over great distances. The Coco-Maricopa Trail, leading west from a portage point across the Colorado River adjacent to the City of Blythe, linked the Halchidhoma with the Pacific coast (Dobyns et al. 1963). Ceramic seriation and radiocarbon dates from marine shell artifacts indicate that an extensive trade network linked the lower Colorado River region and the Pacific coast by at least

1100 B.P. (Sample 1950). The Halchidhoma traded with the Cahuilla, Hualapai, Papago, and Pima of Arizona, and were closely allied with the Maricopa (Bean and Vane 1978).

By all accounts, the Halchidhoma were frequently in conflict with their Colorado River neighbors, the Quechan and Mohave (e.g., Bean and Vane 1978; Kroeber 1925). During the decades, if not centuries, of open hostility, the Halchidhoma established strong alliances with the Yuman-speaking Maricopa and Cocopa peoples who lived to the east along the Gila River. Ultimately, the Halchidhoma left to live with and intermarry their allies, the Maricopa; therefore, they are poorly documented in the ethnographic literature. Spier's (1933) ethnography of the Maricopa touches only briefly on the Halchidhoma. Other sources include Castetter and Bell (1951), Kroeber (1925), and a more recent summary article by Harwell and Kelly (1983). Bean and Vane (1978) discuss the central role the Halchidhoma played in the intertribal trading network known as the Northern Sonoran Desert Amity-Enmity System, as well as their eventual migration to the east.

2.3.3 Mojave

The Mojave were one of the most respected and feared groups in California at the time of European contact. They were known equally for their military might, powerful shamans and religious ceremonies, and proclivity for long-distance travel. The Mojave are also notable for their understanding of themselves as a unified "nation" of people, known as the *Hamakhava*, rather than as a series of loosely related clans or villages (Kroeber 1925:727). The Mojave acted together in defending their territory and attacking their enemies. Parties of Mojave also traveled far and wide, apparently largely out of curiosity and almost entirely without fear. Thus, the Mojave became spiritually and socially influential over a vast portion of the U.S. Southwest and southern California. Even the notably insular Zuñi pueblo people "perform dances that they attribute to the Mohave" (Kroeber 1925:599).

In 1604, the Oñate Spanish expedition encountered the Mojave as far south as the present Colorado River Indian Tribes Reservation (Stewart 1969), although their largest settlements were known to be farther north. Kroeber (1959) reports that the majority of the Mojave population lived along both sides of the lower Colorado River from south of Davis Dam to Topock. According to Stewart (1969), the Mojave also extended their territory south into the Chemehuevi and Colorado valleys, and intermittently controlled areas as far south as the Palo Verde Valley (cf. Kroeber 1959). After the Halchidhoma vacated the Parker-Blythe area between 1825 and 1830, the Mojave briefly settled there but soon returned to their stronghold in the Mojave Valley (Bean and Vane 1982).

During much of the year, the Mojave lived in villages on terraces above the Colorado River, only moving down onto the floodplain in the spring to plant crops after the seasonal floods. Like other lower Colorado River people, the Mojave relied on floodplain horticulture, fishing, and gathering for subsistence. Crops included maize, black-eyed beans (cowpeas), squash, pumpkin, and several local grasses. Cultivated plants were supplemented by the collection of wild plant foods, including honey mesquite and mesquite screwbean, which could be stored for long periods of time and were traditional staple foods. Although the pods of both plants could be eaten green, they were usually pounded into flour using long stone or wooden pestles. Additionally, screwbean pods were often processed in large pits dug into sandy soil where the pods were placed, covered with vegetation, and then periodically watered to leach out bitter compounds (Lightfoot and Parrish 2009:355). Individuals and families owned specific parcels of farmland as well as individual mesquite trees. Disputes over privately-owned resources were usually settled through physical contests “calculated to prevent fatalities” and to avoid violent reprisals (Kroeber 1925:744).

The bulk of the traditional Mojave diet was vegetarian but hunting and fishing were important components of the seasonal subsistence cycle. Mojave hunters considered spring the best time to hunt, when they could lie in wait next to springs where the young grass would attract deer. Hunters also targeted rabbits and other small game, although they were more often taken in traps, snares, and communal drives. When the high waters of the Colorado River receded in July and August, the Mojave turned to fishing and caught a variety of fish species by driving them into shallow sloughs or trapping them in seines (Kroeber 1925:737; Stewart 1957).

The Mojave are well known for their long-distance travel. Like other Colorado River tribes, they participated in a trade network extending east to the Pueblos of Arizona and west to the Pacific coast (Bean and Vane 1978). They developed or frequented important passes and routes of travel, including the well-known Mojave trail connecting the high deserts with the southern California coastal valleys. The endurance and speed of Mojave travelers were legendary at the time of European contact. According to one hyperbolic account, groups of Mojave men, running only at night, were said to be capable of traveling from the Colorado River to the Pacific coast in only 3 days, although the typical duration of such a trip was 15 to 16 days (McCawley 1996:112; see also Bean and Vane 1978:5–25). During the colonial era, the Spanish frequently encountered groups of traveling Mojave who continued the tradition of desert-coastal travel and trade throughout the mission period, occasionally in conflict with the wishes of Spanish officials (Cook 1962:158–159).

The general Yuman belief in the importance of dreaming, and the fundamental interrelationship between the mundane and spiritual worlds, was particularly developed among the Mojave (Kroeber 1925:754). All people were capable of meaningful dreaming, and most individuals came to their chosen roles in life as a result of their dreams. In dreams, the Mojave travel in a mythical place and time when the world was first formed and the important places, such as mountains and springs, came into being. Dreams also inform public rituals, and the many complicated “song series” that singers perform from memory are said to be dreamed as much as learned. The songs of the Mojave are remarkably specific geographically, noting “the exact spot at which each character journeyed or slept or stood or looked about” (Kroeber 1925:755). Thus, Mojave songs seem to act as a means of storing and transferring important landscape knowledge; they are, among other things, a collection of meaningfully constituted mental maps of the Mojave territory and beyond (Stoffle et al. 1997:235). Many nearby groups, including the Chemehuevi, borrowed extensively from the Mojave song series repertoire. Primary ethnographic sources for the Mojave include Castetter and Bell (1951) and Kroeber (1920, 1925). More recently, Stewart (1983) summarized the ethnographic literature regarding the Mojave.

2.3.4 Chemehuevi

The Chemehuevi are the southernmost of 16 groups of Southern Paiute people (Kelly and Fowler 1986) and the only non-Yuman speakers living along the lower Colorado River at the time of European contact. The traditional territory of the Chemehuevi was an extensive area southwest of Las Vegas, including portions of the eastern Mojave Desert. In his description of Chemehuevi territory, Kroeber (1925:595) observes that it was “the largest in California occupied by a people of uniform dialect,” although they were “certainly among the two or three most thinly populated.” On the other hand, Bean and Vane (1978:5–20) challenge the view that the Chemehuevi population was extremely low at the time of European contact. Citing work by Stoffle and Evans (1976), Bean and Vane (1978:5–20) argue that there were at least 13,000 Southern Paiute people (Chemehuevi and Las Vegas groups) “living in a territory running from Las Vegas south to the Palo Verde Valley and from the Colorado River west to the Iron Mountains.”

The vast Chemehuevi territory contains some of the driest deserts in the west, and the traditional Chemehuevi subsistence system was the most attuned to desert resources of all of the groups discussed here. The Chemehuevi living in the deserts practiced a relatively nomadic hunting/gathering way of life, with larger settlements near reliable water sources but no permanent villages. Groups moved with the rhythm of the seasons, arriving to harvest plant foods as they matured and hunting primarily small game. Hunting parties also traveled to the San Bernardino Mountains and visited their allies, the Northern Serrano, or Vanyume. Owing to the impermanence of most desert encampments, housing was typically of brush erected to protect inhabitants from the harsh sun and wind (Kroeber 1925:597–598; Laird 1976:5). Several foods, including dried meats, dried melon and squash, agave hearts, and various seeds, were stored in specially prepared baskets, earth pits, and caves. Chemehuevi groups did not live permanently with their food caches, though, and the stealing of cached food was apparently a grave issue, one that could incite war and inflict spiritual harm (Laird 1976:6).

Until their expansion into the lower Colorado River region, the Chemehuevi did not use pottery but relied instead on a variety of woven baskets and implements, often with painted designs. Chemehuevi hunters were known for their recurved, sinew-backed bows that, although shorter than comparable Mojave bows, were nonetheless accurate, powerful, and well-suited to hunting deer and other big game (Laird 1976:6). Those groups that settled along the Colorado River adopted agriculture, more substantial wooden dwellings, pottery, and a number of other cultural features from their riverine neighbors.

Despite an underlying friction, the Chemehuevi were traditional allies of the Mojave, and after the Halchidhoma were driven from the Colorado River area in the early nineteenth century, the Chemehuevi moved into the Parker/Blythe area they vacated. The Chemehuevi may have settled in the vicinity of the Palo Verde Valley before the expulsion of the Halchidhoma (Bean and Vane 1978; Roth 1976:81). According to Mojave tradition, the Chemehuevi were invited to come to the Colorado River after 1830 by the Mojave (Kroeber 1925:594). According to Laird’s (1976:123) Chemehuevi sources, though, the Chemehuevi Valley and Cottonwood Island along the Colorado River were part of the Chemehuevi traditional territory prior to the 1800s. Ethnographic work by Kelly (1934:556) suggests that the southern expansion of the Chemehuevi was relatively “recent,” dating to the early 1800s. This continues to be a point of disagreement between scholars and between the descendants of the historical Mojave and Chemehuevi.

In the Protohistoric and Historic periods, the Chemehuevi traveled extensively through the deserts and as far west as the Pacific coast “just to look around” as well as to exchange goods and obtain marine shell ornaments and raw materials (Kelly and Fowler 1986:377). Periodically, small groups of Chemehuevi and Las Vegas Southern Paiute would travel together to the Hopi villages in Arizona, although such trips were described as purely social visits involving gift exchanges, not trading expeditions (Kelly and Fowler 1986:377).

When Europeans first reached the California desert, the Chemehuevi occupied the eastern half of the Mojave Desert from south of Death Valley to Riverside and Imperial counties. As mentioned above, traditional Chemehuevi subsistence was based on hunting and gathering, although the groups living along the lower Colorado River adopted floodplain horticulture similar to that practiced by the Mojave and Quechan (Kroeber 1925; Roth 1976). Nevertheless, the Colorado River Chemehuevi retained a greater reliance on hunting and gathering than their Yuman neighbors. Primary ethnographic sources for the Chemehuevi include Laird (1976), Kelly (1934), and Kelly and Fowler (1986), as well as Euler (1966), who wrote a comprehensive ethnohistory of the Southern Paiute.

2.3.5 Desert Cahuilla

The Desert Cahuilla traditionally occupied the Coachella Valley, west of the APE, near the modern towns of La Quinta and Indio, where desert and montane geographies collide. During the Late Prehistoric and Protohistoric periods, the Cahuilla were in regular contact with groups along the lower Colorado River. The traditional route to the river followed the course of the modern I-10 freeway. Along with other Takic speakers, the Cahuilla are believed to have migrated into southern California from the Great Basin. Scholars disagree about the timing and effect of the Takic migration, and it remains an important topic of ongoing research (Golla 2007; Sutton 2009). Based on linguistic data and archaeological materials, researchers have suggested that the migration dates from 1500 B.P. to as early as 2500 B.P. Before inland Lake Cahuilla dried up around 500 B.P. Cahuilla people lived densely along the shoreline, making pottery very similar to that fashioned by the Yuman people of the Colorado River. Historically, the Cahuilla territory spanned from the Orocopia Mountains in the east to the San Gorgonio Pass and the San Jacinto Plain near modern-day Riverside (Bean and Vane 1978:5–8).

Most large Cahuilla villages were inhabited year-round by a single related lineage. With the exception of the Lake Cahuilla settlements, high desert canyons with perennial springs were particularly favored village locations. High canyon villages straddled several ecological niches and afforded protection from wind, weather, and enemies. The Cahuilla were organized into several clans, each consisting of several lineage groups tracing their ancestry to a single male ancestor. Each lineage group controlled a territory spanning four critical ecotones or “life zones”: the low desert, high desert, transition, and mountain zones (Bean and Bourgeault 1989:38). Specific resources within these zones, such as springs and mesquite patches, were owned by lineage groups. Traditional songs and stories, some related to specific resources and landscape features, could also be owned exclusively by lineage groups and larger clans.

Cahuilla subsistence was an extensive hunting and gathering system tethered to permanent villages near reliable water. Seasonally, as different foods became available, small groups would move to temporary camps to hunt and collect localized plant resources. Important game animals included rabbits, deer, and bighorn sheep. The Cahuilla primarily exploited desert plant resources such as agave, yucca, mesquite, various cacti, and grasses. In addition, large groups periodically traveled into the mountains to harvest acorns and pinyon nuts with their Serrano allies. They would bring the harvests back to the permanent settlements where the nuts could be stored for many months.

In the Northern Sonoran Desert Amity-Enmity System (Bean and Vane 1978), the Cahuilla were key trading partners with the Halchidhoma, moving a majority of the traded goods through the southern California desert valleys and mountain passes. During historic times the Cahuilla, along with the Maricopa, were instrumental in reopening trade and communication between the Spanish settlements along the California coast and the Sonoran Desert (Bean and Vane 1978:5–39).

There are several ethnographic sources for the Cahuilla (e.g., Barrows 1900; Kroeber 1908; Strong 1929). Since the 1970s, Bean (e.g., 1972, 1978) has become the foremost nonnative interpreter of traditional Cahuilla culture, synthesizing the extant ethnographic data and working closely with modern tribal members (Bean and Saubel 1972; Bean and Vane 1978).

2.4 HISTORICAL CONTEXT

From the era of Spanish exploration of the Colorado Desert to the present, this region has been (and remains) remote from centers of historical development and settlement. The history of the area relates to themes involving transportation routes and development of the Far West and the Colorado Desert, mining and homesteading activities, military desert training, and agribusiness in the late twentieth century.

2.4.1 Early Settlement

The sixteenth-century Spanish explorers Francisco de Ulloa, Hernando de Alarcón, and Francisco de Coronado led expeditions from the Gulf of Mexico up the Colorado River past the Gila confluence. However, it was not until 1702 that Father Eusebio Francisco Kino, a Jesuit missionary, cartographer, and explorer, scouted the interior of the Colorado Desert. One focus of Kino's exploration was to dispel the myth that Baja California was an island, which led him to seek routes from Arizona to the Pacific Ocean. New Spain officials in Mexico City, however, rejected establishment of an overland route to Monterey to access the Manila galleon trade, believing it was too risky and resources could be better spent elsewhere (Lavender 1972; Rice et al. 1996). The inhospitable nature of the route deterred further exploration.

Father Francisco Garcés followed Kino's route and reached the confluence of the Gila and Colorado rivers in 1771. The Garcés expedition, assisted by Native American guides, crossed the Colorado River near present-day Needles and traveled west through the desert until the San Jacinto Mountains were visible in the distance. Garcés attempted an overland route to Monterey again 3 years later, accompanying border captain Juan Bautista de Anza. When they reached the Colorado River, the local Yumans assisted them in fording the river, locating wells and trails, and rescuing an exploring party lost in the desert. Anza and Garcés crossed the desert to the west, eventually traversing the San Jacinto Mountains by way of a small canyon, arriving at Mission San Gabriel in March 1774. Due to a shortage of supplies, most of the party, including Garcés, turned back while Anza continued on to Monterey (Rice et al. 1996). Garcés' route across the desert became part of the Old Spanish Trail, an important transportation link between New Mexico and California. The major route of migration to the north primarily circumvented the Colorado Desert, and early Spanish development of the region was tied to activity along the Colorado River.

In 1780, under the direction of Garcés, missions La Purísima Concépcion and San Pedro y San Pablo de Bicuñer were established on the west bank of the Colorado River (near present-day Yuma). Although the Yumans were initially welcoming and assisted the early settlements, abuse and theft of prize farmland by the Spanish soldiers resulted in escalating hostilities between the two groups. In 1781, the Quechan attacked a military camp and both missions. More than 30 soldiers and settlers were killed, including Garcés. The women and children were taken prisoner by the Quechan, although they were eventually ransomed (Lavender 1972). This action, dubbed the "Yuma massacre," effectively closed Anza's trail, halting further immigration and forcing Spain to supply the new colonies using the expensive and unreliable sea route (Rice et al. 1996:99–100). Subsequent military campaigns by Spain and Mexico failed to defeat or subdue the Quechan, and the area was effectively closed to European exploration, settlement, and mining until after the Republic of Mexico was established in 1823.

Until 1848, development in the Colorado Desert remained sparse. The Romero expedition crossed into Cahuilla territory near the San Gorgonio Pass in 1823 and possibly explored as far east as present-day Desert Center (Bean and Mason 1962). Meanwhile, Euro-American settlers began arriving in California. Jedediah Smith blazed a new trail to California in 1826 (through present-day Needles). As the migration into California continued and boomed with the gold rush after the 1848, tensions between the settlers and Native Americans increased. The U.S. Cavalry developed camps and forts throughout the Arizona, Nevada, and California deserts to protect settlers and immigrants from hostile tribes. One of the earliest of these was Camp Calhoun, established in 1849 on the banks of the Colorado River near present-day Yuma. In 1855, the name was changed to Fort Yuma.

2.4.2 Regional Development

Following the establishment of forts throughout the area, the California deserts again opened up for exploration and settlement. The U.S. government conducted a series of surveys from 1853 to 1855 to identify feasible routes for a railroad from St. Louis to the Pacific Ocean. Lieutenant Amiel Weeks Whipple, a topographical engineer in the U.S. Army, surveyed the section from Arkansas to Los Angeles. Whipple passed through Mojave territory in 1854 and crossed the Colorado River near present-day Needles (Rice et al. 1996). The railroad surveys also recorded the terrain and geology of the Colorado Desert. The land that encompasses the APE was included in the survey of 1853 (Bureau of Land Management 2009).

The United States took control of the American southwest after the Treaty of Guadalupe-Hidalgo in 1848. That same year gold was discovered in California. Mining camps were established in the desert as early as 1850 at Salt Creek in the Amargosa Desert. Along the eastern bank of the

Colorado River, the town of La Paz, once known as Pot Holes, developed when gold was discovered nearby. The subsequent mini-gold rush made La Paz an instant boomtown whose population peaked at 1,500 in the 1860s (Wilson 1961:25). La Paz was an important stop along the stage line between San Bernardino and the Colorado River, serving as the county seat for Yuma County until 1870 (Thompson 1985). The La Paz mining district yielded placer gold for only a short period, and by the end of the nineteenth century La Paz passed from boomtown to ghost town.

The first Americans to arrive in the Colorado Desert in any significant numbers were prospectors hunting for the next big gold strike. Regionally, mining and prospecting were most intense in the mountains and high deserts of the Mojave, but small-scale mining has been a consistent feature of the Colorado Desert from the 1800s to the present day. By 1863, between “2,500 and 3,000 Americans and Mexicans were on the river between Palo Verde Valley and El Dorado Canyon,” most of them engaged in mining (Poston 1863:387, as cited in Bean and Vane 1978:5-21).

Significant economic development of the Colorado Desert region began in the 1870s and came to fruition in the early part of the twentieth century. Development was dependent largely on two things: transportation and water. The first of these came in 1872, with construction of the Southern Pacific Railroad from Los Angeles to present-day Indio, and eventually Yuma. Indio, the mid-point between Los Angeles and Yuma, was created to provide living quarters for train crews and railroad workers. A nearby Native American reservation provided some of the labor force. The first trains ran on May 29, 1876 (Pittman 1995:36). Railroad stops were built at Walters (now called Mecca), Woodspur (Coachella), and Thermal, among others. The second transcontinental railroad was completed when the Southern Pacific and the Atchison, Topeka, and Santa Fe railroads were linked at Deming in New Mexico Territory on March 8, 1881, providing settlers relatively quick and easy access to the region.

The Southern Pacific Railroad reached Yuma on September 30, 1877. The railroad was the single most important boost to mining in the southeastern Colorado Desert, offering convenient transportation of heavy mining equipment, supplies, personnel, and bullion. By 1880, the Southern Pacific Railroad was providing regional access to gold and silver ore deposits in the Chocolate, Cargo Muchacho, and Palo Verde mountains. When mines opened up near the turn of the twentieth century, stamp mills and small tracks leading from the mines to the stamp mills were built. Mining productivity in the southeastern Colorado Desert was greatest between 1890 and 1910, with a brief resurgence in the 1930s (Morton 1977; Rice et al. 1996).

A further boost to regional development in the Colorado Desert was the rail rate war of 1887, when fares from the Missouri River to California were slashed to $1. Advertising programs attracted settlers to the West. With the railroad to transport crops and the consistently warm climate, irrigated areas in the desert were attractive places for prospective farmers. Besides settlers, others were attracted to sanitariums that took advantage of the warm climate and desert hot springs at Palm Springs.

2.4.3 Mining

Mining, particularly of precious metals, was a fundamental factor influencing California’s early economy, culture, and politics. Gold and silver mines and the wealth they generated were central to the influx of prospectors and settlers that transformed the former Mexican outpost into a land of plenty. The Colorado Desert's mining history, albeit less intensive than in other areas of California, similarly fostered the arrival of prospectors and the subsequent development of numerous towns and communities. Between 1849 and 1860, an estimated 8,000 emigrants crossed the Colorado Desert (Laflin 1998:10). The surge in mining activities in the early 1850s led to rapid changes in mining technology and the character of the industry.

Before the 1850s, mining activities in the Colorado Desert region were limited. Franciscan monks began hard rock mining and placer mining near present-day Yuma by 1780. Some of the earliest mining activity in the region occurred at Potholes, approximately 10 miles north of present-day Yuma. Potholes is named for the placer deposits that were worked there by the Spanish from 1779 until 1781 (Morton 1977:27). In the 1820s, limited placer mining occurred in the eastern Colorado Desert. These early Spanish prospectors named the Cargo Muchacho ("loaded boy") Mountains after the gold they found there (Rice et al. 1996). These activities continued into the mid-nineteenth century.

Survey and prospecting of the mountains near Palen Lake, about 45 miles from the APE, began to increase in the 1860s, when declining results in lode mines of the Sierra Nevada led to exploration in other areas. In the 1860s, mining districts were established at La Paz and Castle Rock on the Arizona side of the Colorado River near Blythe. No large-scale mining took place in what is now Riverside County, but small-scale mining operations were present in isolated spots throughout the Colorado Desert (California Department of Transportation 2008:18).

Mining claims had been staked in the Mule Mountains by 1861 and in the Big Maria and McCoy mountains by 1862. These mines were part of the larger Ironwood Mining District (Gunther 1984; von Till Warren et al. 1980; Vredenburgh et al. 1981). The Big Maria Mountains were originally called the Half-Way Mountains by the Ives expedition, and the Chemehuevi Mountains on maps dating to the 1860s (Gunther 1984:310–311). In addition to mines that were part of the Ironwood District, the Chemehuevi Mining District included mines in the Big Maria, McCoy, and Palen mountains (Gunther 1984). Eagle Mountain was prospected by Joe Torres between the late 1870s and early 1880s. Jack Moore staked a claim with his father in the Eagle Mountains in the early 1880s. They established the Eagle Mountain Mining District for the extraction of iron, gold, and silver. They were unsuccessful in maintaining the mine, and it was abandoned shortly after it was founded. The mine was reopened in 1895 by L. S. Barnes as part of a consolidation of Joe Torres' former claims (Belden 1964).

Small-scale mining took place in the Chuckwalla Mountains near Corn Springs as well. The ore from the Bryan Mine, and perhaps from other nearby mines, was processed at a stamp mill operated by two men, Adams and Pickering, near Corn Springs between 1898 and 1900 (Vredenburgh et al. 1981). In 1909, the Chemehuevi Mountains were divided and renamed the Big Maria and Little Maria mountains. Mineral deposits at these mines included gold, silver, fluorite, manganese, copper, gypsum, and uranium (Warren et al. 1981). Mining continued at Corn Springs into the early twentieth century.

With the onset of World War II (WWII), the demand for steel increased. However, the iron ore in the Eagle Mountain claims was protected as part of the Joshua Tree National Monument. Henry J. Kaiser had a steel mill in Fontana and the Vulcan iron mine near Kelso that supplied materials for his west coast shipyards. Kaiser purchased the mine and succeeded in having the boundaries of Joshua Tree Monument shifted to exclude Eagle Mountain. Kaiser constructed a rail line that connected to the Southern Pacific Railroad, and ore mining commenced in 1948. By 1971, the Eagle Mountain Mine produced 90 percent of California's iron (U.S. Department of the Interior 1971). At its height, the mine employed more than 4,000 people, making it the largest employer in Riverside County. The mine closed in 1983 due to economic factors and competition from abroad.

2.4.4 Agriculture/Ranching

By the late 1850s agriculture had become an important industry, second only to mining. Homesteading formed the foundation for California's agricultural economy in the nineteenth century, and passage of the Homestead Act in 1862 opened vast areas of the public domain to private citizens. The Desert Land Act of 1877 also promoted the acquisition of open tracts of land, with an entitlement to 640 acres for each applicant, who were primarily speculators. Generally, lands that fell under this act were marginal for sustained agriculture. Transforming arid land into productive farming and grazing lands was the key. Although agriculture became an important industry in the Palo Verde Valley, significant agricultural development did not take place near the APE.

Land claims continued into the twentieth century, and numerous Desert Land Entries date to 1909 and 1910 (BLM 2009); however, most residual federal lands claimed in the twentieth century were poorly suited for agriculture. Several claims were abandoned or rejected. Many Desert Land Entries were never improved or established due to inadequate water supplies and harsh conditions. Lands available for homesteading also became increasingly marginal over time, requiring ever-larger tracts to achieve success. Large-scale farming came to dominate the regional marketplace.

Despite harsh climatic conditions, "[p]alms, and citrus did well in the desert if well-watered. Jojoba farms did well with minimal water and many plants still survive on abandoned farms nearby, only getting water from natural weather events" (George Kline, personal communication 2018). Jojoba oil became popular during the latter decades of the twentieth century and farming was commercially viable for a brief period but was soon undercut by foreign competition. Virtually all of the Jojoba farms in eastern Riverside County now lie fallow.

2.4.5 Transportation

Early in the 1860s, Hank Brown and John Frink independently developed routes to access the gold mines in the vicinity of La Paz (von Till Warren et al. 1980). Frink's east-west route established an alternative to the more southern Butterfield Stage route. This was apparently the first development across the Palo Verde Mesa, although it has since all but disappeared (von Till Warren and Roske 1981:17–18). In 1862, William D. Bradshaw opened the eponymous Bradshaw Trail to cross the desert from San Bernardino to the La Paz mining district in Arizona. Bradshaw also operated a ferry across the Colorado River near Providence Point, opposite a small community that would become Ehrenberg, Arizona. The east-west overland stage route was used extensively between 1862 and 1877 to haul miners and other passengers to the gold fields at La Paz (Lyman 2004). Several stagecoach stops were present along this trail, such as the

Mule Spring Station, located southwest of the Project area between the Little Chuckwalla Mountains and Mule Mountain (Johnson 1987:132). The trail and Mule Spring Station have been largely or completely obliterated by a 65-mile-long graded road that traverses mostly public land south of the Chuckwalla Mountains.

Early roads in the United States often followed trails that had been established by Native Americans during prehistoric times. Like the majority of early trailblazers, Bradshaw used Native American routes that predated Spanish exploration. Part of the Bradshaw Trail may have been the Coco-Maricopa Trail, which intersected the Colorado River near Blythe and may have passed southwest of the APE. As with many other cross-country routes, the Bradshaw Trail became largely obsolete with the arrival of rail service in the desert and the depletion of the La Paz gold fields in the late 1870s. The railroads reoriented trails and wagon roads that connected new mining communities to major routes of transportation. Railroad stops became destinations for wagon roads, allowing points of access to the remote desert interior (von Till Warren et al. 1980). The early highway system in the United States developed out of a patchwork of trails that later became unimproved roads and eventually were connected into an integrated system of paved routes.

2.4.6 Water Conveyance

The Colorado River Aqueduct (CRA) is a water conveyance system operated by the Metropolitan Water District of Southern California. Construction began in 1933, and water first flowed through the system in 1941. The CRA system carries Colorado River water, impounded at Lake Havasu on the California-Arizona border, across mountains and desert to the coastal and inland valleys of southern California. The CRA stretches 242 miles from Parker Dam to Lake Mathews (formerly known as Cajalco Reservoir). Water from Lake Mathews was then distributed to local water districts in the Los Angeles Basin and lower Santa Ana River drainage. The system is composed of 3 reservoirs, 5 pumping plants, 63 miles of canals, 92 miles of tunnels, and 84 miles of buried conduit and siphons. The nearest of these pump stations is the Eagle Mountain Pump Lift, 7 miles north of Desert Center.

The project required ingenious engineering solutions and new equipment introduced at the time of its construction. It also employed over 35,000 people during an 8-year span of construction, and as many as 10,000 people at one time, making it southern California’s single largest work opportunity during the Great Depression (Gruen 1998). Because of its many engineering merits, the CRA has been named a National Historic Civil Engineering Landmark by the American Society of Civil Engineers. Today, it is one of the principal water supplies for southern California.

In building the CRA, Metropolitan chose an aqueduct route that required four pump lift stations. A fifth was added when the Granite Mountains tunnel could not be easily holed through. Each station was built with three pumps and the capability for expansion to nine pumps (Gruen 1998). Large amounts of electricity were required to operate the pumps, which necessitated construction of transmission lines from Hoover Dam to the pump stations. Construction of the transmission lines to power the system began in 1934 with the grading of dirt roads to provide access to the tower locations. The contractor for construction of the transmission lines was Fritz Ziebarth of Long Beach, who established a construction camp at Camino where the single H-frame steel towers with cross supports were assembled. The steel was sent by rail to Goffs on the Santa Fe Railroad and then by truck to Camino. Erection of the towers began in February 1936, and the line from Hoover Dam to Iron Mountain Pump Lift was completed by the end of 1936. The line from Iron Mountain Pump Lift to Hayfield Pump Lift was completed in July 1937 (Gruen 1998).

2.4.7 Military Training

Evidence of military training is present across the Colorado Desert. George Patton's Desert Training Center/California-Arizona Maneuver Area (DTC/C-AMA) and Operation Desert Strike have left many artifacts, features, and sites across the region. The APE is within the greater DTC/C-AMA. Tank tracks from their exercises are visible throughout the APE.

2.4.8 Desert Training Center (DTC/C-AMA)

During WWII, shortly after the bombing of Pearl Harbor and U.S. entry into the war, Lt. General Lesley J. McNair, Director of Army Ground Forces and Combat Training for the War Department, established the DTC in southeastern California, Arizona, and Nevada to train troops in the event they were sent to North Africa to fight. It would be the first simulated theater of operations in the U.S. (Meller 1946). Major General George S. Patton Jr., the first DTC Commanding General, oversaw the transformation of the desert stretching from the California/Arizona-Mexican border north to the southern part of Nevada. Participation in large-scale maneuvers was a standard practice for all divisions and corps prior to deployment to active theaters of operation.

General Patton scouted the area by plane, jeep, and horseback beginning in March 1942. The area was suitable for training because of its openness, established railroads and highways, and the presence of several military installations throughout the region (Henley 1992:5–7). The DTC was also suitable because it contained a variety of terrain types and no large population centers (Howard 1985:273–274). Patton also investigated water supplies, meeting with the Water District Office in Los Angeles to ascertain what facilities would be available. He brokered agreements with the Southern Pacific Railroad to use the only existing tracks between Indio and Yuma and with the Southern California Telephone Company and the Coachella Valley Home Telephone Company to set up three talking circuits for use at the DTC and to prohibit female operators on the circuits (Meller 1946:2). He was "unstinting in his praise of the area," and found it "probably the largest and best training ground in the United States" (Meller 1946:3). The first reaction of the troops, however, was "distinctly unfavorable" (Meller 1946:11).

The DTC was the largest training installation ever created (approximately 16,156 square miles). Its purpose was to train soldiers for the harsh conditions of North Africa, as well as to field test equipment and supplies. The original facility extended from the Colorado River on its eastern border to just west of Desert Center, California, and from Searchlight, Nevada in the north to Yuma, Arizona in the south. After 19 months of training and expansion, the DTC was officially named the Desert Training Center California-Arizona Maneuver Area (DTC/C-AMA), and had grown to an area twice the size of Maryland. The DTC/C-AMA included tank, infantry, and air units training for desert warfare. Patton established his base of operations at Shaver's Summit (now Chiriaco Summit) at Camp Young. Troops began arriving at the DTC/C-AMA in April 1942 and endured harsh physical training that included restricted access to water, endurance exercises, and lack of sleep. Life at the DTC/C-AMA was so difficult that the officers and enlisted men came to refer to it as “the place that God forgot” (Henley 1992:22–24).

Patton commanded the DTC/C-AMA until July 1942, when he was placed in charge of Operation Torch, the Allied invasion of North Africa. Patton had developed tactics at the DTC/C-AMA that he would use in his campaign. When Patton was replaced by Major General Alvan Cullom Gillem Jr., 12,000 troops were stationed at the DTC/C-AMA. As WWII continued, that number grew to more than 200,000 troops by May 1943 (Henley 1992:25). The need for troops around the world during WWII required that the various units stationed there be sent to places other than North Africa. In light of this need, the DTC/C-AMA was closed in April 1944.

With the end of WWII came a reduction in military activity in the Colorado Desert region. Buildings and airports converted for use by the military during the war years returned to civilian use. Surplus military barracks were recycled for a variety of uses throughout local communities. The primary post-war activities in the area were mining and agriculture. Agriculture was primarily confined from the middle to the western portion of Riverside County, but there was also agricultural development in the Palo Verde Valley due to its location near the Colorado River.

Several of the camps, training sites, and maneuver areas associated with the DTC/C-AMA are relatively near the APE. Blythe Army Air Field is northeast of the Project area. Camp Coxcomb is northwest and Camp Young west, near Chiriaco Summit and the George S. Patton Museum. In addition, the Desert Center Army Airfield is northwest of the APE at Camp Desert Center, and Camp Granite and Camp Iron Mountain are farther north. The Government Pass training site is in the Chuckwalla Mountains to the west and the Palen Pass Maneuver Area is north of the APE.

Blythe Army Air Field. This air field was originally a civilian facility that was expanded in the early 1940s to accommodate the needs of local military training efforts. The air field became the Blythe Army Air Base (AAB) in 1942. During this time, construction of barracks began along with the construction of taxiways and runway expansion. Initially, the AAB was used by the 46th Bombardment Group with minimal or unfinished structures. The AAB was then expanded and used for heavy bombers. To accommodate larger crews, the AAB now consisted of a hanger, 4 runway aprons, 60 barracks, a Link trainer facility, numerous support buildings, and rifle and pistol ranges. In 1943, the Base was downgraded to Blythe Army Air Field, then declared surplus in July 1946. The Air Field was momentarily revived for use by the 99th Fighter Squadron (i.e. the Tuskegee Airmen) (Bischoff 2000:86—88).

Camp Coxcomb. Camp Coxcomb was constructed in the summer of 1942. Several armored divisions and infantry divisions were stationed there in 1942 and 1943. Camp Coxcomb was a more permanent camp than the other DTC/C-AMA camps, and featured a relief map of the entire DTC/C-AMA. There was also a series of live-fire ranges, and the surrounding canyons were used for training exercises (Bischoff 2000:55–56). Camp Coxcomb is currently in disrepair, but footprints of its buildings remain. Portions have been washed away over time, but rock alignments and insignias remain, as does an altar that was constructed there. Camp Coxcomb was recommended eligible for inclusion in the NRHP by Bischoff (2000:56–58).

Camp Young. Camp Young was the headquarters of the DTC/C-AMA and the first divisional camp to be inhabited. It is where General Patton was stationed during his time at the DTC/C-AMA. Camp Young had the most improved facilities of any of the camps, including more than 3,000 tents (many with wood floors, half walls, and stoves). The facilities at Camp Young included two hospitals, warehouses, administrative buildings, bathhouses, mess halls, latrines, various live-fire ranges, a radio station, coliseum, theater, garages, pump stations, and shops (Bischoff 2000:88–89). The camp was heavily impacted by construction of I-10 and various pipelines and power lines. It also has been affected by erosion and pot-hunting. Bischoff (2000:89) noted that the impacts to Camp Young preclude it from being listed in the NRHP, although he suggested that listing it in the CRHR was a possibility for its preservation.

Camp Desert Center. Camp Desert Center consisted of approximately 34,000 acres set aside through a permit obtained by the War Department from the Department of the Interior. The camp is along the north side of what is currently I-10, between Chiriaco Summit and Desert Center. The installation reportedly consisted of a maneuver area, temporary housing, and other facilities such as an air field and evacuation hospital (Bischoff 2000:58). Little remains of Camp Desert Center besides rock-lined roads, walkways, and tent areas in the vicinity of Eagle Mountain Road, many of which were oiled or asphalted. Refuse is also apparent around the camp and to the immediate north, mostly consisting of oil cans, gas cans, and food cans (Bischoff 2000:59–61).

Camp Granite. Camp Granite was established in 1943. The original camp was flooded and was subsequently moved closer to the mountains. The camp included pyramidal tents, shower buildings, latrines, and a 50,000-gallon water tank. Portions of the camp have been washed away over time, although some rock-lined footpaths remain. The western portion of the camp is well preserved, and sections have been roped off to aid in preservation (Bischoff 2000:63). Bischoff recommended Camp Granite as eligible for inclusion in the NRHP because enough of the camp retains sufficient integrity to reflect the camp’s historical associations (Bischoff 2000:63).

Camp Iron Mountain. Camp Iron Mountain was established in the spring of 1942. Numerous roads and live-fire ranges were located at the camp. Many of the maneuvers of the DTC/C-AMA were planned at Camp Iron Mountain, which benefited from the use of a relief map similar to that at Camp Coxcomb (Bischoff 2000:71). The map showed an area from Kingman to Twentynine Palms and Hoover Dam to Coachella Valley. Bischoff (2000:71) listed Camp Iron Mountain as a district, as he did several other portions of the DTC/C-AMA. Portions of the camp have been fenced off to preserve walkways and chapels that were part of the original camp (Bischoff 2000:71).

Government Pass Training Site. Located in the Chuckwalla Mountains, Government Pass contains approximately 100 training features, including defensive positions (e.g., rifle pits, fox holes, rock walls, and artillery/tank firing pits), a cluster of cleared circles, and associated artifacts (e.g., WW II ration cans and shell casings). The site is a well-preserved example of the training of infantry troops in the DTC/C-AMA during WW II (Bischoff 2008:144).

Palen Pass Maneuver Area. The Palen Pass Maneuver Area is the best preserved and most extensive in the DTC/C-AMA. Defensive positions were established for mock battles, including trenches, tank traps, and bunkers. Most of the military activity occurred in an area bordered by the Palen, Little Maria, and McCoy mountains. Maneuvers in the Palen Pass area were known as the Battle of Southern California (Bischoff 2008:149-150). According to BLM Archaeologist George Kline (personal communication 2018), “Palen Pass was the maneuvers location best served by the closely located Camps Iron Mountain, Granite Mountain, Coxcomb, and Desert Center. Most of the Palen Pass sites have not been inventoried (recorded) due to many factors such as remoteness from maintained roads, location mostly in now congressionally Designated Wilderness areas, and of course, funding.”

2.4.9 Desert Strike

One brief military training exercise, known as Desert Strike, took place in the desert maneuver area in May 1964. Amidst the nuclear arms race, the U.S. Strike Command conducted the joint Army and Air Force field training exercise for the major combat organizations and their support units in employing tactical nuclear and conventional weapons (Desert Strike n.d.:312). Army and Air Force troop units were trained in passive and active tactics as well as concepts and procedures for joint operations.

The exercise was a two-sided enactment, with fictitious world powers “Calonia” and “Nezona” sharing a common border at the Colorado River. The premise of the conflict between these two entities, each led by a Joint Task Force, was a dispute over water rights. Major tactical operations during the exercise included deep armor thrusts, defensive operations along natural barriers, counterattacks including airmobile and airborne assaults, and the simulated use of nuclear weapons. The Air Force provided fighter, air defense, interdiction, counterair reconnaissance, and troop carrier operations in support of both joint task forces (Desert Strike n.d.:316). In the first phase of Desert Strike, Calonia initiated a mock battle with a full-scale invasion of Nezona. A new concept for military river crossings was put into operation during this invasion, accomplished with a combination of assault boats, amphibious armored personnel carriers, ferries, bridges, and fords at eight major sites across a 140-mile-long stretch of the Colorado River. The practice of attack and counterattack continued into a second phase, in which simulated nuclear strikes and airborne assaults were traded between the forces.

Desert Strike “proved once again the lessons [that] had been learned in WW II when this same area had been part of the great California-Arizona Maneuver Area,” with one commander, General Bastion, praising the extensive DTC/C-AMA, as it “provided freedom of maneuver and reduced the dependence of units on existing road nets. The long distances involved, the possibility for uninhibited movement, and the lack of civilian population centers as an alternate supply source provided extremely fine tests in logistics, communications, and maintenance” (Desert Strike n.d.:325).

The magnitude of the troop movements and the required supplies and equipment created one of the largest operations that has occurred in the U.S. since WWII (Desert Strike n.d.:319). The nature of the Desert Strike joint training exercise proved cumbersome and somewhat controversial. The total cost of Desert Strike was $35,342,493, with the participation of 89,788 troops (Desert Strike n.d.:323). The U.S. Continental Army Command initially critiqued the operation as being inefficiently planned because of poor timing in the unit training cycles, equipment degradation in the difficult environment, and a lack of value in troop training for the time and cost (Desert Strike n.d.:321). After Desert Strike, large-scale joint field training exercises were discontinued in the DTC/C-AMA.

2.4.10 Community Development

There are few communities surrounding the APE. The nearest large city is Blythe, California, a short distance northeast, and Desert Center, California, is approximately 60 miles west. Blythe has a population of 22,000 people. The largest contributor to its economy is agriculture along the wide, fertile Colorado River floodplain, where more than 100,000 acres are under cultivation, grossing in excess of $100,000,000 annually. The Blythe Chamber of Commerce (2016) touts the many recreational activities in the area, including fishing and boating on the Colorado River, camping, rock hunting, prospecting, and visiting old mines. The Palo Verde Mesa and the former Blythe Army Air Base are also attractive weekend destinations for local citizens who enjoy exploring the desert, the mines, and the WWII-era features associated with the DTC/C-AMA.

Desert Center was founded in 1921 by Stephen Ragsdale, who opened a small gas station and diner with his wife Lydia. They pumped gasoline from a 55-gallon drum and served food to weary travelers. The town was eventually moved 5 miles north to its current location along I-10 (what was then known as U.S. Route 60). Ragsdale constructed a large cafe and attached gas station along with a market and post office. He also built several cabins for travelers. Desert Center experienced a resurgence with the DTC and the establishment of Camp Desert Center and Airfield. However, the town once again became a small, quiet place once the DTC/C-AMA was closed at the end of WWII. Today, Desert Center is in disrepair, although it still serves as a stopping point along I-10. It thrives on a small tourist industry associated with the DTC/C-AMA and Patton’s time in the area.

2.5 ARCHAEOLOGICAL SITE TYPES AND RESEARCH THEMES

An understanding of site types common to the APE and vicinity help form the basis for evaluating resources in both local and regional contexts. Specific site types listed below have been documented in other parts of the Colorado Desert.

2.5.1 Prehistoric Site Types

Prehistoric site types fall into several categories, each distinguished by particular characteristics. The site types that are typically found in California, especially the deserts of the southeastern part of the state, are described below. Traits for each of these categories are provided for context and interpretive purposes.

2.5.1.1 Trails

Trails are generally tamped into stable surfaces, such as intact desert pavement, sometimes with larger gravel and pebbles pushed to the sides to form slight berms along the trail edges. Trail markers and shrines in the form of pebble or rock piles, petroglyphic markings on boulders, and other identifiers are also frequent indicators of the presence of a trail. In the desert, trails are typically found on the shoulders and tops of ridge systems and other upland areas, and on relatively stable alluvial fans, often disappearing into washes. Prehistoric trails can follow washes for considerable distances, although they are rarely well preserved due to the instability of wash environments. Kline (personal communication 2018) observed that “[t]he key to [a] trail’s preservation is location away from eolian sand transport, erosion, and abrasion. Best preserved trail segments have had the ground tamped down so as to repel water and any seeds that may land in the trail have no way to penetrate the hard-packed surface and are thus blown (or kicked) to the edges or eaten by birds.”

2.5.1.2 Lithic Scatters and Flaking Stations

This resource category can range from apparent single-event flaking stations to large scatters that often contain numerous flaking stations connected by a sparse background scatter of debitage. The flaking stations often include cores but rarely formed tools. The tools that are found are usually early stage biface blanks or expedient tools. The debitage is typically a result of core reduction. Debitage size is variable and is usually determined by the size of the parent material. A lithic study in nearby McCoy Wash attempted to assess reduction techniques and core size to provide a means of relative dating and to identify the technological patterns behind the reduction sequence (Flenniken and Spencer 2001). Others have examined cobble terrace locales to identify the range of reduction strategies that were employed in prehistory (Hintzman and Garfinkel 2011). Additionally, Native American representatives have pointed out that certain ritual activities also result in the production of scatters of flaked stone materials.

2.5.1.3 Ceramic Scatters and Pot Drops

“Ceramic scatter” refers to a dispersed surface distribution of ceramics, typically from multiple vessels. A “pot drop” usually refers to a small, distinct concentration of sherds from a single vessel. As early as the 1930s, Malcolm Rogers (n.d.) recognized that trail shrines and other ceremonially significant sites in the Colorado Desert might contain concentrations of prehistoric ceramics.

2.5.1.4 Cleared Circles

Cleared circles, sometimes referred to as “sleeping circles,” are commonly found throughout the region. These cleared areas in the desert pavement are roughly to nearly circular in outline. Cleared circles of sufficient size have often been considered to be sleeping or resting places, and smaller ones as vision quest or meditation circles (Davis 1980; Ezzo and Altschul 1993; Pigniolo et al. 1997; Rogers 1966; von Werlhof and von Werlhof 1977). Habitation debris is rarely found in direct association with cleared circles (Rogers 1966), and subsurface deposits at cleared circles in the Colorado Desert are rare or absent (Marmaduke and Dosh 1994; Pendleton et al. 1986; Schaefer 1986).

2.5.1.5 Rock Rings

Prehistoric rock rings are commonly found throughout southeastern California, southwestern Arizona and Utah, southern Nevada, and the Pinacate region of Mexico. Rock rings are found as isolates or in clusters and are situated in areas of desert pavement or other stable surfaces. Rings larger than 1 meter in diameter are typically regarded as habitation places, with the rocks possibly used to support brush walls (Pigniolo et al. 1997; von Werlhof and von Werlhof 1977). Smaller rock rings may indicate hearths or may have had a ceremonial function (Cleland 2005; Pigniolo et al. 1997). Although generally circular in shape, these features also occur as ovoids or rectangles (Rogers 1966) and are composed of one (usually) or more courses of rocks ranging from cobble-sized to small boulders.

2.5.1.6 Petroglyphs

Petroglyphs are typically formed by the removal, by various means, of the desert varnish or weathered surface from boulders or bedrock outcrops. Considered ceremonial in nature, petroglyphs in the Colorado Desert include anthropomorphic, zoomorphic, abstract, and geometric forms (Cleland and Apple 2003; Ezzo and Altschul 1993). Although found singly, petroglyphs usually occur clustered on rock faces, forming “panels.” A large-scale petroglyph site, CA-RIV-504, has been recorded in the nearby Mule Mountains.

2.5.1.7 Ground Figures: Geoglyphs and Rock Alignments

For the purposes of this study, two types of ground figures are recognized: geoglyphs and rock alignments. Both are considered to have ceremonial or ritual significance. Geoglyphs, sometimes referred to as intaglios, are typically composed of figures incised or scraped into the desert pavement (Harner 1953; Johnson 1985; Rogers 1945). In this kind of geoglyph, the rocks and gravel forming the desert pavement are removed, exposing the lighter-colored soil to form the shape. The removed gravel is often pushed to the edge to form a low gravel berm around the geoglyph. Depending on the construction method and the degree of erosion, these berms can range from well-defined to ill-defined or may be nonexistent (von Werlhof 1987). Geoglyphs may alternatively be tamped into the desert pavement rather than incised. For example, in tamped rings, the pavement surface is compressed but not actually removed; these are thought to have been used in ritual circle dances (Johnson 1985; Solari and Johnson 1982; von Werlhof 2004). Ground figures can also be formed by an additive process wherein cobbles and/or small boulders are placed on the ground surface in various types of alignments (Johnson 1985; von Werlhof 1987). Such types are referred to herein as rock alignments.

2.5.1.8 Cremations/Human Remains

Human remains are culturally highly sensitive and are subject to special protection under federal and state laws. Sites with cremations or other human remains have been recorded in the Colorado Desert, and including several in the vicinity and/or viewshed of the current Project (Kline p.c. 2018).

2.5.1.9 Ground Stone Quarries and Ground Stone Tools

Large-scale ground stone tool production is known from Bullhead Bajada (Crownover et al. 1994) and Antelope Hill (Schneider 1996) in Arizona, as well as at Elephant Mountain in the eastern Mojave Desert (Schneider et al. 1995). Evidence of ground stone production has been found in the Palo Verde Hills (Apple et al. 2001), Palo Verde Point (Johnson 2001), and Picacho Basin (Pendleton et al. 1986). Johnson (2001) indicates that there are several large quarries in the Palo Verde Point area used for the manufacture of mano, metate, and pestle blanks. At temporary campsites and habitation sites, ground stone tools are often cached or left in situ in places to which mobile groups intend to return.

2.5.1.10 Prehistoric Cairns

Within the Colorado Desert, prehistoric cairns are typically situated on stable surfaces. The cairns, which may be partially collapsed, are generally composed of multiple courses of rocks consisting of pebbles to small boulders. Prehistoric cairns are frequently found associated with trails or other features.

2.5.1.11 Habitation Sites

Habitation sites typically contain a large quantity and variety of artifacts and occupation debris. Multiple artifact classes may be present, along with subsistence remains (fish or mammal bone), fire-altered rock (FAR), and/or domestic architecture. Living areas, cooking hearths, middens, and discrete activity areas for lithic reduction, milling, or other subsistence-related activities may be identifiable at these sites.

2.5.1.12 Tenaja Sites

Tenaja is a geomorphic term originating in the American Southwest for ephemeral surface depressions in bedrock where water collects. These depressions or scour pools are formed by various processes, including erosion by spring seepage or waterfalls, or by sand and gravel scouring in intermittent streams or arroyos. Tenajas provide a vital source of surface water storage in arid environments (Osterkamp 2008). One example of such a site near the Project area is Mule Tank, a small, seasonal tenaja in the foothills of the Mule Mountains. This catchment would have been an important source of water in this vast and arid region. Tenaja sites are also found along dry lake playas such as Ford Dry Lake.

2.5.2 Historical Site Types

2.5.2.1 Transportation Routes

Transportation routes consist of historic trails and roads. The condition of the roads may vary from faint two-track routes to graded or paved alignments. Roads around the APE may relate to early transportation through the Chuckwalla Valley and other locations. Other transportation routes in the area may be associated with DTC/C-AMA activities (see below), such as two-track roads or tank tracks still visible on some surfaces.

2.5.2.2 Historical Camps

Temporary construction camps for linear facilities (e.g., railroads, transmission lines, water conveyance), military camps, and mining camps are found throughout the Colorado Desert. The camps include cleared areas that may be historic tent pads; associated features such as campfires/hearths and debris scatters are often present.

2.5.2.3 Refuse Scatters and Dumps

This site type ranges from small discrete deposits to large sparse scatters. These are often found along trails or roads, making associations difficult to establish. The APE traverses the DTC/C-AMA, which was an active military training facility during WWII. Refuse scatters dating between the mid-1930s and late-1940s are likely representative of DTC/C-AMA activities. Earlier refuse deposits may date to historical routes through the area.

2.5.2.4 Emplacements

The area in and around the APE also contains remnants of various landscape modifications that are likely associated with active battles during the training maneuvers of the DTC/C-AMA. Most appear to be fortified positions consisting of shallow dug-out depressions surrounded by low earthen berms and occasionally low walls of dry-stacked stones, usually including one to a few emplacements in a small area.

2.5.2.5 Vehicle Tracks

Vehicle tracks include those from tanks and troop transport vehicles (half-tracks). Track widths can be measured and correlated with specific tanks and vehicle types. In the APE and environs, tracks can be observed on stable terraces. Their general direction can be determined, but tracks tend to disappear across washes or when in less stable (i.e., sandier) sediments.

2.5.2.6 Historical Cairns

Many of the rock piles within the Colorado Desert are associated with historical mining claims. These can vary in size and composition. Rarely, a can or other container in the cairn will contain information regarding the claim.

2.5.2.7 Land Surveying Objects

Known and anticipated Land Surveying Objects include survey markers, monuments, benchmarks, and rock cairns. Survey markers were left by the U.S. General Land Office (GLO), USGS, U.S. Coast and Geodetic Survey, or by private property owners and land surveyors. Markers were left as benchmarks on topographic features and other locations and serve as a point of reference. Most such resources within the vicinity of the Project are U.S. GLO survey markers dated to 1917. Land Surveying Objects are generally not eligible for listing on the NRHP unless they are prominent mapping features such as brass or stone obelisks, or they are part of an important survey, such as state boundary lines, or base and meridian lines. Archival research may be required to evaluate the individual significance of Land Surveying Objects.

2.6 RESEARCH THEMES

This report assesses the significance of all resources in the APE, including those recorded prior to the current study. Research issues in the Colorado Desert relate to both prehistoric and historical archaeological sites. Research questions in prehistoric archaeology focus primarily around chronology, settlement patterns and land use, and lithic technology. Historical research themes are related principally to transportation, mining, agriculture/ranching, and military activity. Sites in the APE are interpreted within the context of their associated research themes to better address current challenges in modern archeological research.

2.6.1 Research Themes in Prehistory

2.6.1.1 Chronology

Chronology building continues to be a major research emphasis in the Colorado Desert. Most known sites are surface scatters of lithic artifacts and ceramics. Stratified sites of any kind are very rare in the region, and datable organics are limited by poor preservation conditions (Cleland and Apple 2003; Schaefer 1994). The general concentration of populations within the lower river valleys has meant that the majority of sites with intact datable deposits have been removed from the archaeological record by fluvial action. Thus, various factors have conspired to hinder the development of an adequate cultural chronology in the region. In view of this, one of the most important aspects of a prehistoric research program for the Colorado Desert should be to aid in the refinement of the regional chronological framework. Any site that contains organic cultural remains suitable for radiocarbon dating could prove useful in this endeavor. Key chronological topics that might be addressed include: (1) the reliability of regional dating methods, (2) issues regarding the earliest phases of human occupation of the region, (3) questions related to Archaic-era occupation, and (4) refinements of the regional ceramic sequence. Site types that may provide important new information in this theme include lithic scatters with temporally diagnostic projectile points, ceramic scatters and pot drops, and habitation sites. Furthermore, subsurface middens or charcoal associated with hearth features or temporary campsites may contribute new information to the chronology of the Colorado Desert.

2.6.1.2 Prehistoric Settlement and Land Use

Archaeological research in the Colorado Desert has not fully answered questions regarding early occupation and adaptations to unstable lacustrine environments (Schaefer 1994). Sites along prehistoric shorelines in the Mojave Desert to the north show evidence of a generalized resource procurement strategy that included both small and large game, indicating that a range of habitats was used (Sutton et al. 2007:237).

Studies of lacustrine environments in the Colorado Desert have focused primarily on Lake Cahuilla in the Coachella Valley, beginning with Rogers (1945). Wilke's (1978) archaeological excavations helped to confirm that the late Holocene saw a sequence of inundations at Lake Cahuilla. Working around the northern end of the lake, Wilke focused largely on settlement and subsistence issues. He concluded that lake stands were of adequate duration and the lacustrine environment was sufficiently productive to support year-round occupation of residential sites.

Weide (1976), on the other hand, concluded that Lake Cahuilla filled and receded rapidly, calling into question the viability of permanent shoreline settlements. Weide (1976) suggested that inland spring-fed streams provided more reliable and stable resources than shorelines could. Augmenting this argument, Weide and Barker (1974:106–107) suggested that the wide fluctuations of Lake Cahuilla may have been too unstable to support permanent habitation or large population shifts. Rather, small seasonal camps were the only habitation sites possible along prehistoric shorelines.

This debate fueled research across the Colorado Desert in subsequent years. Research orientations surrounding lacustrine environments have focused on establishing sustainable population sizes within sites. This is a challenging task because of the numerous variables involved, including site size, midden thickness/depth, artifact density and variability, presence of multiple cremations or cremation grounds, presence of ceremonial artifacts, and other signs of sustained presence at a residential base for hunter-gatherer societies (Schaefer 1994:69).

Other aspects of lacustrine environments in the Colorado Desert are particularly relevant to the APE. For example, areas where alluvial fans come abruptly down onto shorelines (such as at Ford Dry Lake and along the edge of the Colorado River floodplain) are likely to have more densely concentrated site clusters. Research has indicated that shallow midden deposits exist at these sites (Schaefer 1994:70). Sites in the APE that may relate to this theme include lithic scatters and flaking stations, ceramic scatters and pot drops, habitation sites, rock alignments, and ground stone tools.

2.6.1.3 Lithic Technology

Several factors affect the ways that hunter-gatherers chose to organize the procurement, manufacture, and discard of flaked stone tools, including the relative availability and quality of toolstone within their territorial range, distance to raw materials, intended tool functions, the frequency and nature of residential moves, the organization of work groups, and division of labor (e.g., Bamforth 1990; Beck et al. 2002; Eerkens et al. 2007; Kelly 1988). Hence, the documentation of lithic technology can be useful in addressing more general questions regarding territoriality, mobility, settlement patterns, and down-the-line exchange. For example, highly mobile people may “gear up” when they encounter toolstone suitable for knapping (Kelly and Todd 1988). In doing so, they discard curated tools, often from distant sources. Changes in toolstone procurement behavior may reflect intensified subsistence procurement within more restricted territories and/or changes in the scheduling and directionality of seasonal subsistence-related residential mobility.

Because of high transport costs, ground stone tools were often cached or left in situ at places to which mobile groups intended to return, although the high costs of ground stone transport may have been reduced by river transport (Schneider 2006). Because of this cost, these tool types may indicate a location of relatively frequent and/or long-term use. Ground stone procurement patterns have been studied along the lower Colorado River (Huckell 1986; Schneider 2006). The Bullhead City quarry, approximately 100 miles north of the APE on the Colorado River, produced a material variously referred to as alkali-olivine basalt or andesite, used in the manufacture of metates (Huckell 1986; Schneider 2006). Huckell (1986:55) notes that the quarry appears to have been used by the Mojave for a period of a few hundred years. Other ground stone production quarries include Elephant Mountain and Antelope Hill, northwest and southwest of the APE, respectively. Site types that may relate to this theme include lithic scatters, flaking stations, and sites containing ground stone tools.

2.6.2 Historical Research Themes

Prior to 2008, before environmental review for utility-scale solar projects and other similarly sized projects became common, cultural surveys indicated that historic-era resources are present in lower frequency than prehistoric resources. As a result, previous research efforts frequently focused on prehistory, leaving historic period research questions relatively underdeveloped. In the intervening years, such research in the region has become more robust, and inventory work has indicated that historic-era resources constitute a large proportion of the sites and isolates in the region. Based on this understanding, transportation, mining, agriculture/ranching, and military training themes are most relevant to the APE.

Material culture associated with early historical routes is evident on the landscape in the form of cans or other refuse typically associated with vehicle maintenance. Debris associated with early automobile use is often found adjacent to modern roadways, which may indicate the age and historical use of the route.

Although large-scale mining was not a major endeavor in and around the APE, evidence of mining activities is still visible on the landscape. Prospect pits, claim posts and cairns, small tailings piles, and associated cans, jars, or other debris indicate that prospecting has taken place. Historical references indicate that mining took place in the region well into the twentieth century. Identifying mining activities, no matter the scale, can provide important information about past development of the APE and the region as a whole.

Lastly, one of the most significant research issues surrounds the use of the area as a military training facility. The history of the DTC/C-AMA has been well documented (see Bischoff 2000, 2008; Henley 1992; Meller 1946), although the material culture of the facility is not well defined in all areas. The DTC/C-AMA was the largest military training facility ever operated in the United States, and physical evidence of its use is visible throughout the region. Various activities may be identified due to the material remains of the DTC/C-AMA. One of the starkest pieces of evidence of such activities are tank tracks that have survived for decades. Just as prehistoric trails display tamped surfaces from use over time, tank tracks leave a semipermanent mark on the land.

Debris from military activities is also evident on the surface. While tin cans tend to have wide dates of manufacture, certain characteristics of the cans (such as the opening method) may allow dating to very specific points in time. Tin cans are often overlooked in terms of their potential to yield information about a site, which can lead to incorrect assumptions about a site (Busch 1981: 102). However, proper identification and documentation of cans as one of several lines of evidence have the potential to narrow the estimated temporal range of historical archaeological sites.

3
LITERATURE AND RECORDS SEARCH

Prior to field surveys, Æ prepared a Class I existing information inventory in accordance with the BLM Manual Section 8110.2.21.A and the requirements of the DRECP PA. This inventory provides a comprehensive account of all known archaeological and historical sites and Traditional Culture Properties (TCPs) in the vicinity of the Project APE. The Class I inventory included an archaeological records and literature search at the Eastern Information Center of the California Historical Resources Information System; a review of existing publications, maps, and technical reports relevant to the Project; and consultation with the BLM regarding known cultural resources and potential TCPs within the direct and indirect APE (Mirro and Clark 2016).

The records search area for the Class I inventory extended for 1 mile beyond the boundary of the Project APE. At the request of the BLM, the records search area was expanded by an additional mile to the southeast from the base of the Mule Mountains to encompass the Mule Mountains ACEC. This records search area (Project Study Area) thus included 30 square miles and extended beyond the indirect APE boundary and view shed of the Project APE in some areas. The BLM used the data presented in the Class I inventory to determine the appropriate identification effort for the proposed undertaking. The BLM submitted the Class I report to the SHPO and other consulting parties for review and comment on October 7, 2016. For a comprehensive review of the known resources, previous studies, and research themes relating to the APE, see *Class I Cultural Resource Inventory for the RE Crimson Solar Project, Riverside County, California*, prepared by Mirro and Clark (2016).

3.1 PREVIOUS CULTURAL RESOURCE INVESTIGATIONS

The literature review and records searches revealed that nine prior archaeological investigations had covered portions of the Project APE (Table 3-1). Seven of the nine surveys completed within the direct APE were completed in support of electric transmission infrastructure projects. These include three linear surveys for the Southern California Edison Devers - Palo Verde (DPV) 500 kV Transmission Line (RI-00220, RI-00221, and RI-00222); two surveys for the Colorado River Substation (RI-08730 and RI-8971); a small survey for the DPV 2 Project (RI-8978); and one survey for the Ten West Link 500 kV Transmission Line. Other cultural work undertaken within the direct APE includes a survey of an archaeological sample unit for the Big Maria Planning Unit, California Desert Program (RI-01249) and a linear survey of the Seisdata Services Chuckwalla Geophysical Test Corridor Project (RI-01664). In total, approximately 14 percent (407 acres) of the direct APE has been inventoried by these previous surveys, with much of this work concentrated in the northern portion of the area.

Table 3-1
Previous Cultural Studies within the Direct APE

Report (RI) #	Year	Author(s)	Affiliation	Title	Amount Surveyed	Resources Identified
RI-00220	1977	Richard A. Cowan and Kurt Wallof	Archaeological Research Unit, U.C. Riverside	Interim Report Field Work and Data Analysis: Cultural Resource Survey of the Proposed Southern California Edison Devers-Palo Verde 500 Kv Transmission Line	216.5 square miles	7
RI-00221	1982	Richard L. Carrico, Dennis K. Quillen, and Dennis Gallegos	WESTEC Service, Inc., San Diego, CA	Cultural Resource Inventory and National Register Assessment of the Southern California Edison Devers-Palo Verde Transmission Line Corridor (California Portion)	6,120 acres	34
RI-00222	1977	Kurt Wallof and Richard A. Cowan	Archaeological Research Unit, U.C. Riverside	Final Report: Cultural Resource Survey of the Proposed Southern California Edison Devers-Palo Verde 500 Kv Power Transmission Line	216.5 miles x 400 feet	23
RI-01249	1978	Bureau of Land Management	Bureau of Land Management	California Desert Program: Archaeological Sample Unit Records for the Big Maria Planning Unit	ca. 5,280 acres	31
RI-01664	1982	WESTEC Service, Inc., San Diego, CA	WESTEC Service, Inc., San Diego, CA	Cultural Resource Inventory of Seisdata Services Chuckwalla Geophysical Test Corridor, Riverside County, California	6.5 miles x 33 meters	1
RI-08730	2011	Erin Enright and Michael Mirro	Applied EarthWorks, Inc.	Class III Resources Survey for the Colorado River Substation Alternatives Analysis, Unincorporated Riverside County, CA	1,264.3 acres	0
RI-08971	2011	Matthew M., DeCarlo and, William T., Eckhardt	ASM Affiliates	Cultural Resources Inventory of the Southern Boundary of the Proposed Colorado River Substation, Riverside County, California	92 acres	10
RI-08978	2013	Matthew M. DeCarlo	ASM Affiliates	Cultural Resources Inventory of Late Engineering Construction Components, Southern California Edison (SCE) Devers-Palo Verde 2 (DPV2) Project, Riverside County, California	Unknown	0
To be assigned	2018	Jill K. Gardner and Amy Ollendorf	Applied EarthWorks, Inc	Class III Cultural Resource Inventory of Route Segments P17 and P18 and a Portion of Route Segment P16 for the Ten West Link 500 kV Transmission Line Project, Riverside County, California	636 acres	93

3.2 PREVIOUSLY RECORDED CULTURAL RESOURCES

Within the previously surveyed portions of the direct APE, 67 cultural resources (45 sites and 22 isolated finds) were documented (Table 3-2). Of the 45 sites, 18 are historical, 20 are prehistoric, and 7 contain materials associated with both periods. The isolated finds include 16 prehistoric, 5 historic, and 1 prehistoric and historic.

Table 3-2
Previously Recorded Cultural Resources within the Direct APE

Trinomial	Primary	Temporary Designation	Description
CA-RIV-1819/H	33-001819	Æ-3372-464/H	Historical DTC refuse scatter with emplacements and lithic and ceramic scatter
CA-RIV-10013H			Historical refuse scatter
CA-RIV-10014H			Historical refuse scatter
CA-RIV-10015			Ceramic scatter
CA-RIV-10016H	33-019701	AE-DEV-28H	Historical refuse scatter
CA-RIV-10017H	33-019702	AE-DEV-29H	Historical refuse scatter
CA-RIV-10018H	33-019703	AE-DEV-30H	Historical refuse scatter and emplacement
CA-RIV-10019H	33-019704	AE-DEV-31H	Historical refuse scatter
CA-RIV-10020H	33-019705	AE-DEV-32H	Historical refuse scatter
CA-RIV-10021H	33-010021	AE-DEV-33H	Historical refuse scatter
CA-RIV-10022	33-010022	AE-DEV-34	Lithic scatter
CA-RIV-10023	33-010023	AE-DEV-35	Lithic scatter
CA-RIV-10024	33-019709	AE-DEV-36	Lithic and ceramic scatter
CA-RIV-10025/H	33-010025	AE-DEV-37/H	Lithic scatter, Historical refuse scatter
CA-RIV-10027/H	33-019713	AE-DEV-40/H	Lithic scatter, Historical refuse scatter
CA-RIV-10029H	33-019715	AE-DEV-42H	Historical DTC refuse scatter
CA-RIV-10030H	33-019716	AE-DEV-43H	Historical DTC refuse scatter
CA-RIV-10032/H	33-019718	AE-DEV-45/H	Historical refuse scatter
CA-RIV-10033/H	33-019719		Historical refuse scatter, lithic scatter
CA-RIV-10038	33-019724	AE-DEV-51	Lithic and ceramic scatter
CA-RIV-10080H	33-019797	SJ-CRS-1	Historical refuse scatter
CA-RIV-10081	33-019798	SJ-CRS-2	Ceramic scatter
CA-RIV-10087H	33-019806		Historical refuse scatter, U.S. GLO survey marker
CA-RIV-10088H	33-019807		Historical refuse scatter
CA-RIV-10089	33-019808		Ceramic scatter
CA-RIV-10090H	33-019809		Historical refuse scatter
CA-RIV-10091	33-019810		Ceramic scatter
CA-RIV-10092H	33-019811		Historical refuse scatter
CA-RIV-10884	33-020323		Ceramic scatter
CA-RIV-10962			Ceramic scatter
CA-RIV-10963	33-21131		Lithic and ceramic scatter
CA-RIV-11649	33-023731		Ceramic scatter
CA-RIV-11650	33-023732		Ceramic scatter

Table 3-2 (continued)
Previously Recorded Cultural Resources within the Direct APE

Trinomial	Primary	Temporary Designation	Description
CA-RIV-11651			Ceramic scatter
CA-RIV-11652/H	33-023734	SEZ-RE-S-075	Historical refuse scatter, prehistoric ceramic
CA-RIV-11653H	33-023735	SEZ-RE-S-076	Historical refuse scatter
CA-RIV-11654	33-023736	SEZ-RE-S-077	Ceramic scatter
CA-RIV-11655			Lithic and ceramic scatter
CA-RIV-12683	33-028091	AE-3372-055	Lithic scatter
CA-RIV-12684	33-028092	AE-3372-122	Lithic and ceramic scatter
CA-RIV-12685H	33-028093	AE-3372-127H	Historical refuse scatter
CA-RIV-12686	33-028094	AE-3372-128	Lithic scatter
CA-RIV-12687/H	33-028095	AE-3372-160/H	Historical DTC refuse scatter, emplacement, and lithic scatter
CA-RIV-12688	33-028096	AE-3372-310	Lithic and ceramic scatter
	33-019712	AE-DEV-39H	U.S. GLO Survey Marker S\7 S\8
	33-019764	AE-DEV-ISO-4	Isolated find-Lithic flake
	33-019765	AE-DEV-ISO-5	Isolated find-Lithic flake tool
	33-019769	AE-DEV-ISO-9	Isolated find-Single primary flake
	33-019774	AE-DEV-ISO-14/H	Isolated find-Ceramic sherd and can
	33-019812	MMD-CRS-ISO-1	Isolated find-Historical cans
	33-019813		Isolated find-Historical glass jar
	33-019814		Isolated find-Historical metal pocket tobacco tin
	33-020317		Isolated find-Hammerstone
	33-020319		Isolated find-Chert unidirectional core
	33-020336		Isolated find-Chalcedony core
	33-023038		Isolated find-Glass bottle
	33-023039	PVM-MN_ISO-276	Isolated find-Historical P38-opened can ration lid
	33-023644	SEZ-RE-ISO-050	Isolated find-Ceramics (2)
	33-023646	SEZ-RE-ISO-052	Isolated find-Lithic flake
	33-023647	SEZ-RE-ISO-053	Isolated find-Prehistoric pectenidae fragment
	33-023648	SEZ-RE-ISO-054	Isolated find-Ceramic sherd
	33-023649	SEZ-RE-ISO-055	Isolated find-Ceramics (5, pot drop)
	33-028113	AE-3372-102-ISO	Isolated find-Hammer/groundstone
	33-028114	AE-3372-103-ISO	Isolated find-flake scraper
	33-028115	AE-3372-104-ISO	Isolated find-Utilized secondary chert flake
	33-028116	AE-3372-126-ISO	Isolated find-Ceramic sherd and modified flake
	33-028117	AE-3372-465-ISO	Isolated find-Basalt biface

3.3 TRIBAL PARTICIPATION

3.3.1 Tribal Letters and Meetings

On February 19, 2016, the BLM Palm Springs-South Coast Field Office sent initial pre-application meeting notification letters to 30 tribal chairs, members, Tribal Historic Preservation Officers (THPOs), and cultural committees, as required by the DRECP PA. These letters provided information regarding the proposed Project and invitations to forthcoming meetings and site visits to discuss the proposed ROW and POD. The purpose of these letters was to inform local tribes of proposed actions on public lands and to solicit comments or concerns regarding the proposed undertaking. Specific to Section 106 of the NHPA, the implementing regulations at 36 CFR 800 require the BLM to consult with Native American tribes that attach religious or cultural significance to historic properties that may be affected by an undertaking. All comments from the local tribes were directed to the BLM. A contact log and a sample letter of the Native American pre-application meeting notification letters and their enclosures are included in Appendix E.

3.3.2 Native American Heritage Commission

On June 30, 2016, Æ contacted the Native American Heritage Commission (NAHC) to request a search of their Sacred Lands Inventory to identify any known places within or adjacent to the study area of importance to Native Americans. The NAHC responded to Æ's information request on July 6, 2016 and noted that its search of the Sacred Lands File failed to indicate the presence of any Native American cultural resources within the Project area (Appendix E).

3.3.3 Tribal Monitoring

Tribal members from the Colorado River Indian Tribes (CRIT) and the Agua Caliente Band of Cahuilla Indians (ACBCI), participated in the Class III survey by serving as tribal monitors. Names and tribal affiliation of monitors are presented in Chapter 4.

4
PROJECT METHODS

4.1 SURVEY FIELD METHODS

Between July 24, 2017 and November 21, 2017, archaeologists from Æ and Aspen Environmental, accompanied by Tribal monitors from the Colorado River Indian Tribes (CRIT) and the Agua Caliente Band of Cahuilla Indians (ACBCI), conducted a Class III pedestrian survey[1] of the direct APE.

Matt Tennyson and Barry Price served as Principal Investigators for the Class III inventory. Patrick Moloney and Kurt McLean worked as Field Directors, while crew chief duties were carried out by Evan Mills, William Borkan, and Brendan Fitzsimons. Crew members included Chuck Bouscaren, Renee Elder, Will Huey, Eric Kowalski, Melanie Lerman, Colin Nordall, Josh Noyer, Pam Pyatt, Kent Smolik, Abigail Tirabassi, and Eleni Ziogas. William Sebrell was the Unexploded Ordinance (UXO) Technician. Tribal Monitors and their affiliations are presented in Table 4-1.

Table 4-1
Crimson Tribal Monitors

Name	Position	Affiliation
Ramon Dominguez	Tribal Monitor	Agua Caliente Band of Cahuilla Indians (ACBCI)
William Dominguez	Tribal Monitor	Agua Caliente Band of Cahuilla Indians (ACBCI)
Harry Fisher	Tribal Monitor	Agua Caliente Band of Cahuilla Indians (ACBCI)
Larry Holleman	Tribal Monitor	Agua Caliente Band of Cahuilla Indians (ACBCI)
Luis Rodriguez	Tribal Monitor	Agua Caliente Band of Cahuilla Indians (ACBCI)
Jesse Sandoval	Tribal Monitor	Agua Caliente Band of Cahuilla Indians (ACBCI)
Brian Etsitty	Acting THPO Director	Colorado River Indian Tribes (CRIT)
Albert Chavez	Tribal Monitor	Colorado River Indian Tribes (CRIT)
Matt Cruz	Tribal Monitor	Colorado River Indian Tribes (CRIT)
Coy Eddy	Tribal Monitor	Colorado River Indian Tribes (CRIT)
Jamil Gary	Tribal Monitor	Colorado River Indian Tribes (CRIT)
Kyle Humeyumptewa	Tribal Monitor	Colorado River Indian Tribes (CRIT)
Nick Martinez	Tribal Monitor	Colorado River Indian Tribes (CRIT)
Rudy Martinez	Tribal Monitor	Colorado River Indian Tribes (CRIT)
Vincent Ornelas	Tribal Monitor	Colorado River Indian Tribes (CRIT)
Barry Sharp	Tribal Monitor	Colorado River Indian Tribes (CRIT)
Lorenzo Tahbo Jnr.	Tribal Monitor	Colorado River Indian Tribes (CRIT)
Nick Zeyouma	Tribal Monitor	Colorado River Indian Tribes (CRIT)

[1] A Class III survey is “a professionally conducted, thorough pedestrian survey of an entire target area” intended to “provide managers and cultural resource specialists with a complete record of cultural properties locatable from surface and exposed profile indications” (BLM 2004:8¬73). The purpose of this kind of survey is to identify and record all archaeological and historical sites encountered in the field that may be eligible for listing in the NRHP.

The field survey commenced on July 24, 2017 with a meeting of all field personnel, including archaeologists, tribal monitors, and UXO consultant. The crew discussed survey methods and protocols, general safety, UXO specific safety, daily schedules, meeting times and places, and procedures regarding archaeological resource identification, classification, and documentation. Prior to each subsequent day's field work, all field personnel attended a daily briefing on both general safety protocols and those specific to UXOs. Each daily briefing concluded with an open discussion during which attendees were encouraged to voice their experiences and observations from the previous day's survey, with particular emphasis on safety. General safety topics included:

- Unstable surfaces and avoiding slips and falls on
- Snakes and other venomous or otherwise potentially injurious creatures
- Heat stress and dehydration
- Maintaining the 25 mph (paved roads) and 15 mph (unpaved roads) speed limits within the APE
- Operating the "buddy system" to ensure mutual safety of all survey participants
- Tortoise awareness
- Zero tolerance policy on sexual harassment

UXO specific topics included:

- Avoidance: Staying away from UXOs is the best way to prevent accidental injury or death.
- Halt: Do not touch, photograph, pick up, move, or in any other way disturb a UXO. It could detonate.
- Retreat: Some types of ordnance have magnetic or motion sensitive fusing and will not detonate until they sense a target. DO NOT continue to move toward a suspected UXO.
- Report: Immediately report the discovery of potential UXOs to UXOSO/QCS Technician William Sebrell. If the UXO technician could not be reached then the crew chief, field supervisor, or next responsible person was to be contacted
- Make all cell phone calls from at least 100 meters away from a UXO hazard. UXOs are susceptible to electromagnetic radiation (EMR) and may explode.

Following the daily briefing the survey team divided into 4 four-person crews of archaeologists. Each archaeology crew was accompanied by at least one tribal monitor at all times (personnel permitting). The UXO technician arranged to be at a location that had both good cell phone reception and also allowed expeditious access to all crews.

Each crew systematically examined the ground surface within its given survey area using pedestrian transects spaced no wider than 20 meters (66 feet), as specified in the Work Plan. Tribal monitors walked either between transects or followed behind, thus ensuring full professional coverage of the APE. Transects were reduced to 3–5 meters within previously or newly identified archaeological sites to adequately ascertain and/or confirm and subsequently define site characteristics.

All landforms likely to contain or exhibit archaeological or historical remains were rigorously inspected to ensure that visible, potentially significant cultural resources were discovered and documented. Additionally, the archaeologists investigated any unusual contours, soil changes, distinctive vegetation patterns, features (e.g., road cuts, ditches, and stream cuts), and other potential site indicators. Previously documented cultural resources, both within and immediately adjacent to (within a 20-meter buffer of) the APE, were visited and intensively reexamined to confirm their presence, determine their current condition, and redefine their descriptions and boundaries where necessary.

When cultural resources (i.e., isolated finds, sites, structures, or objects) were encountered during the survey, systematic efforts were made to characterize and define their areal extent. California site definition and recording standards, found in *Instructions for Recording Historical Resources* (Office of Historic Preservation 1995), were used when newly identified cultural resources were encountered. These resources were recorded on State of California site forms which minimally include a Primary Record (DPR 523A) and a Location Map based on a USGS topographic map (DPR 523J). More complex resources required an Archaeological Site Record (DPR 523C), Linear Feature Form (DPR 523E), Photograph Record (DPR 523I), and/or a Sketch Map (DPR 523K). Sketch maps displayed a site datum, cultural features, artifact concentrations, and other cultural elements. Apparent clusters of artifacts were recorded as concentrations or loci. Non-portable elements of sites (e.g., hearths) were recorded as features. In addition to the information required for the cultural resource record forms, Æ produced detailed field notes for each site.

For the purpose of this survey, and in consultation with BLM Archaeologist George Kline, three or more artifacts greater than 50 years of age within a 30-meter (98-foot) radius were recorded as a site. Single features on the landscape, even if absent of observable artifacts on the surface, were also recorded as sites. This included historical U.S. GLO survey markers. Cultural features or clusters of artifacts more than 30 meters away from the nearest known cultural resource were considered a separate site. To help with resource evaluations, and in compliance with BLM Class III standards, the surveyors recorded specific characteristics of flaked and ground stone artifacts and native ceramics including artifact class, raw material type, morphology or form, and count. Material class, functional group, diagnostic information (product names, manufacturer, or makers' marks), and frequency data were recorded for historical artifacts.

All cultural resource locations were plotted on the appropriate 1:24,000 scale USGS 7.5-minute quadrangle using a Trimble Geo XH hand-held global positioning system (GPS) unit with sub-meter accuracy. The GPS unit was also used to determine and document the precise locations and Universal Transverse Mercator (UTM) coordinates of all activity loci, cultural features, and temporally or functionally diagnostic artifacts as well as relevant topographies (e.g., drainage features, rock/vegetation outcrops) that could assist in future relocation and/or understanding of the function and placement of the site. Æ digitally photographed the site capturing images of each activity locus, cultural features, and temporally or functionally diagnostic artifacts present. All cultural features were fully documented and mapped by UTM coordinates.

The same protocols were applied to previously recorded cultural resources within or adjacent to the APE. When possible—presuming items had not been collected during prior surveys and/or controlled surface collections, shovel testing, and/or test unit excavations—Æ attempted to locate all previously documented activity loci, cultural features, and artifacts to authenticate the records. If the cultural resource could not be located at the UTM coordinates given, then Æ noted the site as "Not Located" (See Appendix F). A site record update was not prepared for sites not found during the Crimson Class III inventory. If the resource was located and Æ observed changes in the site's constituents, size, or condition, then Æ prepared a DPR-523L Continuation Sheet to reflect the new findings and/or correct site boundaries (when applicable). If the site was found to be unchanged, a DPR form was prepared noting the date of the site visit and that no change to the resource was observed. Class III surveys are non-collection studies; thus, no artifacts were collected during this survey. All surface items physically handled for inspection and recordation were returned to their original locations.

Isolated finds were documented, photographed, and plotted with a Trimble GPS unit. For the purposes of this Project, per BLM archaeologist George Kline, an isolate was defined as a cultural resource with fewer than three artifacts within a 5 by 5 meter square (25 square meters) which does not meet the definition of an archaeological site. A concentration of prehistoric ceramic sherds from the same vessel, or "pot drop," was recorded as an isolate regardless of the number of sherds present.

At BLM's request, Æ also visited three cultural resources in the indirect APE to verify the site boundaries and update the DPR forms. These resources include the Mule Tank Petroglyph Site (CA-RIV-504) and two trail segments (CA-RIV-343 and -673). As feasible, each trail segment was followed beyond its recorded alignment to more fully document its extent. These sites, all within the Project's indirect APE, will be discussed in a forthcoming Indirect Effects Assessment report.

Also, at BLM's request, several areas previously excluded from the survey were ultimately surveyed when permission was granted. These included five unnamed washes emanating northwest out of the Mule Mountains into the Project area, and several tracts of privately owned land. From east to southwest the washes added 75, 50, 74, 70 and 24 acres respectively. The privately-owned land included an 8.4-acre tract in the northwest, a 3.1-acre tract in the south, an 11.5-acre tract in the east, an 18-acre tract in the southeast, and a 148-acre tract in the northeast sections of the Project area. These additional survey areas amounted to an extra 487 acres.

The survey was completed over 5 ten-day rotations and 1 nine-day rotation, for a total of 59 field days. The extreme heat and other environmental conditions urged conducting the survey as quickly as possible; for that reason all survey blocks were examined in their entirety, and site locations quickly recorded with the GPS unit; crews returned to record each resource after all survey blocks had been inspected. Isolated resources, however, were recorded concurrently with the initial inspection. It had originally been proposed that all site forms, along with all other field forms and all photography, would be completed digitally using Microsoft Surface Pro 3 touch screen tablets; however, extreme weather conditions, in particular temperatures consistently exceeding 105º and occasionally 110º Fahrenheit, proved too much for the electronic equipment and paper documentation was necessarily substituted. Limited vehicular access to the APE, necessitating lengthy daily hikes in and out of the field, further impeded progress.

The field supervisor and crew chiefs completed daily work records documenting survey personnel attendance, including tribal monitors hours worked, weather conditions, ground surface visibility, vegetation, fauna, soils, exposure/slope, topography, natural depositional environments, and identified cultural resources.

Finally, Æ archaeologists adhered to BLM Class III field procedures and protocols which state that “previously recorded cultural resources and newly recorded cultural resources whose boundaries lie partially within or straddle the APE will be fully recorded outside the APE, to the extent practical, regardless of surface ownership.”

4.2 APPROACH TO NRHP ELIGIBILITY EVALUATION

Using all available data from field documentation, archival research, Native American input, and research contexts, the significance and integrity of all identified resources in the direct APE have been assessed in order to develop recommendations regarding their eligibility for inclusion in the NRHP. Each resource was evaluated individually under all four NRHP criteria and, when appropriate, as a contributing element of identified cultural landscapes or districts such as the Prehistoric Trails Network Cultural Landscape (PTNCL) and the DTC/C-AMA.

A property is eligible for listing in the NRHP when it retains integrity and meets at least one of the four criteria of significance presented in 36 CFR 60.4:

> “The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
>
> A. that are associated with events that have made a significant contribution to the broad patterns in our history; or
> B. that are associated with the lives of persons significant in our past; or
> C. that embody distinctive characteristics of a type, period, or method of construction, 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, or
> D. that have yielded, or may be likely to yield, information important in prehistory or history (United States Department of the Interior and National Park Service 1995).

To evaluate the significance of sites described in this Class III Inventory, Æ considered the nature and content of the resource, the quantity and variety of artifacts present, the distribution and spatial patterning of artifacts and features, and the presence (or potential presence) of organic remains suitable for radiocarbon dating. In most cases, sites with a broad quantity and variety of artifacts, discernible features, and datable remains (either temporally diagnostic artifacts or organic material) were judged significant. Those with relatively few artifacts, or lacking in diversity or datable materials, were typically judged insignificant. When eligibility could not be determined based on surface indicators, further testing is recommended. Eligibility and testing recommendations are presented in Chapter 6.

5
SURVEY RESULTS

5.1 SURVEY COVERAGE

The Project APE encompasses 3,089.75 acres. Æ surveyed a slightly larger area to accommodate minor changes in Project design. The overall survey area thus consisted of 3,484.85 acres (Figure 5-1). Æ surveyed the entire area save for 88.4 acres which occur on private land outside the Project footprint. Surface visibility throughout the survey area was greater than 95 percent due to minimal desert vegetation.

Æ identified 350 cultural resources within the APE. Of these, 167 are archaeological sites (82 prehistoric, 58 historical, and 27 with both prehistoric and historical components) while 183 are isolated finds (Appendix F).

5.2 SITES PREVIOUSLY IDENTIFIED WITHIN THE APE

Previous cultural resource inventories within the direct APE identified 45 archaeological sites. Of these, 20 are prehistoric, 18 relate to the historic-era, and 7 contain materials associated with both periods. Æ revisited all but one of the previously identified sites; CA-RIV-10884 could not be located during the current survey. Site record updates were prepared for those resources that had a change in the site constituents, size, or condition (Appendix C).

5.2.1 Prehistoric Sites

CA-RIV-10015

Recorded in 2011 as a very small (70 by 30 centimeter) scatter of three prehistoric ceramic body sherds, Æ archaeologists revisited CA-RIV-10015 during the present survey and found it to be unchanged. The site is situated in a sparse creosote bush scrub environment on the floor of the Chuckwalla Valley.

CA-RIV-10022

This site was recorded in 2011 as a small (37 by 3.6 meters) low-density, prehistoric lithic scatter of one chert flake, two split chert cobbles, and one chalcedony core fragment. Æ visited CA-RIV-10022 during the 2017 survey and observed no changes. The 2011 site record reported the site to be in poor condition due to dune sand encroachment and OHV traffic. The site continues to be significantly impacted by these factors.

CA-RIV-10023

CA-RIV-10023 was recorded in 2011 as a small (37 by 34 meters) lithic scatter with three cores, one flake tool, a variety of flakes, angular shatter, a tested cobble, and a deflated hearth (1.85 by 1.7 meters) composed of 100+ small cobbles and pebbles (Feature 1). The site lies on the partially sand dune covered floor of the Chuckwalla Valley. Æ could not locate the site during the 2017 survey despite intensive efforts. Æ did observe a rock concentration of unknown

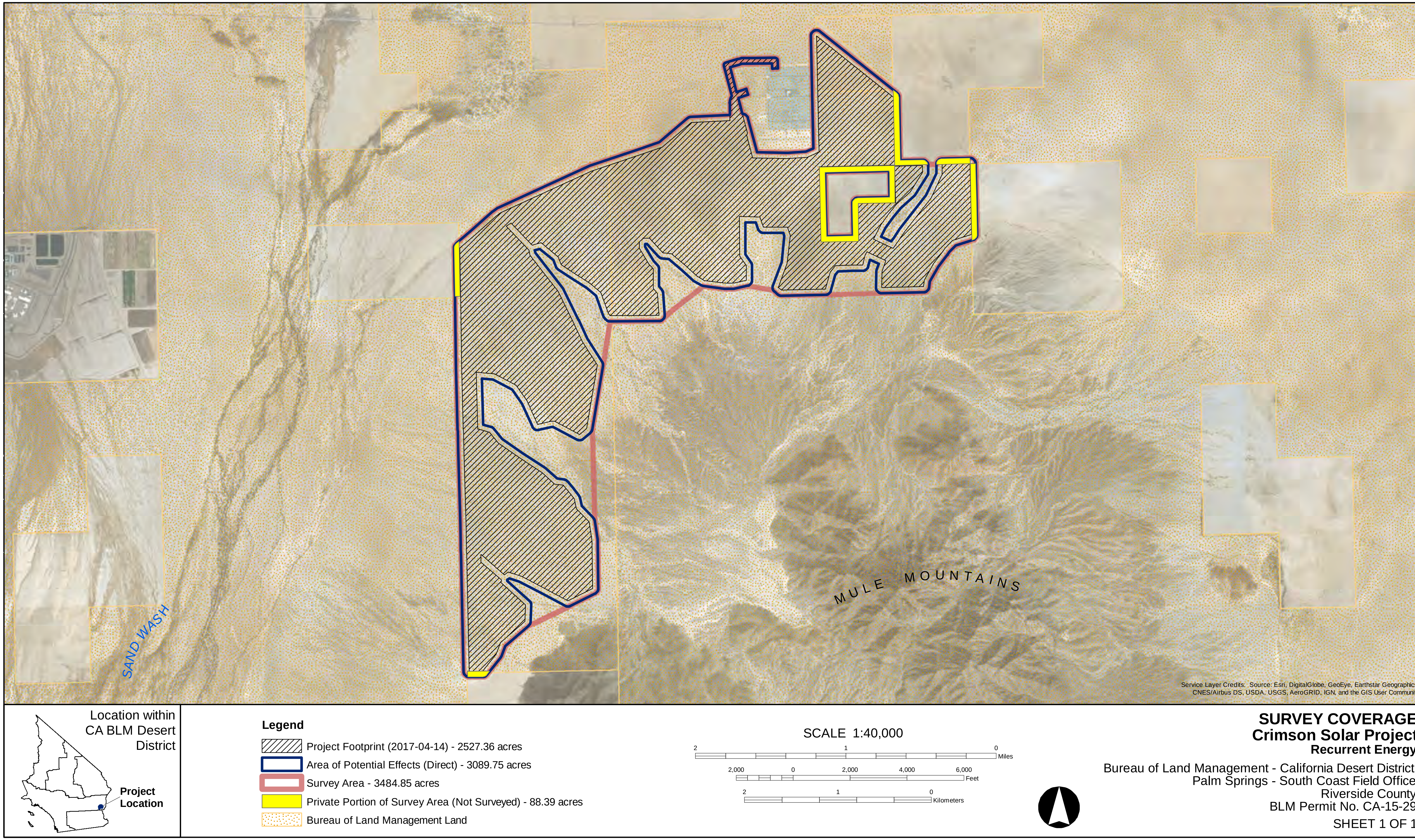


Figure 5-1 Survey coverage.

function (possibly the remnants of the Feature 1) and two wires from former pin flags (without the flags) within or near the previously reported site area; however, the other items that had been previously reported were not present.

CA-RIV-10024

CA-RIV-10024 was previously recorded by Æ in 2011 as a small (150-square-meter), low-density, prehistoric artifact scatter containing 4 flakes and a small concentration of 10 ceramic sherds (Feature 1). During the current survey, Æ identified a chert bifacial cobble tool west of the original site boundary and a lithic procurement station in the north. Æ expanded the boundary of CA-RIV-10024 to include these associated elements. The site now covers 910 square meters.

CA-RIV-10038

CA-RIV-10038 was recorded in 2011 as a low-density (33 by 12 meters) scatter of 50 buffware ceramic sherds in four distinct concentrations (likely the remains of a single globular jar), five fragments of lithic debitage, and one milky-quartz biface. The site is in a sparse creosote bush scrub environment on Pleistocene alluvial fan sediments on the floor of the eastern Chuckwalla Valley.

CA-RIV-10081

CA-RIV-10081 was recorded in 2011 as a very concentrated (4 by 2 meter) scatter of 65+ buffware ceramic sherds, likely from a single vessel. No changes were noted during the present survey. The site is on a level pebble matrix interspersed between eolian sand dunes in a creosote bush scrub environment at the eastern end of the Chuckwalla Valley.

CA-RIV-10089

CA-RIV-10089 was recorded in 2011 as a small (3.5 by 4.5 meter) scatter of 12 buffware ceramic body sherds with a high potential for a subsurface deposit. During the present survey the site record was updated to include four additional ceramic sherds of the same type (Lower Colorado buffware). The site boundary was remapped to include the additional sherds and to redefine the original plotted location, which appeared to be slightly inaccurate.

CA-RIV-10091

This site was recorded in 2011 as a small (5 by 21 meter) scatter of 11 prehistoric ceramic sherds in two distinct concentrations on a level pebble matrix interspersed between eolian sand dunes at the eastern extent of the Chuckwalla Valley. During Æ's 2017 survey the artifact count was expanded from 11 to 61 sherds and an assayed quartzite cobble was added. The 61 Lower Colorado buffware fragments include two recurved and flattened rim sherds (Patayan III) that constitute approximately one-half of an 8-centimeter-diameter vessel opening.

CA-RIV-10962

Recorded in 2012 as a small (2.0 by 1.5 meter) concentration of 22 Lower Colorado buffware ceramic body sherds, CA-RIV-10962 was revisited by Æ archaeologists during the present survey and found to be unchanged. The site is on undisturbed desert pavement on the Palo Verde Mesa.

CA-RIV-10963

Recorded in 2012 as a small concentration (12 square-meters) of 10 prehistoric ceramic sherds, CA-RIV-10963 was expanded during this current survey into a much larger site covering 1,922-square-meters and containing147 artifacts in five distinct loci. Artifacts within the loci are primarily ceramic body sherds, although Locus 3 contains a distinct knapping station. Outside the loci the site contains 8 ceramic sherds, 10 pieces of debitage (4 chert, 3 quartzite, 3 petrified wood), and 3 tools. The site is on Colorado River lag deposits that form a matrix-supported, poorly to moderately well-developed desert pavement.

CA-RIV-11649

CA-RIV-11649 was recorded in 2012 as a 45 by 5 meter scatter of 52 Colorado Beige ceramic sherds, 31 in a distinct concentration (Concentration 1), and 1 neck and 20 body sherds dispersed throughout the remainder of the site. No changes were noted during the present survey. The site is on a broad alluvial plain, derived from multiple sources, composed of a composite of fine sand and poorly-sorted gravels of several material types and is adjacent to a shallow dry wash.

CA-RIV-11650

CA-RIV-11650 was recorded in 2012 as a discrete (150-square-meter) scatter of 39 ceramic sherds from at least two different vessels and distinct wares: Colorado Red and Topoc Buff. During the current survey the site was expanded to the southwest to include 21 more sherds in a distinct locus (Locus 2). The original main concentration of 25 sherds has been designated Locus 1, leaving 14 outlying sherds and bringing the total to 60 sherds. Æ mapped the previously recorded artifacts PP 1 (a rim sherd that has had a repair hole drilled below the rim) and PP 2 (a direct rim sherd with a rounded lip) as Artifacts 1 and 2 respectively. The site is on a stable Early Holocene lag surface in a fully exposed, modern coppice sand dune environment.

CA-RIV-11651

CA-RIV-11651 was recorded in 2012 as a 15.2 by 3.8 meter scatter of eight Topoc buffware ceramic sherds from a single vessel, including one rim (Artifact PP 1), seven body sherds, and one piece of flaked stone debitage. When revisited by Æ archaeologists during the present survey no changes were noted. The site is on a broad alluvial plain, derived from multiple sources, composed of a composite of fine sand and poorly-sorted gravels of several material types and is adjacent to a shallow dry wash.

CA-RIV-11654

CA-RIV-11654 was recorded in 2012 as a 54 by 12.5 meter scatter of 41 Colorado beige ceramic sherds from multiple vessels, including four rim sherds including two that refit. No changes were noted when the site was revisited by Æ archaeologists during the present survey. The site is on a broad alluvial plain, derived from multiple sources, composed of a composite of fine sand and poorly-sorted gravels of several material types and is adjacent to a shallow dry wash.

CA-RIV-11655

CA-RIV-11655 was recorded in 2012 as a 50 by 28 meter scatter of nine Colorado beige ceramic sherds from a single vessel, plus one piece of lithic debitage. No changes were noted during the present survey. The site is on a broad alluvial plain, derived from multiple sources, composed of a composite of fine sand and poorly-sorted gravels of several material types and is adjacent to a shallow dry wash.

CA-RIV-12683

CA-RIV-12683 is a 15 by 13 meter lithic scatter containing 1 assayed pebble,2 edge-modified flakes, and 14 pieces of debitage, all of cryptocrystalline silicate (CCS). The site is on incipient, poorly-sorted desert pavement covered by eolian sands, suggesting the possibility of a subsurface deposit.

CA-RIV-12684

CA-RIV-12684 is a 10 by 7 meter, moderately dense lithic and ceramic scatter containing 37 tested cobbles, 13 hammerstones, 14 modified or used flakes, 5 cobble tools, 1 core, and 51 flakes, plus 30+ body sherds and 1 rim sherd from a single vessel. The site, which is on poorly-developed desert pavement cut by ephemeral drainages, is partially obscured by a thick deposit of eolian sands, suggesting the possible presence of subsurface deposits.

CA-RIV-12686

CA-RIV-12686 is a 37 by 35 meter scatter of 19 flakes and 6 stone tools including 3 hammerstones, 2 mano fragments, and 1 unidentified ground stone fragment. The materials include quartzite, quartz, and CCS. The site is situated among small sand dunes with sparse vegetation, and thick eolian deposits may be obscuring a subsurface deposit.

CA-RIV-12688

CA-RIV-12688 is a 50 by 40 meter prehistoric site containing 6 cobble and flake tools,9 flakes (CCS, petrified wood, metavolcanic, and chalcedony), and a scatter of 22 ceramic body sherds (shoulder and neck fragments) from a single olla. The site is on a well-formed lag-gravel terrace on the far north end of alluvial fan ridges extending from the Mule Mountains into the Palo Verde Mesa. Though the site is in fairly good condition, there are off-road vehicle traffic tracks and erosion near the lithic artifacts from two east-west–trending drainages suggesting they may be secondary deposits.

5.2.2 Historical Sites

CA-RIV-10013H

CA-RIV-10013H was recorded in 2012 as a small (48 by 30 foot), low-density, early twentieth-century historic refuse scatter composed primarily of small amorphous can fragments plus one No. 10 sanitary can (rotary opened), one can friction lid with soldered handle, and the fragmented remains of an evaporated milk can. Æ revisited the site during the present survey and found it to be unchanged. The site is in a sparse creosote bush scrub environment on the floor of the Chuckwalla Valley.

CA-RIV-10014H

The site was recorded in 2011 as a large (326 by 161 foot) early twentieth-century (late 1910s through 1930s) domestic refuse scatter containing glass, cans, ceramics, and milled lumber, plus a quartz cobble concentration (Feature 1), all likely associated with gold mining/prospecting activities. Situated in a sparse creosote bush scrub environment on the floor of the Chuckwalla Valley, no changes in site content or condition were noted during the current survey.

CA-RIV-10016H

Located on a level portion of the Chuckwalla Valley floor, CA-RIV-10016H was originally recorded in 2011 as a small (11 by 1 foot) refuse scatter of three C-ration strips (one with key). The likely remains of a temporary/single-use campsite associated with the WWII-era DTC/C-AMA (1942–1944). The site was reexamined by Æ archaeologists during the present survey and found to be unchanged.

CA-RIV-10017H

CA-RIV-10017H was originally recorded in 2011 as small (38 by 44 foot), low-density, DTC/C-AMA-era refuse scatter containing C-ration cans (three lids, one base, one key strip) and one 1942 mercury head dime. Æ reexamined the site during the present survey and found it to be unchanged.

CA-RIV-10018H

CA-RIV-10018H was originally recorded in 2011 as a small (36 by 27 foot) DTC/C-AMA-era temporary/ single-use camp with a 12 by 12 foot foxhole (Feature 1) and a low-density refuse scatter that includes six C-ration cans (three bases, one lid, one key strip), and one Barrington Hall's Pure Soluble Coffee tin. The site is in a sparse creosote bush scrub environment on the floor of the Chuckwalla Valley. No changes in site content or condition were noted during the current survey.

CA-RIV-10019H

Recorded in 2011 as a small (36 by 10 foot) historic refuse scatter consisting of heavy gauge (0.185 in. diameter) wire, a tapered rectangular meat tin (base and lid), and a single cut metal disk (1 3/36 inch diameter), CA-RIV-10019H was reexamined by Æ archaeologists during the present survey and found to be unchanged.

CA-RIV-10020H

CA-RIV-10020H was recorded in 2011 as a low-density refuse scatter, containing 20 cans/can fragments scattered across a 134 by 39 foot area on the floor of the eastern Chuckwalla Valley. The likely the remains of a temporary/single use camp associated with a DTC/C-AMA, no changes in site condition or content were noted during the current survey.

CA-RIV-10021H

Originally recorded in 2011, CA-RIV-10021H is a historical refuse scatter containing 16 artifacts including a stamped “U.S.” Army mess kit spoon, a tapered copper tube, an ampule, and bottles and cans associated with DTC/C-AMA military activities. Æ expanded the site boundary during the current survey. The metal spoon and copper tube noted in the 2011 record were not relocated, but all other artifacts from the original survey were found and additional historical artifacts were observed (mostly bottle glass fragments).

CA-RIV-10029H

CA-RIV-10029H was recorded in 2011 as a small (52 by 32 foot), DTC/C-AMA-era scatter of C-ration cans (four bases, two lids). Situated in the sparse creosote bush scrub environment at the east end of the Chuckwalla Valley floor, no changes in site condition or content were noted during the current survey.

CA-RIV-10030H

CA-RIV-10030H was recorded in 2011 as a large (325 by 275 foot), low-density, DTC/C-AMA era scatter of 39 artifacts (cans, batteries, milled lumber, etc.) in a sparse creosote bush scrub environment on the east end of the Chuckwalla Valley floor. The site was reexamined during the present survey and found to be unchanged.

CA-RIV-10080H

The original 2011 recording describes CA-RIV-10080H as a small (30.8 by 61.1 foot) scatter of five early-twentieth century round key-strip meat or seafood cans in a fine sand dune deposition within a creosote bush scrub community. CA-RIV-10080H was reexamined during the present survey and found to be unchanged.

CA-RIV-10087H

CA-RIV-10087H was originally recorded in 2011 as a 13,175-square-foot DTC/C-AMA-era refuse deposit with one concentration of 12 hole-in-top cans (Locus A), plus 8 outlying artifacts including colorless glass jars and U.S. army issue Barrington Hall’s Pure Soluble Coffee tins. During the current survey the site record was updated to include a 1917 U.S. GLO survey marker and a pick head with the stamp “US”. During the current survey the site was expanded south of its original boundary and is now 51,193-square-feet. CA-RIV-10087H is on an alluvial fan extending from the Mule Mountains to the south in a low-density creosote bush scrub community.

CA-RIV-10088H

Recorded in 2011as a widely distributed (170 by 59 foot) scatter of eight DTC/C-AMA-related cans, CA-RIV-10088H was reexamined during the present survey and found to be unchanged. The site is predominantly located upon a raised finger of land between two drainages on an alluvial fan extending north from the Mule Mountains.

CA-RIV-10090H

Recorded in 2011 as a diffuse (208 by 22 foot) DTC/C-AMA-era trash scatter containing at least 25 complete and fragmentary brown glass beer bottles in two concentrations, CA-RIV-10090H was reexamined during the present survey and found to be unchanged. The scatter is on a level pebble matrix interspersed between eolian sand dunes at the eastern extent of the Chuckwalla Valley

CA-RIV-10092H

Recorded in 2011 as a discrete (19 by 11 foot) DTC/C-AMA-era trash scatter containing 15 cans and a base fragment from a brown glass bottle, CA-RIV-10092H was reexamined during the present survey and found to be unchanged. Located on a level pebble matrix interspersed between eolian sand dunes at the eastern extent of the Chuckwalla Valley, the cans are tightly concentrated and, with the exception of one hole-in-top can, have all been crushed and degraded, rendering them non-diagnostic.

CA-RIV-11653H

Recorded in 2011as a historical trash scatter measuring 78.7 by 18.4 feet and containing 10 sanitary cans, CA-RIV-11653H was reexamined during the present survey and found to be unchanged. Located within a broad alluvial fan of sandy loam and alluvial gravels overlain by eolian sand dunes in the Chuckwalla Valley, the cans represent a single mid-twentieth century dumping episode from an unknown source.

CA-RIV-12685H

CA-RIV-12685H was recorded in 2017 as a diffuse (196.9 by 124.7 feet) refuse scatter containing 15 sanitary cans of varying sizes and types, plus 1 bottle with screw cap (Artifact 1), all likely related to WWII-era DTC/C-AMA activities. During the present survey no changes in site condition or content were noted.

33-019712

Recorded in 2011, 33-019712 is a 1917 U.S. GLO survey monument marking the quarter section boundary between Sections 7 and 8 of Township 7 South, Range 21E (SBBM). The 2.5-inch diameter brass cap marker, mounted on a 12-inch-tall, 1 1/8-inch diameter steel pipe, and situated in a sparse creosote bursage scrub environment on the floor of the Chuckwalla Valley.

5.2.3 Sites with Prehistoric and Historical Components

CA-RIV-1819/H

CA-RIV-1819/H was originally recorded in 1980 as a 160 by 200 meter chert, jasper, and chalcedony cobble quarry containing approximately 600 lithic artifacts including small cores, flakes, chopping and pounding tools, and a unifacial scraper (Carrico et al. 1980, 1982). Ten ceramic sherds were previously collected from the surface and later identified as Parker buffware (Patayan II and III, AD 1000 to post 1500). The site was revisited in 2004, 2005, and 2008. In

2011 the site record was updated to include the historic component (predominantly WWII-era DTC/C-AMA related foxholes).

In the latter part of 2017, and as a result of two separate surveys conducted by Æ (Gardner 2018 and the current survey), the site record was updated again and the boundary expanded to incorporate an additional 21 features (all of them historic foxholes aligned in north-south parallel rows and relating to DTC/C-AMA training activities), 13 disturbed areas (Disturbances 1 through 13) with pits and/or back dirt piles (possibly either prior archaeological testing pits or pits associated with DTC/C-AMA activities), and 7 previously unidentified loci (five lithic scatters, one chalcedony knapping station, and one ceramic scatter of five body sherds).

During the current survey, Æ identified approximately 250 additional prehistoric tools, designations for which begin with Artifact 7 as Lichtenstein et al. (2011) documented Artifacts 1 through 6. Artifacts include 14 cores; 7 scrapers; 8 edge modified/utilized flakes; 1 knife; 28 hammerstones; 54 assayed cobbles, including 10 bipolar split cobbles; 115 pieces of debitage (44 primary flakes, 44 secondary flakes, 12 tertiary flakes, and 15 pieces of shatter); and 7 Parker buffware ceramic sherds. Also noted were 21 additional historic artifacts, predominantly cans likely associated DTC/C-AMA activities. Lastly, and also as a result of the current survey, the boundary for CA-RIV-1819/H was remapped and in so doing subsumed the following previously recorded sites and isolates: CA-RIV-11268/H, P-33-1819, -023044, -023045, -023046, and -023047.

CA-RIV-10025/H

Recorded in 2011 CA-RIV-10025/H is a multicomponent site consisting of a prehistoric lithic scatter, a historic refuse scatter, a concrete mounted marker with a fallen marker pole, and a partially filled foxhole likely associated with the DTC/C-AMA. The primary cultural constituents observed at that time were lithics (flakes, shatter, core, cobbles) and cans. The overall artifact density was reported to be low, and the condition of the site fair, with visible alterations from natural processes and off-road vehicles. CA-RIV-10025/H is within an alluvial flat with a thin layer of modern dune sands. No change to the site was observed during Æ's 2017 survey.

CA-RIV-10027/H

CA-RIV-10027/H was recorded in 2011 as a prehistoric lithic reduction area overlain by an early twentieth-century temporary/single use campsite. This 64 by 40 meter site includes a prehistoric, deflated hearth (54 by 40 centimeters and composed of 23 large pebbles to small cobbles of petrified wood), a discrete scatter of 15 lithic artifacts, and 3 solder-seam can fragments. No change in site content or condition was noted during the current survey.

CA-RIV-10032/H

CA-RIV-10032/H was recorded in 2011 as a large (289 by 207 feet) low-density, probable remnant of a DTC/C-AMA era temporary camp containing 12 cans, 1 colorless glass jar with Owens-Illinois maker's mark on the base, and a single piece of chert angular shatter. No change in site content or condition was noted during the current survey.

CA-RIV-10033/H

CA-RIV-10033/H was originally recorded in 2011 as a large (21,525-square-meter) prehistoric lithic reduction area containing 644 artifacts spread over three loci, with a surrounding low-density scatter of lithic artifacts. One feature, a 2.3 by 2.4 meter deflated hearth composed of 35 metavolcanic rocks and one quartzite tested cobble, also was recorded. During the current survey three more loci and 38 new point-provenienced artifacts were added and CA-RIV-10034H was incorporated, expanding the site area to 30,720 square meters. The site lies in a sparse creosote bursage scrub environment of modern dune sands over stable Early Holocene lag surface on a Pleistocene non-marine alluvial fan.

CA-RIV-11652/H

CA-RIV-11652/H was originally recorded in 2012 as a small (3-square-meter) scatter of five cans (one hole-in-cap can with double seams and crimped ends, two rectangular tobacco tins, one rectangular sardine can with an external friction lid, and one hinged-lid tobacco tin). During the current survey four solarized amethyst glass bottles and one small Parker buffware ceramic body sherd were also noted and the site area was expanded to 200 square meters.

CA-RIV-12687/H

CA-RIV-12687/H is 83 by 80 meters and has both prehistoric and historical components. The prehistoric component includes one CCS core, one CCS tested cobble, and one CCS primary flake. The historical component consists of four foxhole/fighting positions (Features 1–4) related to DTC/C-AMA military activities as well as 14 artifacts (12 C-ration can tops, 1 coiled key strip, and 1 razor blade). The majority of the C-ration can tops are within Features 1 and 2 along the southern portion of the site, which is bordered by an active inset fan with weakly formed hummocks dissected by rills and ephemeral gullies. The local geomorphology coupled with previous excavations for the foxholes/fighting positions suggest that the site's surface artifacts are likely in secondary context and there is a low potential for intact and significant subsurface archaeological deposits.

5.2.4 Sites not Revisited

CA-RIV-10884

Only one previously recorded site could not be located during the current survey. CA-RIV-10884 was recorded in 2011 as a 5-square-meter scatter of approximately 15–20 buffware ceramic body sherds. Transmission line construction was underway at the time and site protection and avoidance were recommended. This site may have been destroyed during construction or buried by eolian deposition; alternatively, the UTM coordinates may have been recorded incorrectly and the site was misplotted during previous inventories.

5.3 NEWLY DISCOVERED SITES WITHIN THE PROJECT APE

Æ's RE Crimson survey recorded 122 previously unidentified sites. These include 62 prehistoric sites, 40 historical sites, and 20 sites with both prehistoric and historical components. Prehistoric sites include 14 ceramic scatters, 19 lithic scatters, and 21 sites with both ceramic and lithic artifacts. In addition, there 2 cleared circles and 6 thermal feature sites (3 with additional artifacts and 3 with thermal features only). Historical sites include 1 cairn, 1 set of tank tracks with an associated historical refuse scatter, 4 military emplacements without associated artifacts, 10 emplacements with associated refuse scatters, 8 GLO land survey markers (one with a potential historical camp and refuse scatter), and 16 refuse scatters/dumps. The sites with both prehistoric and historical components are mostly lithic/ceramic scatters with historical refuse and emplacements. These sites are described in detail below. Site record forms for these resources are provided in Appendix C.

5.3.1 Prehistoric Sites

AE-3372-026

This sparse lithic and ceramic scatter covers 32 by 19 meters on an alluvial apron. It contains six artifacts including ceramics, lithic debitage, a tested cobble, one core, and one pebble tool. Locus 1 is a concentration of fragments from a single Colorado buffware vessel; it includes one rim sherd. Disturbances include krotovina, plant mounds, and sheetwash. Some artifacts have been redeposited, but not substantially.

AE-3372-028

This diffuse lithic and ceramic scatter covers 27 by 33.5 meters on an alluvial apron. It contains seven artifacts including a flaked stone tool, a hammerstone or percussive tool, two pieces of lithic debitage, one bipolar split (assayed) pebble, two ceramic sherds, and one possible manuport. Disturbances include krotovina, plant mounds, and sheetwash. Some artifacts have been redeposited, but not substantially.

AE-3372-029

This sparse scatter of CCS and quartzite flakes and tools covers 132 by 82 meters on an alluvial fan. It contains three loci surrounded and connected by a more diffuse scatter. Locus 1 includes 11 pieces of debitage, 1 core, and 1 edge-modified flake. Locus 2 includes 6 pieces of debitage. Locus 3 includes 6 pieces of debitage and 1 core. An additional 34 pieces of debitage, 5 cores, and 4 hammerstones were recorded between the loci.

AE-3372-035

AE-3372-035 is a 70 by 29 meter low-density lithic scatter on an erosional fan remnant in a creosote-dominated vegetal community. The assemblage comprises four pieces of debitage, five tested cobbles/pebbles/split cobble fragments, three cores, two cobble tools, and two hammerstones. Artifact materials are petrified wood, quartzite, and CCS. A two-track road traverses northwest-southeast across the site, causing minimal disturbance to this surface scatter.

AE-3372-039

This site covers 175 by 53 meters on a roughly northwest-southeast trending erosional fan remnant north of the Mule Mountains. The assemblage includes 26 pieces of debitage, 16 tested cobbles, 13 tested large pebbles, 28 split cobbles-pebbles, 6 cores, 8 hammerstones, 1 cobble tool, 1 flake tool, and 47 ceramic sherds. Locus 1 is 21 by 15 meters, located in the northern portion of the site; it has the highest density of artifacts, the most artifact types, and a light scatter of FAR. The remaining portions of the site have low-density, but nearly even, distribution of artifacts. A possible prehistoric trail segment (CA-RIV-673/H) crosses the site.

AE-3372-053

This site is an 11.4 by 5.3 meter sparse lithic scatter. The eight flakes and two core fragments are split between two loci scattered across a deflated bajada on incipient desert pavement within the Chuckwalla Valley.

AE-3372-120

This low-density lithic and ceramic scatter contains 11 ceramic body sherds, 3 hammerstones, 2 modified flakes, 2 cortical quartz flakes, 1 piece of CCS bipolar debitage, and 1 piece of modified quartz gravel. Locus 1 contains five ceramic body sherds in a 25 by 30 centimeter area. The site covers 90 by 81 meters on a low rise of desert pavement and adjacent sandy flat with many ephemeral washes crossing the site.

AE-3372-132

The site is a lithic and ceramic scatter contained primarily within two loci. Locus 1 is a dispersed ceramic scatter containing 10 reddish-brown ceramic body sherds with crushed quartz temper in a 5 by 8 meter area in an ephemeral drainage. Locus 2 is a fairly dense, large scatter with more than 100 brown-colored, thick-walled sherds with crushed quartz temper, likely from more than one vessel, in a 6 by 10 meter area on poorly-developed desert pavement adjacent to a wide but shallow ephemeral drainage. One quartzite hammerstone and one quartzite bipolar flake were also observed. The site covers 57 by 40 meters on the edge of an ephemeral wash dissecting two moderately developed stands of desert pavement. Vegetation consists of creosote scrub with eolian sand drifts confined to creosote bushes.

AE-3372-134

The site is a sparse lithic and ceramic scatter with one primary locus containing a quartzite hammerstone and eight pieces of petrified wood debitage. Point-provenienced artifacts include seven hammerstones, two modified flakes, two cores, three cobble tools, and one gravel tool. Four ceramic sherds were observed on the surface. The site is on a remnant alluvial fan terrace of moderately developed desert pavement, with ephemeral washes situated to the east and west. The landform is slightly elevated from the surrounding area.

AE-3372-138

This moderately dense lithic scatter covers 103 by 53 meters on an isolated alluvial terrace with ephemeral drainages on the north and south sides. The assemblage contains eight point-provenienced artifacts: three hammerstones, three modified gravels, and two cores. In addition, 13 CCS flakes and 11 tested cobbles; 13 quartzite flakes and 9 tested cobbles; 2 quartz tested cobbles; and 1 petrified wood tested cobble were observed.

AE-3372-139

The site is a sparse lithic scatter composed of 15 tested cobbles and 6 pieces of debitage. Raw materials consist of quartz, quartzite, and CCS. No features or tools were observed. The site is 60 by 38 meters and is on a northeast-trending slope on the edge of an alluvial terrace. Ephemeral drainages are on the east and west sides of the site.

AE-3372-141

This lithic and ceramic scatter contains two discrete loci. Locus 1 contains 10 buffware sherds, including one rim sherd, in a 15 by 11 meter area. Locus 2 is a dense concentration of lithic materials covering 15 by 11 meters in the south-central portion of the site. Locus 2 includes more than 60 pieces of debitage of various materials and one hammerstone. A single reduction area (3 by 3 meters) with milky quartz is in the eastern portion of the locus. Several pieces of fossilized bone are also present within and east of Locus 2. Additional cultural constituents outside the two loci include 4 ceramic body sherds, 25 pieces of debitage, 22 tested cobbles, and 5 diagnostic artifacts.

AE-3372-150

AE-3372-150 is a lithic and ceramic scatter with three loci. Locus 1 contains four flakes, one cobble tool, and one core. Locus 2 is a moderate- to high-density ceramic concentration containing 60+ sherds of brownish-red buffware that appear to be from the same vessel. Also present within the locus is one CCS secondary flake. Locus 3 is a concentration of approximately 16 body sherds of the same type as in Locus 2 as well as a modified flake, a core, two hammerstones, tested cobbles, and debitage. The site covers 165 by 85 meters on an elevated alluvial terrace with gradual slopes on the north, east, west, and south, in an area of creosote scrub vegetation.

AE-3372-151

This site is a simple lithic procurement site that includes four CCS tested cobbles. The site is on a prominent north-south trending erosional fan remnant elevated above boundary inset fans with eolian sands. The pavement is moderately stabilized but disarticulating.

AE-3372-152

This simple lithic procurement site includes two tested cobbles and five reduction flakes. The assemblage is composed entirely of CCS. The site is on a prominent north-south trending erosional fan remnant with moderately stabilized pavement.

AE-3372-155

This sparse site contains nine ceramic sherds, one metate, one quartzite core, and three pieces of FAR scattered along an ephemeral wash. The artifacts appear to be in secondary context with the exception of the metate. The site is in creosote scrub vegetation on a flat with a mixture of eolian and alluvial sheetwash sands.

AE-3372-158

This site is a small scatter of five ceramic sherds with one quartz core and one quartzite primary flake. There is a large wash less than 2 meters west of the site. The site is on moderately-developed desert pavement with metavolcanic and schist geology surrounded by a creosote scrub environment with palo verde and ironwood trees in the wash.

AE-3372-162

This low density lithic scatter contains a knapping station (Locus 1) with 13 quartz flakes and one flake tool; a large primary quartz flake is outside Locus 1. The site covers 38 by 30 meters on poorly-developed desert pavement bounded by ephemeral washes on the east and west. The dominate vegetation consists of creosote scrub.

AE-3372-165

This scatter of ceramic sherds from a single painted vessel covers 51 by 37 meters in creosote scrub vegetation in an area of low/flat sheetwash. Locus 1 is the primary concentration (20 sherds); seven more sherds are to the south and west. The vessel was painted with red geometric linear motifs. Approximately nine sherds are painted, and a few have pigment eroding away. Multiple small ephemeral washes run through the site, and the spatial distribution of artifacts is likely altered with every heavy rain.

AE-3372-168

This ceramic scatter contains one dense concentration with more than 60 sherds from a single buffware vessel, apparently a short-necked, small-mouthed olla/jar based on four rim sherds. There are two body sherds outside Locus 1 plus a single translucent agate thinning flake approximately 30 meters to the north. The site covers 63 by 20 meters on a small gravel bar of poorly developed desert pavement bounded by ephemeral washes on the north and south. The dominant vegetation is creosote scrub.

AE-3372-183

The site consists of a sparse lithic and ceramic scatter including 12 pieces of debitage, 8 hammerstones, 2 flake tools, 1 edge-modified flake, 1 cobble tool, and 15 tested large gravels/small cobbles. Six ceramic body sherds are also present. The site is on two elevated, moderately developed desert pavement terraces separated by eolian sands. Vegetation is creosote scrub.

AE-3372-185

The site contains 1 quartz hammerstone, 2 tested cobbles, and 38 pieces of quartz debitage primarily within two discrete loci on an elevated, moderately developed desert pavement terrace. Vegetation is creosote scrub, but there is very little vegetation on top of the landform.

AE-3372-186

The site consists of a sparse lithic scatter of 15 artifacts, including Locus 1 which demarcates the site’s northeastern boundary and contains 12 artifacts. Three additional artifacts include two quartzite hammerstones and a large tested CCS gravel. The site is on an elevated, moderately developed desert pavement with creosote scrub vegetation.

AE-3372-188

This sparse lithic scatter contains three tested cobbles and two hammerstones. There is one area of smashed quartz, with 20+ angular pieces all from same initial boulder, which may be modern. The site is on two separate fingers of a moderately developed desert pavement terrace. Eolian sands separate the two fingers of desert pavement. Vegetation is creosote scrub.

AE-3372-189

This lithic scatter contains 3 hammerstones, 1 core, 14 tested cobbles, and 8 pieces of quartzite and CCS debitage. The site is at the northeast end of an elevated, poorly developed pavement terrace bounded by ephemeral washes with a mixture of eolian and alluvial sands. Vegetation is creosote scrub.

AE-3372-191

This sparse lithic scatter contains five flakes and one piece of ground stone inset on a northwest trending fan of soft alluvium. The site is bounded to the north by elevated pavement of the proximal end of an erosional fan remnant and bounded to the west and south by ephemeral swale drainage. There is potential for subsurface deposits because of sedimentation.

AE-3372-195

This scatter of approximately 80 buffware ceramic sherds covers 42 by 49 meters in an ephemeral wash adjacent to an elevated alluvial fan terrace. One rim sherd and one rose quartz secondary flake are present. The dominant vegetation is creosote scrub and soils are a mixture of alluvial sands emanating from the Mule Mountains to the south and eolian sands emanating from the west with the predominant winds.

AE-3372-196

This lithic scatter contains a single quartz knapping station with 1 core, 1 hammerstone, and 23 pieces of debitage. The site is on northwest trending, well established pavement bounded by inset young alluvial fans.

AE-3372-197

This site is a sparse ceramic scatter consisting of 10+ sherds and 2 CCS flake tools on a northwest trending dissected pavement terrace with an ephemeral wash running though the site. Ceramics are distributed along the ephemeral wash.

AE-3372-199

This lithic scatter consisting of approximately 98 CCS flakes in multiple stages of reduction, 1 granitic metate, 1 granitic biface fragment, and 2 fragmented bifacial cores. Vegetation is creosote scrub and soils are a mixture of alluvial sands and gravel emanating from the southeast (Mule Mountains) and eolian sands emanating from the west with the predominant winds.

AE-3372-229

The site is a 175-square-meter ceramic scatter of 41 buffware ceramic sherds, most probably from a single vessel. All but one of the sherds are in a discrete (6-square-meter) concentration, with the outlier being 21 meters at 180 degrees from the concentration. The site is on very early desert pavement formation within unstable, alluvial sand dunes.

AE-3372-230

This 2,520-square-meter site consists of 141 Topoc buffware ceramic sherds, in six discrete but distinct loci; 1 Colorado River buffware sherd, 2 hammerstones, and 2 flakes. This site is on a mixed early-stage-developed desert pavement with shifting sand dunes.

AE-3372-231

This temporary camp contains a sparse lithic scatter with a chert biface and 10 flakes surrounding a deflated thermal feature comprised of 45 FAR, 90 percent of which are petrified wood and the remaining 10 percent evenly represented by pumice and rosaceous quartzite. Two outlying petrified wood FAR are approximately three meters west of the feature boundary. The site covers 5,000 square meters on early-stage desert pavement interspersed by coppice sand dunes and minimal bar and channel morphology.

AE-3372-235

The site is a discrete scatter of 24 Lower Colorado River ceramic sherds, probably from a single vessel. Twenty of the sherds are in a locus (Locus 1) and the other four are outliers. This 32.5-square-meter site is on an early-stage formation desert pavement.

AE-3372-236

The site is a discrete scatter of eight sherds in two distinct loci representing two different ceramic types. The 90-square-meter site is on a very early-developed desert pavement within an alluvial fan.

AE-3372-237

The site is a discrete (70-square-meters) ceramic scatter of 14 sherds in two distinct loci, but most likely from a single vessel, on early-development desert pavement surface within an alluvial fan.

AE-3372-240

The site is a 400-square-meter temporary camp site defined by three variously deflated and/or sand-blown, but nonetheless distinctly visible, thermal features (Features 1-3). Given the eolian deposition, it is possible that other thermal features are present subsurface. No associated artifacts were identified or recorded at the site.

AE-3372-245

This very discrete site is a single thermal feature partially covered by eolian deposition, but nonetheless, distinctly visible. The specific 6-square-meter site area is on unstable eolian sands intermixed with sparse patches of early-stage development desert pavement. Given the sand-blow environment, it is possible that other thermal features are present subsurface. No associated artifacts were identified or recorded at the site.

AE-3372-247

The site is a discrete scatter of 102 ceramic sherds most likely from a single vessel, plus a single chert flake. The 85-square-meters site is on a well-established, gravel lag desert pavement formation within a fully exposed alluvial fan with some well-established coppice sand dunes.

AE-3372-248

The site is a very discrete (32-square-meters) probable temporary prehistoric camp site containing two thermal features on fully exposed eolian sand dunes with some coppice dune development. The features are partially covered by eolian deposition but are nonetheless distinctly visible. Given the depositional environment, it is possible that other thermal features are present subsurface. No associated artifacts were identified or recorded at the site.

AE-3372-249

This sparse site (126-square-meters) contains four ceramic sherds representing two different ceramic types—three Colorado buffware and one Parker buffware #2—scattered across fully exposed eolian dunes and early-stage coppice dune development environment.

AE-3372-250

The site is a sparse, 400-square-meter scatter, containing Locus 1, covering 7 by 2.5 meters, with an assemblage of 25 Parker buffware ceramic sherds, likely from a single vessel; two other ceramic sherds appearing to be from the same vessel but 19 meters north of Locus 1; and a single, chert secondary flake.

AE-3372-252

This site is a sparse scatter of five ceramic fragments representing a single ceramic type, Parker buffware, most likely from a single vessel, and a metavolcanic secondary flake. The site is on fully exposed eolian sand dunes, surrounded by early-stage coppice development intermixed with poorly-developed desert pavement.

AE-3372-255

The site is a 130-square-meter scatter of 16 ceramic sherds in two discrete loci, and representing two ceramic types, on an exposed alluvial fan. Locus 1 consists of six Colorado red sherds, most likely from a single pot drop event and Locus 2 consists of 10 Tizon brownware sherds, probably from a single, but separate, pot drop. The site is on an early-to-mid-formation desert pavement, intermixed with eolian sand dune deposition and dissected by ephemeral washes.

AE-3372-256

This very discrete temporary camp contains six thermal features and six ceramic sherds. All of the thermal features are partially covered by eolian deposited sands but are nonetheless distinctly visible. There is some evidence of a seventh thermal feature, but it is too poorly defined to allow viable recording. Given the eolian environment, it is possible that other thermal features are present subsurface. The 32-square-meter site is on a small playa amidst unstable, eolian sand dune depositions with early coppice development and dissected by ephemeral washes.

AE-3372-258

This somewhat diffuse scatter of consists of 31 moderate, orange-pink (10R 7/4) Colorado red ceramic sherds in three distinct loci with four outlying ceramic artifacts. The site covers 600-square-meter on and alluvial fan apron with eolian sand dune deposits amidst lag gravels that are developing into early-stage desert pavement.

AE-3372-263

The site is a discrete scatter of 5 Colorado red ceramic fragments, 2 metate fragments, and 10 FAR, 8 of which are in a distinct concentration (Feature 1), probably representing the remnants of a hearth. The 126-square-meter resource is on an alluvial fan apron with eolian sand dunes amidst lag gravels developing into early-stage desert pavement.

AE-3372-266

The site is a scatter of 22 Topoc buffware ceramic sherds, 20 of which are in a discrete concentration and the other 2 are outliers. One point-provenienced set of artifacts, 20 meters southeast of Locus 1, consists of a large body and rim fragment with an abstract, almond-eyed, facial representation applied to and below the rim. The 123-square-meter resource is on a small playa within an alluvial fan apron of eolian sand dunes amidst very sparse lag gravels.

AE-3372-267

The site is a 48-square-meter ceramic scatter containing two very discrete pot drops (Loci 1 and 2) of two different ceramic types with a total of 9 artifacts. The loci are 15 meters apart on an alluvial fan apron with eolian sand dunes amidst small outcrops of lag gravels.

AE-3372-270

The site is a discrete (37.4-square-meter) scatter of 22 Colorado buffware ceramic sherds on an alluvial fan apron with eolian sand dunes amidst sparse lag gravel outcrops.

AE-3372-275

The site is a discrete (200-square-meters) scatter of six pale yellowish-orange (10YR 8/6) Colorado buffware ceramic sherds, a white chert flake, and a piece of white chert shatter on alluvial sand deposits amidst lag gravel/early desert pavement formations.

AE-3372-277

The site is a sparse scatter (310-square-meters) of five ceramic sherds, composed of two separate ceramic types, on an alluvial fan apron of eolian sand dunes with coppice dune development. A large northeast-southwest oriented wash is 50 meters south of the site.

AE-3372-279

This is a discrete scatter of 14 Colorado buffware ceramic sherds, probably from a single vessel; and a beige chert flake. The 60-square-meter site is on an alluvial fan apron, partially covered by eolian sands intermixed with early formation desert pavement. A faint set of north-south oriented tank tracks pass the western boundary of the site.

AE-3372-289

This relatively discrete scatter containts 39 ceramic sherds, with two ceramic types (28 Topoc buffware and 11 Colorado beige), in three loci. The 125-square-meter site is on an alluvial fan apron with eolian sand deposits amidst lag gravels that are developing into early-stage desert pavement.

AE-3372-292

The site consists of four cleared circles on a well-established desert pavement, a quartz chipping station with over 50 pieces of debitage, and a single jasper flake. The site is on a gravel terrace surrounded by alluvial fan apron depositions of eolian sand dune and coppice dunes.

AE-3372-294

The site is a 40-square-meter scatter of 17 pot sherds from a single vessel, and 1 quartz secondary flake, on an alluvial fan apron with eolian sand deposits amidst lag gravels that are developing into early-stage desert pavement.

AE-3372-297

The site is a sparse, 227-square-meter, scatter of three Topoc buffware, one Colorado beige, and one Salton buffware ceramic sherds on an alluvial fan apron with well-developed coppice and eolian sand dunes and some sparse lag-gravel development.

AE-3372-324

This temporary camp site covers 480 square meters on incipient desert pavement forming on top of a northeast trending erosional fan piedmont extending from the alluvial fan at the base of the Mule Mountains. It contains a well-defined cleared circle and associated rock ring around its perimeter, plus one quartz lithic concentration with three flakes and one tested cobble. One brown chert flake was found along the southeastern edge of the site.

AE-3372-332

The site is a discrete, 73-square-meter, lithic scatter with 55 pieces of quartz debitage on a section of eroding alluvial piedmont that is being actively degraded by seasonal washouts and flooding events. A wide, creosote and palo verde choked wash drains to the northwest, 9 meters southwest of the site datum.

AE-3372-333

The site is a discrete, 200-square-meter, lithic scatter consisting of two quartz chipping stations (Loci 1 and 2) as well as one red chert secondary flake, located on a stabilized piedmont remnant that is being actively eroded to the north and south by seasonal drainages. Locus 1 is a quartz knapping station, contains 59 pieces of quartz debitage and 3 cores. Locus 2 contains 20 pieces of quartz debitage.

AE-3372-462

This site is a lithic scatter with a large, 3-meter-diameter, quartz knapping station with a core and more than 100 pieces of debitage in a flat sheetwash area at the toe of an alluvial fan remnant.

AE-3372-487

The site is a lithic scatter with a large, 3-meter-diameter, quartz knapping station with more than 100 pieces of debitage, in a flat sheetwash area at the toe of an alluvial fan remnant.

5.3.2 Historical Sites

AE-3372-030H

The site is a diffuse historical refuse scatter of nine metal and glass items, including five cans (two of which are C-ration cans), two lengths of wire, one pocket knife, and one complete soda bottle, with Owens-Illinois maker’s mark dating to pre-1954 on a gentle to flat alluvial fan, in a creosote-bursage dominated vegetal community. Overall condition of the site is fair with artifacts discernible, complete, but most likely redeposited. Two-tracks from modern off-road vehicles disturb the site. This historical refuse scatter likely represents debris associated with DTC/C-AMA activities.

AE-3372-032H

This site is composed of 23 separate linear segments (Segments A through W), each containing one or more distinct set(s) of tank tracks. The tracks, along with associated sites and features such as can deposits, communication wires, foxholes, and temporary military encampments, are all remnants of the DTC/C-AMA. Although not in the locales of any of the 12 divisional camps within the California part of the DTC/C-AMA area, such as Camps Essex, Iron Mountain, Ibis, etc., these tracks clearly fall within the military maneuver area and thus mark the potential locations of DTC-related resources.

AE-3372-043H

The site is an emplacement site with a sparse historical refuse scatter consisting of a U-shaped earthen berm military fighting position with a discrete scatter of three military issue C-ration cans from 1940s era DTC/C-AMA. Sonoran creosote bush scrub is the dominant vegetation community. Specific site area is on an alluvial fan apron with well-developed coppice and eolian sand dunes and some sparse lag-gravel development. Small rodent and reptile burrows are abundant.

AE-3372-044H

The site is an emplacement site with a sparse historical refuse scatter consisting of small military fighting position foxhole with a discrete scatter of three military issue C-ration cans. Sonoran creosote bush scrub is the dominant vegetation community within poorly-formed desert pavement. Specific site area is on an alluvial fan apron with well-developed coppice and eolian sand dunes and some sparse lag-gravel development. Small rodent and reptile burrows are abundant.

AE-3372-045H

The site is an emplacement site with a sparse historical refuse scatter consisting of a vaguely U-shaped military fighting position with a discrete scatter of two military issue C-ration cans (key-wind and condensed milk, respectively) associated with DTC/C-AMA activities. Sonoran creosote bush scrub is the dominant vegetation community within poorly-formed desert pavement.

AE-3372-050H

The site is an emplacement site with a sparse historical refuse scatter consisting of a series of four features, all relating to strategic military fighting positions; three one-man foxholes and one larger small artillery position, plus a diffuse scatter of 22 military issue C-ration cans and three artifacts; a US military issue mess knife, a US military issue mess fork and a US military issue whistle. These cultural resources are associated with 1940s era DTC/ C-AMA activities. Sonoran creosote bush scrub is the dominant vegetation community within poorly-formed desert pavement.

AE-3372-118H

The site is a historical refuse scatter of unknown association, including cans and glass. The majority of the site is contained within Locus 1 and includes 15 cans and lids and 3 glass jars. Artifacts noted outside of Locus 1 include nine cans and lids, a glass bottle, and a butter knife. The site is on a small elevated terrace of developing desert pavement surrounded by flat terrain with scattered creosote bushes.

AE-3372-119H

This historical refuse scatter of unknown association is composed of cans and glass. The majority of the site is found in Locus 1, measuring 5 by 3 meters, which contains 18 cans and 4 clear glass fragments. Artifacts noted outside of Locus 1 include five cans and lids and two bundles of wire. The site is on the northeast slope of an elevated terrace of developing desert pavements surrounded by flat terrain with scattered creosote bushes.

AE-3372-121H

This site is a historical refuse dump of unknown association and includes a concentration of cans (Locus 1) and an excavated square pit (Feature 1). Locus 1, 10 by 4 meters, contains approximately 30 cans and unidentifiable fragments of deteriorated cans. Feature 1 is a previously excavated pit with no artifacts directly associate with the feature. Several outlier constituents were observed, including a crown top bottle cap, sanitary can, and sanitary can lid. The site is at the toe of a west-facing slope situated on a sandy flat with creosote bushes and adjacent to a desert pavement.

AE-3372-123H

This historical land surveying object is a 1917 General Land Office survey marker of standard pipe and cap construction. It reads: “U.S. General Land Office Survey / Penalty $250 for Removal / 1/4 / S18 | S17 / 1917.”

AE-3372-124H

This historical land surveying object is a 1917 General Land Office survey marker of standard pipe and cap construction. It reads: “U.S. General Land Office Survey / Penalty $250 for Removal / 1/4 / S7 | S8 | S18 | S17 / 1917.”

AE-3372-125H

This historical land surveying object is a 1917 General Land Office survey marker of standard pipe and cap construction. It reads: “U.S. General Land Office Survey / Penalty $250 for Removal / T7S R21E / S7 | S18 [over] S18 | S17 / 1917.” A key-opened round can lid was found 0.9 meters east of the marker and is embossed with: “LWE LEMON.”

AE-3372-129H

This historical land surveying object is a 1917 General Land Office survey marker of standard pipe and cap construction. It reads: "U.S. General Land Office Survey / Penalty $250 for Removal / 1/4 / S17 | S16 / 1917." Found on developing pavement west of a large wash.

AE-3372-130H

The site is a small historical refuse scatter on poorly-developed desert pavement in an area measuring 14 by 12 meters. The assemblage comprises five key-wind can lids and one hole-in-top, round hole punch can. The site setting consists of eolian sands between stands of developing pavement.

AE-3372-131H

The site is a historical refuse scatter contains Locus 1 composed of 16 sanitary cans. Additional artifacts outside Locus 1 include one hole-in-top can, one brown beer bottle, five sanitary cans, one oblong tin, and two small cylindrical tins dispersed north and east of Locus 1. A metal backing, possibly from a signal mirror, was also observed.

AE-3372-133H

The site is a historic refuse scatter that includes cans and bottles. Provenienced artifacts include several sanitary cans, a can lid, four brown glass beer bottles, and one metal military fork. Additional cultural constituents include four pieces of ~1/2-inch-thick milled lumber, and one piece with two wire nails protruding.

AE-3372-153H

The site is a single cairn feature (Feature 1) aligned true north-south. The cairn appears to be historical, possibly associated with land surveying activities or prospecting, but period and function are unknown. The cairn is on a young active inset fan with eolian sand sheets roughly stabilized by creosote bursage plant community. No additional artifacts or features were observed.

AE-3372-164H

This emplacement site has one feature containing two parallel berms measuring roughly 29 feet long, 5 feet wide, and 3 feet tall. These are likely associated with DTC/C-AMA activities in the vicinity. The site is in an area of sandy alluvial sheetwash and slopes slightly to the northwest. No artifacts were observed.

AE-3372-167H

This site is a sparse historical refuse scatter of 15 cans, all pre-World War II manufacture, and 3 pieces of medium-gage wire. The site, disbursed along a wash, is on a moderately stabilized, partially deflated inset fan mantled with diffuse eolian sands and fresh fine silty sand alluvium.

AE-3372-173H

This site is a historical refuse scatter consisting of a discrete can dump of seven smaller, single-serve sanitary cans and three multi-serve sanitary cans likely associated with DTC/C-AMA activities in the area.

AE-3372-176H

The site consists of a DTC/C-AMA berm feature and associated historical refuse scatter with six artifacts, including: three 50-caliber cartridge shells with headstamp, two C-ration cans, and one leather boot sole piece. The site is in creosote scrub vegetation on poorly-developed desert pavement, predominately schist and metavolcanic stone, with ephemeral washes going through the site in a northwest direction.

AE-3372-177H

This emplacement site consists of three DTC/C-AMA features on the edge of poorly-developed desert pavement adjacent to an ephemeral wash. No associated artifacts were observed.

AE-3372-179H

The site consists of two DTC/C-AMA foxhole features and historical refuse scatter consisting of 5 sanitary cans, 50-caliber rounds, and 4 glass bottles and jars. There is an upright white boulder, possibly modern, along a two-track road. The site is in an ephemeral wash on poorly-developed desert pavement in a creosote scrub vegetation community.

AE-3372-180H

The site consists of a diffuse historical refuse scatter likely associated with DTC/C-AMA activities. Artifacts include two glass items, 28 cans and lids, a military button, a piece of milled lumber, rubber tire tread, a buckle, and a metal hinge. The site is on poorly-developed desert pavement dissected by numerous ephemeral northwest-oriented washes. Vegetation is creosote scrub. The site is all secondary deposit as artifacts are being dispersed to the northwest by sheetwash during rain episodes. The site is within 100 meters of AE-3372-170/H.

AE-3372-234H

This site is a discrete historical refuse dump of approximately 60 sanitary food/condensed milk cans, glassware, chinaware, and sundry metal artifacts in an area of shifting sand dunes dissected by washes with some very-early formation desert pavement.

AE-3372-251H

This historical land surveying object is a 1917 United States General Land Office Survey section marker (S13). The marker is 3 1/2 inches in diameter with a 1 3/4-inch-deep brass marker cap riveted to a metal pole that is imbedded into the ground to an unknown depth. The metal pole protrudes from the ground to a height of 2 feet 6 inches. The feature is on unstable, eolian sand dunes. Sonoran creosote bush scrub is the dominant vegetation community.

AE-3372-253H

The site is a very diffuse historical refuse scatter with two discrete loci of military C-ration cans, plus several outliers that have probably been windblown from their original location. Also present is a Hazel Atlas perfume/cologne bottle. The site is on well-formed, wash dissected, desert pavement.

AE-3372-257H

The historical land surveying object is a 1917 General Land Office survey marker. The marker is a 3 1/2 inch diameter by 1 3/4 inch deep brass marker cap riveted to a 3 inch diameter galvanized metal pole imbedded into the ground to an unknown depth. The marker is tilted to the west, most likely from being run over by a vehicle (probably a military tank).

AE-3372-269H

The site is a diffuse historical refuse scatter containing five cans and one shell casing, most probably associated with DTC/C-AMA activities. The site is on an alluvial fan apron with eolian sand deposits and early coppice development amidst lag gravels.

AE-3372-271H

The site consists of a historical land surveying object and historical refuse scatter, possibly associated with a temporary camp associated with land surveying activities. This historical land surveying object is a 1917 General Land Office survey marker. The associated historical refuse scatter of 25+ cans and milled lumber fragments. The site area is on unstable, eolian sand dune depositions with little coppice development and some early-development desert pavement. A distinct set of tank tracks (AE-3372-032H) traverses the southern site boundary.

AE-3372-273H

The site is a diffuse historical refuse scatter containing five artifacts consists of three cans and two metal jar or container lids. The site is on an alluvial fan apron with eolian sand dunes with coppice dune development within washes and intermixed with lag gravels/early-desert pavement development.

AE-3372-281H

The site is a diffuse scatter of eight historic artifacts, including a liquor bottle (3 shards), a glass medicinal bottle stopper, two sun-colored amethyst shards, a hole-in-cap food can, and a small bundle of bailing wire. The site is on an alluvial fan apron partially covered by eolian sands and intermixed with early-formation desert pavement.

AE-3372-282H

This 1917 General Land Office survey marker is a 2 1/2 inch diameter by 1 3/4 inch deep brass cap riveted to an 11-inch-high metal pole embedded in the ground to an unknown depth. The feature is on an unstable sand dune with minimal coppice development. Sonoran creosote bush scrub is the dominant vegetation.

AE-3372-283H

The site is a historical refuse scatter of eight cans on an unstable eolian sand dunes with early-stage coppice development.

AE-3372-287H

The site consists of an emplacement feature, a U-shaped berm that was used as a military fighting position, along with an associated discrete scatter of seven military issue C-ration cans from DTC/C-AMA activities. The site is on an alluvial fan apron with eolian sand deposits amidst lag gravels that are developing into early-stage desert pavement.

AE-3372-290H

The site consists of an emplacement feature, a U-shaped berm that was used as a military fighting position, along with an associated discrete scatter of four military issue C-ration cans from DTC/C-AMA activities. The site is on an alluvial fan apron with eolian sand deposits amidst lag gravels that are developing into early-stage desert pavement.

AE-3372-311H

The crescent-shaped site is a DTC/C-AMA military training position with one foxhole and four berms that are somewhat deflated, single-soldier, fighting positions. The site is on a gravel terrace of medium-coarse grained sand, eolian sediments border the landform on the east side, while a sandy wash borders the west. Two sanitary cans in the vicinity of site within the washy areas to the south and west were noted but not recorded due to their secondary placement.

AE-3372-323H

The site is a sparse historical refuse scatter and emplacement from DTC/C-AMA activities, that includes a temporary structure foundation, a foxhole, several cans, one jar, and one burned sheep vertebra.

AE-3372-457H

This site is a sparse historical refuse scatter, comprising three jars and one large 1940s sanitary can, in alluvial sheetwash area, adjacent to large wash.

AE-3372-463H

This emplacement site consists of one foxhole, related to DTC/C-AMA activities. No artifacts were observed. The site in an area of alluvial sheetwash.

5.3.3 Sites with Prehistoric and Historical Components

AE-3372-036/H

This site consists of Feature 1, seven square, hollow, steel posts/rods driven into the ground, possibly associated with DTC/C-AMA-era emplacement activities; and one prehistoric CCS hammerstone. The site is on a narrow low-lying erosional fan remnant on moderately well-developed desert pavement in a creosote bursage scrub vegetation.

AE-3372-046/H

The site contains emplacements, a historical refuse scatter, one quartzite primary flake, and a rim sherd ceramic fragment. The historic features consist of large and diffuse series of four DTC/C-AMA military fighting positions including three, one-man foxholes and one large artillery position, plus a diffuse scatter of 22 military issue C-ration and non-military cans. The site within the Chuckwalla Bench, a variably level, wash-dissected, exposed bajada, 2 degree north is in a vegetation community of Sonoran creosote bush scrub upon poorly-formed desert pavement.

AE-3372-140/H

This multicomponent site has two lithic reduction loci and one historical feature with associated historic-period artifacts. Locus 1 contains debitage from at least four different CCS material types as well as a quartzite hammerstone. Locus 2 is a reduction locus containing primarily crystalline quartz, a few CCS items, and one quartz flake tool. Feature 1 is a pipe in the ground surrounded by a concrete and small cobble base with associated milled lumber, possibly a historical marker associated with land surveying. The milled lumber has four pieces of attached wire, possibly guy wires. The site is on top of an elevated alluvial terrace of desert pavement with slopes on the east, south, and west. The northern side of the site has some eolian deposition.

AE-3372-144/H

The site is on two parallel fingers of low-rising, north-northeast trending erosional fan remnants, bounded in all directions by more active inset fans and head gullies/rills. The prehistoric component is a lithic scatter with hammerstones, tested cobbles/gravels, one core, and primary reduction flakes, one cobble tool, and one flake tool as well as tested cobbles/gravels and debitage. CCS and quartzite are the most common materials represented; mass quartz and metavolcanics are rare. The historical component consists of three features and six artifacts. Features 1 and 2 are rock arrangements, probably rock insignias, unit designations, or individual's initials likely related to DTC/C-AMA military activities and/or small unit training. Feature 3 is a survey marker in the eastern portion of the site. Historical constituents outside of features include six artifacts: a brown beer bottle in 20+ shards, one tobacco tin with striker plate; one meat/fish tin with top key roll strip-open; and three sanitary food cans.

AE-3372-146/H

This is a multicomponent site with a historical emplacement, historical refuse scatter, lithic scatter, and a ceramic scatter on a deflated alluvial desert pavement terrace with ephemeral washes on the east and west sides. The historical emplacement, Feature 1, is a DTC/C-AMA related slit trench. Historical refuse is limited to one can and one can lid. The prehistoric components are a sparse lithic scatter with five tested cobbles/gravels and two pieces of debitage, one ceramic body sherd, and Locus 1 consisting of six buffware ceramic body sherds in the northern portion of the site.

AE-3372-147/H

This site consists of two historical rock features and two loci of prehistoric artifacts. The loci include Locus 1, a concentration of 15 ceramic sherds; and Locus 2 a petrified wood knapping station with 12 pieces of debitage. Additional items include a tested cobble, a core, a hammerstone, and 15 additional pieces of debitage. The historical component includes two rock features, possibly landscape markers associated with the DTC/C-AMA. The site is on the toe of an alluvial desert pavement terrace and follows the slightly elevated terrace landform. Eolian sands and recent alluvial sands are present at the toe of the landform.

AE-3372-154/H

This ceramic scatter and historical refuse scatter is on a low-lying flat with eolian sands and creosote scrub vegetation. The ceramic sherds, some of which are painted, are primarily found within two loci. Locus 1, in the southwest portion of the site, contains 15 buffware body sherds and 4 sherds of a historical porcelain tea/coffee cup. Locus 2 is a pot drop containing four buffware sherds of the same type as in Locus 1. Other prehistoric ceramics were observed outside the two loci. In addition to the porcelain fragments in Locus 1, the historical component includes a sanitary food can, four amorphous tin can body fragments, one metal tea kettle, and a .50-caliber cartridge with head stamp.

AE-3372-157/H

This site consists of a historical refuse scatter and sparse prehistoric artifacts. The prehistoric assemblage consists of a single buffware body sherd and one primary CCS flake. The historical assemblage, on the eastern edge of the site, is indicative of DTC/C-AMA small-unit training/bivouac activities. Historical artifacts are limited to a scatter of 14 cans/lids and one milled wood board where can density is highest. Several other cans have been redeposited downslope to the north-northeast; several are partially buried and were not disturbed. The site is on an active inset fan with eolian coppice dunes. Re-deposition is common. No vehicular disturbance is apparent.

AE-3372-170/H

This site consists of a large historic refuse scatter and sparse prehistoric lithic artifacts. The historic component consists of an extensive historic refuse scatter (mostly secondary deposit) related to DTC/C-AMA activities within Locus 1. The historical assemblage outside Locus 1 consist of redeposited artifacts (secondary context) associated with military training activity and includes a personal mirror with bailing wire handle/hanger, galvanized steel sheets round heard rivets (2 pieces), 1 thin saw blade, 30 pieces of milled lumber, a ketchup bottle, and an additional mason jar (Owens Illinois). Cans located throughout the site consist of 13 single serve sanitary cans, 2 cylindrical upright 8-ounce cans, 3 rectangular upright drums (10-inch square), 4 multi-serve sanitary cans, 1 hole-in-top (standard), 12 C-ration cans (single serve), 1 half-gallon pail, 1 B-unit, 1 flat oval 12-16-ounce meat tin. Locus 1 is a primary historic deposit with three point-provenienced artifacts (jars with makers' marks), three cans, and one CCS primary flake. The historic component is dispersed over an expansive area due to alluvial sheetwash activity. The prehistoric component consists of two artifacts (a biface and a utilized flake) and two CCS tertiary flakes. Numerous ephemeral washes cross the site in a west and northwest direction, moving the cans and refuse with every rain event.

AE-3372-175/H

This site consists of historical emplacements and refuse scatter as well as prehistoric ceramic and lithic artifacts. The historic component consists of seven foxhole and berm features and a very sparse scatter of historic-period refuse limited to two C-ration cans, one "FULMERS" baking powder external-friction 1/2 pound can, one rotary-opened flat oval fish tin, and three .50-caliber ammo links. The prehistoric component consists of Locus 1 containing 15 ceramic body sherds and 10 pieces of scattered debitage. The site is in a creosote scrub environment with poorly-developed desert pavement; multiple ephemeral washes cross the site in a northwest direction.

AE-3372-232/H

This site consists of historical emplacements, historical refuse, and one prehistoric lithic artifact. The emplacements comprise a WWII military field training position with a multi-personnel/light equipment observational dug out position (Feature 1), two smaller military personnel positions or fox holes (Features 2 and 3) and a sparse scatter of 13 variously sized and purposed C-ration cans. The prehistoric component consists of a single cortical quartzite flake. The site is likely the remains of a DTC/C-AMA temporary camp. A set of tank tracks plus other possible military vehicle tracks traverse the site.

AE-3372-261/H

The resource is a multicomponent site composed of eight ceramic sherds of two different types, one unidirectionally flaked quartzite core/sharpened hammerstone, and a discrete historical refuse dump on an alluvial fan apron with eolian sand dunes amidst lag gravels that are developing into early-stage desert pavement. Loci 1 and 2 contain the majority of the site's artifacts. Locus 1 contains seven prehistoric ceramics. Locus 2 contains three sanitary cans, one mason jar, and one mason jar lid.

AE-3372-262/H

This resource is a 2,000-square-meter site with historical refuse and prehistoric ceramics, mainly concentrated within three loci: Loci 1 and 2 are two discrete historic can dumps, possibly from Joint Operation Desert Strike-era military training, and Locus 1 is a prehistoric ceramic pot drop. A diffuse scatter of historic cans connects the three loci. The site is on an alluvial fan apron with sand dunes and lag gravels that are developing into early-stage desert pavement.

AE-3372-286/H

This site is a historical temporary camp composed of a thermal feature, 15 fragments of a brown, salt-glazed, stoneware "crock" pot, a can scatter, and two prehistoric ceramic sherds. The site is on an alluvial fan apron with eolian sand deposits amidst lag gravels that are developing into early-stage desert pavement.

AE-3372-295/H

The site contains prehistoric and historic artifacts. The assemblage is a sparse scatter of 11 ceramic sherds from at least two vessels, and a discrete historic refuse scatter of four cans and one bottle on an alluvial fan apron with well-developed coppice and eolian sand dunes.

AE-3372-320/H

The site is a sparse, somewhat linear, prehistoric lithic and ceramic scatter with some historic refuse (cans and glass jars) on the southwest section of the site. Resources are likely to have been redeposited, especially the historic cans, as the site is bordered by shallow braided intermittent drainages and some thin, eolian sand sheets.

AE-3372-322/H

The site is a diffuse, multicomponent site containing five artifacts: one ground stone milling slab that is in line with the slope of the landform, but buried in the ground an unknown amount, and four cans from a DTC/C-AMA refuse deposit. Resources are likely to have been redeposited, especially the historic cans, as the site is within a broad, sandy wash with sporadic coppice dunes and shallow braided intermittent drainages.

AE-3372-451/H

This site consists of historical emplacements, historical refuse scatter, and a prehistoric lithic scatter. The emplacements include 11 DTC/C-AMA foxholes and one gun-placement station. Historic refuse comprises various cans and one glass bottle. Prehistoric lithics include a quartz knapping station. The site is on an elevated alluvial fan piedmont terrace with creosote scrub vegetation with granitic, schist, and metavolcanic geology and alluvial sandy soils. The terrace is bisected down the center of the site.

AE-3372-459/H

This site consists of one historical emplacement, a sparse historical refuse scatter, and a prehistoric ceramic scatter. The assemblage comprises two cans and a small ceramic scatter with one DTC/C-AMA fox hole in a sheetwash area adjacent to a seasonal wash.

AE-3372-460/H

This is a somewhat discrete site composed of 75 Colorado red ceramic sherds from a single vessel, plus four DTC/C-AMA machine gun magazine clips with five spent cartridges in each. The site is on a fully exposed knoll of moderately developed desert pavement lag gravels surrounded by alluvial washes and eolian sand deposits.

5.4 ISOLATED FINDS WITHIN THE APE

Æ's inventory identified 183 isolated finds within the Project APE. This includes 22 previously recorded and 161 newly identified isolated finds. Of the 183 isolates, 11 that were previously recorded could not be found during the current survey. A brief description of each newly discovered isolates is presented in Table 5-1 below. All newly recorded isolated finds are prehistoric artifacts, including ceramics or ceramic concentrations such as pot drops; stone tools and their manufacturing items such as cores, hammerstones, or lithic debitage; or ground stone. For a comprehensive review of each isolated find, see the isolate records attached in Appendix D. A complete list of all isolates within Project APE (previously recorded and newly recorded) is included in Appendix F.

Table 5-1
Newly Identified Isolated Finds in the APE

Temporary Isolate Number	Isolate
AE-3372-002-ISO	Ceramic concentration-single vessel
AE-3372-003-ISO	Ceramic concentration- single vessel
AE-3372-004-ISO	Unifacial flake tool
AE-3372-006-ISO	2 ceramic sherds
AE-3372-007-ISO	Mano
AE-3372-008-ISO	Ceramic sherd
AE-3372-009-ISO	2 ceramic sherds
AE-3372-010-ISO	3 ceramic sherds- single vessel
AE-3372-011-ISO	2 ceramic sherds- single vessel
AE-3372-012-ISO	Ceramic sherd
AE-3372-013-ISO	3 ceramic sherds- single vessel
AE-3372-014-ISO	2 ceramic sherds, 1 flake
AE-3372-015-ISO	Ceramic concentration- single vessel
AE-3372-016-ISO	2 flakes
AE-3372-017-ISO	Ceramic concentration- single vessel
AE-3372-018-ISO	2 ceramic sherds
AE-3372-019-ISO	2 ceramic sherds, 1 bone fragment
AE-3372-020-ISO	CCS flake
AE-3372-021-ISO	Ceramic sherd
AE-3372-022-ISO	Ceramic concentration- single vessel
AE-3372-023-ISO	Ceramic sherd
AE-3372-027-ISO	2 flakes
AE-3372-031-ISO	Ceramic concentration- single vessel
AE-3372-034-ISO	Flake
AE-3372-037-ISO	Hammerstone, flaked pebble tool
AE-3372-042-ISO	Ceramic sherd
AE-3372-048-ISO	Ceramic sherd, 1 flake
AE-3372-051-ISO	CCS flake
AE-3372-052-ISO	CCS flake

Table 5-1 (continued)
Newly Identified Isolated Finds in the APE

Temporary Isolate Number	Isolate
AE-3372-054-ISO	Assayed pebble
AE-3372-100-ISO	Ceramic concentration- single vessel
AE-3372-101-ISO	2 ceramic sherds
AE-3372-105-ISO	Ceramic sherd
AE-3372-106-ISO	Mano/hammerstone
AE-3372-107-ISO	Hammerstone
AE-3372-108-ISO	2 ceramic sherds
AE-3372-109-ISO	Ceramic sherd
AE-3372-110-ISO	Ceramic sherd
AE-3372-111-ISO	Bifacial tool, flake
AE-3372-112-ISO	Mano
AE-3372-113-ISO	Ceramic rim sherd
AE-3372-114-ISO	Edge-modified flake
AE-3372-115-ISO	Hammerstone, split cobble
AE-3372-116-ISO	Flake
AE-3372-117-ISO	Tested cobble
AE-3372-135-ISO	Ceramic sherd
AE-3372-136-ISO	2 ceramic sherds
AE-3372-137-ISO	Ceramic sherd
AE-3372-143-ISO	Ceramic concentration- single vessel, +58 sherds
AE-3372-149-ISO	Ceramic scatter
AE-3372-156-ISO	Ceramic sherd
AE-3372-161-ISO	4 ceramic sherds- single vessel
AE-3372-163-ISO	1 flake; 1 tested cobble
AE-3372-166-ISO	2 ceramic sherds
AE-3372-169-ISO	3 ceramic sherds
AE-3372-171-ISO	2 ceramic sherds
AE-3372-172-ISO	5 ceramic sherds (1 rim, 4 body)
AE-3372-174-ISO	Ceramic concentration- single vessel; 1 flake
AE-3372-178-ISO	Ceramic sherd
AE-3372-181-ISO	5 ceramic sherds
AE-3372-182-ISO	2 ceramic sherds
AE-3372-184-ISO	Ceramic concentration- single vessel (45+)
AE-3372-187-ISO	Stone tool; 1 flake
AE-3372-190-ISO	2 ceramic sherds
AE-3372-192-ISO	Tested cobble; refit flake
AE-3372-193-ISO	Hammerstone; 1 mano
AE-3372-194-ISO	3 ceramic sherds-same vessel; flaked angular slab; 1 flake
AE-3372-198-ISO	Hammerstone
AE-3372-202-ISO	2 flakes

Table 5-1 (continued)
Newly Identified Isolated Finds in the APE

Temporary Isolate Number	Isolate
AE-3372-203-ISO	3 ceramic sherds
AE-3372-204-ISO	Core
AE-3372-206-ISO	4 ceramic sherds
AE-3372-207-ISO	Ceramic sherd
AE-3372-208-ISO	Ceramic concentration- single vessel
AE-3372-209-ISO	Flake
AE-3372-210-ISO	3 ceramic sherds
AE-3372-211-ISO	Ceramic sherd
AE-3372-212-ISO	3 ceramic sherds
AE-3372-213-ISO	Bipolar reduced quartz crystal
AE-3372-214-ISO	1 flake
AE-3372-215-ISO	2 flakes
AE-3372-216-ISO	2 flakes
AE-3372-217-ISO	Ceramic sherd
AE-3372-218-ISO	Ceramic sherd
AE-3372-219-ISO	Hammerstone
AE-3372-220-ISO	2 ceramic sherds
AE-3372-221-ISO	2 flakes
AE-3372-223-ISO	Flake
AE-3372-224-ISO	Flake
AE-3372-225-ISO	Ceramic concentration- single vessel
AE-3372-226-ISO	Core
AE-3372-227-ISO	2 flakes
AE-3372-228-ISO	3 ceramic sherds
AE-3372-233-ISO	Core, bi-directional
AE-3372-238-ISO	Ceramic concentration- single vessel
AE-3372-239-ISO	Ceramic concentration- single vessel
AE-3372-241-ISO	Ceramic sherd
AE-3372-246-ISO	Ceramic sherd
AE-3372-254-ISO	Ceramic concentration
AE-3372-259-ISO	5 ceramic sherds
AE-3372-260-ISO	Ceramic concentration
AE-3372-268-ISO	Ceramic sherd
AE-3372-274-ISO	Hammerstone spall
AE-3372-278-ISO	Ceramic sherd
AE-3372-280-ISO	Ceramic concentration- single vessel
AE-3372-285-ISO	Colorado red bowl frags (38 sherds)
AE-3372-288-ISO	Ceramic concentration- single vessel
AE-3372-291-ISO	Flake
AE-3372-293-ISO	Lithic concentration
AE-3372-298-ISO	Ceramic sherd

Table 5-1 (continued)
Newly Identified Isolated Finds in the APE

Temporary Isolate Number	Isolate
AE-3372-299-ISO	Ceramic sherd
AE-3372-302-ISO	Flake
AE-3372-303-ISO	2 hammerstone
AE-3372-304-ISO	2 flakes
AE-3372-305-ISO	2 ceramic sherds
AE-3372-306-ISO	2 ceramic sherds
AE-3372-307-ISO	Core tool
AE-3372-308-ISO	Split cobble
AE-3372-309-ISO	Core, unifacial
AE-3372-312-ISO	Core; 1 ceramic rim sherd
AE-3372-313-ISO	2 ceramic sherds; 1 flake
AE-3372-314-ISO	Ceramic sherd; 1 flake
AE-3372-315-ISO	Ceramic sherd
AE-3372-316-ISO	Ceramic concentration
AE-3372-317-ISO	Ceramic concentration
AE-3372-318-ISO	Ceramic sherd
AE-3372-319-ISO	Ceramic concentration
AE-3372-326-ISO	3 ceramic sherds
AE-3372-327-ISO	Flake
AE-3372-328-ISO	Lithic flake tool
AE-3372-329-ISO	Flake
AE-3372-330-ISO	Flake
AE-3372-331-ISO	2 flakes
AE-3372-334-ISO	Ceramic concentration- single vessel
AE-3372-450-ISO	Mano
AE-3372-452-ISO	Ceramic concentration
AE-3372-453-ISO	Ceramic sherd
AE-3372-454-ISO	6 ceramic sherds (two types)
AE-3372-455-ISO	Ceramic sherd
AE-3372-456-ISO	Ceramic sherd
AE-3372-458-ISO	Flake
AE-3372-461-ISO	Tested cobble
AE-3372-466-ISO	Flake
AE-3372-467-ISO	Core
AE-3372-468-ISO	Ceramic sherd
AE-3372-469-ISO	2 ceramic sherds
AE-3372-470-ISO	Mano
AE-3372-471-ISO	Ceramic sherd
AE-3372-472-ISO	Flake
AE-3372-473-ISO	Ceramic sherd
AE-3372-474-ISO	2 ceramic sherds

Table 5-1 (continued)
Newly Identified Isolated Finds in the APE

Temporary Isolate Number	Isolate
AE-3372-475-ISO	Ceramic sherd
AE-3372-476-ISO	4 ceramic sherds
AE-3372-477-ISO	2 ceramic sherds
AE-3372-478-ISO	Flake
AE-3372-479-ISO	Flake
AE-3372-480-ISO	Ceramic sherd
AE-3372-481-ISO	Ceramic concentration- single vessel
AE-3372-483-ISO	Ceramic concentration- single vessel
AE-3372-486-ISO	Core
AE-3372-488-ISO	Assayed cobble with one piece of debitage

5.5 PREVIOUSLY RECORDED SITES OUTSIDE THE APE

The BLM requested that Æ visit three cultural resources within the indirect APE to verify the site boundaries and update the site records. These resources include the Mule Tank Petroglyph Site (CA-RIV-504) and two trail segments (CA-RIV-343 and -673/H). Survey crews followed the trail segments within the indirect APE beyond their recorded alignments to more fully document the extent of these resources. The crews examined a 30-meter-wide corridor centered on the trail to identify associated features. Detailed descriptions and assessments of these three resources will be presented in a separate report discussing the sites within the indirect APE, specifically CA-RIV-343, -504, and -673/H.

6
SUMMARY AND MANAGEMENT RECOMMENDATIONS

6.1 SUMMARY

Between July 24, 2017 and November 21, 2017, Æ cultural resource specialists, accompanied by tribal monitors, conducted an intensive Class III field survey of the direct APE for the RE Crimson Solar Project. Nine prior cultural resource investigations had covered portions of the Project APE; approximately 14 percent (407 acres) of the direct APE had been inventoried by these previous surveys. As a result of this previous work, 67 cultural resources (45 sites and 22 isolated finds) had been identified and documented. During the current survey, Æ attempted to visit all 45 previously identified sites; however, CA-RIV-10884 could not be located. The other 44 sites were visited by Æ survey crews and the site records for 11 of these resources were updated to reflect new findings or changed conditions at the sites.

In addition to locating the previously recorded sites, Æ discovered and documented 122 new sites and 161 new isolated finds within the direct APE. In sum, Æ identified 350 cultural resources within the APE. Of these, 167 are archaeological sites (82 prehistoric, 58 historical, and 27 with both components), while 183 are isolated finds. Æ identified three common types of prehistoric sites within the APE: (1) lithic and/or ceramic scatters, (2) FAR concentrations, thermal features, or hearths, and (3) cleared circles. The most prevalent historical sites within the APE are: (1) refuse scatters/can dumps, (2) military emplacements, and (3) military vehicle tracks. Many sites within the APE contain both prehistoric and historical components. The majority of these contain scatters of prehistoric lithics/ceramics and historical refuse.

6.2 SIGNIFICANCE RECOMMENDATIONS

Using surface indicators, contextual information gathered from other studies in the region, and tribal input, Æ offers the following recommendations regarding site significance, integrity, and eligibility for listing in the NRHP. To evaluate site significance, Æ considered the nature and content of the resource, the quantity and variety of artifacts present, the distribution and spatial patterning of artifacts and features, and the presence (or potential presence) of organic remains suitable for radiocarbon dating. In most cases, sites with a broad quantity and variety of artifacts, discernible features, and datable remains (either temporally diagnostic artifacts or organic material) were judged significant. Those with relatively few artifacts, or lacking in diversity or datable materials, were typically judged insignificant. When eligibility could not be determined based on surface indicators, further testing is recommended.

Isolated artifacts by convention are not considered to be significant resources eligible for listing on the National Register due to their lack of context and association; thus, none of the isolated finds are considered eligible for inclusion in the NRHP.

Æ recommends that 3 of the 167 archaeological sites within the APE are significant and eligible for listing in the NRHP (Table 6-1). CA-RIV-1819/H has a large quantity and wide variety of surface artifacts, along with evident features. The setting strongly suggests that CA-RIV-1819/H may possess equally intact subsurface deposits. Despite intensive past military activities in the immediate area, the site retains sufficient integrity to be considered eligible for listing on the NRHP under Criterion D.

Æ-3372-292 and -324 are cleared circles with associated features and artifacts. Æ-3372-292 contains four cleared circles, a quartz chipping station with more than 50 pieces of debitage, and a single jasper flake. Æ-3372-324 contains a single well-defined cleared circle surrounded by a rock ring, plus a scatter of lithic artifacts. Cleared circles, sometimes referred to as "sleeping circles," have often been considered to be sleeping or resting places, and smaller ones as vision quest or meditation circles (Cleland 2005; Davis 1980; Ezzo and Altschul 1993; Pigniolo et al. 1997; Rogers 1966; von Werlhof and von Werlhof 1977). Because of their possible association with trans-regional travel, vision questing, and other ceremonial functions, and because of their importance to the tribes, these two sites are considered eligible for listing on the NRHP under Criteria A and D.

Table 6-1
Sites Considered NRHP Eligible

Trinomial	Primary	Temporary ID	Description	Eligibility Status
CA-RIV-1819/H	33-001819	—	Extensive lithic scatter with prehistoric ceramics and 21 historical features	Recommended eligible
—	—	AE-3372-292	Cleared circles on desert pavement	Recommended eligible
—	—	AE-3372-324	Cleared circle with rock ring and lithics	Recommended eligible

Æ recommends subsurface testing at nine additional sites to evaluate their significance and integrity (Table 6-2). These sites contain thermal features with possible subsurface deposits of datable organic remains. If present, such materials could provide important new information regarding regional cultural chronology, land use, and settlement systems, and the sites would thus be considered eligible for listing on the NRHP under Criterion D. Æ is currently preparing a formal Phase 2 testing and evaluation plan that will be presented in a separate document.

Table 6-2
Sites Recommended for Further Testing and Evaluation

Trinomial	Primary	Temporary ID	Description	Eligibility Status
CA-RIV-10033/H	33-019719	AE-DEV-046	Historical refuse scatter, lithic scatter	Recommended eligible pending testing and evaluation
—	—	AE-3372-039	Lithic and ceramic scatter	Recommended eligible pending testing and evaluation
—	—	AE-3372-199	Lithic and ground stone scatter with large amounts of imported material	Recommended eligible pending testing and evaluation
—	—	AE-3372-231	Temporary camp with sparse lithic scatter	Recommended eligible pending testing and evaluation

Table 6-2 (continued)
Sites Recommended for Further Testing and Evaluation

Trinomial	Primary	Temporary ID	Description	Eligibility Status
—	—	AE-3372-240	Three thermal features	Recommended eligible pending testing and evaluation
—	—	AE-3372-245	One thermal feature	Recommended eligible pending testing and evaluation
—	—	AE-3372-248	Two thermal features	Recommended eligible pending testing and evaluation
—	—	AE-3372-256	Six thermal features with ceramics	Recommended eligible pending testing and evaluation
—	—	AE-3372-263	One fire altered rock feature, ceramics, and ground stone	Recommended eligible pending testing and evaluation

The remaining 155 sites do not contain sufficient numbers or types of artifacts to meet the significance standards of 36 CFR 60.4, lack discernible features, and do not demonstrate potential to harbor buried deposits; thus, they are not considered eligible for listing in the NRHP. We note, however, that roads and trails considered individually ineligible for listing in the NRHP may be found to be elements of a larger prehistoric transportation district or a historic military district in the event that such a designation is contemplated in the future. Appendix F provides a complete list of the cultural resources within the direct APE as identified during the Class I (Mirro and Clark 2016) and Class III inventories, along with all eligibility recommendations.

6.3 POTENTIAL FOR BURIED AND UNIDENTIFIED ARCHAEOLOGICAL SITES

Archaeological sites recorded during the current Class III survey were found primarily in areas subject to continuous deflation, erosion, and burial by drift sands. Portions of the Project APE, however, possess a high potential for buried archaeological deposits. The BLM may require a formal geoarchaeological analysis of buried site potential in the future.

Five prior geoarchaeological studies are of note in this regard, four in Riverside County in the vicinity of the current Project and one farther west in Kern County. Steinkamp (2009a) conducted geotechnical testing and sediment logging for the Blythe Solar Power Project (BSPP), about 10 miles west of Blythe in Riverside County. This testing demonstrated the existence of middle to late Pleistocene lacustrine and alluvial fan deposits, in addition to Holocene alluvial fan deposits. Steinkamp (2009a:iii) reported no evidence of paleosols or buried cultural deposits, but nonetheless felt the project area had a high probability to contain buried archaeological deposits. Steinkamp recommended construction monitoring “within targeted areas of these deposits within the BSPP Project area” (2009a:iii).

In a similar project involving geotechnical testing and sediment logging for the Palen Solar Power Project (PSPP), Steinkamp (2009b:iii) recommended construction monitoring for “any future excavations that may impact culturally sensitive geologic deposits known to occur within the project area and vicinity” even though no evidence of subsurface cultural deposits or paleosols was found. The third geotechnical study was in the Mojave Desert for the Ridgecrest Solar Power Project (RSPP) in Kern County, about 300 miles west of the current APE.

Steinkamp (2010:iii) reported that the RSPP contained fluvial and eolian accumulations with a high potential for buried archaeological deposits. As such, construction monitoring was again recommended “within targeted areas of the Project area” (Steinkamp 2010:iii).

Young (2009) performed a study of landform structure and archaeological sensitivity in the Fremont Valley for the Beacon Solar Energy Project (BSEP), about 300 miles west of the Crimson Solar survey but still within the Mojave Desert. He noted that the fan systems within the project area coalesced to form axial washes that extend toward Koehn Lake. Several significant stands of Koehn Lake have been reported and demonstrate favorable conditions for prehistoric occupation of the area around the lake (Sutton 2016; also see Sutton 1991; Gardner 2002, 2007). A large village known as the Koehn Lake Site (CA-KER-875; Sutton 2016) is along one of these high lake stands. Specific to the BSEP, Young (2009:1) reported that Pine Tree Canyon has a “high-resolution record of regional erosion and deposition, processes that may preserve or alter a buried archaeological record.” Various climatic fluctuations during the Holocene “often resulted in abrupt landform or resource changes that may leave depositional signatures on the landscape” that “have been appropriate for preservation of an intact archaeological record” (Young 2009:2–3).

One example of a deeply buried Pinto-age site in a region south of the BSEP that falls within an active fan along the Garlock Fault is CA-KER-3939 (Gardner et al. 2002; also see Young 2009:7), which contained buried hearths up to 5 meters below the surface. Young (2009:18) concluded that archaeological sensitivity models such as the one proposed for the BSEP could be developed based on the “timing and energy of landform development within and surrounding the proposed Beacon Solar Energy Project,” and that it was possible to evaluate the potential to encounter buried archaeological sites during project development.

Finally, in a Class III inventory for the Desert Quartzite Solar Project (DQSP), Lerch et al. (2016) discussed a previous study by McDonald and Schaefer (1998) that created a buried site sensitivity model based on geomorphology and site density from records search data. Noting that buried-site sensitivity models are “based on the relationship between landform age and the accepted dates of human habitation in North America,” Lerch et al. (2016:110, 112) cautioned about the importance of recognizing discrepancies between geologic potential and actual probability for buried archaeology, “including the precise age of the landform/geomorphic surface, slope gradient, the depositional environment of the sediments underlying the landform, the presence or absence of buried soils, proximity to water, and indeterminate cultural influences.” With that caveat, Lerch et al. (2016:112–113) assessed the potential for buried and intact archaeological resources within the DQSP using those criteria. He concluded that specific areas of high geologic potential, such as natural drainages that may have been blocked by eolian sand, “should be of special concern during future cultural resource investigations.”

6.4 FURTHER MANAGEMENT RECOMMENDATIONS

No further cultural resource management measures are recommended for the sites judged ineligible for listing in the NRHP. For those sites judged significant, avoidance is preferable. If avoidance is not possible, Æ recommends that the BLM, in consultation with the Applicant and Tribes, prepare a Historic Properties Treatment Plan to resolve the adverse effects of the undertaking on sites eligible for listing in the NRHP.

To address areas with high potential for buried cultural deposits and/or high sensitivity to Native American tribes, the BLM should also prepare a plan for construction monitoring, treatment of sites discovered during construction, and treatment of any unanticipated adverse effects of the Project. This plan will include acceptable procedures for unanticipated discoveries and a NAGPRA Plan of Action. A designated Cultural Resource Specialist should be retained to provide on-site monitoring and inspection services. The Cultural Resource Specialist will coordinate with the Project owner's construction manager and environmental compliance manager to stop all work in the vicinity of any potentially significant unanticipated find until it can be evaluated. If the discovery is determined not significant through consultation with BLM staff and interested consulting parties, work may continue.

All Project-specific plans will be developed through the consultation process with the Project owner, BLM, and interested Native American tribes.

7
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1991 *Archaeological Investigations at Nelson Wash, Fort Irwin, California*. Report submitted to the Interagency Archaeological Services, National Park Services, Western Region, San Francisco, California.

Warren, Claude N., Martha Knack, and Elizabeth von Till Warren

1981 *A Cultural Resource Overview for the Amargosa-Mojave Basin Planning Units*. Bureau of Land Management Cultural Resources Publications, Riverside.

Weide, Margaret

1976 A Cultural Sequence for the Yuha Desert. In *Background to Prehistory of the Yuha Desert Region*, edited by Philip J. Wilke, pp. 81–94. Ballena Press, Ramona, California.

Weide, Margaret L., and James P. Barker

1974 *Background to Prehistory of the Yuha Desert Region*, edited by Philip J. Wilke, Bureau of Land Management, Riverside, California.

Wells, Stephen G., William J. Brown, Yehouda Enzel, Roger Y. Anderson, and Leslie D. McFadden

2003 Late Quaternary Geology and Paleohydrology of Pluvial Lake Mojave, Southern California. In *Paleoenvironments and Paleohydrology of the Mojave and Southern Great Basin Deserts*, edited by Yehouda Enzel, Stephen G. Wells, and Nicholas

Lancaster, pp. 79–114. Geological Society of America Special Paper 368. Boulder: Geological Society of America.

White, Christopher
1974 Lower Colorado River Area: Aboriginal Warfare and Alliance Dynamics. In *'Antap: California Indian Political and Economic Organization*, edited by Lowell J. Bean and Thomas F. King, pp. 113–135. Ballena Press Anthropological Papers 2. Ramona, California.

Whitley, David S.
1996 *A Guide to Rock Art Sites: Southern California and Southern Nevada.* Mountain Press Publishing Company. Missoula, Montana.

Wilke, Philip J.
1978 *Late Prehistoric Human Ecology at Lake Cahuilla, Coachella Valley, California*. Contributions of the University of California Archaeological Research Facility 38. University of California. Berkeley.

Wilson, Eldred D.
1961 *Gold Placers and Placering in Arizona*. Arizona Geological Survey Bulletin 168.

Young, D. Craig
2009 *Landform Structure and Archaeological Sensitivity in the Beacon Solar Energy Project Area*. Far Western Anthropological Research Group, Inc. Submitted to EDAW, Inc., San Diego, California.

APPENDIX A

Résumés of Key Personnel

BARRY A. PRICE

Principal Archaeologist

Areas of Expertise

- Cultural resource management
- Land use planning and facility siting
- California and Great Basin history and prehistory
- NHPA, NEPA, and CEQA compliance

Years of Experience

- 43

Education

M.A., Cultural Resource Management, Sonoma State University, 1994

B.A., Anthropology (with honors), Sonoma State University, 1976

Registrations/Certifications

- Registered Professional Archaeologist 15108

Permits/Licensure

- Principal Investigator, California BLM Statewide Cultural Resource Use Permit CA-15-29
- Principal Investigator (prehistoric and historic), Nevada BLM Statewide Cultural Resource Use Permit N-95359

Professional Affiliations

- Society for American Archaeology
- Society for California Archaeology
- Society for Historical Archaeology

Professional Experience

2017—	Vice President and Managing Principal, Applied EarthWorks, Inc.
2015–2017	Chairman, Board of Directors, Applied EarthWorks, Inc.
1995–2015	Vice President, Principal Archaeologist, and Western Division Manager, Applied EarthWorks, Inc., Fresno and San Luis Obispo, California
1989–1995	Vice President (1992–1995), Assistant Vice President (1991–1992), Senior Archaeologist/Program Manager (1989–1991), INFOTEC Development, Inc., Fresno, California
1984–1989	Principal Investigator and Project Director, Retrospect Research Associates, Ely, Nevada
1983–1984	Archaeologist, Bureau of Land Management, Ely District
1982–1983	Archaeological Specialist/Historian, California Department of Parks and Recreation, Sacramento
1979–1982	Staff Archaeologist (1979–1982), Archaeological Resource Service, Novato, California; Field Technician and Laboratory Analyst (1981–1982), INFOTEC Development, Inc.
1975–1979	Staff Archaeologist (1977–1979), Curatorial Assistant (1975–1979), Cultural Resources Facility, Sonoma State University Foundation

Technical Qualifications

Mr. Price has more than 40 years of experience in prehistoric and historical archaeology, architectural history, historic preservation, and other aspects of cultural resource management. He has directed and/or participated in projects throughout California, Nevada, Arizona, Oregon, Washington, and Idaho, and has authored scores of technical reports, journal articles, planning documents, and other publications including research designs, management plans, National Register nominations, and other CEQA, NEPA, and National Historic Preservation Act (NHPA) compliance documents. Mr. Price has expertise in many facets of cultural resources management including project design and administration, data acquisition, laboratory analysis, report preparation, and technical management. As Principal Archaeologist for Applied EarthWorks, he directs professional staff and subcontractors in the performance of project work. In addition to his duties at Æ, Mr. Price currently teaches cultural resource law and practice at California Polytechnic State University (CalPoly) in San Luis Obispo.

Jasmine Kidwell

Staff Archaeologist

Areas of Expertise

- Cultural resource management
- Archaeological fieldwork
- GIS analysis
- Geoarchaeological analysis
- Prehistory and history of California and the Southwest

Years of Experience

- 12

Education

M.A., Anthropology and Applied Archaeology, Eastern New Mexico University, Portales, 2018

B.A., Anthropology, University of California, Santa Barbara, California, 2007

Permits/Licensure

- Permitted to serve as Crew Chief for State Lands in New Mexico, issued by the Cultural Properties Review Committee of the New Mexico Historic Preservation Division

Professional Affiliations

- Society for American Archaeology
- New Mexico Archaeological Society

Professional Experience

2018– Staff Archaeologist/GIS Technician, Applied EarthWorks, Inc., San Luis Obispo, California

2017–2018 Archaeologist, Bureau of Land Management, Carlsbad, New Mexico

2011 Archaeological Field School, Oregon State University, Cooper's Ferry Site, Cottonwood, Idaho

2008–2009 Cultural Resources Intern, Student Conservation Association, Vandenberg Air Force Base, Lompoc, California

2008– Projects for the following firms throughout the U.S.:

- Applied EarthWorks, Inc., Lompoc, California
- Office of Contract Archaeology, Albuquerque, New Mexico
- Versar, Inc., Roosevelt County, New Mexico
- William and Self Associates, Pike County, Arkansas
- Ecosystems Management, Inc., Navajo and Apache Counties, Arizona
- SWCA Inc., Doña Ana County, New Mexico

2006– Seasonal archaeologist for the following federal agencies throughout the U.S.:

- United States Forest Service, Apache-Sitgreaves National Forest, Springerville, Arizona
- United States Forest Service, Humbolt-Toyabe National Forest, Bridgeport, California
- United States Forest Service, Humbolt-Toyabe National Forest, Carson City, Nevada
- Bureau of Land Management, Cañon City, Colorado

Technical Qualifications

Ms. Kidwell has served as a field technician, crew chief, and regulatory archaeologist in both the private and public sectors throughout the Southwest, Great Basin, and California. Her archaeological experience includes pedestrian survey, site recording, artifact analysis, site evaluation testing, excavation, technical report writing and production, GIS analysis, and crew leadership. In the public sector, she worked closely with industry representatives by providing NEPA consultation, treatment and management recommendations, and compliance decisions while reviewing cultural resource projects. As a graduate student, her thesis research investigated the Paleo-Indian stratigraphic deposits of a stream channel to assess the changing hydrologic conditions during the Late Pleistocene/Holocene Transition at Blackwater Locality No. 1, the Clovis-type site of North America. She has presented her research at state and national archaeological meetings.

PATRICK MOLONEY

Staff Archaeologist

Areas of Expertise

- Prehistoric archaeology
- Survey and site documentation
- Archival research and technical writing
- Archaeological/paleontological construction monitoring

Years of Experience

- 12

Education

B.A., Social Anthropology, University of East Anglia, Norwich, England, 1981

Permits/Licensure

- Field Director, California BLM Statewide Cultural Resources Use Permit CA-15-29

Professional Experience

2006–	Staff Archaeologist, Applied EarthWorks, Inc., Hemet, California.
2007	Field Archaeologist, AECOM, 401 West A Street, Suite 1200, San Diego, CA 92101

Technical Qualifications

Mr. Moloney has been practicing archaeology in the United States for the past 12 years, exclusively in California, Nevada, and Arizona. He has worked as a field archaeologist for Applied EarthWorks in Nevada, Arizona, and Southern California as well as the Central Coast and Central Valley regions. Within this capacity Moloney has participated in all aspects of fieldwork as a technician and supervisor, including intensive-level and reconnaissance-level field surveys; recording of prehistoric and historic-period archaeological sites; mapping with GPS; Phase II Testing and Phase III data recovery as well as archaeological monitoring.

Since 2006 Moloney has represented Applied EarthWorks as the lead archaeologist for the Pacific Gas and Electric Company (PG&E) Topock Remediation Project in San Bernardino County, California and Mohave County, Arizona. In this capacity Moloney has been responsible for conducting and leading archaeological surveys; participating as an archaeologist in biological, hydrological, and geological surveys; and monitoring construction, drilling, and other mitigation activities. Moloney has also assisted in project design and design applications, management discussions, report production and inter-agency liaison between the primary actor (PG&E), Applied EarthWorks, several federal and state agencies (including BLM, BOR, DOI, DTSC), and nine Native American tribes (the Chemehuevi Indian Tribe, the Cocopah Tribe, the Colorado River Indian Tribes, Fort Mojave Indian Tribe, Fort Yuma Quechan Tribe, Hualapai Tribe, Havasupai Tribe, Twenty-Nine Palms Band of Mission Indians and the Yavapai-Prescott Indian Tribe).

CONFIDENTIAL APPENDIX*
Not for Public Distribution

APPENDIX B

Project Site Atlas

*Archaeological site location information is exempt from the Freedom of Information Act (FOIA) and California Public Records Act (CPRA).

CONFIDENTIAL APPENDIX*
Not for Public Distribution

APPENDIX C

DPR Site Records

*Archaeological site location information is exempt from the Freedom of Information Act (FOIA) and California Public Records Act (CPRA).

CONFIDENTIAL APPENDIX*
Not for Public Distribution

APPENDIX D

DPR Isolate Records

*Archaeological site location information is exempt from the Freedom of Information Act (FOIA) and California Public Records Act (CPRA).

APPENDIX E

Native American Consultation

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Palm Springs-South Coast Field Office
1201 Bird Center Drive
Palm Springs, CA 92262-8001
(760) 833-7100 Fax (760) 833-7199

Visit us on the Internet at
www.blm.gov/ca/palmsprings/

February 19, 2016

In Reply Refer To:
8100 (P)
CAD066.66

CERTIFIED MAIL # 7014 2870 0001 5047 2471
RETURN RECEIPT REQUESTED

Arlene Kingery
Historic Preservation Officer
Fort Yuma Quechan Tribe
P.O. Box 1899
Yuma, AZ 85366-1899

Dear Ms. Kingery:

The Bureau of Land Management, Palm Springs Field Office (BLM) is reviewing an application for a right-of-way (ROW) grant and proposed Plan of Development (POD) submitted by RE Sonoran West Solar Holdings LLC, a wholly owned subsidiary of Recurrent Energy, to construct, operate, and maintain a 450 megawatt (MW) photovoltaic (PV) solar electrical generating facility on approximately 4,000 acres of public lands managed by the BLM. Referred to presently as the Crimson Solar Project (Project), the Project area was formerly proposed for development as a concentrating solar power tower project known as the Sonoran West Solar Energy Generating Station by BrightSource Energy. The new proposed Project would interconnect to the regional electrical grid at the Southern California Edison 220 kilovolt Colorado River Substation. It would be located south of Interstate 10, approximately 15 miles southwest of the City of Blythe in Riverside County, California (Enclosure 1) and is located within the Riverside East Solar Energy Zone as defined in the Record of Decision for the Solar Programmatic Environmental Impact Statement dated October 2012. The Project constitutes the undertaking for purposes of review under Section 106 of the National Historic Preservation Act (NHPA).

Under Federal law, the BLM is responsible for processing ROW applications for facilities proposed to be constructed and operated on public lands. In processing the applications, the BLM must comply with the requirements of the National Environmental Policy Act (NEPA), which requires that Federal agencies reviewing projects under their jurisdiction consider the environmental impacts associated with their construction and operation. The BLM will be developing an Environmental Impact Statement (EIS) for the proposed Project in compliance with the NEPA. Alternatives will concurrently be analyzed for their potential to affect historic properties as required by Section 106 of the NHPA, and we will utilize the public review process described in the NEPA to partially meet our public involvement responsibilities under the NHPA. In addition, Section 106 documentation for this proposed Project will be published on our website at: http://www.blm.gov/ca/st/en/fo/palmsprings.html. Consistent with the principles stated in Executive Order 13175 (Consultation and Coordination with Indian Tribal Governments, November 6, 2000) and the Executive Memorandum of April 29, 1994, (Government to Government Relations with Native American Tribal Governments), we are contacting you at the earliest stages of project review and seeking your views and comments, particularly with regard to any issues that may affect resources that are important to your Tribe.

This letter serves to provide initial notification of the proposed Project, explain the role of the BLM, and invite your Tribe to enter into government-to-government consultation. The BLM will update the Tribe on the Project throughout the review process, unless the Tribe has not further interest in consulting on this proposed Project. We would request that the Tribe inform us if it has no interest in this proposed Project or entering into consultation.

Specific to Section 106 of the NHPA, the implementing regulation at 36 CFR 800 requires the BLM to consult with Indian tribes that attach religious or cultural significance to historic properties that may be affected by an undertaking. We request your assistance in identifying any issues or concern the Tribe may have about the proposed Project. The regulations at 36 CFR 800.2(c)(2)(ii)(C) also state that Federal agency consultation with an Indian tribe must recognize the government-to-government relationship and requires the agency to consult with representatives designated or identified by the Tribal Government. To facilitate government-to-government consultation on this proposed Project for the purposes of section 106 and to meet the requirements of the regulation, the BLM requests that your Tribal Government identify those tribal representatives who have been designated to consult with the BLM on this proposed Project. If you are aware of any other Tribes, individuals, or affiliated Native American organizations that should be contacted regarding this proposed Project please let us know. A list of other Tribal Government officials receiving this letter is provided for your reference (Enclosure 2).

Identification Efforts

Recurrent Energy has retained Aspen Environmental Group (Aspen) and Applied Earthworks as the primary consultants. The BLM has been working with the Aspen team to develop a cultural resources work plan for the proposed Project. This work plan will include the results of the cultural resources records search and literature review and will guide the identification efforts, including the BLM Class III archaeological survey and the historic built environment survey. It will also include a research design and will discuss how all identified resources will be evaluated for National Register of Historic Places (NRHP) eligibility. Aspen will contact you when the work plan is available for your review and regarding the upcoming archaeological survey for the proposed Project.

The BLM is requesting your assistance in identifying any issues or concerns the Tribes may have about the proposed Project, including places of religious and cultural significance that might be affected. To facilitate consultation on this proposed Project, the BLM will have the Aspen team conduct a review of the available ethnographic literature to identify any known resources with tribal significance. When complete, the ethnographic literature review will be provided for your review. If the Tribe has information regarding additional culturally significant resources that should be considered you can contact me to schedule a government-to-government consultation meeting.

Pre-Application Meeting

In addition to inviting you to consult with us in a government-to-government manner on this proposed Project, the BLM would also like to invite you, tribal staff, and other designated tribal representatives to attend the second pre-application meeting regarding this proposed Project. This meeting is intended to identify everyone that might be interested in participating in the Section 106 process as Consulting Parties.

Information and an overview of the proposed Project will be provided at that meeting by Recurrent representatives. The second pre-application meeting will also be an opportunity for you to share information about the proposed Project area and identify any additional issues or concerns the Tribe may have especially related to places of religious and cultural significance that may be affected by the proposed Project and should be taken into consideration. The second pre-application meeting is scheduled for March 15, from 10:00 AM to 3:30 PM. The meeting will be held at the Palo Verde College Room CS 123 in Blythe, California (Enclosure 3). A field trip to the proposed Project site will be conducted on March 16, 2016. Participants should meet at the Valero Station located on corner of Mesa Drive and Black Rock Rd 7.0 miles west of Blythe at 9:00 AM and come prepared with comfortable clothes and outdoor walking shoes. A sack lunch and water will be provided. Representatives from Recurrent Energy will be present at this meeting. We hope that you will be able to join us.

If you would like to designate a representative to consult with the BLM, know of any other Tribes that should be contacted regarding this proposed Project, or have any questions or concerns about the proposed Project, please contact Frank McMenimen (BLM Project Manager) at 760-833-7150 or fmcmenimen@blm.gov.

We look forward to hearing from you regarding your interest in the proposed Crimson Solar Project and out invitation to initiate government-to-government consultation. If you would like to schedule a separate government-to-government consultation meeting with the BLM please contact the field office manager George Kline (BLM Archaeologist) at 760-833-7135 or gkline@blm.gov.

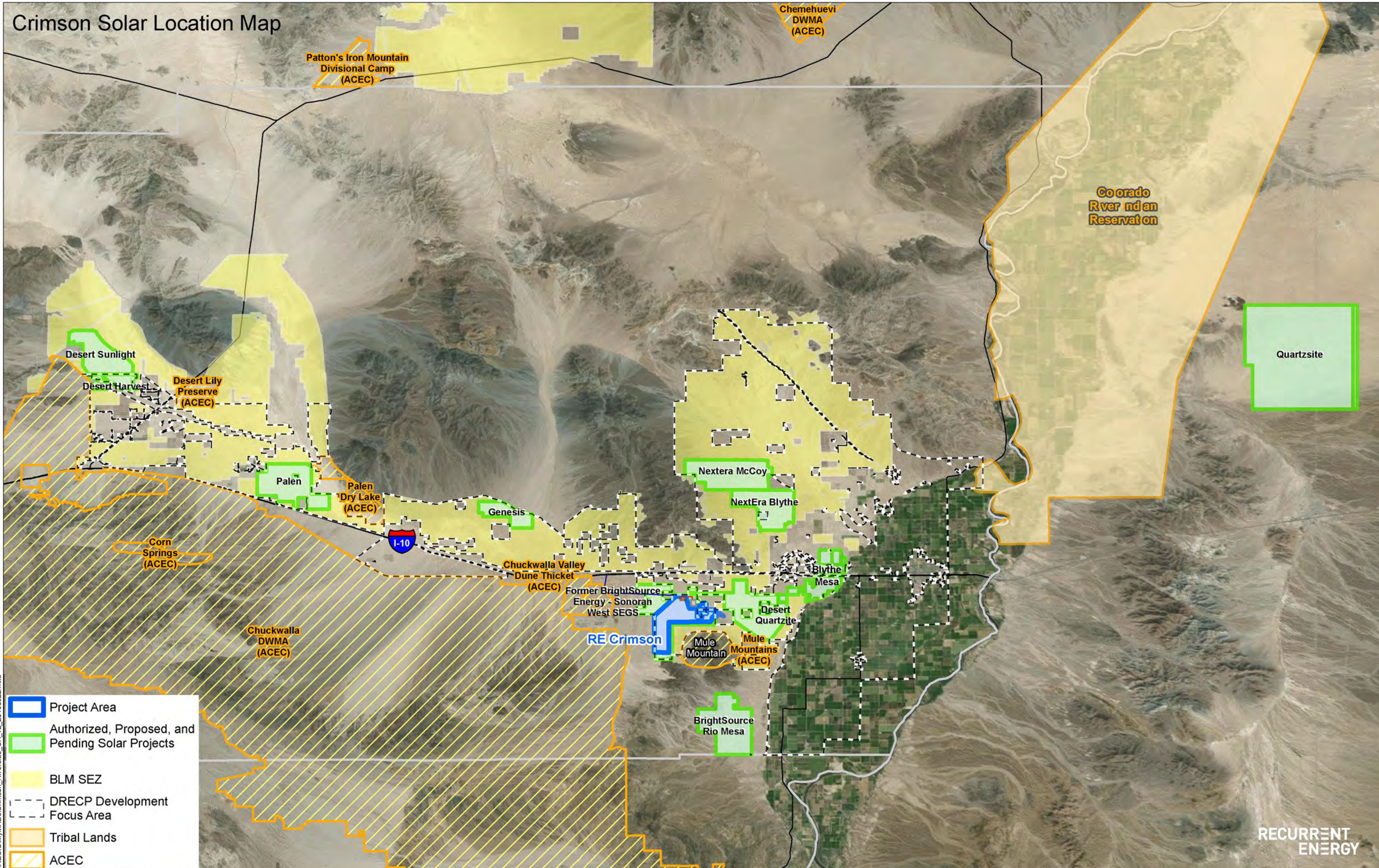
Sincerely,

John R. Kalish
Field Manager
Palm Springs-South Coast Field Office

<u>Blythe Meeting</u>	**<u>Crimson Site Visit</u>**
March 15, 2016 10 am to 3:30 pm **Palo Verde College** One College Dr. Blythe, CA (760) 921-5500 Box lunch and drinks provided Call-in toll-free number: 1-877-668-4493 (US/Canada) Access Code: 922 034 262 #	March 16, 2016 9 am to 3:00 pm Meet at the Valero Station on the corner of Mesa Drive & Black Rock Rd 7.0 miles west of Blythe. This visit Includes walking on uneven terrain Comfortable shoes and clothes recommended Sack lunch and water provided

Enclosures;

1- Crimson Solar Project Location Map
2- Tribal Contact List for the Proposed Crimson Solar Project
3- March 15, 2016 Meeting Location Map



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Crimson Solar Project
Tribal Contact List

Jeff Grubbe
Chairman
Agua Caliente Band of Cahuilla Indians
5401 Dinah Shore Drive
Palm Springs, CA 92264
Phone: (760) 699-6800

Mary Ann Green
Chairwoman
Augustine Band of Cahuilla Indians
P.O. Box 846
Coachella, CA 92236
Phone: (760) 398-4722

Doug Welmas
Chairman
Cabazon Band of Mission Indians
84-245 Indio Springs Parkway
Indio, CA 92203-3449
Phone: (760) 342-2593
email: dwelmas@cabazonindians-nsn.gov

Daniel Salgado
Chairman
Cahuilla Band of Mission Indians
52701 US Highway 371
Anza, CA 92539
Phone: (909) 763-5549
email: tribalcouncil@cahuilla.net

Charles Wood
Chairman
Chemehuevi Indian Tribe
P.O. Box 1976
Havasu Lake, CA 92363
Phone: (760) 858-4219
email: chairman@cit-nsn.gov

Sherry Cordova
Chairwoman
Cocopah Indian Tribe
14515 S. Veterans Dr
Somerton, AZ 85350
Phone: (928) 627-2102

Dennis Patch, Sr
Chairman
Colorado River Indian Tribes
26600 Mohave Road
Parker, AZ 85344
Phone: (928) 669-1280
email: tashina.harper@crit-nsn.gov

Timothy Williams
Chairman
Fort Mojave Indian Tribe
500 Merriman Avenue
Needles, CA 92363
Phone: (760) 629-4591
email: timothywilliams@fortmojave.com

Michael Jackson, Sr.
President
Fort Yuma Quechan Tribe
P.O. Box 1899
Yuma, AZ 85366-1899
Phone: (760) 572-0213
email: m.emerson@quechantribe.com

Robert Martin
Chairman
Morongo Band of Mission Indians
12700 Pumarra Rd.
Banning, CA 92220
Phone: (951) 849-4697
email: rmartin@morongo-nsn.gov

Lynn Valbuena
Chairwoman
San Manuel Band of Mission Indians
26569 Community Center Drive
Highland, CA 92346
Phone: (909) 864-8933
email: lvalbuena@sanmanuel-nsn.gov

Rosemary Morillo
Chairwoman
Soboba Band of Luiseno Indians
P.O. Box 487
San Jacinto, CA 92581
Phone: (951) 654-2765
email: rmorillo@soboba-nsn.gov

Crimson Solar Project

Tribal Contact List

Mary Resvaloso
Chairwoman
Torres-Martinez Desert Cahuilla Indians
P.O. Box 1160
Thermal, CA 92274
Phone: (760) 397-0300
email: tmchair@torresmartinez.org

Darrell Mike
Chairman
Twenty-Nine Palms Band of Mission Indians
46-200 Harrison Place
Coachella, CA 92236
Phone: (760) 863-2444
email: 29chairman@29palmsbomi-nsn.gov

Tom Davis
Chief Planning and Development Officer
Agua Caliente Band of Cahuilla Indians
5401 Dinah Shore Drive
Palm Springs, CA 92264
Phone: (760) 325-3400
email: tdavis@aguacaliente-nsn.gov

Patricia Garcia
Tribal Historic Preservation Officer
Agua Caliente Band of Cahuilla Indians
5401 Dinah Shore Drive
Palm Springs, CA 92264
Phone: (760) 699-6907
email: ACBCI-THPO@aguacaliente.net

David Saldivar
Environmental Department
Augustine Band of Cahuilla Indians
84-001 Avenue 54
Coachella, CA 92236
email: dlsaldivar@augustinetribe.com

Judy Stapp
Cultural Affairs Director
Cabazon Band of Mission Indians
84-245 Indio Springs Parkway
Indio, CA 92203-3449
email: jstapp@cabazonindians-nsn.gov

Luther Salgado, Jr.
Environmental Director
Cahuilla Band of Mission Indians
52701 US Highway 371
Anza, CA 92539
Phone: (951) 763-2631
email: environmentaldirector@cahuilla.net

Jay Cravath
Chemehuevi Cultural Center
Chemehuevi Indian Tribe
P.O. Box 1976
Havasu Lake, CA 92363
Phone: (760) 858-1115
email: nuwuviculturalcenter@gmail.com

Jill McCormick
Cultural Resources Manager
Cocopah Indian Tribe
14515 S. Veterans Dr
Somerton, AZ 85350
Phone: (928) 627-4849
email: culturalres@cocopah.com

Rebecca Loudbear
Attorney General
Colorado River Indian Tribes
26600 Mohave Road
Parker, AZ 85344
email: rloudbear@critdoj.com

Nancy Jasculca
Deputy Attorney General
Colorado River Indian Tribes
26600 Mohave Road
Parker, AZ 85344
email: njasculca@critdoj.com

David Harper
Tribal Historic Preservation Officer
Colorado River Indian Tribes
Route 1, Box 23-B
Parker, AZ 85344-1899
Phone: 928-669-5822
email: davidharper_747@hotmail.com

Crimson Solar Project

Tribal Contact List

Linda Otero
AhaMakav Cultural Society
Fort Mojave Indian Tribe
500 Merriman Avenue
Needles, CA 92363
Phone: (928) 768-4475
email: lindaotero@fortmojave.com

Arlene Kingery
Historic Preservation Officer
Fort Yuma Quechan Tribe
P.O. Box 1899
Yuma, AZ 85366-1899
Phone: (928) 920-6068
email: quechanhpo@gmail.com

Daniel McCarthy
Cultural Resources Management Department
San Manuel Band of Mission Indians
26569 Community Center Drive
Highland, CA 92346
Phone: (909) 864-8933 x 3248
email: DmcCarthy@sanmanuel-nsn.gov

Ann Brierty
Cultural Resources Field Manager
San Manuel Band of Mission Indians
26569 Community Center Drive
Highland, CA 92346
Phone: (909) 864-8933x3250
email: abrierty@sanmanuel-nsn.gov

Joseph Ontiveros
Cultural Resources Department
Soboba Band of Luiseno Indians
P.O. Box 487
San Jacinto, CA 92581
Phone: (951) 654-5544x4137
email: jontiveros@soboba-nsn.gov

Anthony Madrigal, Jr.
Tribal Historic Preservation Officer
Twenty-Nine Palms Band of Mission Indians
46-200 Harrison Place
Coachella, CA 92236
Phone: (760) 775-3259
email: amadrigal@29palmsbomi-nsn.gov

Directions to the March 15, 2016 Pre-application Meeting for the Crimson Solar Project

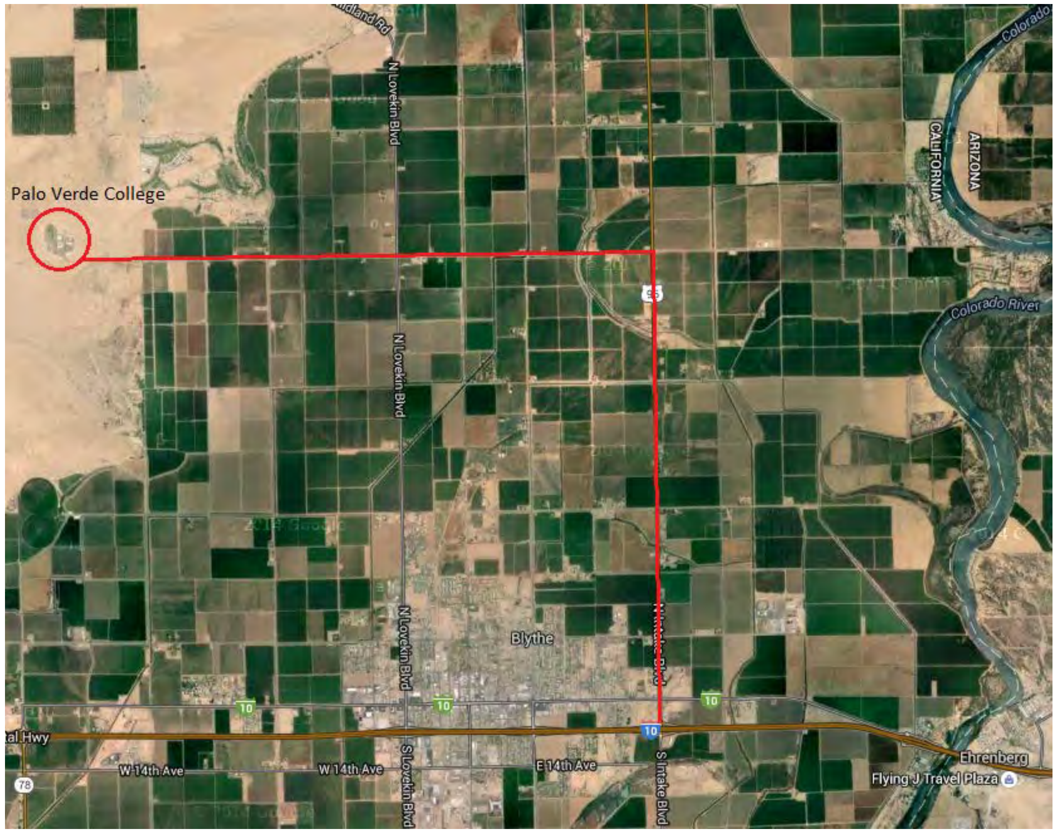
The meeting will be held on Tuesday March 15th from 10 AM to 3:30 PM at Palo Verde College in room CS 123.

Lunch will be provided.

To get to Palo Verde College take Highway 95 North from I 10.

Then follow Highway 95 until 6th Avenue and make a left turn.

Lastly follow 6th Avenue until reaching Palo Verde College on your right.



Upon arriving at the college proceed to the John O. Crain Student Services Building (CS) marked here. Room CS 123 will be in that building.

Sacred Lands File & Native American Contacts List Request

NATIVE AMERICAN HERITAGE COMMISSION
915 Capitol Mall, RM 364
Sacramento, CA 95814
(916) 653-4082
(916) 657-5390 – Fax
nahc@pacbell.net

Information Below is Required for a Sacred Lands File Search

Date: June 30, 2016

Project: Crimson Solar Project

County: Riverside County

USGS Quadrangle Name: Hopkins Well, McCoy Peak, McCoy Spring, McCoy Wash, Ripley, Roosevelt Mine, Thumb Peak, and Wiley Well

Township: T 6S/R 20E, T 6S/R 22E, T 7S/R 19E, T 7S/R 20E, T 7S/R 21E, T 7S/R 22E, T 8S/R 19E, T 8S/R 20E, and T 8S/R 21E, SBB&M

Company/Firm/Agency: Applied EarthWorks, Inc.

Contact Person: Michael Mirro, Tiffany Clark

Street Address: 133 North San Gabriel Blvd., Suite 201

City: Pasadena Zip: 91107

Phone: (626) 578-0119

Fax: (626) 204-5590

Email: mmirro@appliedearthworks.com, TClark@appliedearthworks.com

Project Description: Recurrent Energy is preparing a Plan of Development for the proposed Crimson Solar Project near the Mule Mountains, Riverside County, California. The proposed Project is on federal lands managed by the Bureau of Land Management (BLM) and is situated southwest of Blythe and south of Interstate 10 in unincorporated Riverside County, California. The proposed Project covers approximately 4,000 acres. This Sacred Lands file search not only includes the Project Area of Direct Effects, but also includes the Area of Indirect Effects, which includes a 5-mile radius buffer around all project features (roughly 147 square miles).

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710
Fax (916) 373-5471

July 6, 2016

Michael Mirro
Tiffany Clark
Applied EarthWorks, Inc.

Sent by Email: mmirro@appliedearthworks.com
tclark@appliedearthworks.com

RE: Proposed Crimson Solar Project, near the Mule Mountains; Hopkins Well, McCoy Peak, McCoy Spring, McCoy Wash, Ripley, Roosevelt Mine, Thumb Peak, and Wiley Well USGS Quadrangles, Riverside County, California

Dear Mr. Mirro and Ms. Clark:

A record search of the Native American Heritage Commission (NAHC) *Sacred Lands File* was completed for the area of potential project effect (APE) referenced above with negative results. Please note that the absence of specific site information in the *Sacred Lands File* does not indicate the absence of Native American cultural resources in any APE.

I suggest you contact all of the listed Tribes. If they cannot supply information, they might recommend others with specific knowledge. The list should provide a starting place to locate areas of potential adverse impact within the APE. By contacting all those on the list, your organization will be better able to respond to claims of failure to consult. If a response has not been received within two weeks of notification, the NAHC requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact via email: gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton

Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst

Native American Heritage Commission
Tribal Consultation List
Riverside County
7/6/2016

Agua Caliente Band of Cahuilla Indians
Jeff Grubbe, Chairperson
5401 Dinah Shore Drive
Palm Springs, CA, 92264
Phone: (760)699-6800
Fax: (760)699-6919
Cahuilla
Luiseno

Agua Caliente Band of Cahuilla Indians
Patricia Garcia-Plotkin, Director
5401 Dinah Shore Drive
Palm Springs, CA, 92264
Phone: (760)699-6907
Fax: (760)699-6924
ACBCI-THPO@aguacaliente.net
Cahuilla
Luiseno

Augustine Band of Cahuilla Mission Indians
Amanda Vance, Chairperson
P.O. Box 846
Coachella, CA, 92236
Phone: (760)398-4722
Fax: (760)369-7161
Cahuilla

Barona Group of the Capitan Grande
Clifford LaChappa, Chairperson
1095 Barona Road
Lakeside, CA, 92040
Phone: (619)443-6612
Fax: (619)443-0681
cloyd@barona-nsn.gov
Kumeyaay

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This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Crimson Solar, Riverside County.

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Riverside County
7/6/2016

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Native American Heritage Commission
Tribal Consultation List
Riverside County
7/6/2016

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This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Crimson Solar, Riverside County.

Native American Heritage Commission
Tribal Consultation List
Riverside County
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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 Resource 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 Crimson Solar, Riverside County.

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APPENDIX F

Master Table of All Cultural Resources Within the Direct APE

*Archaeological site location information is exempt from the Freedom of Information Act (FOIA) and California Public Records Act (CPRA).

K.2 Non-Confidential Addendum 2 to the Class III Cultural Resource Inventory for the Crimson Solar Project – APE modification, additional 15-acre survey at tie-in to Colorado River Substation, December 2018

Applied EARTHWORKS Inc.

811 El Capitan Way, Suite 100
San Luis Obispo, CA 93401-8943
O: (805) 594-1590 | F: (805) 594-1577

NON-CONFIDENTIAL

December 20, 2018

Mr. George E. Kline, Archaeologist
Bureau of Land Management
Palm Springs - South Coast Field Office
1201 Bird Center Drive
Palm Springs, CA 92262

RE: Addendum 2 to the Class III Cultural Resource Inventory for the Crimson Solar Project
APE modification, additional 15-acre survey at tie-in to Colorado River Substation.

Dear Mr. Kline:

On July 24, 2018, Applied EarthWorks, Inc. (Æ) submitted to the Bureau of Land Management the *Class III Cultural Resource Inventory for the Crimson Solar Project, Riverside County, California* (Kidwell et al. 2018). The report documented the results of an intensive pedestrian survey for Recurrent Energy's proposed 350-megawatt photovoltaic solar energy generation and storage project (Project) to be built west of Blythe, California, in the Riverside East Solar Energy Zone. Æ cultural resource specialists, accompanied by tribal monitors, surveyed a 3,484.85-acre area encompassing the 3,089.75-acre Area of Potential Effects (APE) and identified 350 prehistoric and historical resources. Of these, 167 are archaeological sites (82 prehistoric, 58 historical, and 27 with both components), while 183 are isolated finds.

Subsequent to completion of the Class III inventory, Recurrent Energy redesigned the alignment of the generation tie-line where it connects to the Colorado River Substation (CRS). A portion of the new alignment had not been included in the original APE or surveyed previously, and thus required an additional Class III investigation. This Addendum to the original Class III inventory report describes the methods and results of an additional 15-acre survey (APE modification) around the tie-in location to the CRS (Figure 1).

The APE modification pedestrian surface survey was conducted by Æ Archaeologists Evan Mills and Dennis McDougall on December 14, 2018. Field staff was accompanied by two Native American monitors representing the Colorado River Indian Tribes. Transect intervals were 15-meters, and ground visibility was 100 percent. The survey began at the southern extent of the APE modification and proceeded north and east to the tie-in location directly north of the CRS. Transect lines were mapped on a Trimble GeoXH Global Positioning System unit and photos of the survey are stored (digitial) at the Æ Hemet office.

No cultural resources were identified during the survey. Soils observed are consistent with adjacent areas of the Project. A few pieces of modern refuse were noted on the new portion of the APE. The area immediately north of the substation (Figure 2) is disturbed substantially from construction of the substation (concrete drain and slopes created north of the substation wall). The remainder of the new APE modification is intact with little to no disturbances (Figure 3).

Should you have any questions, comments, or concerns related to this Addendum 2, please feel free to contact me.

Sincerely,

Barry A. Price, M.A., RPA 15108
Managing Principal

REFERENCES CITED

Kidwell, Jasmine, Barry A. Price, Patrick Moloney, and Jennifer VanderSmith
2018 *Class III Cultural Resource Inventory for the Crimson Solar Project, Riverside County, California*. Applied EarthWorks, Inc., San Luis Obispo, California. Prepared for RE Crimson LLC, Walnut Creek, California.

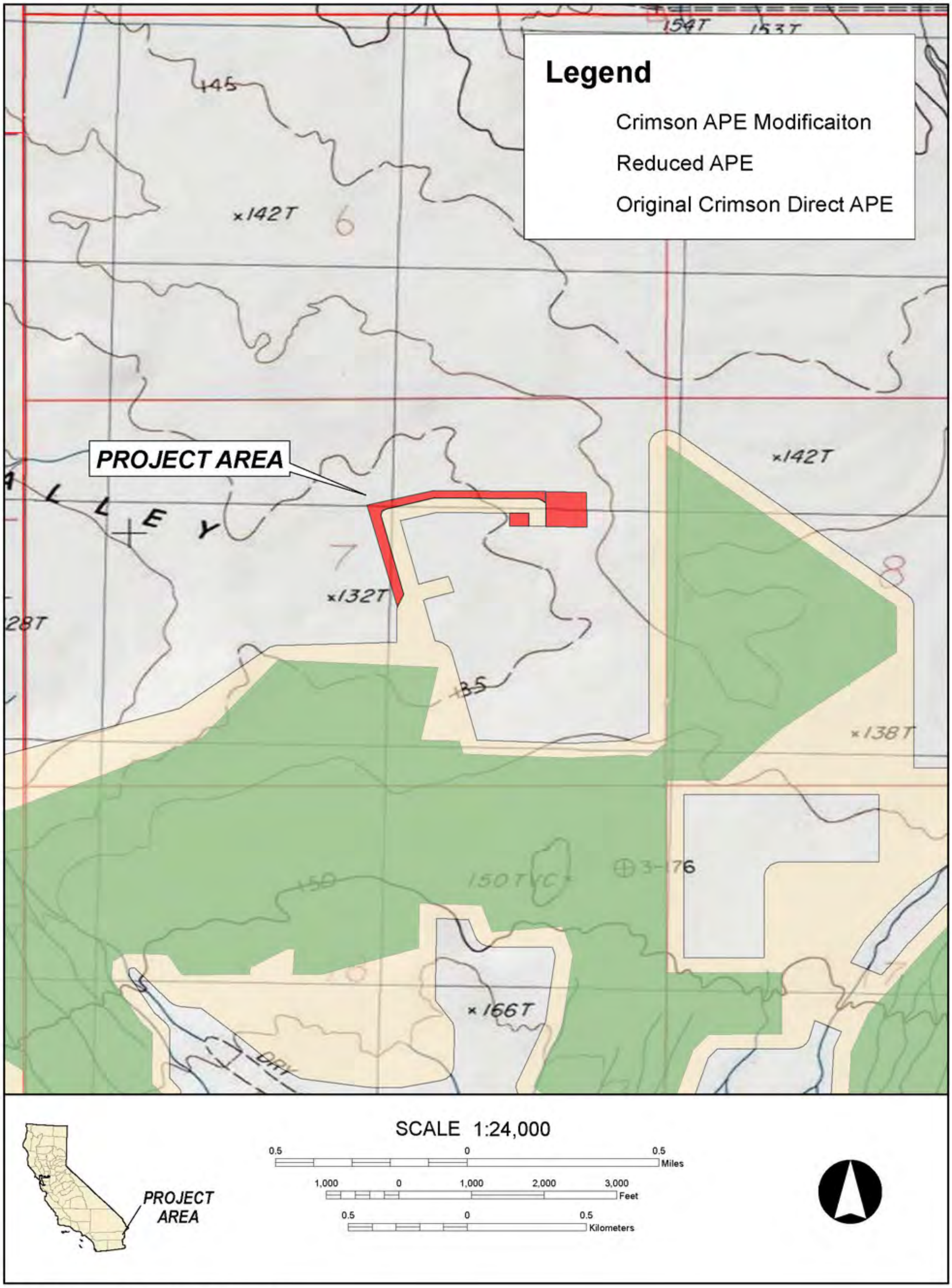

Figure 1 Project vicinity map.

Figure 2 Overview of APE portion directly north of the substation, facing west.

Figure 3 Overview of APE modification. View is north of the substation, facing west.

K.3 Non-Confidential Assessment of Indirect Effects to Culturally Sensitive Locations for the RE Crimson Solar Project

NON-CONFIDENTIAL

Assessment of Indirect Effects to Culturally Sensitive Locations for the RE Crimson Solar Project, Riverside County, California

Richard C. Hanes

Prepared By

Applied EarthWorks, Inc.
811 El Capitan Way, Suite 100
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Prepared For
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and
Bureau of Land Management
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October 2018; revised October 2019

MANAGEMENT SUMMARY

This report documents the results of an indirect effects assessment for the RE Crimson Solar Project (Project), a utility-scale photovoltaic solar energy generation and storage project in eastern Riverside County, California. Sonoran West Holdings, LLC, a wholly owned subsidiary of Recurrent Energy, LLC, proposes to build and operate the project, which is approximately 13 miles west of Blythe, just north of the Mule Mountains and just south of Interstate 10, primarily on public land administered by the Department of Interior, Bureau of Land Management (BLM).

The proposed Project area (i.e., the Permitting Boundary) is 2,489 acres, including a 2,465-acre solar field development area with approximately 1,859 acres of solar panels (array blocks) and 24 acres for linear facilities including access/perimeter roads. The Area of Potential Effects (APE) associated with the direct effects, as amended since July 2016, includes the proposed project footprint and covers 2,881 acres. Applied EarthWorks, Inc. (Æ) completed a Class III cultural resource inventory of the direct effects APE (Kidwell et al. 2018) to satisfy BLM requirements under Section 106 of the National Historic Preservation Act and the Desert Renewable Energy Conservation Plan Programmatic Agreement.

The focus of this assessment is on three historic properties with heightened cultural sensitivity and values that could be indirectly affected by the proposed undertaking: the Mule Tank Petroglyph Site (CA-RIV-504), Mule Canyon Intaglio Site (CA-RIV-773), and archaeological site CA-RIV-1821/H. The first two of these (CA-RIV-504 and -773) are currently listed on the National Register of Historic Places (NRHP) under Criteria C and D individually and as contributors to the Mule Tank Discontiguous Rock Art District. The BLM considers archaeological site CA-RIV-1821/H eligible for listing in the NRHP under Criteria C and D. Visual effects are judged to be non-adverse for all three sites. Indirect atmospheric and auditory effects to all three sites will be transitory in nature and also are considered non-adverse.

CONTENTS

FIGURES

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INTRODUCTION

1.1 PROJECT OVERVIEW

Sonoran West Holdings, LLC, a wholly owned subsidiary of Recurrent Energy, LLC (RE), proposes to build and operate the RE Crimson Solar Project (Project), a utility-scale photovoltaic (PV) solar energy generation and storage project in eastern Riverside County, California (Figure 1-1). The Project would be approximately 13 miles west of Blythe, just north of the Mule Mountains and just south of Interstate 10 (I 10), primarily on federal land administered by the Department of Interior, Bureau of Land Management (BLM). It lies in the Chuckwalla Valley, in the Riverside East Solar Energy Zone (SEZ) and within the Desert Renewable Energy Conservation Plan (DRECP) Development Focus Area (DFA) as presented in the Final Environmental Impact Statement (EIS) and approved in the Record of Decision (ROD) and associated Land Use Plan Amendment (LUPA) in September 2016 (BLM 2016). The Project site is also within the California Desert Conservation Area (CDCA) planning area.

The Project would generate up to 350 megawatts (MW) of renewable energy using PV technology, with up to 350 MW of integrated energy storage capacity. It would interconnect to the regional electrical grid at the Southern California Edison Company (SCE) 230-kilovolt (kV) Colorado River Substation (CRS). The total area for the Project (i.e., the Permitting Boundary) is 2,489 acres, including a 2,465-acre solar field development area with approximately 1,859 acres of solar panels (array blocks) and 24 acres for linear facilities including access/perimeter roads with a 30- to 60-foot-wide corridor and generation tie line (gen-tie) and powerline corridors at 150-foot intervals.

The Project site is surrounded primarily by BLM-managed lands and some private parcels. It sits at the northern foot of the Mule Mountains Area of Critical Environmental Concern (ACEC), which is an important location for local Native American Tribes. SCE’s high-voltage transmission line and CRS are directly north of the Project site, and I 10 is north of and parallel to those facilities.

Access to the Project site would be provided via the existing paved Wiley’s Well Road and Powerline Road that lead from I 10 south to the CRS. The Project’s on-site roadway system would include a perimeter road, access roads, and internal roads. These roads would be surfaced with gravel, compacted dirt, or another commercially available surface and would accommodate the Project operations and maintenance (O&M) activities.

Several other solar energy projects have been proposed and some implemented in recent years in the Chuckwalla Valley/Palo Verde Valley region of eastern Riverside County (Figure 1-2). In 2012, BrightSource Energy, Inc. began the process of applying for a certification to construct the Sonoran West Solar Electric Generating Facility in the approximate footprint of the current Crimson Project proposal. That effort was suspended the following year.

Figure 1-1 **Project vicinity map.**

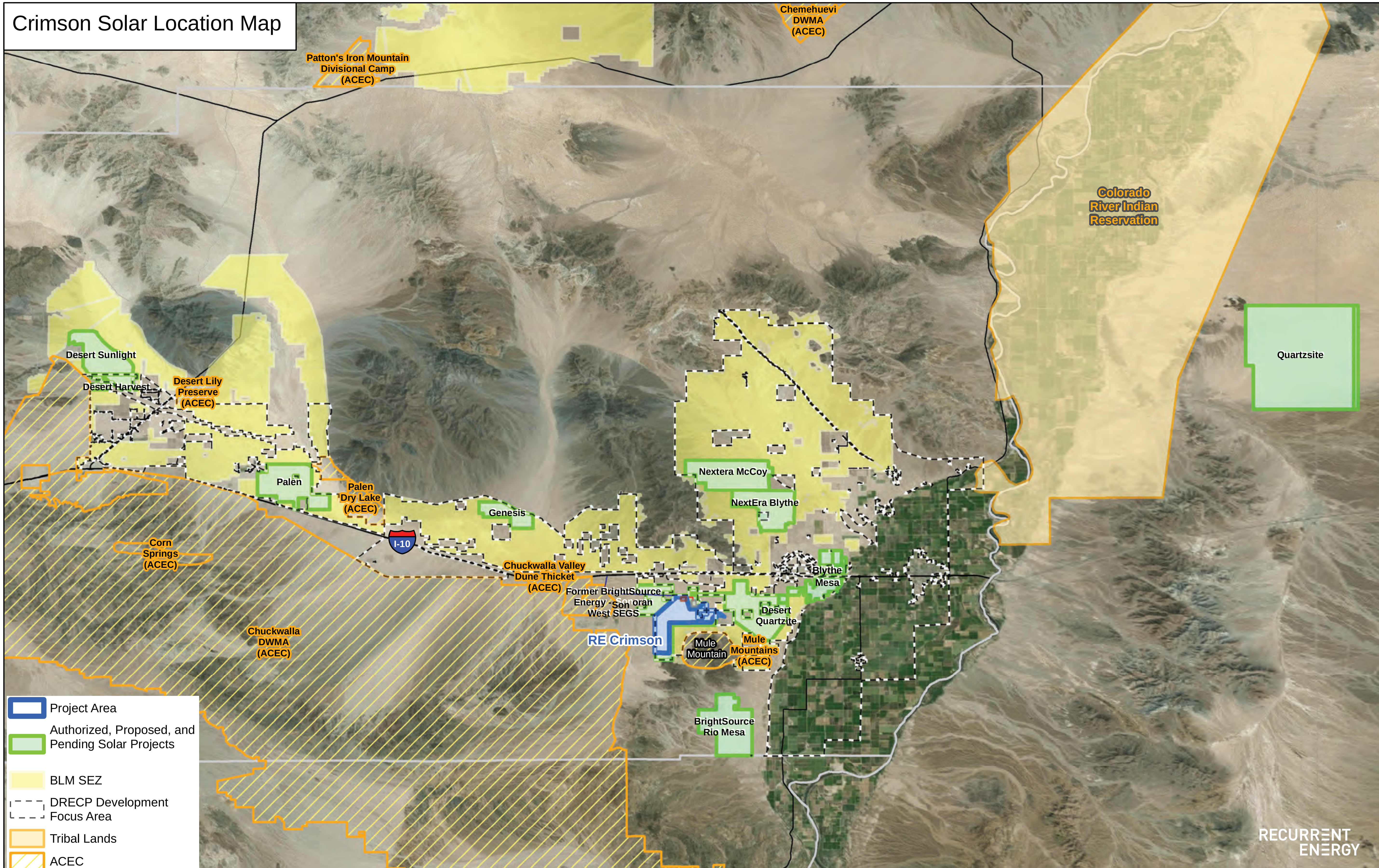

Figure 1-2 Crimson Project area in relation to other solar energy projects (adapted from Recurrent Energy 2016).

Immediately east of the Crimson Project site is First Solar's proposed Desert Quartzite project. Northeast of the Desert Quartzite project is RRG Renewables' recently approved Blythe Mesa Solar Power Project. Farther north are NextEra's Blythe and McCoy project areas, while BrightSource's former Rio Mesa project lies to the south on the eastern flanks of the Mule Mountains. Farther west in the SEZ are the Genesis, Palen, Desert Harvest, and Desert Sunlight projects. These projects' environmental studies have provided important context for understanding the purpose, environmental and cultural setting, and archaeological and historical resources of the Crimson Project.

1.2 SCOPE AND PURPOSE OF INVESTIGATION

The purpose of the current study is to complete an indirect effects assessment for selected cultural resources within the Project's indirect Area of Potential Effects (APE) in satisfaction of BLM requirements under Section 106 of the National Historic Preservation Act (NHPA). The BLM sought to identify historic properties in the indirect effects APE that are eligible for listing on the National Register of Historic Places (NRHP) under Criteria A–C through a process of tribal consultation and review of existing records. A property's values under one of those criteria might be more susceptible to most forms of indirect effects than its archaeological values under Criterion D. Other factors that might make a property susceptible to indirect effects include the nature of its significant historic features; its character and/or use; important aspects of its integrity; whether a tribe attaches religious and cultural significance to the property, and the nature of these values. This assessment describes the historic properties identified by the BLM and potential indirect effects posed by the Project (Figure 1-3). Given the nature of findings to date in the immediate Project area (Kidwell et al. 2018; Mirro and Clark 2016), the focus of this assessment is on prehistoric period sites.

The report analyzes visual, auditory, and atmospheric (air quality) intrusions to the historic properties that might occur during the various phases the Project, including site preparation, construction, operation, maintenance, and decommissioning. It assesses the extent to which such effects might diminish the integrity of the characteristics of these properties that make them eligible for listing on the NRHP. Indirect effect assessments are based on line-of-sight visual impacts resulting from introduction of both temporary human activities and equipment during construction and permanent physical introductions such as solar panel fields, transmission lines, structures, and roads. Auditory and atmospheric impacts are also considered. These recommendations will subsequently form the basis for protocols to reduce indirect impacts.

This report satisfies the indirect effects assessment requirements of the Cultural Resources Work Plan for Section 106 Compliance on the RE Crimson Solar Project (Applied EarthWorks 2017a) and will facilitate BLM's consultation with the California State Historic Preservation Officer (SHPO), Advisory Council on Historic Preservation (ACHP), and Native American Tribes. It is also intended to assist the BLM and California Department of Fish and Wildlife (CDFW) in their respective National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) reviews and ensure timely public review of the associated Environmental Impact Statement and Environmental Impact Report (EIS/EIR). The effects assessment presented herein is, however, preliminary and subject to further consultation with the BLM, CDFW, and the tribes which choose to participate in the federal and state consultation processes.

Figure 1-3 Map of sites selected for Indirect Effects Assessment.

CONFIDENTIAL FIGURE
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1.3 PROJECT LOCATION AND DESCRIPTION

The proposed Project covers portions of Sections 1, 2, 11, 12, 13, 24, and 25 within Township 7 South, Range 20 East, and portions of Sections 6, 7, 8, 17, and 18 within Township 7 South, Range 21 East, San Bernardino Baseline and Meridian (Figures 1-4 and 1-5). The Project site lies at the east edge of the Chuckwalla Valley on a broad alluvial fan that includes many braided washes and channels. These converge into a primary channel flowing into a playa lake northwest of the Project site. The Project is not sited within the adjacent Section 368 Federal Energy Corridor pursuant to the West-wide Energy Corridor Final Programmatic Environmental Impact Statement (PEIS), except for a short gen-tie line that would interconnect the Project to the CRS.

An estimated 2 million solar panels would be arranged on the site in the form of solar arrays. Steel piles (cylindrical pipes, H-beams, or similar structures) supporting the PV modules would be driven into the soil using pneumatic techniques, such as a hydraulic attachment on the boom of a backhoe tractor. The arrays are laid out primarily in 2-MW increments; each 2-MW increment would include an inverter-transformer station erected on a concrete pad or steel skid and would be centrally located within the PV module arrays. Each inverter-transformer station would contain up to four inverters, a transformer, a battery enclosure, and a switchboard.

Underground cables would be installed to convey the direct current (DC) electricity from the panels to the inverters to convert the DC to alternating current (AC). Between 300 and 500 wooden poles would be installed across the entire site to convey energy to a central substation, which would transform voltage from 34.5 kV to 230 kV. Energy storage may be achieved by either a battery or flywheel system capable of storing up to 350 MW of electricity. The storage system would consist of banks of batteries or flywheels housed in indoor electrical enclosures within the Project energy storage facilities.

RE has prepared a Plan of Development (POD) as part of the SF299 application process for a right-of-way (ROW) grant from the BLM. The POD includes a traditional PV design, as well as consideration of several potential low environmental impact design (LEID) elements. The traditional PV design approach consists of desert tortoise exclusion fencing, a mow and roll approach to site preparation, compacted roads, and trenching for electrical lines; however, the applicant has also been actively investigating alternative LEID elements and the potential for those to reduce Project impacts. Potential LEID changes include:

- Using wildlife-friendly fencing during operations to allow desert tortoise, kit fox, and other wildlife access to the Project site.
- Minimizing grading during site preparation and maintaining more on-site vegetation to facilitate post-construction residual habitat value and post-operations/site reclamation success.
- Avoiding or limiting trenching by placing electrical wiring above ground.
- Placing transformer/inverter groups on elevated support structures in lieu of cement foundations.

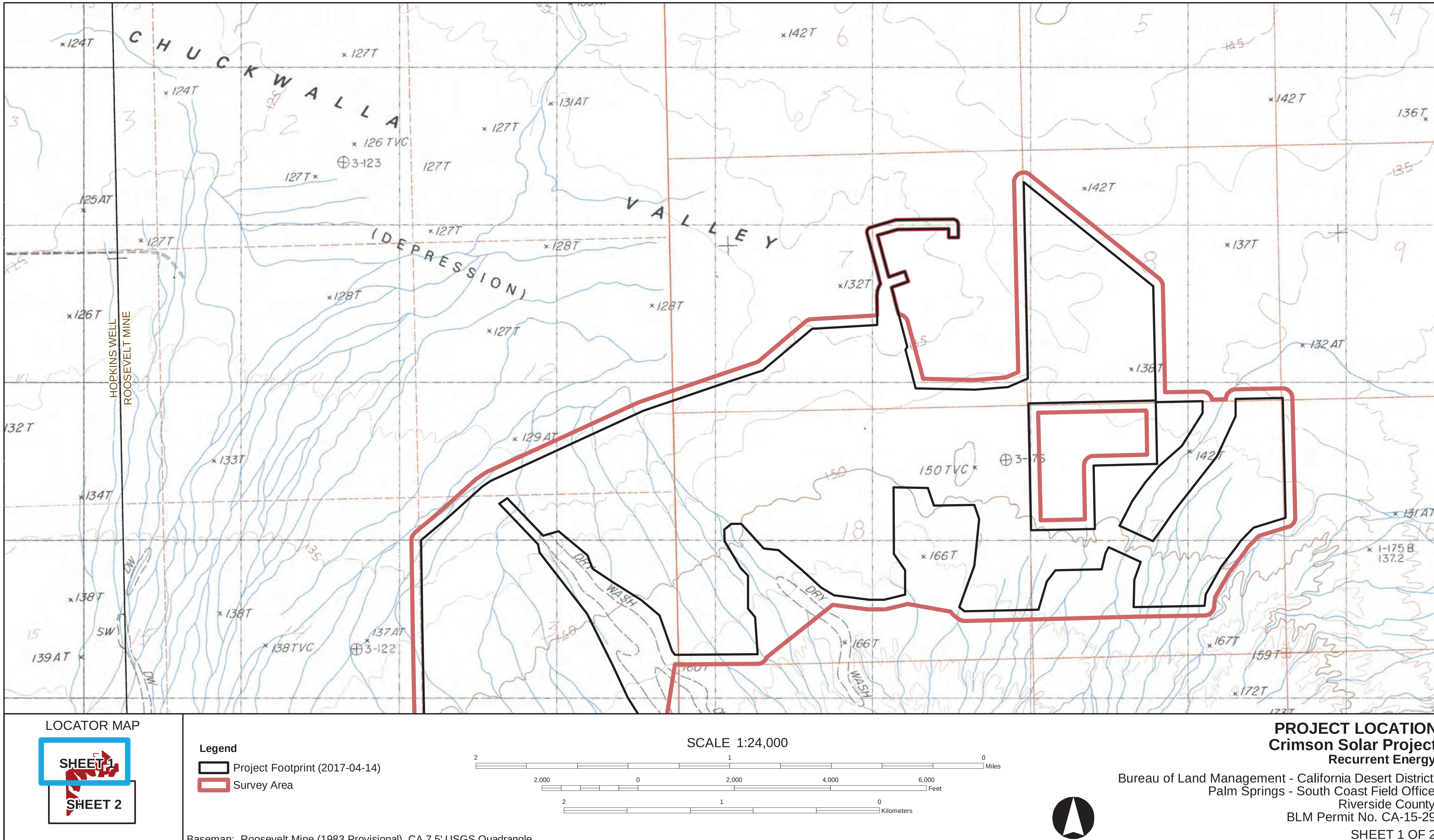
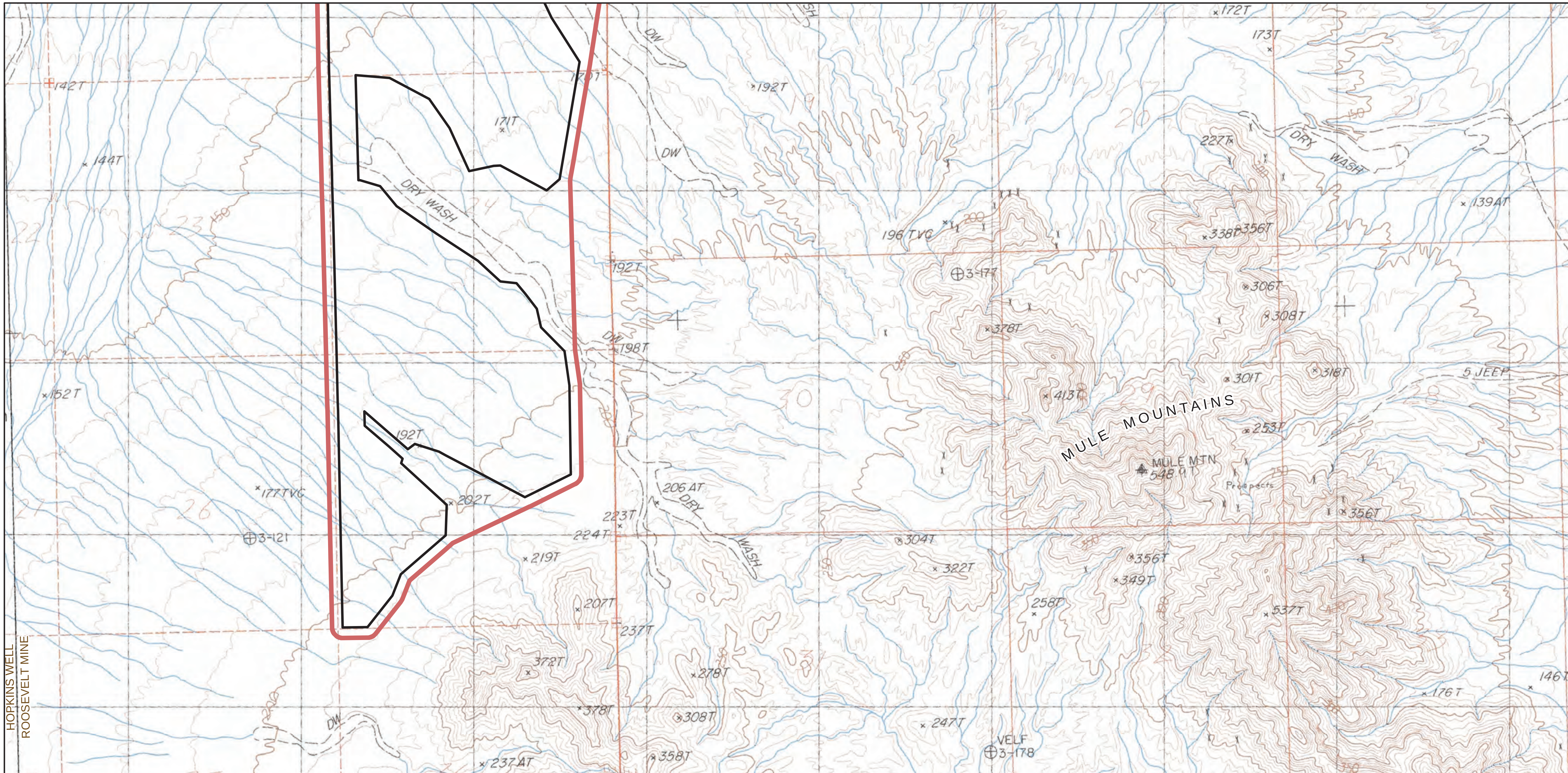


Figure 1-4 Project location on U.S. Geologic Survey Roosevelt Mine 7.5' topographic quadrangle (Sheet 1 of 2).



LOCATOR MAP

Legend

Project Footprint (2017-04-14)

Survey Area

SCALE 1:24,000

Miles: 2, 1, 0

Feet: 2,000, 0, 2,000, 4,000, 6,000

Kilometers: 2, 1, 0

Basemap: Roosevelt Mine (1983 Provisional), CA 7.5' USGS Quadrangle

PROJECT LOCATION
Crimson Solar Project
Recurrent Energy
Bureau of Land Management - California Desert District
Palm Springs - South Coast Field Office
Riverside County
BLM Permit No. CA-15-29
SHEET 2 OF 2

Figure 1-5 Project location on U.S. Geologic Survey Roosevelt Mine 7.5' topographic quadrangle (Sheet 2 of 2).

The LEID elements would further minimize grading, trenching, and vegetation removal beyond traditional design approaches for PV projects with the objective of reducing overall long-term impacts for the Project. Although the incorporation of LEID elements could result in slight modifications to the panel block locations due to topographic constraints, the Permitting Boundary or limits of development would be the same with LEID elements incorporated and the construction and operation of the two design options would be similar.

1.4 REGULATORY CONTEXT

Numerous federal, state, and local laws, ordinances, regulations, and standards govern the management of cultural resources, which are defined as buildings, structures, sites, objects, districts, areas, places, records, manuscripts, or similar properties which may hold important cultural values. Those particularly related to indirect effects assessments are summarized below.

1.4.1 Federal

Numerous federal laws, regulations, executive orders, and policies direct management of cultural resources on federal lands and by federal agencies. These include the NHPA, the Archaeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), the American Indian Religious Freedom Act (AIRFA), Executive Order (EO) 13007, and the Antiquities Act. For the BLM in particular, the Federal Land Policy and Management Act (FLPMA) and several sections of BLM Manuals (Manual 8110: Guidance for identifying and evaluating cultural resources) are relevant as well. The following is a discussion of the most pertinent laws affecting the indirect effects assessment for this Project.

The principal federal law addressing cultural resources is the NHPA of 1966, as amended (54 United States Code [USC], Section 300101), and its implementing regulations (36 Code of Federal Regulations [CFR], Part 800), that primarily address compliance with Section 106 of the act. Because the proposed Crimson Project is primarily on BLM land and requires a BLM ROW grant, it is considered an undertaking subject to Section 106 of the NHPA. Section 106 requires that Federal agencies consider the effects of their undertakings on historic properties, including indirect effects, and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment. The implementing regulations describe the process for identifying and evaluating historic properties in the APE, for assessing the effects of federal actions on historic properties, and for consulting with interested parties, including the SHPO, Native American Tribes, local governments, and the public to develop measures that would avoid, reduce, or minimize adverse effects to historic properties.

The term "historic properties" refers to cultural resources listed on, or that meet specific criteria of eligibility for listing on, the NRHP. To be eligible for listing on the NRHP, a property must be significant in American history, architecture, archeology, engineering, or culture and it must possess integrity of location, design, setting, materials, workmanship, feeling, and/or association. The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects:

A. That are associated with events that have made a significant contribution to the broad patterns of our history; or

B. That are associated with the lives of persons significant in our past; or

C. That embody the distinctive characteristics of a type, period, or method of construction, 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; or

D. That have yielded, or may be likely to yield, information important in prehistory or history.

ARPA (16 USC 470aa et seq.) protects archaeological resources from vandalism and unauthorized collecting on public and Indian lands.

AIRFA (Title 42, U.S. Code, Section 1996) establishes policy of respect and protection of Native American religious practices. It seeks to correct federal policies and practices that could (a) deny access to sacred sites required in traditional religions, (b) prohibit use and possession of sacred objects necessary for religious ceremonies, and (c) intrude upon or interfere with religious ceremonies. The BLM complies with AIRFA by obtaining and considering the views of traditional religious practitioners as part of the NEPA compliance process.

Executive Order (EO) 13007 directs federal agencies to accommodate access to, and ceremonial use of, Native American sacred sites by Native American religious practitioners. It requires federal agencies to avoid adversely affecting the physical integrity of sacred sites to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions. EO 13007 reinforces the purposes expressed in AIRFA. The BLM complies with EO 13007 by consulting with tribal governments and Native American religious practitioners as part of the NEPA compliance process.

The Antiquities Act of 1906 [16 USC 431–433] establishes criminal penalties for unauthorized destruction or appropriation of “any historic or prehistoric ruin or monument, or any object of antiquity” on federal land; provides for issuance of permits for excavation of archaeological sites or collection of “antiquities: on federal land to qualified institutions; and empowers the President to establish historical monuments and landmarks.

FLPMA establishes policy and goals to be followed in the administration of public lands by the BLM. The intent of FLPMA is to protect and administer public lands within the framework of a program of multiple-use and sustained yield, and the maintenance of environmental quality. Particular emphasis is placed on the protection of the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resources and archaeological values.

1.4.2 State of California

The Project requires discretionary approval from CDFW and is therefore subject to the requirements of CEQA. The CEQA Statute and Guidelines direct lead agencies to determine whether a project will have a significant impact on significant historical resources. Generally, a cultural resource shall be considered “historically significant” if it meets the requirements for listing on the California Register of Historical Resources (CRHR) under any one or more of the following criteria (Title 14, California Code of Regulations [CCR], Section 15064.5):

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

2. Is associated with the lives of persons important in our past;

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; or,

4. Has yielded, or may be likely to yield, information important in prehistory or history.

Under CCR, Title 14, Chapter 11.5, properties listed on or formally determined to be eligible for listing in the NRHP are automatically eligible for listing in the CRHR.

A project with an effect that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment (14 CCR 15064.5[b]). A substantial adverse change can result from physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings in a manner that substantially alters the physical characteristics that convey its historical significance.

1.4.3 Riverside County

The following policies outlined in the Riverside County General Plan address cultural resources:

- **OS 19.1** Cultural resources (both prehistoric and historic) are a valued part of the history of the County of Riverside.
- **OS 19.2** The County of Riverside shall establish a cultural resources program in consultation with Tribes and the professional cultural resources consulting community. Such a program shall, at a minimum, address each of the following: application processing requirements; information database(s); confidentiality of site locations; comment and review of technical studies; professional consultant qualifications and requirements; site monitoring; examples of preservation and mitigation techniques and methods; and the descendant community consultation requirements of local, state, and federal law. (A1 144)
- **OS 19.3** Review proposed development for the possibility of cultural resources and for compliance with the cultural resources program.

1.5 AREA OF POTENTIAL EFFECTS

As defined at 36 CFR 800.16(d), the 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, if any such properties exist." The BLM has defined the APE for the current undertaking based on the submitted Project design, an assessment of the local terrain characteristics, factors considered in establishing an APE for previously proposed solar energy projects nearby, and information provided by Native American groups. In a letter dated July 28, 2016, the BLM formally defined the APE to assess both direct and indirect cultural resource impacts. The APE for direct effects (Project APE), as originally proposed, encompassed 3,255.7 acres and included the original footprint of the PV solar facility along with a 200-foot-wide buffer. In addition, it included a 3,980-foot-long gen-tie and a 1,285-foot-long access road, both of which are centered on a 200-foot-wide ROW corridor. Since July 2016, the Applicant has reduced the Project footprint, thereby reducing the Project APE to 2,881 acres. An updated letter was sent to the California SHPO in February 2017 to reflect the updated Project APE and acreage. The Project APE may be refined further in coordination with the applicable agencies as permitting and development proceed.

The APE for indirect effects (indirect APE) is dictated largely by the low-profile nature of the facility design and the local terrain features surrounding the Project site. The maximum height of the solar panels will be 12 feet with the maximum height of the gen-tie and substation dead-end towers up to 150 feet. The indirect APE extends as much as 5 miles to the west, north, and northeast from the Project footprint. Mountainous terrain to the south limits the extent of the indirect APE, but it includes the entirety of the area between the Project APE and boundary of the Mule Mountains ACEC. The direct and indirect APE are shown in Figures 1-6 and 1-7. In a letter dated September 14, 2016, the SHPO, pursuant to 36 CFR 800.4(a)(1), found the APE to be appropriate and sufficient for this undertaking. The updated APE, as reflected by the February 2017 letter to the SHPO, did not significantly alter the APE for indirect effects.

1.6 REPORT ORGANIZATION

This report documents the results of the indirect effects assessment for the proposed RE Crimson Solar Project. This introductory chapter has introduced and described the Project and its location, explained the scope and purpose of the cultural resource investigation, outlined the regulatory context, and defined the direct and indirect APE. Chapter 2 presents the results of previous research and information gathering for the immediate region and Crimson Project area itself. Chapter 3 describes the methods employed for the indirect effects assessment, the sites assessed, and results of the visual assessments. Chapter 4 offers management recommendations. Bibliographic references are cited in Chapter 5. The résumé of the report author and photographic simulations used for the assessment are provided in Appendices A and B.

1.7 CONFIDENTIALITY

The data and images presented in this document, particularly cultural resource locations, are of a sensitive nature and must remain confidential. Caution must be exercised when distributing this information. Maps should be available to agency managers and staff and others who have a legitimate “need to know.” In no case should these maps be included in versions of this document that are made available to the public, either in electronic or paper form. When no longer needed, electronic files should be deleted from computers, external storage devices, and e-mail archives. Other electronic media such as compact discs (CDs) or digital versatile discs (DVDs) should be shredded or otherwise rendered unreadable. Excess or outdated paper copies of documents should be shredded or burned to protect confidentiality.

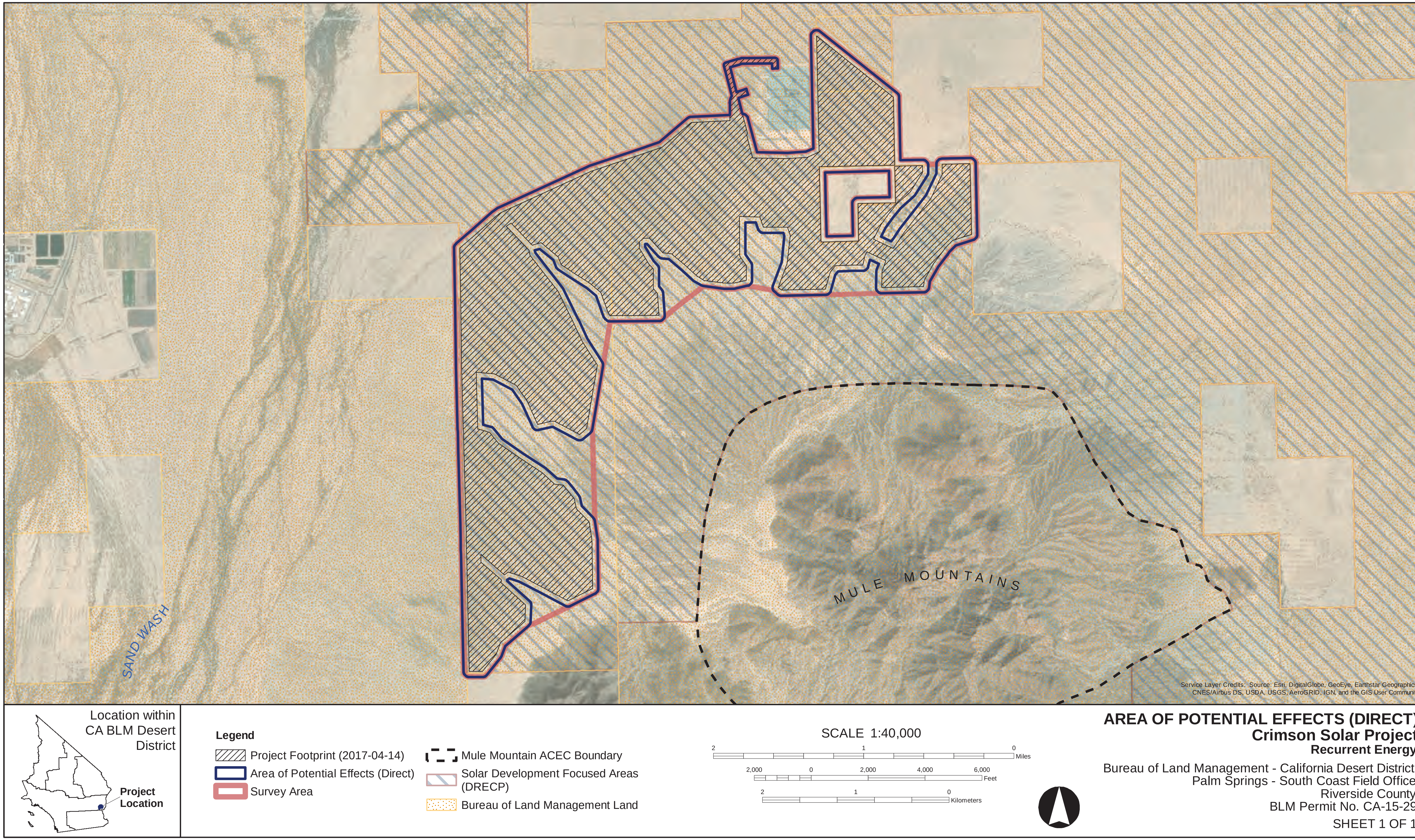


Figure 1-6 Direct APE.

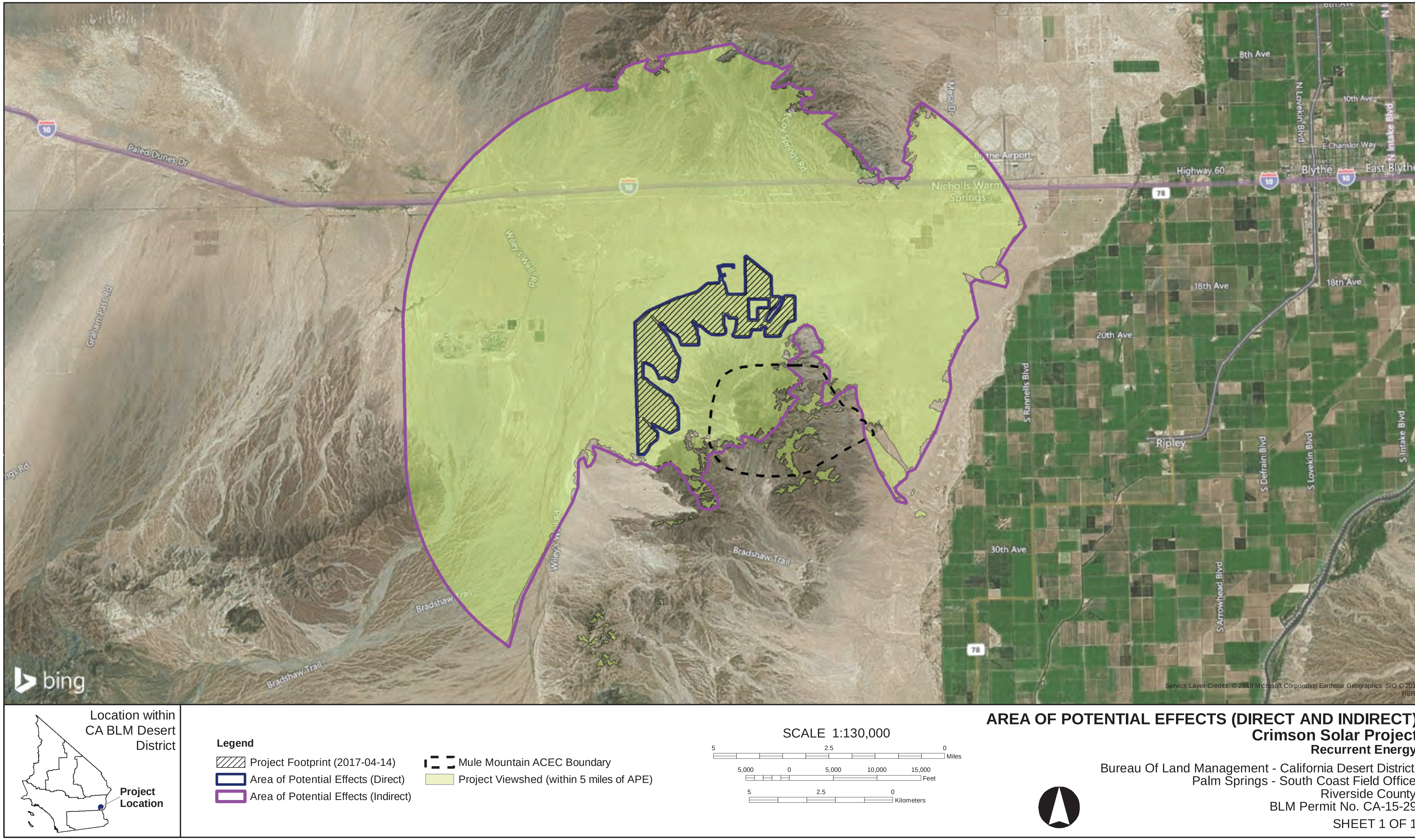


Figure 1-7 Indirect APE.

2
RELEVANT PRIOR RESEARCH

The natural, cultural, and archaeological contexts of the Project area have been described in considerable detail by Mirro and Clark (2016), Earle (2017), Applied EarthWorks (2017a, 2017b), and Kidwell et al. (2018). The reader is referred to those documents for details on the history, ethnography, prehistory, archaeology, and natural history of the general area.

2.1 OTHER STUDIES IN THE REGION

Numerous solar energy projects have been proposed and some implemented in recent years in the Chuckwalla Valley/Palo Verde Valley region in eastern Riverside County. The various levels of cultural review performed for these projects are described in the Crimson Class I overview (Mirro and Clark 2016). Prior studies include Class I overviews (Contreras et al. 2013; Rawson 2011), Class II and Class III surveys (Akyüz 2012; Bagwell et al. 2012; Chambers Group and Applied EarthWorks 2012; Chandler et al. 2011; ECORP 2010; Farmer et al. 2009; Keller 2010; Lerch et al. 2016; Nixon et al. 2011; Power Engineers 2013a, 2013b; SWCA 2011; Tennyson and Apple 2009; Tennyson et al. 2013; URS 2011), geoarchaeological assessments (Nials 2013), indirect effects assessments (Hanes 2018; Smallwood et al. 2012), and ethnographic literature reviews (AECOM 2013; Earle 2017; Gates 2012; Halmo 2003; URS 2012).

Five other projects have been proposed near the Crimson Project area: Sonoran West Solar Electric Generating System Project, Desert Quartzite Solar Project, Rio Mesa Solar Electric Generating Facility, McCoy Solar Energy Project, and Blythe Solar Power Project. The various levels of cultural review performed for these projects are described below, with particular reference to potential indirect effects.

Sonoran West Solar Electric Generating Facility. In 2012 BrightSource Energy, Inc. began the process of applying for a certification to construct the Sonoran West Solar Electric Generating Facility in the approximate footprint of the current Crimson proposal. In the following year, the effort was suspended. Prior to the project's suspension, a draft Phase I archaeological resource report was prepared (URS 2012) for compliance with CEQA. The Sonoran West project included an approximately 6,562.5-acre site, but only the private lands, totaling 736.1 acres, were surveyed for archaeological resources. The potential for indirect effects was not assessed; however, significant cultural sites were identified on the north side of the Mule Mountains (URS 2012:6–1).

McCoy Solar and Blythe Solar Power Projects. The proposed McCoy Solar Energy Project and adjacent Blythe Solar Power Project are several miles northeast of the Crimson Project area. Halmo (2003) conducted ethnographic work for the Blythe project area. He identified the Palo Verde Valley and Mesa (both partially within the eastern extent of the Crimson indirect APE) as integral parts of the traditional landscape containing a variety of resources including culturally significant ceremonial places.

More recently, AECOM (2013) performed an ethnographic assessment for the proposed McCoy project and identified several types of places of cultural and religious significance, including petroglyph and geoglyph sites. The assessment centered on the Palo Verde Mesa and McCoy Wash and the surrounding viewshed, with the Mule Mountains and the eastern extent of Chuckwalla Valley bordering to the south. These culturally sensitive places were frequently related to traditional beliefs, origin myths, and mythological places where religious practitioners might go (AECOM 2013:12). The assessment highlighted the cultural sensitivity of the Mule Mountains as the center of a regional network of trails leading to places of spiritual significance, including ceremonial locations containing rock art, ground figures, cleared circles, and rock tanks for storing water. Tribal representatives identified concerns relating to visual effects on a petroglyph site along a long wash on the east flank of the McCoy Mountains, west of the McCoy project area (AECOM 2013:70).

Rio Mesa Solar Electric Generating Facility. To the southeast, on the eastern flanks of the Mule Mountains, an ethnographic assessment for the proposed Rio Mesa Solar Electric Generating Facility highlighted places of cultural significance in the Mule Mountains and Palo Verde Mesa (Gates 2012). For Palo Verde Mountains, Gates (2012:59) noted the Mule Mountains "are understood to be a spiritual training area … The Mule Mountains are considered to be a place of 'wandering souls' that abide in these mountains during the one year period between the funeral and mourning ceremonies." Gates (2012: 58) also notes that Palo Verde Peak, the highest point in the Palo Verde Mountains, is the

> location of a Big House along the *Xam Kwatcan* trail. Numerous trails, and trail features (i.e., cairns, cleared circles, rock rings, lithics and earth figures) connect from the *Xam Kwatcan* to Palo Verde Peak, as well as various earth figures and viewpoints of Palo Verde Peak (Johnson 2001). Palo Verde Peak is a place to visit for those involved in the Keruk/Mourning ceremony where mourners petition their deceased loved ones to move on to the next world.

Desert Quartzite Solar Project. The proposed Desert Quartzite Solar Project (DQSP) is south of I 10 and immediately east of the Crimson Project area. The indirect APE was initially defined as a 1-mile area surrounding the 5,010-acre direct APE, however tribal consultation led to expansion of the indirect APE. Two NRHP-listed sites associated with the Mule Tank Discontiguous Rock Art District are within the indirect APE. Lerch et al. (2016) recommended that a viewshed analysis be conducted to assess possible visual adverse effects that the DQSP may pose to the district. That analysis is currently in progress.

In regard to other culturally significant locations in the region, the Desert Quartzite Class III report (Lerch et al. 2016:59) stated:

> Traditional sacred places are found throughout the Colorado Desert. . . . Often, these sacred locations are marked by intaglios depicting the mythic events and actors (Bourke 1889; Johnson n.d.) and also contain dance circles and dance paths (Kroeber 1925). In addition to these large-scale ceremonial areas, small intaglios are often found, including what are called sleeping circles and vision circles. Sleeping circles most likely functioned as temporary campsites for travelers or for people attending ceremonies. Visions circles, sometimes called "power circles" (Johnson 1985:37), are considerably smaller than sleeping circles and tend to be found in clusters and along trails. They are intended for dreaming or meditation by an individual attempting to acquire knowledge and wisdom from the supernatural world (Ezzo 1994; Ezzo and Altschul 1993:17). Other intaglios were apparently made by shamans for other purposes. One account identifies a large

anthropomorph as a self-portrait by a shaman. Other accounts link some of these ground images to shamanic sorcery (Forde 1931:195; Harrington 1986; Trippel 1889).

2.2 CRIMSON CLASS I CULTURAL RESOURCE INVENTORY

Prior to conducting a Class III survey, several other cultural resource documents were produced for the RE Crimson Solar Project. These include a Class I overview and literature review (Mirro and Clark 2016), a Work Plan and Research Design to guide further cultural resource investigations (Applied EarthWorks 2017a, 2017b), and an ethnographic and ethnohistoric literature review (Earle 2017).

The Crimson Class I inventory provides a comprehensive account of all known archaeological and historical sites and Traditional Culture Properties (TCPs) within the Project direct and indirect APE (Mirro and Clark 2016: see Part II Table C-1 and Figures C-1 to C-6). The document included an archaeological records and literature search at the Eastern Information Center of the California Historical Resources Information System; a review of existing publications, maps, and technical reports relevant to the Project; and consultation with the BLM regarding known cultural resources and potential TCPs within the direct and indirect APE.

The records search area for the Class I inventory extended for 1 mile beyond the boundary of the Project direct APE. At the request of the BLM, the records search area was expanded by an additional mile to the southeast from the base of the Mule Mountains to encompass the Mule Mountains ACEC. This records search area thus included 30 square miles and extended beyond the indirect APE boundary and viewshed of the Project APE in some areas. The data presented in the Class I inventory was used to determine the appropriate identification effort for the proposed undertaking.

2.3 CRIMSON CLASS III CULTURAL RESOURCE INVENTORY

Applied EarthWorks, Inc. (Æ) completed a Class III survey of the direct APE, which includes a slight buffer around the proposed Project footprint (Kidwell et al. 2018). The goal was to verify and update records for known archaeological and historical sites and identify and record previously unknown resources. Æ cultural resource specialists, accompanied by tribal monitors, surveyed the original direct effects APE and identified 350 prehistoric and historical resources. Of these, 167 are archaeological sites (82 prehistoric, 58 historical, and 27 with both components), while 183 are isolated finds.

3
INDIRECT EFFECTS ASSESSMENT

3.1 INDIRECT EFFECTS ASSESSMENT METHODS

The DRECP LUPA states that “typical impacts from renewable energy developments” on cultural resources come in various forms. The “introduction of visual, auditory, olfactory, or atmospheric elements are out of character with the resource or cause changes that may alter its setting” (BLM 2015:IV.8–3). The DRECP LUPA identifies places and areas of traditional importance and concern to Native Americans in the region. In regard to culturally sensitive locations, “Introduction of visual elements can diminish the integrity of a historic property’s significant historic features … for which the visual setting is an important component” (BLM 2015: IV.8–7). An important element of Native American natural aesthetics is the relation among landforms, skies, and traditional practitioners. Local, intermediate, and distant horizons provide a context within which natural and cultural resources are understood in culturally integrated ways.

With this in mind, the culturally important Mule Mountains are immediately south of the Crimson Project area and partially within the indirect APE. The Mule Mountains extend southward about 14 miles and include a portion known as the Palo Verde Mountains. The region was occupied historically by the so-called River Yuman speakers, the Mohave and Quechan (formerly called the Yuma), who attached spiritual and cultural values to the mountains and surrounding area; prior to them, the Halchidoma occupied the area into the early part of the protohistoric period (Earle 2017:9). Individual dream experiences were an important component of the religious beliefs and practices of Yuman-speakers (Kroeber 1925). Mohave shamans acquired their supernatural power through solitary vision quests at mountains (Forde 1931), and young males created rock art at the conclusion of ceremonies and instruction.

The DRECP LUPA notes significant cultural resource values in the Mule Mountains, including prehistoric trails, cleared circles, and rock art in the form of petroglyphs, pictographs, and geoglyphs (or intaglios). Additionally, prehistoric cremation sites have been identified on the bajadas bordering the northern flank of the Mule Mountains. Viewshed concerns were also noted in relation to the rock art sites (BLM 2016:Appendix B, 189).

In his recent ethnohistoric assessment for the Crimson Project, Earle (2017: 75) noted in regard to the Mule Mountains “This mountain ridge is mentioned in a Mojave sacred story as a stopping place during the travel down and then up the river of a female Mojave culture hero named Nyohaiva (Kroeber 1948:27–36).” Situated just west of what is described as a “pilgrimage route” by the local tribes, Earle further notes “These mountains are believed by the Quechan tribes to have served as “Big Houses,” supernatural places where the spirits of the recently deceased tarried …” and special places served as places for spiritual instruction.

An overview of the cultural context for the Crimson Project noted that some culturally sensitive locations may be present within the indirect APE. Known native trail systems in the area include the Salt Song Trail, the Maricopa Trail, the Bradshaw Trail, and the *Keruk Xan Kwatcan* Earth Figure Landscape, a Yuman sacred trail corridor that follows the Colorado River just to the east of the Project area. Also located within the indirect APE at the northern end of the Mule Mountains is the NRHP-listed Mule Tank Discontiguous Rock Art District.

3.2 SELECTED CULTURALLY SENSITIVE LOCATIONS

The BLM identified three historic properties (also apparently culturally sensitive sites) for indirect effects analysis based on information provided by Tribes through consultation and assessments such as those mentioned above. The three sites have qualities of materials, design, setting, location, and workmanship that make them potentially vulnerable to project indirect effects. This section analyzes the Project's potential indirect effects on these locations, which are also recognized as formally recorded archaeological sites. All resources identified for this assessment are outside the defined direct APE, therefore are not subject to direct effects of Project construction and operation (Figure 1-3).

Two sites, the Mule Tank Petroglyph Site (CA-RIV-504) and the Mule Canyon Intaglio Site (CA-RIV-773), comprise the NRHP-listed Mule Tank Discontiguous Rock Art District. The third, archaeological site, CA-RIV-1821/H, contains at least one human cremation. CA-RIV-504 and -773 are described in the Class I Cultural Resource Inventory report (Mirro and Clark 2016) and ethnographic overview (Earle 2017) for the Crimson Project and are summarized below. Site CA-RIV-1821/H, recommended eligible for listing on the NRHP, is described in the archaeological survey reports for the Desert Quartzite Solar Project (Lerch et al. 2016:88) and Ten West Link Transmission Line (Gardner 2018:95). Using simulations from three Key Observation Points (KOPs; see Appendix B, Figure 1), the effects on the viewshed of each resource are examined. Based on these analyses and previous testimony from tribal informants, assessments of indirect effects on these resources are offered.

3.2.1 Mule Tank Petroglyph Site (CA-RIV-504)

The Mule Tank Petroglyph Site, part of the NRHP-listed Mule Tank Discontiguous Rock Art District, covers approximately 4 acres on both sides of a small, rocky arroyo on the north side of the Mule Mountains, approximately 1.2 miles east of the Project's direct APE. Some 143 petroglyph panels are on either side and within the arroyo. No other rock art is known in the Mule Mountains area. As noted by Earle (2017:75):

> The archaeological site at the tank features Grapevine Style petroglyphs, commonly found in the lower Colorado River region, incised on boulders and rock faces (Christenson and Dickey 2001). This style consists of geometric incised figures, mask shapes, enclosed crosses, diamonds, triangles, enclosed circles, and hourglass figures.

As noted by Mirro and Clark (2016:I–88):

> According to Whitley (2001:7-10), many of the petroglyphs from Mule Tank consist of "entoptic designs," which include spirals and concentric circles, grid patterns, meanders of filigrees, dot patterns, tick marks or parallel lines, nested curves, and zigzags. These designs are often associated with the visionary imagery of puberty initiates suggesting that some of the rock art at CA-RIV-504 may be associated with coming-of-age rites.

Distinctive differences in weathering, with variable covering in desert varnish (the dark mineral coating), are noticeable among the individual rock art motifs at the Mule Tank Petroglyph Site. This trait suggests a considerable time-depth for creation of the numerous panels. The site is presently listed in the NRHP under Criteria C and D.

The site was determined significant under Criterion C since it embodies the distinctive characteristics of the Great Basin Rock Art Tradition, an ancient and long-lived art and belief system. It is an important example of that tradition and possesses high artistic values. In addition, this is the only rock art site in the Mule Mountain vicinity and it contains human figure petroglyphs which are relatively rare in the Colorado River Desert region. Related to Criterion C significance, the rock art retains integrity of location, materials, design, workmanship, and the setting of its immediate environment owing to its association with an important water source—a large tinaja, a natural stone basin also referred to as a tank within the arroyo, as described further below. Much of the rock art is on rock outcrops within the arroyo near the tinaja.

The site has also been listed under Criterion D in that it has yielded and may likely further yield information important in prehistory. For example, a rare female human figure panel may be suggesting one or more women conducting vision quests at this site (Whitley 1996). Distinct differences in the degree that the dark mineral coating of desert varnish covers individual motifs demonstrates the considerable time-depth of the Mule Tank Petroglyph Site. The rock art panels are protected by fencing and interpretation and are considered of good physical integrity.

The site is not considered significant under Criterion A because the lack of precise dating of the rock art does not enable association with specific events or time periods. The site does not exhibit any attributes that convey specific associations with famous or important persons or artists with national, statewide, or local significance; therefore, it is not considered significant under Criterion B.

A historically important source of water facilitating the use of the area by native people is located in a deep depression at the head of a narrow winding wash. Within this dry wash is a large tinaja, a natural stone basin also referred to as a tank, at the base of a 30-foot waterfall. It collects and stores water after rainfall events. The north facing orientation provides shade to aid in conserving the rare water source. Tinaja is a geomorphic term originating in the American Southwest for ephemeral surface depressions in bedrock where water collects. These depressions or scour pools are formed by various processes, including erosion by spring seepage or waterfalls, or by sand and gravel scouring in intermittent streams or arroyos (Osterkamp 2008). Constituting one of the few seasonal water sources for travelers in the area, the tinaja is a key natural feature of the Mule Tank Petroglyph Site, along with the numerous dark stained boulders. Elsewhere within the Chuckwalla Valley area, petroglyph sites are often associated with trails, springs or natural tanks, mountain passes or canyons, or distinctive topographic landmarks.

3.2.2 Mule Canyon Intaglio Site (CA-RIV-773)

Also situated on the north side of the Mule Mountains with a commanding view of Palo Verde Mesa to the northeast, the Mule Canyon Intaglio Site (CA-RIV-773) is a unique cultural site covering approximately 6 acres. It is one of the few intaglio sites in the immediate area and is part of the NRHP-listed Mule Tank Discontiguous Rock Art District. Mirro and Clark (2016:I-87–88) describe the site as

> eight horseshoe shaped clusters of 10 small cleared circles, each approximately 1 m in diameter; two groups of 20 cleared circles, organized into two rows of 10 circles in each group, with each circle approximately 1 m in diameter; an area with 5 larger cleared circles, which may be "house circles" (Whitley 2001); a cleared ring area approximately 33 m in diameter that may have been a "dance circle;" and numerous petroglyphs in small shielded drainage approximately 0.5 mi west of the geoglyphs. A prehistoric trail, CA-RIV-343, also passes through the site.

Earle (2017:75) describes the site as

> an area with eight sets of small cleared circles forming roughly circular shaped patterns. These ground figures are aligned very approximately in a row just downslope from a native trail. They are located next to a large trail circle. Further to the east are two other ground figures composed of two parallel rows of ten ground circles cleared in the desert pavement, also located on the downslope edge of the trail. Between the two sets of ground figures, there is a junction of two native trails running from the east. These features have been interpreted as dance circles and areas for instruction of the young by native elders.

Cleared circles of sufficient size have often been considered to be sleeping or resting places, and smaller ones as vision quest or meditation circles (Davis 1980; Ezzo and Altschul 1993; Pigniolo et al. 1997; Rogers 1966; von Werlhof and von Werlhof 1977). Though prehistoric rock rings are commonly found throughout southeastern California, southwestern Arizona and Utah, and southern Nevada, few have been recorded in the immediate vicinity of the Project APE (Mirro and Clark 2016:89). Therefore, the Mule Canyon Intaglio Site is particularly noteworthy for this feature.

Located on a pebble stream terrace about 1.8 miles east of the Mule Tank Petroglyph Site within the indirect APE, the intaglio figures were created by scraping away the thin natural pavement of dark stained pebbles that covers the ground surface exposing the lighter sand below (Harner 1953; Johnson 1985; Rogers 1945; Solari and Johnson 1982).

The intaglios at this site are representative of the Geoglyph Variant of the larger Earth Figure Tradition of Native California rock art found along both sides of the Colorado River in this region and the Gila River region of central Arizona (Whitley 2001:66–67). The art tradition is at least 3,000 years old and continued to be used in the recent past.

Such intaglios may be examples of pilgrimage art, which marks the location of important mythic events (Lerch et al. 2016:67–68). Ceremonies conducted at these sites may commemorate the activities of the gods and spirits during the mythic past (Whitley 2001). The site is listed in the NRHP under Criteria C and D.

The Mule Canyon Intaglio Site (CA-RIV-773) and the Mule Tank Petroglyph Site (CA-RIV-504) are the products of religious beliefs and practices of those accessing the area and are expressions of their artistic talents and concerns. Both the petroglyphs and intaglios, overlooking the broad, open Palo Verde Mesa, which stretches to the Colorado River approximately 15 miles to the east, help sustain and give meaning to Native American spiritual lives. Modern ethnographic information from Quechan and Mojave consultants indicate Yuman-speakers carried out pilgrimages to these places (Johnson 1985). The rock art and intaglios, referred to as pilgrimage art placed on the landscape (Earle 2017), can be considered signs of supernatural power and demonstrations of a successful vision quest experience. Thus, they were combined into the NRHP-listed Mule Tank Discontiguous Rock Art District. The two sites have been fenced and interpreted by the BLM, serving to keep vehicles away and the art features intact.

3.2.3 CA-RIV-1821/H

Earle (2017:75) noted that cremation locations have been reported along the margin of the Mule Mountains. Tribal representatives of the Chemehuevi, Quechan, and Mojave indicated the Palo Verde Valley and Palo Verde Mesa have potential importance due to the possibility of Halchidhoma burial and cremation sites (Halmo 2003:27).

One archaeological site, CA-RIV-1821/H, identified for indirect effects assessment represents such a cremation location. The site is in an active drainage on the Pale Verde Mesa northeast of the Mule Mountains. It was discovered in 1980 during the archaeological survey for the Devers-Palo Verde high voltage transmission line (Carrico et al. 1982; Day et al. 1980; Stanton 2015) and was initially characterized as a dispersed scatter of lithic debitage and cores, ceramic sherds, and hearth features covering approximately 590 by 92 meters. The sherds were identified as Tumco buff (Lerch et al. 2016:82), a ceramic type attributed to the Patayan II period (A.D. 1000–1500) and manufactured locally along the Colorado River. Test excavation revealed shallow culture-bearing deposits of 20 centimeters with no discernible soil structure (Lerch et al. 2016). The surface is characterized by drifting sands and pockets of deepening sand deposits in continuous movement driven by eolian forces.

The site has been revisited for additional archaeological observations on multiple occasions. During one of these visits BLM archaeologists and tribal representatives identified a suspected cremation locus that had not been recorded previously (Lerch et al. 2016:75). The locus contains a scatter of approximately a dozen completely and partially calcined long bone fragments plus one small cranial fragment. Calcined bone was noted within several of the intact fire-altered rock/hearth features in deflated surface areas and blowouts. In a visit to the site on August 21, 2018, Dr. Deborah Gray, forensic anthropologist for the Riverside County Coroner, identified the bones as cremated human remains. The site has been recommended eligible for listing in the NRHP and retains the qualities of integrity of setting, feeling, and association (Gardner 2018:90; Lerch et al. 2016:128).

3.3 ASSESSMENT OF INDIRECT EFFECTS

This indirect effects analysis focuses primarily on visual line-of-sight concerns. Auditory and atmospheric effects posed by the Project will occur primarily during the construction phase and will be transitory in nature; thus, they will not pose adverse effects on the three locations assessed.

Of relevance to the indirect effects analysis, the Applicant proposes to employ lower-impact PV technology in lieu of a higher-impact power tower technology proposed by the site's former development sponsor; facilitate grid interconnection by collocating substantial electrical storage capacity at the PV facility site; and construct a major utility-scale solar facility on contiguous lands in the immediate vicinity of a high-voltage interconnection to the CAISO-controlled grid.

3.3.1 Mule Tank Petroglyph Site (CA-RIV-504)

The Mule Tank Petroglyph Site is within the south-central portion of the indirect APE approximately 1.2 miles east of the direct APE boundary for the Project. The site lies primarily on a northwest facing slope of the Mule Mountains and looks across the eastern Chuckwalla Valley toward the Project area. The rock art panels border the small arroyo and mostly occur within the arroyo. The physical setting is considered a key characteristic of the cultural site as the water source in its immediate environment facilitated tribal pilgrimages (Earle 2017:75) and thus embodies spiritual and cultural significance.

To aid assessment of visual effects posed by the proposed Project, a simulation of the view from KOP 1 at the rock art location was developed (Appendix B, Figures 2 and 3). From this slightly elevated point among rock art panels bordering the arroyo, the solar tracking arrays appear as a dark area against the lighter soils of the valley floor. The gen-tie, on the north side of the Project area, is more faintly visible than the field of solar panels due to blending with the valley floor.

The introduction of the distinct, dark horizontal linear area creates a visual contrast with the landscape surrounding the site when viewed from portions of the site. The site's elevated position lessens the effect of low-profile shielding by intervening vegetation and subtle topography for those panels bordering the arroyo. However, the visual change in form, line, color, and texture of the landscape that would be introduced by the proposed Project would not create a substantial indirect effect upon this site as key integrity factors of location, materials, design, and workmanship are not susceptible to visual effects. In addition, the importance of setting is associated with the more immediate occurrence of the water source and much of the site is within the arroyo, out of sight of the proposed Project. The visual effect would not be adverse because the visual intrusion would not diminish the integrity of location, setting, design, materials, and workmanship that qualify the site for listing in the NRHP under Criterion C as part of the Mule Tank Discontiguous Rock Art District.

3.3.2 Mule Canyon Intaglio Site (CA-RIV-773)

The Mule Canyon Intaglio Site is within the south-central portion of the indirect APE approximately 1.2 miles southeast of the direct APE boundary for the Project. Similar to the Mule Tank Petroglyph Site, this site lies primarily on a north facing slope of the Mule Mountains; however, intervening topography largely shields its viewshed across the eastern Chuckwalla Valley toward the Project area. The site has spiritual and cultural significance to the Tribes (Earle 2017:75).

Though no Project construction would take place within the immediate site vicinity, indirect effects in the form of visual intrusions may occur given the proximity of the site to the construction area. To aid assessment of visual effects posed by the proposed Project, a simulation of the view from KOP 2 at the site was developed (Appendix B, Figures 4 and 5). From the slightly elevated point, those solar tracking arrays visible around the intervening topography appear as a dark area against the lighter soils of the valley floor. The gen-tie is only faintly visible due to blending with the valley floor. Given the intervening topography, the solar arrays are only slightly visible from the intaglio site; thus, there is only a limited visual contrast with the landscape surrounding the site. Given the scale of the surrounding landscape and varied topography, the visual change in form, line, color, and texture of the landscape that would be introduced by the proposed Project does not create a substantial indirect effect upon this site. Like the Mule Tank Petroglyph Site, the effect would not be adverse because the visual intrusion does not diminish the integrity of the characteristics that qualify the site for listing in the NRHP under Criterion C as part of the Mule Tank Discontiguous Rock Art District.

3.3.3 CA-RIV-1821/H

CA-RIV-1821/H lies within the southeastern portion of the indirect APE approximately 2.5 miles southeast of the direct APE boundary for the Project. The site lies on the gently sloping bajada bordering the northern flank of the Mule Mountains. Because cremation of the deceased occurred at the site, it has spiritual significance for the Tribes and was recommended eligible for listing on the NRHP under multiple criteria (Gardner 2018:83; Lerch et al. 2016:128). Construction would not take place in the immediate site vicinity. Consequently, no direct impacts to this resource would occur. However, given the proximity of the site to the construction area, indirect effects in the form of visual intrusions may occur.

To aid assessment of visual effects posed by the proposed Project, a simulation of the view from KOP 3 at the site was developed (Appendix B, Figures 6 and 7). CA-RIV-1821/H is on relatively flat terrain, so the solar arrays appear only as a slightly darker area against the lighter soils of the valley floor. The gen-tie is distant on the opposite side of the Project area and is not visible. Given the lower profile and lessened reflectivity of the solar arrays and the distance of the site, the intervening vegetation and the topographic northward extension of the Mule Mountains provide considerable natural screening between the cultural site and the Project area to the west, thus reducing the visibility of the Project from this site. The visual impact would not be adverse despite the proximity of the site to the Project because the integrity of setting, feeling, and association are not substantially diminished by the proposed Project.

4
CONCLUSIONS

4.1 SUMMARY OF INDIRECT EFFECTS

This analysis considers potential visual, atmospheric, and auditory effects on selected sites. The primary focus is on visual line-of-sight effects. Auditory and atmospheric (dust) effects potentially posed by the Project will occur primarily during the construction phase and will be transitory; thus, they will not pose adverse effects on the locations assessed.

Despite its proximity of just over 1 mile, the proposed Project development does not pose an adverse effect to the Mule Tank Petroglyph Site (CA-RIV-504) along the rim of the arroyo. The site is considered significant under NRHP eligibility Criteria C and D; the distant viewshed does not constitute an important integrity factor since setting concerns are related to the immediate environment of the site and the important water source facilitating cultural use of the area. Though visible from a portion of the site, the flat dark color of the solar panels minimizes contrast with the surrounding environment in terms of form, color, texture, and pattern. Light reflection is also minimized and a diverse accumulation of elements is not introduced by the proposed facility. The facility does not become an important element of the landscape surrounding the immediate setting of the Mule Tank Petroglyph Site.

CA-RIV-773 and -1821/H are more distant from the proposed Project and are largely screened by intervening vegetation and topographic features on the north side of the Mule Mountains. Given the scale of the surrounding landscape and varied topography, the visual intrusion of the development is not considered an adverse effect on these sites. Due to their location and distance from the Project site, atmospheric dust will not pose adverse effects on these sites.

5
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APPENDIX A

Résumé of Key Personnel

Richard Clay Hanes

Senior Compliance Specialist

Areas of Expertise

- Environmental law compliance
- Archaeological method
- Tribal relations
- Cultural resource management
- Project management
- Prehistory of the American West
- Early American history

Years of Experience

- 43 years

Education

Ph.D., Anthropology, University of Oregon, Eugene, 1980

M.S., Anthropology, University of Oregon, Eugene, 1975

B.S., Aerospace Engineering, Texas A&M University, *Sigma Gamma Tau Honor Society*, 1970

Registrations/Certifications

- Register of Professional Archaeologists (2014)

Professional Experience

2013–	Senior Compliance Specialist. Applied EarthWorks, Inc., Fresno, California.
2008–2012	Chief, Division of Cultural and Paleontological Resource Management and Tribal Consultation, U.S. Department of Interior, Bureau of Land Management, Washington, D.C.
1986–2008	Regional Historic Preservation Program Lead, U.S. Department of Interior, Bureau of Land Management, Oregon/Washington State Office, concurrently Regional Heritage Program Lead for Region 6, U.S. Forest Service (2005–2008), Portland, Oregon.
1979–1986	Regional Historic Preservation Program Lead, U.S. Department of Interior, Bureau of Land Management, Nevada State Office Reno, Nevada.
1976–1979	Cultural Resource Specialist, U.S. Department of Interior, Bureau of Land Management, Roseburg District, Roseburg, Oregon.
1975	Field Supervisor, New Melones Project, San Francisco State University, Sonora, California.

Technical Qualifications

Dr. Hanes has worked in historic preservation for four decades and has completed archaeological assessments for projects of all sizes and types. He has substantial experience in facilitating solutions to complex undertakings involving environmental legal compliance among diverse interests, including governmental, political, and private sector interests, and pursuing negotiated agreements. Stakeholders range from mining and energy firms, to American Indian tribal governments and traditional practitioners, to nongovernment special interest organizations. Dr. Hanes has published extensively on applied anthropology and prehistory of the American West. He has conducted training sessions and public presentations at industry meetings, government programs, academic conferences, and university classrooms on the interface of federal resource preservation law, public land law, and Indian law in applied case scenarios. As Senior Compliance Specialist, Dr. Hanes has served as expert witness on the multistate Ruby Pipeline Project litigation, performed due diligence on historic preservation compliance for a solar energy project acquisition, and assessed the legal adequacy of environmental planning documents prepared for a proposed major water project.

Selected Project Experience

Palen Solar PV Project, Riverside County, California. (2016-present). Directed tribal outreach program for EDF Renewable Energy Company in support of a proposed 4,200-acre solar photovoltaic (PV) energy generation plant project located in the Chuckwalla Valley region of the Mohave Desert. Primary tasks were to assess the potential indirect effects to selected traditional cultural properties (TCP) and culturally sensitive landscapes that may result from visual or auditory intrusion posed by the Project to determine whether the Project may adversely alter the character defining features of those resources that contribute to their NRHP/CRHR eligibility; contribute relevant sections to the Project's NEPA documents; and, develop in coordination with all interested parties an MOA prescribing appropriate measures to resolve adverse effects.. Client: EDF RE.

Crimson Solar Project, Riverside County, California. (2016-present). Assisted in directing tribal outreach program for Sonoran West Holdings, LLC, a wholly owned subsidiary of Recurrent Energy, LLC, in support of a proposed 3,255-acre solar photovoltaic (PV) energy generation plant and energy storage project located in eastern Riverside County, approximately 13 miles west of Blythe. Primary tasks also included an assessment of the potential indirect effects to at least three culturally sensitive archaeological sites that may result from visual or auditory intrusion posed by the Project to determine whether the Project may adversely alter the character defining features of those resources that contribute to their NRHP/CRHR eligibility; contribute relevant sections to the Project's NEPA documents; and, develop in coordination with all interested parties an MOA prescribing appropriate measures to resolve adverse effects. Client: Recurrent Energy/Aspen.

Topock Compressor Station Remediation, San Bernardino County. California. (2013–present). As a member of an Applied EarthWorks' team provides Pacific Gas and Electric Company with a broad range of services to facilitate remediation of soil and groundwater contamination at a large natural gas compressor station on the Colorado River in San Bernardino County, California. With the cleanup under direction of the California Department of Toxic Substances Control and the U.S. Department of the Interior, the primary focus has been assisting CEQA and NHPA compliance including development of a project treatment plan addressing a wide range of historical resources including a traditional cultural property (TCP) landscape. Client: Pacific Gas and Electric Company.

Bureau of Land Management National General Services, Washington, D.C. Project Manager (2014–present). Develop new agency national manuals and handbooks (MS 1780 and H-1780, and the MS Series 8100) addressing new Department of the Interior policies guiding government-to-government consultation with federally recognized Native American tribal governments and redirecting the focus of the Bureau's Cultural Heritage Program. The 1780 handbook describes compliance responsibilities of all agency resource programs whose actions pose substantial effects to tribal interests on public lands, including energy, minerals, fire management, cadastral survey, and cultural resource management. The documents not only address legal compliance but also opportunities for collaboration on common interests. The new 8100 Manual Series shifts focus to a more proactive management approach. Client: U.S. Bureau of Land Management.

Southern California Edison's Lugo-Victorville 500kV Transmission Line Modification/Eldorado-Lugo-Mohave Series Capacitor Project, San Bernardino County, California. (2017-2018). Responsible for development of environmental assessment documents and review of consultant cultural resource technical reports for the transmission upgrade project that is 84 miles in length and crosses a combination of federally administered public lands and privately-owned lands, including the National Park Service's Mojave National Preserve. The proposed project would install a new independent telecommunication path consisting of fiber optic cable between Eldorado Substation in Nevada and Pisgah Substation in California that would mitigate against thermal overloads. Client: NV5.

Weymouth Water Treatment Plant, Los Angeles County, California. (2015-2017). Developed a Cultural Resources Treatment Plan for the Weymouth Water Treatment Plant Historic District located in the City of LaVerne. The 150-acre district houses a number of operational buildings and structures owned and operated by Metropolitan Water District. Its period of historic significance from 1941 to 1972 is associated with initial water delivery to southern California by the historic California River Aqueduct. Client: Metropolitan Water District of Southern California.

NextEra Solar Acquisition Project, Clark County, Nevada. (2013). Provided a due diligence assessment of archaeological, historic-era, and tribal issues associated with the proposed Silver State South solar energy project in Southern Nevada. The assessment involved a comprehensive review of compliance and research efforts related to cultural resources in the region south of Las Vegas, Nevada, to determine the state of knowledge, potential issues including culturally sensitive landscapes yet to be resolved or surface, and needs for completing Section 106 compliance for construction of a commercial energy solar development. Client: NextEra, Inc.

State Route 79 Realignment Project, Riverside County, California. (2017-). Assessment of a proposed Traditional Cultural Property (TCP) in the Winchester region located within the viewshed of the highway project reconfiguring State Route 79 as an expressway extending south of Domenigoni Parkway and north to Gilman Springs Road. The Study Area Boundary includes much of the San Jacinto Basin. Assessment includes conducting interviews with members of four tribes and producing reports that provide information to assist development of a nomination package for listing of the TCP to the National Register of Historic Places. Lead Agency is the California Department of Transportation (Caltrans) for the Federal Highway Administration (FHWA).

Temecula Inn, Temecula, California. (2014). Provided JC Resorts, Inc., owner of the Temecula Inn in Southern California, an analysis of a proposed Luiseno Ancestral Origin Landscape nomination to the National Register of Historic Places and prepared testimony for a public meeting before the California State Historical Resources Commission concerning the TCP. The analysis and testimony were coordinated with San Diego Gas and Electric and Metropolitan Water District. Client: JC Resorts, Inc.

Bay Delta Conservation Plan (BDCP) Review, Central California. (2013–2014). Conducted a detailed review of the regulatory compliance status of BDCP for the California Department of Water Resources and other public water agencies. The BDCP is a comprehensive conservation strategy for restoring ecological functions of the Sacramento-San Joaquin Delta and improving water supply reliability in central California. Goal of the review was to ensure compliance of the current environmental review documents and supporting technical reports with CEQA, NEPA, and NHPA historic preservation requirements before they were released for public review. Client: Metropolitan Water District of Southern California.

Analysis of Oil and Gas Well Stimulation Treatments in California, Southern and Central California. (2014–2015). Analyzed the potential effects of oil and gas exploration and development including well stimulation practices on archaeological, built-environment, and paleontological resources and developed recommendations and mitigation measures for site protection in conformance with CEQA and the NHPA. Separate assessments were performed for the Bureau of Land Management's Hollister Field Office and the State of California (known as SB4) addressing potential development areas extending from the Los Angeles Basin of Southern California northward along the coast and Central Valley to near the San Francisco Bay area. Clients: California Division of Oil, Gas and Geothermal Resources/U.S. Bureau of Land Management.

Renewable Energy National Task Groups, Washington, D.C. (2009–2012). As Chief of the Division of Cultural and Paleontological Resource Management and Tribal Consultation, U.S. Bureau of Land Management (BLM), Dr. Hanes co-chaired with the Advisory Council on Historic Preservation an interagency task group on energy development and the historic preservation regulatory compliance processes. Following a Renewable Energy Summit Meeting in Las Vegas, Nevada, in 2009, the task group reviewed regulatory compliance issues associated with numerous proposed solar projects including Desert Sunlight, Genesis, Palen, and Blythe projects in Riverside County and Calico and Ivanpah in San Bernardino County, California, and developed revisions to the NHPA/ NEPA compliance processes in consultation with interested Tribes tailored to large, complex projects and their associated cumulative effects on public lands. It included a review of the 1996 Sacred Sites Executive Order No. 13007 in light of the increasing landscape scale of proposed renewable energy development. Client: U.S. Department of the Interior.

APPENDIX B

Photographic Simulations

Figure 1 Key observation points and selected sites for Crimson Solar Indirect Effects Assessment.

CONFIDENTIAL FIGURE
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Figure 2 Existing view toward proposed project area from the Mule Tank Petroglyph Site (CA-RIV-504).

Figure 3 Simulated view of proposed project development from the Mule Tank Petroglyph Site (CA-RIV-504).

Figure 4 Existing view toward proposed project area from the Mule Canyon Intaglio Site (CA-RIV-773).

Figure 5 Simulated view of proposed project development from the Mule Canyon Intaglio Site (CA-RIV-773).

Figure 6 Existing view toward proposed project area from CA-RIV-1821/H.

Figure 7 Simulated view of proposed project development from CA-RIV-1821/H.

Appendix L
Energy Conservation

1. ESA Construction Fuel Conversion Calculations, August 2019
2. ESA Operational Fuel Conversion Calculations, August 2019

L.1 ESA Construction Fuel Conversion Calculations, August 2019

Crimson Solar Project
Construction Energy Analysis

Annual Fuel Summary

	Heavy-Duty Construction Equipment
1,297,650	Total Project Consumption
675,859	Annual Consumption
	Haul Trucks
-	Total Project Consumption
-	Annual Consumption
	Vendor Trucks
550,073	Total Project Consumption
286,496	Annual Consumption
	Workers
347,188	Total Project Consumption
180,827	Annual Consumption
550,073	Project Consumption of diesel for Haul Trucks and Vendors
286,496	Annual Consumption
1,847,723	Total Gallons Diesel
347,188	Total Gallons Gasoline

1.9	Estimated Project Construction Duration (years)
962,356	Annual Average Gallons Diesel
180,827	Annual Average Gallons Gasoline

Riverside County [1]			**Percent of Annual Project Compared to Riverside County**
Source	**Fuel Type**	**Gallons**	
Workers	Gasoline	1,052,000,000	0.017%
Off-Road/Vendor/Haul Trucks	Diesel	290,200,000	0.33%

Annual Electricity Summary

Temporary Construction Trailer - Electricity	12,990	kWh/year
Construction Water Energy Estimates [2]	2,209,847	kWh/year
	2,222,837	kWh/year
	2,222.84	MWh/year

Notes:

1 Gasoline and diesel amounts from CEC, 2017. Available:
https://www.energy.ca.gov/almanac/transportation_data/gasoline/2010-2017_A15_Results.xlsx

2 Assuming 1,000 acre-feet of water needed. See electricity from water worksheet.

Crimson Solar Project
Construction Energy Analysis

Off-Road Equipment

Equipment ≤ 100 hp		
pounds diesel fuel/hp-hr (lb/hp-hr):[1]	0.408	lb/hp-hr
diesel density (lb/gal):[1]	7.11	lb/gal
diesel gallons/hp-hr:	0.0574	gal/hp-hr
Total <100	5,670,360	hp-hr
Total diesel gallons:	325,438	gal
Equipment > 100 hp		
pounds diesel fuel/hp-hr (lb/hp-hr):[1]	0.367	lb/hp-hr
diesel density (lb/gal):[1]	7.11	lb/gal
diesel gallons/hp-hr:	0.0516	gal/hp-hr
Total >100	18,832,038	hp-hr
Total diesel gallons:	972,212	gal
Total diesel gallons (off-road equipment):	**1,297,650**	**gal**

1. California Air Resources Board: 2017 Off-Road Diesel Emission Factor Update for NOx and PM, Available at : https://ww3.arb.ca.gov/msei/ordiesel/ordas_ef_fcf_2017.pdf

Construction Phase	Equipment	Number	Hours/Day	HP	Load	Days	Total hp-hr
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Water Truck	4	8	230	0.38	378	1,057,190
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Auger Drill	5	4	238	0.5	378	899,640
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Backhoe/Excavator	6	4	90	0.37	378	302,098
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Cranes	6	5	400	0.29	378	1,315,440
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Forklifts	3	4	90	0.2	378	81,648
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Mini Excavator	1	6	42	0.5	378	47,628
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Aerial Lifts	2	4	60	0.31	378	56,246
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Tractor	1	6	190	0.36	378	155,131
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Truck, flatbed	2	2	200	0.38	378	114,912
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Truck	13	2	200	0.38	378	746,928
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Generator Sets	2	4	60	0.74	378	134,266
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Crawler Tractors	1	4	147	0.29	126	21,486
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Truck Mounted Digger	1	4	190	0.42	126	40,219
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Tensioner	1	4	238	0.42	126	50,380
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Wire Truck	1	4	238	0.38	126	45,582
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Motor Grader	1	1	185	0.41	126	9,557
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Scraper	1	1	365	0.4	126	18,396
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Cable trencher	5	10	42	0.5	126	132,300
Solar Array Structural Components	Water Truck	8	8	238	0.38	399	2,309,476
Solar Array Structural Components	ATV	40	4	24	0.4	399	612,864
Solar Array Structural Components	Air Compressors	2	6	49	0.48	399	112,614
Solar Array Structural Components	Cranes	2	2	400	0.29	399	185,136
Solar Array Structural Components	Forklifts	10	4	67	0.2	399	213,864
Solar Array Structural Components	Forklifts	10	4	110	0.31	399	544,236
Solar Array Structural Components	Post Machine	14	6	49	0.4	399	656,914
Solar Array Structural Components	Skid Steer	20	4	80	0.4	399	1,021,440
Solar Array Structural Components	Truck, flatbed	4	4	238	0.38	399	577,369
Solar Array Structural Components	Truck	30	4	238	0.38	399	4,330,267
Solar Array Structural Components	Generator Sets	1	24	60	0.74	399	425,174
Solar Array Structural Components	Backhoe/Excavator	4	4	90	0.37	399	212,587
Solar Array Structural Components	Cable Plow	1	6	120	0.42	399	120,658
Solar Array Structural Components	Cable trencher	1	6	42	0.5	399	50,274
Solar Array Structural Components	Compactors	1	4	180	0.43	399	123,530
Solar Array Structural Components	Roller/Vibrator/Padder	2	6	180	0.38	399	327,499
Solar Array Structural Components	Mini Trencher	4	6	40	0.5	399	191,520
Solar Array Structural Components	Sheepsfoot Roller	3	6	95	0.38	399	259,270
Solar Array Structural Components	Dump Truck	1	4	480	0.38	399	291,110
Move On, Grading, Site Preparation	Water Truck	2	8	230	0.38	399	557,962
Move On, Grading, Site Preparation	Water Pull	2	8	185	0.41	399	484,226
Move On, Grading, Site Preparation	Motor Grader	3	6	185	0.41	399	544,755
Move On, Grading, Site Preparation	Dozer	1	6	158	0.4	399	151,301
Move On, Grading, Site Preparation	Loader	2	6	190	0.36	399	327,499
Move On, Grading, Site Preparation	Skid Steer	3	6	83	0.4	399	238,442
Move On, Grading, Site Preparation	Tractor Buster	2	6	120	0.42	399	241,315
Move On, Grading, Site Preparation	Tractor Disk	2	6	300	0.42	399	603,288
Move On, Grading, Site Preparation	Truck	10	4	238	0.38	399	1,443,422
Move On, Grading, Site Preparation	Generator Sets	1	24	60	0.74	399	425,174
Move On, Grading, Site Preparation	Generator Sets	1	24	40	0.74	399	283,450
Move On, Grading, Site Preparation	Roller/Vibrator/Padder	1	6	160	0.38	399	145,555
Move On, Grading, Site Preparation	Scraper	3	6	365	0.4	399	1,048,572
Move On, Grading, Site Preparation	Water Pump	2	8	45	0.74	399	212,587
						Total >100	18,832,038
						Total <100	5,670,360

Crimson Solar Project
Construction Energy Analysis

On-Road Vendor Trucks

			miles/gallon	
	0.1564	gallons/mile	6.4	
	3,483,334	miles		
Total VMT diesel gallons (on-road vendor trucks):	**544,776**			
				Estimated Fuel Savings from
EMFAC2014 Diesel Fuel Consumption Factor:[2]	0.7645	gallons/hour		*Anti-Idling Regulation (64 percent based on*
Total Haul Truck Idle-Hours per Year:	6,929	hours		*estimated CARB emissions reductions):*[3]
Total Idling diesel gallons (on-road haul trucks):	**5,297**			*14,715*
Total diesel gallons (on-road haul trucks):	**550,073**	gal		

California Air Resources Board, EMFAC2014 (South Coast Air Basin; HHDT and MHDT; Annual; CY 2017; Aggregate MY; Aggregate Speed)

California Air Resources Board, EMFAC2014 (South Coast Air Basin; HHDT and MHDT; Annual; CY 2017; Aggregate MY; 5 miles per hour converted to hourly rate)

Source: California Air Resources Board (CARB), 2004. Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling, Appendix F, July 2004, https://www.arb.ca.gov/regact/idling/idling.htm, accessed November 2016.

Phase		Days	Trips/Day	Miles/Trip	VMT	Idle Hours
Move On, Grading Site Preparation	Gravel Delivery	0	0	13.0	-	-
Move On, Grading Site Preparation	Module Delivery	81	10	228.0	369,360	135
Move On, Grading Site Preparation	Foundation Delivery	98	10	228.0	446,880	163
Move On, Grading Site Preparation	Water Delivery	0	0	13.0	-	-
Solar Array Structural Components	Gravel Delivery	0			-	-
Solar Array Structural Components	Module Delivery	81	10	228.0	369,360	135
Solar Array Structural Components	Tracker Delivery	207	9	228.0	849,528	311
Solar Array Structural Components	Foundation Delivery	98	10	228.0	446,880	163
Solar Array Structural Components	Inverter Delivery	36	2	228.0	32,832	12
Solar Array Structural Components	Water Delivery	0	0	13.0	-	-
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Inverter Delivery	36	2	228.0	32,832	12
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Concrete Trucks	378	9	13.0	88,452	567
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	Water Delivery	0	0	13.0	-	-
		Total Round Trips	Total Trips	Miles/Trip	VMT	
Water Delivery Trips	Water Delivery	32,585	65,170	13.0	847,210	5,431
				Total Vendor Truck VMT:	3,483,334	
				Total Idle-Hours:		6,929

Crimson Solar Project
Construction Energy Analysis

On-Road Workers (LDA, LDT1, LDT2)

EMFAC2014 Gasoline Fuel Consumption Factor:[1]	0.0359	gallons/mile	miles/gallon	
Total Worker VMT:	9,663,654	miles	27.8	
Total VMT gasoline gallons (workers):	**347,188**			

California Air Resources Board, EMFAC2014 (South Coast Air Basin; LDA, LDT1, LDT2; CY 2017; Aggregate MY; Aggregate Speed)

Phase	Days	Roundtrip Trips/Day	Miles/Trip	VMT
Visitor/Management Trips				
Move On, Grading Site Preparation	399	334	13	3,464,916
Solar Array Structural Components	399	427	13	4,429,698
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	378	180	13	1,769,040
			Total Worker VMT:	**9,663,654**

Crimson Solar Project
Construction Energy Analysis

On-Road Haul Trucks

	0.1549	gallons/mile	miles/gallon	
	-	miles	6.46	
Total VMT diesel gallons (on-road haul trucks):	**-**			
EMFAC2014 Diesel Fuel Consumption Factor:[2]	0.7746	gallons/hour		*Estimated Fuel Savings from Anti-Idling Regulation (64 percent based on estimated CARB emissions reductions):* [3]
Total Haul Truck Idle-Hours per Year:	-	hours		
Total Idling diesel gallons (on-road haul trucks):	**-**			-
Total diesel gallons (on-road haul trucks):	**-**	gal		

California Air Resources Board, EMFAC2014 (South Coast Air Basin; T7 Single Construction; Annual; CY 2017; Aggregate MY; Aggregate Speed)

California Air Resources Board, EMFAC2014 (South Coast Air Basin; T7 Single Construction; Annual; CY 2017; Aggregate MY; 5 miles per hour converted to hourly rate)

Source: California Air Resources Board (CARB), 2004. Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling, Appendix F, July 2004, https://www.arb.ca.gov/regact/idling/idling.htm, accessed November 2016.

Phase	Total One-Way Trips	Miles/Trip	VMT	Idle Hours
Move On, Grading Site Preparation	0	25	0	0
Solar Array Structural Components	0		0	0
Electrical (Substation, Gen-Tie, Collection System, Storage, O&M)	0	21	0	0
		Total Haul Truck VMT:	-	
		Total Idle-Hours:		-

Crimson Solar Project
Construction Energy Analysis

Construction Water Energy Estimates

Source	Construction Water Use per Day (Mgal)	Total Construction Water Use (Mgal)	Total Electricity Demand from water Demand (kWh)	Annual Electricity Demand from water Demand (kWh)
Project		325.851	4,242,906	2,209,847
CalEEMod Water Electricity Factors	**Electricity Intensity Factor To Supply (kWh/Mgal)**	**Electricity Intensity Factor To Treat (kWh/Mgal)**	**Electricity Intensity Factor To Distribute (kWh/Mgal)**	**Electricity Intensity Factor For Wastewater Treatment (kWh/Mgal)**
Project	9727	111	1272	1911

Sources:

Electricity Intensity Factors - California Emissions Estimator Model (CalEEMod).

Estimated construction water use assumed to be generally equivalent to landscape irrigation, based on a factor of 20.94 gallons per year per square foot of landscaped area within the Los Angeles area (Mediterranean climate), which assumes high water demand landscaping materials and an irrigation system efficiency of 85%. Factor is therefore (20.94 GAL/SF/year) x (43,560 SF/acre) / (365 days/year) / (0.85) = 2,940 gallons/acre/day, rounded up to 3,000 gallons/acre/day. (U.S. Department of Energy, Energy Efficiency & Renewable Energy, Federal Energy Management Program. “Guidelines for Estimating Unmetered Landscaping Water Use." July 2010. Page 12, Table 4 - Annual Irrigation Factor – Landscaped Areas with High Water Requirements).

Crimson Solar Project
Construction Energy Analysis

Temporary Construction Trailer - Electricity		
Land Use	**Square Feet**	**Energy Use per year (kWh)**
General Office	1,000	12,990
Note: CalEEMod 2016.3.2 used to estimate energy use for temporary construction office		

This tool provides a quick estimation of the fuel use and emissions for your equipment in a specific year. The results may slightly differ from those from the official inventory model.
Instructions:
Enter the horsepwer, model year, and other details about your equipment in the Input box.
Make sure to update the ***load factor*** for your equipment using the lookup table.
The ***Output*** box gives a quick estimation of the fuel use, NOx, PM, and THC emission for your equipment.

Input	Input Engine Here
Horsepower (hp)	120
Model year	2011
Calendar year	2015
Activity (annual hours)	250
Accumulated hours on equipment (estimate using annual-hours*age if you only know the age of the equipment)	1000
Load factor (check the lookup table)	0.2

Results	
Fuel Used (gallon)	310
NOx Emissions (kg)	15.4
PM Emissions (kg)	0.7
THC Emissions (kg)	0.7
CO2 Emissions (kg)	3162.6
NOx Emission Factor (including deterioration and fuel correction factor): gram/bhp-hr	2.57
PM Emission Factor (including deterioration and fuel correction factor): gram/bhp-hr	0.12
THC Emission Factor (including deterioration and fuel correction factor): gram/ bhp-hr	0.11

Intermediate steps	
HPbin	175
NOx_EF0	2.67
NOx_DR	3.5E-05
NOx_FCF	0.950
PM_EF0	0.12
PM_DR	8.6E-06
PM_FCF	0.90
THC_EF0	0.10
THC_DR	2.5E-05
THC_FCF	0.90
NOx_EF (g/hp-hr)	2.57
PM_EF (g/hp-hr)	0.12
THC_EF (g/hp-hr)	0.11
CO2_EF (kg/gallon-diesel)*	10.21
BSFC (lb/hp-hr)	0.367
Unit conversion (lb/gallon)	7.109

*Reference: www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf

Load Factor Lookup Table

Equipment Category	Equipment Type	Details	Load Factor
Agriculture equipment	Agricultural tractors		0.48
	Combine harvesters		0.44
	Forage & silage harvesters		0.44
	Cotton pickers		0.44
	Nut harvester		0.44
	Other harvesters		0.44
	Balers (self propelled)		0.50
	Bale wagons (self propelled)		0.50
	Swathers/windrowers/hay conditioners		0.48
	Hay Squeeze/Stack retriever		0.42
	Sprayers/Spray rigs		0.42
	Construction equipment		0.40
	Other non-mobile		0.48
	Forklifts		0.40
	Atvs		0.40
	Others		0.40
Portable equipment	All portable equipment		0.31
Cargo Handling Equipment	Construction equipment		0.55
	Container handling equipment		0.59
	Forklift		0.30
	Other general industrial equipment		0.51
	Rtg crane		0.20
	Yard tractor		0.39

Transport Refrigeration Units (TRU)	TRU on trailers	25 HP and over, MY2012 and Older	0.46
	TRU on trailers	25 HP and over, MY2013 and Newer	0.38
	TRU on trailers	23 HP and Over, below 25 HP, All years	0.46
	TRU on trucks	Below 23 HP, All Model years	0.56
	TRU on railcars	25 HP and over, MY2012 and Older	0.33
	TRU on railcars	25 HP and over, MY2013 and Newer	0.27
	TRU on railcars	Below 25 HP, All Model years	0.33
	TRU with generators	25 HP and over, MY2012 and Older	0.46
	TRU with generators	25 HP and Over, MY2013 and Newer	0.38
	TRU with generators	23 HP and Over, below 25 HP, All Model Years	0.46
Ground Support Equipment	Passenger Stand		0.40
	A/C Tug Narrow Body		0.54
	A/C Tug Wide Body		0.54
	Baggage Tug		0.37
	Belt Loader		0.34
	Bobtail		0.37
	Cargo Loader		0.34
	Cargo Tractor		0.36
	Forklift (GSE)		0.20
	Lift (GSE)		0.34
	Other GSE		0.34
Construction and Industrial Equipment	Cranes		0.29
	Crawler Tractors		0.43
	Excavators		0.38
	Graders		0.41
	Off-Highway Tractors		0.44
	Off-Highway Trucks		0.38
	Other Construction Equipment		0.42
	Pavers		0.42
	Paving Equipment		0.36
	Rollers		0.38
	Rough Terrain Forklifts		0.40
	Rubber Tired Dozers		0.40
	Rubber Tired Loaders		0.36
	Scrapers		0.48
	Skid Steer Loaders		0.37
	Surfacing Equipment		0.30
	Tractors/Loaders/Backhoes		0.37
	Trenchers		0.50
	Aerial Lifts		0.31
	Forklifts		0.20
	Other General Industrial Equipment		0.34
	Other Material Handling Equipment		0.40
	Sweepers/Scrubbers		0.46
Oil and Drill Rigs	Drill Rig (Mobile)		0.50
	Workover Rig (Mobile)		0.50
	Bore/Drill Rigs		0.50

L.2 ESA Operational Fuel Conversion Calculations, August 2019

Crimson Solar Project
Operational Energy Analysis Summary

Electricity	Electricity Use (MWh)
Proposed Project	
Net Electricity Consumption	(1,532,919)
Total Electricity	**(1,532,919)**
Crimson Solar Greenhouse Gas Emissions Technical Report, March 2019	**85,879,000**
Project % of SCE	**1.7850%**

Source: SCE, 2017 Annual Report, https://www.edison.com/content/dam/eix/documents/investors/corporate-governance/2017-eix-sce-annual-report.pdf

Electricity demand (production) (MWh/yr)

	Project	
Gasoline		**Fuel Use (gal)**
General Maintenance		3,643
Electricity demand (MWh/yr)		**1,052,000,000**
	290,200,000	**0.00035%**
Diesel		**Electricity Demand**
General Maintenance		4,271
County Total - Diesel		**290,200,000**
% of County		**0.0015%**

Source: California Energy Commission (CEC), California Annual Retail Fuel Outlet Report, 2017.

Crimson Solar Project
Operational Energy Analysis

Energy and VMT Estimates

Source	Natural Gas demand (million kBTU/yr)	Electricity demand (production) (MWh/yr)	Electricity demand (MWh/yr)	Annual VMT
Crimson Solar Greenhouse Gas Emissions Technical Report, March 2019	0.000	(1,533,000)	81.1	128,700

Source	CalEEMod Indoor Water Use (Mgal/yr)	CalEEMod Outdoor Water Use (Mgal/yr)	Total Water Use (Mgal/yr)	Electricity Demand (MWh/year)
Crimson Solar Greenhouse Gas Emissions Technical Report, March 2019	7.30	0.000	7.299061	81.1

CalEEMod Water Electricity Factors	Energy Factor for Outdoor Water Use for Southern CA (kWh/MG)
Crimson Solar Greenhouse Gas Emissions Technical Report, March 2019	11,110

Source: California Emissions Estimator Model (CalEEMod).

Crimson Solar Project
Operational Energy Analysis

On-Road Workers (LDA, LDT1, LDT2)

EMFAC2014 Gasoline Fuel Consumption Factor:[1]	0.0359	gallons/mile	miles/gallon	
Total Worker VMT:	101,400	miles	27.8	
Total VMT gasoline gallons (Maintenance):	**3,643**			
Total VMT gasoline gallons (Panel Cleaning):	**-**			

California Air Resources Board, EMFAC2014 (South Coast Air Basin; LDA, LDT1, LDT2; CY 2017; Aggregate MY; Aggregate Speed)

Phase	Days	Roundtrip Trips/Day	Miles/Trip	VMT
Worker Trips	Days	Total One-Way Trips	Miles/Trip	VMT
Maintenance	78	100	13	101,400
			Total Worker VMT:	**101,400**

Crimson Solar Project
Operational Energy Analysis

On-Road Vendor Trucks

				miles/gallon	
	0.1564	Electricity dem	Electricity demar	6.4	
Crimson Solar Greenhouse Gas Emissions Technical Report, March 2019	27,300	miles	0		
Total VMT diesel gallons (on-road vendor trucks):	**4,270**			Electricity Demand	
				4,271	*Estimated Fuel Savings from*
EMFAC2014 Diesel Fuel Consumption Factor:[2]	0.7645	gallons/hour			*Anti-Idling Regulation (64 percent based on*
Total Haul Truck Idle-Hours per Year:	2	hours			*estimated CARB emissions reductions):*[3]
Total Idling diesel gallons (on-road haul trucks):	**2**				*5*
Total diesel gallons (on-road haul trucks):	**4,271**	gal			

California Air Resources Board, EMFAC2014 (South Coast Air Basin; HHDT and MHDT; Annual; CY 2017; Aggregate MY; Aggregate Speed)

California Air Resources Board, EMFAC2014 (South Coast Air Basin; HHDT and MHDT; Annual; CY 2017; Aggregate MY; 5 miles per hour converted to hourly rate)

Source: California Air Resources Board (CARB), 2004. Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling, Appendix F, July 2004, https://www.arb.ca.gov/regact/idling/idling.htm, accessed November 2016.

Phase		Days	Trips/Day	Miles/Trip	VMT	Idle Hours
Operations	Water Delivery	75	28	13.0	27,300	2
				Total Vendor Truck VMT:	27,300	
				Total Idle-Hours:		2

Appendix M
Geology and Soil Resources

Desktop Geotechnical Study

RE Crimson Solar Project

by Sonoran West Solar Holdings, LLC

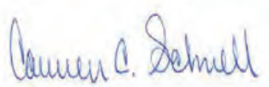
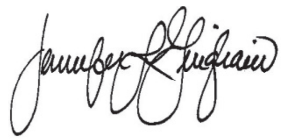
Desktop Geotechnical Study

Project Number: 60487757

March 20, 2018

Sonoran West Solar Holdings,
LLC Recurrent Energy LLC
353 Sacramento Street, 21st Floor
San Francisco, CA 94101

Quality information

Prepared by	Checked by	Verified by	Approved by
			
Miriam Akselrod Senior Geologist	Carmen Caceres-Schnell, P.G. Senior Project Manager	Jennifer Guigliano, AECOM	Jennifer Guigliano, AECOM

Revision History

Revision	Revision date	Details	Authorized	Name	Position
1	May 30, 2018	Response to agency comments		Jennifer Guigliano	Project Director

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Tables

Executive Summary

Recurrent Energy is proposing to construct and operate the RE Crimson Solar Project (Project). The Project will not have significant adverse impacts on resources or be acutely affected by geologic hazards. No major unique geologic or physical features have been identified in the Project area. A geotechnical investigation is recommended to verify site conditions at the Project site and to provide information of site grading and slope, slope stability, corrosion potential of soils and verification of soil types and characteristics.

No evidence of ground subsidence (e.g., fractures possibly caused by historic groundwater extraction) has been recorded at the Project site, although the site is in an area considered to be susceptible to subsidence. Given the high historic use of local groundwater resources for agricultural development approximately 5 miles east of the Project, in the Colorado Floodplain, with no subsidence reported, it is not anticipated that the Project's limited pumping program will induce subsidence below the site due to groundwater pumping. Although seismically induced subsidence can occur at the site due to soil conditions, adherence to the recommendations of the Project geotechnical investigation would mitigate these hazards to a less-than-significant level.

1. Proposed Project

Recurrent Energy (RE, Applicant) is proposing to construct and operate the RE Crimson Solar Project (Project), a utility-scale solar photovoltaic (PV) and energy storage project that would be located on Federal lands managed by the Bureau of Land Management (BLM) within the California Desert Conservation Area planning area. A Right of Way application for the Project is being processed separately by the BLM.

The Project would be located on up to 2,900 acres of BLM land and would interconnect to the regional electrical grid at the Southern California Edison (SCE) 220-kilovolt Colorado River Substation. It would generate up to 350 megawatts (MW) of renewable energy using PV technology and would include up to 350 MW of integrated energy storage capacity. Per the Plan of Development, water demand during construction for the Traditional Design is 1,000 acre feet (AF), and with the incorporation of all LEID elements is 600 AF. The water demand for operations and maintenance would be approximately 22 acre feet per year (AFY).

This desktop geotechnical report has been prepared to assess soil conditions at the site and to facilitate the preparation of the Environmental Impact Study being prepared for the Project. No site investigations or soil property testing were conducted as part of this study.

2. Approach and Methodology

To prepare this geotechnical report, online resources were utilized to assess soil type and characterization, faults, landslides, liquefaction and seismically induced settlement, subsidence, erosion and groundwater resources. The online resources include local, state and federal agency websites, white papers found in scientific journals and Google Earth for viewing Project location, area faults and soil classification data.

3. Existing Setting

3.1 Site Description and Topography

The Project is located in the northwestern Colorado Desert characterized by isolated mountain ranges separated by broad alluvium-filled basins of Cenozoic sedimentary and volcanic materials overlying older rocks (Norris and Webb 1990). The flood plain of the Colorado River forms the east margin of the area. The structural geology of the area is dominated by deformations associated with historic tectonic activity and recent and historical alluvial deposits associated with the Colorado River and the local mountain erosion patterns. Much of the Colorado Desert lies at low elevations, with some areas below sea level. The Colorado Desert province includes the Salton Sea, the Imperial Valley in the south, and the Coachella Valley in the north (Norris and Webb 1990).

Regionally, the ground surface slopes gently downward in a southeast direction at a gradient of less than one percent. Topography at the site slopes gently away from the Mule Mountains alluvial fans from the south to the north. Ground surface elevations at the Project site range from approximately 690 feet above mean sea level (msl) in the central southeast to 420 feet above MSL in the central northwest (Google 2017).

3.2 Geologic Setting

The Project is located on the Palo Verde Mesa (Solar Millennium 2009). The Palo Verde Mesa is characterized by desert terrain of extensive alluvial fans and mountain ranges. Much of the land surface is composed of Quaternary alluvial deposits. Mountainous areas are primarily bedrock exposures with the adjacent valleys underlain by alluvial fan and plain deposits originating from the nearby uplands. The Project site is bound by the Mule Mountains to the east and south, by the Chuckwalla Valley to the north, and by a dry wash to the west. This area has generally low relief until near the surrounding mountains. Approximately 4.5 miles east of the eastern site boundary, a break in the mesa forms the boundary between the Palo Verde Mesa and the Palo Verde Valley, which is 80 to 130 feet below the mesa. In the region, the Palo Verde Valley is roughly equivalent to the recent historic floodplain of the Colorado River.

Locally, the Project site is underlain by Holocene to Late Pleistocene surficial deposits with the Mule Mountains underlain by Mesozoic bedrock of sedimentary and volcanic origin (USGS and United Stated Department of the Interior [USDI] 2006). The Project site is situated at the eastern edge of the Chuckwalla Valley and supports a broad alluvial fan that includes many braided washes and channels that converge into a primary channel flowing into an intra-state playa lake northwest of the Project site. The Project area is undeveloped and covered with native vegetation.

Surface water in Palo Verde Mesa drains to the southeast. At the Project site, flow is to the west-northwest and northeast. Numerous dry washes originate on the flanks of the Mule Mountains and enter the site from the south where they disperse as they enter the sandier alluvial plain. Local drainage is intermittent and occurs as dry washes because of the high temperatures, low precipitation, and permeable soils. In areas where topography is flat, soils are very sandy and there are no adjacent uplands to introduce surface runoff; therefore, discrete channels have not formed which indicates that most precipitation infiltrates immediately into the ground (CH2MHill 2008).

There are no permanent bodies of water located on the Project site. Groundwater in the area of the site is contained within the Palo Verde Mesa Groundwater Basin. Groundwater levels at the site are estimated to be 234 feet to 160 feet below ground surface (USGS 2018b).

3.3 Soil Description

The Site is located in an area that has not been surveyed in detail by the National Resources Conservation Services (NRCS) since 1974; however, California Geological Survey (CGS) and the USGS have mapped the area. A geotechnical site investigation to verify on-site conditions at the Project site should be conducted. The investigation should include an evaluation of grading and slope, slope stability, corrosion potential of soils and soil property testing to verify soil types and characteristics. General soil description and geologic hazard information is available through the USGS, California Geological Survey (CGS), Soil and the Riverside County General Plan (RCGP) as discussed below.

3.3.1 Soil Classification

According to the CGS, the site is overlain by alluvial deposits of Pleistocene to Holocene age. The alluvium is composed of gravel, sand and silt and deposited in a fan-shaped cone with gravelly sand predominant in the area (CGS 2010).

General soils data was derived from the USGS west half of the Blythe quadrangle map at a scale of 1:100,000. Based on the quadrangle map, there are four map units on the Project site (**Figure 1**):

1) Rillito-Gunsight map unit: The Rillito-Gunsight map unit is the predominant map unit, comprising 39.5 percent of the Project site. It is characterized by sandy loam soils with moderate susceptibility to wind erosion.

2) Vaiva-Quilotosa-Hyder-Cipriano-Cherioni map unit: The Vaiva-Quilotosa-Hyder-Cipriano-Cherioni map unit comprises 28 percent of the Project site and is characterized by soils with high percentage (greater than 65 percent) of sand with moderate susceptibility to wind erosion.

3) Rositas-Dune land-Carsitas map unit: The Rositas-Dune land Carsitas map unit comprises 24.5 percent of the Project site characterized by soils that are excessively drained and formed in alluvium from granitoid or gneissic rock. It is also comprised of soils formed in eolian material on dunes or sand sheets.

4) Rositas-Orita-Carrizo-Aco map unit: The Rositas-Orita-Carrizo-Aco map unit comprises 8 percent of the Project site and is characterized by soils with high sand percentages and moderate susceptibility to wind erosion.

Detailed soil descriptions were developed from the Official Series Descriptions (United States Department of Agriculture NRCS 2009). Soil characteristics including texture, drainage, permeability, and erosion hazard of these soil series are included in **Table 1**. Land capability classification is an indicator of the soils primary limitations for revegetation. Soil types on the Project site include VIIe, VIIs, VIIIc, and VIIIs Capability Subclasses, which means the soils have very severe limitations that make them unsuitable for cultivation.

Soil types at the site are based on information from the 2010 West Half of the Blythe Quadrangle (USGS and USDI 2006) and Section 4.12 of the Riverside County Environmental Impact Report (RCPD 2014). Additionally, the Natural Resources Conversation Service provides boundaries and information on soil types on Google Earth (UC Davis 2018). Corrosion potential of the soil has not been evaluated.

Table 1: Soil Mapping Unit Descriptions and Characteristics

Map Unit	Description
Carrizo	Extremely Gravelly Sand Formed in mixed alluvium Excessively drained Slopes range from 0 to 15 percent Negligible or very low runoff Rapid to very rapid permeability Moderate hazard of wind erosion Capability Subclass VIIs Taxonomic Class: Sandy-skeletal, mixed, hyperthermic Typic Torriorthents
Vaiva	Gravelly Loam Formed in slope alluvium from granite and gneiss Well drained Slopes range from 1 to 65 percent Medium to rapid runoff Moderate permeability Taxonomic Class: Loamy-skeletal, mixed, superactive, hyperthermic Lithic Haplargids

Table 1: Soil Mapping Unit Descriptions and Characteristics

Map Unit	Description
Quilotosa	Extremely Gravelly Coarse Sandy Loam Formed in slope alluvium from granitic and metamorphic rock Somewhat excessively drained Slopes range from 3 to 65 percent Medium to rapid runoff Moderately rapid permeability Low susceptibility to wind erosion Capability Subclass VIIIc nonirrigated Taxonomic Class: Loamy-skeletal, mixed, superactive, calcareous, hyperthermic Lithic Torriorthents
Hyder	Extremely Gravelly Sandy Loam Formed in alluvium from rhyolite and related volcanic rock Somewhat excessively drained Slopes range from 1 to 70 percent High runoff Moderate or moderately rapid permeability Low susceptibility to wind erosion Capability Subclass VIIIc nonirrigated Taxonomic Class: Loamy-skeletal, mixed, superactive, calcareous, hyperthermic Lithic Torriorthents
Cipriano	Very Gravelly Loam Formed in fan alluvium from volcanic rock Somewhat excessively drained Slopes range from 0 to 55 percent Low to very high runoff Moderate permeability Low susceptibility to wind erosion Capability Subclass VIIIc nonirrigated Taxonomic Class: Loamy-skeletal, mixed, superactive, hyperthermic, shallow Typic Haplodurids
Cherioni	Very Gravelly Fine Sandy Loam Formed in slope alluvium on volcanic bedrock Somewhat excessively drained Slopes range from 0 to 70 percent Medium to rapid runoff Moderate permeability Low susceptibility to wind erosion Capability Subclass VIIIc nonirrigated Taxonomic Class: Loamy-skeletal, mixed, superactive, hyperthermic, shallow Typic Haplodurids
Gunsight	Very Gravelly LoamFormed in alluvium from mixed sources Somewhat excessively drained Slopes range from 0 to 60 percent Very low to high runoff Moderate or moderately rapid permeability Low susceptibility to wind erosion Capability Subclass VIIs nonirrigated Taxonomic Class: Loamy-skeletal, mixed, superactive, hyperthermic Typic Haplocalcids

Table 1: Soil Mapping Unit Descriptions and Characteristics

Map Unit	Description
Rillito	Very Gravelly Fine Sandy Loam Formed in mixed alluvium Somewhat excessively drained Slopes range from 0 to 40 percent Slow to medium runoff Moderate permeability Low susceptibility to wind erosion Capability Subclass VIIs nonirrigated Taxonomic Class: Coarse-loamy, mixed, superactive, hyperthermic, Typic Haplocalcids
Carsitas	Gravelly Sand Formed in alluvium from granitoid and or gneissic rock Located on alluvial fans, valley fills and in drainageways Slopes range from 0 to 30 percent No to low runoff High permeability when saturated Low susceptibility to wind erosion Capability Subclass VIIe nonirrigated Taxonomic Class: Mixed, hyperthermic Typic Torripsamments
Orita	Gravelly Loamy Sand Formed in alluvium from mixed sources Located on fan remnants and terraces Slopes range from 0 to 2 percent Low to medium runoff Moderate permeability Low susceptibility to wind erosion Capability Subclass VIIs Taxonomic Class: Fine- loamy, mixed, superactive, hyperthermic Typic Haplargids
Aco	Sandy Loam Formed in mixed alluvium on terraces Located on fan remnants and terraces Slopes range from 0 to 8 percent Low runoff Moderately rapid permeability High susceptibility to wind erosion Capability Subclass VIIe Taxonomic Class: Coarse- loamy, mixed, superactive, hyperthermic Typic Haplocalcids
Dune land	Sand Dune height ranges from 10 to 25 feet high Very slow runoff High hazard of wind erosion None or slight hazard of water erosion
United States Department of Agriculture NRCS 2009. Official Soil Series Descriptions, http://soils.usda.gov/technical/classification/osd/index.html	

3.4 Hazards Related to Soil Conditions

3.4.1 Faulting and Ground Rupture

The Project is located in a seismically active area and therefore will likely be subjected to ground shaking from movement along one or more of the sufficiently active or well-defined faults in the region. A “sufficiently active fault” (previously referred to as an “active fault”) is defined as a fault that has broken the surface in the past 11,000 years (Bryant and CGS 2009). A “well-defined fault” (previously referred to as “potentially active fault”) is defined as a fault whose trace is clearly detectable by a trained geologist as a physical feature at or just below the ground surface.

The USGS Google Earth/KML files for the Quaternary Faults and Folds in the U.S. (USGS 2018a) identified a total of 16 sufficiently active faults and well-defined faults within a 100-mile radius of the Project site (USGS 2018). It is important to note that none of the 16 faults identified have the potential to generate ground accelerations of 0.1 gravity (g) (Solar Millennium 2009) at the Project site. The 0.1 g value is an industry standard for significance in terms of foundational design, and this potential acceleration can be managed with proper foundational design and site geotechnical investigation (CH2MHill 2008).

The closest seismically active area to the site is the San Andreas Coachella Segment fault zone. This fault zone is located approximately 55 miles to the west and has the potential to generate a moment magnitude of 7.1 (Riverside County Planning Department 2014); however, the possible maximum ground acceleration for this fault zone is 0.7 g (USGS 2014b) and an estimated slip rate of 10 millimeters (mm) to 35 mm per year (van der Woerd, et al. 2006) with a reoccurrence rate of 20 years to over 300 years (Southern California Earthquake Center 2009). The maximum historical earthquake magnitude within a 100-mile radius was a 6.9 approximately 2.5 miles northwest of Holtville, California which occurred on May 19, 1940 (QuakeBulletin 2018).

Based on available online Seismic Hazard Zone Maps (CGS 2008) and the State of California’s EQ: Zapp (SCDC 2018), the Project site is located in an area that has not been mapped for seismic hazards, including fault rupture, liquefaction, or seismically induced landslides. The CGS’s Probabilistic Seismic Hazards Mapping Ground Motion Page (2008) has a 10-percent probability of earthquake ground motion exceeding 0.144 g at the Project site over a 50-year period.

Although located in an acknowledged seismically active area, the Project site is not located on a fault trace as designated by mapping as part of the Alquist-Priolo (AP) Earthquake Fault Zoning Act. Therefore, the Project is not subject to the AP Earthquake Fault Zoning Act and the risk of earthquake-induced ground rupture is considered to be low. Fissures caused by the lowering of groundwater tables and by hydrocollapse when groundwater tables have risen have been reported in Riverside County near active faults that bound the San Jacinto Valley and the Elsinore Trough, and the southern Coachella Valley. The closest known fissuring from subsidence is approximately 49 miles west of the Project site (RCPD 2015). In addition, fissures have occurred along active faults that bound the San Jacinto Valley and Elsinore Trough approximately 85 miles west of the site (Riverside County Planning Department 2015). Fissures associated with groundwater levels or faults have not been reported at the site.

3.4.2 Collapsible Soil

Alluvial soils in arid and semi-arid environments have the tendency to possess characteristics that make them prone to collapse with increase in moisture content and without increase in external loads. In Riverside County, collapsible soils occur predominantly at the bases of the mountains, where Holocene-aged alluvial sediments have been deposited during rapid runoff events (Riverside County Planning Department 2015). Additionally, some windblown sands may be vulnerable to collapse and hydro-consolidation (Riverside County Planning Department 2015). It is possible that, given the aeolian (wind) and alluvial (streams and washes) deposition of the site soils, there may be loose deposits across portions of the Project site that may be subject to partial collapse and settlement if they are subjected to long-term wetting (CH2MHill 2008). The Project is located in a geologic environment where the potential exists for collapsible soils. The potential for damage due to collapsible soils is considered to be very low, provided that measures for sub-grade improvements are implemented as part of the Project design process. Although site-specific information is not available, design measures and construction procedures to minimize soil erosion and collapse are expected to include:

- Engineering berms and drainage to minimize wetting of these soils, and directing runoff away from the power block;
- Pre-watering the plant site to induce hydro-consolidation in advance of the grading program that will be part of Project construction; and
- Removing collapsible soils as part of the grading program.

3.4.3 Expansive Soil

Expansive soil consists of fine-grained clay which occurs naturally. It is generally found in areas that were historically a flood plain or lake area, but can occur in hillside areas. Expansive soil is subject to swelling and shrinkage, and can vary in proportion to the amount of moisture present in the soil. As water is initially introduced into the soil (by rainfall or watering) expansion takes place. If dried out, the soil will contract, often leaving small fissures or cracks. Excessive drying and wetting of the soil can progressively deteriorate structures over the years by leading to differential settlement within buildings and other improvements.

Site-specific information regarding expansive soils is not available; a geotechnical site investigation can provide this information. Based on the types of soils mapped by the USGS and NRCS, the soils are generally composed of gravels, sand and silts. As such, the expansion potential is low.

3.4.4 Erosion

Erosion is the displacement of solids (soil, mud, rock, and other particles) by wind, water, or ice and by downward or down-slope movement in response to gravity. Due to generally flat terrain, the Project site currently is not prone to significant mass wasting. Detailed soil characteristics at the Project site are not known because this area has not been mapped by the NRCS; however, the Riverside County General Plan (2015) has classified the soils at the site as having a moderate to high susceptibility to wind erosion hazards.

3.4.5 Landslides

The Project site is located in an area that has not been mapped for the potential of seismically induced landslides (SCDC 2018). However, the Project is not considered to be in an area with the potential for permanent ground displacement due to earthquake-induced landslides because surface topography at and near the site is relatively flat. A review of aerial photographs (Google Earth 2017) did not identify any active or inactive landslides at the site or in the adjacent areas. The Mule Mountains are directly adjacent to the southern portion of the Site. These mountains have slopes with angles of 30 percent or greater and have a high potential for seismically induced rockfalls and landslides (Riverside County Planning Department 2015). Given the relatively flat topography, it is unlikely that falling rocks would reach the edge of the Project site. Based on topography, the potential for seismically induced rockfalls and landslides to affect the site is low.

3.4.6 Groundwater Occurrence

The Project is located within the Palo Verde Mesa Groundwater Basin and the Chuckwalla Valley Groundwater Basin. The two basins are hydraulically connected. Groundwater development within the basins is sparse, with the exception of the Blythe area, located in the Colorado Floodplain. In the 1970s and 1980s, agricultural groundwater development on the Palo Verde Mesa increased substantially to over 6,500 acres, but by the late 1980s and early 1990s the majority of this agricultural effort had failed (CH2MHill 2008). Pumping rates at the peak of agricultural developments are not available and total consumptive use (historical and current) for agricultural wells in the area is not known. Groundwater level data shows an overall decline (less than 25 feet) in the water table during the 1960s and 1970s, with some recovery (CH2MHill 2008).

The Chuckwalla Valley Groundwater Basin water-bearing units consist of the Quaternary and Pliocene-aged deposits. Recharge to the basin is from percolation of runoff from surrounding mountains and precipitation which averages 3.2 inches per year (USGS 2013). Recharge estimates into the groundwater is estimated to be 3,737acre-feet per year (AFY) (AECOM 2018). The total storage capacity of the Chuckwalla Valley Groundwater Basin has been reported as 9.1 million acre-feet (AF) (DWR 2004a).

The Palo Verde Mesa Groundwater Basin water-bearing units consist Quaternary-age alluvium and there are no known barriers to inhibit groundwater flow (DWR 2004b).Recharge is primarily provided by percolation of runoff from the surrounding mountains and hills as well as precipitation to the valley floor and subsurface inflow through a gap in the McCoy and Mule Mountains. Recharge estimates into the groundwater basin is estimated to be 4,761 AFY (AECOM 2018). The total storage capacity of the Palo Verde Mesa Groundwater Basin has been reported as 6.84 million AF (DWR 2004b).

The Project proposes to use a maximum total of 1,660 AF of groundwater over the term of construction and operation, which is estimated to be a period of approximately 31.4 years. This volume of water represents about 0.00024 percent of the total estimated water storage volume for the Palo Verde Mesa Groundwater Basin (6.84 million AF), and about 0.00018 percent of the total estimated water storage volume for the Chuckwalla Valley Groundwater Basin (9.1 million AF).

Based on the Riverside County General Plan (2015), the majority (85 percent) of the Project is located in an area with deep groundwater that is moderately susceptible to liquefaction. However, depth to water near the Project site was measured by the USGS in 2017. One continuously monitored well (#333400114444701) located 1.87 miles from the site had a measured water depth of 137 feet bgs and the second continuously monitored well (#333527114511902), located 3.5 miles to the east, had a measured water depth of 153 feet bgs, which is relatively high compared to historical measurements (USGS 2018b). A third well within the Palo Verde Mesa Groundwater Basin was recently measured by the property owner and recorded a groundwater level of 147 feet bgs (Cobb 2018).

3.4.7 Liquefaction and Seismically-Induced Settlement

Liquefaction is a soil condition in which seismically induced ground motion causes an increase in soil water pressure in saturated, loose, sandy soils, resulting in loss of soil shear strength. Liquefaction can lead to near-surface ground failure, which may result in loss of foundation support and/or differential ground settlement. Sandy deposits deeper than 50 feet below ground surface (bgs) usually are not prone to causing surface damage. In addition, soils above the groundwater table (soils that are not saturated) will not liquefy.

Based on the estimated depth of the groundwater at the site (137 to 153 feet bgs), liquefaction is considered unlikely.

Seismically induced settlement occurrence depends on the intensity and duration of groundshaking, and the relative density of the subsurface soils (i.e., the ratio between the in-place density and the maximum density). Sediments in the alluvial valleys of Riverside County were deposited fairly rapidly, which may lead to conditions of low density sediments that can settle in an earthquake (Riverside County Planning Department 2014).

Seismically induced settlement can occur in areas where earthquake shaking causes densification of relatively loose sediments. Settlement can cause damage to surface and near-surface structures. However, with implementation of mitigation measures the potential for damage due to seismically induced settlement is considered to be low at the Project site (Riverside County Planning Department 2015). Assessment of seismically induced settlement in the vicinity of the Project site should be performed as part of the site-specific geotechnical investigation and detailed design process. Although the potential for damage due to seismically induced settlement is considered to be low, the results of the investigation should be used to support Project-specific detailed design and construction.

3.4.8 Land Subsidence

Subsidence due to groundwater withdrawal has been documented in three regions of Riverside County: the Elsinore Trough, including Temecula and Murrieta; the San Jacinto Valley from Hemet to Moreno Valley; and the southern

Coachella Valley (Riverside County Planning Department 2014), all approximately 25 miles or more west of the Project site. No subsidence has been documented at the Project site, although the site is in an area considered to be susceptible to subsidence (Riverside County Planning Department 2015). Regional subsidence attributed to historical groundwater withdrawal has affected more populated areas in the eastern part of Riverside County. Since the 1970's, cities in the Coachella Valley, such as Palm Springs and Indian Wells, demanded more water than the imported surface water could supply, increasing groundwater pumping. As a result, declining water levels have resulted in new fissures and subsidence. In 1995, a land subsidence monitoring network was established and found rates from 0.72 to 1.97 feet of subsidence (Luhdorff and Scalmanini 2014). Subsidence as a result of groundwater pumping has not been reported in the area of the Project or in the vicinity; therefore, subsidence from groundwater withdrawal associated with the Project is considered to be low (USGS 2018c).

4. Summary of Findings

The desktop geotechnical study indicates that the potential for geologic hazards associated with soil properties is low due to soil types, lack of active faults, topography, and groundwater conditions at and near the Project site. Evidence of ground subsidence (e.g., fractures possibly caused by historic groundwater extraction) has not been recorded at the Project site, although the site is in an area considered to be susceptible to subsidence. Given the high historic use of local groundwater resources for agricultural development approximately 5 miles east of the Project, in the Colorado Floodplain, with no subsidence reported, and given the total estimated storage in the basins, it is not anticipated that the Project's limited pumping program (maximum water use of 1,660 AF over 31.4 years) will induce subsidence below the site due to groundwater pumping. However, the potential for seismically induced subsidence exists at the site due to soil conditions. Therefore, a geotechnical investigation is recommend to verify the potential for subsidence and other on-site soil types and conditions discussed in this desktop study.

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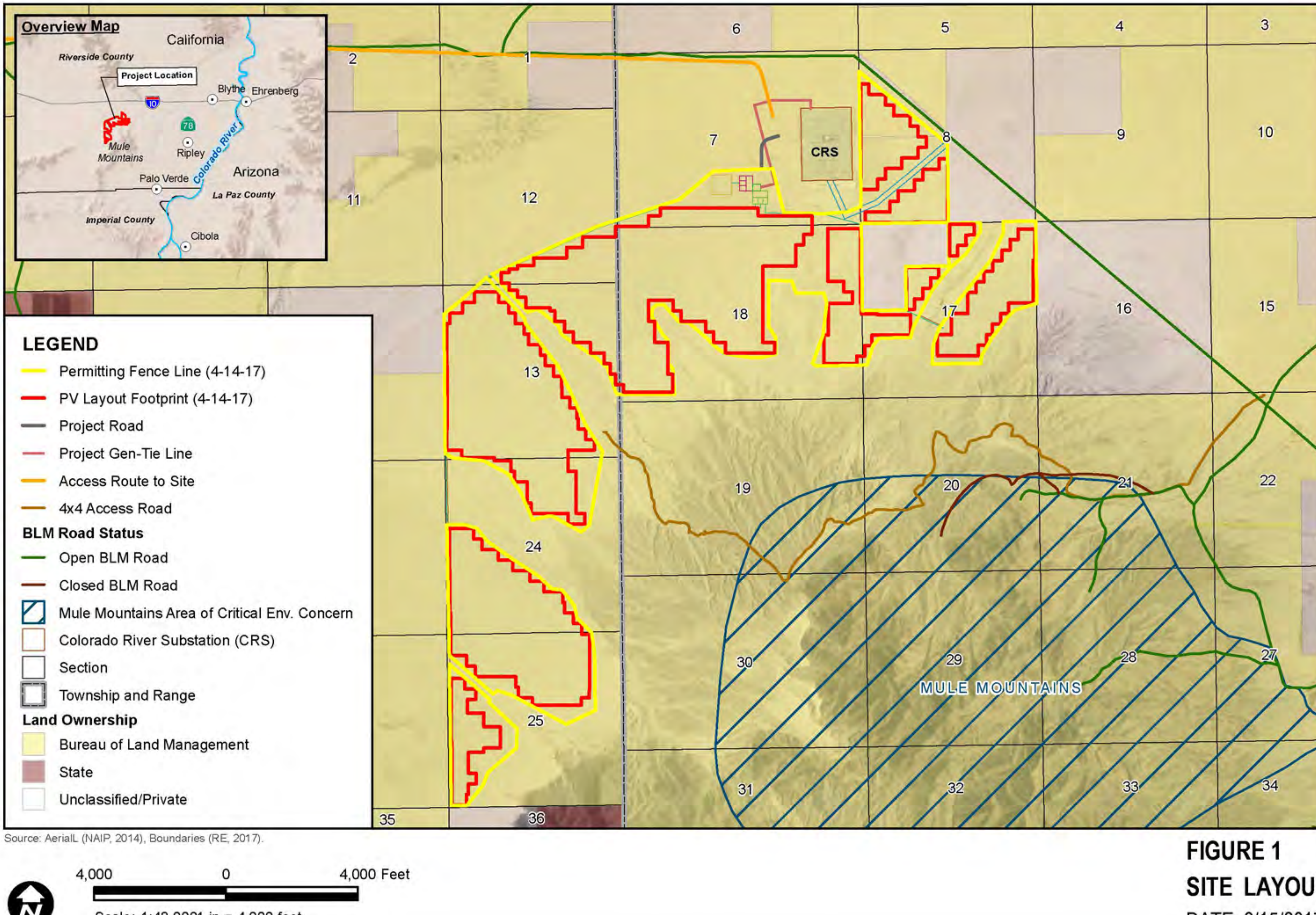
Figures



Source: AerialL (NAIP, 2014), Boundaries (RE, 2017).

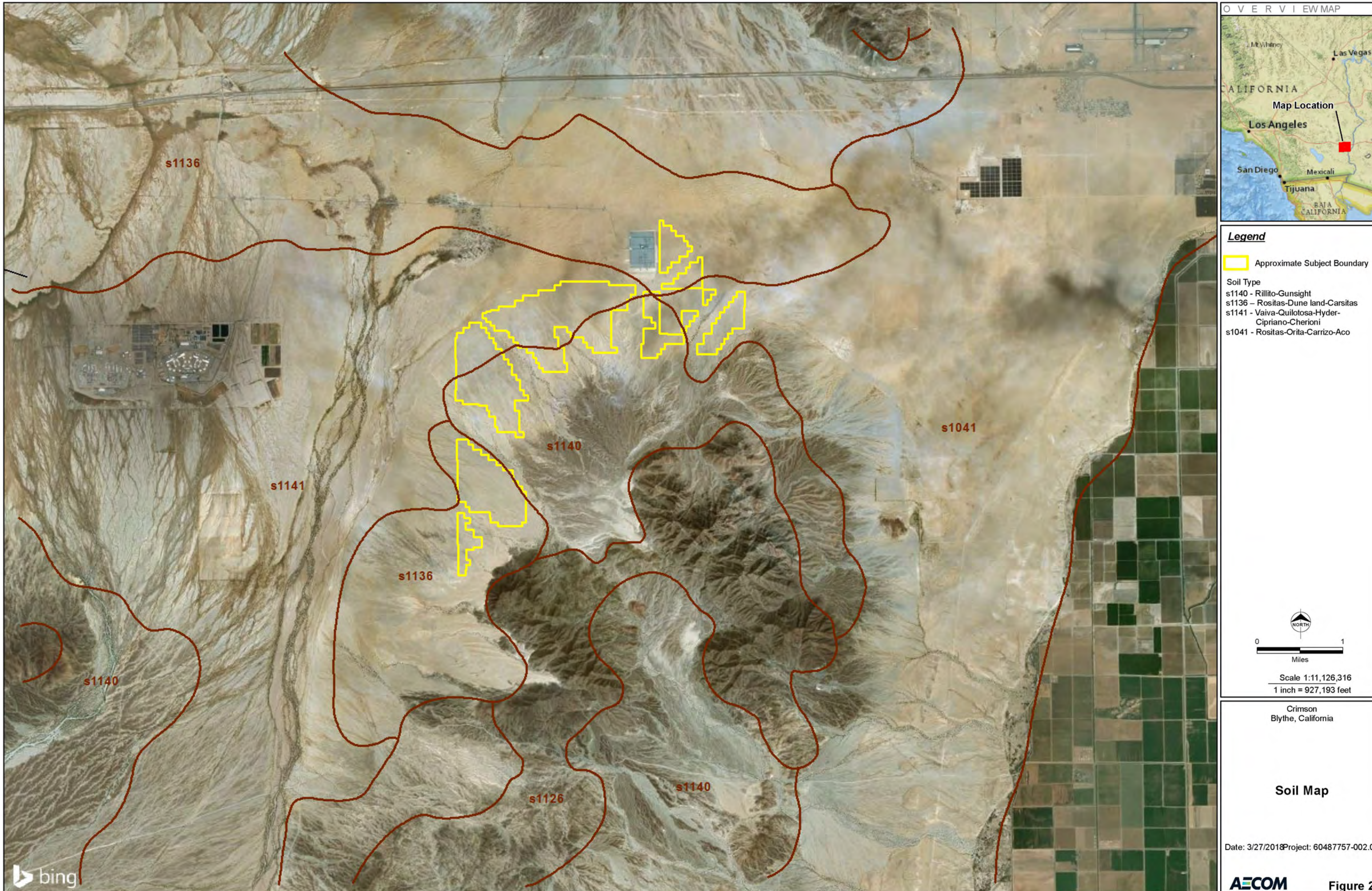
FIGURE 1

SITE LAYOUT

DATE: 8/15/2017

RE Crimson Solar - Riverside County, CA

Path: U:\Projects\Recurrent Energy\60487757_Crimson\900-Work\920-GIS\map_docs\mxd\Project_Features\Crimson_ProjectFeatures_8x11.mxd, jason.sokol, 8/15/2017, 6:23:20 PM



Path: J:\Client-Projects\Recurrent Renewables Group\Source Water Assmnt\Graphics\Soil_Crimson.mxd | Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet | User: scopm1

Appendix N
Hazards and Hazardous Materials

Phase I Environmental Site Assessment, May 2018

Phase I Environmental Site Assessment

Sonoran West Solar Holdings, LLC
Blythe, California

Prepared for:
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Project No. 185804157

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Sign-off Sheet and Signatures of Environmental Professionals

This document entitled Phase I Environmental Site Assessment was prepared by Stantec Consulting Services Inc. (Stantec) for the account of Sonoran West Solar Holdings, LLC. The material in it reflects Stantec's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Stantec accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

All information, conclusions, and recommendations provided by Stantec in this document regarding the Phase I ESA have been prepared under the supervision of and reviewed by the professionals whose signatures appear below.

Prepared by ______________________
(signature)

Dion Monge
Senior Scientist

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in § 312.10 of 40 CFR 312. I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the Property. I have developed and performed all the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Reviewed by ______________________
(signature)

Anne Perez
Geologic Associate

Approved by ______________________
(signature)

Kyle Emerson
Managing Principal Geologist

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Abbreviations

AAI	All Appropriate Inquiry
ACM	Asbestos containing material
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
BER	Business Environmental Risk
BLM	Bureau of Land Management
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulation
CREC	Controlled Recognized Environmental Conditions
CWA	Clean Water Act
DTSC	Department of Toxic Substances Control
ELUC	Environmental Land Use Control
EP	Environmental Professional
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
ft msl	Feet above mean sea level
HREC	Historical Recognized Environmental Conditions
HWMU	Hazardous Waste Management Unit
LBP	Lead-based Paint
LUST	Leaking Underground Storage Tank
MC	Munitions Constituents
MD	Munitions Debris
MEC	Munitions and Explosives of Concern
NESHAP	National Emissions Standard for Hazardous Air Pollutants
PAHs	Polynuclear Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
pVEC	Potential Vapor Encroachment Condition
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Conditions
RWQCB	Regional Water Quality Control Board
SCE	Southern California Edison
SWMU	Solid Waste Management Unit
TSCA	Toxic Substance Control Act
USACE	United States Army Corps of Engineers

USDA	United States Department of Agriculture
USGS	United States Geological Survey
UST	Underground Storage Tank
UXO	Unexploded Ordnance
VOCs	Volatile Organic Compounds

1.0 SUMMARY

Stantec Consulting Services Inc. (Stantec) has completed a Phase I Environmental Site Assessment (ESA) report for the property located on approximately 2,489 acres located southeast of Interstate-10 (I-10) and Wiley's Well Road, near the city of Blythe in Riverside County, California (the "Property"), on behalf of Sonoran West Solar Holdings, LLC (the "Client").

The Phase I ESA was conducted in conformance with the requirements of American Society for Testing and Materials (ASTM) Designation E 1527-13 and All Appropriate Inquiries (AAI) Final Rule 40 CFR Part 312, except as may have been modified by the scope of work, and terms and conditions, requested by the Client. Any exceptions to, or deletions from, the ASTM practice are described in Section 2.3. The work was performed according to Stantec's proposal and terms and conditions dated March 16, 2018.

The Property consists of undeveloped desert land at the base of the northwest side of the Mule Mountains. The only structural improvement at the Property is a row of power lines that extend from Power Line Road, through the northeast portion of the Property, and connect to the offsite Southern California Edison (SCE) substation adjacent to the north. The Property is proposed for development as a photovoltaic facility with interconnecting aboveground power lines (i.e. "gen-tie lines).

Surrounding properties consist of undeveloped land with the exception of the aforementioned SCE substation and a row of power lines that parallel Power Line Road, adjacent to the north/northeast. A site location map is provided as Figure 1. A site map illustrating the main features of the Property is provided as Figure 2. Photographs taken during the Property reconnaissance visit are provided in Appendix A.

With the exception of Power Line Road, the entire Property was inaccessible by vehicle due to the potential presence of sensitive plant and animal species in the area. Therefore, the Property reconnaissance was performed by foot. Stantec made a concerted effort to traverse as much of the Property as possible making observations from any high ground locations in order to obtain a general understanding of Property conditions. However, Stantec could not inspect all areas of the Property due to its size, time constraints, and the aforementioned vehicular restrictions.

We have performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E-1527-13 and the requirements of AAI for the "Property". Any exceptions to, or deletions from, this practice are described in the Data Gaps section of this report. This assessment has revealed no evidence of recognized environmental conditions (RECs) in connection with the Property except for the following:

- Munitions and Explosives of Concern and Unexploded Ordnance. Historical documentation reviewed by Stantec for the Property vicinity found that portions of the Property are located within an area that is classified as a formerly used defense site (FUDS).

The FUDS is identified as Wiley Well Water Point. The historical documents indicate that Wiley Well Water Point was a military camp that was part of the Desert Training Center (DTC) in the early 1940s. The DTC was a collection of military camps designed to train the United States army for desert combat in North Africa during World War II. The DTC was later renamed the California-Arizona Maneuver Area (CAMA) as the war effort expanded to other overseas campaigns. The Wiley Well Water Point camp was used for combat and tactical training for approximately nine months between late 1943 and early 1945.

The Wiley Well Water Point was issued the FUDS designation following review of a large collection of archived maps, drawings, technical ordnance data, real estate documentation, correspondence, and various other records by the United States Army Corps of Engineers (USACE). The historical documents related to Wiley Well Water Point indicate that the majority of the training exercises took place in the areas to the north and west of the Wiley Well area, but no specific training areas or artillery ranges are listed in the archived documents. However, based on a site visit conducted by USACE in 1994, an area containing seven targets and munitions debris (MD) was found in the northeast portion of the Wiley Well Water Point FUDS. This area was later designated as "MRS01 – Impact Area" (MRS01) and comprises approximately 94 acres. Munitions debris known or suspected to be within MRS01 based on past site visits and discoveries include munitions cartridges, bullet shells, practice mines, and projectiles. MRS01 is located more than ½ mile south of the Property boundary. However, the Property overlaps with portions of the northern reaches of the Wiley Well Water Point FUDS designated area at two locations.

In addition to these FUDS delineated areas that overlap the Property, it should be noted that other UXO, MEC, and MD has also been found outside of the MRS01 – Impact Area in the northern areas of the Wiley Well Water Point FUDS, including at the location of the nearby state prisons and the Coon Hollow campground area. Additionally, a previous Phase 1 ESA prepared by URS indicates that potential MEC/UXO or MD was observed in the southern portion of the Property parcel during a biological survey in 2011. The location plotted on URS figures is outside of the FUDS delineated area. Stantec did not observed any MEC, UXO, or MD during the Property visit. The URS report does not indicate what the item was that was believed to be MEC/UXO or whether it was ever confirmed to be MEC/UXO by certified professionals.

Based on the information above, in May/June of 2017 Bay West LLC (Bay West) was engaged to evaluate the potential for MEC/UXO to exist at the Property and to prepare a Site Characterization Report documenting the findings. The portion of the Bay West Site Characterization Report that was provided to Stantec is attached in Appendix D. The site characterization work performed by Bay West included a historical records review, interviews, and a visit to the Property for a visual reconnaissance of a random transect in the southern portion. The historical records review provided no definite information regarding the use of the Property as an artillery range or minefield. However, an interview performed with Riverside County Sheriff (Sheriff) Sergeant Bob Epps revealed that the Sheriff's Hazardous Device Team has responded on numerous occasions regarding M1B1 practice landmines and small arms ammunition within the Property boundaries. The practice landmines were recovered at the approximate locations shown on Figure 2. During the visit, Bay West personnel observed evidence of military materials including gas masks canisters, food cans, and a first aid kit. No UXO or evidence of UXO such as craters or targets were observed. However, Bay West recommended further investigation of the Property using geophysical mapping and investigation of magnetic anomalies.

Based on the information provided above, MEC, munitions debris (MD), munitions constituents (MC), or unexploded ordnance (UXO) may be present at the Property and may be encountered during development activities. The FUDS delineated areas that overlap onto the Property, the approximate locations of the alleged MEC/UXO found by URS, and the practice landmines found in the southern portion of the Property, are illustrated on Figure 2. The designation of portions of the Property as a FUDS, and the potential presence of UXO/MEC to exist at the Property, is considered an REC.

Based on past conversations with the DTSC and United Stated Army Corps of Engineers (USACE) on similar sites in the region, and on Bay West's report conclusions, Stantec recommends the following with regard to the potential existence of MEC, UXO, or MD:

- Consultation and guidance from a certified MEC/UXO professional to evaluate the appropriate course of action and associated costs related to assessment, remediation, and construction support;
- Where ground disturbance work is involved, contractors should be OSHA HAZWOPER-trained in accordance with standard 29CFR 1910.120 and hold a current certification;
- Where ground disturbance work is involved, contractors should be trained in identifying UXO/MEC;
- If suspected munitions are encountered at any point by any onsite individual, the "3R's of Explosives Safety" should be followed. The "3R's" include:
  - Recognize – when something may be a munition and the dangers involved.
  - Retreat – do not touch the potential munition and carefully leave the area.
  - Report – immediately report the finding to local law enforcement.

Although not considered a REC, the following items of note were identified during this Phase I ESA:

- Indistinguishable Surface Feature, 2002 Aerial Photograph. A short diagonal line measuring approximately 60 feet is visible in the northeast corner of parcel 8790-050-007. This area of the parcel appears to be within the boundaries of where the Wiley Well Water Point FUDS is mapped (see Section 4.4.6 and Figure 2). The line is not visible in any of the other historic aerial photographs.

The preceding summary is intended for informational purposes only. Reading of the full body of this report is recommended.

2.0 INTRODUCTION

The objective of this Phase I ESA was to perform appropriate inquiry into the past ownership and uses of the Property consistent with good commercial or customary practice as outlined by the ASTM in "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process", Designation E1527-13. The purpose of this Phase I ESA was to identify adverse environmental conditions including recognized environmental conditions ("RECs") of the Property.

The ASTM E1527-13 standard indicates that the purpose of the Phase I ESA is to identify RECs, including historical recognized environmental conditions ("HRECs"), and controlled recognized environmental conditions ("CRECs") that may exist at a property. The term "recognized environmental conditions" means the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property:

(1) Due to any release to the environment;

(2) Under conditions indicative of a release to the environment; or

(3) Under conditions that pose a material threat of a future release to the environment.

ASTM defines a "HREC" as a REC that has occurred in connection with the property but has been addressed to the satisfaction of the applicable regulatory authority and meets unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls). Before calling the past release a HREC, the environmental professional must determine whether the past release is a REC when the current Phase I ESA is conducted (for example, if there has been a change in the regulations). If the EP considers the past release to be a REC at the time the Phase I ESA is conducted, the condition shall be included in the conclusions section of the report as a REC.

ASTM defines a "CREC" as a REC resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority), but with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls).

De minimis conditions are not RECs. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. As indicated, the term REC does not include de minimis conditions, which generally do not present a material risk to human health and would not likely be subject to enforcement action if brought to the attention of governmental agencies.

This ESA was conducted in accordance with our proposal to Sonoran West Solar Holdings, LLC dated March 16, 2018 and the Client's authorization on March 20, 2018. The scope of work conducted during this Phase I ESA consisted of a visual reconnaissance of the Property, interviews with key individuals, and review of reasonably ascertainable documents. The scope of work did not include an assessment for environmental regulatory compliance of any facility ever operated at the Property (past or present), or sampling and analyzing of environmental media. Stantec was not contracted to perform any independent evaluation of the purchase or lease price of the Property and its relationship to current fair market value. The conclusions presented in this ESA Report are professional opinions based on data described herein. The opinions are subject to the limitations described in Section 2.3.

ASTM E1527-13 notes that the availability of record information varies from source to source. The User or Environmental Professional is not obligated to identify, obtain, or review every possible source that might exist with respect to a property. Instead, ASTM identifies record information that is reasonably ascertainable from standard sources. "Reasonably ascertainable" means:

(1) Information that is publicly available;

(2) Information that is obtainable from its source within reasonable time and cost constraints; and

(3) Information that is practicably reviewable.

2.1 PROPERTY DESCRIPTION

The Property consists of approximately 2,489 acres located southeast of Interstate-10 (I-10) and Wiley's Well Road, near the city of Blythe in Riverside County, California. The Property includes portions of the following ten parcels:

- 8790-070-006
- 8790-050-007
- 8790-050-004
- 8790-030-017
- 8790-080-022
- 8790-100-006
- 8790-080-023
- 8790-080-026
- 8790-080-028
- 8790-100-007

The Property is undeveloped desert land at the base of the northwest side of the Mule Mountains. The only structural improvement at the Property is a row of power lines that extend from Power Line Road, through the northeast portion of the Property, and connect to the substation adjacent to the north. Surrounding properties also consist of undeveloped land with the exception of the Southern California Edison substation and a row of power lines on the adjacent property to the north/northeast. A site location map is provided as Figure 1. A site map illustrating the main features of the Property is provided as Figure 2. Photographs taken during the Property reconnaissance visit are provided in Appendix A.

With the exception of Power Line Road, the entire Property was inaccessible by vehicle due to the potential presence of sensitive plant and animal species in the area. Therefore, the Property reconnaissance had to be performed by foot. Stantec made a concerted effort to traverse as much of the Property as possible from high ground in order to obtain a general understanding of Property conditions. However, Stantec could not inspect all areas of the Property due to its size, time constraints, and the aforementioned vehicular restrictions.

2.2 SPECIAL TERMS, CONDITIONS, AND SIGNIFICANT ASSUMPTIONS

There were no special terms, conditions, associated with the Phase I ESA. However, there is an unknown condition, where it is unclear as of this date if certain features (pipeline and wells) are part of the property to be acquired.

2.3 EXCEPTIONS AND LIMITING CONDITIONS

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential and actual liabilities and conditions associated with the identified property.

This report provides an evaluation of selected environmental conditions associated with the identified portion of the property that was assessed at the time the work was conducted and is based on information obtained by and/or provided to Stantec at that time. (40 CFR 312.20(f)(2) requires that the Environmental Professional evaluate the thoroughness and reliability of provided information.) All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

If a service is not expressly indicated, do not assume it has been provided. If a matter is not addressed, do not assume that any determination has been made by Stantec in regard to it.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report, and are based solely on the scope of work described in the report, the limited data available and the results of the work. They are not a certification of the property's environmental condition.

This report relates solely to the specific project for which Stantec was retained and the stated purpose for which this report was prepared and shall not be used or relied upon by the client identified herein for any variation or extension of this project, any other project, or any other purpose.

This report has been prepared for the exclusive use of the client identified herein and any use of or reliance on this report by any third party is prohibited, except as may be consented to in writing by Stantec or as required by law or by the MSA. The provision of any such consent with the MSA. Stantec assumes no responsibility for losses, damages, liabilities, or claims, howsoever arising, from third party use of this report that was not granted by Stantec.

Project Specific limiting conditions are provided in Section 2.2.

The locations of any utilities, buildings and structures, and property boundaries illustrated in or described within this report, if any, including pole lines, conduits, water mains, sewers and other surface or sub-surface utilities and structures are not guaranteed. Before starting work, the exact location of all such utilities and structures must be confirmed by the client and Stantec assumes no liability resulting from damage to such utilities and structures.

The conclusions are based on the site conditions encountered by Stantec at the time the work. Accordingly, additional studies and actions may be required. As the purpose of this report is to identify selected site conditions which may pose an environmental risk; the identification of non-environmental risks to structures or people on the site is beyond the scope of this assessment. The findings, observations, and conclusions expressed by Stantec in this report are not an opinion concerning the compliance of any past or present owner or operator of the site which is the subject of this report with any Federal, state, provincial or local law or regulation.

This report presents professional opinions and findings of a scientific and technical nature. It does not and shall not be construed to offer a legal opinion or representations as to the requirements of, nor compliance with, environmental laws, rules, regulations, or policies of Federal, state, provincial or local governmental agencies. Issues raised by the report should be reviewed by client legal counsel.

Stantec specifically disclaims any responsibility to update the conclusions in this report if new or different information later becomes available or if the conditions or activities on the property subsequently change.

2.4 PERSONNEL QUALIFICATIONS

This Phase I ESA was conducted by, or under the supervision of, an individual that meets the ASTM definition of an Environmental Professional (EP). The credentials of the EP and other key Stantec personnel involved in conducting this Phase I ESA are provided in Appendix B.

3.0 USER-PROVIDED INFORMATION

ASTM E1527-13 describes responsibilities of the User to complete certain tasks in connection with the performance of "All Appropriate Inquiries" into the Property. The ASTM standard requires that the Environmental Professional request information from the User on the results of those tasks because that information can assist in the identification of RECs, CRECs, HRECs, or de minimis conditions in connection with the Property. Towards that end, Stantec requested that the User provide the following documents and information:

Description of Information	Provided (Yes / No)	Description and/or Key Findings
User Questionnaire	Yes	The questionnaire was returned but contained no Property specific information.
Environmental Liens or Activity Use Limitations	No	Information on liens or activity use limitations were not provided to Stantec for review. However, a lien search was ordered from a third-party source (Section 4.4.1).
Previous Environmental Permits or Reports Provided by User	Yes	Two previous environmental reports were provided by the User. The reports are summarized in Section 4.4.6.
Purpose of the Phase I ESA	Yes	Due diligence

Stantec forwarded the ASTM recommended User Questionnaires to Mr. Scott Dawson of Sonoran West Solar Holdings, LLC. The completed User Questionnaire was returned to Stantec by Mr. Dawson and is included in Appendix D.

The User provided information is included in Appendix D.

4.0 RECORDS REVIEW

The objective of consulting historical sources of information is to develop the history of the Property and surrounding area, in order to evaluate if past uses may have resulted in RECs. Physical setting records are evaluated to determine if the physical setting may have contributed to adverse environmental conditions in connection with the Property. During the review of historical records, Stantec attempted to identify uses of the Property from the present to the Properties first developed use. Stantec's research included the reasonably ascertainable and useful records described in this section.

4.1 PHYSICAL SETTING

A summary of the physical setting of the Property is provided in the table below with additional details in the following subsections

Topography:	The Property is located within the Mojave Desert Geomorphic Province and falls within portions of the Roosevelt Mine, McCoy Peak, Thumb Peak, Hopkins Well, and Wiley Well Quadrangles. The Property is situated at the base of the north slope of the Mule Mountains. Therefore, the Property slopes to the north/northwest. Elevations range from approximately 690 feet above mean sea level (amsl) in the south end to approximately 430 feet amsl at the northwest end of the Property.
Soil/Bedrock Data:	Soils over the majority of the Property are derived from Pleistocene aged marine and nonmurine sedimentary rock consisting of alluvium, lake, playa, and terrace deposits. Soils at the Property consist primarily of alluvial sand and gravel.
Estimated Depth to Groundwater/ Estimated Direction of Gradient:	Ground water in the Property vicinity is deep with the shallowest levels being recorded at 150 feet below ground surface (bgs) in a well that is 3 miles to the west. No site-specific information was obtained from the records regarding gradient. However, as discussed in Section 4.1.3, groundwater is expected to generally flow east/southeast toward the Colorado River.
Note: Site-specific groundwater direction and depth can only be determined by conducting site-specific testing, which Stantec has not conducted.	

4.1.1 Property Topography and Surface Water Flow

Based on a review of available topographic maps, the Property ranges from approximately 690 feet above mean sea level (amsl) in the south end to approximately 430 feet amsl at the northwest end of the Property. Seasonal surface drainages have formed at the base of the Mule Mountains and extend northward between the Property parcels. Based on the topography, surface water on the Property infiltrates the ground surface or flows overland toward topographic low-points.

4.1.2 Regional and Property Geology

The Property is located in Riverside County. The area is located within the Mojave Desert Geomorphic Province, which is characterized by an interior region of isolated mountain ranges separated by expanses of desert plains. In general, the province has an interior enclosed drainage and many playas. Two important fault trends control topography in the Mojave province, one being a prominent northwest/southeast trend and the other a secondary east-west trend (California Geological Survey [CGS], 2002). According to the Geologic Map of California, Needles Sheet, soils in the Property vicinity are derived from Pleistocene-Halocene aged alluvium, lake, playa, and terrace deposits. Soils at the Property consist primarily of fine to coarse sand with interbedded gravel, silt, and clay (CDMG, 1963).

The closest mapped fault is the Aztec Mine Wash Fault located approximately 22 miles west of the Property (Jennings, 1994). According to official maps of California, the Property is not located within an Alquist-Priolo (AP) Earthquake Fault Zone boundary or a liquefaction zone (CDMG, 2000).

4.1.3 Regional and Property Hydrogeology

The Property is located within the Chuckwalla Valley Groundwater Basin. The basin is bound to the south by the consolidated rocks of the Chuckwalla, Little Chuckwalla, and Mule Mountains; to the west by the Eagle Mountains; to the east by the Mule and McCoy Mountains; and to the north by rocks of the Coxcomb, Granite, Palen, and Little Maria Mountains. Water-bearing units consist of consist of Pliocene to Quaternary age continental deposits that are divided into three formations - Quaternary alluvium, the Pinto Formation, and the Bouse Formation. The Quaternary alluvium aquifer is believed to be the most important in the area (Department of Water Resources [DWR], 2004). Groundwater in the Property vicinity is deep with the shallowest levels being recorded at 150 feet below ground surface (bgs) in a well that is 3 miles to the west. Groundwater contours for the basin suggest that groundwater flows from the north and west toward the gap between the Mule and McCoy Mountains which is where the Property is located. As such, groundwater flow direction is believed to generally be to the east/southeast (DWR, 1979).

4.2 FEDERAL, STATE AND TRIBAL ENVIRONMENTAL RECORDS

A regulatory agency database search report was obtained from Environmental Data Resources Inc. (EDR), a third-party environmental database search firm. A complete copy of the database search report, including the date the report was prepared, the date the information was last updated, and the definition of databases searched, is provided in Appendix C.

Stantec evaluated the information listed within the database relative to potential impact to the Property, assessing the potential for impacts based in part on the physical setting. As part of this process, inferences have been made regarding the likely groundwater flow direction at or near the Property. As described in 4.1.3, the groundwater flow direction in the Property vicinity is generally toward the east/southeast. Observations about the Property and surrounding properties made during the Property reconnaissance are provided in more detail in section 5.

4.2.1 Listings for Property

No listings for the Property were identified in the EDR database review.

4.2.2 Listings for Nearby Sites with Potential to Impact Property

Stantec assessed data presented in the environmental agency database search report to evaluate the potential for conditions to pose a REC, CREC, or HREC for the Property.

There are no release sites or other sites listed in the EDR within a one-mile radius of the Property. The nearest release site is the Chuckwalla Valley State Prison which reported a release of fuel from an underground storage tank (UST). However, the prison is 2 miles from the Property and therefore considered unlikely to have impacted the Property.

4.3 LOCAL/REGIONAL ENVIRONMENTAL RECORDS

Stantec checked the following sources to obtain information pertaining to Property use and/or indications of RECs in connection with the Property:

4.3.1 Local Health Department

Agency Name Contact Information	Finding
County of Riverside Department of Environmental Health (CRDEH), 4065 County Circle Dr, Room 104 Riverside, CA 92503 Telephone: (951) 358-5055	The CRDEH files archived records by address. Consequently, since there are no addresses associated with the Property, no request could be submitted.

4.3.2 State Departments

Agency Name Contact Information	Finding
Regional Water Quality Control Board (RWQCB), Colorado River Region 73-720 Fred Waring Drive, Suite 100 Palm Desert, CA 92260 Phone: 760-346-7491	Since the Property does not have any specific address, a records request was not able to be submitted to the RWQCB. However, Stantec accessed the State Water Resources Control Board's Geotracker website (http://geotracker.swrcb.ca.gov) for the Property and the surrounding area. The GeoTracker website shows no release sites at the Property or within a one-mile radius of the Property.
Department of Toxic Substances Control 9211 Oakdale Avenue Chatsworth, CA 91311 Phone: (818) 717-6500 Website: http:// http://www.envirostor.dtsc.ca.gov/public	Stantec searched the DTSC Envirostor website for the Property and the surrounding area within one mile of the Property boundaries. Stantec's research found that the Wiley Well Water Point formerly used defense site (FUDS) overlaps onto portions of the Property. The Wiley Well Water Point FUDS was a military camp that was part of the Desert Training Center (DTC) in the early 1940s. The DTC was a collection of military camps designed to train the United States army for desert combat in North Africa during World War II. The DTC was later renamed the California-Arizona Maneuver Area (CAMA) as the war effort expanded to other oversea campaigns. The Wiley Well Water Point camp was used for combat and tactical training for nine months between late 1943 and early 1945. Three reports were available on Envirostor regarding investigations related to residual munitions and explosives of concern ("MEC") and unexploded ordnance ("UXO") that may remain in the area from historic training actives. These former environmental reports and recommendations regarding potential MEC and UXO at the Property are discussed in Section 4.4.6.
Division of Oil, Gas, and Geothermal Resources (DOGGR), District 4 4800 Stockdale Highway, Suite 100 Bakersfield, CA 93309 Well Finder Database Website: http://www.conservation.ca.gov	Stantec reviewed the Well Finder provided on the Department of Oil, Gas, and Geothermal Resources (DOGGR) website in an effort to evaluate if there are any known oil, gas, or geothermal wells in the Property vicinity. According to the Well Finder there are no oil, gas, or geothermal wells within at least 10 miles of the Property. Due to the lack of known wells at the Property or in the vicinity, Stantec considers it unlikely that oil, gas, or geothermal wells represent an environmental concern to the Property and recommends no further investigation regarding this issue.

4.3.3 Local Building and/or Planning Department Records

Agency Name, Contact Information	Findings
Riverside County Department of Building and Safety 4080 Lemon St, 9th Floor PO Box 1629 Riverside, CA 92502 Telephone: (951) 955-2021 http://rctlma.org/building/bs_records	Building department records were requested for the ten parcels that comprise the Property. Riverside County personnel responded to the request indicating that no records were available for the Property.

4.4 HISTORICAL RECORDS REVIEW

4.4.1 Land Title Records/Deeds

An environmental lien and activity use limitation search was obtained through EDR for the ten parcels that comprise the Property. The assessor parcel numbers researched are as follows:

- 8790-070-006
- 8790-050-007
- 8790-050-004
- 8790-030-017
- 8790-080-022
- 8790-100-006
- 8790-080-023
- 8790-080-026
- 8790-080-028
- 8790-100-007

Parcel 8790-080-028 is owned by Southern California Edison Company. The remaining nine Property parcels are owned by the United States, Department of the Interior, Bureau of Land Management (BLM). No environmental liens or activity use limitations were found for the Property.

4.4.2 Aerial Photographs

Stantec reviewed historical aerial photographs provided by EDR. The general type of activity on a property and land use changes can often be discerned from the type and layout of structures visible in the photographs. However, specific uses usually cannot be discerned from aerial photographs alone. The following table summarizes Stantec's observations of the reviewed historical aerial photographs. Copies of the aerial photographs (resolution reduced) are provided in Appendix F.

Year	Observations, Property, and Adjoining Properties
1948, 1956	The Property appears as undeveloped desert land with low lying annual forbs and grasses. The Mule Mountains are visible to the south of the Property. Several seasonal drainages run down the north side of the Mule Mountains into areas

Year	Observations, Property, and Adjoining Properties
	adjacent to the Property. Taller, more established vegetation is visible along these areas. Surrounding properties appear similar to the Property, i.e. undeveloped desert land.
1977	This photograph is in poor resolution and is very pixelated. However, the general discernable features of the Property and surrounding area appear the same as the previous photographs, i.e. undeveloped desert land.
1981	The Property and surrounding properties appear similar to the previous photographs with the exception of the two minor differences. In the west portion of the Property a very thin "S-shaped" pattern is visible in the northern portion of parcel 8790-050-004 and two dark dots are visible in the northwest corner of parcel 8790-050-007. Neither feature is visible in earlier or later photographs. However, dot features are most likely trees and the thin line may be vegetation following some sort of low-lying area where water had accumulated over a series of seasonal rain events. Several power poles are visible along Power Line Road, adjacent to the northeast Property boundary.
1996	The Property appears the same as the previous photographs except without the two features called out in the 1981 photograph.
2002	The Property appears similar to the previous photograph except that a short diagonal line is visible in the northeast corner of parcel 8790-050-007 which also falls within the boundaries of where the Wiley Well Water Point FUDS is mapped (see Section 4.4.6). The line is not visible in any other photographs and may just be vegetation. Surrounding properties appear similar to the previous photograph.
2010	The Property appears the same as the previous photographs except without the diagonal line feature called out in the 2002 photograph
2012	The Property appears similar to the previous photograph. The adjacent property to the north is under construction with the present-day SCE substation. The remaining properties in the surrounding area appear the same as the previous photograph.
2014	The Property appears similar to the previous photograph and consistent with observations made during the Property visit. The SCE substation to the north appears to be fully constructed.

Name of aerial photograph source: Georeferenced Aerial Photographs provided by EDR.net.

4.4.3 City Directories

City directories were available for the Property and vicinity for the years of 1990 through 2010. The directories from 2000 through 2010 include addresses associated with the Chuckwalla Valley and Ironwood State Prisons. The prisons appear in the 1990 and 1995 directories along with multiple commercial contractors (i.e. electricians, construction and masonry companies, and mechanical/electronics companies). No RECs were identified during Stantec's review of city directories.

4.4.4 Historical Fire Insurance Maps

Fire insurance maps were developed for use by insurance companies to depict facilities, properties, and their uses for many locations throughout the United States. These maps provide information on the history of prior land use and are useful in assessing whether there may be potential environmental contamination on or near the Property. These maps, which have been periodically updated since the late 19th century, often provide valuable insight into historical Property uses.

The Property lies within an unmapped area. Therefore, historical fire insurance maps are not available for the Property or vicinity.

4.4.5 Historical Topographic Maps

Stantec reviewed historical topographic maps of the area to help identify past Property usage and areas of potential environmental concern.

No RECs were noted during our review of the topographic maps. Copies of the historical maps are provided in Appendix E. The following table summarizes the maps reviewed and our observations.

Year	Scale	Observations, Property, and Adjoining Properties
1952	1:62,500	The topographic map set shows the Property as undeveloped land with contours indicating a decrease in elevation away from the Mule Mountains. Wiley Well Road is illustrated as a dirt road approximately 1.5 miles west of the Property adjacent to a wash. A "Radio Station" is illustrated approximately 2.5 miles to the northeast.
1983	1:24,000	This set of maps depict similar features as the 1952 map set. However, several washes are illustrated and labeled in areas adjacent to the Property.
2012	1:24,000	The maps depict similar features as the previous map sets for the Property and surrounding area.

Name of topographic source: EDR Historical Topo Map Report, 5256788.4, 2018.

4.4.6 Other Historical Sources

The reports listed and summarized below were available for review through DTSC's Envirostor website and pertain to the regional concerns regarding historic military use of the area during World War II.

- Parsons, 2009, Final Technical Project Planning Memorandum and Associated Documentation (Memorandum), Wiley Well Water Point, Ripley, California, FUDS Project Number J09CA071001, dated August.

- Parsons, 2009, Final Site-Specific Work Plan Addendum to the Programmatic Work Plan (Work Plan), Wiley Well Water Point, Ripley, California, FUDS Project Number J09CA071001, dated October.

- Parsons, 2010, Final Site Inspection Report (SI), Wiley Well Water Point, Ripley, California, FUDS Project Number J09CA071001, dated April.

A general history of the Wiley Well Water Point formerly used defense site (FUDS) is provided in each of the above documents. The documents indicate that Wiley Well Water Point was a military camp that was part of the Desert Training Center (DTC) in the early 1940s. The DTC was a collection of military camps designed to train the United States army for desert combat in North Africa during World War II. The DTC was later renamed the California-Arizona Maneuver Area (CAMA) as the war effort expanded to other oversea campaigns. The Wiley Well Water Point camp was used for combat and tactical training for nine months between late 1943 and early 1945.

The documents review by Stantec indicate that the Wiley Well Water Point was issued the FUDS designation following review of a large collection of archived maps, drawings, technical ordnance data, real estate documentation, correspondence, and various other records by the United States Army Corps of Engineers (USACE). The historical documents related to Wiley Well Water Point indicate that the majority of the training exercises took place in the areas to the north and west of the Wiley Well area, but no specific training areas or artillery ranges are listed in the archived documents. However, based on a site visit conducted by USACE in 1994, an area containing seven targets and munitions debris (MD) was found in the northeast portion of the Wiley Well Water Point FUDS. This area was later designated as "MRS01 – Impact Area" (MRS01) and comprises approximately 94 acres. Munitions debris known or suspected to be within MRS01 based on past site visits and discoveries include munitions cartridges, bullet shells, practice mines, and projectiles. Other MD has also been found in the northern areas of the Wiley Well Water Point FUDS, including the location of the state prisons and the Coon Hollow campground area. Based on the reports available to Stantec, MRS01 is the closest location to the Property where MD has been found. MRS01 is located more than ½ mile south of the Property boundary. However, the Property overlaps with portions of the northern reaches of the Wiley Well Water Point FUDS designated area at two locations. The FUDS delineated areas that overlap onto the Property are illustrated on Figure 2.

The bullets below summarize the overall content and findings of the Memorandum, Work Plan, and SI reports listed above.

- The 2009 memorandum and work plan documents describe Parson's planning activities and scope of work for performing the SI. The scope of work included performing a visual identification of MEC and MC, land scarring, stressed vegetation, water sources, and soil characteristics within the MRS01 impact area. The documents also discuss soil sample collection protocol and analysis for MC (i.e. metals, explosives, pH, and picric acid). Contact information for contractors and agencies involved with the project are also listed along with the tasks that they would perform/oversee. Health and Safety and Quality Control procedures are also described in these documents.

- The visual reconnaissance for MEC and MC conducted during the 2010 SI included visual evaluations in MRS01, an area believed to have been incorrectly mapped as MRS01, and areas near Coon Hollow Campground and the Fire Agate Mine where munitions debris (bullets, cartridges) have historically been found. In total, 16 surface soil samples were collected for a variety of analysis including select heavy metals, pH, explosives, picric acid, and white phosphorus.

  The visual reconnaissance identified no MEC at the MRS01 – Impact Area. However, MD (bullet casings, cartridges, mortar debris, and projectile fuze parts), wood target remains, and tank tracks were observed throughout MRS01. No MEC, MD, or munitions related features were observed in the area believed to have been incorrectly mapped as MRS01, or the areas near Coon Hollow Campground and the Fire Agate Mine.

- Analytical results of the 16 surface soil samples at MRS01 during the 2010 SI reported no presence of explosives, picric acid, or white phosphorus. No metals were detected above background (i.e. naturally occurring levels for California) except for calcium. However, Parsons concluded that calcium is an essential nutrient and is not expected to pose a risk to human or ecological receptors. The report concludes that there is no non-essential nutrient MC metals contamination in the surface soil at MRS01. Parsons recommended no further MC evaluation of surface soil within MRS01.

- Based on the 2010 SI, Parsons performed a qualitative MEC risk evaluation for the MRS01 – Impact Area. The qualitative MEC risk evaluation concluded that there is the possibility that human receptors may come into contact with explosively hazardous MEC at Wiley Well Water Point. However, immediate removal action for MEC was considered "not warranted at this time". However, Parsons recommended further investigation to conclusively determine the nature of potential MEC hazards within the MRS01 – Impact Area.

The reports summarized below were provided to Stantec by Sonoran West Solar Holdings, LLC for review and pertain specifically to the Property.

- URS, 2011, Phase I Environmental Site Assessment, Sonoran West Solar Electric Generating Facility, 12 Miles Southwest of Blythe, Riverside County, California, dated December 21.

This report discusses the environmental condition of the Property, as observed and researched by URS in late 2011. The report was performed for BrightSource Energy Inc for a proposed Solar Electric Generating Facility (SEGF). URS found no past uses of the Property or the surrounding area that suggested environmental impacts to soil or groundwater. Additionally, URS found that the Property was not identified in any agency databases associated with storage, generation, or disposal of hazardous wastes. However, URS noted that many desert areas in southern California were used for military training exercises during World War II. URS indicated that a former military training area, UXO, and MEC have been identified in the Blythe area but did not provided any specific information regarding the training site. URS did, however, indicate that they identified a UXO and/or MEC item on the Property during a biological survey in 2011. The report does not indicate what the UXO/MEC item appeared to be or whether the item was ever confirmed to be UXO/MEC by a certified professional. The reported location of this UXO/MEC item is shown on Figure 2. URS recommended that appropriate UXO/MEC monitoring be performed during the construction of the proposed SEGF.

- Bay West, LLC (2017), Desert Training Center Site Characterization Report and Action Recommendation.

In early to mid-2017, Bay West LLC (Bay West) was engaged to evaluate the potential for MEC/UXO to exist at the Property and to prepare a Site Characterization Report documenting the findings. The portion of the Bay West Site Characterization Report that was provided to Stantec is attached in Appendix D. The site characterization work performed by Bay West included a historical records review, interviews, and a visit to the Property for a visual reconnaissance of a random transect in the southern portion. The historical records review, which was conducted by TLI Solutions, Inc, provided no definite information regarding the use of the Property as an artillery range or minefield. However, an interview performed by Bay West with Riverside County Sheriff (Sheriff) Sergeant Bob Epps revealed that the Sheriff's Hazardous Device Team has responded on numerous occasions regarding M1B1 practice landmines and small arms ammunition within the Property boundaries. The practice landmines were recovered at the approximate locations shown on Figure 2. During the visit, Bay West personnel observed evidence of military materials including gas masks canisters, food cans, and a first aid kit. No UXO or evidence of UXO such as craters or targets were observed. However, Bay West recommended further investigation of the Property using geophysical mapping and investigation of magnetic anomalies.

In summary, the designation of portions of the Property as a FUDS, and the potential presence of UXO/MEC to exist at the Property, is considered an REC. Recommendations related to this REC are provided in Sections 1.0 and 8.0.

5.0 PROPERTY RECONNAISSANCE

A visit to the Property and its vicinity was conducted by Dion Monge and Anne Perez on March 27, 2018. Access to the Property was confirmed by Scott Dawson of Sonoran West Solar Holdings, LLC. Stantec was unaccompanied during the Property visit. Figure 1 provides information about the Property and adjoining properties. Figure 2 shows the Property boundaries and locations of the photographs that are included in Appendix A.

5.1 PROPERTY RECONNAISSANCE METHODOLOGY

The Property reconnaissance focused on observation of current conditions and observable indications of past uses and conditions that may indicate the presence of a RECs. Due to the biological sensitive areas reportedly present at the Property and the surrounding areas, vehicular travel was limited to Power Line Road. The remainder of the Property reconnaissance was performed on foot using higher vantage points to observe portions of the Property. Areas travelled by foot were limited due to the size, time constraints, and the aforementioned vehicular restrictions. Stantec utilized the following methodology to observe the Property:

- Traverse transects across the Property, where reasonably accessible.
- Stantec was unable to observe some areas due to the remoteness of the Property but gained an overall view of these areas from higher elevation vantage points throughout the Property and adjacent properties.
- The area of the Property that is closest to the Wiley Well Water Point FUDS impact area (MRS01), as discussed in Sections 4.3.2 and 4.4.6, was specifically visited and evaluated.
- Open areas of native desert land for which there was no evidence of current or prior use were generally photograph but not traversed by foot in its entirety.

Weather conditions during the visit to the Property were windy and warm. Other than warm mid-day temperatures, there were no significant weather-related property access restrictions encountered during the reconnaissance visit.

5.2 GENERAL DESCRIPTION

Property and Area Description:	The Property consists of a total of approximately 2,489 acres located southeast of Interstate-10 (I-10) and Wiley's Well Road, near the city of Blythe in Riverside County, California. The Property is undeveloped desert land at the base of the northwest side of the Mule Mountains. The only structural improvement at the Property is a row of power lines that extend from Power Line Road, through the northeast portion of the Property, and connect to the substation adjacent to the north.

	Based on the information provided by the Sonoran West Solar Holdings, LLC, the Property includes portions of the following ten parcels: • 8790-070-006 • 8790-050-007 • 8790-050-004 • 8790-030-017 • 8790-080-022 • 8790-100-006 • 8790-080-023 • 8790-080-026 • 8790-080-028 • 8790-100-007
Property Operations.	Other than a row of power lines in the northeast portion, the Property is vacant undeveloped desert land.
Structures, Roads, Other Improvements:	The only structural improvements at the Property is a row of power lines and an associated access road that connect the offsite substation to the north, to Power Line Road to the northeast.
Property Size (acres):	Approximately 2,489 acres
Estimated % of Property Covered by Buildings and/or Pavement:	0%
Observed Current Property Use/Operations:	Other than the aforementioned powerlines, there are no uses or operations ongoing at the Property.
Observed Evidence of Past Property Use(s):	None
Electric Utility:	None other than Southern California Edison utility poles

5.3 HAZARDOUS SUBSTANCES AND PETROLEUM PRODUCTS

The following table summarizes Stantec's observations during the Property reconnaissance.

Observations	Description/Location
Hazardous Substances and Petroleum Products as Defined by CERCLA 42 U.S.C. § 9601(14):	None observed
Drums (≥ 5 gallons):	None observed
Strong, Pungent, or Noxious Odors:	None observed
Pools of Liquid:	None observed
Unidentified Substance Containers:	None observed

Observations	Description/Location
PCB-Containing Equipment:	None observed
Other Observed Evidence of Hazardous Substances or Petroleum Products:	None observed

5.4 INTERIOR OBSERVATIONS

Due to the lack of structures there were no interior observations to be made.

5.5 EXTERIOR OBSERVATIONS

Stantec made the following observations during the site reconnaissance of exterior areas of the Property and/or identified the following information during the interview or records review portions of the assessment:

Observations	Description
On-site Pits, Ponds, or Lagoons:	None observed
Stained Soil or Pavement:	None observed
Stressed Vegetation:	None observed
Waste Streams and Waste Collection Areas:	None observed
Solid Waste Disposal:	Minor wind-blown debris and occasional discarded cans and small buckets from transients were observed.
Potential Areas of Fill Placement:	None observed
Wastewater:	None observed
Stormwater:	None observed
Wells:	None observed
Septic Systems:	None observed
Other exterior observations	A row of power lines and an associated access road that connect the offsite substation to the north, to Power Line Road to the northeast.

5.6 UNDERGROUND STORAGE TANKS/STRUCTURES

Existing USTs:	No visible evidence (fill pipes, vent pipes, dispensers, surface patches), which would indicate the presence of USTs, was discovered during the site reconnaissance.
Former USTs:	No visible evidence (fill pipes, vent pipes, dispensers, surface patches), which would indicate the presence of USTs, was discovered during the site reconnaissance.
Other Underground Structures:	None observed.

5.7 ABOVEGROUND STORAGE TANKS

Existing ASTs:	No visible evidence (fill pipes, vent pipes, dispensers, surface stains), reports, or other evidence of existing ASTs were discovered during this Phase I ESA.
Former ASTs:	No visible evidence (fill pipes, vent pipes, dispensers, surface stains), reports, or other evidence of former ASTs were discovered during this Phase I ESA.

5.8 ADJOINING PROPERTIES

5.8.1 Current Uses of Adjoining Properties

An electrical substation is located to the north/northeast of the Property boundary (Figure 2). The remaining adjoining properties consist of native desert land.

5.8.2 Observed Evidence of Past Uses of Adjoining Properties

Stantec observed no evidence of past uses of adjoining properties.

5.8.3 Pits, Ponds, or Lagoons on Adjoining Properties

As viewed from the Property and/or from public rights-of-way, Stantec made the following observations about the presence of pits, ponds, and lagoons on adjoining properties:

NORTH	None observed.
SOUTH	None observed.
EAST	None observed.
WEST	None observed.

5.9 OBSERVED PHYSICAL SETTING

Topography of the Property and Surrounding Area:	The Property slopes to the north/northwest. Elevations range from approximately 690 feet above mean sea level (amsl) in the south end to approximately 430 feet amsl at the northwest end of the Property.

6.0 INTERVIEWS

The AAI final rule requires that a Property interview be conducted with the owner or Property occupants that are most familiar with the Site. Interviews with available parties are discussed below.

Name and Phone Number	Findings
Chris Haley Bureau of Land Management (BLM) Equipment Operator (760) 408-9179	Mr. Haley of the BLM was interviewed by Stantec via telephone on April 24, 2018. Mr. Haley stated that the Property is vacant desert land and that he knows of no past uses other than that the general area was used for military training in the early 1940s. He was not aware of any existing or past ordnance found at the Property. Mr. Haley indicated that the nearest evidence of past military use are observable tank tracks near the Coon Hollow Campground, located approximately 6 miles south of the Property. Mr. Haley was not aware of any environmental issues associated with the Property.

7.0 DATA GAPS

The federal AAI rule [40 CFR 312.10(a)] and ASTM E1527-13 identify a "data gap" as the lack or inability to obtain information required by the standards and practices of the rule despite good faith efforts by the Environmental Professional or the User.

Any data gaps resulting from the Phase I ESA described in this report are listed and discussed below.

Gap	Discussion
Deletions or Exceptions from Scope of Work Referenced in Section 1:	None.
Weather-Related Restrictions to Site Reconnaissance:	None.
Facility Access Restrictions to Site Reconnaissance:	None.
Other Site Reconnaissance Restrictions:	Due to the potential presence of sensitive plant and animal species in the area, the majority of the Property could not be accessed by vehicle and had to be traversed by foot. As a result, Stantec made a concerted effort to traverse specific areas as much of the Property by foot and to evaluate areas from higher ground to obtain a general understanding/view of Property conditions. However, it should be noted that because the Property is undeveloped desert land, not all areas were traversed due to the Property size and time constraints. The areas not traversed were observed from higher vantage points in the eastern, northern, and southern portions of the Property where photographs locations are plotted on Figure 2.
Data Gaps from Environmental Records Review:	None.
Data Gaps from Historical Records Review:	The CRDEH files archived records by address. Consequently, since there are no addresses associated with the Property, no request could be submitted. However, sufficient information has been obtained through other third-party sources, online government databases, and former environmental reports. Therefore, this data gap is not considered significant.
Data Gaps from Interviews:	None.
Other Data Gaps:	None.

8.0 CONCLUSIONS

We have performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E-1527-13 and the requirements of AAI for the "Property". Any exceptions to, or deletions from, this practice are described in the Data Gaps section of this report. This assessment has revealed no evidence of recognized environmental conditions (RECs) in connection with the Property except for the following:

- Munitions and Explosives of Concern and Unexploded Ordnance. Historical documentation reviewed by Stantec for the Property vicinity found that portions of the Property are located within an area that is classified as a formerly used defense site (FUDS). The FUDS is identified as Wiley Well Water Point. The historical documents indicate that Wiley Well Water Point was a military camp that was part of the Desert Training Center (DTC) in the early 1940s. The DTC was a collection of military camps designed to train the United States army for desert combat in North Africa during World War II. The DTC was later renamed the California-Arizona Maneuver Area (CAMA) as the war effort expanded to other overseas campaigns. The Wiley Well Water Point camp was used for combat and tactical training for approximately nine months between late 1943 and early 1945.

  The Wiley Well Water Point was issued the FUDS designation following review of a large collection of archived maps, drawings, technical ordnance data, real estate documentation, correspondence, and various other records by the United States Army Corps of Engineers (USACE). The historical documents related to Wiley Well Water Point indicate that the majority of the training exercises took place in the areas to the north and west of the Wiley Well area, but no specific training areas or artillery ranges are listed in the archived documents. However, based on a site visit conducted by USACE in 1994, an area containing seven targets and munitions debris (MD) was found in the northeast portion of the Wiley Well Water Point FUDS. This area was later designated as "MRS01 – Impact Area" (MRS01) and comprises approximately 94 acres. Munitions debris known or suspected to be within MRS01 based on past site visits and discoveries include munitions cartridges, bullet shells, practice mines, and projectiles. MRS01 is located more than ½ mile south of the Property boundary. However, the Property overlaps with portions of the northern reaches of the Wiley Well Water Point FUDS designated area at two locations.

  In addition to these FUDS delineated areas that overlap the Property, it should be noted that other UXO, MEC, and MD has also been found outside of the MRS01 – Impact Area in the northern areas of the Wiley Well Water Point FUDS, including at the location of the nearby state prisons and the Coon Hollow campground area. Additionally, a previous Phase 1 ESA prepared by URS indicates that potential MEC/UXO or MD was observed in the southern portion of the Property (parcel during a biological survey in 2011. The location plotted on URS figures is outside of the FUDS delineated area. Stantec did not observed any MEC, UXO, or MD during the Property visit. The URS report does not indicate what the item was that was believed to be MEC/UXO or whether it was ever confirmed to be MEC/UXO by certified professionals.

Based on the information above, in May/June of 2017 Bay West LLC (Bay West) was engaged to evaluate the potential for MEC/UXO to exist at the Property and to prepare a Site Characterization Report documenting the findings. The portion of the Bay West Site Characterization Report that was provided to Stantec is attached in Appendix D. The site characterization work performed by Bay West included a historical records review, interviews, and a visit to the Property for a visual reconnaissance of a random transect in the southern portion. The historical records review provided no definite information regarding the use of the Property as an artillery range or minefield. However, an interview performed with Riverside County Sheriff (Sheriff) Sergeant Bob Epps revealed that the Sheriff's Hazardous Device Team has responded on numerous occasions regarding M1B1 practice landmines and small arms ammunition within the Property boundaries. The practice landmines were recovered at the approximate locations shown on Figure 2. During the visit, Bay West personnel observed evidence of military materials including gas masks canisters, food cans, and a first aid kit. No UXO or evidence of UXO such as craters or targets were observed. However, Bay West recommended further investigation of the Property using geophysical mapping and investigation of magnetic anomalies.

Based on the information provided above, MEC, munitions debris (MD), munitions constituents (MC), or unexploded ordnance (UXO) may be present at the Property and may be encountered during development activities. The FUDS delineated areas that overlap onto the Property, the approximate locations of the alleged MEC/UXO found by URS, and the practice landmines found in the southern portion of the Property, are illustrated on Figure 2. The designation of portions of the Property as a FUDS, and the potential presence of UXO/MEC to exist at the Property, is considered an REC.

Based on past conversations with the DTSC and United Stated Army Corps of Engineers (USACE) on similar sites in the region, and on Bay West's report conclusions, Stantec recommends the following with regard to the potential existence of MEC, UXO, or MD:

- Consultation and guidance from a certified MEC/UXO professional to evaluate the appropriate course of action and associated costs related to assessment, remediation, and construction support;
- Where ground disturbance work is involved, contractors should be OSHA HAZWOPER-trained in accordance with standard 29CFR 1910.120 and hold a current certification;
- Where ground disturbance work is involved, contractors should be trained in identifying UXO/MEC;
- If suspected munitions are encountered at any point by any onsite individual, the "3R's of Explosives Safety" should be followed. The "3R's" include:
    - Recognize – when something may be a munition and the dangers involved.

- Retreat – do not touch the potential munition and carefully leave the area.
- Report – immediately report the finding to local law enforcement.

Although not considered a REC, the following items of note were identified during this Phase I ESA:

- Indistinguishable Surface Feature, 2002 Aerial Photograph. A short diagonal line measuring approximately 60 feet is visible in the northeast corner of parcel 8790-050-007. This area of the parcel appears to be within the boundaries of where the Wiley Well Water Point FUDS is mapped (see Section 4.4.6 and Figure 2). The line is not visible in any of the other historic aerial photographs.

9.0 NON-SCOPE CONSIDERATIONS

The scope of work completed was limited solely to those items in the ASTM E1527-13 standard. No ASTM E1527-13 non-scope services were performed as part of this Phase I ESA.

9.1 LEAD-BASED PAINT

Concern for lead-based paint (LBP) is primarily related to residential structures. The EPA's Final Rule on Disclosure of Lead-Based Paint in Housing (40 CFR Part 745) defines LBP as paint or other surface coatings that contain lead equal to or in excess of 1.0 milligram per square centimeter or 0.5 percent by weight.

The risk of lead toxicity in LBP varies based upon the condition of the paint and the year of its application. The U.S. Department of Housing and Urban Development (HUD) has identified the following risk factors:

The age of the dwelling as follows: maximum risk is from paint applied before 1950.

There is severe risk from paint applied before 1960.

There is moderate risk from deteriorated paint applied before 1970.

There is slight risk from the paint that is intact but applied before 1977.

The condition of the painted surfaces.

The presence of children and certain types of households in the building.

Previously reported cases of lead poisoning in the building or area.

Construction Date	Residential (Yes/No)	Observed Condition of Painted Surfaces
n/a	n/a	There are no painted structures or surfacing at the Property.

9.2 ASBESTOS

Asbestos can be found in many applications, including sprayed-on or blanket-type insulation, pipe wraps, mastics, floor and ceiling tiles, wallboard, mortar, roofing materials, and a variety of other materials commonly used in construction. The greatest asbestos-related human health risks are associated with friable asbestos, which is ACM that can be reduced to powder by hand pressure. Friable asbestos can become airborne and be inhaled, and has been associated with specific types of respiratory disease. The manufacturing and use of asbestos in most building products was curtailed during the late 1970s.

The Property is not developed with any structures or paved areas and no construction debris piles were noted on the Property. As a result, asbestos is not considered an environmental concern.

9.3 RADON

Radon is a colorless, tasteless radioactive gas with an EPA-specified action level of 4.0 PicoCuries per liter of air (pCi/L) for residential properties. Radon gas has a very short half-life of 3.8 days. The health risk potential of radon is primarily associated with its rate of accumulation within confined areas near or in the ground, such as basements, where vapors can readily transfer to indoor air from the ground through foundation cracks or other pathways. Large, adequately ventilated rooms generally present limited risk for radon exposure. The radon concentrations in buildings and homes depend on many factors, including soil types, temperature, barometric pressure, and building construction (EPA, 1993).

Stantec reviewed regional data published by the EPA (http://www.epa.gov/radon/zonemap.html) on average indoor radon concentrations in the vicinity of the Property.

<table>
<tr><td>Zip Code 92239</td><td>Riverside County</td></tr>
<tr><td colspan="2">EPA Radon Zones (w/Average Measured Indoor Radon concentrations)</td></tr>
<tr><td>100% below 4 pCi/L</td><td>Zone 2 – moderate
(>=2 pCi/L and <=4 pCi/L);
average first floor concentration 0.117 pCi/L</td></tr>
<tr><td colspan="2">Normally-occupied sub grade areas (i.e. basement apartments, offices, stores, etc.).</td></tr>
<tr><td colspan="2">No subgrade areas are present or proposed at the Property.</td></tr>
</table>

The property is located in Zone 2 and is considered to have only a moderate potential for radon. Stantec concludes that radon is unlikely to represent an environmental concern to the Property and recommends no further investigation regarding this issue.

9.4 FLOOD ZONES

According to the Physical Setting summary portion of the EDR report, the Property is not located within a flood plain. Stantec also searched the FEMA flood plain map service at www.msc.fema.gov and the Property is not located in a flood plain.

10.0 REFERENCES

Bay West, LLC (2017), Desert Training Center Site Characterization Report and Action Recommendation.

California Department of Conservation Division of Mines and Geology (CDMG), 1963, Geologic Map of California: Needles Sheet.

California Department of Conservation Division of Mines and Geology (CDMG), 1986, Note 36 Geomorphic Provinces of California, May.

Environmental Data Resources, Inc. (EDR), EDR Radius Atlas with Geocheck, Inquiry Number 5256788.2s, dated April 12, 2018.

_____, Historical Topographic Map Report, Inquiry Number 5256788.4, dated April 13, 2018.

_____, Aerial Photo Decade Package (Georeferenced), Inquiry Number 5256788, dated April 17, 2018.

_____, City Directory Image Report, Inquiry Number 52567885.5, dated April 13, 2018.

Jennings, C.W., 1994, Fault activity map of California and adjacent areas, with locations of recent volcanic eruptions: California Division of Mines and Geology Geologic Data Map 6, 92 p., 2 pls., scale 1:750,000.

Parsons, 2009, Final Technical Project Planning Memorandum and Associated Documentation, Wiley Well Water Point, Ripley, California, FUDS Project Number J09CA071001, dated August.

Parsons, 2009, Final Site Specific Work Plan Addendum to the Programmatic Work Plan, Wiley Well Water Point, Ripley, California, FUDS Project Number J09CA071001, dated October.

Parsons, 2010, Final Site Inspection Report, Wiley Well Water Point, Ripley, California, FUDS Project Number J09CA071001, dated April.

URS, 2011, Phase I Environmental Site Assessment, Sonoran West Solar Electric Generating Facility, 12 Miles Southwest of Blythe, Riverside County, California, dated December 21.

Website References

California Military Department, State Military Museums website: http://www.militarymuseum.org

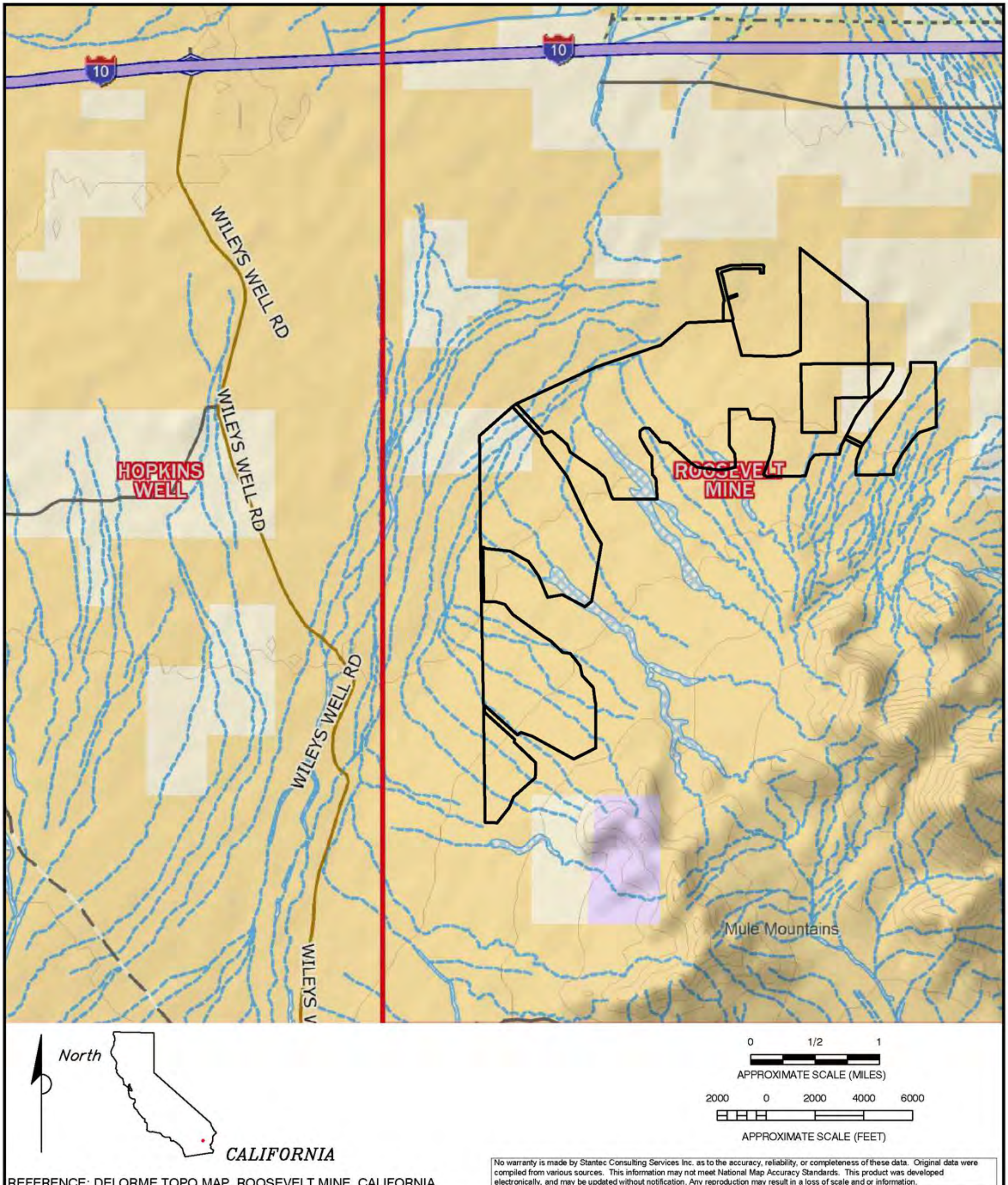
Department of Toxic Substances Control, Envirostor website: https://www.envirostor.dtsc.ca.gov/public/

State Water Resources Control Board, GeoTracker website:
https://geotracker.waterboards.ca.gov/

US EPA, Map of Radon Zones, Interactive Radon Map, website:
https://www.epa.gov/radon/epa-map-radon-zones

Division of Oil, Gas, and Geothermal Resources, Well Finder website:
http://www.conservation.ca.gov/dog/Pages/Wellfinder.aspx

Figures

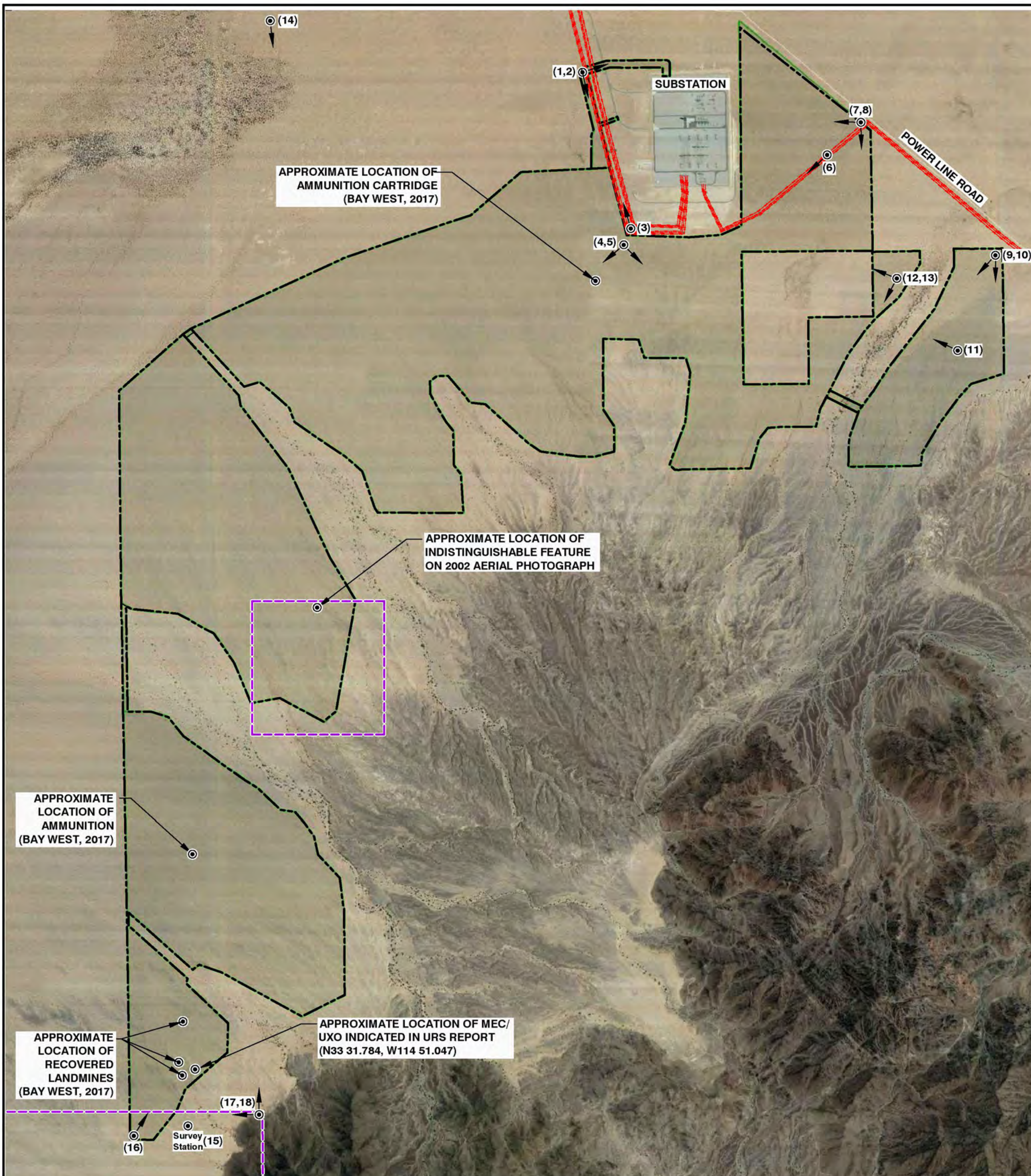


REFERENCE: DELORME TOPO MAP, ROOSEVELT MINE, CALIFORNIA

Stantec

PHASE 1 ESA SONORAN WEST SOLAR HOLDINGS, LLC BLYTHE, CALIFORNIA		SITE LOCATION MAP		FIGURE: 1
JOB NUMBER: 185804157	DRAWN BY: STA	CHECKED BY: DM	APPROVED BY: KM	DATE: 04/16/18

FILEPATH:V:\1858\active\185804157\FIG 1_SONORAN WEST SOLAR HOLDINGS, LLC_SITE LOCATION MAP.dwg | Layout Tab: 1 | Drafter: saguinaldo | May 14, 2018 at 16:18



LEGEND:

PROPERTY BOUNDARY

ELECTRIC LINE - HIGH VOLTAGE

WILEY WELL WATER POINT FORMERLY USED DEFENSE SITE (FUDS) BOUNDARY

(1) PHOTOGRAPH NUMBER,
APPENDIX A

N

0 2000 4000

APPROXIMATE SCALE IN FEET

REFERENCE: GOOGLE EARTH PRO AERIAL IMAGE AND
STANTEC FIELD NOTES.

FOR: PHASE 1 ESA SONORAN WEST SOLAR HOLDINGS, LLC BLYTHE, CALIFORNIA		PROPERTY MAP		FIGURE: 2
JOB NUMBER: 185804157	DRAWN BY: STA	CHECKED BY: DM	APPROVED BY: KM	DATE: 04/16/18

FILEPATH:V:\1858\active\185804157\FIG 2_FIG 1_SONORAN WEST SOLAR HOLDINGS, LLC_SITE VICINITY MAP.dwg | Layout Tab: 2 | Drafter: saguinaldo | May 14, 2018 at 16:18

Appendix A
PHOTOGRAPHS OF THE PROPERTY AND VICINITY

STANTEC CONSULTING SERVICES, INC
PHOTOGRAPHIC RECORD

Client: Sonoran West Solar Holdings, LLC	**Job Number:** 185804157
Site Name: Sonoran West Solar Holdings, LLC	**Location:** Blythe, California
Photographer: Dion Monge	**Date:** March 27, 2018

Photograph No. 1

View from the northern portion of the Property, facing east along the proposed gen-tie line that would connect to the substation near the northeast Property boundary.

Photograph No. 2

View from the northern portion of the Property, facing south/southeast along the proposed gen-tie line that would connect to the substation near the northeast Property boundary

STANTEC CONSULTING SERVICES, INC PHOTOGRAPHIC RECORD	
Client: Sonoran West Solar Holdings, LLC	**Job Number:** 185804157
Site Name: Sonoran West Solar Holdings, LLC	**Location:** Blythe, California
Photographer: Dion Monge	**Date:** March 27, 2018

Photograph No. 3

View from the northern portion of the Property, facing north along the proposed gen-tie line that would connect to the substation near the northeast Property boundary.

Photograph No. 4

Facing southwest across the Property near the northern boundary.

STANTEC CONSULTING SERVICES, INC
PHOTOGRAPHIC RECORD

Client: Sonoran West Solar Holdings, LLC	**Job Number:** 185804157
Site Name: Sonoran West Solar Holdings, LLC	**Location:** Blythe, California
Photographer: Dion Monge	**Date:** March 27, 2018

Photograph No. 5

Facing southeast across the Property near the northern boundary.

Photograph No. 6

Facing southwest in the northeast portion of the Property. Substation is in the background.

STANTEC CONSULTING SERVICES, INC PHOTOGRAPHIC RECORD	
Client: Sonoran West Solar Holdings, LLC	**Job Number:** 185804157
Site Name: Sonoran West Solar Holdings, LLC	**Location:** Blythe, California
Photographer: Dion Monge	**Date:** March 27, 2018

Photograph No. 7

View facing west toward the substation from the northeast portion of the Property.

Photograph No. 8

View facing south from the northwest portion of the Property.

STANTEC CONSULTING SERVICES, INC PHOTOGRAPHIC RECORD	
Client: Sonoran West Solar Holdings, LLC	**Job Number:** 185804157
Site Name: Sonoran West Solar Holdings, LLC	**Location:** Blythe, California
Photographer: Dion Monge	**Date:** March 27, 2018

Photograph No. 9

View facing southwest from the eastern portion of the Property.

Photograph No. 10

View facing southwest from the eastern portion of the Property.

STANTEC CONSULTING SERVICES, INC PHOTOGRAPHIC RECORD	
Client: Sonoran West Solar Holdings, LLC	**Job Number:** 185804157
Site Name: Sonoran West Solar Holdings, LLC	**Location:** Blythe, California
Photographer: Dion Monge	**Date:** March 27, 2018

Photograph No. 11

View facing northwest from the eastern portion of the Property. Typical undeveloped desert land.

Photograph No. 12

View facing southwest from the eastern portion of the Property.

STANTEC CONSULTING SERVICES, INC **PHOTOGRAPHIC RECORD**	
Client: Sonoran West Solar Holdings, LLC	**Job Number:** 185804157
Site Name: Sonoran West Solar Holdings, LLC	**Location:** Blythe, California
Photographer: Dion Monge	**Date:** March 27, 2018

Photograph No. 13

View facing northwest from the eastern portion of the Property.

Photograph No. 14

General view of the Property and surrounding properties from a vantage point along Power Line Road. The entire area is open desert land.

STANTEC CONSULTING SERVICES, INC PHOTOGRAPHIC RECORD	
Client: Sonoran West Solar Holdings, LLC	**Job Number:** 185804157
Site Name: Sonoran West Solar Holdings, LLC	**Location:** Blythe, California
Photographer: Dion Monge	**Date:** March 27, 2018

Photograph No. 15

View of former survey station located to the southeast of the Property.

Photograph No. 16

View facing north from the southern corner of the Property.

STANTEC CONSULTING SERVICES, INC PHOTOGRAPHIC RECORD	
Client: Sonoran West Solar Holdings, LLC	**Job Number:** 185804157
Site Name: Sonoran West Solar Holdings, LLC	**Location:** Blythe, California
Photographer: Dion Monge	**Date:** March 27, 2018

Photograph No. 17

Facing west from an offsite vantage point near the south end of the Property.

STANTEC CONSULTING SERVICES, INC
PHOTOGRAPHIC RECORD

Client: Sonoran West Solar Holdings, LLC	**Job Number:** 185804157
Site Name: Sonoran West Solar Holdings, LLC	**Location:** Blythe, California
Photographer: Dion Monge	**Date:** March 27, 2018

Photograph No. 18

Facing north from an offsite vantage point near the south end of the Property.

Appendix B
STANTEC RESUMES

Dion Monge

Project Scientist

Dion has extensive knowledge of underground storage tank investigations, Phase I and II environmental site assessment, groundwater monitoring and reporting, soil, soil vapor, and groundwater quality assessments, and testing for asbestos and lead based paint. His project experience is extensive and wide ranging and includes many types of soil, soil vapor, and groundwater assessment and monitoring for planned, existing, and former sites. Dion also has experience in testing fill soils placed on grading sites.

He has experience on redevelopment of former oil field sites that include submittal of construction site review plans, oil well mitigation (venting and casing alterations), abandonment of oil wells, and remedial investigations and remediation involving soil contamination.

Dion also has experience working with 1166 AQMD air monitoring on projects ranging from limited access dry cleaner excavations, solvent excavations, and petroleum excavations related to underground storage tank releases. Included in this type of monitoring is the assessment of a safe work environment for the contractors involved with this type of work.

He has considerable knowledge in asbestos and lead based paint sampling as a building inspector and lead sampling technician. Asbestos and lead based paint surveys have ranged from large office buildings to sampling highway bridges.

EDUCATION

BS, Soil Science, California Polytechnic University, Pomona, Pomona, California, 2004

Health & Safety Certification (29 CFR 1910.120),, 40-Hour OSHA Health & Safety Certification, Redlands, California, 2005

Health & Safety Annual Update Certification, 8-Hour OSHA, Redlands, California, 2009

First Aid/CPR, American Red Cross, Redlands, California, 2009

Certified Building Inspector, AHERA 8-Hour Refresher, Redlands, California, 2009

PROJECT EXPERIENCE

Asbestos, Lead Based Paint, and Hazardous Material Management

Haller Wash Bridge No. 54-0891R&L, San Bernardino County, California (Asbestos and Lead-Based Paint Sampling Assistant)

Dion conducted asbestos and lead based paint survey on highway bridge. He assisted with planning field operations, measuring bridge dimensions, and collecting samples. Tasks included sample collection, bridge measurements, and documentation.

Project Management Oversight

Magnolia Plaza, Fountain Valley, California

Dion is providing project management of soil, soil vapor, and quarterly groundwater sampling related to a solvent release at a former dry cleaning facility. Tasks include preparation of work plans for approval by the Regional Water Quality Control Board and oversight of field sampling, including lithologic logging, for soil and soil vapor investigations performed within a multi-tenant strip center. Additional tasks include preparation of investigative reports and quarterly groundwater monitoring reports. The site remains an open case and preparation of a work plan to use electrical resistive heating ("ERH") will be prepared in the coming weeks.

Dion Monge

Project Scientist

Former Superb Dry Cleaners, Anaheim, California

Dion performed field oversight, direction, and confirmation soil sampling of a limited access excavation within a former dry cleaner unit. Post excavation field activities included application of a barrier type floor sealant along with post excavation indoor air sampling. Remedial work led to regulatory closure being granted from the local agency.

Site Assessment
I-15/I-215 Interchange Improvements, San Bernardino County, California (Sampling Technician)

Dion helped conduct site investigations and surveys for potentially hazardous materials. His efforts supported Caltrans' plans to improve and widen the existing freeway lanes, entrance and exit ramps, and vehicle and railroad bridges along a 6-mile stretch of the I-15 and I-215 freeways in the Devore area of San Bernardino County. Dion's efforts included Environmental Evaluation of Recognized Environmental Concerns identified in ISAs

Highway 138 Environmental Investigations, San Bernardino County, California (Field Assessment and Reporting)

Dion helped complete hazardous material site investigations on five bridges along State Highway 138 along a 20-mile segment through portions of Los Angeles and San Bernardino Counties, California. The investigation was conducted in accordance with Caltrans protocols and was compliant with EPA's all appropriate inquiries guidance and ASTM Standard Practice E1527. He performed site reconnaissance, conducted regulatory and agency field reviews, and reviewed environmental databases and historical fire insurance, telephone directories, aerial photographs, topographic maps, and other environmental records for properties within one half mile of the proposed 20-mile segment of Highway 138. Dion compiled an report summarizing findings and identifying recognized environmental conditions.

Proposed Friends Christian High School, Yorba Linda, California

Dion prepared preliminary site assessment (PSA) report for future private school site to identify recognized environmental conditions ("RECs") related to past property usage as an oil field with 21 oil wells abandoned prior to 1990. Completion of the PSA led to his management of the project through site closure. Field investigations and reporting by Dion included Phase II investigations, methane survey, oil well leak testing and venting, backfill and compaction (including soils testing), DOGGR Construction Site Review, and excavation and onsite management of more than 5,000 cubic yards of petroleum impacted soils.

SR-58 Widening, San Bernardino County, California

Dion performed Initial Site Assessment (ISA) for Caltran at Kramer Junction for the proposed widening of State Route 58. The ISA was performed in accordance with guidelines promulgated by the American Society for Testing and Materials (ASTM) and included historical research and coordination of permit/file reviews with local building/planning departments and environmental agencies. Dion's role included the field visit, observation documentation, agency reviews, and reporting.

Soil Sampling
Caltrans I-15, Task Order 28, Hesperia, California

Dion conducted a soil investigation for metals analysis alongside I-15 for disposal recommendations during construction of mortar-lined channels at several locations. He assisted with planning field operations and collected soil samples. Tasks included sample collection, preservation, and documentation.

** denotes projects completed with other firms*

Anne E. Perez

Geologic Associate

Ms. Perez has more than 10 years of professional experience in the environmental and geotechnical engineering fields as both a geologist and a project manager. She serves as office health and safety coordinator for Stantec's Redlands, California, office—providing overall health and safety direction to the project managers and field staff as they implement assignments associated with CVOC; SVOC; and metal impacts to soil, groundwater, and/or air. Ms. Perez has extensive experience in the installation and logging of monitoring wells, soil borings, and groundwater sampling. She has also been involved in the development of remedial investigation plans, health and safety plans, and corrective action plans. Ms. Perez is also the project manager on several underground storage tank (UST) sites, chlorinated solvent release sites, and wastewater sampling sites.

EDUCATION

MS, Geology, University of California, Riverside, Riverside, California, 2003

BS, Geology, University of California, Riverside, Riverside, California, 2000

MEMBERSHIPS

Earth Science Department Fellowship, University of California, Riverside

Member, Golden Key International Honour Society

PROJECT EXPERIENCE

Education

Project Unknown* (Teaching Assistant)

Ms. Perez's duties included conducting class/field instruction during the chairman of the Geology Department's absence, instructing students on the methods of measuring sedimentary sections in the field, and assisting students with their final field mapping projects.

Natural Hazards and Disasters* (Teaching Assistant)

Ms. Perez's duties included independently conducting four one-hour weekly discussion sessions, grading weekly homework assignments and midterms, holding office hours to assist students with lecture concepts/homework/exam preparation, and maintaining extensive grade reports (Excel).

Advanced Petrogenesis* (Teaching Assistant)

Ms. Perez's duties included assisting the professor and students on weekly field trips, obtaining journals/maps relevant to the lecture topic, assisting in writing and correcting exams, and assisting students with their project reports.

Igneous Petrology* (Teaching Assistant)

Ms. Perez's duties included assisting with lecture preparation, administering the laboratory section of the course (80 percent dealt with mineral identification using microscopes, 20 percent dealt with hand sample identification), writing the laboratory exams, grading the lab exams and twice-weekly exercises, and assisting the professor and students on field trips.

Environmental Assessments

Environmental Site Assessments, Various Locations, California

Ms. Perez performed Phase I, Phase II, and Additional Environmental Site Assessments on properties ranging from residential sites to former military parts manufacturing facilities in California. Tasks performed included subsurface soil investigations with direct push geoprobe drill rigs, soil classification, sample collections, and documentation.

Geologic Mapping

Southern California Area Mapping Project (SCAMP)* (Undergraduate Student Employee)

Ms. Perez assisted on the Southern California Area Mapping Project (SCAMP), utilizing GIS and ARC/INFO for map digitization.

Southern California Area Mapping Project (SCAMP)* (Graduate Student Employee)

Ms. Perez's duties included construction of map description and correlation for Open-file/DMG/USGS projects utilizing Adobe Illustrator; digitizing with GIS and ARC/INFO; and assisting the USGS supervisor with specific research projects which included Excel flowchart presentations (rock type flowcharts), soil data map integration with geologic maps, aerial photo reviews (recent landslides), and sample collection for Helium-3 absolute age dating research.

** denotes projects completed with other firms*

Anne E. Perez

Geologic Associate

Geologic Studies

Multiple Projects* (Geologist)

Ms. Perez's field duties included drilling oversight (hollow stem auger, direct push, AirVac); borehole logging and soil sampling; groundwater monitoring, well installation, development, gauging, and sample collecting; seismic survey oversight; and oversight on the installation of an ozone system.

Multiple Projects* (Geologist)

Ms. Perez's duties included report writing/preparation (work plans, investigation, reports, letter reports, data summary reports, health and safety plans); preparing and gathering report supporting documents (figures/tables); data collection/research/evaluation; groundwater/plume contouring; constructed geologic and hydrogeologic cross-sections; managing refinery remediation file database (Excel); aerial photo review/interpretation; and QA/QC reports/figures/tables.

Geotechnical Engineering

Project Unknown* (Summer Intern for Senior County Engineering Geologist)

Ms. Perez's duties included filing, geotechnical documents, reading and commenting on geotechnical/EIR reports, meeting with clients, updating county maps to note known faults and liquefaction concerns, attending planning commission meetings, and assisting a geotechnical firm with trench cleaning/logging (trench dimensions: 300 feet long, 25 feet wide, and 15 feet deep).

Multiple Projects* (Junior Engineering Geologist)

Working directly with the senior County engineering geologist, Ms. Perez reviewed and commented on geotechnical/soils/EIR/mining/mining reclamation reports and maps; verified slopes on grading , provided aerial photo analysis/interpretation, interacted with clients (both in the office and out in the field) regarding job site status, updated county maps to note location of faults and liquefaction concerns, attended planning commission meetings, logged boreholes during groundwater monitoring well installations at waste/dump sites (assisted the Water Department), updated clients and the public with regard to the status of their projects/property, and handled the requests/questions of visitors to the county office (retrieved maps/file information and project information).

Multiple Projects* (Junior Engineering Geologist)

Working directly with the senior county engineering geologist, Ms. Perez reviewed and commented on geotechnical/soils/EIR/mining/mining reclamation reports and maps, verified slopes on grading plans, provided aerial photo analysis/interpretation, interacted with clients (in office and field) regarding job site status, updated county maps to note location of faults and liquefaction concerns, attended planning commission meetings, and logged boreholes during groundwater monitoring well installations at waste/dump sites (assisted the Water Department).

Research / Laboratories

Project Unknown* (Research Assistant)

Ms. Perez analyzed and described approximately 100 thin sections in support of paleontology research (led by Dr. Mary Droser, graduate advisor for the Department of Geology).

Multiple Projects* (Research Assistant)

Ms. Perez worked with such chemicals as HCL, HF, HNO, and Perchloric Acid in the rock dissolution and quartz purification processes.

Project Unknown* (Research Assistant)

Ms. Perez collected and processed rock samples for cosmogenic radionuclide surface exposure age dating, using the chemistry lab facilities at Lawrence Livermore National Laboratory.

Retail

Chevron Litigation Case, California

Ms. Perez assisted the expert witness with the collection of data relevant to the case. Tasks included extensive file reviews, meetings with the attorneys involved with the case, generation of file and cost information databases, and attendance and assistance at the mediation.

Roadways

I-15 Widening, San Bernardino County, California (Site Assessment)

Anne conducted site investigations and surveys for potentially hazardous materials. Her efforts supported Caltrans' plans to widen I-15 from Baker to Mountain Pass. Her efforts included aerially deposited lead surveys; Site Investigations to evaluate environmental concerns related to railroad property; and Asbestos Containing Materials surveys; and Lead-Based Paint surveys.

** denotes projects completed with other firms*

Anne E. Perez

Geologic Associate

I-215 Bi-county HOV Gap Closure, Riverside and San Bernardino County, California (Site Assessment)

Anne conducted site investigations and surveys for potentially hazardous materials. Her efforts supported Caltrans' plans to widen I-215 in the median and outside shoulders on the northbound and southbound shoulders of a 7.3-mile segment through Riverside, Colton, and San Bernardino. Anne's efforts included aerially deposited lead surveys; Site Investigations to evaluate environmental concerns related to railroad property; and Asbestos Containing Materials surveys; and Lead-
Based Paint surveys on 13 bridges.

I-15/I-215 Interchange Improvement, Devore, California (Site Assessment)

Anne helped conduct site investigations and surveys for potentially hazardous materials. Her efforts supported Caltrans' plans to improve and widen the existing freeway lanes, entrance and exit ramps, and vehicle and railroad bridges along a 6-mile stretch of the I-15 and I-215 freeways. Anne's efforts included environmental evaluation of recognized environmental concerns identified in ISAs.

I-10/Tippecanoe Avenue Interchange Improvements, San Bernardino, California (Site Assessment)

Anne helped conduct site assessments, site investigations, and surveys for potentially hazardous materials to support SANBAG/Caltrans' plans to realign freeway access routes and widen Tippecanoe Avenue in San Bernardino. Work included aerially deposited lead surveys; Site Investigations on five existing and former gasoline service stations, an ISA Addendum, remedial feasibility studies, human health risk evaluations, and remedial actions by soil vapor extraction and site closure.

Caltrans District 8, San Bernardino, California (Task Manager)

Ms. Perez was responsible for the preparation of proposals, work plans, reports, staff scheduling, invoicing, site visits, correspondence with the District 8 office, amendment requests, monthly task progress reports, monthly invoicing/budget progress reports, and all task order management duties for each project.

** denotes projects completed with other firms*

Kyle D. Emerson PG, CEG

Managing Principal Geologist

Stantec

Kyle has more than 35 years of professional experience—25 of those years with Stantec—providing geotechnical and environmental consulting. During the course of his experience, he has been involved with a wide variety of geological and engineering projects. He has been in direct charge of quality control/quality assurance (QA/QC) work for Stantec and previous firms for geological, engineering geological, and environmental services primarily in California. Additionally, Kyle has been a primary contact for Stantec with many different clients (including multi-party actions) and regulatory bodies involving contracting, workplan approvals, site assessments and closures, permitting, remedial action, and litigation support. With regard to litigation services, Kyle has extensive experience providing expert witness testimony, second-party review, and litigation support and analysis.

Kyle's extensive experience includes assessment and remediation of property-specific and regional issues involving soil and groundwater contaminated with petroleum hydrocarbons, chlorinated solvents, heavy metals, pesticides, and PCBs.

He currently serves as the managing principal geologist in Stantec's Redlands, California office.

EDUCATION

Engineering Geology/Hydrogeology, California State University, Los Angeles, California, 1984

AS, General Science, Crafton Hills College, Yucaipa, California, 1975

BS, Geological Sciences, California State University, Long Beach, California, 1982

REGISTRATIONS

Certified Engineering Geologist #1271, State of California

Professional Geologist #4066, State of California

PROJECT EXPERIENCE

Bioremediation

Excavation and Treatment of Petroleum-Contaminated Soil

Kyle designed the excavation and treatment of 45,000 cubic yards of petroleum-contaminated soil. Soil treatment included utilizing vapor extraction, combined with bioremediation.

Chemicals & Polymers

Two Former Chemical Plants, Environmental Site Assessments and Remediation, Vernon, California

Mr. Emerson was part of the team for conducting Phase I and Phase II Environmental Site Assessments (ESA) and developing remedial action plans for two former chemical plant sites with 80-year industrial histories. Phase I ESAs used historical files, maps, aerial photographs, available documents, and data from public agencies and historical directories for identifying recognized environmental concerns. Extensive Phase II ESA survey activities aided in identifying below-grade structures such as vaults/USTs, as well as assessing the extent of influence and nature of the contamination. These investigations confirmed the presence of heavy metals, petroleum hydrocarbons, volatile organic compounds, polychlorinated biphenyls, radioactive materials, semi-volatile organic compounds, and polycyclic aromatic compounds in the soils for these sites. Specific areas of concern included former settling ponds, a bone yard, maintenance areas, transformer and substations, wastewater treatment facilities, and above-ground storage tank farms. A conceptual mode was developedl for use in a health risk assessment and developed risk-based corrective actions to address potential health and environmental concerns. He assisted with the development and implementation of a remedial action plan, combined administrative controls, engineering controls, and active remediation; this resulted in the cost-effective return of one site to active use, and is reducing health risks to occupants and the public at the second site.

Kyle D. Emerson PG, CEG

Managing Principal Geologist

CONFIDENTIAL: Aerospace Adhesives and Coatings Plant, Glendale, California

Mr. Emerson was part of the team that conducted feasibility studies to evaluate remedial alternatives for remediation of chlorinated VOCs, 1,4 dioxane, and hexavalent chromium (CrVI) in soil, soil vapor, and groundwater. Feasibility studies included groundwater pump testing, benchscale column testing to evaluate in situ alternatives for reducing CrVI to the less mobile CrIII valence state, soil vapor extraction, capping, and excavation. Field pilot studies were performed to evaluate the efficiency of various CrVI reductants including the use of ferrous sulfate, calcium polysulfide, emulsified oil, and fructose. Extensive multi-depth soil vapor testing was conducted to evaluate the distribution of VOCs in the subsurface and to support vapor intrusion risk assessment. Feasibility studies were completed in 2008. Remedial actions are expected to be completed in 2011.

Condition Assessments

Assessment and Mitigation of Manufacturing Facility

Kyle managed the assessment and mitigation of an ammunition manufacturing facility covering 1,100 acres in a complex geologic environment. The contaminates involved red and white phosphorous, TNT, chlorinated solvents, solid wastes, and live ordinance.

Soil Contamination Assessment Supervision and Management

Kyle managed and supervised soil contamination assessment and in-situ remediation of heavy metals involving chromium, cadmium, nickel and zinc by chemical fixation to depths in excess of 40 feet below ground surface beneath existing structures within several manufacturing facilities.

Litigation Support and Expert Testimony

Kyle provided litigation support and expert testimony on more than 20 separate projects involving service stations, chlorinated solvent cases, heavy metal, and semi-volatile releases.

Corporate / Office

CT Realty Environmental Remediation of Former Dry Cleaners, El Centro, California

Mr. Emerson was responsible for assessments and remediation at this former dry cleaners which released the dry cleaning chemical tetrachloroethene (PCE) to the ground and underlying groundwater. The work included initial site assessment, agency interaction and negotiations with the California Regional Water Quality Control Board (CRWQCB), and Colorado Basin Region human health risk assessment (HHRA), design and implementation of remedial investigations, feasibility studies, remedial action plans, and implementation of remediation in mitigating chlorinated solvent contamination in vadose and saturated zones at concentrations indicative of DNAPL. The results of the completed remediation, as well as continued confirmation sampling and monitoring, allowed the CRWQCB to issue site closure in 2008. The site has since been redeveloped into a new commercial development.

Environmental Assessments

Siting Studies

Kyle performed initial siting studies for potential Class I, II, and III landfills. The project included detailed geologic mapping, hydrogeological studies, and permeability studies of caps and liners.

Environmental Site Remediation

Assessment and Remedial Design, California (Project Supervisor)

Kyle supervised the assessment and remedial design of a system to eliminate salt brine contamination in shallow perched water horizons in the Yucaipa, San Bernardino, and Riverside areas of southern California.

Design and Installation of Recovery Systems*

Kyle designed and installed numerous free-product recovery systems that successfully recovered product. One of the sites contained product up to 11-feet thick covering more than three city blocks. The dissolved phase had affected a multi-aquifer system and a public drinking water system.

Geophysical Characterizations*

Kyle performed and supervised numerous geophysical characterizations to determine the extent of old landfills. He provided classification studies, landfill gas monitoring, removal verification during grading, methane collection and mitigation plans, permitting, and closure plans.

** denotes projects completed with other firms*

Kyle D. Emerson PG, CEG

Managing Principal Geologist

Domestic Landfill Development*

Kyle designed and supervised the dynamic consolidation of a domestic landfill for development. He used this process to minimize expected settlement to overlying structures. Kyle designed commercial developments on closed landfills that involved complex methane collection and monitoring systems and building settlement controls.

Clay Borrow Site Studies

Kyle performed more than 10 separate clay borrow site studies for determining sources of material to cap landfills; ranged from a 20-acre dry lakebed to a 450-acre parcel in complex folded marine sediments.

Assessment, Clean Up, and Regulatory Support Management, Santa, Monica (Project Manager)

Kyle managed the assessment, clean up, and complex regulatory support of a PRP site in an MTBE case (Charnock subbasin). His work involved more than 20 environmental professionals working full time for two years to complete the assessment and clean up mandated by the regulatory agencies.

Hazardous Waste

San Gabriel Valley Superfund Site, Remediation & Closure of Multiple Source Areas, Industry, California

Mr. Emerson performed feasibility studies to evaluate appropriate and relevant remedial alternatives to mitigate constituents of concern in five AOCs contaminated with chlorinated hydrocarbons, heavy metals, petroleum fuel, and cutting oils. Ultimately, a combination of remedial alternatives was implemented that included large-diameter auger excavation to 45 feet to minimize impacts on facility operations, vapor extraction, vapor intrusion risk assessment, deed restriction, and monitored natural attenuation. At the completion of remedial actions, confirmation soil, soil vapor, and groundwater sampling were conducted and followed with risk assessment to demonstrate that remedial objectives had been achieved. No further action was recently granted by the US EPA and Los Angeles Regional Water Quality Control Board.

Mixed-Use

Port of San Diego Rohr Facility, Chula Vista, California

Mr. Enerson assisted in a detailed subsurface assessment of the Rohr facility. The intent of the assessment was to evaluate the 40-acre former aircraft part manufacturing facility for acquisition by the Port of San Diego for redevelopment into a business park and entertainment complex. The assessment identified the presence of soil, soil vapor, and groundwater impacts by petroleum hydrocarbons, VOCs, heavy metals, PCBs, and semi-volatile organic compounds. He utilized many sampling techniques to assess the limits and concentrations of contaminants in the subsurface. Ultimately, the team was able to develop a cost estimate for potential remedial action cost associated to corrective action to allow redevelopment.

Master Planned Commercial/Residential Redevelopment Project, Whittier, California (Project Manager)

Kyle oversaw the assessment of 26 contiguous properties that are part of a 21-acre master planned commercial/residential redevelopment project. The properties included industrial facilities, platting lines, fuel USTs, and metal processing plants, among others. The estimated cleanup costs are approximately $2 million.

Multi-Unit / Family Residential

Residential Development Assessment, Ventura, California (Project Director)

Kyle directed an assessment of a 40-acre former agricultural property proposed for residential development. Pesticides were identified above hazardous waste levels and preliminary remediation goals established by the U.S. Environmental Protection Agency. Through corrective grading methods and onsite placement of the pesticide impacted soils, all material were re-used on site without offsite disposal. The over all cost savings for the client was more than $1 million. Total cost was less than $250,000 for all necessary activities.

Oil & Gas

Oil Field Site Assessments*

Kyle performed site assessments at oil field leases involving refineries, bulk storage areas, piping systems and wellhead, and drilling mud pit contamination.

** denotes projects completed with other firms*

Kyle D. Emerson PG, CEG

Managing Principal Geologist

Environmental Protection Agency Superfund Action, Culver City, California (Project Manager)
Kyle served as the project manager representing a major oil company in the assessment, remedial action, and litigation support in a multi-party contamination case affecting a City water supply. The assessment involved more than 250 continuous core borings up to 100 feet, as well as extensive remedial actions. The total cost for all related activities was $22 million. The case is settled and the closure of the site is pending.

Project Management
Liability and Property Management Consulting Services
Kyle is providing liability and property management consulting services to more than 10 medium to large property development firms in the US. His work involves property transaction assessments, contract review, acquisition guideline development, liability management evaluation, insurance acquisition, and strategic planning.

Residential Development
Environmental Development Management and Review (Project Manager)
Kyle manages and reviews environmental development issues for a large residential developer specializing in development of contaminated industrial properties by providing innovative solutions in developing contaminated properties for residential use through risk assessment, engineering, and administrative and property development controls.

Site Management and Remediation
Design and Implementation of Biodegradation Programs*, California
Kyle designed and implemented one of the first in-situ biodegradation programs in California; it involved 50,000 cubic yards of diesel-contaminated soils, and groundwater to depths of 70 feet below ground surface.

Soil and Groundwater Remediation Systems
Soil and Groundwater Contamination Assessments and Mitigation*, California (Project Manger)
Kyle managed numerous chlorinated solvent soil and groundwater contamination assessments and mitigation programs in southern California. The projects involved releases that impacted soil and groundwater to depth of groundwater more than 700 feet in multi-aquifer systems. One case involved with plume dimensions more than 1 mile from the source affecting residential properties.

Soil and Groundwater Assessment and Remediation Programs*
Implemented hundreds of soil and groundwater assessment and remediation programs at various service station facilities in Southern and Northern California, and Nevada. Work involved assessment, remedial design, installation, maintenance and monitoring. Closure has been received on a majority of these sites.

Assessment and Remediation Management*
Kyle managed the assessment and remediation of soil and groundwater manufacturing at dry cleaning facilities contaminated with chlorinated solvents.

Warehouse / Light Industrial
Glendale Redevelopment Project, Glendale, California (Project Manager)
Kyle managed the assessment and remedial actions during the redevelopment of and industrial property. The project involved the demolition of a historic manufacturing facility and a commercial dry cleaner. Each of these facilities were associated with releases of solvents and petroleum hydrocarbons. Remedial actions involved excavation by pattern drilling and off site disposal along with removal of former USTs. The total cost of remediation and assessment was $450,000.00.

** denotes projects completed with other firms*

Kyle D. Emerson PG, CEG

Managing Principal Geologist

Compton Redevelopment Project, Compton, California (Project Manager)

Kyle is serving as project manager for the assessment and remedial actions for a large redevelopment project. The project involves the redevelopment of a historic manufacturing facility and a former dry cleaner. Each of these facilities were associated with releases of solvents and petroleum hydrocarbons. The industrial facility was also associated with significant volumes of buried waste that required removal and disposal. These wastes also included the chemical referenced above, as well as PCBs and heavy metals. Remediation has included excavation, vapor extraction, and chemical fixation. The total cost of this project has been $2.8 million to date.

** denotes projects completed with other firms*

Kyle D. Emerson PG, CEG

Managing Principal Geologist

PUBLICATIONS

In-Situ Bioremediation of an Underground Diesel Fuel Spill: A Case Study. *Environmental Management*, 1989.

Appendix C

ENVIRONMENTAL AGENCY DATABASE SEARCH REPORT

RE Crimson, LLC
Blythe
Blythe, CA 92239

Inquiry Number: 5256788.2s
April 12, 2018

The EDR Radius Atlas™ with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

BLYTHE
BLYTHE, CA 92239

COORDINATES

Latitude (North):	33.5636030 - 33˚ 33' 48.97''
Longitude (West):	114.8405000 - 114˚ 50' 25.80''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	700462.2
UTM Y (Meters):	3715667.0
Elevation:	493 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5620012 ROOSEVELT MINE, CA
Version Date:	2012
North Map:	5619994 MCCOY PEAK, CA
Version Date:	2012
South Map:	5620016 THUMB PEAK, CA
Version Date:	2012
Southwest Map:	5620026 WILEY WELL, CA
Version Date:	2012
West Map:	5619988 HOPKINS WELL, CA
Version Date:	2012
Northwest Map:	5619996 MCCOY SPRING, CA
Version Date:	2012

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

EXECUTIVE SUMMARY

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL - National Priority List
Proposed NPL - - - - - - - - - - - - - - - Proposed National Priority List Sites
NPL LIENS - - - - - - - - - - - - - - - - - - Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL - - - - - - - - - - - - - - - - National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY - - - - - - - - - Federal Facility Site Information listing
SEMS - Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE - - - - - - - - - - - - Superfund Enterprise Management System Archive

Federal RCRA CORRACTS facilities list

CORRACTS - - - - - - - - - - - - - - - - - Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF - - - - - - - - - - - - - - - - RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG - - - - - - - - - - - - - - - - - - RCRA - Large Quantity Generators
RCRA-SQG - - - - - - - - - - - - - - - - - - RCRA - Small Quantity Generators
RCRA-CESQG - - - - - - - - - - - - - - - RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

LUCIS - Land Use Control Information System
US ENG CONTROLS - - - - - - - - - Engineering Controls Sites List
US INST CONTROL - - - - - - - - - - Sites with Institutional Controls

Federal ERNS list

ERNS - Emergency Response Notification System

State- and tribal - equivalent NPL

RESPONSE - - - - - - - - - - - - - - - - - State Response Sites

EXECUTIVE SUMMARY

State- and tribal - equivalent CERCLIS

ENVIROSTOR - - - - - - - - - - - - - - EnviroStor Database

State and tribal landfill and/or solid waste disposal site lists

SWF/LF - Solid Waste Information System

State and tribal leaking storage tank lists

LUST - Geotracker's Leaking Underground Fuel Tank Report
INDIAN LUST - - - - - - - - - - - - - - - Leaking Underground Storage Tanks on Indian Land
SLIC - Statewide SLIC Cases

State and tribal registered storage tank lists

FEMA UST - - - - - - - - - - - - - - - - - Underground Storage Tank Listing
UST - Active UST Facilities
AST - Aboveground Petroleum Storage Tank Facilities
INDIAN UST - - - - - - - - - - - - - - - - Underground Storage Tanks on Indian Land

State and tribal voluntary cleanup sites

INDIAN VCP - - - - - - - - - - - - - - - - Voluntary Cleanup Priority Listing
VCP - Voluntary Cleanup Program Properties

State and tribal Brownfields sites

BROWNFIELDS - - - - - - - - - - - - - Considered Brownfieds Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS - - - - - - - - - - A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT - - - - - - - - - - - - - - Waste Management Unit Database
SWRCY - Recycler Database
HAULERS - - - - - - - - - - - - - - - - - - - Registered Waste Tire Haulers Listing
INDIAN ODI - - - - - - - - - - - - - - - - - Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9 - - - - - - - - - - Torres Martinez Reservation Illegal Dump Site Locations
ODI - Open Dump Inventory
IHS OPEN DUMPS - - - - - - - - - - Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL - - - - - - - - - - - - - - - Delisted National Clandestine Laboratory Register
HIST Cal-Sites - - - - - - - - - - - - - - Historical Calsites Database
SCH - School Property Evaluation Program
CDL - Clandestine Drug Labs
Toxic Pits - - - - - - - - - - - - - - - - - - - Toxic Pits Cleanup Act Sites

US CDL	National Clandestine Laboratory Register

Local Lists of Registered Storage Tanks

SWEEPS UST	SWEEPS UST Listing
HIST UST	Hazardous Substance Storage Container Database
CA FID UST	Facility Inventory Database

Local Land Records

LIENS	Environmental Liens Listing
LIENS 2	CERCLA Lien Information
DEED	Deed Restriction Listing

Records of Emergency Release Reports

HMIRS	Hazardous Materials Information Reporting System
CHMIRS	California Hazardous Material Incident Report System
LDS	Land Disposal Sites Listing
MCS	Military Cleanup Sites Listing
SPILLS 90	SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR	RCRA - Non Generators / No Longer Regulated
FUDS	Formerly Used Defense Sites
DOD	Department of Defense Sites
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR	Financial Assurance Information
EPA WATCH LIST	EPA WATCH LIST
2020 COR ACTION	2020 Corrective Action Program List
TSCA	Toxic Substances Control Act
TRIS	Toxic Chemical Release Inventory System
SSTS	Section 7 Tracking Systems
ROD	Records Of Decision
RMP	Risk Management Plans
RAATS	RCRA Administrative Action Tracking System
PRP	Potentially Responsible Parties
PADS	PCB Activity Database System
ICIS	Integrated Compliance Information System
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS	Material Licensing Tracking System
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data
CONSENT	Superfund (CERCLA) Consent Decrees
INDIAN RESERV	Indian Reservations
FUSRAP	Formerly Utilized Sites Remedial Action Program
UMTRA	Uranium Mill Tailings Sites
LEAD SMELTERS	Lead Smelter Sites
US AIRS	Aerometric Information Retrieval System Facility Subsystem

EXECUTIVE SUMMARY

US MINES	Mines Master Index File
ABANDONED MINES	Abandoned Mines
FINDS	Facility Index System/Facility Registry System
UXO	Unexploded Ordnance Sites
ECHO	Enforcement & Compliance History Information
DOCKET HWC	Hazardous Waste Compliance Docket Listing
FUELS PROGRAM	EPA Fuels Program Registered Listing
CA BOND EXP. PLAN	Bond Expenditure Plan
Cortese	"Cortese" Hazardous Waste & Substances Sites List
CUPA Listings	CUPA Resources List
DRYCLEANERS	Cleaner Facilities
EMI	Emissions Inventory Data
ENF	Enforcement Action Listing
Financial Assurance	Financial Assurance Information Listing
HAZNET	Facility and Manifest Data
ICE	ICE
HIST CORTESE	Hazardous Waste & Substance Site List
HWP	EnviroStor Permitted Facilities Listing
HWT	Registered Hazardous Waste Transporter Database
MINES	Mines Site Location Listing
MWMP	Medical Waste Management Program Listing
NPDES	NPDES Permits Listing
PEST LIC	Pesticide Regulation Licenses Listing
PROC	Certified Processors Database
Notify 65	Proposition 65 Records
UIC	UIC Listing
WASTEWATER PITS	Oil Wastewater Pits Listing
WDS	Waste Discharge System
WIP	Well Investigation Program Case List

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	EDR Proprietary Manufactured Gas Plants
EDR Hist Auto	EDR Exclusive Historical Auto Stations
EDR Hist Cleaner	EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF	Recovered Government Archive Solid Waste Facilities List
RGA LUST	Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were not identified.

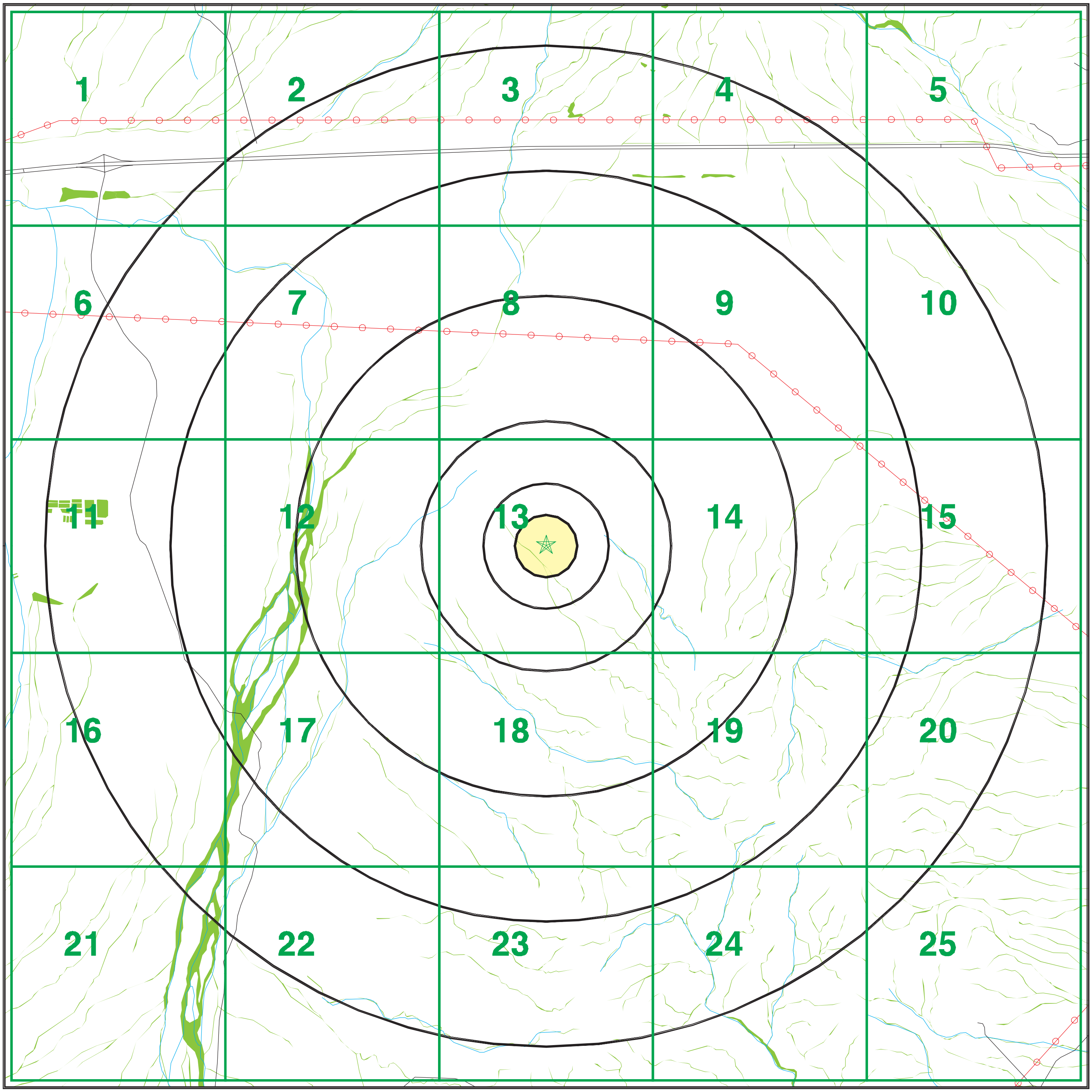
Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 23 records.

Site Name	Database(s)
HARVEY'S FISHING HOLE	RGA LUST
CRA SAND TRAP REPLACEMENT EAGLE MO	CHMIRS, ENF, NPDES
ST HWY 111 NE PALM SPRINGS	NPDES
	CDL
	CDL
PAR ELECTRIC CONTRACTORS	CHMIRS, HAZNET
RCIT - ROAD 62 #44	AST
DESERT SUNLIGHT 250, LLC& DESERT S	AST
SO. CALIF. GAS CO. - DESERT CENTER	AST
SOUTHERN CALIFORNIA GAS CO	HAZNET
CALTRANS D-8/CONSTR/EA08-0K6304	HAZNET
LONG BEACH CONTAINER TTRANSPORT, I	HAZNET
COVENANT TRANSPORTATION	HAZNET
MARQUEZ TRUCKING	HAZNET
HERTZ EQUIPMENT RENTAL CORPORATION	HAZNET
SWIFT TRANSPORTATION CORPORATION	HAZNET
DESERT SUNLIGHT 250 LLC AND DESERT	HAZNET
DESERT SUNLIGHT 250NA LLC& DESERT	FINDS
UNION FEED YARDS DISPOSAL SITE	RGA LF
BLYTHE SANITARY LANDFILL	RGA LF
CHUCKWALLA VALLEY STATE PRISON RAS	RGA LF
CHUCKAWALLA VALLEY STATE PRISON RA	RGA LF
KAISER EAGLE MOUNTAIN	DOCKET HWC

OVERVIEW MAP - 5256788.2S



0 1 2 4 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Upgradient Area
- Areas of Concern

SITE NAME:	RE Crimson, LLC	CLIENT:	Stantec
ADDRESS:	Blythe	CONTACT:	Dion Monge
	Blythe CA 92239	INQUIRY #:	5256788.2s
LAT/LONG:	33.563603 / 114.8405	DATE:	April 12, 2018 4:47 pm

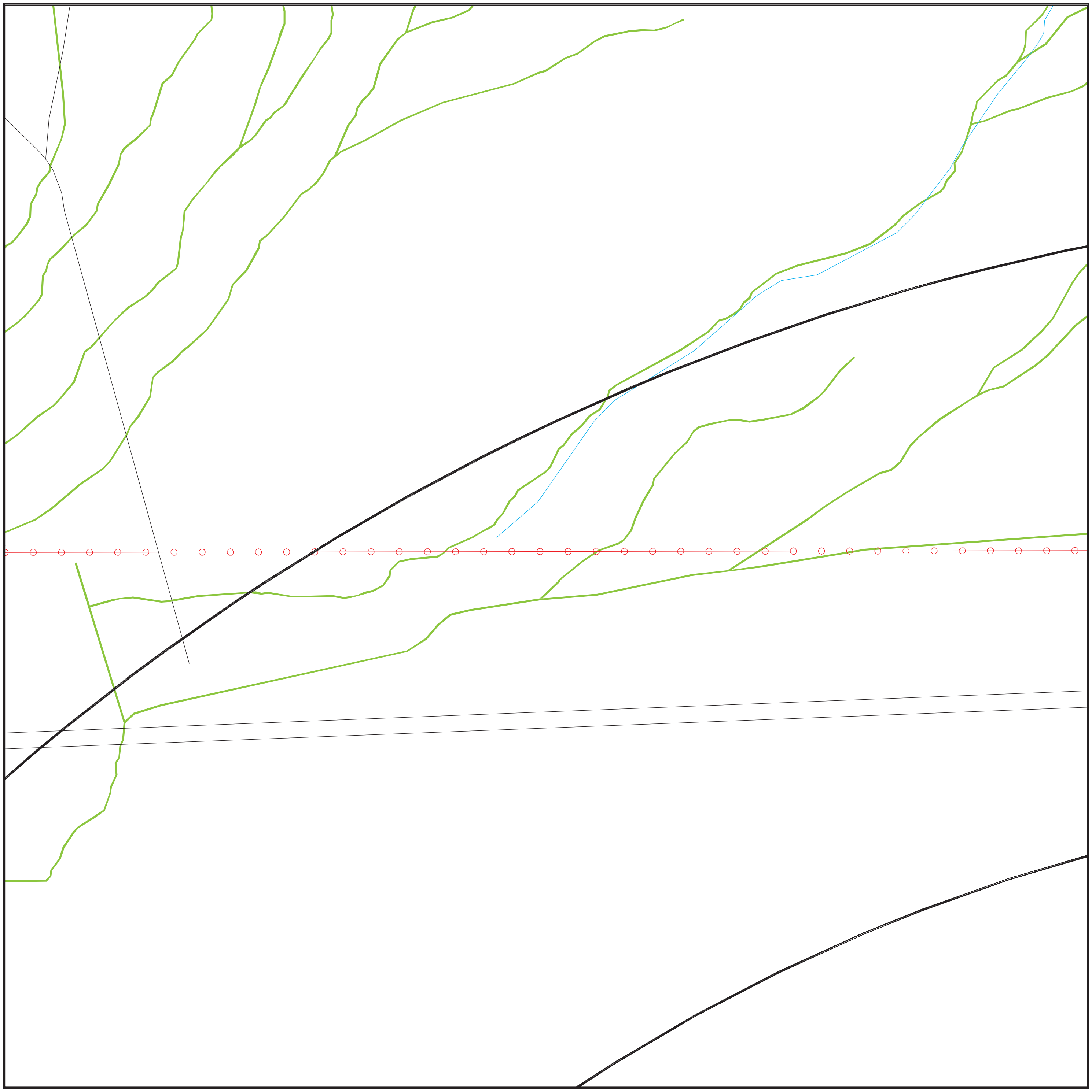
DETAIL MAP 1 OF 25 - 5256788.2S

0 1/8 1/4 1/2 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

SITE NAME:	RE Crimson, LLC	CLIENT:	Stantec
ADDRESS:	Blythe	CONTACT:	Dion Monge
	Blythe CA 92239	INQUIRY #:	5256788.2s
LAT/LONG:	33.563603 / 114.8405	DATE:	April 12, 2018 4:48 pm

DETAIL MAP 2 OF 25 - 5256788.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites

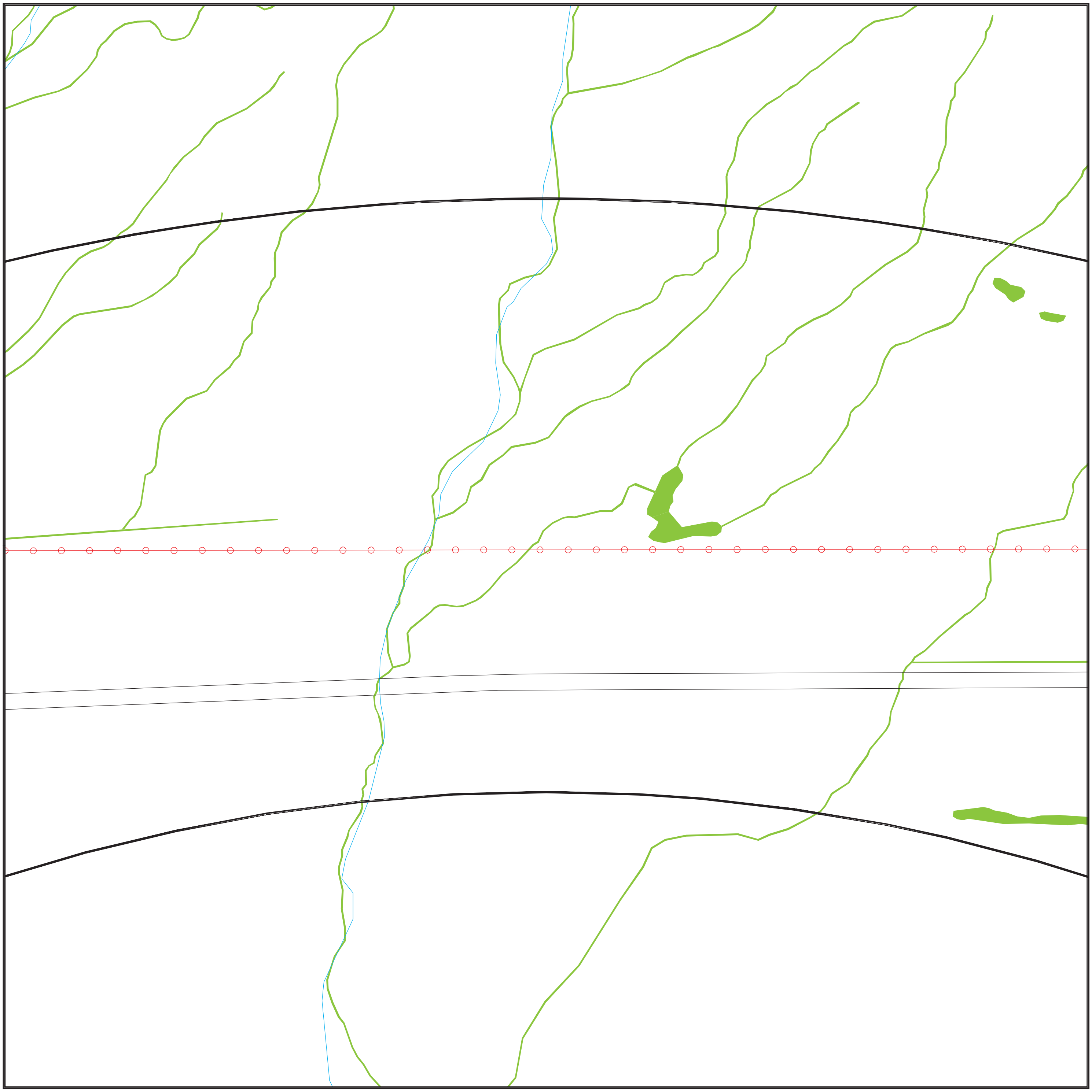
0 1/8 1/4 1/2 Miles

- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

- Areas of Concern

SITE NAME:	RE Crimson, LLC	CLIENT:	Stantec
ADDRESS:	Blythe Blythe CA 92239	CONTACT:	Dion Monge
		INQUIRY #:	5256788.2s
LAT/LONG:	33.563603 / 114.8405	DATE:	April 12, 2018 4:48 pm

DETAIL MAP 3 OF 25 - 5256788.2S



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

Sensitive Receptors

National Priority List Sites

Dept. Defense Sites

0 1/8 1/4 1/2 Miles

Indian Reservations BIA

Power transmission lines

100-year flood zone

500-year flood zone

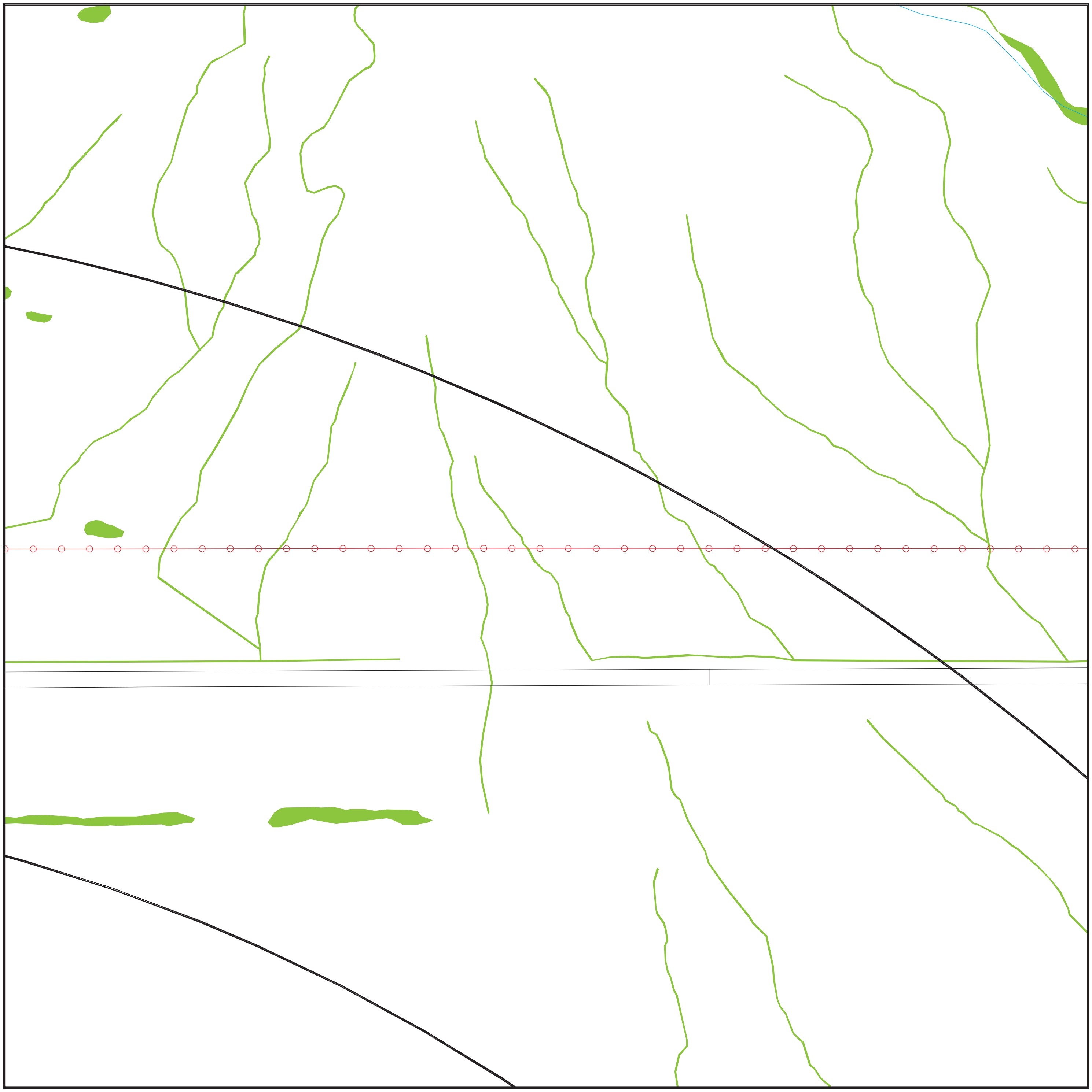
National Wetland Inventory

State Wetlands

Areas of Concern

SITE NAME: RE Crimson, LLC ADDRESS: Blythe Blythe CA 92239 LAT/LONG: 33.563603 / 114.8405	CLIENT: Stantec CONTACT: Dion Monge INQUIRY #: 5256788.2s DATE: April 12, 2018 4:48 pm

DETAIL MAP 4 OF 25 - 5256788.2S

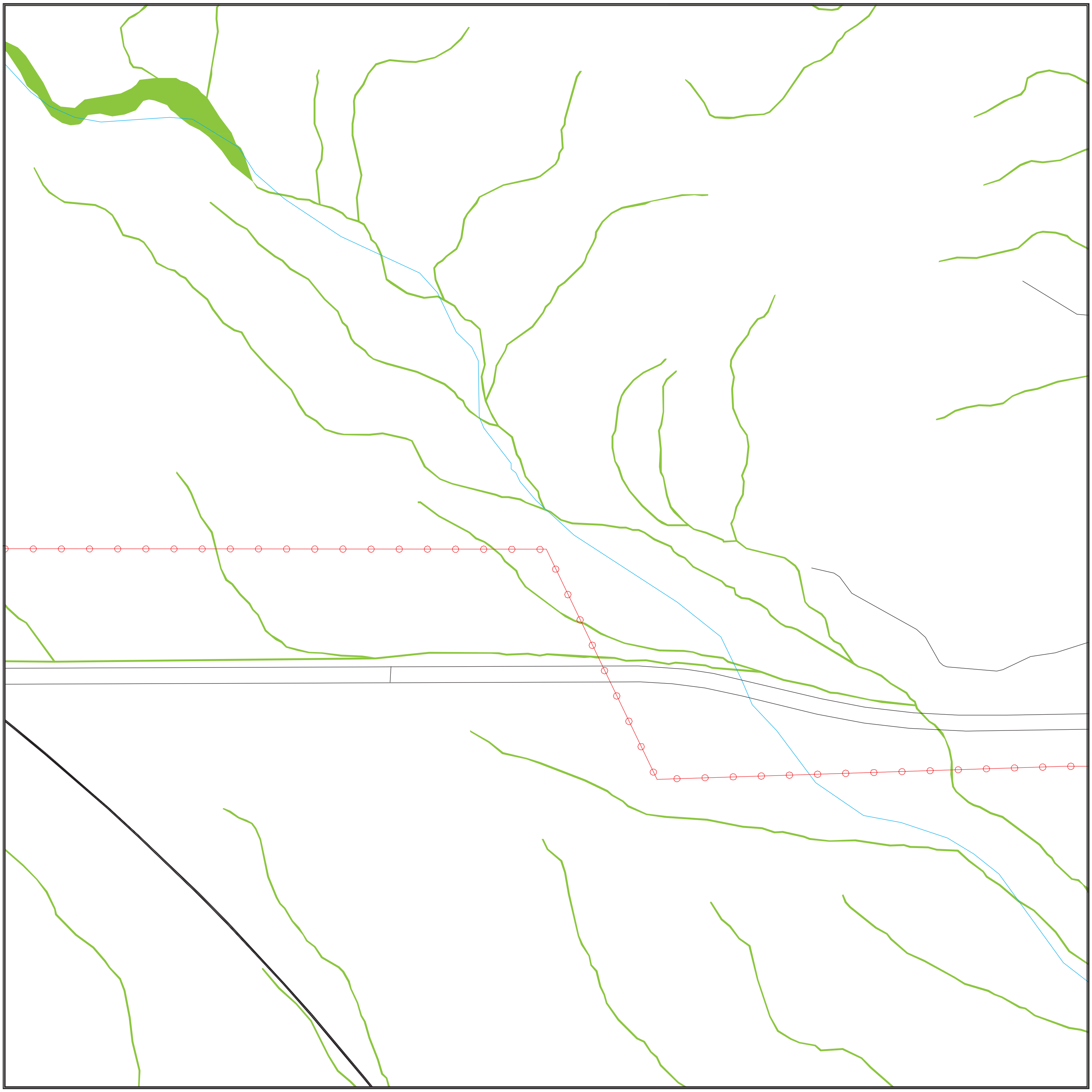


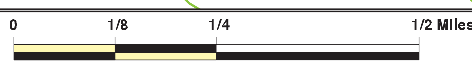
0 1/8 1/4 1/2 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

SITE NAME: RE Crimson, LLC ADDRESS: Blythe Blythe CA 92239 LAT/LONG: 33.563603 / 114.8405	CLIENT: Stantec CONTACT: Dion Monge INQUIRY #: 5256788.2s DATE: April 12, 2018 4:49 pm

DETAIL MAP 5 OF 25 - 5256788.2S

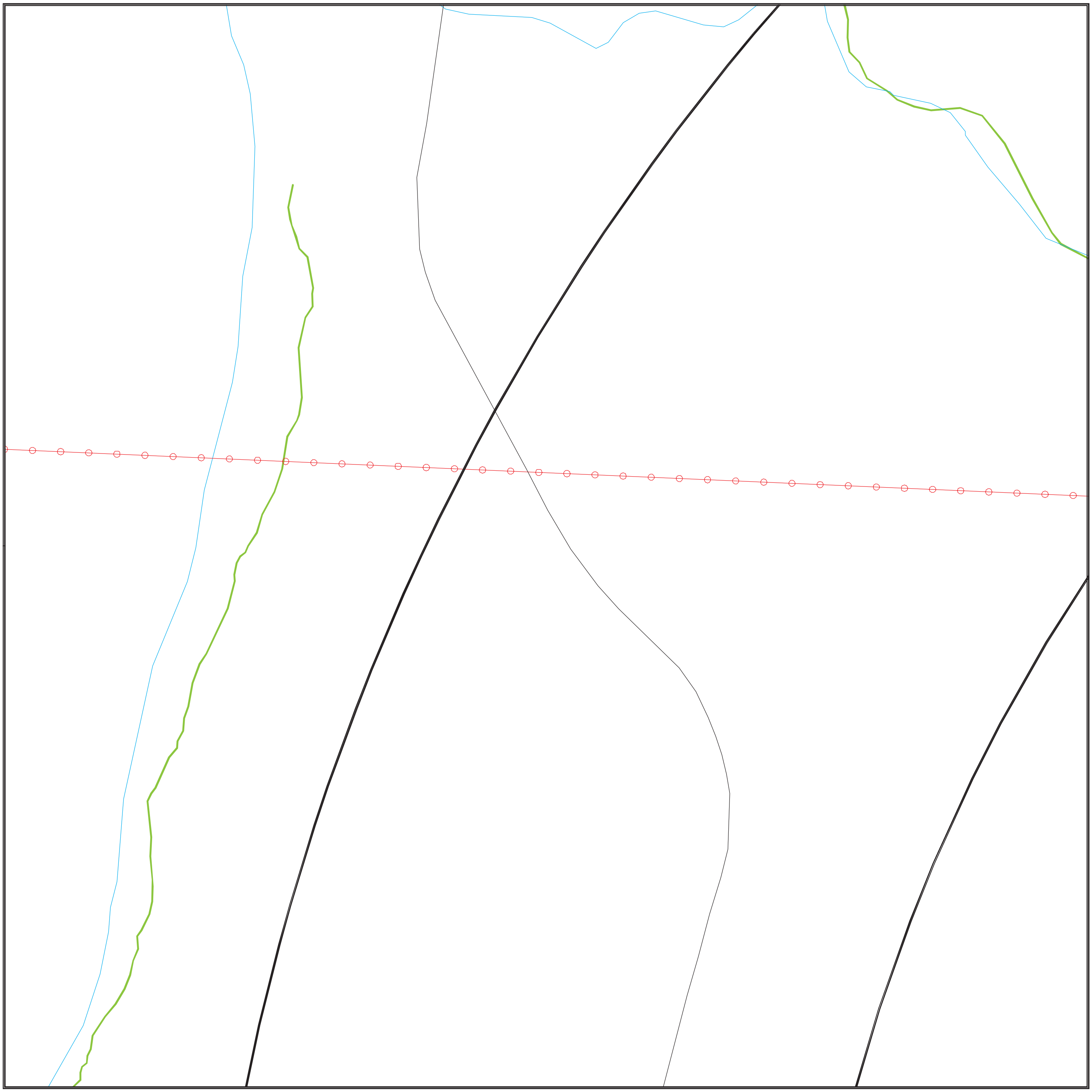




- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

SITE NAME:	RE Crimson, LLC	CLIENT:	Stantec
ADDRESS:	Blythe Blythe CA 92239	CONTACT:	Dion Monge
		INQUIRY #:	5256788.2s
LAT/LONG:	33.563603 / 114.8405	DATE:	April 12, 2018 4:49 pm

DETAIL MAP 6 OF 25 - 5256788.2S



Target Property
Sites at elevations higher than or equal to the target property
Sites at elevations lower than the target property
Manufactured Gas Plants
Sensitive Receptors
National Priority List Sites
Dept. Defense Sites

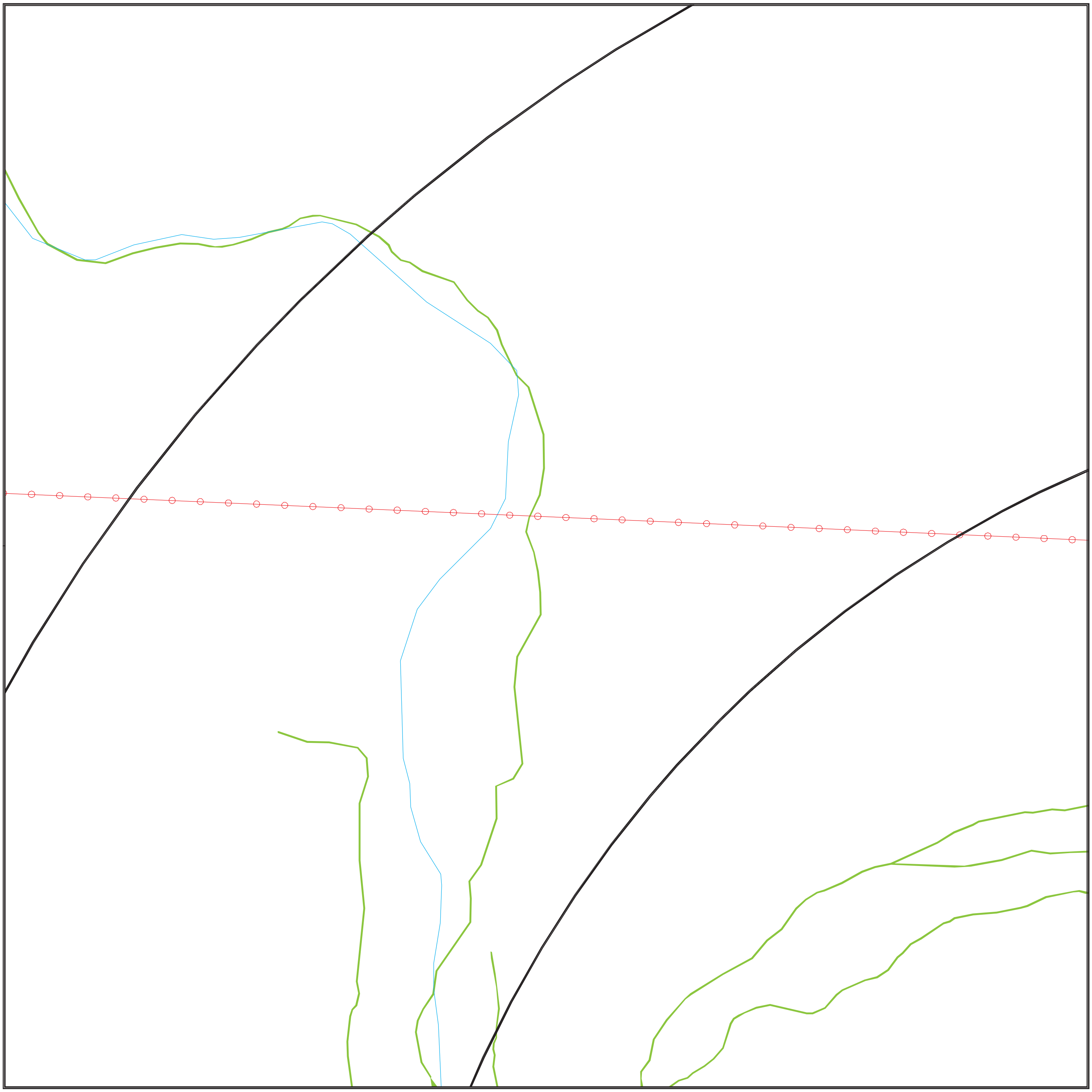
0 1/8 1/4 1/2 Miles

Indian Reservations BIA
Power transmission lines
100-year flood zone
500-year flood zone
National Wetland Inventory
State Wetlands

Areas of Concern

SITE NAME: RE Crimson, LLC ADDRESS: Blythe Blythe CA 92239 LAT/LONG: 33.563603 / 114.8405	CLIENT: Stantec CONTACT: Dion Monge INQUIRY #: 5256788.2s DATE: April 12, 2018 4:49 pm

DETAIL MAP 7 OF 25 - 5256788.2S

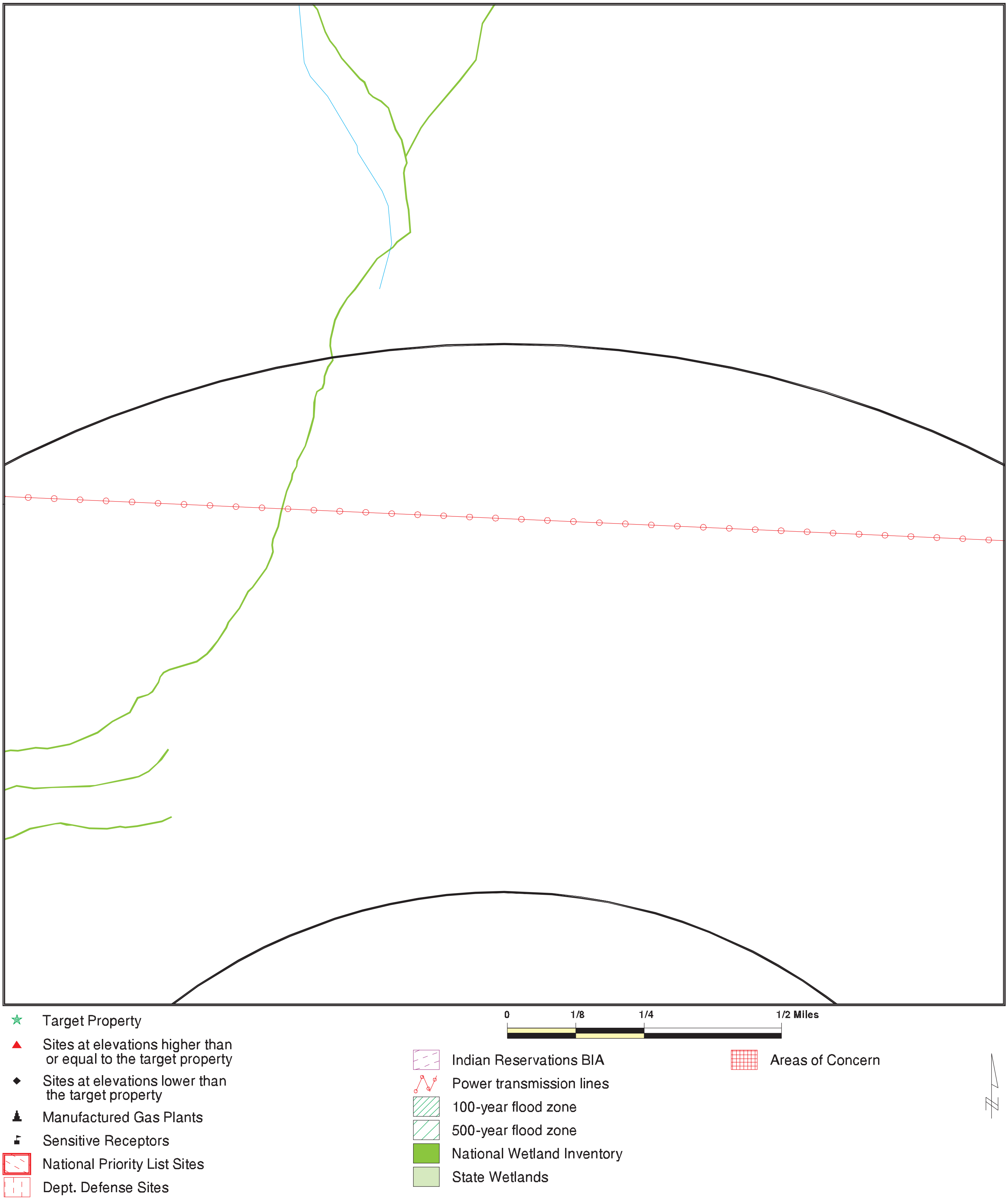


0 1/8 1/4 1/2 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

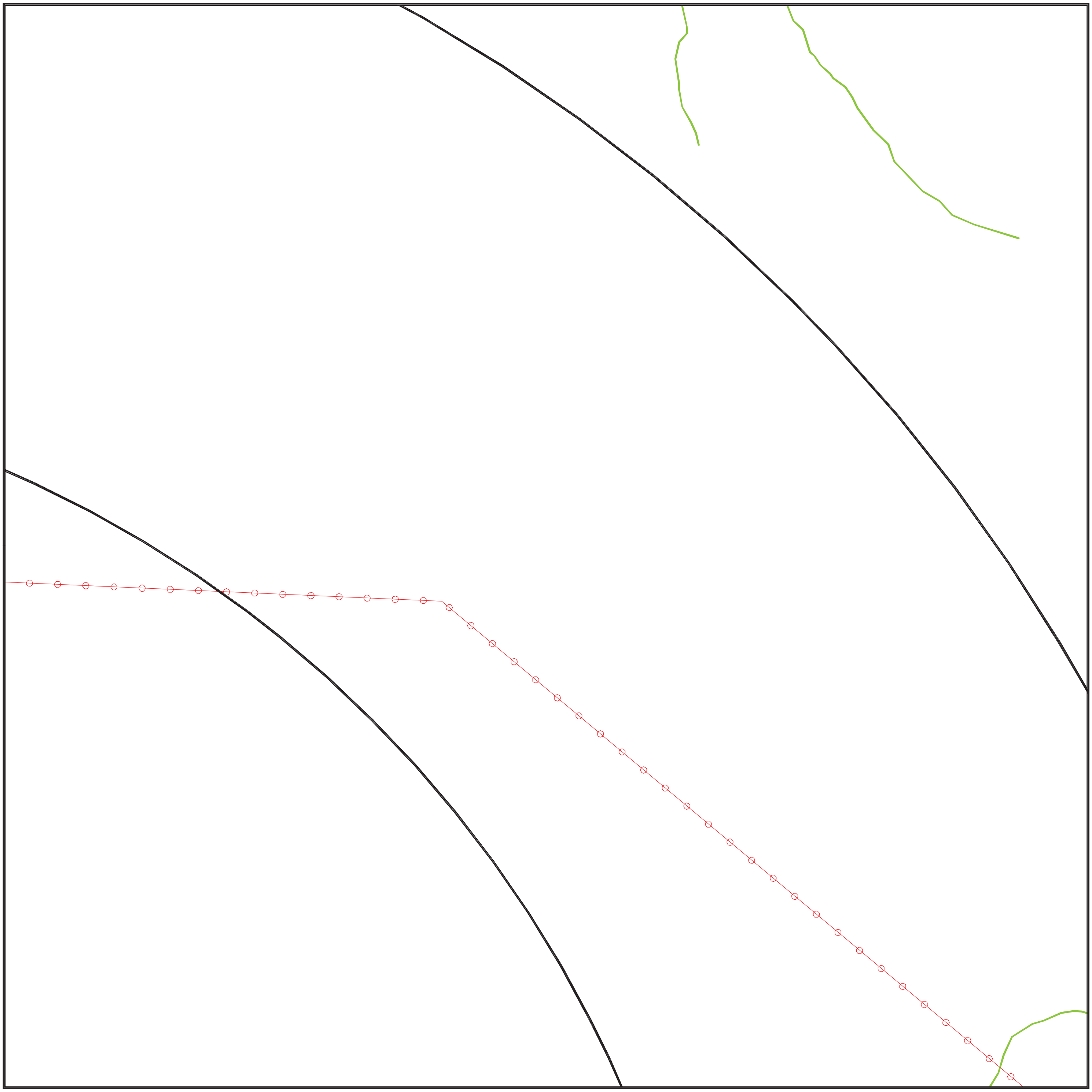
SITE NAME: RE Crimson, LLC ADDRESS: Blythe Blythe CA 92239 LAT/LONG: 33.563603 / 114.8405	CLIENT: Stantec CONTACT: Dion Monge INQUIRY #: 5256788.2s DATE: April 12, 2018 4:49 pm

DETAIL MAP 8 OF 25 - 5256788.2S



SITE NAME:	RE Crimson, LLC	CLIENT:	Stantec
ADDRESS:	Blythe	CONTACT:	Dion Monge
	Blythe CA 92239	INQUIRY #:	5256788.2s
LAT/LONG:	33.563603 / 114.8405	DATE:	April 12, 2018 4:50 pm

DETAIL MAP 9 OF 25 - 5256788.2S



0 1/8 1/4 1/2 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

SITE NAME:	RE Crimson, LLC	CLIENT:	Stantec
ADDRESS:	Blythe Blythe CA 92239	CONTACT:	Dion Monge
		INQUIRY #:	5256788.2s
LAT/LONG:	33.563603 / 114.8405	DATE:	April 12, 2018 4:50 pm

DETAIL MAP 10 OF 25 - 5256788.2S

0 1/8 1/4 1/2 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

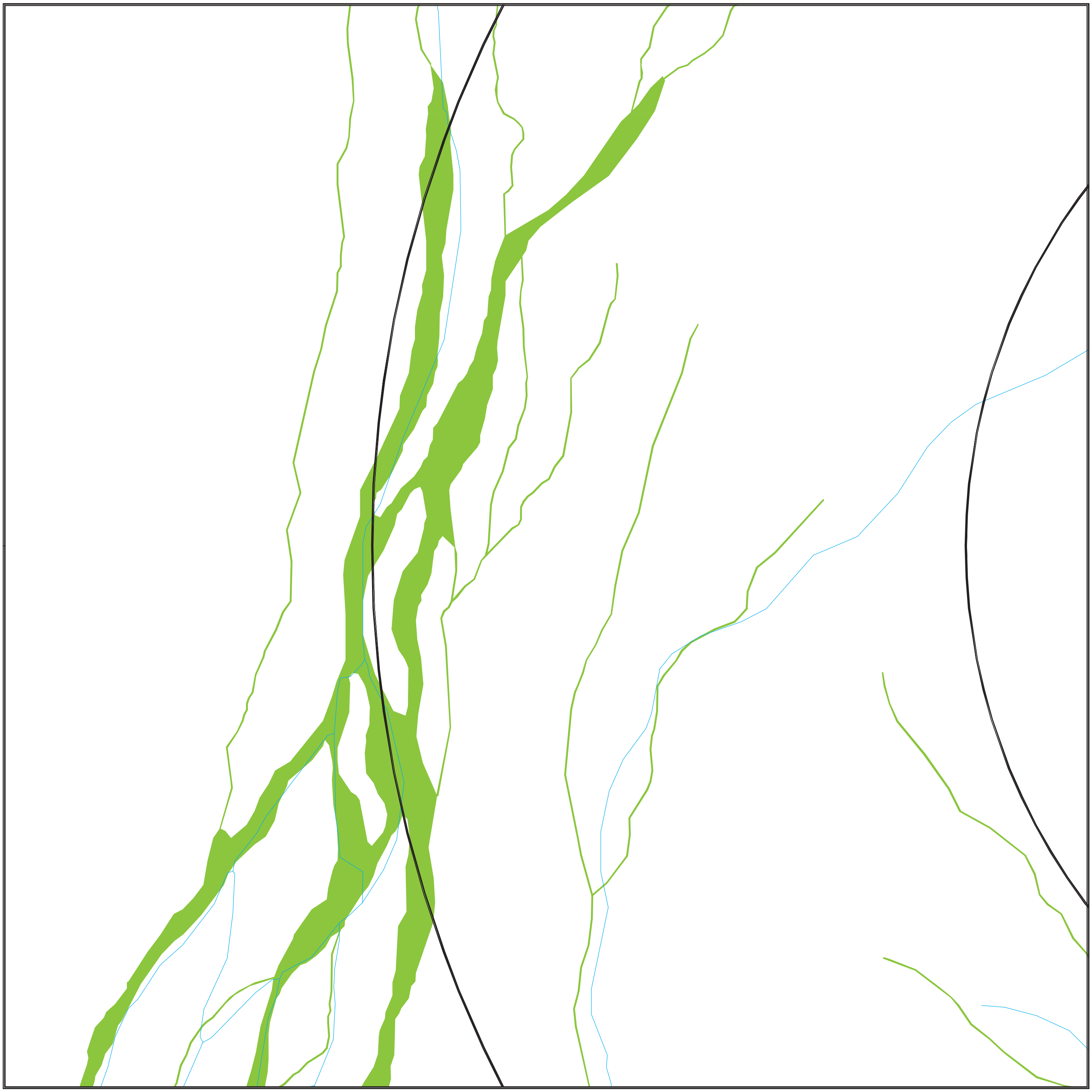
SITE NAME:	RE Crimson, LLC	CLIENT:	Stantec
ADDRESS:	Blythe Blythe CA 92239	CONTACT:	Dion Monge
		INQUIRY #:	5256788.2s
LAT/LONG:	33.563603 / 114.8405	DATE:	April 12, 2018 4:50 pm

DETAIL MAP 11 OF 25 - 5256788.2S

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

SITE NAME: RE Crimson, LLC ADDRESS: Blythe Blythe CA 92239 LAT/LONG: 33.563603 / 114.8405	CLIENT: Stantec CONTACT: Dion Monge INQUIRY #: 5256788.2s DATE: April 12, 2018 4:51 pm

DETAIL MAP 12 OF 25 - 5256788.2S

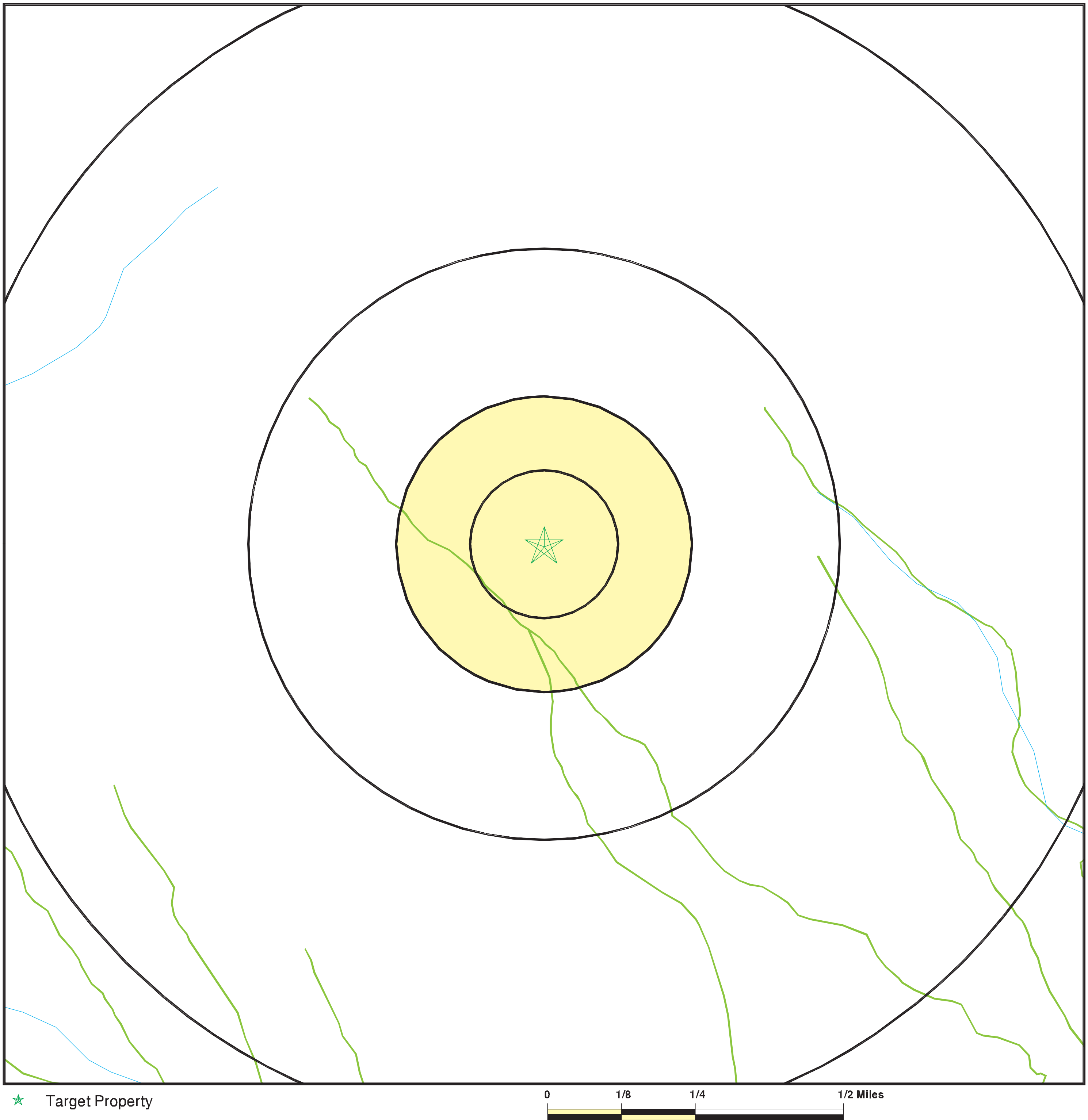


0 1/8 1/4 1/2 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

SITE NAME: RE Crimson, LLC ADDRESS: Blythe Blythe CA 92239 LAT/LONG: 33.563603 / 114.8405	CLIENT: Stantec CONTACT: Dion Monge INQUIRY #: 5256788.2s DATE: April 12, 2018 4:51 pm

DETAIL MAP 13 OF 25 - 5256788.2S



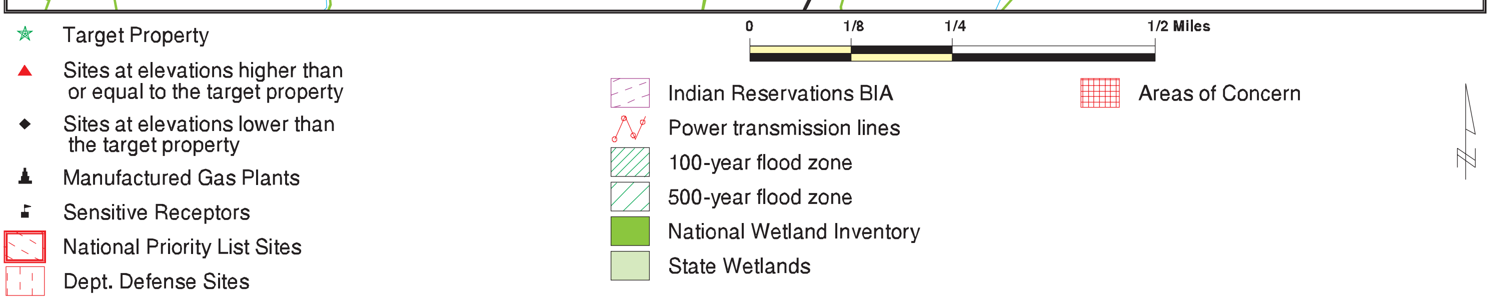
Target Property
Sites at elevations higher than or equal to the target property
Sites at elevations lower than the target property
Manufactured Gas Plants
Sensitive Receptors
National Priority List Sites
Dept. Defense Sites

Indian Reservations BIA
100-year flood zone
500-year flood zone
National Wetland Inventory
State Wetlands

Areas of Concern

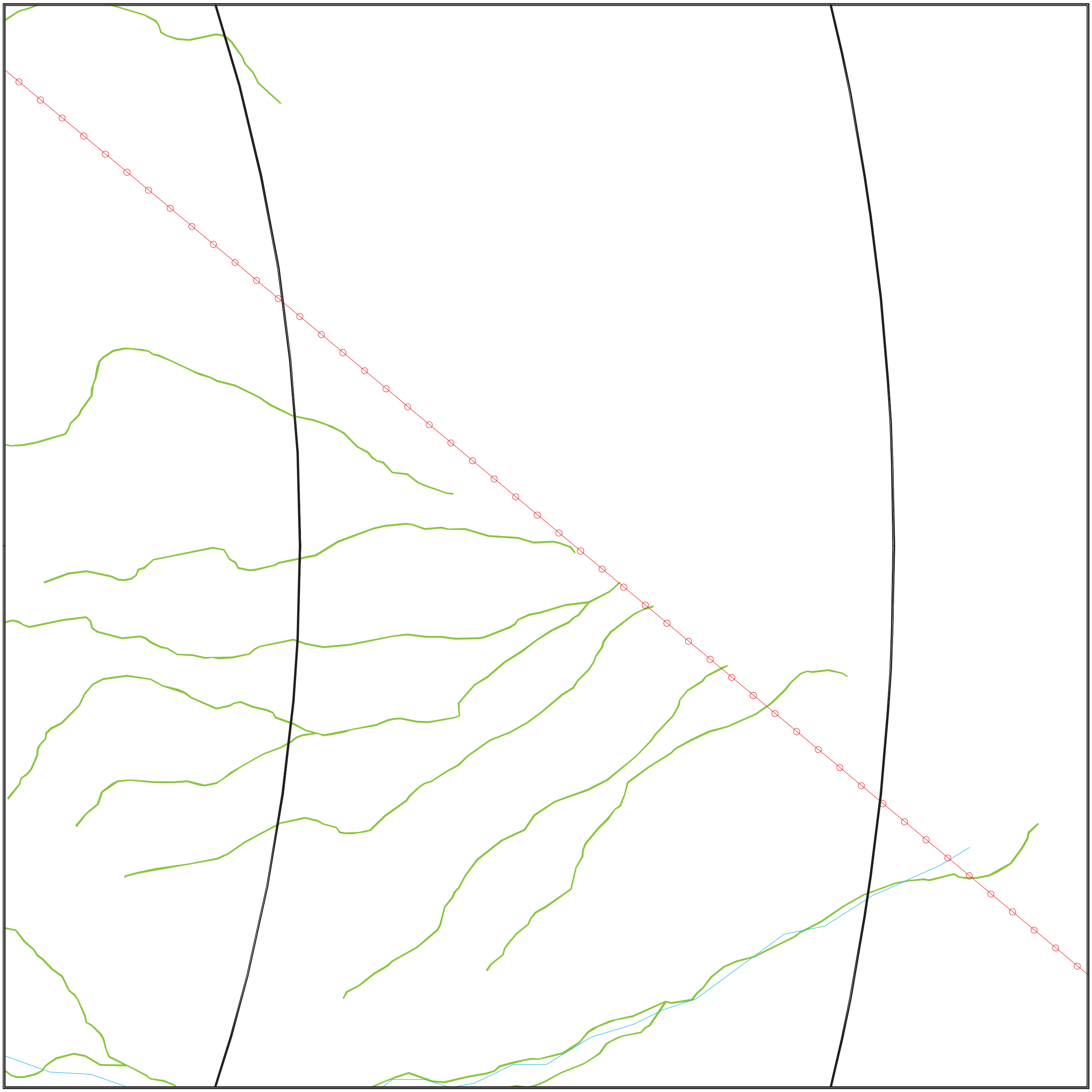
SITE NAME:	RE Crimson, LLC	CLIENT:	Stantec
ADDRESS:	Blythe	CONTACT:	Dion Monge
	Blythe CA 92239	INQUIRY #:	5256788.2s
LAT/LONG:	33.563603 / 114.8405	DATE:	April 12, 2018 4:52 pm

DETAIL MAP 14 OF 25 - 5256788.2S



SITE NAME: RE Crimson, LLC	CLIENT: Stantec
ADDRESS: Blythe	CONTACT: Dion Monge
Blythe CA 92239	INQUIRY #: 5256788.2s
LAT/LONG: 33.563603 / 114.8405	DATE: April 12, 2018 4:52 pm

DETAIL MAP 15 OF 25 - 5256788.2S

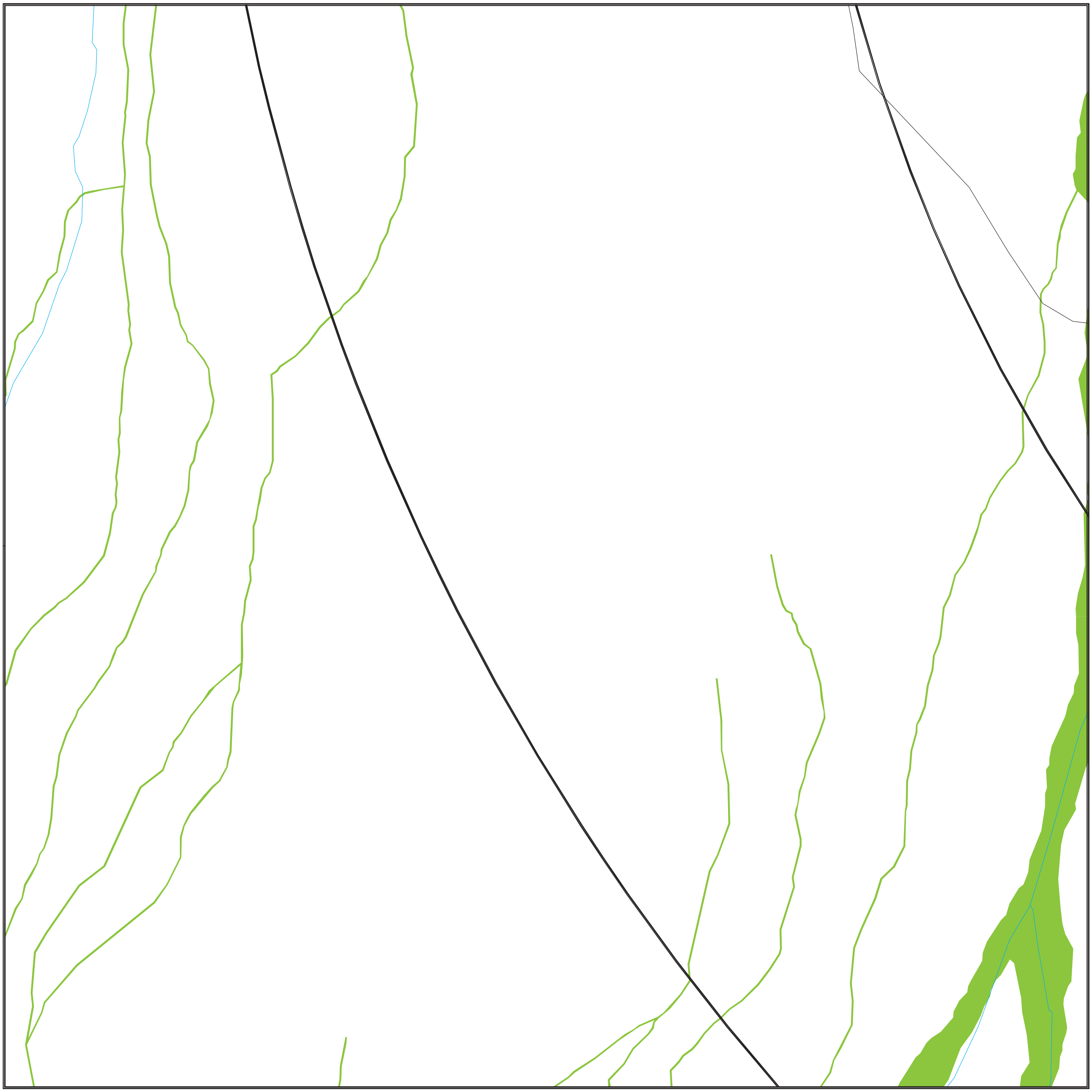


0 1/8 1/4 1/2 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

SITE NAME:	RE Crimson, LLC	CLIENT:	Stantec
ADDRESS:	Blythe	CONTACT:	Dion Monge
	Blythe CA 92239	INQUIRY #:	5256788.2s
LAT/LONG:	33.563603 / 114.8405	DATE:	April 12, 2018 4:52 pm

DETAIL MAP 16 OF 25 - 5256788.2S



0 1/8 1/4 1/2 Miles

Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

Sensitive Receptors

National Priority List Sites

Dept. Defense Sites

Indian Reservations BIA

100-year flood zone

500-year flood zone

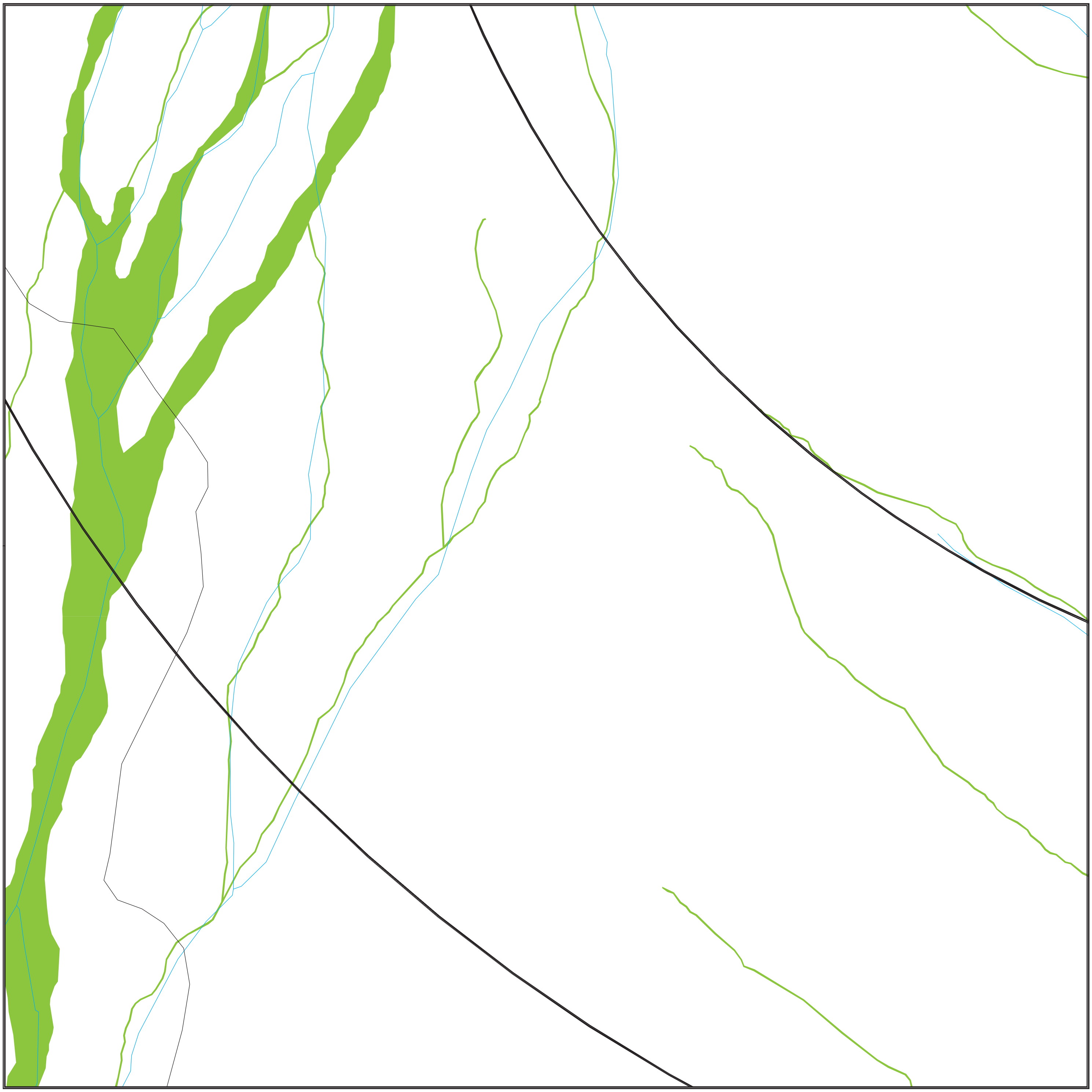
National Wetland Inventory

State Wetlands

Areas of Concern

SITE NAME:	RE Crimson, LLC
ADDRESS:	Blythe Blythe CA 92239
LAT/LONG:	33.563603 / 114.8405
CLIENT:	Stantec
CONTACT:	Dion Monge
INQUIRY #:	5256788.2s
DATE:	April 12, 2018 4:53 pm

DETAIL MAP 17 OF 25 - 5256788.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites

0 1/8 1/4 1/2 Miles

- Indian Reservations BIA
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

SITE NAME:	RE Crimson, LLC	CLIENT:	Stantec
ADDRESS:	Blythe	CONTACT:	Dion Monge
	Blythe CA 92239	INQUIRY #:	5256788.2s
LAT/LONG:	33.563603 / 114.8405	DATE:	April 12, 2018 4:53 pm

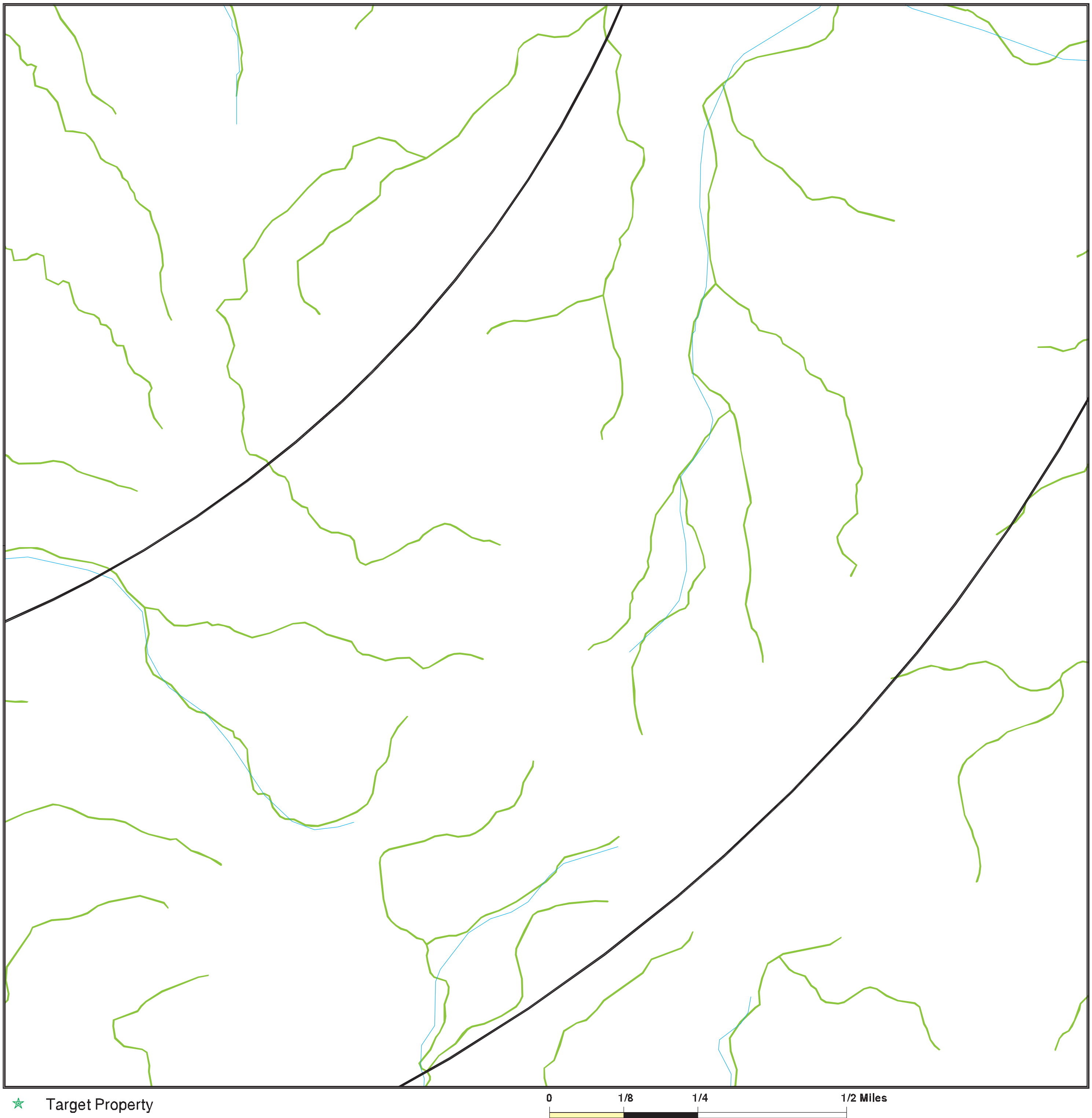
DETAIL MAP 18 OF 25 - 5256788.2S

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

0 1/8 1/4 1/2 Miles

SITE NAME: RE Crimson, LLC ADDRESS: Blythe Blythe CA 92239 LAT/LONG: 33.563603 / 114.8405	CLIENT: Stantec CONTACT: Dion Monge INQUIRY #: 5256788.2s DATE: April 12, 2018 4:53 pm

DETAIL MAP 19 OF 25 - 5256788.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

SITE NAME:	RE Crimson, LLC	CLIENT:	Stantec
ADDRESS:	Blythe Blythe CA 92239	CONTACT:	Dion Monge
		INQUIRY #:	5256788.2s
LAT/LONG:	33.563603 / 114.8405	DATE:	April 12, 2018 4:54 pm

DETAIL MAP 20 OF 25 - 5256788.2S

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites

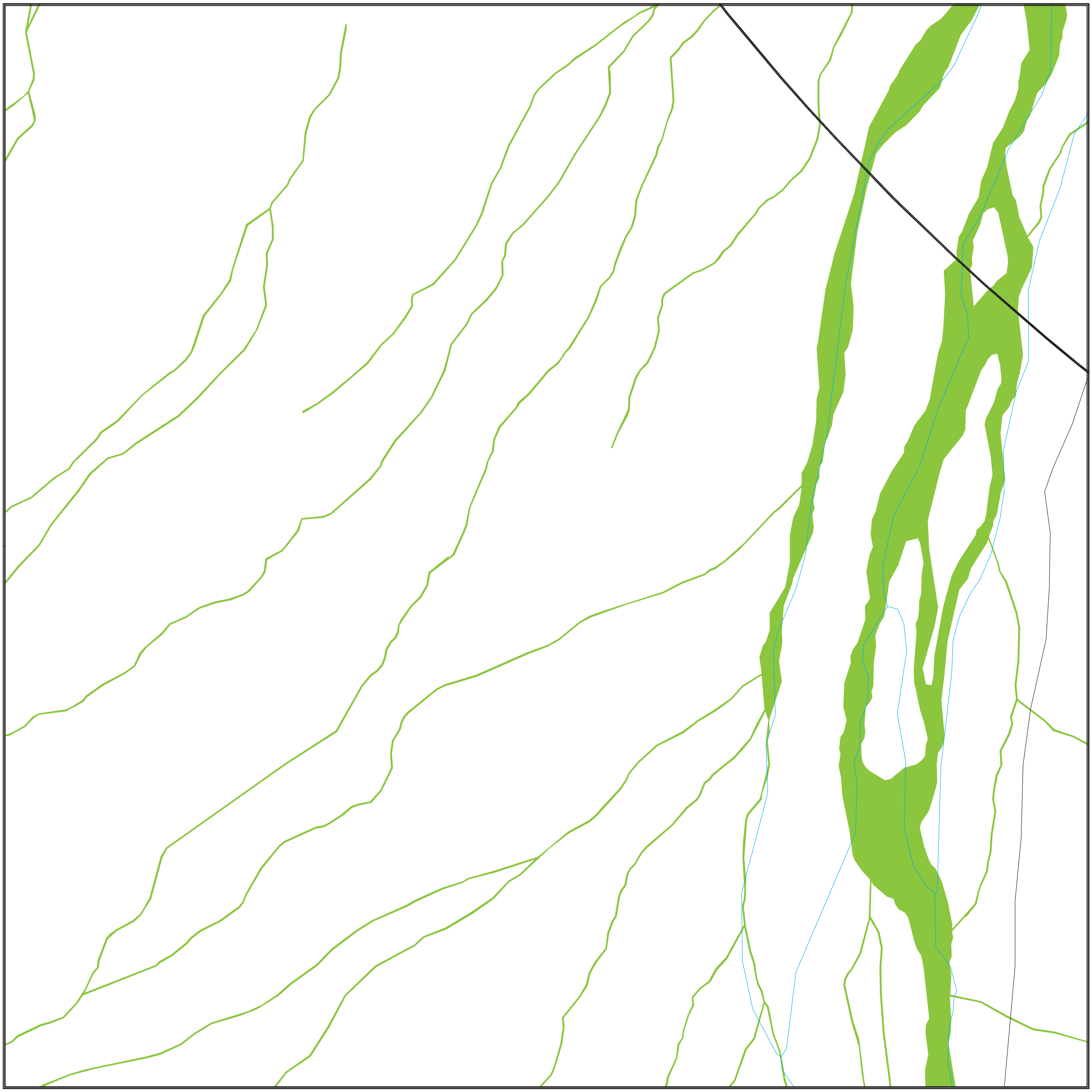
0 1/8 1/4 1/2 Miles

- Indian Reservations BIA
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

- Areas of Concern

SITE NAME: RE Crimson, LLC ADDRESS: Blythe Blythe CA 92239 LAT/LONG: 33.563603 / 114.8405	CLIENT: Stantec CONTACT: Dion Monge INQUIRY #: 5256788.2s DATE: April 12, 2018 4:54 pm

DETAIL MAP 21 OF 25 - 5256788.2S



0 1/8 1/4 1/2 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

SITE NAME:	RE Crimson, LLC	CLIENT:	Stantec
ADDRESS:	Blythe	CONTACT:	Dion Monge
	Blythe CA 92239	INQUIRY #:	5256788.2s
LAT/LONG:	33.563603 / 114.8405	DATE:	April 12, 2018 4:54 pm

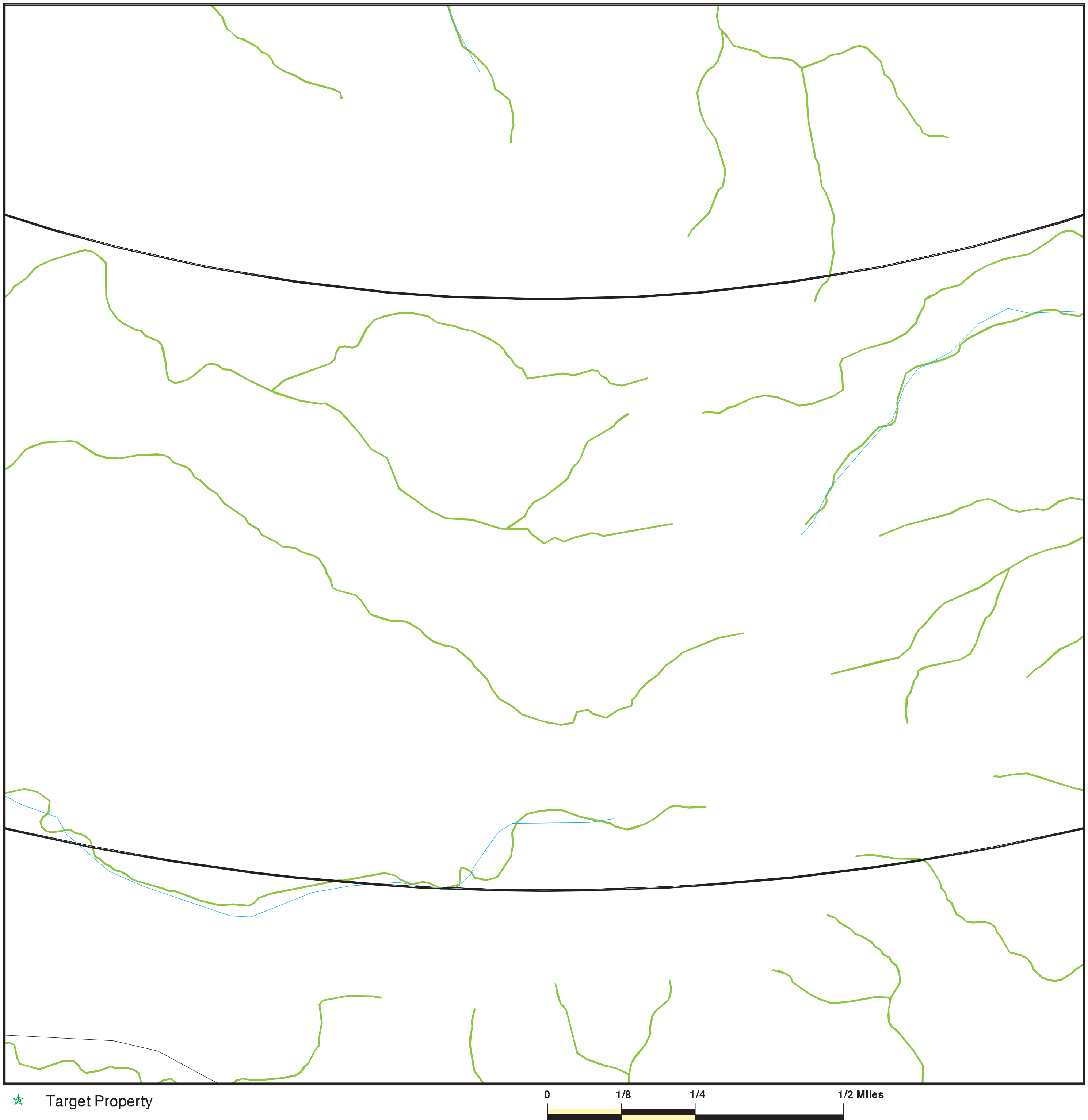
DETAIL MAP 22 OF 25 - 5256788.2S

0 1/8 1/4 1/2 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

SITE NAME:	RE Crimson, LLC	CLIENT:	Stantec
ADDRESS:	Blythe	CONTACT:	Dion Monge
	Blythe CA 92239	INQUIRY #:	5256788.2s
LAT/LONG:	33.563603 / 114.8405	DATE:	April 12, 2018 4:55 pm

DETAIL MAP 23 OF 25 - 5256788.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

SITE NAME: RE Crimson, LLC ADDRESS: Blythe Blythe CA 92239 LAT/LONG: 33.563603 / 114.8405	CLIENT: Stantec CONTACT: Dion Monge INQUIRY #: 5256788.2s DATE: April 12, 2018 4:55 pm

DETAIL MAP 24 OF 25 - 5256788.2S

Target Property
Sites at elevations higher than or equal to the target property
Sites at elevations lower than the target property
Manufactured Gas Plants
Sensitive Receptors
National Priority List Sites
Dept. Defense Sites

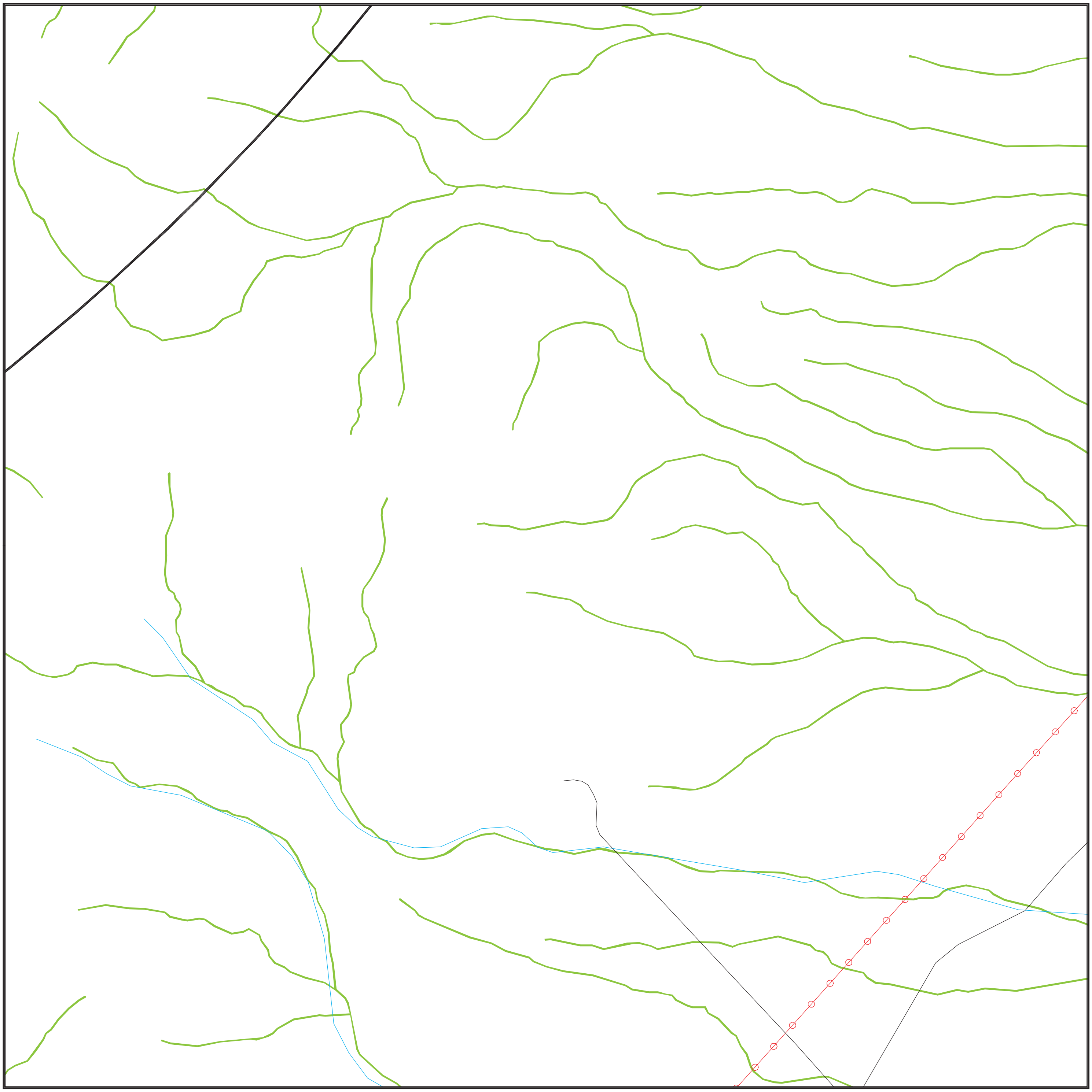
0 1/8 1/4 1/2 Miles

Indian Reservations BIA
100-year flood zone
500-year flood zone
National Wetland Inventory
State Wetlands

Areas of Concern

SITE NAME: RE Crimson, LLC ADDRESS: Blythe Blythe CA 92239 LAT/LONG: 33.563603 / 114.8405	CLIENT: Stantec CONTACT: Dion Monge INQUIRY #: 5256788.2s DATE: April 12, 2018 4:55 pm

DETAIL MAP 25 OF 25 - 5256788.2S



0 1/8 1/4 1/2 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

SITE NAME: RE Crimson, LLC ADDRESS: Blythe Blythe CA 92239 LAT/LONG: 33.563603 / 114.8405	CLIENT: Stantec CONTACT: Dion Monge INQUIRY #: 5256788.2s DATE: April 12, 2018 4:56 pm

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	4.000		0	0	0	0	0	0
Proposed NPL	4.000		0	0	0	0	0	0
NPL LIENS	3.000		0	0	0	0	0	0
Federal Delisted NPL site list								
Delisted NPL	4.000		0	0	0	0	0	0
Federal CERCLIS list								
FEDERAL FACILITY	3.500		0	0	0	0	0	0
SEMS	3.500		0	0	0	0	0	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	3.500		0	0	0	0	0	0
Federal RCRA CORRACTS facilities list								
CORRACTS	4.000		0	0	0	0	0	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	3.500		0	0	0	0	0	0
Federal RCRA generators list								
RCRA-LQG	3.250		0	0	0	0	0	0
RCRA-SQG	3.250		0	0	0	0	0	0
RCRA-CESQG	3.250		0	0	0	0	0	0
Federal institutional controls / engineering controls registries								
LUCIS	3.500		0	0	0	0	0	0
US ENG CONTROLS	3.500		0	0	0	0	0	0
US INST CONTROL	3.500		0	0	0	0	0	0
Federal ERNS list								
ERNS	3.000		0	0	0	0	0	0
State- and tribal - equivalent NPL								
RESPONSE	4.000		0	0	0	0	0	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	4.000		0	0	0	0	0	0
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	3.500		0	0	0	0	0	0
State and tribal leaking storage tank lists								
LUST	3.500		0	0	0	0	0	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	3.500		0	0	0	0	0	0
SLIC	3.500		0	0	0	0	0	0
State and tribal registered storage tank lists								
FEMA UST	3.250		0	0	0	0	0	0
UST	3.250		0	0	0	0	0	0
AST	3.250		0	0	0	0	0	0
INDIAN UST	3.250		0	0	0	0	0	0
State and tribal voluntary cleanup sites								
INDIAN VCP	3.500		0	0	0	0	0	0
VCP	3.500		0	0	0	0	0	0
State and tribal Brownfields sites								
BROWNFIELDS	3.500		0	0	0	0	0	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	3.500		0	0	0	0	0	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	3.500		0	0	0	0	0	0
SWRCY	3.500		0	0	0	0	0	0
HAULERS	3.000		0	0	0	0	0	0
INDIAN ODI	3.500		0	0	0	0	0	0
DEBRIS REGION 9	3.500		0	0	0	0	0	0
ODI	3.500		0	0	0	0	0	0
IHS OPEN DUMPS	3.500		0	0	0	0	0	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	3.000		0	0	0	0	0	0
HIST Cal-Sites	4.000		0	0	0	0	0	0
SCH	3.250		0	0	0	0	0	0
CDL	3.000		0	0	0	0	0	0
Toxic Pits	4.000		0	0	0	0	0	0
US CDL	3.000		0	0	0	0	0	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	3.250		0	0	0	0	0	0
HIST UST	3.250		0	0	0	0	0	0
CA FID UST	3.250		0	0	0	0	0	0
Local Land Records								
LIENS	3.000		0	0	0	0	0	0
LIENS 2	3.000		0	0	0	0	0	0
DEED	3.500		0	0	0	0	0	0
Records of Emergency Release Reports								
HMIRS	3.000		0	0	0	0	0	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
CHMIRS	3.000		0	0	0	0	0	0
LDS	3.000		0	0	0	0	0	0
MCS	3.000		0	0	0	0	0	0
SPILLS 90	3.000		0	0	0	0	0	0
Other Ascertainable Records								
RCRA NonGen / NLR	3.250		0	0	0	0	0	0
FUDS	4.000		0	0	0	0	0	0
DOD	4.000		0	0	0	0	0	0
SCRD DRYCLEANERS	3.500		0	0	0	0	0	0
US FIN ASSUR	3.000		0	0	0	0	0	0
EPA WATCH LIST	3.000		0	0	0	0	0	0
2020 COR ACTION	3.250		0	0	0	0	0	0
TSCA	3.000		0	0	0	0	0	0
TRIS	3.000		0	0	0	0	0	0
SSTS	3.000		0	0	0	0	0	0
ROD	4.000		0	0	0	0	0	0
RMP	3.000		0	0	0	0	0	0
RAATS	3.000		0	0	0	0	0	0
PRP	3.000		0	0	0	0	0	0
PADS	3.000		0	0	0	0	0	0
ICIS	3.000		0	0	0	0	0	0
FTTS	3.000		0	0	0	0	0	0
MLTS	3.000		0	0	0	0	0	0
COAL ASH DOE	3.000		0	0	0	0	0	0
COAL ASH EPA	3.500		0	0	0	0	0	0
PCB TRANSFORMER	3.000		0	0	0	0	0	0
RADINFO	3.000		0	0	0	0	0	0
HIST FTTS	3.000		0	0	0	0	0	0
DOT OPS	3.000		0	0	0	0	0	0
CONSENT	4.000		0	0	0	0	0	0
INDIAN RESERV	4.000		0	0	0	0	0	0
FUSRAP	4.000		0	0	0	0	0	0
UMTRA	3.500		0	0	0	0	0	0
LEAD SMELTERS	3.000		0	0	0	0	0	0
US AIRS	3.000		0	0	0	0	0	0
US MINES	3.250		0	0	0	0	0	0
ABANDONED MINES	3.250		0	0	0	0	0	0
FINDS	3.000		0	0	0	0	0	0
UXO	4.000		0	0	0	0	0	0
ECHO	3.000		0	0	0	0	0	0
DOCKET HWC	3.000		0	0	0	0	0	0
FUELS PROGRAM	3.250		0	0	0	0	0	0
CA BOND EXP. PLAN	4.000		0	0	0	0	0	0
Cortese	3.500		0	0	0	0	0	0
CUPA Listings	3.250		0	0	0	0	0	0
DRYCLEANERS	3.250		0	0	0	0	0	0
EMI	3.000		0	0	0	0	0	0
ENF	3.000		0	0	0	0	0	0
Financial Assurance	3.000		0	0	0	0	0	0
HAZNET	3.000		0	0	0	0	0	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
ICE	3.000		0	0	0	0	0	0
HIST CORTESE	3.500		0	0	0	0	0	0
HWP	4.000		0	0	0	0	0	0
HWT	3.250		0	0	0	0	0	0
MINES	3.250		0	0	0	0	0	0
MWMP	3.250		0	0	0	0	0	0
NPDES	3.000		0	0	0	0	0	0
PEST LIC	3.000		0	0	0	0	0	0
PROC	3.500		0	0	0	0	0	0
Notify 65	4.000		0	0	0	0	0	0
UIC	3.000		0	0	0	0	0	0
WASTEWATER PITS	3.500		0	0	0	0	0	0
WDS	3.000		0	0	0	0	0	0
WIP	3.250		0	0	0	0	0	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	4.000		0	0	0	0	0	0
EDR Hist Auto	3.125		0	0	0	0	0	0
EDR Hist Cleaner	3.125		0	0	0	0	0	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	3.000		0	0	0	0	0	0
RGA LUST	3.000		0	0	0	0	0	0
- Totals --		0	0	0	0	0	0	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number

MAP FINDINGS

NO SITES FOUND

Count: 23 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
BLYTHE	S114631092	HARVEY'S FISHING HOLE	RT 2, BOX 229A		RGA LUST
BLYTHE	S114733789	UNION FEED YARDS DISPOSAL SITE	2 1/2 MI S OF BLYTHE ON SOUTH		RGA LF
BLYTHE	S114725416	BLYTHE SANITARY LANDFILL	6 MI N OF BLYTHE ON MIDLAND RD		RGA LF
BLYTHE	S114726339	CHUCKWALLA VALLEY STATE PRISON RAS	WILEY WELL ROAD		RGA LF
BLYTHE	S114726338	CHUCKAWALLA VALLEY STATE PRISON RA	WILEY WELL ROAD		RGA LF
CACTUS	S113005883	SOUTHERN CALIFORNIA GAS CO	I-10 20 MI EAST OF INDIO	92239	HAZNET
DESERT CENTER	S112974323	CALTRANS D-8/CONSTR/EA08-0K6304	RTE 177 PM 0.0-27.0	92239	HAZNET
DESERT CENTER	S108407375		I-10, 3 MILES W OF STATE ROUTE	92239	CDL
DESERT CENTER	A100423762	RCIT - ROAD 62 #44	34505 HIGHWAY 62	92239	AST
DESERT CENTER	S111759643	PAR ELECTRIC CONTRACTORS	30855 CORN SPRINGS RD	92239	CHMIRS, HAZNET
DESERT CENTER	S121011395	LONG BEACH CONTAINER TTRANSPORT, I	I-10 FWY W/B, POST MILE 99	92239	HAZNET
DESERT CENTER	S120991346	COVENANT TRANSPORTATION	I-10 FWY E/B AT POST MILE 101	92239	HAZNET
DESERT CENTER	S118929108	MARQUEZ TRUCKING	I-10 FWY AT PM 118.5 WEST B	92239	HAZNET
DESERT CENTER	S118925098	HERTZ EQUIPMENT RENTAL CORPORATION	I-10 FWY AT POST MILE 103	92239	HAZNET
DESERT CENTER	S118200690	SWIFT TRANSPORTATION CORPORATION	EB I-10 @ PM125.5	92239	HAZNET
DESERT CENTER	S113801346	DESERT SUNLIGHT 250 LLC AND DESERT	44810 KAISER RD	92239	HAZNET
DESERT CENTER	A100419393	DESERT SUNLIGHT 250, LLC& DESERT S	44810 KAISER RD	92239	AST
DESERT CENTER	1023279258	DESERT SUNLIGHT 250NA LLC& DESERT	44810 KAISER RD	92239	FINDS
DESERT CENTER	S107144793	CRA SAND TRAP REPLACEMENT EAGLE MO	15500 KAISER TRUCK ROAD	92239	CHMIRS, ENF, NPDES
DESERT CENTER	A100424613	SO. CALIF. GAS CO. - DESERT CENTER	1 MILE EAST OF DESERT CTR. ON	92239	AST
DESERT CENTER	1018132372	KAISER EAGLE MOUNTAIN	N OF HWY 10 8M OFF KAISER RD	92239	DOCKET HWC
RIVERSIDE COUNTY	S107537885		BOX SPRINGS RD & HWY 215 (SEE		CDL
RIVERSIDE COUNTY	S117711495	ST HWY 111 NE PALM SPRINGS	ST HWY 111 NE OF PALM SPRINGS		NPDES

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 14

Source: EPA
Telephone: N/A
Last EDR Contact: 04/06/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 10
Telephone 206-553-8665

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 14

Source: EPA
Telephone: N/A
Last EDR Contact: 04/06/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 14

Source: EPA
Telephone: N/A
Last EDR Contact: 04/06/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 11/07/2016
Date Data Arrived at EDR: 01/05/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 92

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 04/06/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 21

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 02/06/2018
Next Scheduled EDR Contact: 04/30/2018
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 21

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 02/06/2018
Next Scheduled EDR Contact: 04/30/2018
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/26/2017
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 45

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/28/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/26/2017
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 45

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/28/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/26/2017
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 45

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/28/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/26/2017
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 45

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/28/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/26/2017
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 45

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/28/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 05/22/2017
Date Data Arrived at EDR: 06/13/2017
Date Made Active in Reports: 09/15/2017
Number of Days to Update: 94

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/09/2018
Next Scheduled EDR Contact: 05/28/2018
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 11/13/2017
Date Data Arrived at EDR: 11/27/2017
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 74

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/27/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 11/13/2017
Date Data Arrived at EDR: 11/27/2017
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 74

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/27/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 01/16/2018
Date Data Arrived at EDR: 01/19/2018
Date Made Active in Reports: 03/23/2018
Number of Days to Update: 63

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 03/27/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

State- and tribal - equivalent NPL

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 01/30/2018
Date Data Arrived at EDR: 01/31/2018
Date Made Active in Reports: 03/19/2018
Number of Days to Update: 47

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/31/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 01/30/2018
Date Data Arrived at EDR: 01/31/2018
Date Made Active in Reports: 03/19/2018
Number of Days to Update: 47

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/31/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 02/12/2018
Date Data Arrived at EDR: 02/14/2018
Date Made Active in Reports: 04/03/2018
Number of Days to Update: 48

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 02/14/2018
Next Scheduled EDR Contact: 05/28/2018
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 4: Underground Storage Tank Leak List
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List
Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST: Leaking Underground Fuel Tank Report (GEOTRACKER)

Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/12/2018
Date Data Arrived at EDR: 03/14/2018
Date Made Active in Reports: 03/21/2018
Number of Days to Update: 7

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Quarterly

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Varies

LUST REG 9: Leaking Underground Storage Tank Report

Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 04/25/2017
Date Data Arrived at EDR: 11/07/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 31

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 04/13/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 05/01/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 04/14/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 04/24/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/14/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 10/14/2016
Date Data Arrived at EDR: 01/27/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 98

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Semi-Annually

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 04/26/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

SLIC: Statewide SLIC Cases (GEOTRACKER)
Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/12/2018
Date Data Arrived at EDR: 03/14/2018
Date Made Active in Reports: 03/21/2018
Number of Days to Update: 7

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: Annually

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 05/15/2017
Date Data Arrived at EDR: 05/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 136

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/09/2018
Next Scheduled EDR Contact: 04/23/2018
Data Release Frequency: Varies

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 03/12/2018
Date Data Arrived at EDR: 03/14/2018
Date Made Active in Reports: 03/29/2018
Number of Days to Update: 15

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 03/21/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

INDIAN UST R10: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 04/25/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 04/13/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 05/01/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 05/02/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 04/24/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 134

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 04/26/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 04/14/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/23/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 10/14/2016
Date Data Arrived at EDR: 01/27/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 98

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Semi-Annually

State and tribal voluntary cleanup sites

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 03/21/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 01/30/2018
Date Data Arrived at EDR: 01/31/2018
Date Made Active in Reports: 03/19/2018
Number of Days to Update: 47

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/31/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Quarterly

State and tribal Brownfields sites

BROWNFIELDS: Considered Brownfieds Sites Listing
A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 12/22/2017
Date Data Arrived at EDR: 12/26/2017
Date Made Active in Reports: 01/31/2018
Number of Days to Update: 36

Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 03/27/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 01/19/2018
Date Data Arrived at EDR: 01/19/2018
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 03/21/2018
Next Scheduled EDR Contact: 07/02/2018
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT: Waste Management Unit Database
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 01/31/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/12/2017
Date Made Active in Reports: 01/17/2018
Number of Days to Update: 36

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 02/08/2018
Date Data Arrived at EDR: 02/09/2018
Date Made Active in Reports: 03/20/2018
Number of Days to Update: 39

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 02/09/2018
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 01/30/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 01/22/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 02/02/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 01/19/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 16

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/27/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: No Update Planned

HIST CAL-SITES: Calsites Database
The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 01/30/2018
Date Data Arrived at EDR: 01/31/2018
Date Made Active in Reports: 03/19/2018
Number of Days to Update: 47

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/31/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 06/30/2017
Date Data Arrived at EDR: 08/18/2017
Date Made Active in Reports: 09/21/2017
Number of Days to Update: 34

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 04/05/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Varies

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 01/09/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 16

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/27/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Quarterly

Local Lists of Registered Storage Tanks

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database
A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 02/28/2018
Date Data Arrived at EDR: 03/01/2018
Date Made Active in Reports: 03/28/2018
Number of Days to Update: 27

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 02/22/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database
The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CA FID UST: Facility Inventory Database
The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Land Records

LIENS: Environmental Liens Listing
A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 11/30/2017
Date Data Arrived at EDR: 12/01/2017
Date Made Active in Reports: 01/11/2018
Number of Days to Update: 41

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/28/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 02/06/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Semi-Annually

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 02/08/2018
Date Data Arrived at EDR: 02/08/2018
Date Made Active in Reports: 02/08/2018
Number of Days to Update: 0

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 03/06/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 01/19/2018
Date Data Arrived at EDR: 01/19/2018
Date Made Active in Reports: 03/23/2018
Number of Days to Update: 63

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 03/27/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

CHMIRS: California Hazardous Material Incident Report System
California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 02/15/2018
Date Data Arrived at EDR: 02/20/2018
Date Made Active in Reports: 04/03/2018
Number of Days to Update: 42

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 02/20/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Semi-Annually

LDS: Land Disposal Sites Listing (GEOTRACKER)
Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/12/2018
Date Data Arrived at EDR: 03/14/2018
Date Made Active in Reports: 03/21/2018
Number of Days to Update: 7

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing (GEOTRACKER)
Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/12/2018
Date Data Arrived at EDR: 03/14/2018
Date Made Active in Reports: 03/21/2018
Number of Days to Update: 7

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/26/2017
Date Made Active in Reports: 02/09/2018
Number of Days to Update: 45

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/28/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/31/2015
Date Data Arrived at EDR: 07/08/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 97

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 02/21/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 10/13/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 04/11/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 02/16/2018
Next Scheduled EDR Contact: 05/28/2018
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 01/11/2018
Date Data Arrived at EDR: 01/19/2018
Date Made Active in Reports: 03/02/2018
Number of Days to Update: 42

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 03/27/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 01/31/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 04/22/2013
Date Data Arrived at EDR: 03/03/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 02/08/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/21/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 198

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/23/2018
Next Scheduled EDR Contact: 07/02/2018
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 01/10/2018
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 2

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/23/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 04/09/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 21

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 03/09/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 11/17/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 10/17/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 3

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 02/06/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 06/01/2017
Date Data Arrived at EDR: 06/09/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 126

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 01/12/2018
Next Scheduled EDR Contact: 04/23/2018
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 04/09/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 08/30/2016
Date Data Arrived at EDR: 09/08/2016
Date Made Active in Reports: 10/21/2016
Number of Days to Update: 43

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 03/09/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 03/06/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 05/24/2017
Date Data Arrived at EDR: 11/30/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 15

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 01/26/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 10/02/2017
Date Data Arrived at EDR: 10/05/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 04/05/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 11/10/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 63

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 04/06/2018
Next Scheduled EDR Contact: 07/02/2018
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 09/28/2017
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 02/23/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/11/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 12/23/2016
Date Data Arrived at EDR: 12/27/2016
Date Made Active in Reports: 02/17/2017
Number of Days to Update: 52

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 01/19/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 06/23/2017
Date Data Arrived at EDR: 10/11/2017
Date Made Active in Reports: 11/03/2017
Number of Days to Update: 23

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/23/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites
A listing of former lead smelter site locations.

Date of Government Version: 01/09/2018
Date Data Arrived at EDR: 02/06/2018
Date Made Active in Reports: 03/02/2018
Number of Days to Update: 24

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 04/06/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites
A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)
The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File
Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 10/29/2017
Date Data Arrived at EDR: 11/28/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 45

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 02/28/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing
This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 03/02/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 03/02/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 12/20/2017
Date Data Arrived at EDR: 12/21/2017
Date Made Active in Reports: 03/23/2018
Number of Days to Update: 92

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 03/07/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 02/21/2018
Date Data Arrived at EDR: 02/23/2018
Date Made Active in Reports: 03/23/2018
Number of Days to Update: 28

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 02/23/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 09/30/2016
Date Data Arrived at EDR: 10/31/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 73

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 01/02/2018
Next Scheduled EDR Contact: 04/30/2018
Data Release Frequency: Varies

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 06/27/2017
Date Data Arrived at EDR: 11/21/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 03/02/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 01/13/2018
Date Data Arrived at EDR: 01/19/2018
Date Made Active in Reports: 03/02/2018
Number of Days to Update: 42

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 03/07/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 02/20/2018
Date Data Arrived at EDR: 02/21/2018
Date Made Active in Reports: 03/23/2018
Number of Days to Update: 30

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 02/21/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Quarterly

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 02/08/2018
Date Data Arrived at EDR: 02/08/2018
Date Made Active in Reports: 02/08/2018
Number of Days to Update: 0

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 03/27/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

DRYCLEANERS: Cleaner Facilities

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 12/01/2017
Date Data Arrived at EDR: 02/02/2018
Date Made Active in Reports: 03/16/2018
Number of Days to Update: 42

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 02/28/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Annually

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 03/21/2017
Date Made Active in Reports: 08/15/2017
Number of Days to Update: 147

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 03/23/2018
Next Scheduled EDR Contact: 07/02/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ENF: Enforcement Action Listing
A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/19/2018
Number of Days to Update: 54

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 01/22/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing
Financial Assurance information

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/20/2018
Number of Days to Update: 55

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 01/22/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing
A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 02/14/2018
Date Data Arrived at EDR: 02/16/2018
Date Made Active in Reports: 04/03/2018
Number of Days to Update: 46

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 02/08/2018
Next Scheduled EDR Contact: 05/28/2018
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data
Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 07/12/2017
Date Made Active in Reports: 10/17/2017
Number of Days to Update: 97

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 01/08/2018
Next Scheduled EDR Contact: 04/23/2018
Data Release Frequency: Annually

ICE: ICE
Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 02/20/2018
Date Data Arrived at EDR: 02/21/2018
Date Made Active in Reports: 04/03/2018
Number of Days to Update: 41

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 02/21/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List
The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HWP: EnviroStor Permitted Facilities Listing

Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 02/20/2018
Date Data Arrived at EDR: 02/21/2018
Date Made Active in Reports: 04/03/2018
Number of Days to Update: 41

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/21/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 01/08/2018
Date Data Arrived at EDR: 01/09/2018
Date Made Active in Reports: 02/06/2018
Number of Days to Update: 28

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 04/11/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Quarterly

MINES: Mines Site Location Listing

A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/12/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 31

Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Quarterly

MWMP: Medical Waste Management Program Listing

The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 11/29/2017
Date Data Arrived at EDR: 12/05/2017
Date Made Active in Reports: 01/16/2018
Number of Days to Update: 42

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 03/06/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Varies

NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

Date of Government Version: 02/14/2018
Date Data Arrived at EDR: 02/14/2018
Date Made Active in Reports: 03/15/2018
Number of Days to Update: 29

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 05/28/2018
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing

A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 12/04/2017
Date Data Arrived at EDR: 12/05/2017
Date Made Active in Reports: 01/16/2018
Number of Days to Update: 42

Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 03/05/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Quarterly

PROC: Certified Processors Database

A listing of certified processors.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/12/2017
Date Made Active in Reports: 01/16/2018
Number of Days to Update: 35

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records

Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 12/14/2017
Date Data Arrived at EDR: 12/15/2017
Date Made Active in Reports: 01/16/2018
Number of Days to Update: 32

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 07/02/2018
Data Release Frequency: No Update Planned

UIC: UIC Listing

A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/12/2017
Date Made Active in Reports: 01/17/2018
Number of Days to Update: 36

Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing

Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water board?s review found that more than one-third of the region?s active disposal pits are operating without permission.

Date of Government Version: 04/15/2015
Date Data Arrived at EDR: 04/17/2015
Date Made Active in Reports: 06/23/2015
Number of Days to Update: 67

Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 01/12/2018
Next Scheduled EDR Contact: 04/23/2018
Data Release Frequency: Varies

WDS: Waste Discharge System

Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 02/15/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Quarterly

WIP: Well Investigation Program Case List

Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 03/21/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 01/09/2018
Date Data Arrived at EDR: 01/11/2018
Date Made Active in Reports: 02/22/2018
Number of Days to Update: 42

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 04/05/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/28/2018
Number of Days to Update: 63

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 04/05/2018
Next Scheduled EDR Contact: 04/24/2047
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA Facility List

Cupa Facility List

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/05/2018
Date Made Active in Reports: 03/15/2018
Number of Days to Update: 10

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 02/28/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA Facility Listing

Cupa facility list.

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 04/05/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 01/25/2018
Date Data Arrived at EDR: 01/26/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 47

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 03/26/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 02/26/2018
Date Data Arrived at EDR: 03/01/2018
Date Made Active in Reports: 03/15/2018
Number of Days to Update: 14

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 02/14/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 11/20/2017
Date Data Arrived at EDR: 11/29/2017
Date Made Active in Reports: 01/19/2018
Number of Days to Update: 51

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 01/29/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA Facility List
Cupa Facility list

Date of Government Version: 01/05/2018
Date Data Arrived at EDR: 02/02/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 40

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 01/29/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 12/04/2017
Date Data Arrived at EDR: 12/06/2017
Date Made Active in Reports: 12/27/2017
Number of Days to Update: 21

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 01/29/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA Resources List

Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/05/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 9

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 03/06/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 01/22/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

HUMBOLDT COUNTY:

CUPA Facility List

CUPA facility list.

Date of Government Version: 08/03/2017
Date Data Arrived at EDR: 08/08/2017
Date Made Active in Reports: 10/16/2017
Number of Days to Update: 69

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 02/05/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA Facility List

Cupa facility list.

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/26/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 47

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 01/22/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

INYO COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 06/08/2017
Date Data Arrived at EDR: 06/09/2017
Date Made Active in Reports: 08/04/2017
Number of Days to Update: 56

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 03/28/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 02/02/2018
Date Data Arrived at EDR: 02/02/2018
Date Made Active in Reports: 03/28/2018
Number of Days to Update: 54

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 02/01/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 11/14/2017
Date Data Arrived at EDR: 11/17/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 28

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

LAKE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 02/06/2018
Date Data Arrived at EDR: 02/09/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 33

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 01/16/2018
Next Scheduled EDR Contact: 04/30/2018
Data Release Frequency: Varies

LASSEN COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 01/22/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

LOS ANGELES COUNTY:

San Gabriel Valley Areas of Concern

San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 07/02/2018
Data Release Frequency: No Update Planned

HMS: Street Number List

Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 01/16/2018
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 03/20/2018
Number of Days to Update: 56

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 04/05/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities

Solid Waste Facilities in Los Angeles County.

Date of Government Version: 01/16/2018
Date Data Arrived at EDR: 01/16/2018
Date Made Active in Reports: 02/14/2018
Number of Days to Update: 29

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 01/16/2018
Next Scheduled EDR Contact: 04/30/2018
Data Release Frequency: Varies

City of Los Angeles Landfills

Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 04/21/2017
Date Made Active in Reports: 10/09/2017
Number of Days to Update: 171

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 04/11/2018
Next Scheduled EDR Contact: 07/30/2018
Data Release Frequency: Varies

Site Mitigation List

Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 01/01/2018
Date Data Arrived at EDR: 01/17/2018
Date Made Active in Reports: 02/14/2018
Number of Days to Update: 28

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 01/17/2018
Next Scheduled EDR Contact: 04/30/2018
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank

Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 04/11/2018
Next Scheduled EDR Contact: 07/30/2018
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank

Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 03/09/2017
Date Data Arrived at EDR: 03/10/2017
Date Made Active in Reports: 05/03/2017
Number of Days to Update: 54

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 01/22/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Annually

City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 01/04/2018
Date Data Arrived at EDR: 01/05/2018
Date Made Active in Reports: 01/18/2018
Number of Days to Update: 13

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 04/05/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 02/21/2018
Date Data Arrived at EDR: 02/22/2018
Date Made Active in Reports: 04/03/2018
Number of Days to Update: 40

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 02/14/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 01/02/2018
Date Data Arrived at EDR: 01/05/2018
Date Made Active in Reports: 01/17/2018
Number of Days to Update: 12

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 03/29/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 01/11/2018
Date Data Arrived at EDR: 01/12/2018
Date Made Active in Reports: 02/08/2018
Number of Days to Update: 27

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 02/14/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

MONO COUNTY:

CUPA Facility List
CUPA Facility List

Date of Government Version: 02/22/2018
Date Data Arrived at EDR: 02/27/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 15

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 02/22/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Varies

MONTEREY COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA Facility Listing

CUPA Program listing from the Environmental Health Division.

Date of Government Version: 01/09/2018
Date Data Arrived at EDR: 01/11/2018
Date Made Active in Reports: 01/31/2018
Number of Days to Update: 20

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 02/20/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

NAPA COUNTY:

Sites With Reported Contamination

A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 02/22/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites

Underground storage tank sites located in Napa county.

Date of Government Version: 02/22/2018
Date Data Arrived at EDR: 02/27/2018
Date Made Active in Reports: 03/29/2018
Number of Days to Update: 30

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 02/22/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA Facility List

CUPA facility list.

Date of Government Version: 01/31/2018
Date Data Arrived at EDR: 02/01/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 41

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 01/29/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Varies

ORANGE COUNTY:

List of Industrial Site Cleanups

Petroleum and non-petroleum spills.

Date of Government Version: 02/05/2018
Date Data Arrived at EDR: 02/13/2018
Date Made Active in Reports: 04/03/2018
Number of Days to Update: 49

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/05/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups

Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 02/05/2018
Date Data Arrived at EDR: 02/13/2018
Date Made Active in Reports: 03/20/2018
Number of Days to Update: 35

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/05/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Quarterly

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 01/02/2018
Date Data Arrived at EDR: 02/07/2018
Date Made Active in Reports: 03/28/2018
Number of Days to Update: 49

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 02/07/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 12/08/2017
Date Data Arrived at EDR: 12/12/2017
Date Made Active in Reports: 01/31/2018
Number of Days to Update: 50

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 03/15/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/15/2018
Number of Days to Update: 50

Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 01/22/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 01/18/2018
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 03/20/2018
Number of Days to Update: 56

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 03/19/2018
Next Scheduled EDR Contact: 07/02/2018
Data Release Frequency: Quarterly

Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 01/18/2018
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 03/28/2018
Number of Days to Update: 64

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 03/19/2018
Next Scheduled EDR Contact: 07/02/2018
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 01/03/2018
Date Made Active in Reports: 02/05/2018
Number of Days to Update: 33

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 04/04/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List

Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 01/03/2018
Date Made Active in Reports: 02/14/2018
Number of Days to Update: 42

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 04/04/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 11/01/2017
Date Data Arrived at EDR: 11/03/2017
Date Made Active in Reports: 11/17/2017
Number of Days to Update: 14

Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 02/15/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

Hazardous Material Permits

This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 11/30/2017
Date Data Arrived at EDR: 12/01/2017
Date Made Active in Reports: 01/16/2018
Number of Days to Update: 46

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 04/06/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 12/04/2017
Date Data Arrived at EDR: 12/05/2017
Date Made Active in Reports: 01/11/2018
Number of Days to Update: 37

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 03/07/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Quarterly

Solid Waste Facilities
San Diego County Solid Waste Facilities.

Date of Government Version: 10/31/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 58

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 02/01/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

Environmental Case Listing
The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 02/28/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 02/01/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Quarterly

Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 11/07/2017
Date Made Active in Reports: 12/19/2017
Number of Days to Update: 42

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 04/02/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 12/20/2017
Date Data Arrived at EDR: 12/21/2017
Date Made Active in Reports: 02/01/2018
Number of Days to Update: 42

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 07/02/2018
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 11/16/2017
Date Data Arrived at EDR: 11/17/2017
Date Made Active in Reports: 12/18/2017
Number of Days to Update: 31

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 02/15/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

SAN MATEO COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Business Inventory

List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 12/12/2017
Date Data Arrived at EDR: 12/14/2017
Date Made Active in Reports: 01/11/2018
Number of Days to Update: 28

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 03/07/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Annually

Fuel Leak List

A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/23/2018
Date Made Active in Reports: 04/11/2018
Number of Days to Update: 78

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 03/07/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA Facility Listing

CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 02/15/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

SANTA CLARA COUNTY:

Cupa Facility List

Cupa facility list

Date of Government Version: 02/20/2018
Date Data Arrived at EDR: 02/20/2018
Date Made Active in Reports: 03/19/2018
Number of Days to Update: 27

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 02/15/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

HIST LUST - Fuel Leak Site Activity Report

A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing

A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 02/22/2018
Next Scheduled EDR Contact: 06/11/2018
Data Release Frequency: Annually

Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 02/04/2018
Date Data Arrived at EDR: 02/06/2018
Date Made Active in Reports: 03/20/2018
Number of Days to Update: 42

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 02/01/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 02/15/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 02/15/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Varies

SOLANO COUNTY:

Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 12/14/2017
Date Data Arrived at EDR: 12/15/2017
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 28

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 02/28/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Quarterly

Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 03/08/2018
Date Data Arrived at EDR: 03/13/2018
Date Made Active in Reports: 03/29/2018
Number of Days to Update: 16

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 02/28/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Quarterly

SONOMA COUNTY:

Cupa Facility List
Cupa Facility list

Date of Government Version: 12/20/2017
Date Data Arrived at EDR: 12/21/2017
Date Made Active in Reports: 01/31/2018
Number of Days to Update: 41

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 03/22/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Varies

Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 01/04/2018
Date Data Arrived at EDR: 01/09/2018
Date Made Active in Reports: 02/06/2018
Number of Days to Update: 28

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 03/22/2018
Next Scheduled EDR Contact: 07/09/2018
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 02/06/2018
Date Data Arrived at EDR: 02/07/2018
Date Made Active in Reports: 03/16/2018
Number of Days to Update: 37

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 01/16/2018
Next Scheduled EDR Contact: 04/30/2018
Data Release Frequency: Varies

SUTTER COUNTY:

Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 01/08/2018
Date Data Arrived at EDR: 03/01/2018
Date Made Active in Reports: 03/30/2018
Number of Days to Update: 29

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 02/28/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA Facility List
Cupa facilities

Date of Government Version: 01/26/2018
Date Data Arrived at EDR: 02/02/2018
Date Made Active in Reports: 03/21/2018
Number of Days to Update: 47

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 02/01/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/25/2018
Date Made Active in Reports: 03/19/2018
Number of Days to Update: 53

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 01/22/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

TULARE COUNTY:

CUPA Facility List
Cupa program facilities

Date of Government Version: 09/27/2017
Date Data Arrived at EDR: 09/28/2017
Date Made Active in Reports: 10/16/2017
Number of Days to Update: 18

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 03/06/2018
Next Scheduled EDR Contact: 05/21/2018
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/25/2018
Date Made Active in Reports: 03/16/2018
Number of Days to Update: 50

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 01/22/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Varies

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 12/26/2017
Date Data Arrived at EDR: 01/25/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 48

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 01/22/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 03/29/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 02/08/2018
Next Scheduled EDR Contact: 05/28/2018
Data Release Frequency: Quarterly

Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 12/26/2017
Date Data Arrived at EDR: 01/25/2018
Date Made Active in Reports: 03/20/2018
Number of Days to Update: 54

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 01/22/2018
Next Scheduled EDR Contact: 05/07/2018
Data Release Frequency: Quarterly

Underground Tank Closed Sites List

Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 02/28/2018
Date Data Arrived at EDR: 03/14/2018
Date Made Active in Reports: 03/30/2018
Number of Days to Update: 16

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 03/14/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report

Underground storage tank sites located in Yolo county.

Date of Government Version: 01/02/2018
Date Data Arrived at EDR: 01/09/2018
Date Made Active in Reports: 01/19/2018
Number of Days to Update: 10

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 03/29/2018
Next Scheduled EDR Contact: 07/16/2018
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List

CUPA facility listing for Yuba County.

Date of Government Version: 02/01/2018
Date Data Arrived at EDR: 02/02/2018
Date Made Active in Reports: 03/21/2018
Number of Days to Update: 47

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 01/29/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 01/03/2018
Date Data Arrived at EDR: 02/14/2018
Date Made Active in Reports: 03/22/2018
Number of Days to Update: 36

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 02/14/2018
Next Scheduled EDR Contact: 05/28/2018
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 04/11/2017
Date Made Active in Reports: 07/27/2017
Number of Days to Update: 107

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 04/10/2018
Next Scheduled EDR Contact: 07/23/2018
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 01/31/2018
Date Made Active in Reports: 03/09/2018
Number of Days to Update: 37

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 01/31/2018
Next Scheduled EDR Contact: 05/14/2018
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 07/25/2017
Date Made Active in Reports: 09/25/2017
Number of Days to Update: 62

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 01/16/2018
Next Scheduled EDR Contact: 04/30/2018
Data Release Frequency: Annually

RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 02/23/2018
Date Made Active in Reports: 04/09/2018
Number of Days to Update: 45

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 02/21/2018
Next Scheduled EDR Contact: 06/04/2018
Data Release Frequency: Annually

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 04/13/2017
Date Made Active in Reports: 07/14/2017
Number of Days to Update: 92

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 03/08/2018
Next Scheduled EDR Contact: 06/25/2018
Data Release Frequency: Annually

Oil/Gas Pipelines

Source: PennWell Corporation

Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Electric Power Transmission Line Data

Source: PennWell Corporation

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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:

Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association’s annual survey of hospitals.

Medical Centers: Provider of Services Listing

Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish & Game
Telephone: 916-445-0411

STREET AND ADDRESS INFORMATION

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

RE CRIMSON, LLC
BLYTHE
BLYTHE, CA 92239

TARGET PROPERTY COORDINATES

Latitude (North):	33.563603 - 33˚ 33’ 48.97’’
Longitude (West):	114.8405 - 114˚ 50’ 25.80’’
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	700462.2
UTM Y (Meters):	3715667.0
Elevation:	493 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5620012 ROOSEVELT MINE, CA
Version Date:	2012
North Map:	5619994 MCCOY PEAK, CA
Version Date:	2012
South Map:	5620016 THUMB PEAK, CA
Version Date:	2012
Southwest Map:	5620026 WILEY WELL, CA
Version Date:	2012
West Map:	5619988 HOPKINS WELL, CA
Version Date:	2012
Northwest Map:	5619996 MCCOY SPRING, CA
Version Date:	2012

EDR’s GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

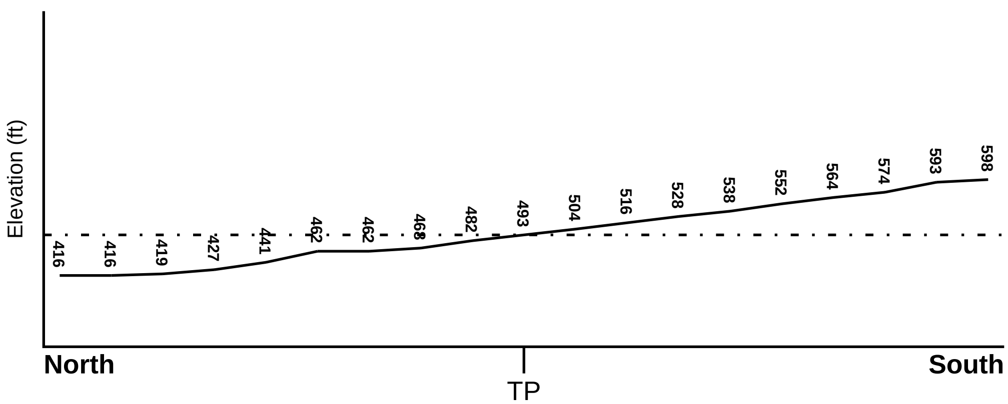
TOPOGRAPHIC INFORMATION

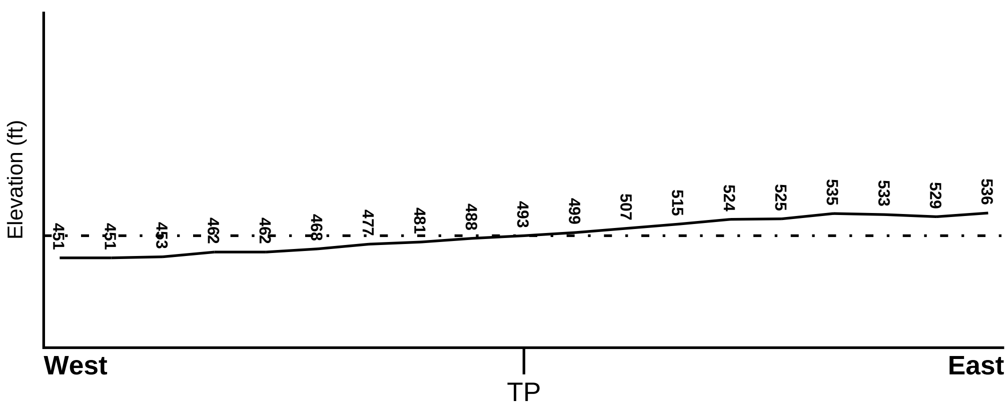
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

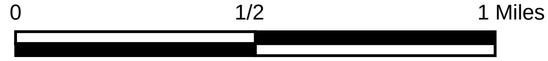
General Topographic Gradient: General NNW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES





Target Property Elevation: 493 ft.



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
0602453225A	FEMA Q3 Flood data

Additional Panels in search area:	FEMA Source Type
0602453200A	FEMA Q3 Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius: 1.25 miles
Status: Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era:	Cenozoic
System:	Quaternary
Series:	Quaternary
Code:	Q *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name:	GUNSIGHT
Soil Surface Texture:	very gravelly - sandy loam
Hydrologic Group:	Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.
Soil Drainage Class:	Somewhat excessive. Soils have high hydraulic conductivity and low water holding capacity. Depth to water table is more than 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel:	HIGH
Depth to Bedrock Min:	> 60 inches
Depth to Bedrock Max:	> 60 inches

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	2 inches	very gravelly - sandy loam	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel	Max: 6.00 Min: 2.00	Max: 8.40 Min: 7.90
2	2 inches	8 inches	very gravelly - loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel. COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel.	Max: 2.00 Min: 0.60	Max: 8.40 Min: 7.90
3	8 inches	60 inches	very gravelly - loam	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel	Max: 2.00 Min: 0.60	Max: 8.40 Min: 7.90

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: gravelly - loam
very gravelly - silt loam
gravelly - loamy sand
very gravelly - sandy clay loam
clay loam
extremely gravelly - sandy loam
gravelly - sandy loam
loam

Surficial Soil Types: gravelly - loam
very gravelly - silt loam
gravelly - loamy sand
very gravelly - sandy clay loam
clay loam
extremely gravelly - sandy loam
gravelly - sandy loam
loam

Shallow Soil Types: sandy clay loam
very gravelly - sandy loam

	cemented
	clay loam
	very gravelly - loam
Deeper Soil Types:	very gravelly - sandy loam
	very gravelly - sand
	stratified
	unweathered bedrock
	gravelly - sandy loam
	extremely gravelly - sandy loam
	sandy clay loam
	gravelly - sand
	loam
	extremely gravelly - coarse sand

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	4.000
Federal FRDS PWS	Nearest PWS within 3.000 miles
State Database	4.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	USGS40000135728	2 - 3 Miles NE
2	USGS40000127644	3 - 4 Miles WNW
A3	USGS40000135573	3 - 4 Miles WNW
4	USGS40000127439	3 - 4 Miles SW
B8	USGS40000127814	3 - 4 Miles NE
B9	USGS40000127813	3 - 4 Miles NE
C10	USGS40000127495	3 - 4 Miles West
D12	USGS40000127446	3 - 4 Miles WSW
D13	USGS40000127447	3 - 4 Miles WSW
D14	USGS40000127448	3 - 4 Miles WSW

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

No PWS System Found

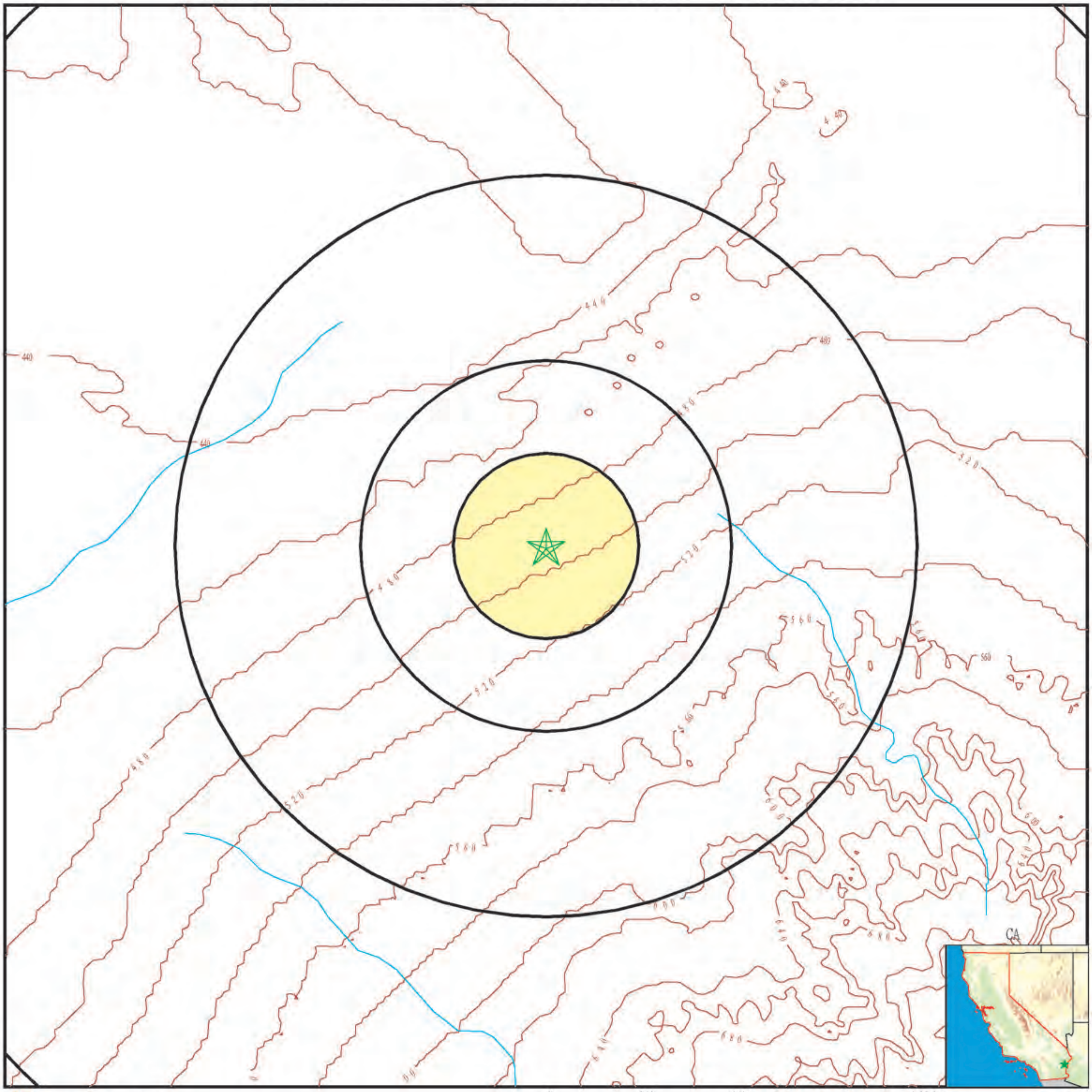
Note: PWS System location is not always the same as well location.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A5	CADW60000022661	3 - 4 Miles WNW
B6	CADW60000016334	3 - 4 Miles NE
B7	CADW60000001591	3 - 4 Miles NE
C11	18406	3 - 4 Miles West
D15	CADW60000001588	3 - 4 Miles WSW

PHYSICAL SETTING SOURCE MAP - 5256788.2s



County Boundary
Major Roads
Contour Lines
Earthquake Fault Lines
Earthquake epicenter, Richter 5 or greater
Water Wells
Public Water Supply Wells
Cluster of Multiple Icons

Groundwater Flow Direction
Indeterminate Groundwater Flow at Location
Groundwater Flow Varies at Location
Closest Hydrogeological Data
Oil, gas or related wells

SITE NAME: RE Crimson, LLC	CLIENT: Stantec
ADDRESS: Blythe	CONTACT: Dion Monge
Blythe CA 92239	INQUIRY #: 5256788.2s
LAT/LONG: 33.563603 / 114.8405	DATE: April 12, 2018 4:56 pm

Map ID Direction Distance Elevation	Database	EDR ID Number
1 **NE** **2 - 3 Miles** **Higher**	**FED USGS**	**USGS40000135728**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-333544114483701		
Monloc name:	007S021E05F001S		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	15030104	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	33.59558
Longitude:	-114.811074	Sourcemap scale:	Not Reported
Horiz Acc measure:	Unknown	Horiz Acc measure units:	Unknown
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	Not Reported
Vert measure units:	Not Reported	Vertacc measure val:	Not Reported
Vert accmeasure units:	Not Reported		
Vertcollection method:	Not Reported		
Vert coord refsys:	Not Reported	Countrycode:	US
Aquifername:	Basin and Range basin-fill aquifers		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 0

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2 **WNW** **3 - 4 Miles** **Lower**	**FED USGS**	**USGS40000127644**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-333503114531601		
Monloc name:	007S020E03N001S		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18100100	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	33.5841913
Longitude:	-114.8885763	Sourcemap scale:	24000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	408.48
Vert measure units:	feet	Vertacc measure val:	1
Vert accmeasure units:	feet		
Vertcollection method:	Level or other surveying method		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		

Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	170
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1990-09-16		

Note: The site was dry (no water level recorded).

A3
WNW
3 - 4 Miles
Lower

FED USGS **USGS40000135573**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-333502114532501		
Monloc name:	007S020E04R001S		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18100100	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	33.5839135
Longitude:	-114.8910764	Sourcemap scale:	62500
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	418.
Vert measure units:	feet	Vertacc measure val:	20
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Basin and Range basin-fill aquifers		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	315.7
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 21

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1979-04-24					

Note: The site was dry (no water level recorded).

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1970-04-30	150.95		1969-10-23	150.89	
1967-10-25	150.86		1967-03-16	150.92	
1966-10-27	150.89		1966-03-02	150.66	
1965-11-18	151.40		1965-03-18	151.21	
1964-11-25	151.13		1964-03-19	150.77	
1963-10-31	150.91		1963-03-13	150.84	
1962-10-31	150.90		1962-05-07	150.83	
1962-04-09	150.73		1962-03-08	150.89	
1962-01-10	151.04		1961-11-08	151.03	
1961-10-10	151.09		1961-06-12	151.83	

Map ID Direction Distance Elevation	Database	EDR ID Number
4 **SW** **3 - 4 Miles** **Higher**	**FED USGS**	**USGS40000127439**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-333203114525601		
Monloc name:	007S020E27L001S		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18100100	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	33.5325733
Longitude:	-114.8835339	Sourcemap scale:	24000
Horiz Acc measure:	.01	Horiz Acc measure units:	seconds
Horiz Collection method:	Differentially corrected Global Positioning System (DGPS)		
Horiz coord refsys:	NAD83	Vert measure val:	512.1
Vert measure units:	feet	Vertacc measure val:	0.1
Vert accmeasure units:	feet		
Vertcollection method:	Differential Global Positioning System (GPS)r		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	53.6
Welldepth units:	ft	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 3

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel

2000-10-05
Note: An obstruction was encountered in the well above the water surface (no water level recorded).
1990-09-25
Note: An obstruction was encountered in the well above the water surface (no water level recorded).
1961-08-05
Note: The site was dry (no water level recorded).

Map ID Direction Distance Elevation	Database	EDR ID Number
A5 **WNW** **3 - 4 Miles** **Lower**	**CA WELLS**	**CADW60000022661**

Objectid:	22661
Latitude:	33.5839
Longitude:	-114.8919
Site code:	335839N1148919W001
State well numbe:	07S20E04R001S
Local well name:	’’
Well use id:	6
Well use descrip:	Unknown
County id:	33
County name:	Riverside

Basin code:	’7-5’
Basin desc:	Chuckwalla Valley
Dwr region id:	80238
Dwr region:	Southern Region Office
Site id:	CADW60000022661

B6
NE
3 - 4 Miles
Higher

CA WELLS CADW60000016334

Objectid:	16334
Latitude:	33.6028
Longitude:	-114.8065
Site code:	336028N1148065W001
State well numbe:	07S21E05C002S
Local well name:	’’
Well use id:	6
Well use descrip:	Unknown
County id:	33
County name:	Riverside
Basin code:	’7-39’
Basin desc:	Palo Verde Mesa
Dwr region id:	80238
Dwr region:	Southern Region Office
Site id:	CADW60000016334

B7
NE
3 - 4 Miles
Higher

CA WELLS CADW60000001591

Objectid:	1591
Latitude:	33.6029
Longitude:	-114.8063
Site code:	336029N1148063W001
State well numbe:	07S21E05C001S
Local well name:	’’
Well use id:	6
Well use descrip:	Unknown
County id:	33
County name:	Riverside
Basin code:	’7-39’
Basin desc:	Palo Verde Mesa
Dwr region id:	80238
Dwr region:	Southern Region Office
Site id:	CADW60000001591

B8
NE
3 - 4 Miles
Higher

FED USGS USGS40000127814

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-333610114481801		
Monloc name:	007S021E05C002S		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18100100	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	33.6028271
Longitude:	-114.8057073	Sourcemap scale:	24000
Horiz Acc measure:	.01	Horiz Acc measure units:	seconds
Horiz Collection method:	Differentially corrected Global Positioning System (DGPS)		
Horiz coord refsys:	NAD83	Vert measure val:	504.4
Vert measure units:	feet	Vertacc measure val:	0.1
Vert accmeasure units:	feet		
Vertcollection method:	Differential Global Positioning System (GPS)r		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 5

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
2002-03-19	256.59		2002-02-05	256.18	
2002-02-05	256.18				
2000-10-04					

Note: An obstruction was encountered in the well above the water surface (no water level recorded).

1992-02-10	255.28	

B9
NE
3 - 4 Miles
Higher

FED USGS USGS40000127813

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-333610114481701		
Monloc name:	007S021E05C001S		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18100100	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	33.6028743
Longitude:	-114.8054628	Sourcemap scale:	24000
Horiz Acc measure:	.01	Horiz Acc measure units:	seconds
Horiz Collection method:	Differentially corrected Global Positioning System (DGPS)		
Horiz coord refsys:	NAD83	Vert measure val:	504.5
Vert measure units:	feet	Vertacc measure val:	0.1
Vert accmeasure units:	feet		
Vertcollection method:	Differential Global Positioning System (GPS)r		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		

Aquifer type:	Not Reported		
Construction date:	Not Reported	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	Not Reported
Wellholedepth units:	Not Reported		

Ground-water levels, Number of Measurements: 2

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
2000-10-04					

Note: An obstruction was encountered in the well above the water surface (no water level recorded).

1990-09-25		

Note: An obstruction was encountered in the well above the water surface (no water level recorded).

C10
West
3 - 4 Miles
Lower

FED USGS **USGS40000127495**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-333333114541701		
Monloc name:	007S020E16M001S		
Monloc type:	Well		
Monloc desc:	19025 WILEYS WELL ROAD		
Huc code:	18100100	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	33.5591308
Longitude:	-114.9053349	Sourcemap scale:	24000
Horiz Acc measure:	.01	Horiz Acc measure units:	seconds
Horiz Collection method:	Differentially corrected Global Positioning System (DGPS)		
Horiz coord refsys:	NAD83	Vert measure val:	457.5
Vert measure units:	feet	Vertacc measure val:	0.1
Vert accmeasure units:	feet		
Vertcollection method:	Differential Global Positioning System (GPS)r		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	1987	Welldepth:	1200
Welldepth units:	ft	Wellholedepth:	1220
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 6

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
2000-10-05					

Note: The site was being pumped.

2000-03-16		

Note: The site was being pumped.

1992-02-11	206.27	

Note: Foreign substance was present on the surface of the water.

1992-02-10	206.7	

Note: Foreign substance was present on the surface of the water.

1990-09-17	205.62		1987	202.25	

Map ID Direction Distance Elevation	Database	EDR ID Number
C11 **West** **3 - 4 Miles** **Lower**	**CA WELLS**	**18406**

Water System Information:

Prime Station Code:	3310802-003	User ID:	WAT
FRDS Number:	3310802003	County:	Riverside
District Number:	14	Station Type:	WELL
Water Type:	Well/Groundwater	Well Status:	Active Raw
Source Lat/Long:	333333.0 1145420.0	Precision:	10 Feet (1/10 Second)
Source Name:	WELL 03		
System Number:	3310802		
System Name:	Chuckawalla Valley State Prison		
Organization That Operates System:			
	P.O. Box 2289 Blythe, CA 92226		
Pop Served:	3800	Connections:	1357
Area Served:	Not Reported		
Sample Collected:	20-MAY-15	Findings:	37. UG/L
Chemical:	ARSENIC		
Sample Collected:	27-MAY-15	Findings:	15. UG/L
Chemical:	ARSENIC		
Sample Collected:	03-JUN-15	Findings:	51. UG/L
Chemical:	ARSENIC		
Sample Collected:	10-JUN-15	Findings:	6.2 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	10-JUN-15	Findings:	53. UG/L
Chemical:	ARSENIC		
Sample Collected:	10-JUN-15	Findings:	1300. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	17-JUN-15	Findings:	23. UG/L
Chemical:	ARSENIC		
Sample Collected:	24-JUN-15	Findings:	52. UG/L
Chemical:	ARSENIC		
Sample Collected:	08-JUL-15	Findings:	6.48 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	08-JUL-15	Findings:	65.9 UG/L
Chemical:	ARSENIC		
Sample Collected:	08-JUL-15	Findings:	1390. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	09-SEP-15	Findings:	6.82 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	09-SEP-15	Findings:	1290. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		

Sample Collected:	14-OCT-15	Findings:	7.01 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	14-OCT-15	Findings:	1220. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	21-OCT-15	Findings:	58.8 UG/L
Chemical:	ARSENIC		
Sample Collected:	10-NOV-15	Findings:	7.97 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	10-NOV-15	Findings:	1020. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	02-DEC-15	Findings:	41.6 UG/L
Chemical:	ARSENIC		
Sample Collected:	09-DEC-15	Findings:	7.34 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	09-DEC-15	Findings:	53.5 UG/L
Chemical:	ARSENIC		
Sample Collected:	09-DEC-15	Findings:	1230. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	16-DEC-15	Findings:	57.2 UG/L
Chemical:	ARSENIC		
Sample Collected:	30-DEC-15	Findings:	48.2 UG/L
Chemical:	ARSENIC		
Sample Collected:	06-JAN-16	Findings:	50.1 UG/L
Chemical:	ARSENIC		
Sample Collected:	13-JAN-16	Findings:	6.83 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	13-JAN-16	Findings:	50.3 UG/L
Chemical:	ARSENIC		
Sample Collected:	13-JAN-16	Findings:	1320. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	20-JAN-16	Findings:	48.9 UG/L
Chemical:	ARSENIC		
Sample Collected:	27-JAN-16	Findings:	53.4 UG/L
Chemical:	ARSENIC		
Sample Collected:	03-FEB-16	Findings:	49.7 UG/L
Chemical:	ARSENIC		
Sample Collected:	10-FEB-16	Findings:	7.77 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	10-FEB-16	Findings:	45.9 UG/L
Chemical:	ARSENIC		
Sample Collected:	10-FEB-16	Findings:	1130. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	24-FEB-16	Findings:	57.8 UG/L
Chemical:	ARSENIC		

Sample Collected:	02-MAR-16	Findings:	50.7 UG/L
Chemical:	ARSENIC		
Sample Collected:	09-MAR-16	Findings:	7.08 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	09-MAR-16	Findings:	55.1 UG/L
Chemical:	ARSENIC		
Sample Collected:	09-MAR-16	Findings:	1330. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	16-MAR-16	Findings:	45.1 UG/L
Chemical:	ARSENIC		
Sample Collected:	23-MAR-16	Findings:	46.3 UG/L
Chemical:	ARSENIC		
Sample Collected:	30-MAR-16	Findings:	41.3 UG/L
Chemical:	ARSENIC		
Sample Collected:	06-APR-16	Findings:	39.1 UG/L
Chemical:	ARSENIC		
Sample Collected:	13-APR-16	Findings:	6.81 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	13-APR-16	Findings:	46. UG/L
Chemical:	ARSENIC		
Sample Collected:	13-APR-16	Findings:	1330. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	20-APR-16	Findings:	42.9 UG/L
Chemical:	ARSENIC		
Sample Collected:	27-APR-16	Findings:	38.7 UG/L
Chemical:	ARSENIC		
Sample Collected:	18-MAY-16	Findings:	36.5 UG/L
Chemical:	ARSENIC		
Sample Collected:	15-JUN-16	Findings:	1.85 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	15-JUN-16	Findings:	3.1 PCI/L
Chemical:	GROSS ALPHA MDA95		
Sample Collected:	13-JUL-16	Findings:	48.9 UG/L
Chemical:	ARSENIC		
Sample Collected:	20-JUL-16	Findings:	6.45 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	20-JUL-16	Findings:	46. UG/L
Chemical:	ARSENIC		
Sample Collected:	20-JUL-16	Findings:	1460. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	27-JUL-16	Findings:	51.1 UG/L
Chemical:	ARSENIC		
Sample Collected:	03-AUG-16	Findings:	47. UG/L
Chemical:	ARSENIC		

Sample Collected:	11-AUG-16	Findings:	49.1 UG/L
Chemical:	ARSENIC		
Sample Collected:	24-AUG-16	Findings:	47.6 UG/L
Chemical:	ARSENIC		
Sample Collected:	31-AUG-16	Findings:	52.2 UG/L
Chemical:	ARSENIC		
Sample Collected:	14-SEP-16	Findings:	35.3 UG/L
Chemical:	ARSENIC		
Sample Collected:	21-SEP-16	Findings:	22.7 UG/L
Chemical:	ARSENIC		
Sample Collected:	28-SEP-16	Findings:	20.3 UG/L
Chemical:	ARSENIC		
Sample Collected:	05-OCT-16	Findings:	46.6 UG/L
Chemical:	ARSENIC		
Sample Collected:	12-OCT-16	Findings:	5.62 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	12-OCT-16	Findings:	1380. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	09-NOV-16	Findings:	7.24 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	09-NOV-16	Findings:	43.4 UG/L
Chemical:	ARSENIC		
Sample Collected:	09-NOV-16	Findings:	1190. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	14-DEC-16	Findings:	8.35 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	14-DEC-16	Findings:	47.1 UG/L
Chemical:	ARSENIC		
Sample Collected:	14-DEC-16	Findings:	1180. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	28-DEC-16	Findings:	2.13 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	28-DEC-16	Findings:	3.08 PCI/L
Chemical:	GROSS ALPHA MDA95		
Sample Collected:	11-JAN-17	Findings:	6.54 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	11-JAN-17	Findings:	45. UG/L
Chemical:	ARSENIC		
Sample Collected:	11-JAN-17	Findings:	1440. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	08-FEB-17	Findings:	7.07 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	08-FEB-17	Findings:	51.8 UG/L
Chemical:	ARSENIC		

Sample Collected:	08-FEB-17	Findings:	1220. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	08-MAR-17	Findings:	6.72 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	08-MAR-17	Findings:	49.3 UG/L
Chemical:	ARSENIC		
Sample Collected:	08-MAR-17	Findings:	1320. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	12-APR-17	Findings:	6.75 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	12-APR-17	Findings:	53.5 UG/L
Chemical:	ARSENIC		
Sample Collected:	12-APR-17	Findings:	1410. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	10-MAY-17	Findings:	8.29 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	10-MAY-17	Findings:	48.2 UG/L
Chemical:	ARSENIC		
Sample Collected:	10-MAY-17	Findings:	1020. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	13-MAR-12	Findings:	40. UG/L
Chemical:	ARSENIC		
Sample Collected:	30-MAY-12	Findings:	1900. US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	30-MAY-12	Findings:	8.36
Chemical:	PH, LABORATORY		
Sample Collected:	30-MAY-12	Findings:	82. MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	30-MAY-12	Findings:	38. MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	30-MAY-12	Findings:	12.9 MG/L
Chemical:	CALCIUM		
Sample Collected:	30-MAY-12	Findings:	1.72 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	30-MAY-12	Findings:	770. MG/L
Chemical:	SODIUM		
Sample Collected:	30-MAY-12	Findings:	294. MG/L
Chemical:	CHLORIDE		
Sample Collected:	30-MAY-12	Findings:	326. MG/L
Chemical:	SULFATE		
Sample Collected:	30-MAY-12	Findings:	1080. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	30-MAY-12	Findings:	1.1 UG/L
Chemical:	THALLIUM		

Sample Collected:	30-MAY-12	Findings:	1.8 PCI/L
Chemical:	GROSS ALPHA COUNTING ERROR		
Sample Collected:	12-JUN-12	Findings:	8.1 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	12-JUN-12	Findings:	976. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	12-JUN-12	Findings:	45. UG/L
Chemical:	ARSENIC		
Sample Collected:	11-JUL-12	Findings:	45. UG/L
Chemical:	ARSENIC		
Sample Collected:	01-AUG-12	Findings:	44. UG/L
Chemical:	ARSENIC		
Sample Collected:	01-AUG-12	Findings:	45. UG/L
Chemical:	ARSENIC		
Sample Collected:	05-SEP-12	Findings:	8. MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	05-SEP-12	Findings:	903. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	05-SEP-12	Findings:	45. UG/L
Chemical:	ARSENIC		
Sample Collected:	17-OCT-12	Findings:	7.7 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	17-OCT-12	Findings:	861. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	17-OCT-12	Findings:	44. UG/L
Chemical:	ARSENIC		
Sample Collected:	20-NOV-12	Findings:	42. UG/L
Chemical:	ARSENIC		
Sample Collected:	20-NOV-12	Findings:	7.8 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	20-NOV-12	Findings:	980. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	05-DEC-12	Findings:	6.5 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	05-DEC-12	Findings:	1200. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	05-DEC-12	Findings:	39. UG/L
Chemical:	ARSENIC		
Sample Collected:	16-JAN-13	Findings:	8.2 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	16-JAN-13	Findings:	914. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	24-APR-13	Findings:	45. UG/L
Chemical:	ARSENIC		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Sample Collected:	15-MAY-13	Findings:	7.5 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	15-MAY-13	Findings:	42.1 UG/L
Chemical:	ARSENIC		
Sample Collected:	15-MAY-13	Findings:	926. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	05-JUN-13	Findings:	49. UG/L
Chemical:	ARSENIC		
Sample Collected:	17-JUL-13	Findings:	8.1 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	17-JUL-13	Findings:	872. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	17-JUL-13	Findings:	37. UG/L
Chemical:	ARSENIC		
Sample Collected:	07-AUG-13	Findings:	9.4 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	07-AUG-13	Findings:	47. UG/L
Chemical:	ARSENIC		
Sample Collected:	07-AUG-13	Findings:	1000. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	04-SEP-13	Findings:	49. UG/L
Chemical:	ARSENIC		
Sample Collected:	11-SEP-13	Findings:	8.2 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	11-SEP-13	Findings:	42. UG/L
Chemical:	ARSENIC		
Sample Collected:	11-SEP-13	Findings:	1100. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	09-OCT-13	Findings:	8.4 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	09-OCT-13	Findings:	37. UG/L
Chemical:	ARSENIC		
Sample Collected:	09-OCT-13	Findings:	900. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	13-NOV-13	Findings:	12. MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	13-NOV-13	Findings:	41. UG/L
Chemical:	ARSENIC		
Sample Collected:	13-NOV-13	Findings:	910. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	11-DEC-13	Findings:	10. MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	11-DEC-13	Findings:	39. UG/L
Chemical:	ARSENIC		

Sample Collected:	11-DEC-13	Findings:	950. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	18-DEC-13	Findings:	38. UG/L
Chemical:	ARSENIC		
Sample Collected:	24-DEC-13	Findings:	44. UG/L
Chemical:	ARSENIC		
Sample Collected:	22-JAN-14	Findings:	41. UG/L
Chemical:	ARSENIC		
Sample Collected:	29-JAN-14	Findings:	41. UG/L
Chemical:	ARSENIC		
Sample Collected:	12-FEB-14	Findings:	9. MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	12-FEB-14	Findings:	40. UG/L
Chemical:	ARSENIC		
Sample Collected:	12-FEB-14	Findings:	900. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	12-MAR-14	Findings:	9.2 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	12-MAR-14	Findings:	45. UG/L
Chemical:	ARSENIC		
Sample Collected:	12-MAR-14	Findings:	790. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	09-APR-14	Findings:	9.4 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	09-APR-14	Findings:	40. UG/L
Chemical:	ARSENIC		
Sample Collected:	09-APR-14	Findings:	1000. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	07-MAY-14	Findings:	42. UG/L
Chemical:	ARSENIC		
Sample Collected:	14-MAY-14	Findings:	8.1 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	14-MAY-14	Findings:	38. UG/L
Chemical:	ARSENIC		
Sample Collected:	14-MAY-14	Findings:	840. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	21-MAY-14	Findings:	36. UG/L
Chemical:	ARSENIC		
Sample Collected:	28-MAY-14	Findings:	40. UG/L
Chemical:	ARSENIC		
Sample Collected:	04-JUN-14	Findings:	47. UG/L
Chemical:	ARSENIC		
Sample Collected:	11-JUN-14	Findings:	6.5 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		

Sample Collected:	11-JUN-14	Findings:	45. UG/L
Chemical:	ARSENIC		
Sample Collected:	11-JUN-14	Findings:	1200. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	23-JUL-14	Findings:	6.8 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	23-JUL-14	Findings:	42. UG/L
Chemical:	ARSENIC		
Sample Collected:	23-JUL-14	Findings:	950. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	30-JUL-14	Findings:	44. UG/L
Chemical:	ARSENIC		
Sample Collected:	06-AUG-14	Findings:	31. UG/L
Chemical:	ARSENIC		
Sample Collected:	13-AUG-14	Findings:	8.1 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	13-AUG-14	Findings:	27. UG/L
Chemical:	ARSENIC		
Sample Collected:	13-AUG-14	Findings:	910. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	20-AUG-14	Findings:	38. UG/L
Chemical:	ARSENIC		
Sample Collected:	03-SEP-14	Findings:	40. UG/L
Chemical:	ARSENIC		
Sample Collected:	10-SEP-14	Findings:	8.5 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	10-SEP-14	Findings:	38. UG/L
Chemical:	ARSENIC		
Sample Collected:	10-SEP-14	Findings:	890. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	17-SEP-14	Findings:	40. UG/L
Chemical:	ARSENIC		
Sample Collected:	24-SEP-14	Findings:	36. UG/L
Chemical:	ARSENIC		
Sample Collected:	01-OCT-14	Findings:	42. UG/L
Chemical:	ARSENIC		
Sample Collected:	08-OCT-14	Findings:	8.6 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	08-OCT-14	Findings:	39. UG/L
Chemical:	ARSENIC		
Sample Collected:	08-OCT-14	Findings:	880. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	15-OCT-14	Findings:	38. UG/L
Chemical:	ARSENIC		

Sample Collected:	19-NOV-14	Findings:	46. UG/L
Chemical:	ARSENIC		
Sample Collected:	26-NOV-14	Findings:	43. UG/L
Chemical:	ARSENIC		
Sample Collected:	03-DEC-14	Findings:	44. UG/L
Chemical:	ARSENIC		
Sample Collected:	10-DEC-14	Findings:	11. MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	10-DEC-14	Findings:	44. UG/L
Chemical:	ARSENIC		
Sample Collected:	10-DEC-14	Findings:	930. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	23-DEC-14	Findings:	47. UG/L
Chemical:	ARSENIC		
Sample Collected:	30-DEC-14	Findings:	50. UG/L
Chemical:	ARSENIC		
Sample Collected:	07-JAN-15	Findings:	45. UG/L
Chemical:	ARSENIC		
Sample Collected:	14-JAN-15	Findings:	8.8 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	14-JAN-15	Findings:	43. UG/L
Chemical:	ARSENIC		
Sample Collected:	14-JAN-15	Findings:	900. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	21-JAN-15	Findings:	43. UG/L
Chemical:	ARSENIC		
Sample Collected:	28-JAN-15	Findings:	50. UG/L
Chemical:	ARSENIC		
Sample Collected:	11-FEB-15	Findings:	8.8 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	11-FEB-15	Findings:	42. UG/L
Chemical:	ARSENIC		
Sample Collected:	11-FEB-15	Findings:	960. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	18-FEB-15	Findings:	35. UG/L
Chemical:	ARSENIC		
Sample Collected:	25-FEB-15	Findings:	43. UG/L
Chemical:	ARSENIC		
Sample Collected:	04-MAR-15	Findings:	35. UG/L
Chemical:	ARSENIC		
Sample Collected:	11-MAR-15	Findings:	8.8 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	11-MAR-15	Findings:	40. UG/L
Chemical:	ARSENIC		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Sample Collected:	11-MAR-15	Findings:	880. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	18-MAR-15	Findings:	28. UG/L
Chemical:	ARSENIC		
Sample Collected:	25-MAR-15	Findings:	41. UG/L
Chemical:	ARSENIC		
Sample Collected:	01-APR-15	Findings:	42. UG/L
Chemical:	ARSENIC		
Sample Collected:	07-APR-15	Findings:	7. MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	07-APR-15	Findings:	32. UG/L
Chemical:	ARSENIC		
Sample Collected:	07-APR-15	Findings:	1200. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	15-APR-15	Findings:	33. UG/L
Chemical:	ARSENIC		
Sample Collected:	22-APR-15	Findings:	33. UG/L
Chemical:	ARSENIC		
Sample Collected:	29-APR-15	Findings:	48. UG/L
Chemical:	ARSENIC		
Sample Collected:	06-MAY-15	Findings:	37. UG/L
Chemical:	ARSENIC		
Sample Collected:	13-MAY-15	Findings:	6.4 MG/L
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)		
Sample Collected:	13-MAY-15	Findings:	54. UG/L
Chemical:	ARSENIC		
Sample Collected:	13-MAY-15	Findings:	1400. MG/L
Chemical:	TOTAL DISSOLVED SOLIDS		
Sample Collected:	20-MAY-15	Findings:	2100. US
Chemical:	SPECIFIC CONDUCTANCE		
Sample Collected:	20-MAY-15	Findings:	8.2
Chemical:	PH, LABORATORY		
Sample Collected:	20-MAY-15	Findings:	120. MG/L
Chemical:	ALKALINITY (TOTAL) AS CACO3		
Sample Collected:	20-MAY-15	Findings:	150. MG/L
Chemical:	BICARBONATE ALKALINITY		
Sample Collected:	20-MAY-15	Findings:	43. MG/L
Chemical:	HARDNESS (TOTAL) AS CACO3		
Sample Collected:	20-MAY-15	Findings:	14. MG/L
Chemical:	CALCIUM		
Sample Collected:	20-MAY-15	Findings:	1.7 MG/L
Chemical:	MAGNESIUM		
Sample Collected:	20-MAY-15	Findings:	440. MG/L
Chemical:	SODIUM		

Sample Collected:	20-MAY-15	Findings:	330. MG/L
Chemical:	CHLORIDE		
Sample Collected:	20-MAY-15	Findings:	390. MG/L
Chemical:	SULFATE		

D12
WSW
3 - 4 Miles
Higher

FED USGS **USGS40000127446**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-333214114535401		
Monloc name:	007S020E28C002S		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18100100	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	33.5372481
Longitude:	-114.8989955	Sourcemap scale:	24000
Horiz Acc measure:	.01	Horiz Acc measure units:	seconds
Horiz Collection method:	Differentially corrected Global Positioning System (DGPS)		
Horiz coord refsys:	NAD83	Vert measure val:	505.3
Vert measure units:	feet	Vertacc measure val:	0.1
Vert accmeasure units:	feet		
Vertcollection method:	Differential Global Positioning System (GPS)r		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19891012	Welldepth:	1100
Welldepth units:	ft	Wellholedepth:	1145
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1989-11-29	234	

D13
WSW
3 - 4 Miles
Higher

FED USGS **USGS40000127447**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-333214114535402		
Monloc name:	007S020E28C003S		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18100100	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	33.5372481
Longitude:	-114.8991317	Sourcemap scale:	24000

Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Differentially corrected Global Positioning System (DGPS)		
Horiz coord refsys:	NAD83	Vert measure val:	505.
Vert measure units:	feet	Vertacc measure val:	1
Vert accmeasure units:	feet		
Vertcollection method:	Differential Global Positioning System (GPS)r		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19890511	Welldepth:	Not Reported
Welldepth units:	Not Reported	Wellholedepth:	825
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 0

D14
WSW
3 - 4 Miles
Higher

FED USGS **USGS40000127448**

Org. Identifier:	USGS-AZ		
Formal name:	USGS Arizona Water Science Center		
Monloc Identifier:	USGS-333214114535501		
Monloc name:	007S020E28C001S		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18100100	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	33.5372509
Longitude:	-114.8991372	Sourcemap scale:	24000
Horiz Acc measure:	.01	Horiz Acc measure units:	seconds
Horiz Collection method:	Differentially corrected Global Positioning System (DGPS)		
Horiz coord refsys:	NAD83	Vert measure val:	505.6
Vert measure units:	feet	Vertacc measure val:	0.1
Vert accmeasure units:	feet		
Vertcollection method:	Differential Global Positioning System (GPS)r		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19820218	Welldepth:	830
Welldepth units:	ft	Wellholedepth:	830
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 21

Date	Feet below Surface	Feet to Sealevel
2004-03-02	235.65	
2003-11-05	236.45	
2003-06-03	235.61	
2002-10-02	236.04	
2002-04-03	234.69	
2001-11-07	235.66	
2001-07-10	235.40	
2001-04-16	234.82	
2001-01-10	234.89	
2000-03-29	234.50	

Date	Feet below Surface	Feet to Sealevel
2004-03-02	235.63	
2003-11-05	236.46	
2003-06-03	235.59	
2002-10-02	236.16	
2002-04-03	234.69	
2001-11-07	235.69	
2001-04-16	234.82	
2001-02-23	234.45	
2000-10-05	234.84	
1992-02-13	232.35	

Ground-water levels, continued.

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1982-03-15	248				

Note: The site was being pumped.

D15
WSW
3 - 4 Miles
Higher

CA WELLS CADW60000001588

Objectid:	1588
Latitude:	33.5373
Longitude:	-114.8999
Site code:	335373N1148999W001
State well numbe:	07S20E28C001S
Local well name:	''
Well use id:	6
Well use descrip:	Unknown
County id:	33
County name:	Riverside
Basin code:	'7-5'
Basin desc:	Chuckwalla Valley
Dwr region id:	80238
Dwr region:	Southern Region Office
Site id:	CADW60000001588

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
92239	1	0

Federal EPA Radon Zone for RIVERSIDE County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for RIVERSIDE COUNTY, CA

Number of sites tested: 12

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.117 pCi/L	100%	0%	0%
Living Area - 2nd Floor	0.450 pCi/L	100%	0%	0%
Basement	1.700 pCi/L	100%	0%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5’ Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5’ Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish & Game
Telephone: 916-445-0411

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture’s (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

OTHER STATE DATABASE INFORMATION

California Oil and Gas Well Locations
Source: Department of Conservation
Telephone: 916-323-1779
Oil and Gas well locations in the state.

RADON

State Database: CA Radon
Source: Department of Health Services
Telephone: 916-324-2208
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

Appendix D
USER PROVIDED RECORDS

PHASE I ESA USER'S QUESTIONNAIRE

In order to qualify for protection from land owner liability under CERCLA as an *innocent landowner, bona fide prospective purchaser,* or *contiguous property owner*, ASTM standard practice E1527-13 and the federal AAI rule (40 CFR 312) require that the User of the Phase I ESA report provide certain information (if available) to the Environmental Professional completing the assessment. Failure to provide this information could result in a determination that "all appropriate inquiry" is not complete. Information that is not or cannot be provided to the Environmental Professional may be identified as a "data gap" in the Phase I ESA report.

Please answer the following questions as completely as possible. Attach additional pages as needed. Return the completed questionnaire to Stantec along with the executed Authorization For services form.

1. Property Information

Property Name: Crimson Solar Project Site ______________________________

Property Address(es): West of Blythe ______________________________

City: ______________________________ State CA________Zip ______________

Property Owner Name: US Bureau of Land Management ______________________

Property Owner Phone #: ______________________________

2. Contact For Site Access

Name: NA ______________________________

Company/Organization/Title: ______________________________

Phone # ____________________ E-Mail Address: ______________________

3. Environmental Cleanup Liens. Are you aware of any environmental cleanup liens against the property that are filed or recorded under federal, tribal, state or local law?

__________ Yes ______X____ No

If yes, describe or attach details of the lien ______________________________

____

4. Activity and Land Use Limitations. Are you aware of any activity and use limitations, such as engineering controls, land use restrictions, or institutional controls that are in place at the property and/or have been filed or recorded as applicable to the property as a result of environmental contamination, investigation, cleanup, or related matters?

__________ Yes _______X___ No

If yes, describe or attach details of the limitations ______________________________

____

5. Specialized Knowledge or Experience. As the User of this ESA, do you have any specialized knowledge or experience related to the property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the property or an adjoining property, such that you would have specialized knowledge about chemicals and processes used by this type of business?

__________ Yes _____X_____ No

If yes, describe or attach details of your specialized knowledge or experience __________
____

6. Relationship of Purchase Price to Fair Market Value of Property. Does the purchase price being paid for this property reasonably reflect the fair market value of the property?

_______Yes NA____No

If you conclude that there is a difference, do you have any reason to believe that the reduced purchase price may be related to contamination known or believed to be present at the property?

_________Yes, I have reason to believe that the purchase price for the property has been reduced in comparison with the fair market value due to contamination known or believed to be present at the property?

_________No, I have no reason to believe that the purchase price for the property has been reduced in comparison with the fair market value due to contamination known or believed to be present at the property?

NA_______Not applicable. User is not involved in a purchase of the property.

7. Commonly Known or Reasonably Ascertainable Information. Are you aware of commonly known or reasonably ascertainable information about the property that would help the Environmental Professional to identify conditions indicative of releases or threatened releases of hazardous substances or petroleum products? For example:

Do you know the past uses of the property?
_________Yes (describe) ____
____
____
X_________No

Do you know of chemicals, hazardous substances or petroleum products that are present or once were present at the property?
_________Yes (describe) ____
____
____
X_________No

Do you know of spills or other releases of chemicals, hazardous substances or petroleum products that have taken place at the property?

_________Yes (describe) ____

X________No

Do you know of any environmental cleanups that have taken place at the property?

_________Yes (describe) ____

X________No

8. The Degree of Obviousness of Contamination. E1527-13 and the federal AAI rule (40 CFR 312.31) require that the Phase I ESA consider the degree of obviousness of the presence or likely presence of contamination at the property, and the ability to detect the contamination by appropriate investigation. Based on your knowledge and experience related to the property, are there any *obvious* indictors that point to the presence or likely presence of contamination at the property?

_________Yes (describe) ____

X________No

9. Availability of Previous Environmental Reports. Are you aware of previous environmental site assessment reports, other environmental reports, documents, correspondence, etc. concerning the property and its environmental condition?

X________Yes (describe) ______________________________________

_________Previous Phase I on a portion of the property_____________________

_________No

Signature: ____

Name (printed): Scott Dawson____________________________________

Title: Director of Permitting,Recurrent Energy________________________

Date: 4-24-2017____

Desert Training Center Site Characterization Report and Action Recommendation

Introduction

RE Crimson LLC (Crimson) is constructing a solar energy array on a portion of the former California-Arizona Maneuver Area (CAMA). The US Army used the CAMA for military training maneuvers during World War II and the construction footprint is known to contain unexploded ordnance (UXO). Figure 1 (Attachment 1) depicts the construction footprint and the area requiring UXO characterization.

Crimson engaged Bay West LLC (Bay West) to perform site characterization and, if necessary, UXO removal in the construction footprint. We have prepared this Site Characterization Report to describe the history and characterization results and to provide a recommendation for future actions. Bay West engaged TLI Solutions, Inc. (TLI) to conduct historical research as part of the characterization. TLI's report is presented as Attachment 2.

Site Background

The CAMA was created by revocable permit on March 24, 1942, for conducting armored division maneuvers. Initially named the Desert Training Center, the name was changed to CAMA on October 20, 1943. The CAMA was subdivided into three areas; the construction footprint is located within Maneuver Area A.

The Army used the CAMA to train soldiers in realistic combat conditions. The large size of the training area allowed infantry and armored divisions to camp and make one- to three-week excursions into the desert and train using live ordnance ranging from small arms to heavy artillery. Additional training included air to ground training, chemical warfare training, and land mine laying and removal training. The Army closed the CAMA May 1, 1944.

Historical Records Review and Research

TLI conducted a Historical Records Review by researching documents at US government file repositories. TLI's Historical Records Review indicates that the United States Army Corps of Engineers (USACE) conducted dedudding programs from 1944 until 1947. The USACE reported that all lands believed to have been used for maneuver areas or camp sites had been dedudded and restored. TLI obtained no maps or aerial photographs showing that the construction footprint was used as a bombing or artillery target or minefield[1]. The construction footprint was not dedudded (Figure 2, Attachment 1).

Research Results

Bay West conducted online research, resulting in several maps and articles about the Desert Training Center and CAMA. This research resulted in no information to confirm nor refute the use of munitions in the construction footprint.

---

[1] Abbreviated Historical Records Review for Blythe Army Airfield/Desert Training Center, CA, TLI Solutions, Mar 2017

Bay West visited the Patton Museum in Indio, CA, during the site visit. While the museum is interesting for military enthusiasts, it provided no new information on military use in the construction footprint. Museum personnel suggested that we contact the Bureau of Land Management (BLM).

Bay West requested information from the Riverside County Sheriff and the BLM.

We emailed and called the BLM several times and left voicemails, but they never responded. We talked to a BLM representative once; he provided no useful information and suggested we do online research.

The Sheriff's Department directed us to their Hazardous Device Team. We interviewed Sergeant Bob Epps of the Hazardous Device Team by telephone. The Sergeant provided useful information. He stated that he has responded to the construction footprint numerous times and retrieved M1B1 practice landmines. About half of these have been expended. About half of those that were unexpended still had the safety clip installed. He said that he had not found any mortars or projectiles there. Sgt. Epps said he could not determine a source area for the UXO. Heavy rains distribute UXO randomly. He gets most of his calls from hikers shortly after rainstorms. He also stated that rifles and small arms ammunition have been recovered.

M1B1 practice landmines contain a red phosphorus spotting charge and black powder expelling charge. While these do not fragment, if the fuze functions the mine may expel red phosphorus with sufficient energy to kill or injure a person. Also, persons within 6 feet may suffer ear damage.

Site Visit

The construction footprint lies within BLM land with open public access. Guy Buchanan and Wayne Martrildonno visited the site on 1 June 2017. We parked our vehicle in a designated parking area on Wiley's Well Road and walked into the construction footprint. We swept a random transect using visual observation.

We encountered evidence of the presence of military personnel and materials such as a gas mask canister, first aid kit, and various food cans. Occasional monitoring with the Schonstedt revealed sparse ferrous anomalies.

We did not encounter any unexploded ordnance or evidence of such (e.g. craters, targets).

We were unable to access the construction footprint through Colorado River substation at the north of the area of operations because the road was restricted to authorized personnel only. We called Recurrent Energy for advice on who to call to gain entry and they were unaware. We called Southern California Edison and they did not return our call. There was no other readily available access to the site, so we were not able to visit the north portion.

Conclusions

The Army conducted military training in and around the construction footprint. It is unclear whether minefields were laid within the construction footprint or if mines migrated due to storms and erosion. A USACE document indicates that the entire CAMA was dedudded. One map found during the HRR indicates that the Army conducted dedudding on parts of the construction footprint. However, it is clear that these operations were unsuccessful.

UXO (M1B1 practice landmines) has been recovered. They are widely scattered throughout the construction footprint. Rain causes erosion, which uncovers buried mines and/or washes them downgrade.

No concentrated munitions use areas (CMUA; e.g., minefields, artillery or bomb targets) have been identified. However, evidence shows that there were minefields and these would constitute a CMUA.

No evidence of other types of UXO have been reported; however, their presence cannot be ruled out. This is because the types of people using this area for recreation would probably not recognize fragments from projectiles and bombs nor would they be likely to call the Sheriff to report such. Further, bombs and projectiles may penetrate deep enough to be unaffected by erosion. Rifles and small arms ammunition, while slightly hazardous, are not typically the subject of a UXO clearance.

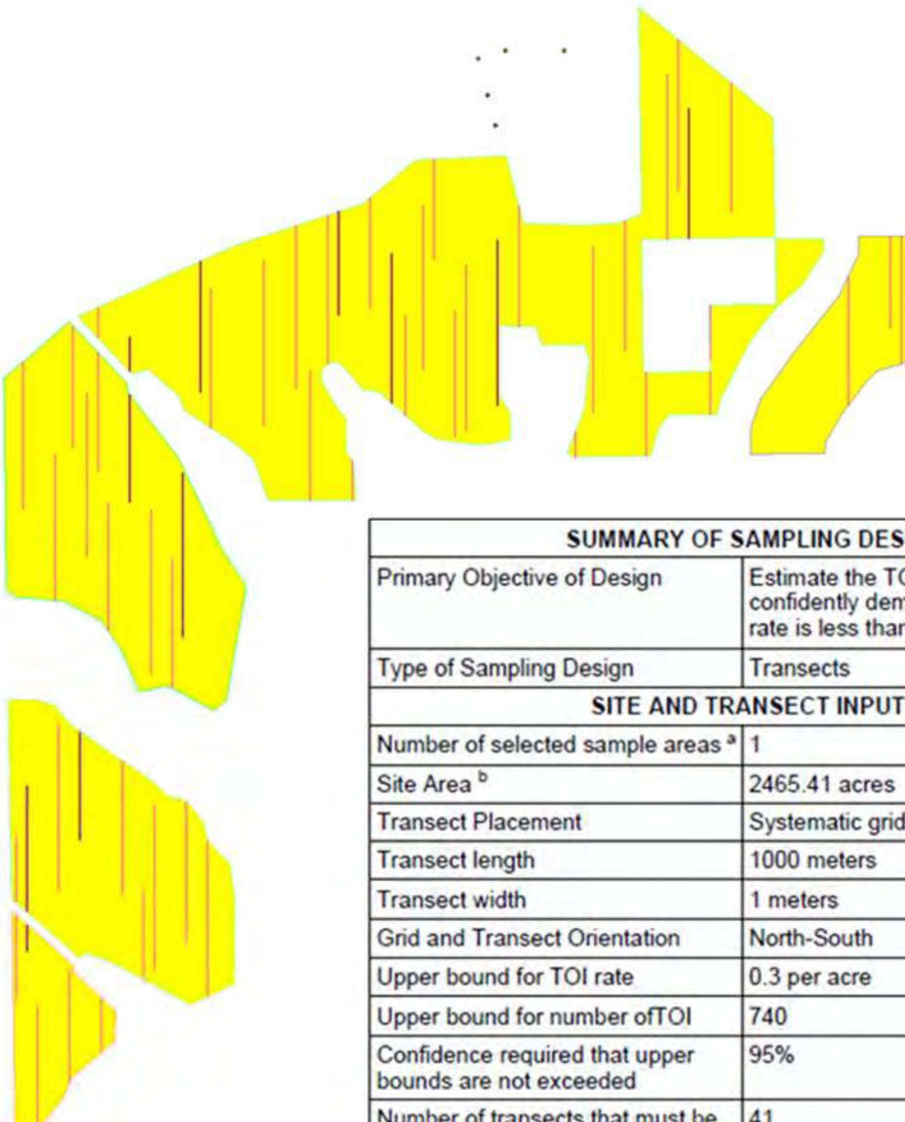
Recommendations

Bay West recommends further investigating the site using digital geophysical mapping. Pacific Northwest National Laboratories Visual Sample Plan (VSP) will use statistics concepts to design a transect pattern to determine with 95% confidence that there are ≤ 0.3 UXO per acre and or that concentrated munitions use areas (CMUA) exist. This will require sampling of approximately 10 acres. Exhibit 1 depicts our transect sampling plan. The confidence level and acceptable UXO per acre may be adjusted. Higher confidence levels and/or lower numbers of UXO per acre will increase the area of sampling.

Our DGM team will collect data over the transects and develop a Dig List of anomalies that may represent UXO. A UXO Team will investigate each of these anomalies. DGM equipment will detect landmines. Penetrating ordnance such as bombs and projectiles would be distributed vertically in such a way that DGM equipment would detect at least some of them.

We will analyze the field data subjectively and with VSP and present a risk scenario to Crimson. Crimson can then determine the level of risk they are willing to accept. Exhibit 2 illustrates possible outcomes and actions.

Exhibit 1: Transect Sampling Plan



SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Estimate the TOI rate for a site and confidently demonstrate that the true rate is less than a pre-specified value.
Type of Sampling Design	Transects
SITE AND TRANSECT INPUTS	
Number of selected sample areas [a]	1
Site Area [b]	2465.41 acres
Transect Placement	Systematic grid placement
Transect length	1000 meters
Transect width	1 meters
Grid and Transect Orientation	North-South
Upper bound for TOI rate	0.3 per acre
Upper bound for number ofTOI	740
Confidence required that upper bounds are not exceeded	95%
Number of transects that must be surveyed and found to be free of TOI to achieve desired confidence	41
Total length of surveyed transects	25.05 miles
Area to be surveyed (Area under the transects)	9.9607 acres
Transect Coverage	0.40%

Exhibit 2: Possible Outcomes and Follow-On Actions

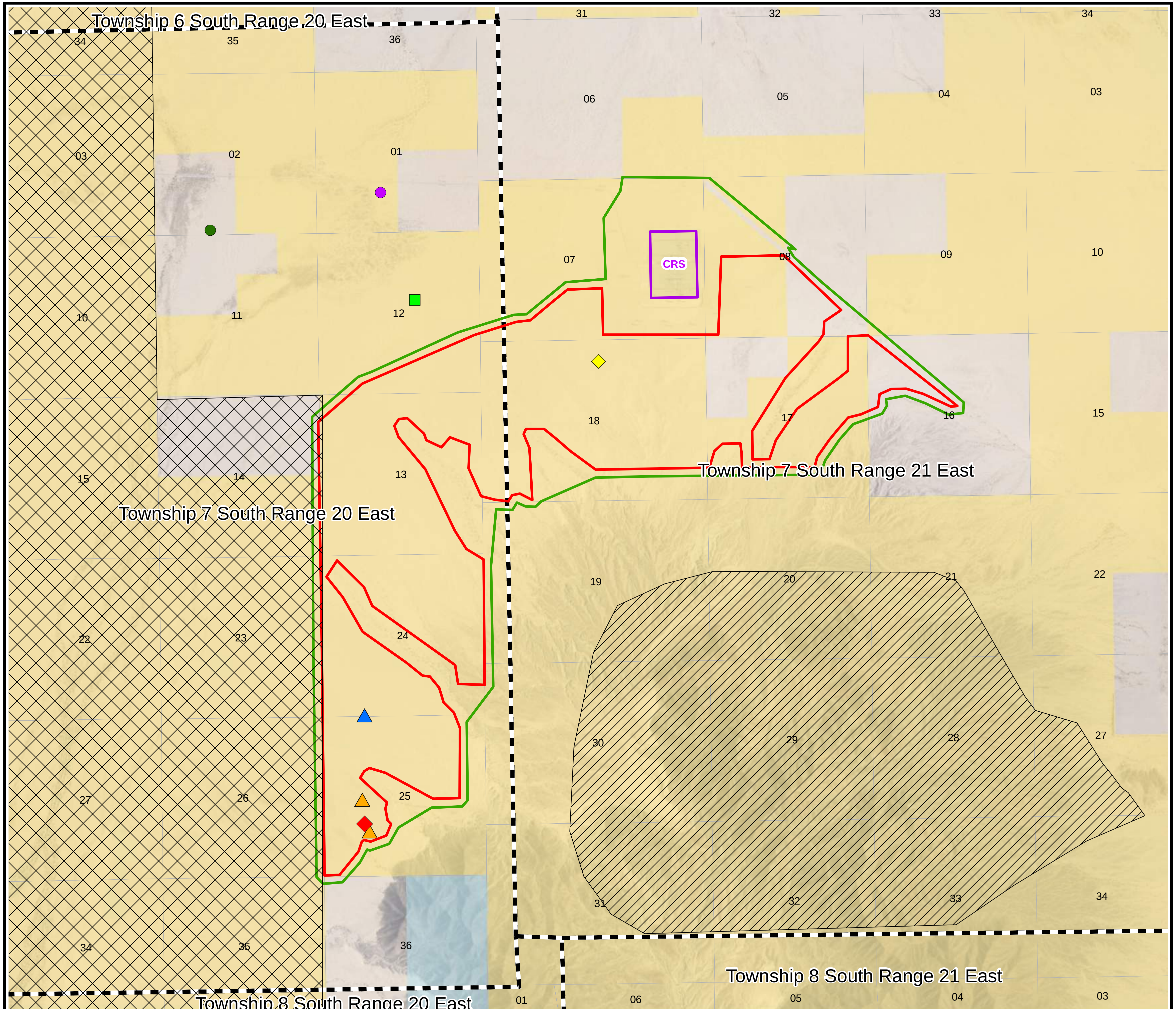
<table>
<tr><th>Outcome</th><th>Actions</th><th></th><th></th><th></th></tr>
<tr><td>VSP condition met, no CMUA</td><td>Construction support</td><td></td><td></td><td></td></tr>
<tr><td>VSP condition met, CMUA</td><td>Segregate CMUA</td><td>RA on CMUA, remainder under construction support</td><td></td><td></td></tr>
<tr><td rowspan="2">VSP condition not met, no CMUA</td><td rowspan="2">Reevaluate risk (Is a higher number of UXO per acre acceptable?)</td><td>Risk acceptable</td><td>Construction support</td><td></td></tr>
<tr><td>Risk unacceptable</td><td>100% RA</td><td></td></tr>
<tr><td rowspan="2">VSP condition not met, CMUA</td><td rowspan="2">Segregate CMUA</td><td rowspan="2">RA on CMUA, reevaluate risk on remainder</td><td>Risk acceptable</td><td>RA on CMUA, remainder construction support</td></tr>
<tr><td>Risk unacceptable</td><td>100% RA</td></tr>
</table>

CMUA - Concentrated Munitions Use Area
RA - Removal Action
VSP - Visual Sample Plan

Desert Training Center Site Characterization Report and Action Recommendation

Attachment 1

Figures

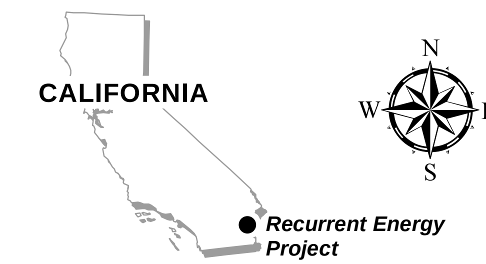


Y:\Clients\RECURRENT_ENERGY\MapDocs\J160244\001_MISC\J160244_Recurrent_006_Historical_Data.mxd

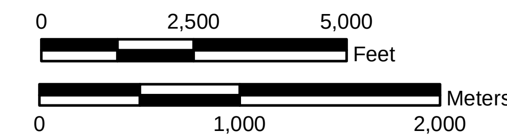
Figure 1

Construction Footprint Recurrent Site

Recurrent Energy Project



NAD 1983 2011 StatePlane California VI FIPS 0406 Ft US



Munitions Items Found

- .50 cal. Ammunition
- 50 mm Cartridges
- Explosive Rod
- M1A1 Practice Antitank Landmine
- MI Garand Rifle
- Practice Antitank Landmine
- Suspect Rifle Grenade

- Proposed Survey Area
- Proposed Development Area
- Desert Tortoise Habitat
- Mule Mountains
- Township/Range
- Section Lines
- Bureau of Land Management (BLM) Property

Date Drawn/Revised: 12/6/2017 Project No. J160244

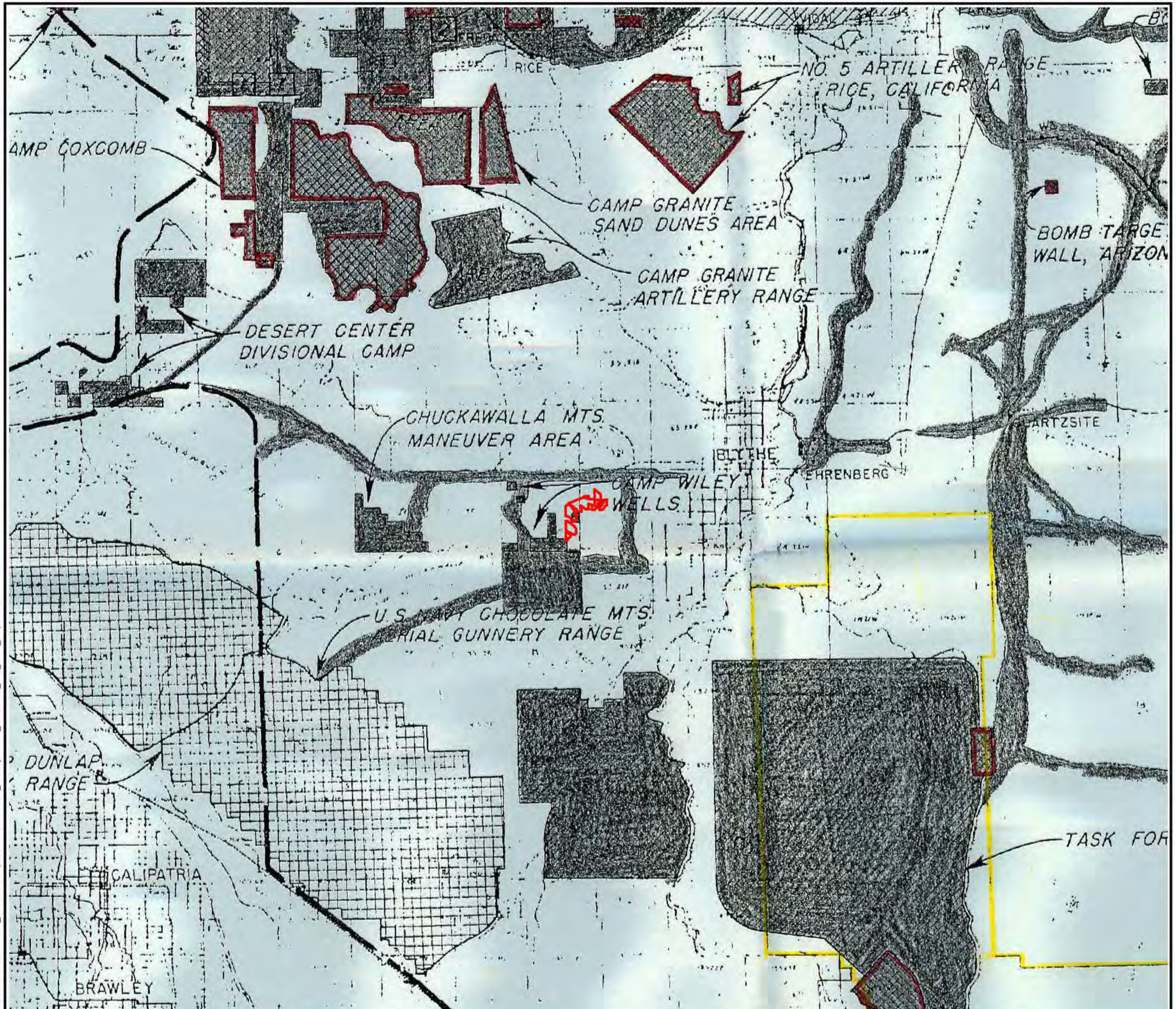


Figure 2

1951 Map

Recurrent Energy Project

NAD 1983 2011 StatePlane California VI FIPS 0406 Ft US

0 10 20 Miles

0 10 20 Kilometers

Site Boundary

Date Drawn/Revised: 8/29/2017 Project No. J160244

Y:\Clients\RECURRENT_ENERGY\MapDocs\J160244\001_MISC\j160244_Recurrent_005_1951_map.mxd

Desert Training Center Site Characterization Report and Action Recommendation

Attachment 2

Abbreviated Historical Records Review Report (TLI Solutions, Inc.)

March 24, 2017

Wayne Martrildonno
UXO Technical Manager
Bay West
VIA E-MAIL: Waynem@baywest.com

RE: **Abbreviated Historical Records Review for Blythe Army Airfield/Desert Training Center, CA**

Dear Mr. Martrildonno:

Enclosed, please find the Abbreviated Historical Records Review Report detailing the results of the abbreviated historical records review conducted on the "Desert Training Center", specifically associated with the Blythe Army Airfield, CA and surrounding area.

If you have any questions regarding this submittal please contact me at 303-586-4912.

Sincerely,

Derek Lawrence
Senior Consultant

Enclosure

c/enc: Chad Webb (TLI)

TLI Solutions, Inc.
112 N. Rubey Drive, Suite 200
Golden, CO 80401

ABBREVIATED HISTORICAL RECORDS REVIEW REPORT

Introduction

This Abbreviated Historical Records Review (HRR) Report has been prepared to document the results of the abbreviated records review conducted to ascertain the past impacts from military munitions use at the "Desert Training Center", specifically associated with the Blythe Army Airfield (AAF), California and the surrounding area.

Purpose and Scope

The scope and objectives of this abbreviated HRR was the Desert Training Center was located in California and Arizona and served as a military maneuver and training area during WW II. Bay West is performing a site characterization and follow-up munitions response activities in support of a solar array project on a portion of the Desert Training Center. The objective of the research was to obtain information regarding historical munitions use including the nature of that use and the types of munitions used. The abbreviated HRR is specific to the area (i.e. the Project Site) outlined in blue and labeled "Crimson RE" on the map provided with the Request for Proposal; and the five surrounding miles to account for the possibility that the area of interest was within an overshoot area. A copy of this map is included as Attachment 1.

Results of the HRR

The California-Arizona Maneuver Area (CAMA) was created by revocable permit on March 24, 1942 for the purpose of conducting armored division maneuvers (SLC 1942). Initially named the Desert Training Center, the name was changed to CAMA on October 20, 1943 (Meller 1946). The CAMA was subdivided into three areas. The Project Site is located within Maneuver Area A (USACE 1943; USACE 1944; Meller 1946; Kennedy 1986).

The role of CAMA was to train men in realistic combat conditions. The large size of the training area made it possible for infantry and armor divisions to camp, and make 1-3 week long excursions into the desert; and train using live ordnance, ranging from small arms to heavy artillery and tank rounds, without the risk of running into other personnel. Additional training included air to ground training, chemical warfare training, and the laying and removal of mine fields (HQAAF 1943; Meller 1946; DTC 2017a). A 1943 report describing maneuvers conducted during February and March 1943 indicated that land mines were extensively used and that more than 20,000 mines were buried by one division during one exercise (HQDTC 1943). [Note: Locations of mine fields were not found during the research for this HRR. However, "dummy mines" were found at the Chuckawalla Valley State Prison which is near the Project Site.]

From February 15 to March 3, 1944, the X Corps directed the last maneuvers held in the CAMA. The major units participating were the 80th and 104th Infantry Divisions, the 15th Tank Destroyer Group, two tank destroyer battalions and two antiaircraft artillery battalions. The Desert Training Center-CAMA was closed May 1, 1944 (Meller 1946; Kennedy 1986).

A restoration and dedudding program was started and completed in November 1944 by the USACE. A 1947 map titled "First Phase, California-Arizona Maneuver Area, Areas to be Surveyed and Searched for Duds" delineated the areas of interest for surveying and dedudding

(USACE 1947). These included a small portion of the Blythe AAF Bombing and Gunnery range east of the Colorado River. No areas near the Project Site, including the Wiley Well Water Point, were indicated. The map was annotated with two "bombing targets" south of the Project Site in Imperial County, California (USACE 1947). These targets appear to be more than five miles from the Project Site. The USACE reported that all lands believed to have been used for maneuver areas or camp sites had been dedudded and restored (USACE 1948).

A 1951 map titled "California-Arizona Maneuver Area, Dedudding Program" shows the areas surveyed and dedudded before 1947 and declared safe for all use; areas surveyed and dedudded before 1947 and restricted to surface use only; areas cleared by Prisoners of War prior to 1944; and the boundaries of U.S. Naval Gunnery Ranges (USACE 1951). This map appears to show that "Camp Wiley Wells" was surveyed and dedduded; however, it does not indicate whether this area is cleared for all use, or is restricted. Later documentation verified that portions of the State-owned contaminated land had been dedudded and certified clear for any use deemed suitable; that other portions had been inspected, dedudded and restricted to surface use only; and that the remaining portions of the State-owned land, although located within the boundaries of the former maneuver area, were not used as impact areas and, therefore, were not contaminated (USACE 1959).

The Revocable Permit No. 12 was valid for the duration of the World War II and six months thereafter (SLC 1942; USACE 1959). In 1959, the USACE recommended that the file on Revocable Permit No. 12 be closed effective October 28, 1952. This date was based on the April 28, 1952 Presidential Proclamation declaring the war to be at an end (USACE 1959).

The Blythe AAF was located on 5,500 plus acres of which was composed of a combination of Fee Owned and Leased land and easements (WAA 1947). Blythe AAF was first used in May, 1942 when it was transferred to the 4th Air Force as part of the Desert Training Center. The base operated mainly as a training facility for various bombardment groups and squadron pilots (DoD 1989; DTC 2017). An undated listing of improvements for the Blythe AAF listed an Air-to-Ground target range and a Bombing Range associated with the base. A historical report from the 85th Fighter Bomber Group described training in October 1942 at the Bombing and Gunnery Range which included dropping 100-pound practice bombs (DoD 1942).

According to an annotated 1943 map titled "*California-Arizona Maneuver Area*" the Gunnery Range affiliated with Blythe AAF was located northwest of the base and the Bombing and Gunnery Range affiliated with Blythe AAF was located southeast of Blythe, across the Colorado River in Arizona (EPP 1943). No ranges or "Areas of Limits" were indicated in the vicinity of the Project Site. A copy of this map, cropped to focus on the Project Site location is included as Attachment 2. The listing of improvements for Blythe AAF also included a Poorman Gunnery Range, Jeep Type Target Range, and Skeet Range; however, these ranges were located within the Blythe AAF boundary in the northwest portion of the base based on two 1946 maps (ODE 1946; ODE 1946a).

The use of Blythe AAF subsided as World War II came to an end. A report from August 1945 described the traffic as light and consisted of refueling and emergency stops for aircraft flying across the desert (DoD 1945). By November 1, 1945, Blythe AAF was listed as "temporarily inactive" in the Army Air Forces Installation Directory (USAF 1945).

The Blythe AAF was declared surplus on January 14, 1947 (WAA 1947). On September 10, 1948, the entire airfield was transferred to the County of Riverside via quitclaim deed (DoD 1989).

The Wileys Well Water Point was located near the Project Site towards the west and southwest. Two of the parcels associated with the Wileys Well Water Point appear to be within the Project Site boundary (SAIC 1991). See map included as Attachment 3. The approximately 28,000 acres associated with the Wileys Well Water Point was used for military training as part of the CAMA from 1943 to 1945. The Defense Environmental Restoration Program (DERP) Formerly Used Defense Sites (FUDS) Project Summary Sheet reported that ordnance and explosive waste may exist on the Wileys Well Water Point land. Four "dummy" land mines were found at the location of the Chuckawalla Valley State Prison, and one .30-caliber rifle shell casing from 1943 had also been found in the area. An April 1949 letter from the U.S. Army Corps of Engineers (USACE) reported that the lands associated with the Wileys Well Water Point had been examined and found to be clear of explosives or explosive objects "reasonably possible to detect by visual inspection" (USACE 1949; DoD 1992). Nonetheless, the DERP FUDS Summary recommended further investigation to locate and remove any ordnance or explosive waste (DoD 1992). The Fiscal Year 2010 Defense Environmental Programs Annual Report to Congress reported that a Military Munitions Response Program Site Inspection Report was completed for the Wileys Well Water Point on April 21, 2010 (DoD 2011). [Note: The Site Inspection Report was not located during research for this abbreviated HRR. Therefore, the results of the site inspection are not known.]

Aerial Photo Review

As part of this abbreviated HRR, historic aerial photographs were obtained that included coverage of the Project Site and were analyzed for evidence of use. High resolution historical aerial photographs were obtained from the U.S. Geological Survey and the University of California, Santa Barbara Library. The earliest available aerial photograph from the U.S. Department of Agriculture was 1959; therefore, aerial photographs were not obtained from this repository. See Attachment 4 for copies of select aerial photographs.

13 April 1943 Aerial Photographs: The scale of these aerials is 1:60,000. The entire Project Site is visible in these aerials. The scale is too small to discern much detail. Possible vehicle tracks are evident south of the Project Site and within the Wileys Well Water Point maneuver area. A faint path appears to run in a northeasterly direction along the western base of the Mile Mountains. Several other faint lines are evident; however, these appear to be artifacts or scratches on the original aerial photograph. No grid lines which could indicate the presence of potential mine fields were observed.

22 August 1947 Aerial Photographs: The scale of these aerials ranges from 1:85,101 to 1:86,498. The scale of these aerials is too small to discern much detail. Possible vehicle tracks are still evident south of the Project Site and within the Wileys Well Water Point maneuver area. Two roughly parallel paths are evident north of the Project Site running east-west just south of Highway 10. As before, several faint lines are evident on the aerial which appear to be artifacts or scratches on the original aerial photographs. No indications of munitions related activities are evident within the Project Site.

June 9 and 11, 1948 Aerial Photographs: The scale of these aerials ranges from 1: 82,325 to 1:84,647. The scale of these aerials is too small and the resolution too poor to discern any details.

June 25, 1948 Aerial Photographs: The scale of these aerials is 1:56,400. Possible vehicle tracks are evident south and southwest of the Project Site and within the Wileys Well Water Point maneuver area. Two roughly parallel paths are still evident north of the Project Site running east-west just south of Highway 10. No indications of any activities are evident within the Project Site.

July 12 and 26, 1948 Aerial Photographs: The scale of this aerial is 1:20,000. Although the scale of these aerials is good, the coverage of the Project Site is lacking. Only the extreme eastern tip of the northern portion of the Project Site is visible. No signs of activity are evident on these aerial photographs.

Conclusions

No records were found during research for this abbreviated HRR which indicated munitions usage specifically within the Project Site boundaries. However, munitions usage was indicated at the nearby Wileys Well Water Point maneuver area. Furthermore, the use of the CAMA as a live fire training area presents the possibility of munitions throughout the CAMA. As a result, any investigation of the Project Site should proceed with caution due to the potential for exposure to munitions.

Attachments

Attachment 1 – Crimson Project Map

Attachment 2 – California-Arizona Maneuver Area Range Map

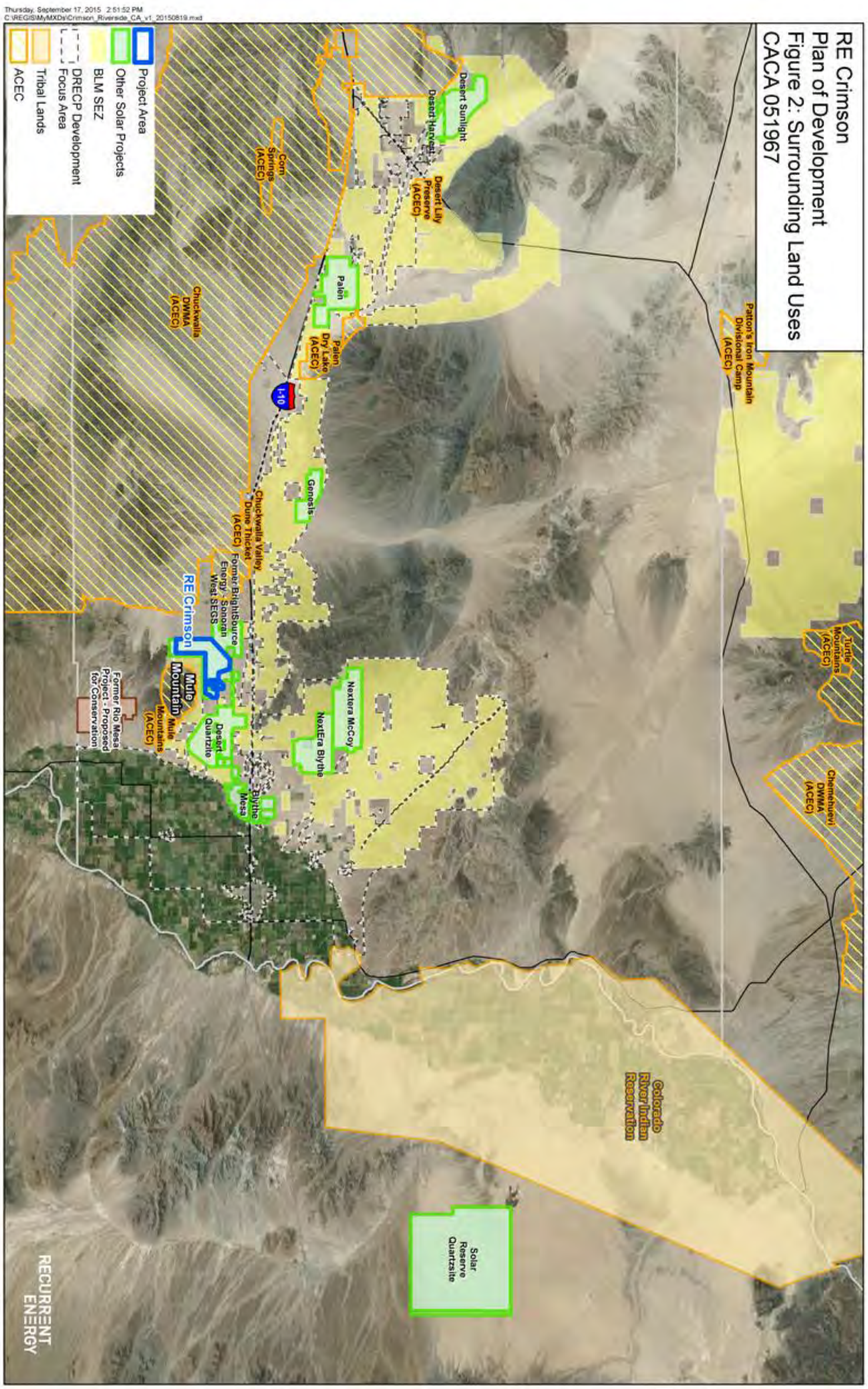
Attachment 3 – Wileys Well Water Point Map

Attachment 4 – Historic Aerial Photographs

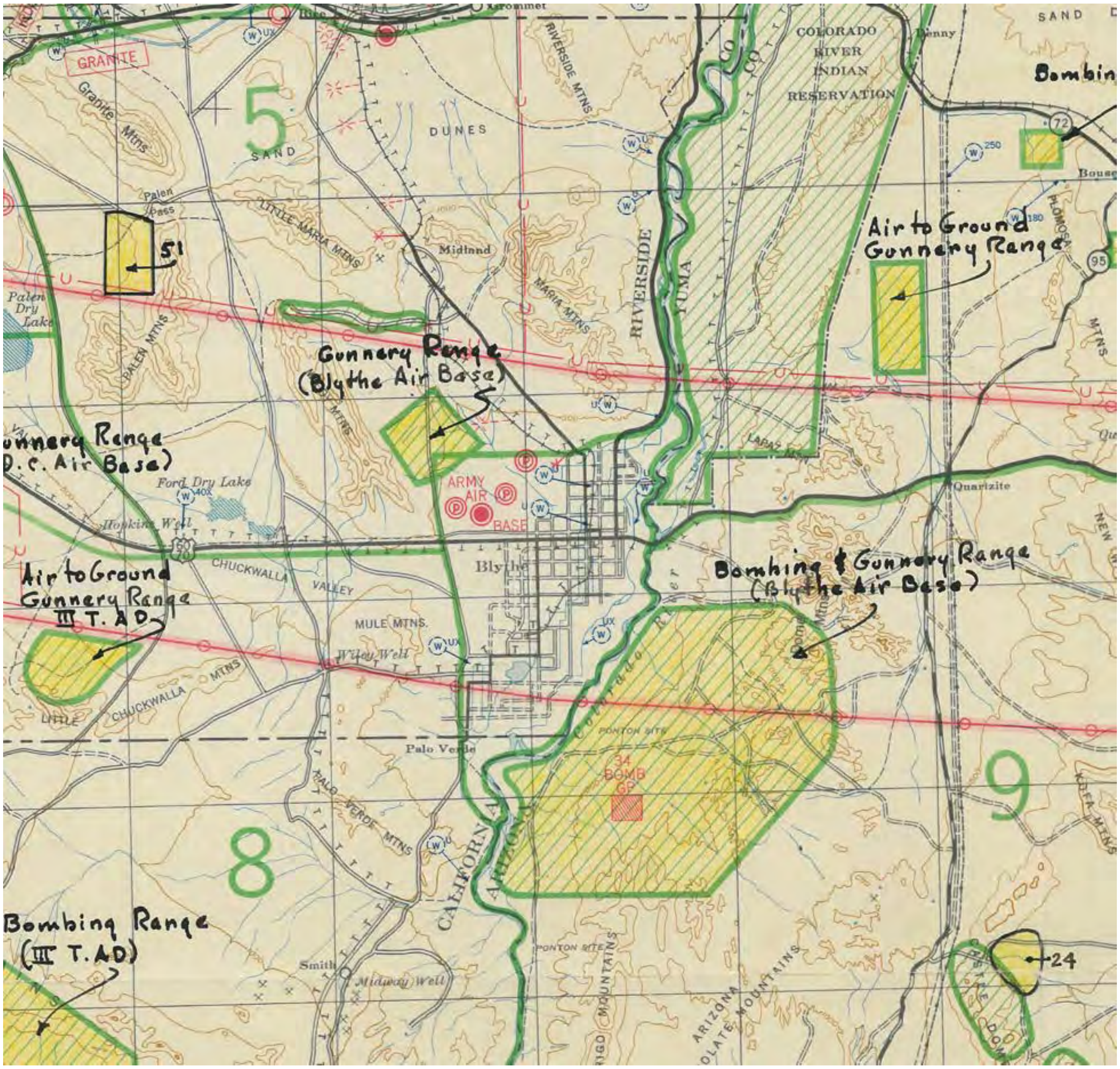
Attachment 5 – References

Attachment 6 – Sources Contacted

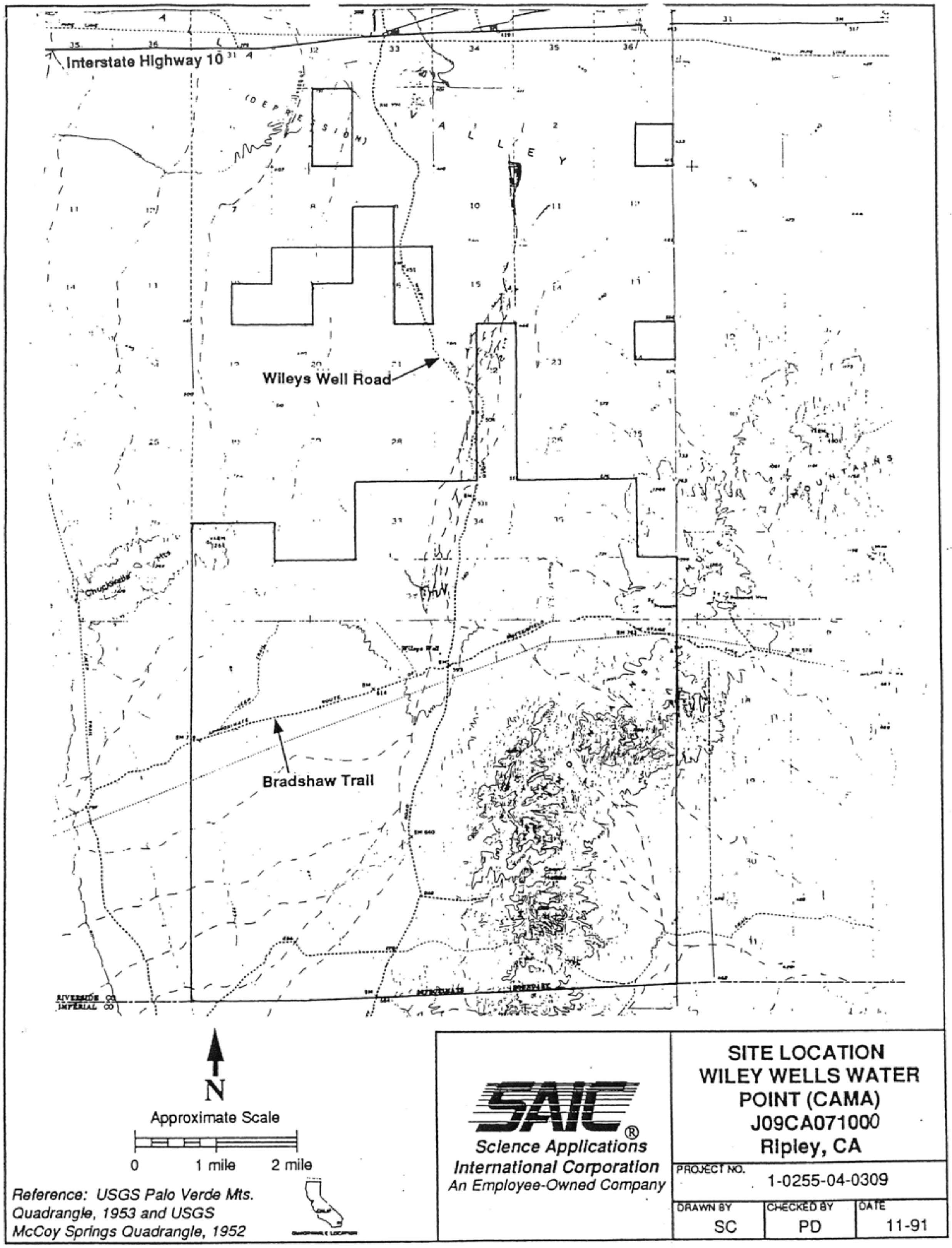
Attachment 1
Crimson Project Map



Attachment 2
California-Arizona Maneuver Area Range Map



Attachment 3
Wileys Well Water Point Map

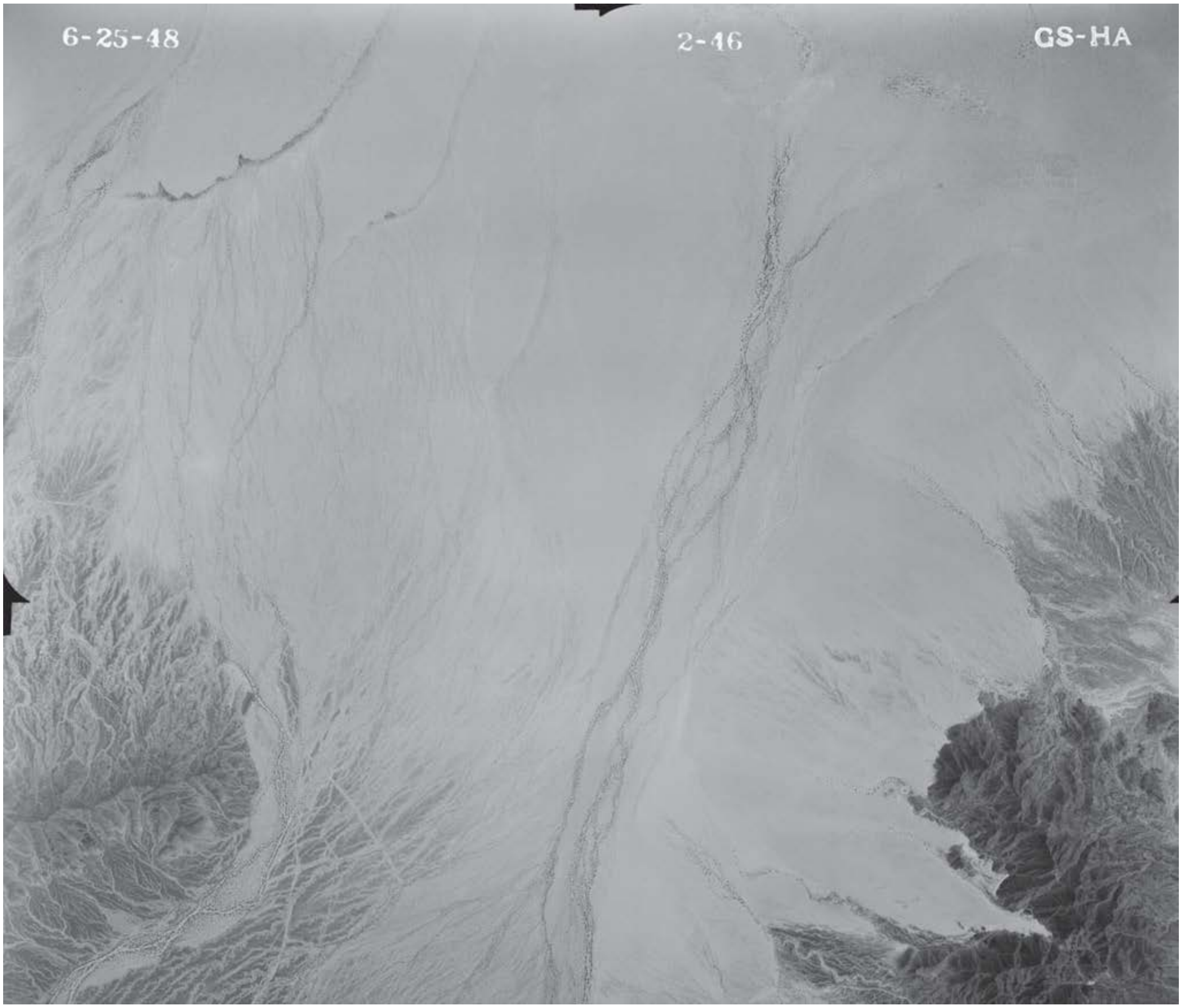


Attachment 4
Historic Aerial Photographs

13-April-1943 Aerial Photograph: Oblique photograph looking southeast across Project Site

August 22, 1947 Aerial Photograph: Shows Blythe AAF in relation to Project Site in lower left quarter section of photograph.

August 22, 1947 Aerial Photograph: Project Site visible in upper central section of photograph.



June 25, 1948 Aerial Photograph: Project Site coverage is incomplete. Aerial shows western and southern portion.

Attachment 5
References

Department of Defense (DoD). 1942. *History of the Eighty Fifth Fighter Bomber Group, Period from 9 February 1942 to 31 December 1942.*

DoD. 1945. *Historical Data of Detachment 731st AAF Base Unit (101st AACS SQ), Blythe Army Air Field for the Period of 1 August 1945 to 31 August 1945.*

DoD. 1989. *Defense Environmental Restoration Program for Formerly Used Defense Sites Findings and Determination of Eligibility, Blythe Army Airfield.* May 24.

DoD. 1992. *Defense Environmental Restoration Program for Formerly Used Defense Sites Findings and Determination of Eligibility, Wiley Wells Water Point.* July 9.

DoD. 2011. *FY10 Defense Environmental Programs Annual Report to Congress.* July.

29th Engineer Production Plant (EPP). 1943. *California-Arizona Maneuver Area, Third Edition*.

Desert Training Center (DTC). 2017. *Blythe Army Airfield California WWII Airbase Desert Training Center*. March 3.

DTC. 2017a. *History of Patton's Desert Training Center in WWII.* March 3.

Headquarters, Army Air Forces (HQAAF). 1943. *Organization and Training, Desert Training Center.* April 2.

Headquarters, Desert Training Center (HQDTC). 1943. *Final Report, D.T.C. Maneuvers.* March 20.

Kennedy, John W. et.al. 1986. *Patton's Desert Training Center.*

Meller, Sgt. Sidney L. 1946. *The Desert Training Center and C-AMA, Study No. 15.*

Office of District Engineer (ODE). 1946. *Blythe Army Airfield, Blythe, California, Layout Plan*. October 4.

ODE. 1946a. *Boundary Sketch, Blythe Army Airfield, Blythe, California*. October 7.

Science Applications International Corporation (SAIC). 1991. *Site Location Wiley Wells Water Point (CAMA) J09CA071000, Ripley, CA*. November.

State of California, State Lands Commission (SLC). 1942. *Revocable Permit No. 12 Public Resources Code.* March 24.

U.S. Army Corps of Engineers (USACE). 1943. *Maneuver Sketch, Desert Training Center.*

USACE. 1944. *Military Construction. California-Arizona Maneuver Area, Key Map*. May 8.

USACE. 1947. *First Phase, California-Arizona Maneuver Area, Areas to be Surveyed and Searched for Duds.* October 14.

USACE. 1948. *Correspondence regarding Revocable Permit No. 12 Public Resources Code.* November 19.

USACE. 1949. *California-Arizona Maneuver Area (Wileys Well Water Point), California*. April 19.

USACE. 1951. *California-Arizona Maneuver Area, Dedudding Program.* October.

USACE. 1959. *Certificate in Lieu of Release.* June 29.

U.S. Air Force (USAF). 1945. *Historical Data Pertaining to Blythe Army Airfield, California, 1942-1945.*

War Assets Administration (WAA). 1947. *Disposal Plan, Blythe Army Airfield, Riverside County, California. W-California 225, WD-1050*. December 19.

Attachment 6
Sources Contacted

Air Force Historical Research Agency (AFHRA)
600 Chennault Circle
Maxwell AFB, AL 36112-6424
Tammy Horton
334-953-2960
FAX: 334-953-4434
http://www.au.af.mil/au/afhra/

The research team used the online research search engine to identify potentially relevant material for review based on the following key words:

- Blythe Army Air Base – 27 Records found
- Blythe Army Air Field – 12 Records found
- Desert Training Center – 6 Records found

The records were reviewed and electronic copies of potentially relevant reels were ordered and reviewed. Relevant information was included in the historical record review.

Defense Technical Information Center (DTIC)
Andrew T. McNamara Headquarters Complex
8725 John J. Kingman Road, Ste. 0944
Ft. Belvoir, VA 22060-6218
1-800-225-3842; 703-767-8673 (Registration Office)
http://www.dtic.mil/dtic/

The DTIC is a DoD Field Activity under the Under Secretary of Defense for Acquisition, Technology and Logistics, reporting to the Director, Defense Research & Engineering. DTIC provides DoD technical information to DoD personnel, DoD contractors and potential contractors, and other U.S. Government agency personnel and their contractors.

The records were reviewed. Relevant information was included in the historical record review.

Internet

Internet research was conducted to obtain general information regarding the history of the Blythe AAF and the Desert Training Center - CAMA. Websites included www.deserttrainingcenter.com, and www.militarymuseum.org. Relevant information was included in the historical record review.

NARA Archives II, College Park, MD
8601 Adelphi Road
College Park, MD 20740-6001
301-837-2000
Archives2reference@nara.gov

Records at Archives II include: textual records from most civilian agencies; Army records dating from World War I; Naval records dating from World War II; still pictures; electronic records; cartographic and architectural holdings. The research team conducted research at Archives II. The on-line catalog was researched and record groups (RGs) were identified which could potentially provide relevant information. The following RGs were research:

RG	**Title**
115	Bureau of Reclamation (Aerial Cartography)
337	Records of Headquarters Army Ground Forces

The records were reviewed. Relevant information was included in the historical record review.

NARA – Riverside
23123 Cajalco Road
Perris, California 92570-7298
951-956-2000
e-mail: riverside.archives@nara.gov

The holdings for the Riverside, CA office are comprised of Federal agencies and courts in Arizona, southern California, and Clark County, Nevada. The research team conducted research at NARA - Riverside. The on-line catalog was researched and record groups were identified which could potentially provide relevant information. The following RGs were research:

RG	**Title**
77	Records of the Office of the Chief of Engineers
269	(Formerly RG 270) Records of the War Assets Administration

The records were reviewed. Relevant information was included in the historical record review.

AERIAL PHOTOGRAPHY

The following repositories were consulted for aerial imagery of the Project Site.

U.S. Geological Survey - EROS Data Center
47914 252nd Street
Sioux Falls, SD 57198
800-252-4547 ext. 2074
http://edcwww.cr.usgs.gov/

The Aerial Photography Single Frame Records collection is a large and diverse group of imagery acquired by Federal organizations from 1937 to the present. Over 6.5 million frames of photographic images are available for download as medium and high resolution digital products. The high resolution data provide access to photogrammetric quality scans of aerial photographs with sufficient resolution to reveal landscape detail and to facilitate the interpretability of landscape features.

The research team conducted research to locate the following imagery for the time period of 1942 to 1950 which provided coverage of the site.

Index/Mapping Photography varies in scale, size, quality, and coverage. The majority of the photos were taken from a vertical perspective. All of the available photos were in black & white only.

Aerial Photography Single Frame						
Acquisition Date	**Scale**	**Entity ID**	**Project**	**Roll Number**	**Frame Number**	**# Frames**
22-Aug-1947	1:85,101 – 1:86,498	ARB00038473XXXX	00038	473	0014 0045 0046 0047 0071 0072	6
09-Jun-1948	1: 82,325	ARB00038823XXXX	00038	823	0026 0027 0028	3
11-Jun-1948	1:84,131 – 1:84,647	ARB00038006XXXX	00038	006	0014 0015 0016	3
25-Jun-1948	1:56,400	AR1HA0000020013	HA000	002	0013 0014 0015 0045 0046 0047	6
12-Jul-1948	1:20,000	AR1HB000004XXXX	HB000	0004	0065	1
26-Jul-1948	1:20,000	AR1HB000004XXXX	HB000	0007	0065	1

NOTE: Last digits of the Entity ID are the frame number (replace XXXX with frame number including zeros).

University of California, Santa Barbara Library Aerial Imagery Research Service
Map & Imagery Lab
525 UCEN Road.
Santa Barbara, California 93106
(805)-893-3948
www.library.ucsb.edu/mil

The Fairchild Aerial Surveys collection is perhaps the most significant of Map & Imagery Lab's aerial photography holdings. This collection contains the earliest (1927) photography held by Map & Imagery Lab, and makes up the bulk of the collection covering southern and central California from the late 1920s to the 1950s.

The online finding aids were reviewed to locate flights with possible coverage of the site. Based on this review the following imagery was obtained.

Aerial Photography Single Frame				
Acquisition Date	**Scale**	**Flight**	**Frame Number**	**# Frames**
13-April-1943	1:60,000	DTM	4-R9 4-R10	2

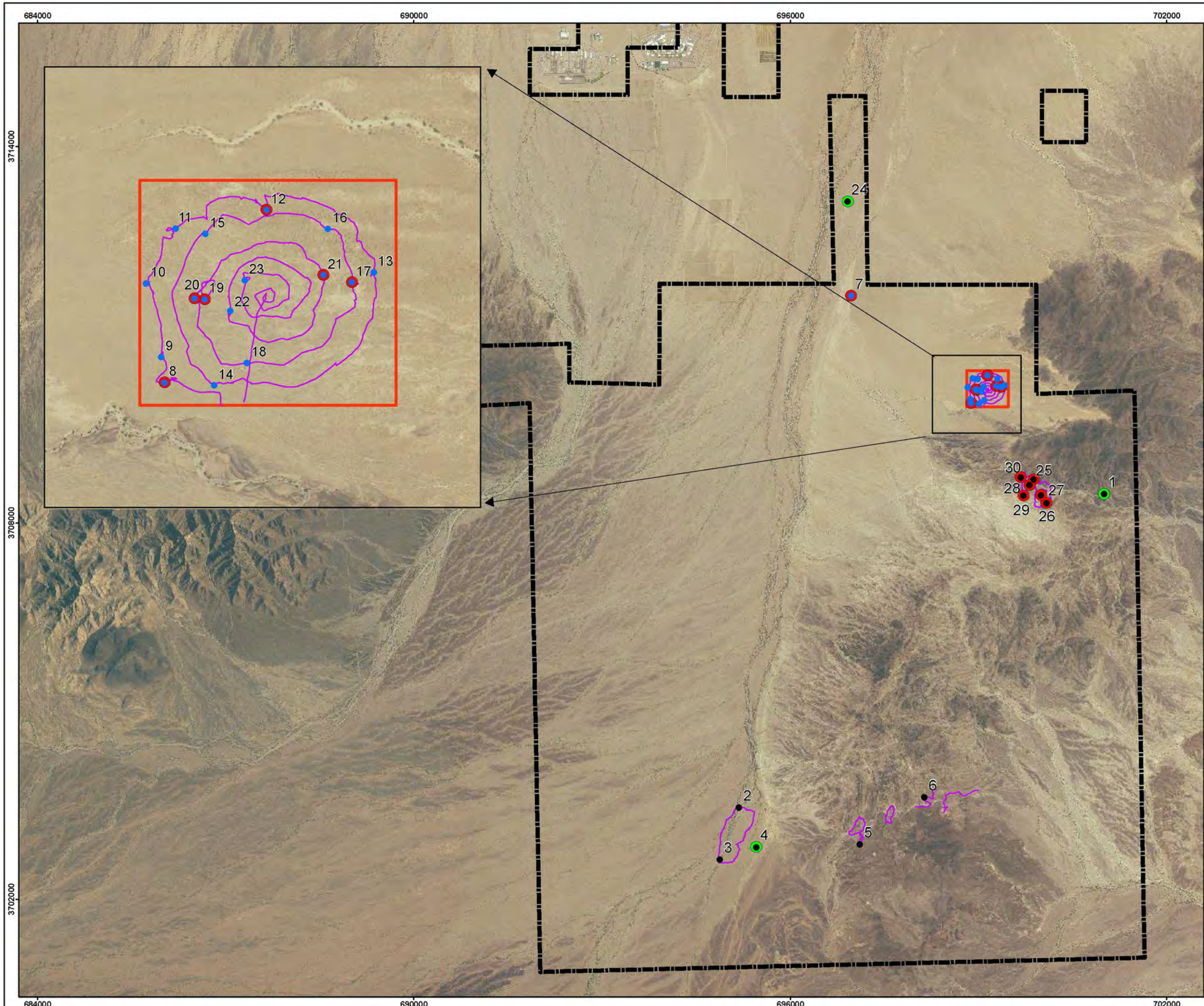
Appendix E

HISTORICAL DOCUMENTS (MILITARY MAPS, TOPOGRAPHIC MAPS, CITY DIRECTORY REPORT)

Figure ES.1

General Site Overview
Wiley Well Water Point
FUDS Project No. J09CA071001

Ripley, California



Legend

- Munitions Debris Location
- Other Field Observation Location
- Biased Soil Sample Location
- Ambient Soil Sample Location
- MRS01 - Impact Area (former PAOI)
- FUDS Boundary
- Qualitative Reconnaissance Track

Site Location in California

Image: 2005 Orthophotos
Projection: UTM Zone 11 NAD83, Units in Meters

Kilometers 1 0.5 0 1

N

PARSONS	U.S. ARMY SOUTH PACIFIC DIVISION RANGE SUPPORT CENTER

DESIGNED BY: BT	General Site Overview	
DRAWN BY: BT		
CHECKED BY: DS	SCALE: As Shown	PROJECT NUMBER: 744653.91196
SUBMITTED BY: DS	DATE: April 2010	PAGE NUMBER: ES-6
	FILE: X:\GIS\Site_inspections_sw\Maps\wiley_ca\FigES_1.mxd	

Introduction

The purpose of this guide is to provide information about the military training activities that took place at the former Wiley Wells Water Point Training Area and to raise awareness of the explosive hazards that may exist at the property.

During World War II, the former Wiley Wells Water Point Training Area was used by the U.S. Army as part of the California-Arizona Maneuver Area to train armored and infantry divisions in desert warfare. There were several different types of units assigned to each of these divisions including armor, field artillery, tank destroyer, anti-aircraft, mechanized cavalry, maintenance, aviation and several others. An area of the former Wiley Wells Water Point Training Area, known as the Impact Area, has been identified through historical research and site visits as having potential explosive hazards. The munitions known or suspected to have been used at the property include mortars, practice land mines, small to medium caliber munitions and small arms ammunition.

The former Wiley Wells Water Point Training Area is located 12 miles west of Ripley, in Riverside County, California. The Impact Area is located in the northeast portion of the former Wiley Wells Water Point Training Area property. The land is owned by the Bureau of Land Management and is undeveloped desert land.

Because explosive hazards associated with military munitions from past military training may remain on the former Impact Area, the U.S. Army Corps of Engineers recommends that the landowner and visitors follow the 3Rs of Explosives Safety – Recognize, Retreat, and Report.

Example of small arms ammunition

Former Wiley Wells Water Point Training Area

For More Information

US Army Corps of Engineers

The U.S. Army Corps of Engineers is responsible for identifying, investigating and, when necessary, conducting an appropriate response to address contamination and military munitions resulting from past Department of Defense activities at Formerly Used Defense Sites, also referred to as FUDS.

For information about the former Wiley Wells Water Point Training Area, contact the FUDS Information Center by calling the toll-free number 1-855-765-FUDS (3837). For general information about the FUDS Program, visit www.fuds.mil.

Follow the 3Rs of Explosives Safety

Recognize

Retreat

Report

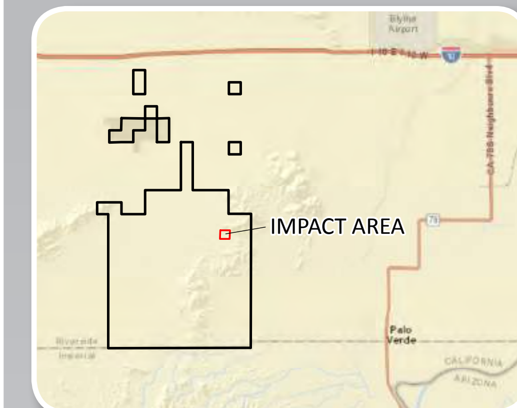
Visit the U.S. Army's Explosives Safety Education website:
www.denix.osd.mil/uxo

3Rs Safety Guide

Former Wiley Wells Water Point Training Area

California

Riverside County



Impact Area

U.S. ARMY

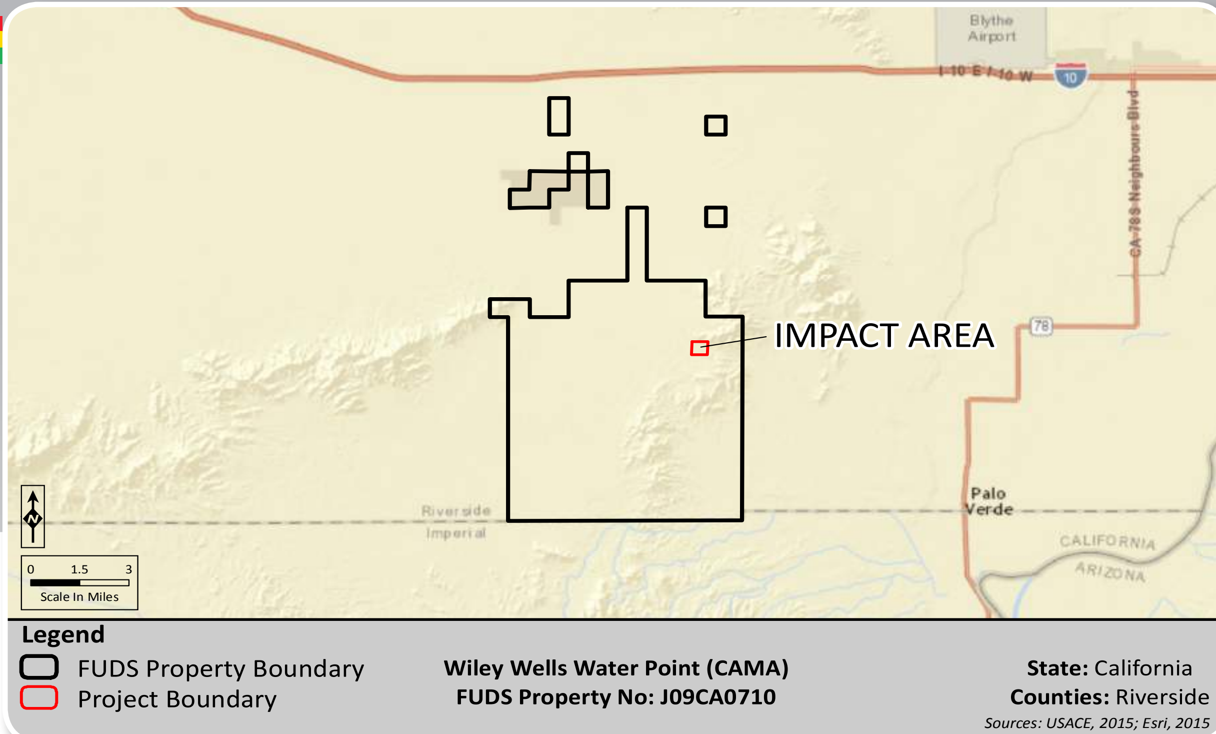
Recognize Retreat Report

US Army Corps of Engineers

2016

Source: Library of Congress

Soldiers on a reconnaissance patrol in the desert of the California-Arizona Maneuver Area



Frequently Asked Questions

Q: *What types of potential hazards exist?*

A: Military munitions, such as mortars, practice land mines, small to medium caliber munitions and small arms ammunition, were potentially used at the former Wiley Wells Water Point Training Area. The U.S. Army Corps of Engineers is unable to rule out the presence of munitions that may pose an explosive hazard.

Q: *What do I do if I suspect I may have come across a military munition?*

A: If you suspect you may have come across a military munition, the best way to ensure your safety is to follow the 3Rs of Explosives Safety: **Recognize** that munitions are dangerous; **Retreat** — do not approach, touch, move or disturb it, but carefully leave the area; and **Report** immediately what you saw and where you saw it to local law enforcement — call 911.

Q: *What are the findings of the work that the government has completed?*

A: Historical research and site inspections indicate that military munitions were potentially used at this training area, and some munitions may remain on the property. The U.S. Army Corps of Engineers has determined that further investigation is required for the Impact Area at the former Wiley Wells Water Point Training Area.

Q: *What will be done next?*

A: The U.S. Army Corps of Engineers will make explosives safety education material that is based on the 3Rs available to the landowner and the community. Additionally, it will coordinate with the landowner as it plans required response activities.

Q: *Where can I get more information?*

A: For more information, call the Formerly Used Defense Sites Information Center toll-free number 1-855-765-FUDS (3837). Additional information can be found by searching for the property name, Wiley Wells Water Point (CAMA), in the Geographical Information System tool on the Formerly Used Defense Sites website at www.fuds.mil.

Follow the 3Rs of Explosives Safety

Recognize when you may have come across a munition, and that munitions are dangerous;

Retreat do not approach, touch, move or disturb a suspect munition, but carefully leave the area; and

Report immediately what was found to local law enforcement — call **911**.

RE Crimson, LLC
Blythe
Blythe, CA 92239

Inquiry Number: 5256788.7S
April 23, 2018

EDR Environmental Lien and AUL Search

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Environmental Lien and AUL Search

The EDR Environmental LienSearch Report provides results from a search of available current land title records for environmental cleanup liens and other activity and use limitations, such as engineering controls and institutional controls.

A network of professional, trained researchers, following established procedures, uses client supplied address information to:

- search for parcel information and/or legal description;
- search for ownership information;
- research official land title documents recorded at jurisdictional agencies such as recorders' offices, registries of deeds, county clerks' offices, etc.;
- access a copy of the deed;
- search for environmental encumbering instrument(s) associated with the deed;
- provide a copy of any environmental encumbrance(s) based upon a review of key words in the instrument(s) (title, parties involved, and description); and
- provide a copy of the deed or cite documents reviewed.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EDR Environmental Lien and AUL Search

TARGET PROPERTY INFORMATION

ADDRESS

RE CRIMSON, LLC
BLYTHE
BLYTHE, CA 92239

RESEARCH SOURCE

Source 1: Recorder
Riverside County, California

Source 2: Assessor
Riverside County, California

PROPERTY INFORMATION

Deed 1:

According to the Riverside County Assessor, the current owner of the subject property is the USA. Records were searched at the Riverside County Recorder's Office back to 1980. No conveyance was found of record for the subject property. Based on our research, it appears that the USA acquired title to the property prior to 1980.

Legal Description: All that certain piece or parcel of land containing 640 acres, more or less, being in Section 12, Township 7 South, Range 20 East, situate and lying in the County of Riverside, State of California.

Legal Current Owner: USA

Property Identifiers: 8790-030-017

Deed 2:

According to the Riverside County Assessor, the current owner of the subject property is the USA. Records were searched at the Riverside County Recorder's Office back to 1980. No conveyance was found of record for the subject property. Based on our research, it appears that the USA acquired title to the property prior to 1980.

Legal Description: All that certain piece or parcel of land containing 640 acres, more or less, being in Section 13, Township 7 South, Range 20 East, situate and lying in the County of Riverside, State of California.

Legal Current Owner: USA

Property Identifiers: 8790-050-004

Deed 3:

According to the Riverside County Assessor, the current owner of the subject property is the USA. Records were searched at the Riverside County Recorder's Office back to 1980. No conveyance was found of record for the subject property. Based on our research, it appears that the USA acquired title to the property prior to 1980.

Legal Description: All that certain piece or parcel of land containing 640 acres, more or less, being in Section 24, Township 7 South, Range 20 East, situate and lying in the County of Riverside, State of California.

Legal Current Owner: USA

Property Identifiers: 8790-050-007

Deed 4:

According to the Riverside County Assessor, the current owner of the subject property is the USA. Records were searched at the Riverside County Recorder's Office back to 1980. No conveyance was found of record for the subject property. Based on our research, it appears that the USA acquired title to the property prior to 1980.

Legal Description: All that certain piece or parcel of land containing 640 acres, more or less, being in Section 25, Township 7 South, Range 20 East, situate and lying in the County of Riverside, State of California.

Legal Current Owner: USA

Property Identifiers: 8790-070-006

Deed 5:

According to the Riverside County Assessor, the current owner of the subject property is the USA. Records were searched at the Riverside County Recorder's Office back to 1980. No conveyance was found of record for the subject property. Based on our research, it appears that the USA acquired title to the property prior to 1980.

Legal Description: All that certain piece or parcel of land containing 895.09 acres, more or less, being a portion of Section 7, Township 7 South, Range 21 East, situate and lying in the County of Riverside, State of California.

Legal Current Owner: USA

Property Identifiers: 8790-080-022

Deed 6:

According to the Riverside County Assessor, the current owner of the subject property is the USA. Records were searched at the Riverside County Recorder's Office back to 1980. No conveyance was found of record for the subject property. Based on our research, it appears that the USA acquired title to the property prior to 1980.

Legal Description: All that certain piece or parcel of land containing 160 acres, more or less, being a portion of the Southwest Quarter of Section 8, Township 7 South, Range 21 East, situate and lying in the County of Riverside, State of California.

Legal Current Owner: USA

Property Identifiers: 8790-080-023

Deed 7:

Type of Deed: Grant Deed

Title is vested in: United States of America

Title received from: Gayle Schaaf Smith (as to an undivided ½ interest), and Jay Armin Schaaf (as to an undivided ½ interest)

Deed Dated: 10/10/1995

Deed Recorded: 10/17/1995

Instrument: 346593

Legal Description: All that certain piece or parcel of land containing 50.16 acres, more or less, being a portion of the Northwest Quarter of Section 8, Township 7 South, Range 21 East, San Bernardino Base and Meridian, situate and lying in the County of Riverside, State of California.

Legal Current Owner: USA

Property Identifiers: 8790-080-026

Deed 8:

Type of Deed: Grant Deed

Title is vested in: Southern California Edison Company, a corporation

Title received from: Southern Surplus Realty Co., a California corporation

Deed Dated: 08/30/1978

Deed Recorded: 09/22/1978

Instrument: 200806

Legal Description: All that certain piece or parcel of land containing 27.44 acres, more or less, being a portion of the Northwest Quarter of Section 8, Township 7 South, Range 21 East, San Bernardino Base and Meridian, situate and lying in the County of Riverside, State of California.

Legal Current Owner: Southern California Edison Company, a corporation

Property Identifiers: 8790-080-028

Deed 9:

According to the Riverside County Assessor, the current owner of the subject property is the USA. Records were searched at the Riverside County Recorder's Office back to 1980. No conveyance was found of record for the subject property. Based on our research, it appears that the USA acquired title to the property prior to 1980.

Legal Description: All that certain piece or parcel of land containing 895.20 acres, more or less, being a portion of Section 18, Township 7 South, Range 21 East, situate and lying in the County of Riverside, State of California.

Legal Current Owner: USA

Property Identifiers: 8790-100-006

Deed 10:

According to the Riverside County Assessor, the current owner of the subject property is the USA. Records were searched at the Riverside County Recorder's Office back to 1980. No conveyance was found of record for the subject property. Based on our research, it appears that the USA acquired title to the property prior to 1980.

Legal Description: All that certain piece or parcel of land containing 520 acres, more or less, being a portion of Section 17, Township 7 South, Range 21 East, situate and lying in the County of Riverside, State of California.

Legal Current Owner: USA

Property Identifiers: 8790-100-007

EDR Environmental Lien and AUL Search

ENVIRONMENTAL LIEN

Environmental Lien: Found ☐ Not Found ☒

If found:

1 st Party:

2 nd Party:

Dated:

Recorded:

Book:

Page:

Docket:

Volume:

Instrument:

Comments:

Miscellaneous:

OTHER ACTIVITY AND USE LIMITATIONS (AULs)

Other AUL's: Found ☐ Not Found ☒

If found:

1 st Party:

2 nd Party:

Dated:

Recorded:

Book:

Page:

Docket:

Volume:

Instrument:

Comments:

Miscellaneous:

DEED EXHIBIT

CHICAGO TITLE COMPANY

580085-44

WHEN RECORDED PLEASE MAIL TO:

BUREAU OF LAND MANAGEMENT
California Desert District
6221 Box Springs Boulevard
Riverside, California 92507-0714
Attn: S. Eubanks (CA064)

DOCUMENTARY TRANSFER TAX: None
(This conveyance is exempt from any documentary transfer tax per California Revenue and Taxation Code Section 11922)

PRELIMINARY CHANGE OF OWNERSHIP REPORT: This transfer is exempt from the requirements of Revenue and Taxation Code Section 480.3 pursuant to Section 5081 et seq., since the property is transferred to the United States of America.

CACA-35027

346593

RECEIVED FOR RECORD
AT 2:00 O'CLOCK

OCT 1 7 1995

Recorded in Official Records of Riverside County, California
Recorder
Fees $ 15

APN: 879-080-026, 879-080-027;

GRANT DEED

For the true and actual consideration as a gift,

Gayle Schaaf Smith, as to an undivided one-half (1/) interest, and **Jay Armin Schaaf**, as to an undivided)1/2) interest, as tenants in common

do hereby grant and convey to the UNITED STATES OF AMERICA, and its assigns, acting under the authority of Section 205 of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1715), all the real property situated in the County of Riverside, State of California, described as follows:

See **EXHIBIT 'A'** Attached

The parcel of land to which the above description applies contains 132.56 acres, more or less.

SUBJECT to existing rights-of-way, of record or in use, for roads, railroads, telegraph, telephone and electrical transmission lines, canals, laterals, ditches, flumes, siphons and pipelines, on, over and across said tracts.

TO HAVE AND TO HOLD the above granted and described premises, together with all tenements, hereditaments, and appurtenances, including easements and water rights, if any, thereto belonging or appertaining, and any reversions, remainders, rents, issues, or profits thereof, unto the UNITED STATES OF AMERICA and its assigns.

IN WITNESS WHEREOF, Grantors have executed this instrument this 10 day of October, 1995.

By: Gayle Schaaf Smith
Gayle Schaaf Smith

By: Jay Armin Schaaf
Jay Armin Schaaf

Accepted by the Department of the Interior, Bureau of Land Management subject to approval of title by the Department of Justice:

Lucia Kenyon, Acting
(California Desert District Manager)

EXHIBIT 'A'

CACA-35027 - Riverside County, California

The Northwest quarter of Section 8, Township 7 South, Range 21 East, San Bernardino Base and Meridian.

Excepting therefrom that portion described as follows:

That portion of the Northwest quarter of Section 8, Township 7 South, Range 21 East, San Bernardino Base and Meridian, lying within a strip of land 370 feet wide, the sidelines thereof being 255 feet Northeasterly and 115 feet Southwesterly, measured at right angles, respectively, from the following described Surveyed Reference Line:

Beginning at a point in the Westerly line of Section 8, Township 7 South, Range 21 East, San Bernardino Base and Meridian, said point being South 00° 46' 48" East, 581.23 feet, measured along said Westerly line, from a found 2 inch iron pipe with U.S.G.L.O. Brass Cap set for the Northwest corner of said Section 8, said point also being North 00° 46' 48" West, 2060.98 feet, measured along said Westerly line, from a found 1 inch iron pipe with U.S.G.L.O. Brass Cap set for the West quarter corner of said Section 8; thence South 50° 56' 41" East, 13,777.50 feet, to a point in the Easterly line of Section 16, Township 7 South, Range 21 East, San Bernardino Base and Meridian, said point being South 00° 52' 14" East, 1496.78 feet, measured along said Easterly line, from a found 1 inch iron pipe with U.S.G.L.O. Brass Cap set for the East quarter corner of said Section 16, said point also being North 00° 52' 14" West, 1155.58 feet, measured along said Easterly line, from a found 2 inch iron pipe with U.S.G.L.O. Brass Cap set for the Southeast corner of said Section 16.

The Northeasterly sideline of said strip of land, 370 feet wide, shall be prolonged Northwesterly so as to terminate in the Westerly line of said Section 8.

Also excepting therefrom all that tract of land 100 feet wide withdrawn by Executive Order of May 17, 1927, under the Act of June 25, 1910 (36 Stat. 847), as amended by the Act of August 24, 1912 (37 Stat. 497), embracing approximately five acres and fifty hundredths of an acre, as to the North half of the Northwest quarter and the Southwest quarter of the Northwest quarter of said Section 8, as excepted and excluded in the Patent from the United States of America to John L. Price, recorded March 7, 1995, as Instrument No. 70789, Official Records.

STATE OF COLORADO,

COUNTY OF Mesa } S.S.

On Oct. 3, 1995, before me, Monette Hopton, a Notary Public in and for said County and State, personally appeared Gayle Schaaf Smith

personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

FOR NOTARY SEAL OR STAMP

WITNESS my hand and official seal.

Signature Monette Hopton

STATE OF Montana

COUNTY OF Yellowstone } S.S.

On October 10, 1995, before me, Kindra L Pursell, a Notary Public in and for said County and State, personally appeared Jay Armin Schaaf

personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

FOR NOTARY SEAL OR STAMP

WITNESS my hand and official seal.

Signature Kindra L Pursell

RW 184 REV. 6-70
S.C.E. CO.

RECORDING REQUESTED BY

SOUTHERN CALIFORNIA EDISON COMPANY

WHEN RECORDED MAIL TO

SOUTHERN CALIFORNIA EDISON COMPANY
SOUTHERN SURPLUS REALTY CO.
P. O. Box 410
LONG BEACH, CA. 90801
Attention: R/W & Land Dept.
ESCROW SECTION

200806

RECEIVED FOR RECORD
SEP 22 1978
AT 9:00 O'CLOCK A.M.
At Request of
TRANSAMERICA TITLE CO.
Book 1978, Page 200806
Recorded in Official Records of Riverside County, California
Recorder
FEES $

SPACE ABOVE THIS LINE FOR RECORDER'S USE

APN 879-080-011-0

DOCUMENTARY TRANSFER TAX $ None
COMPUTED ON FULL VALUE OF PROPERTY CONVEYED,
OR COMPUTED ON FULL VALUE LESS LIENS AND ENCUMBRANCES REMAINING AT TIME OF SALE.
Madie Brown SOUTHERN CALIFORNIA EDISON CO.
SIGNATURE OF DECLARANT OR AGENT DETERMINING TAX. FIRM NAME

Location: Unincorporated Area

Devers - Palo Verde
MABEL RATCLIFFE
152043-5

GRANT DEED

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged, SOUTHERN SURPLUS REALTY CO., a California corporation, hereby GRANTS to SOUTHERN CALIFORNIA EDISON COMPANY, a corporation, that certain real property in the County of Riverside, State of California, described as follows:

That portion of the Northwest quarter of Section 8, Township 7 South, Range 21 East, San Bernardino Base and Meridian, lying within a strip of land 370 feet wide, the sidelines thereof being 255 feet Northeasterly and 115 feet Southwesterly, measured at right angles, respectively, from the following described Surveyed Reference Line:

Beginning at a point in the Westerly line of Section 8, Township 7 South, Range 21 East, San Bernardino Base and Meridian, said point being South 00° 46' 48" East, 581.23 feet, measured along said Westerly line, from a found 2 inch iron pipe with U.S.G.L.O. Brass Cap set for the Northwest corner of said Section 8, said point also being North 00° 46' 48" West, 2060.98 feet, measured along said Westerly line, from a found 1 inch iron pipe with U.S.G.L.O. Brass Cap set for the West quarter corner of said Section 8; thence South 50° 56' 41" East, 13,777.50 feet, to a point in the Easterly line of Section 16, Township 7 South, Range 21 East, San Bernardino Base and Meridian, said point being South 00° 52' 14" East, 1496.78 feet, measured along said Easterly line, from a found 1 inch iron pipe with U.S.G.L.O. Brass Cap set for the East quarter corner of said Section 16, said point also being North 00° 52' 14" West, 1155.58 feet, measured along said Easterly line, from a found 2 inch iron pipe with U.S.G.L.O. Brass Cap set for the Southeast corner of said Section 16.

The Northeasterly sideline of said strip of land, 370 feet wide, shall be prolonged Northwesterly so as to terminate in the Westerly line of said Section 8.

EXCEPTING AND RESERVING unto Southern Surplus Realty Co., its successors and assigns, all uranium, thorium and other fissionable materials, all oil, gas, petroleum, asphaltum, and other hydrocarbon substances and other minerals and mineral ores of every kind and character, whether similar to these herein specified or not, within or underlying, or which may be produced from the hereinbefore described land, together with the right to use that portion only of said land

SA 579834 APPROVED AS TO DESCRIPTION
Y826 [illegible] NOA 3777
2444 6-9-78 R/W & LAND DEPT

MAIL TAX STATEMENTS TO: Southern California Edison Company
P. O. Box 800
Rosemead, CA 91770
(Attn: Tax Dept.)

200806

Grant Deed
S.S.R.Co., a California corp., to
S.C.E.Co., a corp.
Serial No. 51983A

which underlies a plane parallel to and five hundred (500) feet below the present surface of said land, for the purpose of prospecting for, developing and/or extracting said uranium, thorium, and other fissionable materials, oil, gas, petroleum, asphaltum, and other mineral or hydrocarbon substances from said land, it being expressly understood and agreed that said Southern Surplus Realty Co., its successors and assigns, shall have no right to enter upon the surface of said land, or to use said land or any portion thereof to said depth of five hundred (500) feet, for any purpose whatsoever.

SUBJECT TO current real property taxes and to covenants, conditions, restrictions, reservations, exceptions, rights and easements of record.

IN WITNESS WHEREOF, said Southern Surplus Realty Co. has caused its corporate name and seal to be affixed hereto and this instrument to be executed by its duly appointed officers this 30th day of August, 1978.

SOUTHERN SURPLUS REALTY CO.

By [signature]
President

By Joan E. Voegler
Assistant Secretary

STATE OF CALIFORNIA)
) ss.
COUNTY OF LOS ANGELES)

On this 30th day of August, 1978, before me, a Notary Public in and for said State, personally appeared C. J. [illegible], Jr., known to me to be the President, and Joan E. Voegler, known to me to be an Assistant Secretary of Southern Surplus Realty Co., the corporation that executed the within instrument, known to me to be the persons who executed the within instrument on behalf of the corporation herein named, and acknowledged to me that such corporation executed the same, pursuant to its by-laws or a resolution of its board of directors.

WITNESS my hand and official seal.

Robert W. Larkin

OFFICIAL SEAL
ROBERT W. LARKIN
NOTARY PUBLIC-CALIFORNIA
PRINCIPAL OFFICE IN
LOS ANGELES COUNTY
My Commission Expires March 20, 1981

1978 APPROVED

200806

RE Crimson, LLC

Blythe

Blythe, CA 92239

Inquiry Number: 5256788.4

April 13, 2018

EDR Historical Topo Map Report

with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

04/13/18

Site Name:	Client Name:
RE Crimson, LLC	Stantec
Blythe	25864-F Business Center Drive
Blythe, CA 92239	Redlands, CA 92374
EDR Inquiry # 5256788.4	Contact: Dion Monge

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by Stantec were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:		*Coordinates:*	
P.O.#	NA	**Latitude:**	33.563603 33° 33' 49" North
Project:	185804157	**Longitude:**	-114.8405 -114° 50' 26" West
		UTM Zone:	Zone 11 North
		UTM X Meters:	700457.75
		UTM Y Meters:	3715859.98
		Elevation:	492.91' above sea level

Maps Provided:

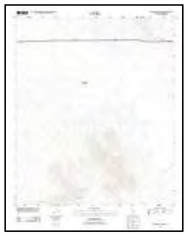
2012
1983
1952

Topo Sheet Key

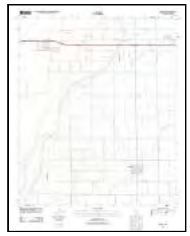
This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2012 Source Sheets

Hopkins Well
2012
7.5-minute, 24000



Roosevelt Mine
2012
7.5-minute, 24000



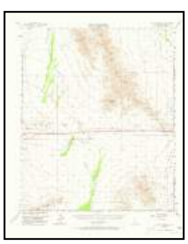
Ripley
2012
7.5-minute, 24000

1983 Source Sheets

Hopkins Well
1983
7.5-minute, 24000
Aerial Photo Revised 1977

Roosevelt Mine
1983
7.5-minute, 24000
Aerial Photo Revised 1977

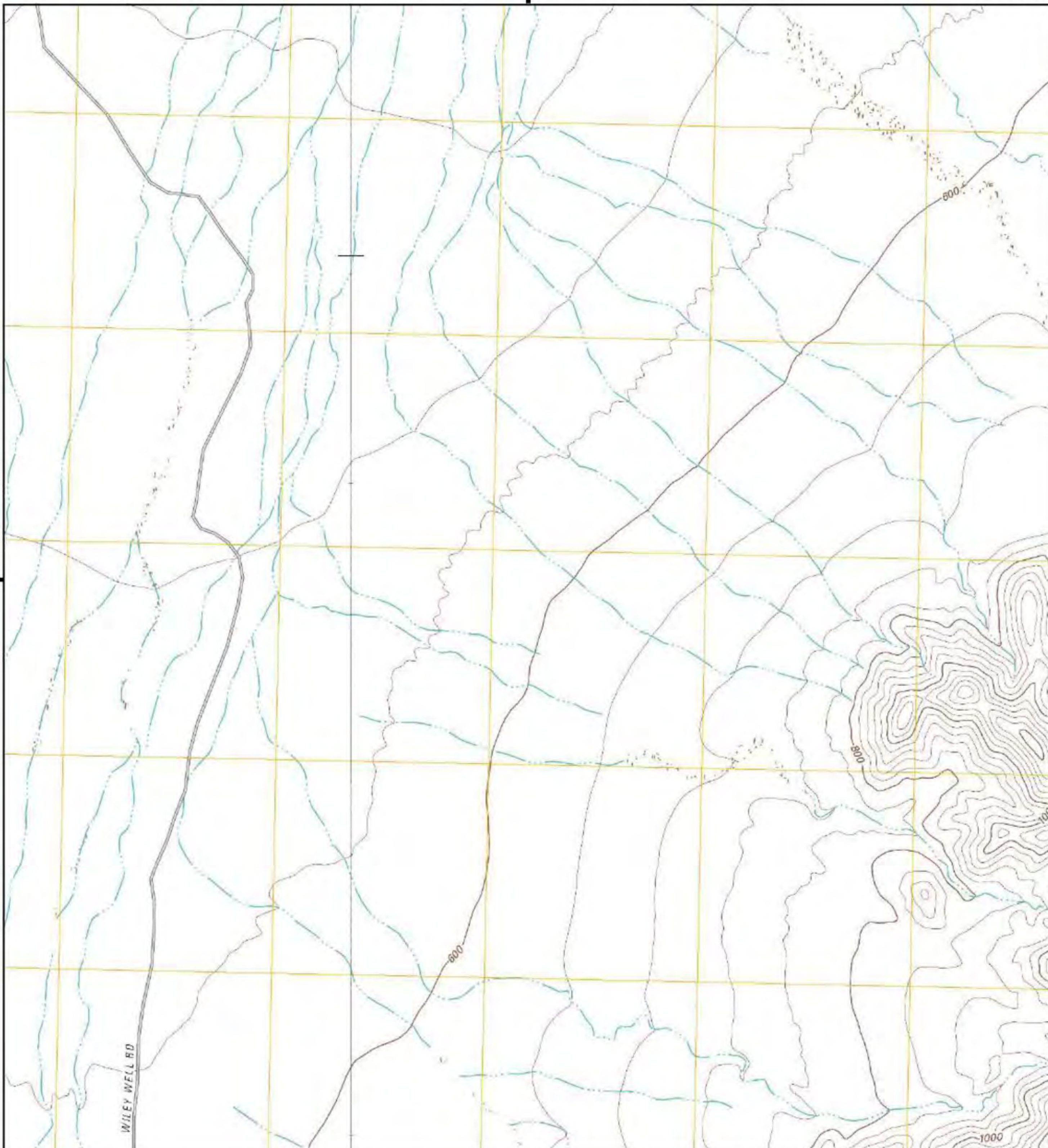
1952 Source Sheets



McCoy Spring
1952
15-minute, 62500
Aerial Photo Revised 1948

Historical Topo Map

2012



0 Miles 0.25 0.5 1 1.5

This report includes information from the following map sheet(s).

NW N NE
W E
SW S SE

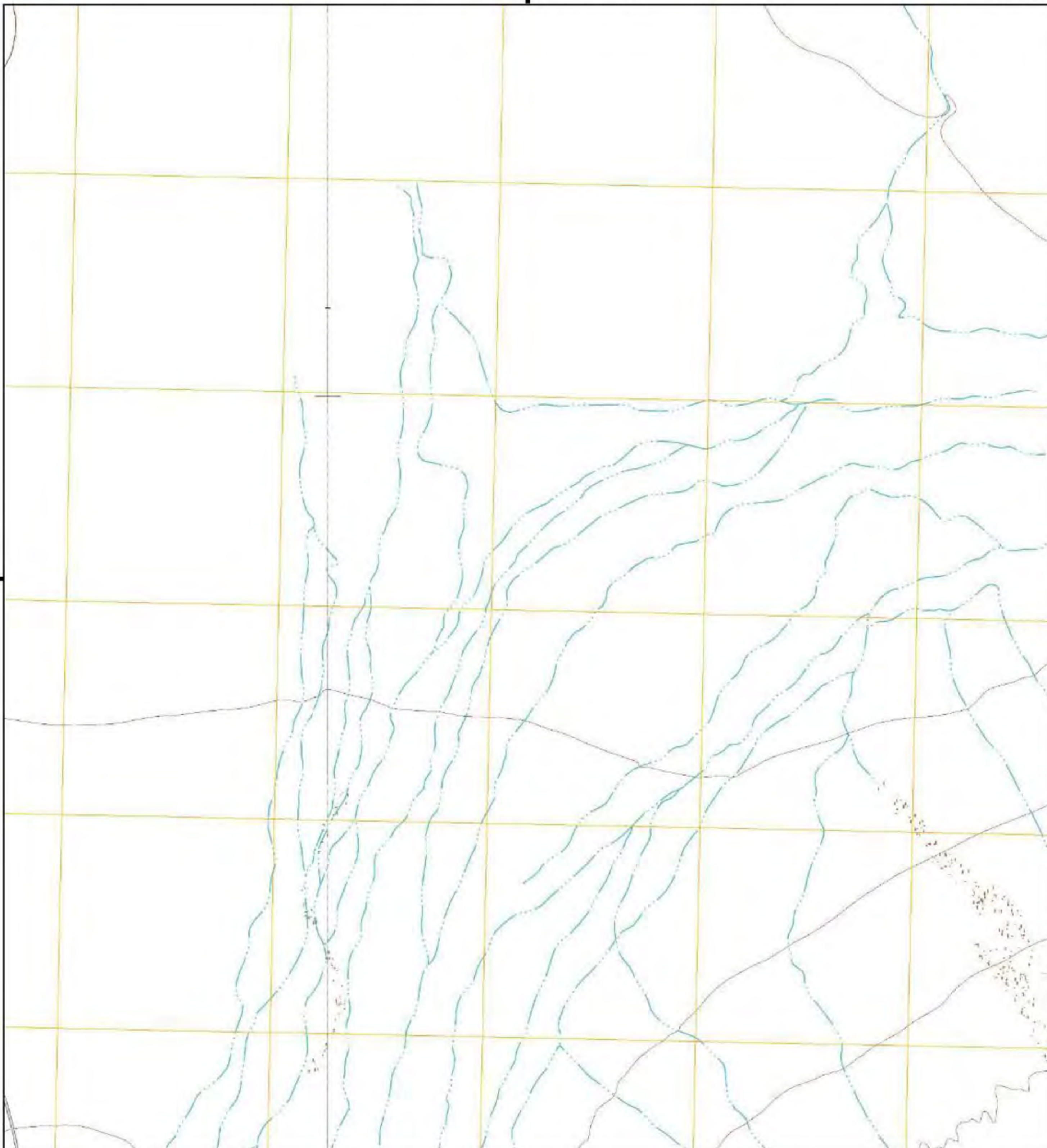
TP, Roosevelt Mine, 2012, 7.5-minute
NW, Hopkins Well, 2012, 7.5-minute

SITE NAME: RE Crimson, LLC
ADDRESS: Blythe
Blythe, CA 92239
CLIENT: Stantec

N

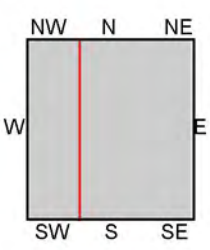
Historical Topo Map

2012



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



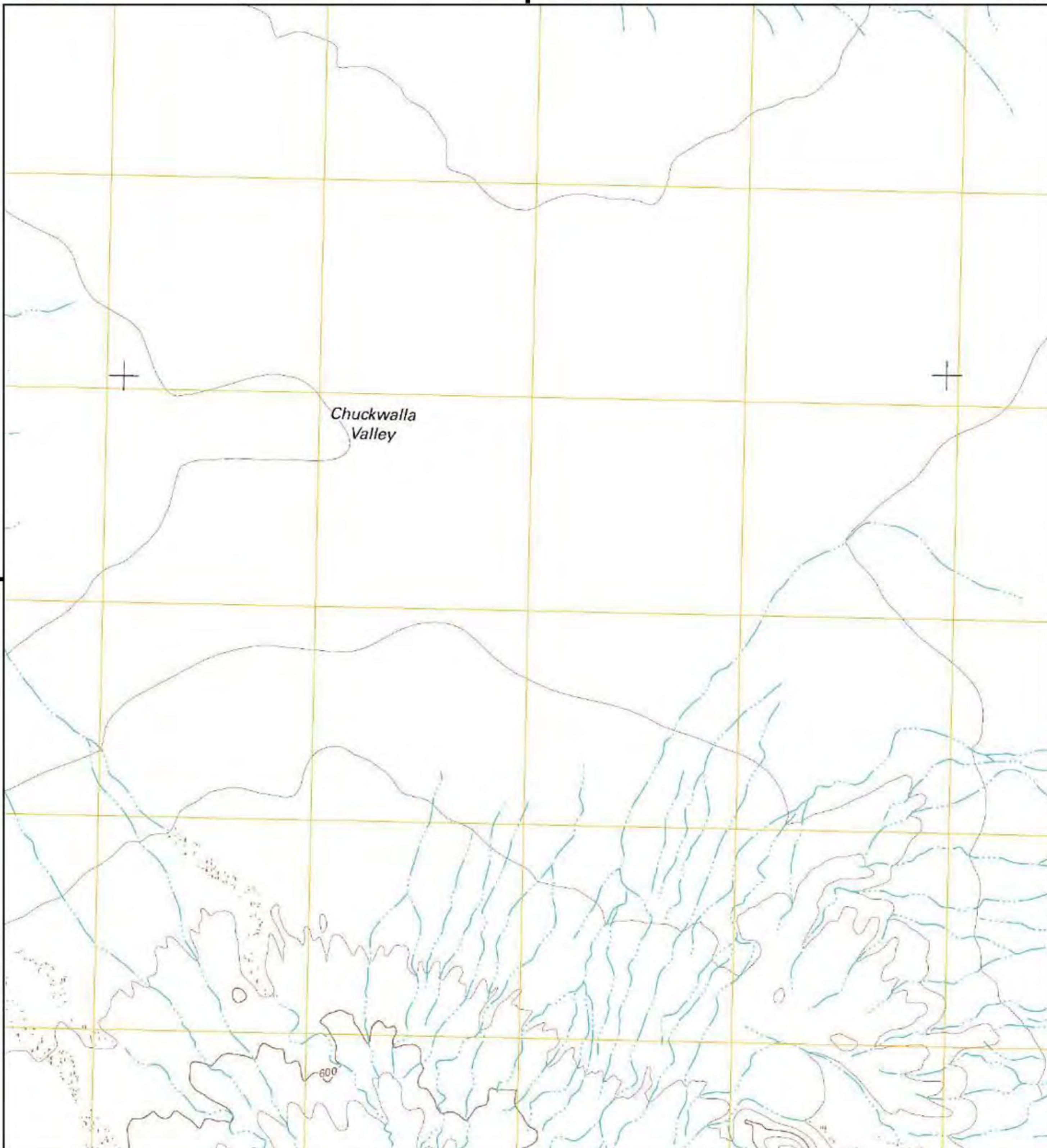
TP, Roosevelt Mine, 2012, 7.5-minute
W, Hopkins Well, 2012, 7.5-minute

SITE NAME: RE Crimson, LLC
ADDRESS: Blythe
Blythe, CA 92239
CLIENT: Stantec

N

Historical Topo Map

2012



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Roosevelt Mine, 2012, 7.5-minute

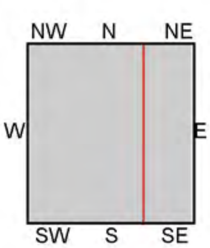
SITE NAME: RE Crimson, LLC
ADDRESS: Blythe
Blythe, CA 92239
CLIENT: Stantec

N

Historical Topo Map

2012

This report includes information from the following map sheet(s).



0 Miles 0.25 0.5 1 1.5

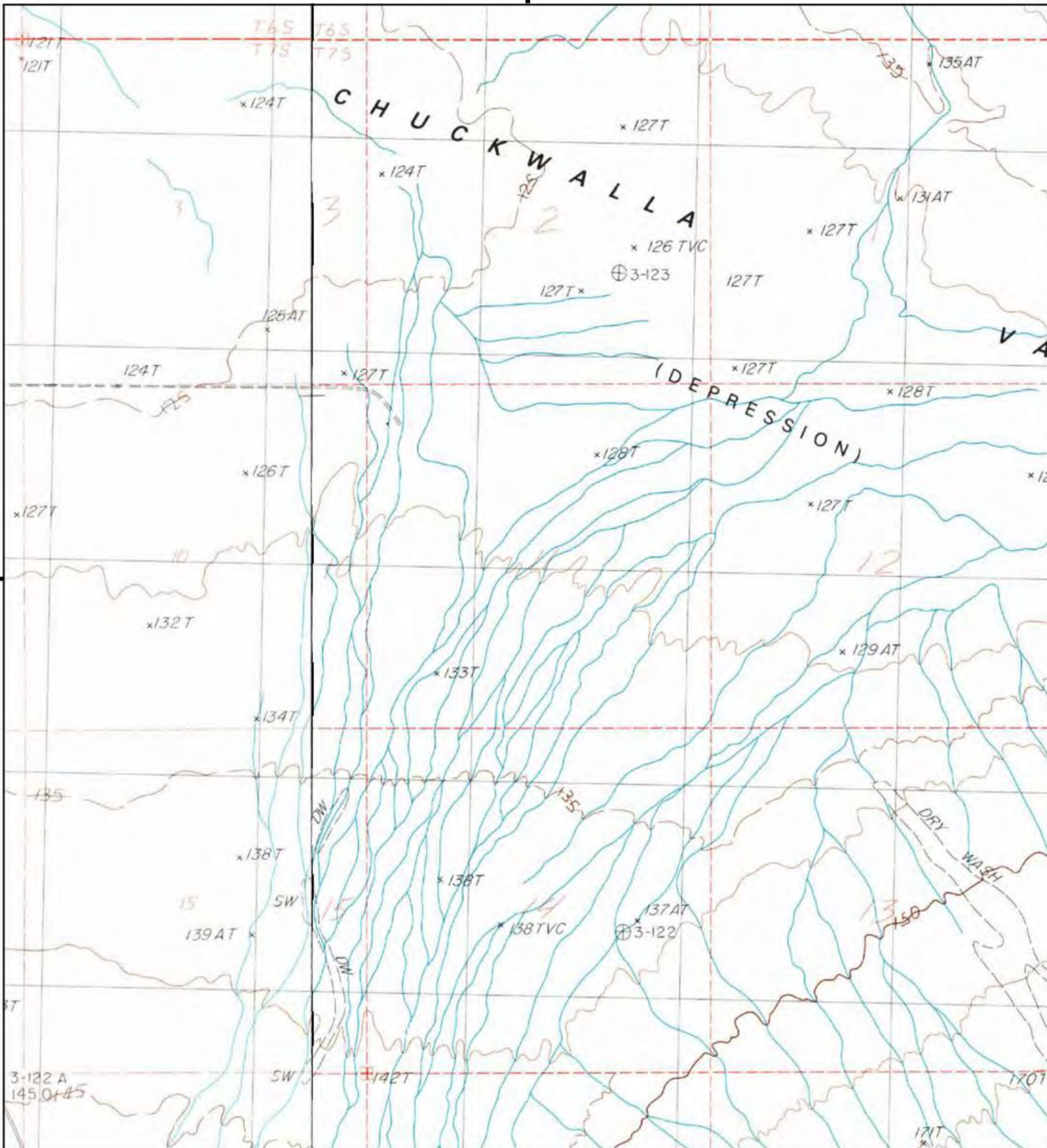
TP, Roosevelt Mine, 2012, 7.5-minute
E, Ripley, 2012, 7.5-minute

SITE NAME: RE Crimson, LLC
ADDRESS: Blythe
Blythe, CA 92239
CLIENT: Stantec

N

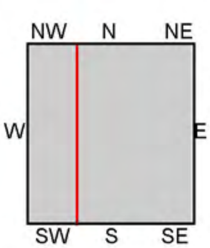
Historical Topo Map

1983



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



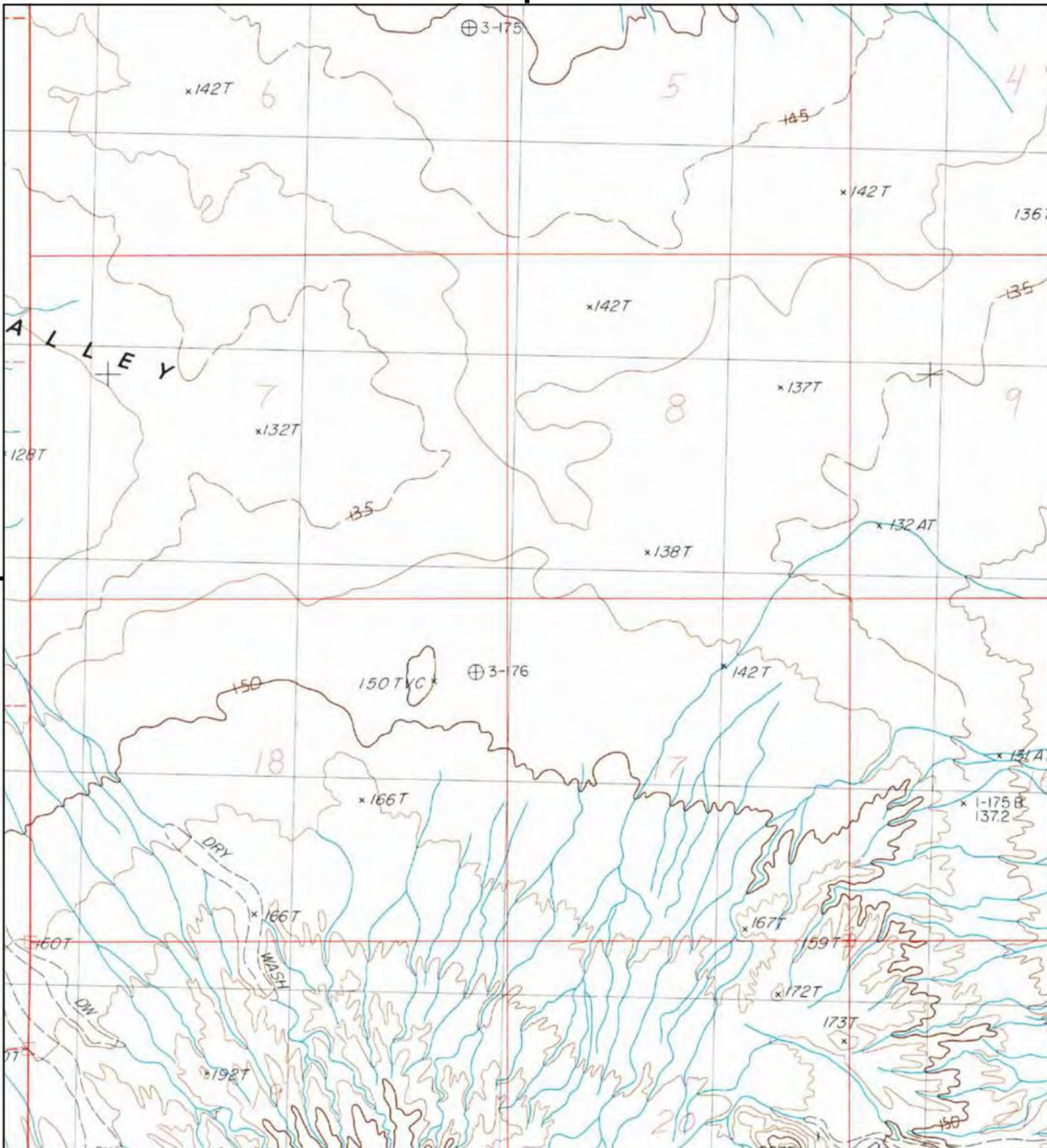
TP, Roosevelt Mine, 1983, 7.5-minute
W, Hopkins Well, 1983, 7.5-minute

SITE NAME: RE Crimson, LLC
ADDRESS: Blythe
Blythe, CA 92239
CLIENT: Stantec

N

Historical Topo Map

1983



0 Miles 0.25 0.5 1 1.5

This report includes information from the following map sheet(s).

NW N NE
W E
SW S SE

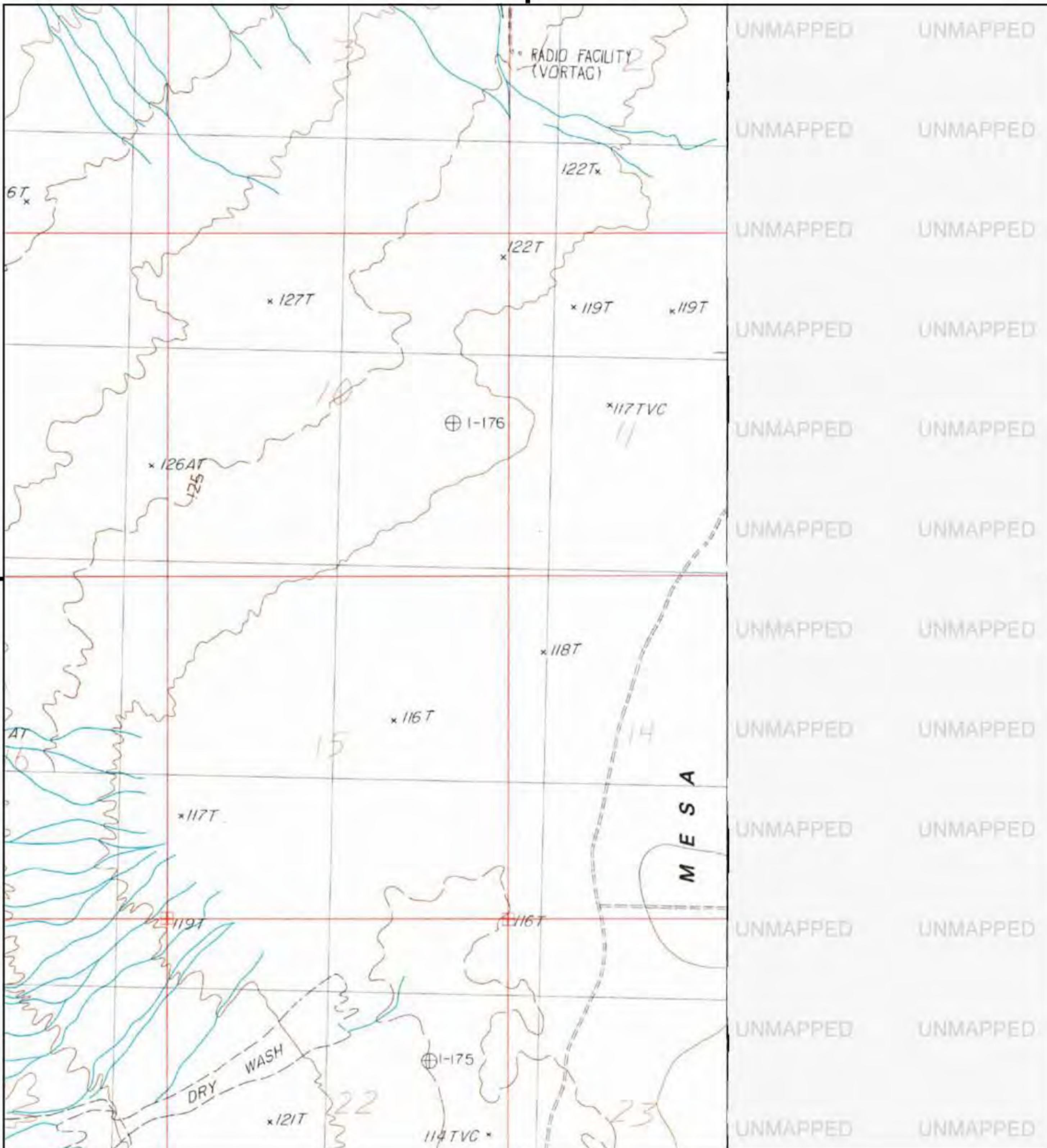
TP, Roosevelt Mine, 1983, 7.5-minute

SITE NAME: RE Crimson, LLC
ADDRESS: Blythe
Blythe, CA 92239
CLIENT: Stantec

N

Historical Topo Map

1983



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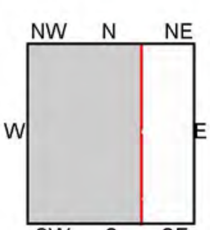
0 Miles 0.25 0.5 1 1.5

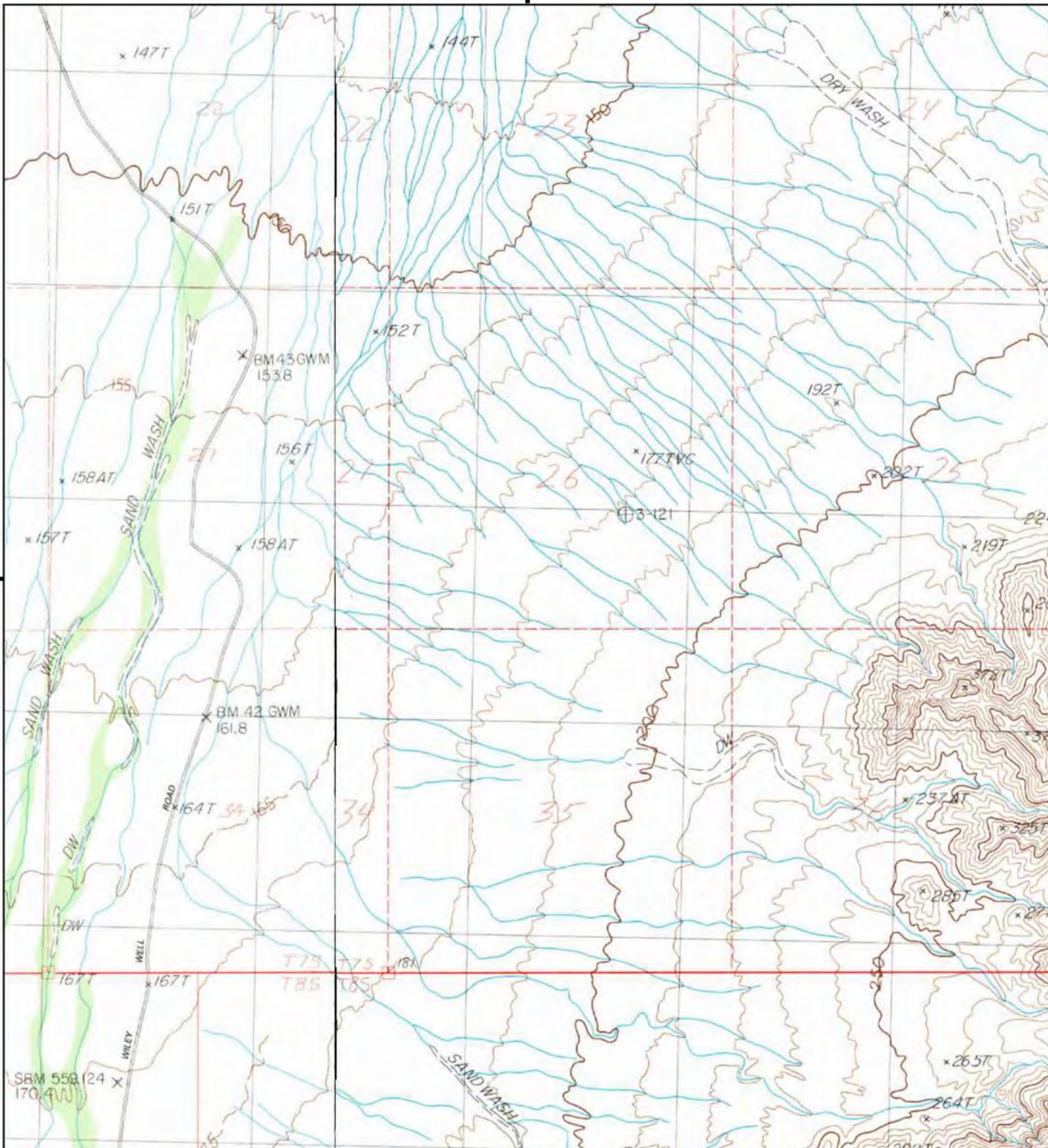


TP, Roosevelt Mine, 1983, 7.5-minute

SITE NAME: RE Crimson, LLC
ADDRESS: Blythe
Blythe, CA 92239
CLIENT: Stantec

Historical Topo Map

1983



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW	N	NE
W		E
SW	S	SE

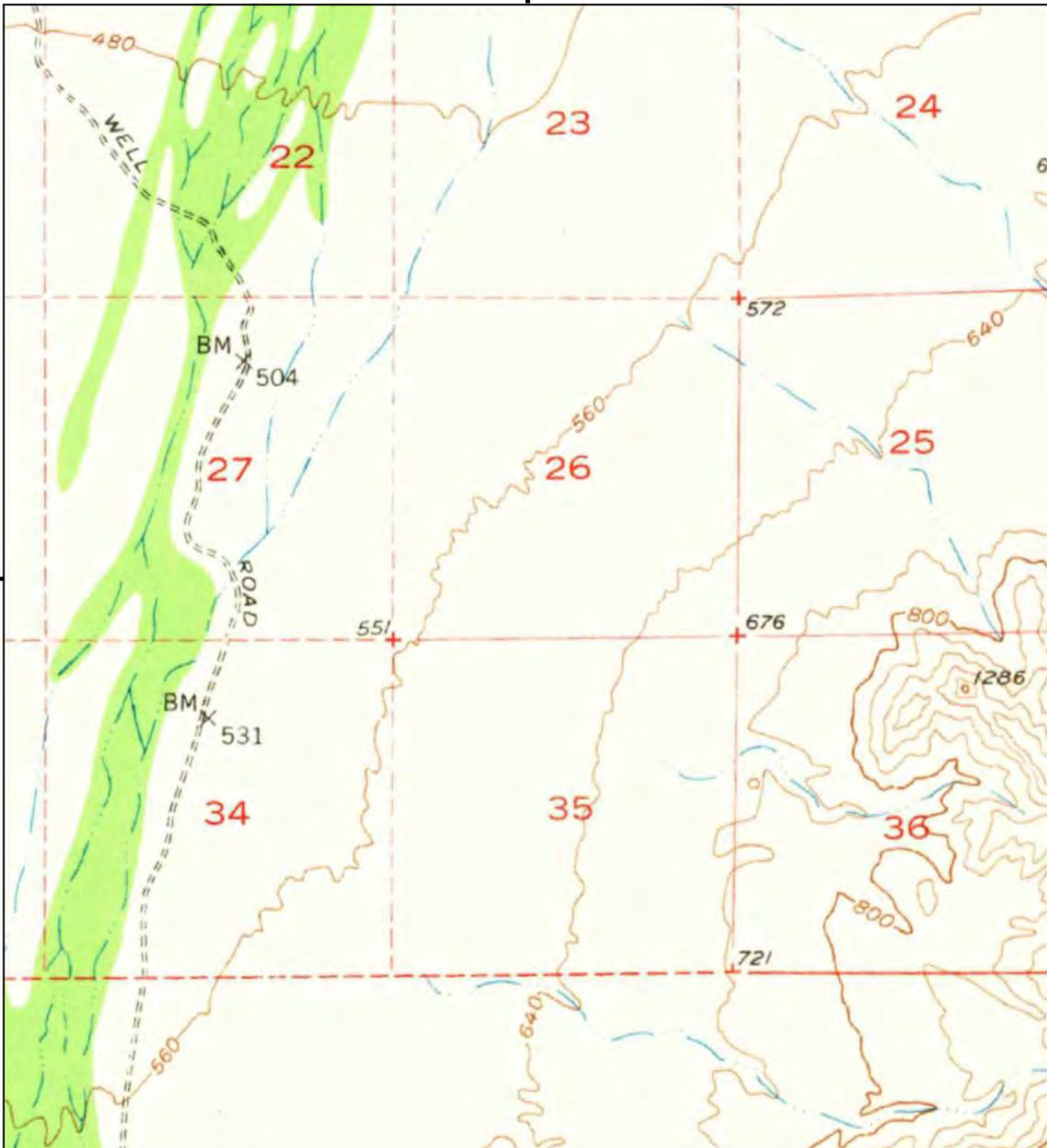
TP, Roosevelt Mine, 1983, 7.5-minute
NW, Hopkins Well, 1983, 7.5-minute

SITE NAME: RE Crimson, LLC
ADDRESS: Blythe
Blythe, CA 92239
CLIENT: Stantec

N

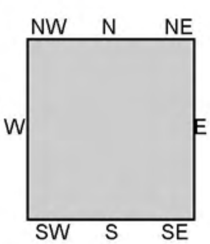
Historical Topo Map

1952



0 Miles 0.25 0.5 1 1.5

This report includes information from the following map sheet(s).

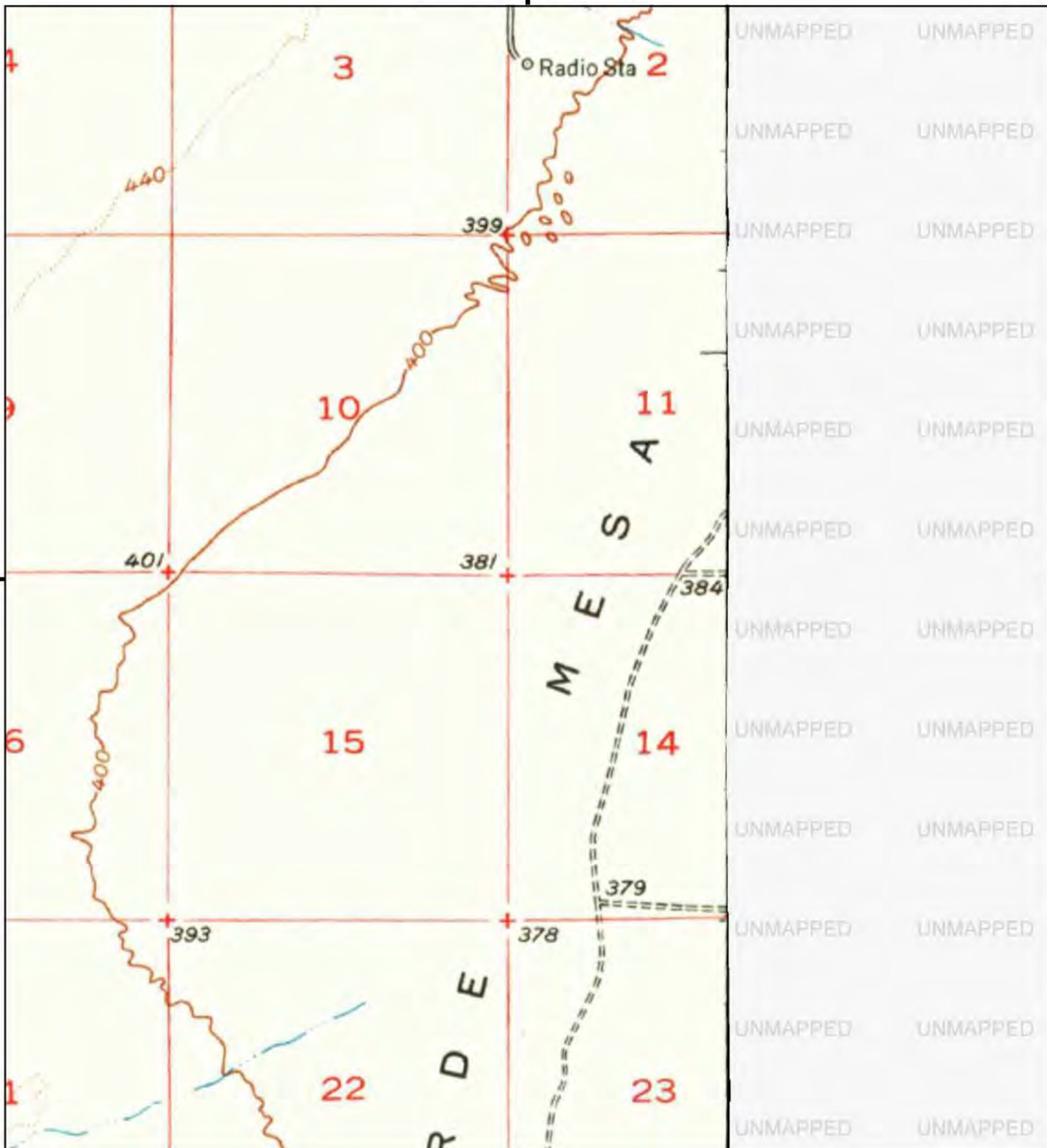


TP, McCoy Spring, 1952, 15-minute

SITE NAME: RE Crimson, LLC
ADDRESS: Blythe
Blythe, CA 92239
CLIENT: Stantec

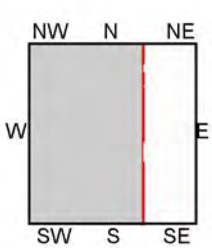
Historical Topo Map

1952



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



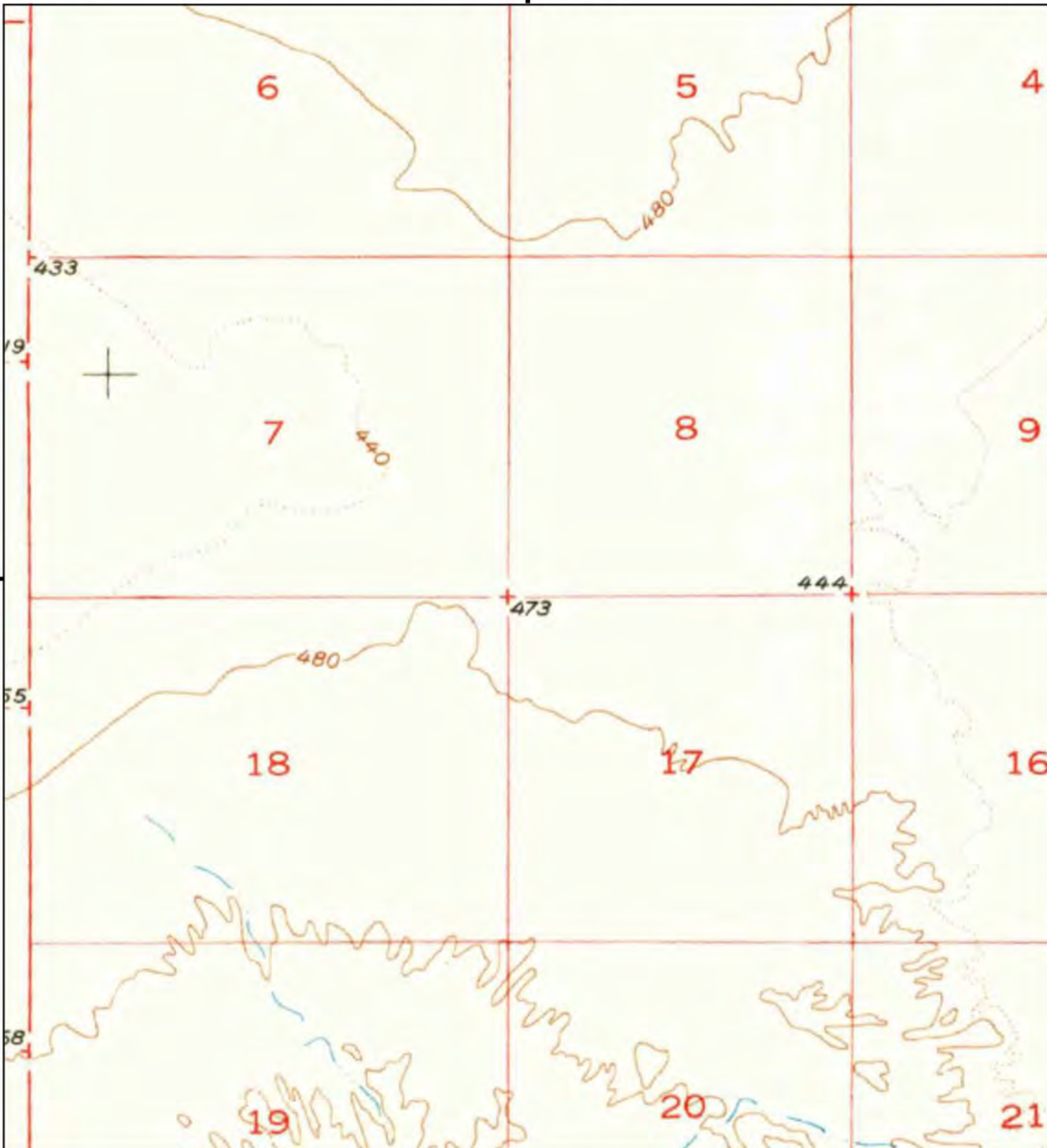
TP, McCoy Spring, 1952, 15-minute

SITE NAME: RE Crimson, LLC
ADDRESS: Blythe
Blythe, CA 92239
CLIENT: Stantec

N

Historical Topo Map

1952



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

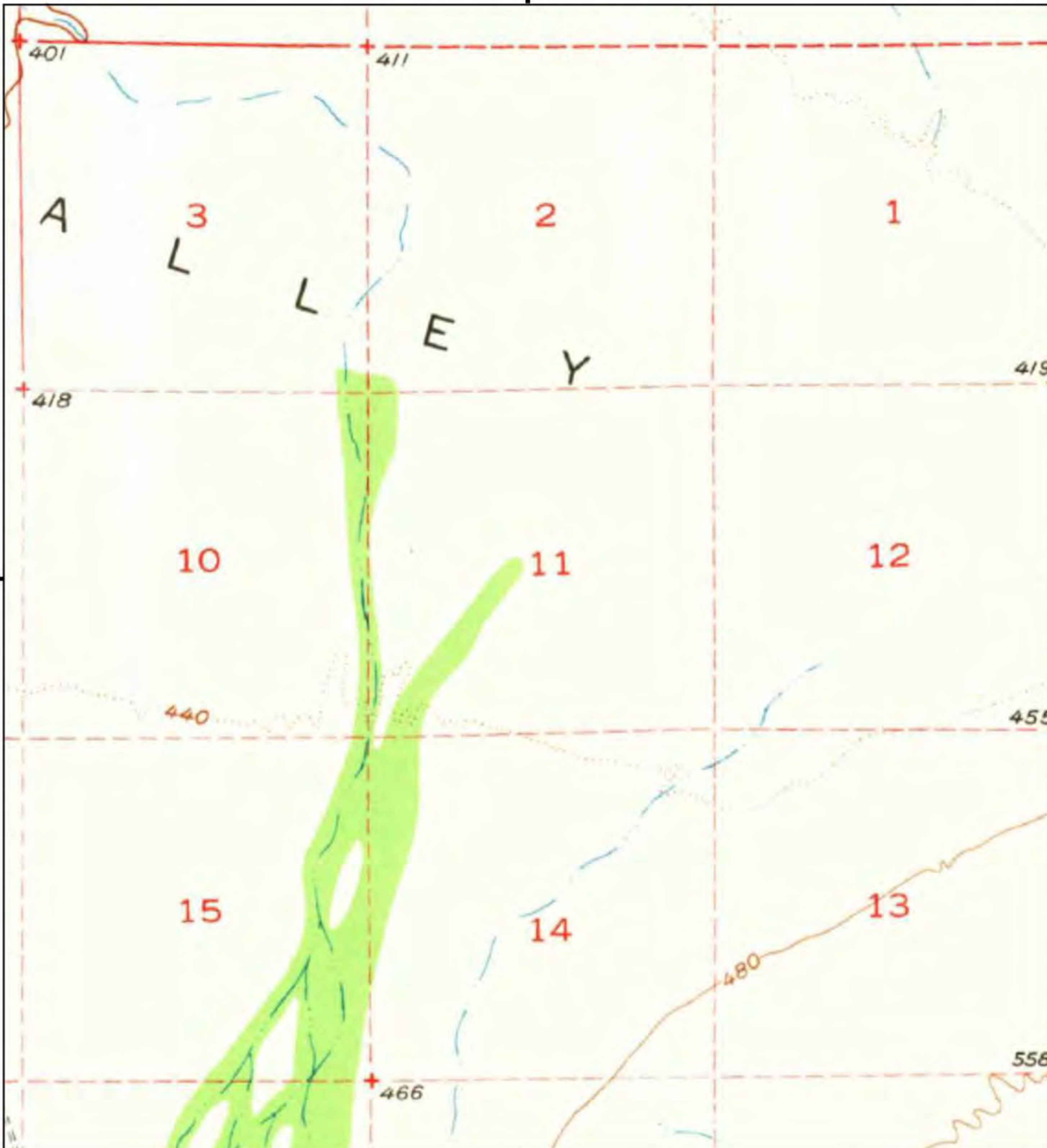
TP, McCoy Spring, 1952, 15-minute

SITE NAME: RE Crimson, LLC
ADDRESS: Blythe
Blythe, CA 92239
CLIENT: Stantec

N

Historical Topo Map

1952



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, McCoy Spring, 1952, 15-minute

SITE NAME: RE Crimson, LLC
ADDRESS: Blythe
Blythe, CA 92239
CLIENT: Stantec

N

RE Crimson, LLC
Blythe
Blythe, CA 92239

Inquiry Number: 5256788.5
April 13, 2018

The EDR-City Directory Image Report

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

TABLE OF CONTENTS

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with any questions or comments.

EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available city directory data at 5 year intervals.

RECORD SOURCES

EDR's Digital Archive combines historical directory listings from sources such as Cole Information and Dun & Bradstreet. These standard sources of property information complement and enhance each other to provide a more comprehensive report.

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RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

Year	***Target Street***	***Cross Street***	***Source***
2010	☑	☐	Haines Criss-Cross Directory
2005	☑	☐	Haines Criss-Cross Directory
2000	☑	☐	Haines Criss-Cross Directory
1995	☑	☐	Haines Criss-Cross Directory
1990	☑	☐	Haines Criss-Cross Directory
1985	☐	☐	Haines Criss-Cross Directory
1980	☐	☐	Haines Criss-Cross Directory
1975	☐	☐	Haines Criss-Cross Directory

FINDINGS

TARGET PROPERTY STREET

Blythe
Blythe, CA 92239

Year	***CD Image***	***Source***	

nearest street to coordinate - WILEYS WELL RD

2010	pg A1	Haines Criss-Cross Directory	
2005	pg A2	Haines Criss-Cross Directory	
2000	pg A3	Haines Criss-Cross Directory	
1995	pg A4	Haines Criss-Cross Directory	
1990	pg A5	Haines Criss-Cross Directory	
1985	-	Haines Criss-Cross Directory	Street not listed in Source
1980	-	Haines Criss-Cross Directory	Street not listed in Source
1975	-	Haines Criss-Cross Directory	Street not listed in Source

FINDINGS

CROSS STREETS

No Cross Streets Identified

City Directory Images

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

nearest street to coordinate - WILEYS WELL RD **2010**

WILEYS WELL RD 92225 BLYTHE

19005	★ FRIENDS OUTSIDE VISITING CNTR	760-921-1964	2
	★ IRON STATE PRISON	760-922-3517	8
	★ STATE OF CA IRONWOOD ST PRISON	760-921-3000	9
19025	★ FRIENDS OUTSIDE VISITING CNTR	760-921-8294	2
	★ STATE OF CA CHCKWLLA VLY ST	760-922-5300	9
	★ TCG	760-921-2539	8

★ 6 BUS 0 RES 0 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

nearest street to coordinate - WILEYS WELL RD **2005**

WILEYS WELL RD
92225 BLYTHE

WEALTH CODE 0

19005	★	FRIENDS OUTSIDE VISITING CNTR	760-921-1964	2
19025	★	FRIENDS OUTSIDE VISITING CNTR	760-921-8294	2

★ 2 BUS 0 RES 0 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

nearest street to coordinate - WILEYS WELL RD **2000**

WILEY WELLS RD 92225 BLYTHE

19005	★ CA ST CORRECTIONS PRISON	760-921-3000	5
	★ CENTERFORCE DESCANSO VISITR CT	760-921-8569	+0
19025	★ CA ST CORRECTIONS PRISON	760-922-5300	9
	★ CA ST FISH&GAME ENFRCMNT&INFO	760-922-5305	9
	★ CENTERFORCE ESPERANZA VISTR CT	760-922-8326	+0
	★ L T I INC	760-921-2502	+0
19205	XXXX	OO	

★ 6 BUS 1 RES 3 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

nearest street to coordinate - WILEYS WELL RD **1995**

WILEY WELLS RD (89)
92225 BLYTHE

19005	★CA ST IRONWOOD PRSN	921-3000	+5
	★LUTHRN SOCIAL SERVS	921-8569	+5
19025	...... BUILDING		
	★BERGELECTRIC CORP	921-2405	+5
	★CA ST CHUCKWALLA	922-5300	9
	★CADRI COMPANY	922-3249	+5
	★CZYSZ CONSTRUCTION	921-2817	4
	★FRIENDS OUTSIDE CTR	922-8326	3
	★HELIX ELECTRIC	921-8318	4
	★HUNTER CORP	921-3126	4
	★I C F KAISER ENGRG	922-5485	4
	★LUSCARDI CONSTR CO	921-8118	4
	★MINGUS CONSTRUCTORS	922-8131	+5
	★SHERWOOD MECHANICAL	921-8641	+5
	★SPECTRUM WEST INC	921-8524	4
	★STEINY&COMPANY	921-3121	4
19025	....		
19205	XXXX	00	

★ 15 BUS 1 RES 6 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

nearest street to coordinate - WILEYS WELL RD **1990**

WILEY WELLS RD (89)
92225 BLYTHE

19025	★C R S S CONSTRUCTOR	922-2633	9
	★CA ST CHUCKWALLA	922-5300	9
	★CATES CONSTR INC	922-6094	9
	★E C M ELECTRONICS	922-6187	+0
	★M M R FOLEY ELCTL	922-8626	9
	★N V E CONSTRUCTORS	922-2171	9
	★PIERCE ENTERPRISES	922-3769	+0
	★QUALITY TILE&MARBLE	922-7414	+0
	★R P RICHARD INC	922-7180	9
19205	★SWINERTON&WALBERG	922-5323	9

★ 10 BUS 0 RES 3 NEW

RE Crimson, LLC

Blythe

Blythe, CA 92239

Inquiry Number: 5256788.3

April 13, 2018

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

04/13/18

Site Name:	Client Name:
RE Crimson, LLC	Stantec
Blythe	25864-F Business Center Drive
Blythe, CA 92239	Redlands, CA 92374
EDR Inquiry # 5256788.3	Contact: Dion Monge

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by Stantec were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # FAEE-487B-84FF

PO # NA

Project 185804157

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: FAEE-487B-84FF

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✔ Library of Congress
- ✔ University Publications of America
- ✔ EDR Private Collection

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RE Crimson, LLC
Blythe
Blythe, CA 92239

Inquiry Number: 5256788.6
April 12, 2018

The EDR Property Tax Map Report

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

EDR Property Tax Map Report

Environmental Data Resources, Inc.'s EDR Property Tax Map Report is designed to assist environmental professionals in evaluating potential environmental conditions on a target property by understanding property boundaries and other characteristics. The report includes a search of available property tax maps, which include information on boundaries for the target property and neighboring properties, addresses, parcel identification numbers, as well as other data typically used in property location and identification.

Thank you for your business.
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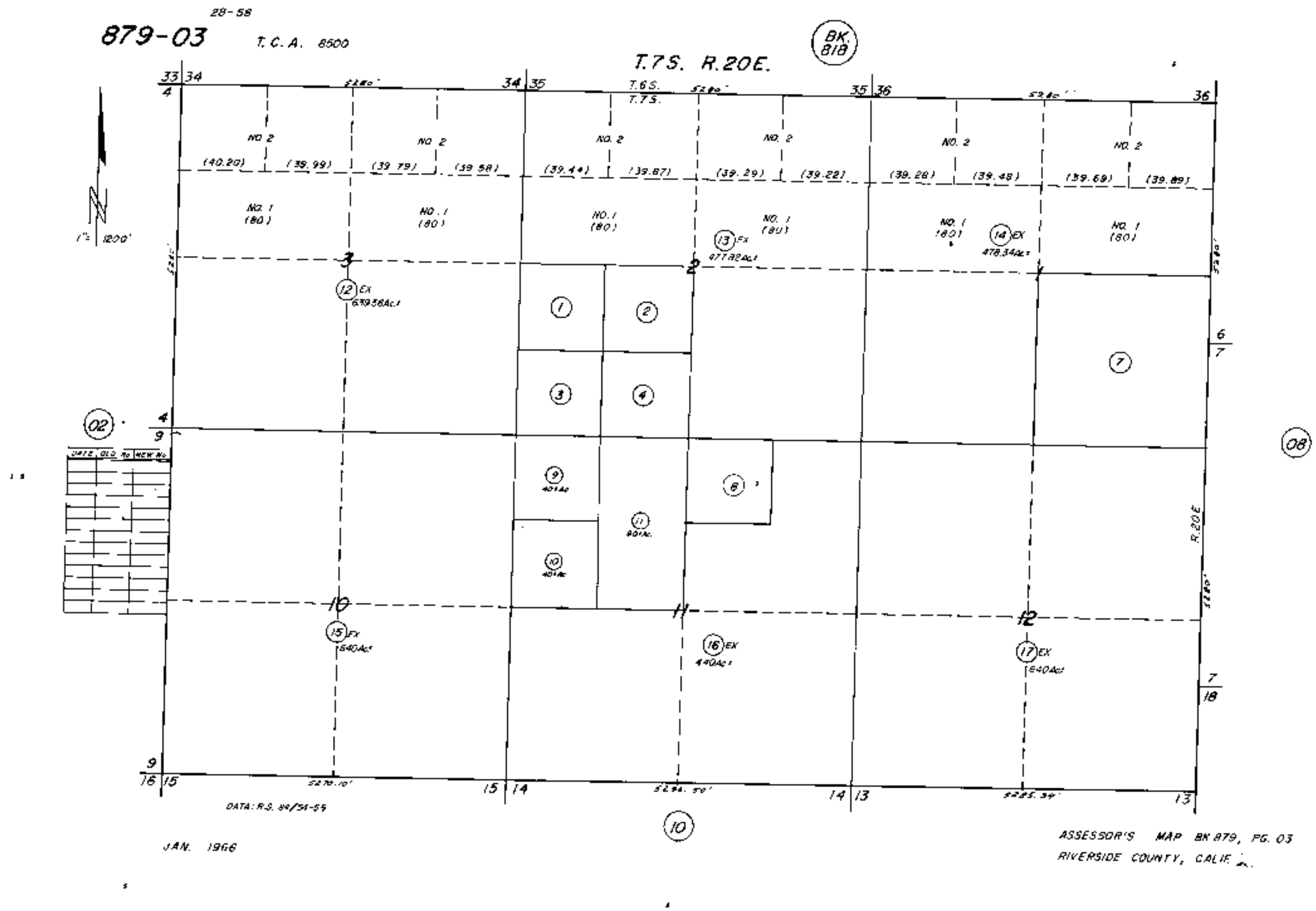
with any questions or comments.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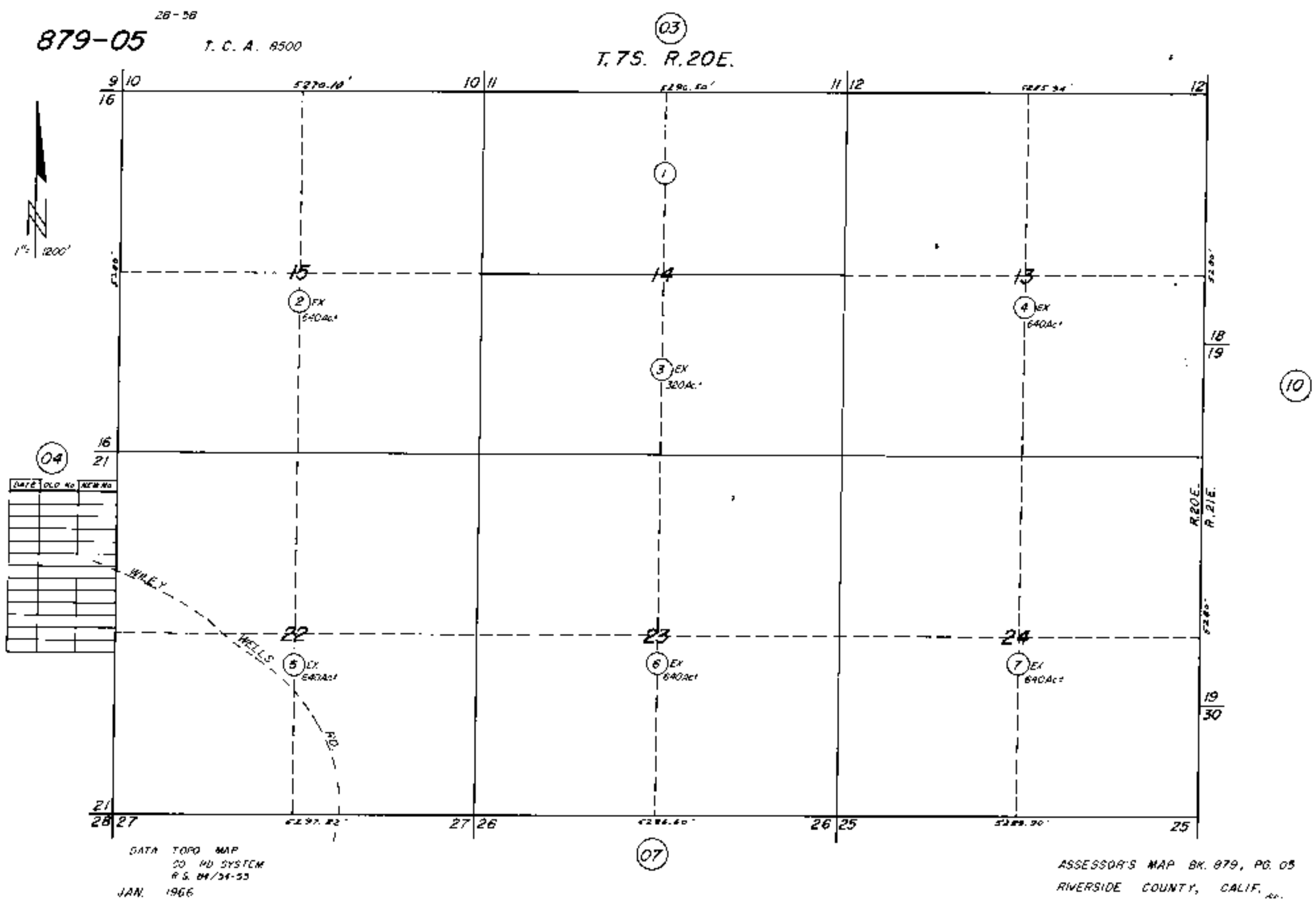
RIVERSIDE COUNTY, CALIF.



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23
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4 EX 640Ac±
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07
WILEY WELLS RD.
R.20E. R.21E.
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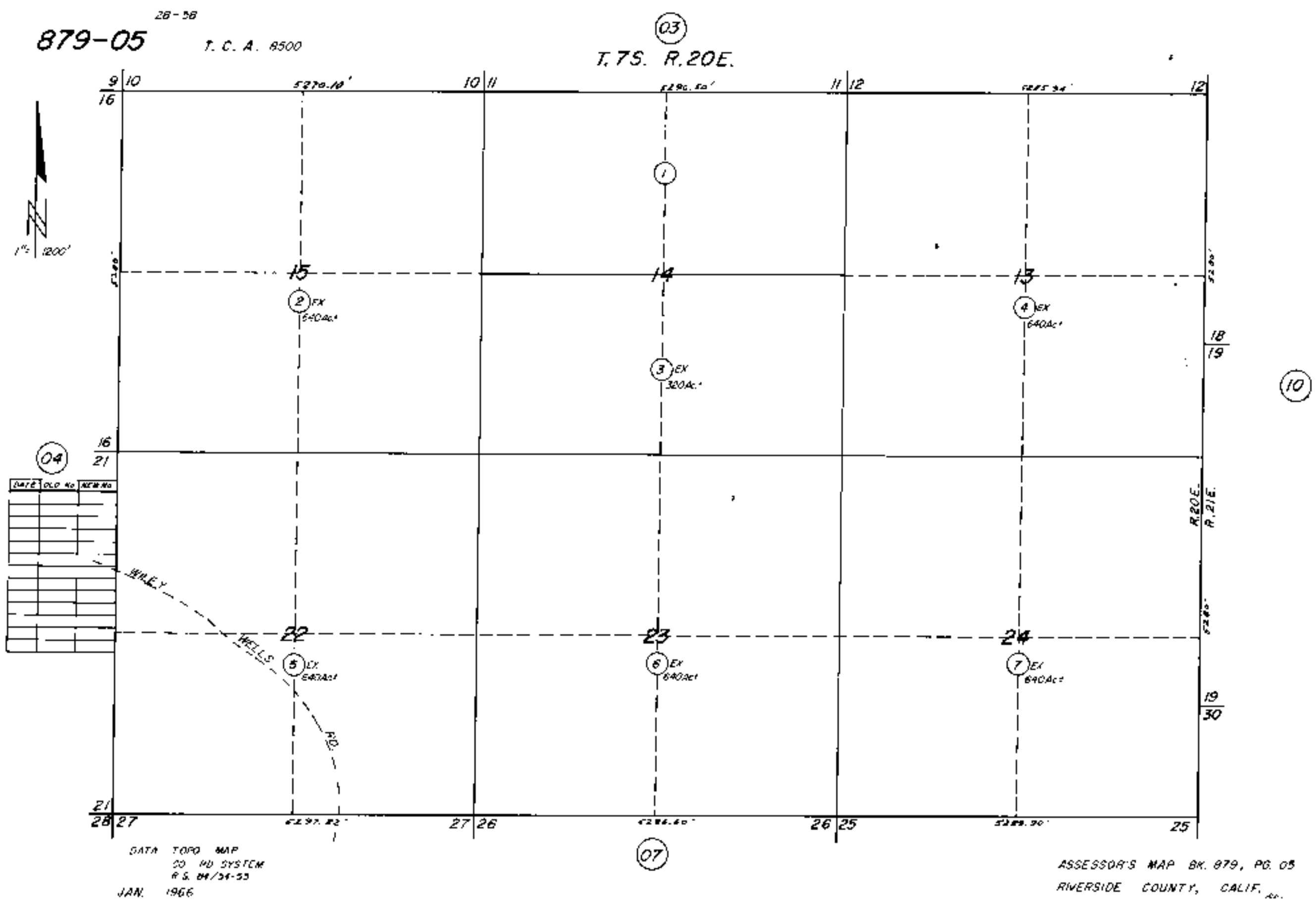

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WILEY WELLS RD.
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R.20E. R.21E.
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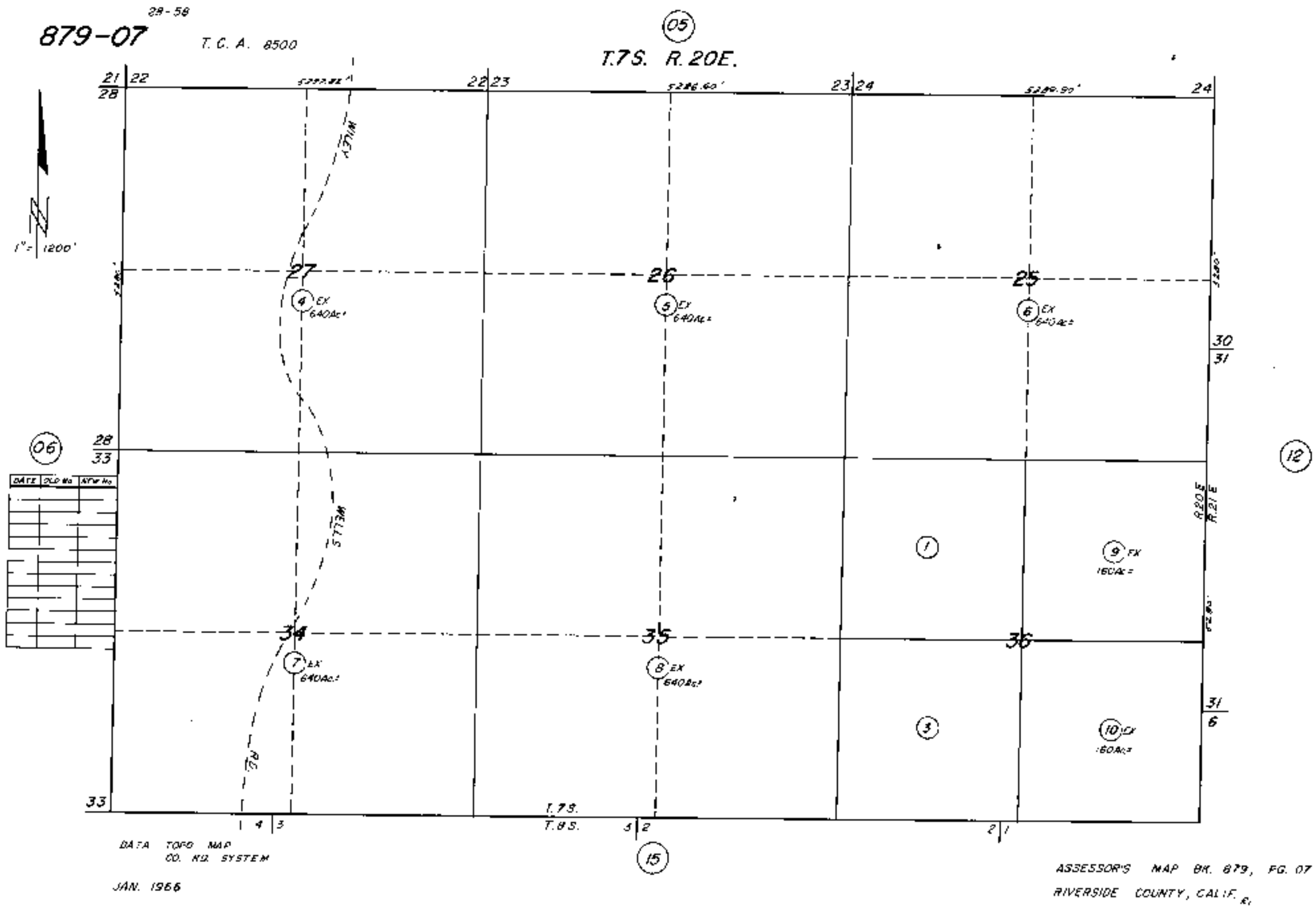
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1" = 1200'
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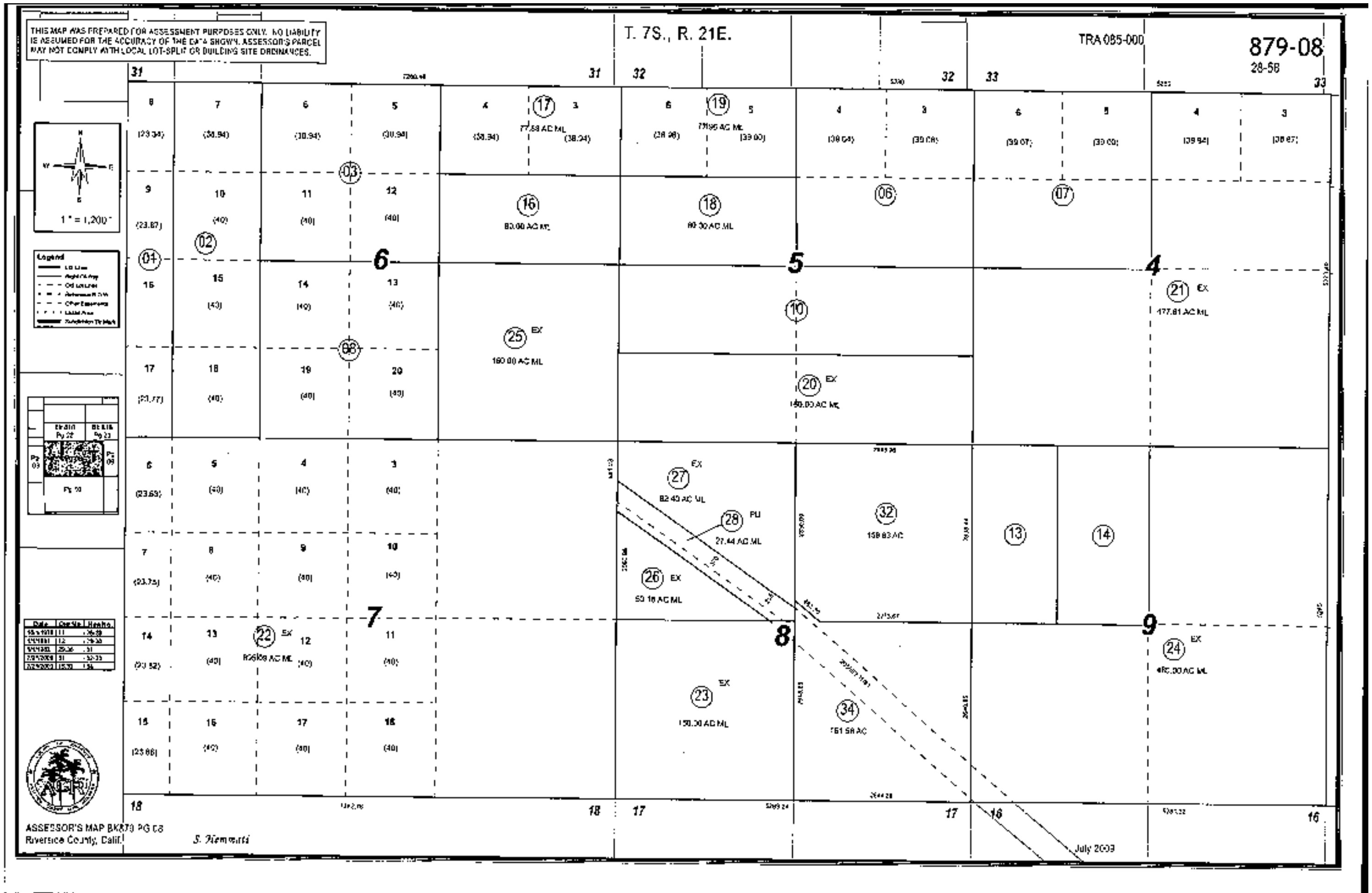
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T. 7S., R. 21E.
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28-58
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27 EX
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28 PU
27.44 AC ML
26 EX
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32
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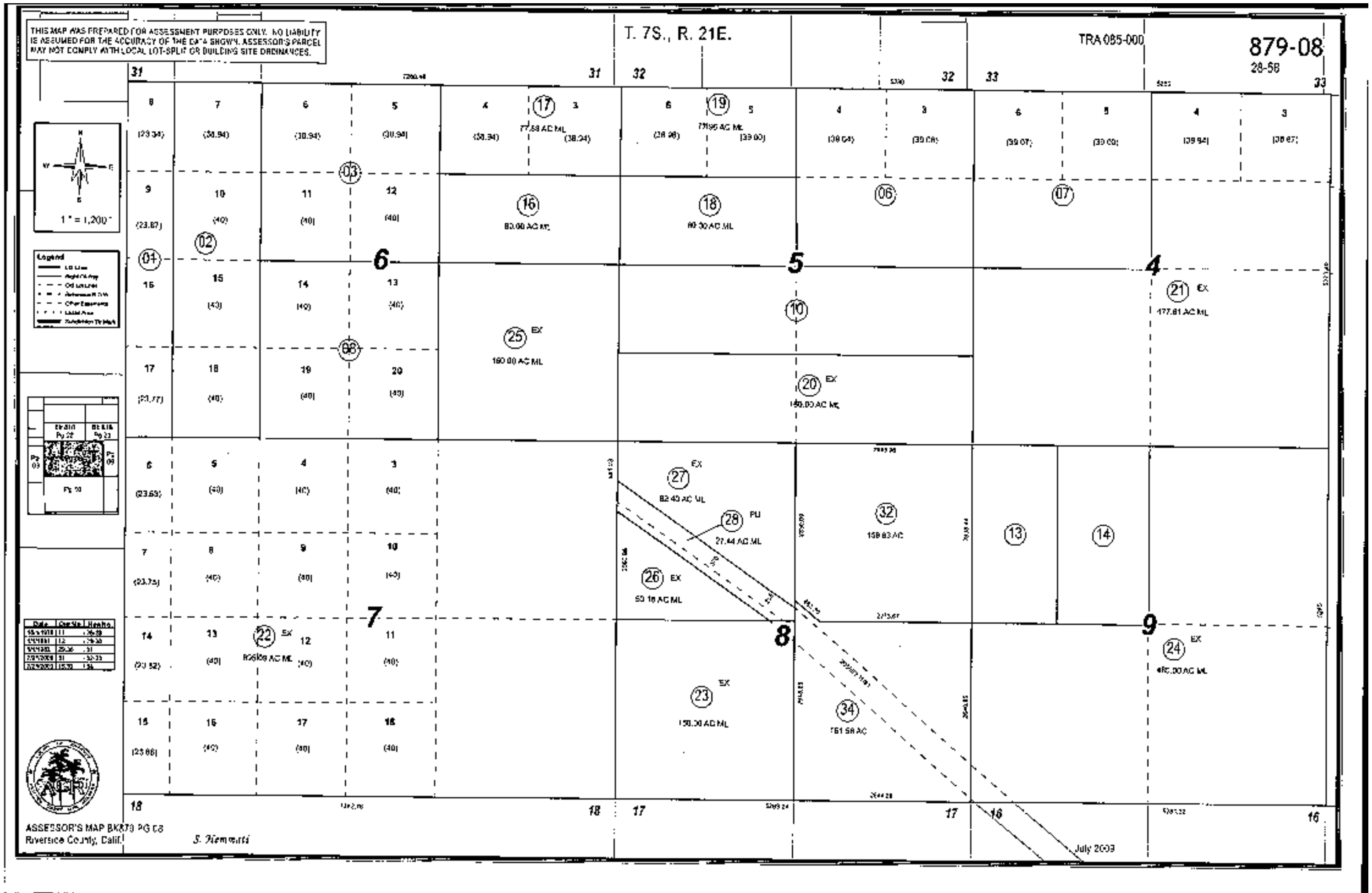
Riverside County, Calif.
S. Hemmati
July 2009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28-58
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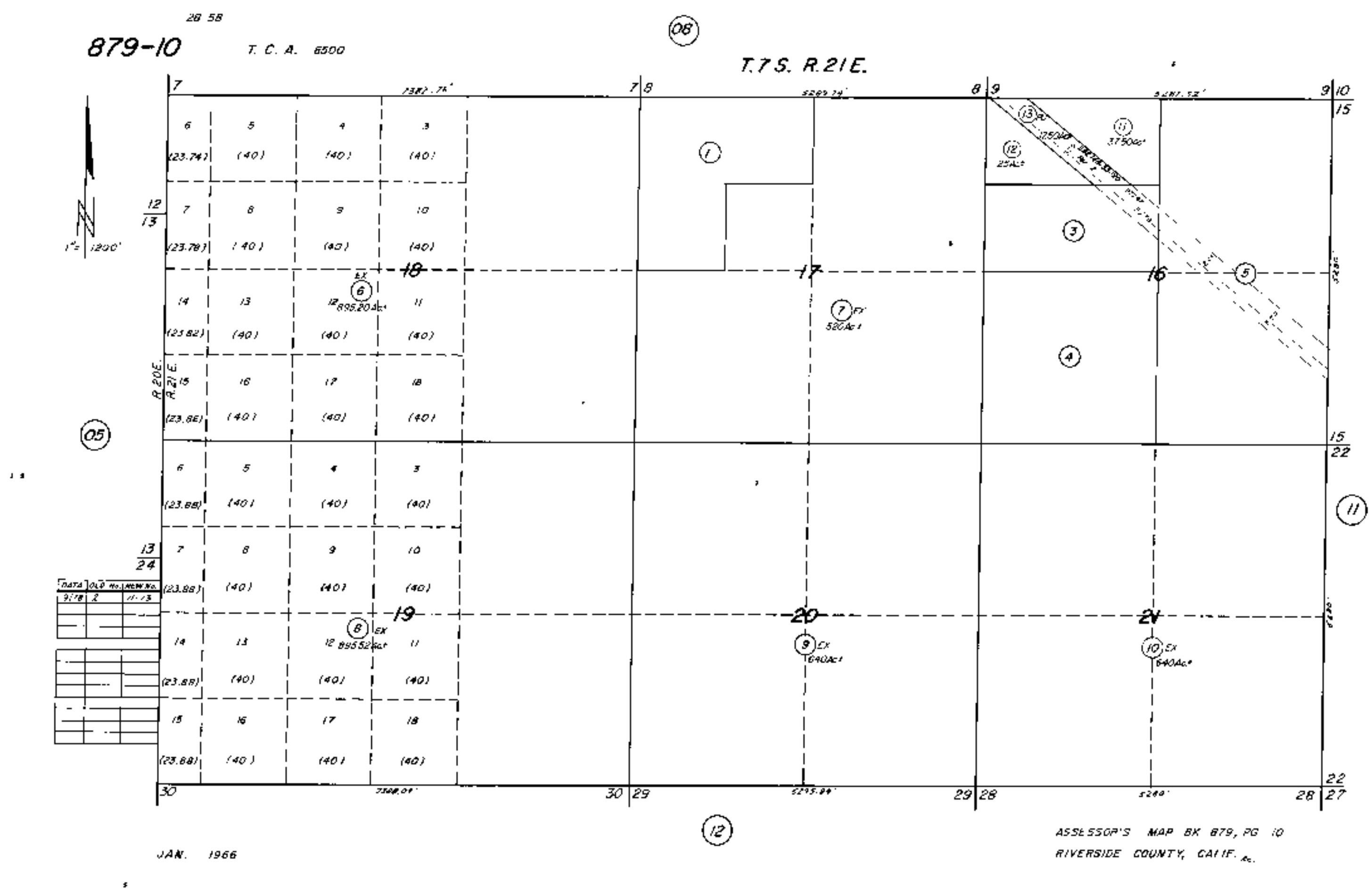
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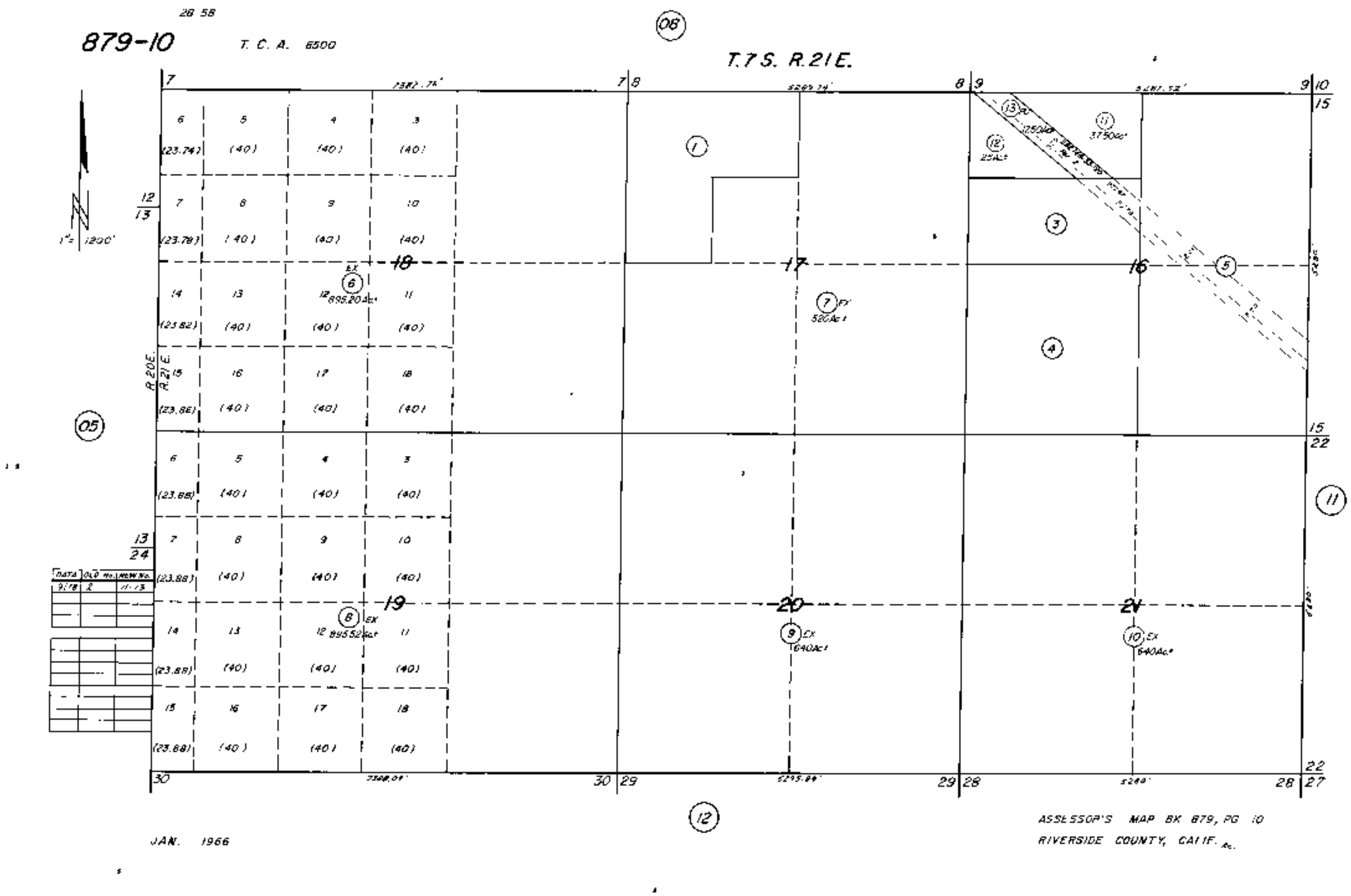
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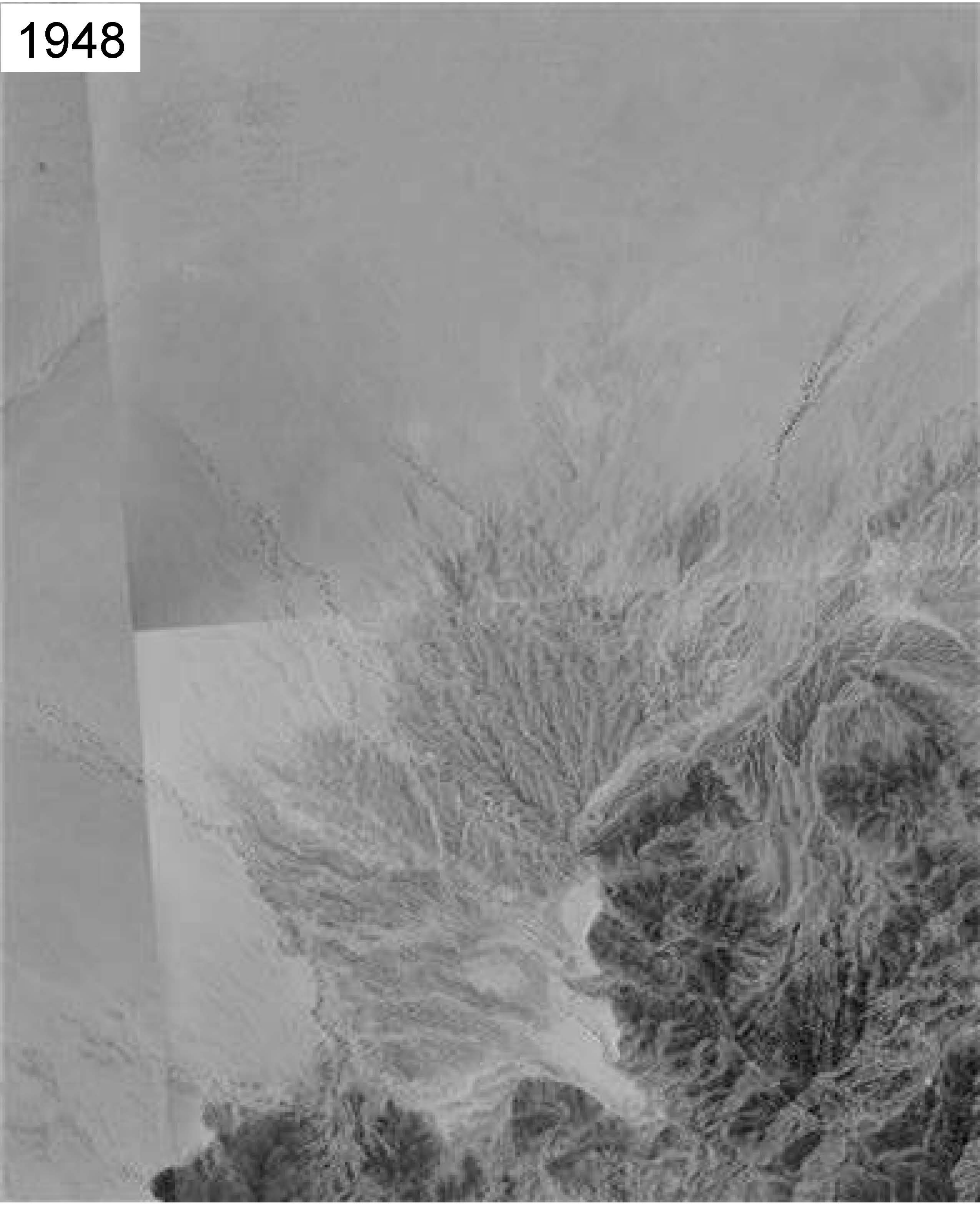
RIVERSIDE COUNTY, CALIF.

Appendix F

HISTORICAL AERIAL PHOTOGRAPHS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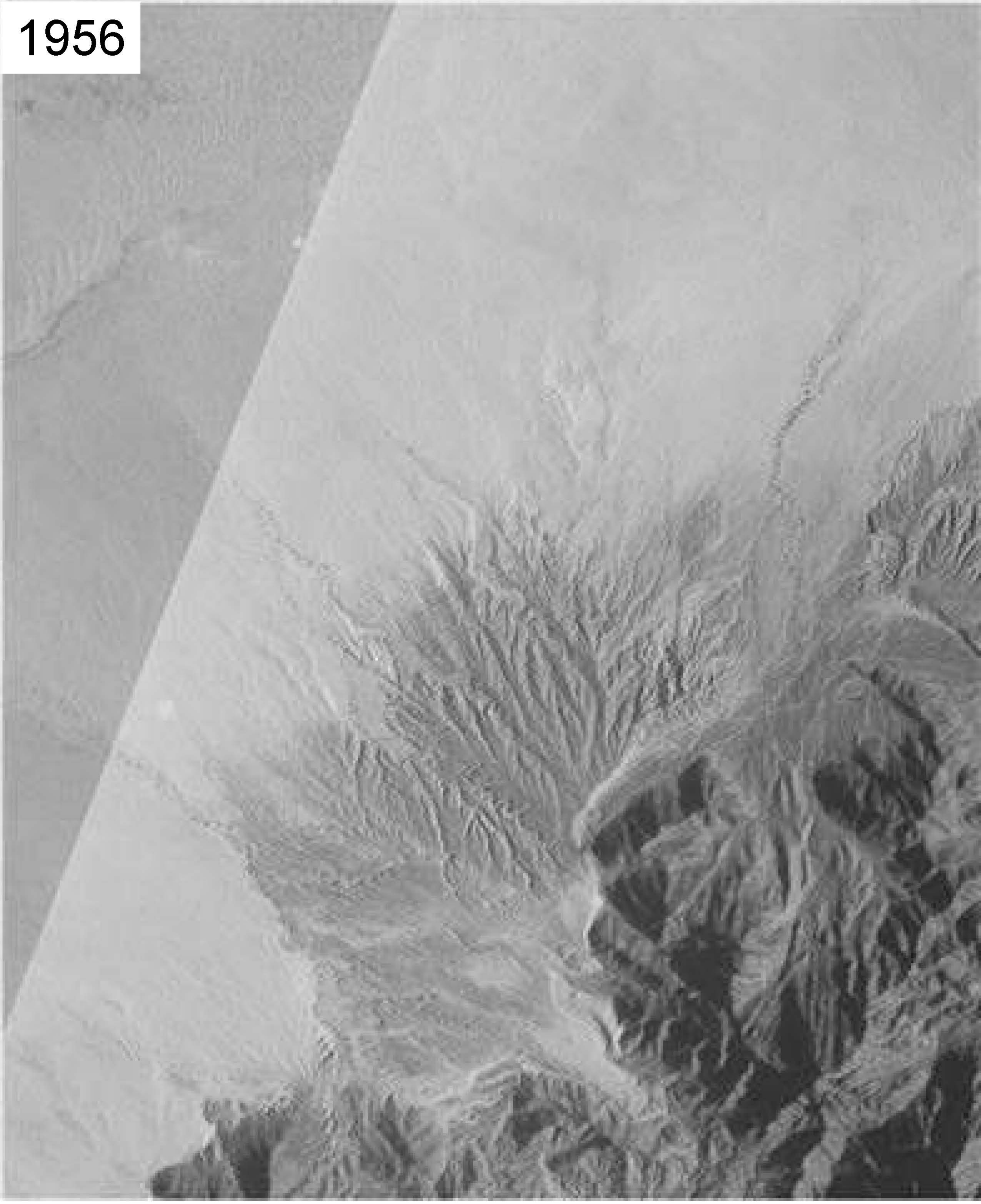
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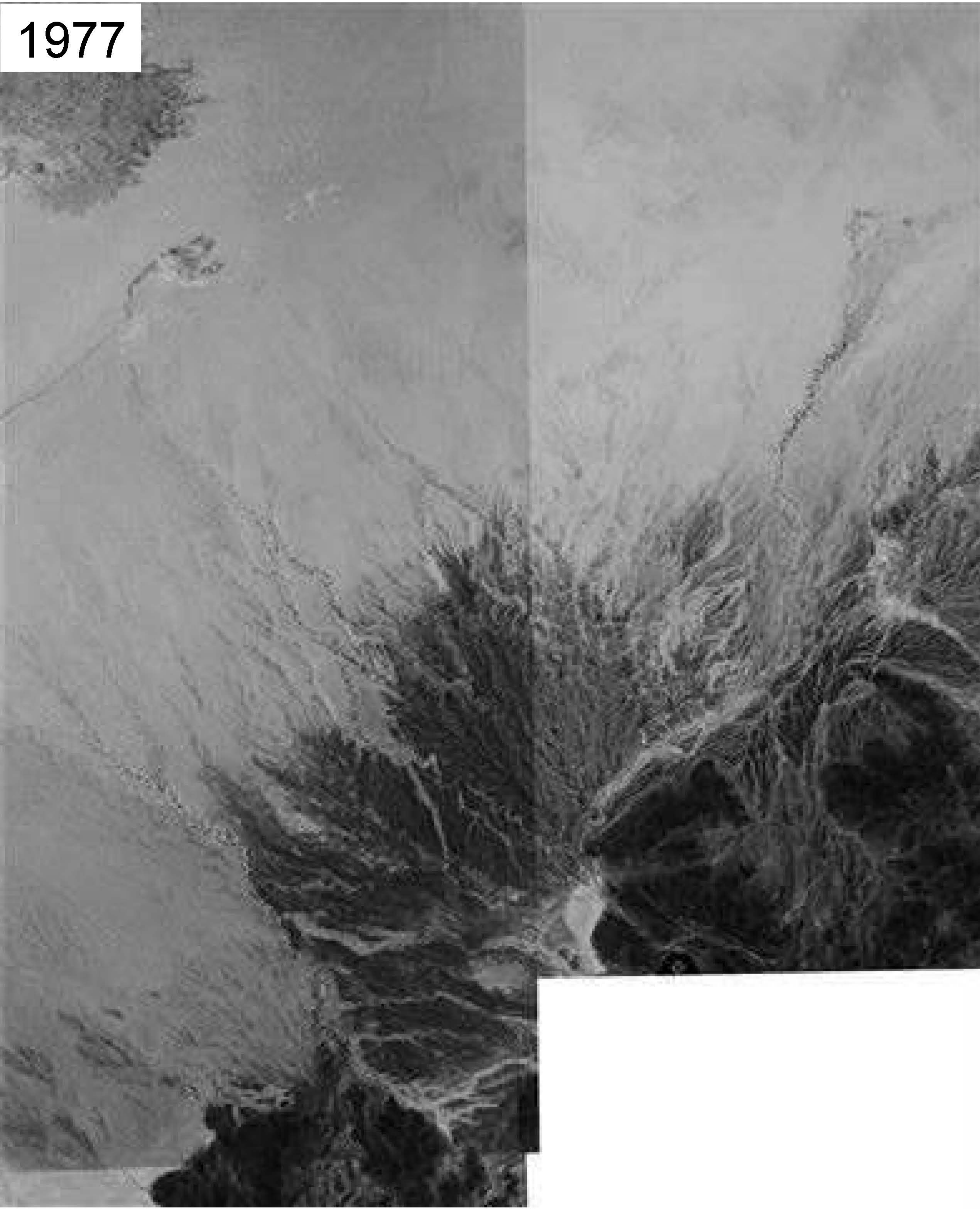
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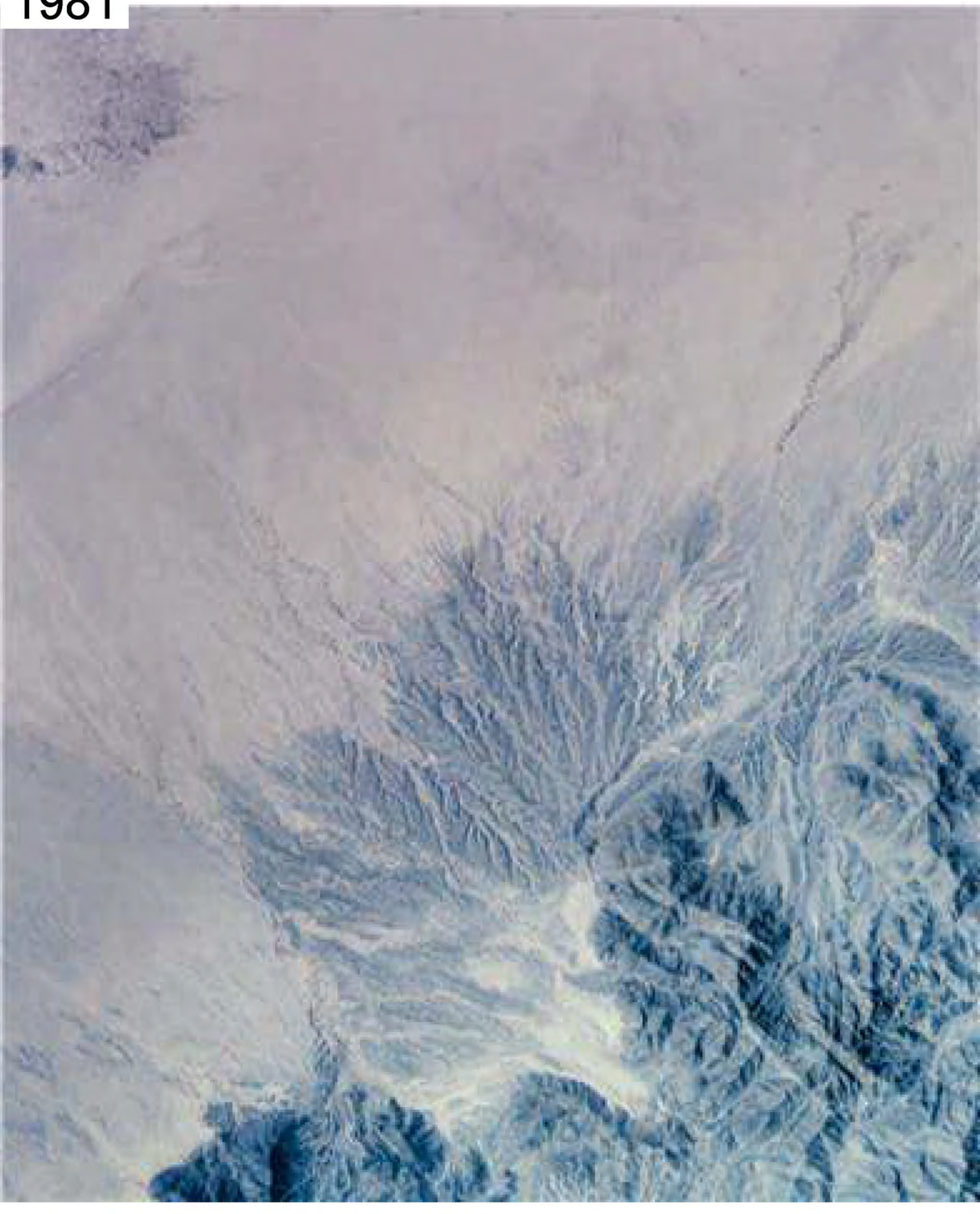

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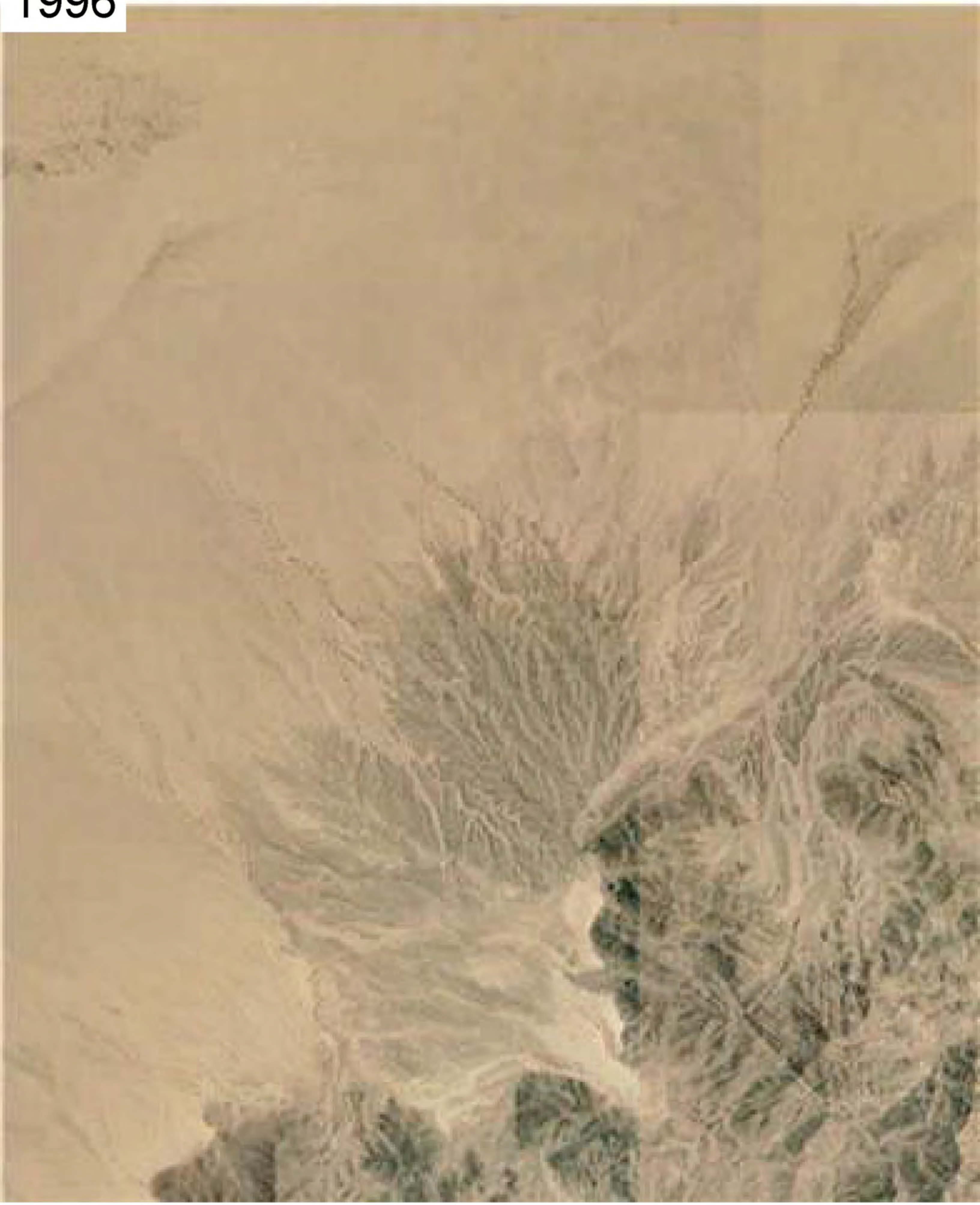

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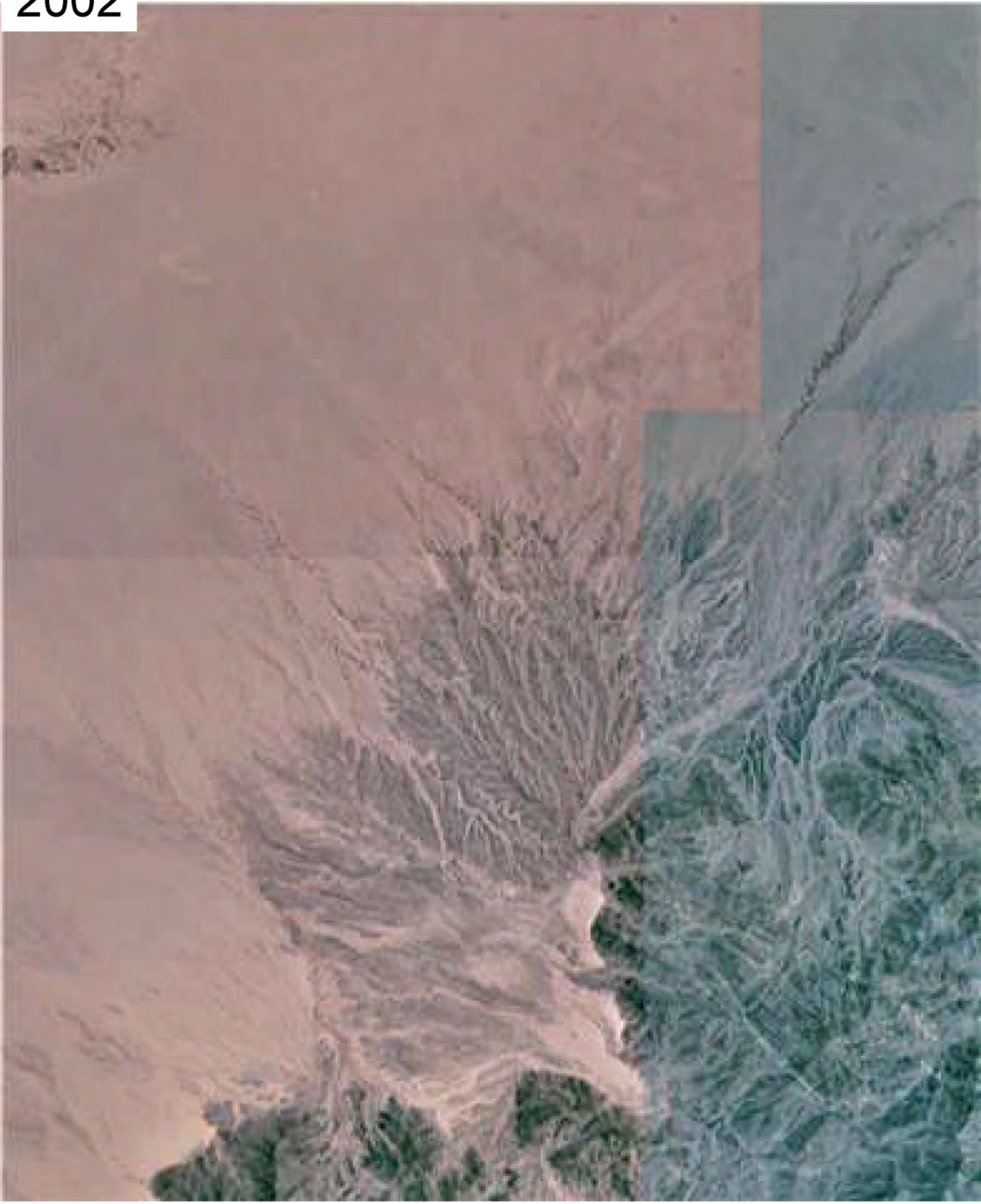



2010


2012


2014

Appendix O
Lands and Realty

Utility Corridor Conflict Analysis, December 2018

Utility Corridor Conflict Analysis

RE Crimson Solar Project

Prepared for:

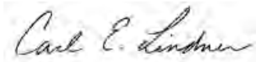
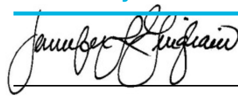
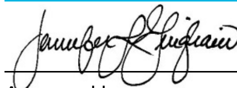
Sonoran West Solar Holdings, LLC
353 Sacramento Street, 21st Floor
San Francisco, CA 94111

Prepared by:

AECOM
401 West A Street, Suite 1200
San Diego, CA 92101
Phone: (619) 610-7600

December 2018

Quality information

Prepared by	Checked by	Approved by
		
Carl Lindner Project Manager	Checked by	Approved by

Revision History

Revision	Revision date	Details	Authorized	Name	Position
Revision					

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Table of Contents

Tables

Figures

1. Introduction

The Crimson Solar Project (Project) is located in unincorporated eastern Riverside County, approximately 13 miles west of Blythe, California, just north of the Mule Mountains and just south of Interstate 10 (See Figure 1). Sonoran West Solar Holdings, LLC (applicant), a wholly owned subsidiary of Recurrent Energy (RE), proposes to construct and operate the Project. The Project is a utility-scale solar photovoltaic (PV) and energy storage project that would be located on federal lands managed by the Bureau of land Management (BLM) within the California Desert Conservation Area (CDCA) and the Desert Renewable Energy Conservation Plan (DRECP) area.

The Project site consists of approximately 2,489 acres of BLM-administered land within the Riverside East Solar Energy Zone (SEZ)/Development Leasing Area and within the DRECP Development Focus Area (BLM 2015) as presented in the Final Environmental Impact Statement (EIS) (See Figure 2). The Project would interconnect to the regional electrical grid at Southern California Edison's (SCE's) Colorado River Substation (CRS). It would generate up to 350 megawatts (MW) of renewable energy using PV technology and would include up to 350 MW of integrated energy storage capacity.

The total area for the Project (i.e., RE Crimson Permitting Boundary; 2,489 acres) includes a 2,465-acre solar field development area with approximately 1,859 acres of solar modules (array blocks) and 24 acres for linear facilities including access/perimeter roads assuming a 30-to 60-foot corridor width and generation tie (gen-tie) and powerline corridor at 150 feet. The Project applicant is proposing to construct the Project using traditional construction methods.

The Project site was formerly proposed for development as the Sonoran West Solar Energy Generating Station by BrightSource Energy with submittal of an SF-299 application for CACA-051967 in 2009. The former Sonoran West project would have been a 540-MW dual-turbine power tower project on approximately 7,000 acres of a combination of BLM-administered and privately owned land. The current revised proposal represents a substantial reduction in land use requirements and associated impacts.

The proposed Project includes portions of Sections 1, 2, 11, 12, 13, 24, and 25 within Township 7 South, Range 20 East, and portions of Sections 6, 7, 17, and 18 within Township 7 South, Range 21 East. The Project is not sited within the adjacent West-wide Section 368 Energy Corridor pursuant to the West-wide Energy Corridor Final Programmatic Environmental Impact Statement (PEIS). There is only a short gen-tie line that would interconnect the Project to the adjacent CRS.

The following Utility Corridor Conflict Analysis has been prepared at BLM's request to determine if the proposed Project is consistent with the BLM's CDCA Plan. Specifically, this analysis was requested by the BLM California Desert District because the Project would be located in close proximity to CDCA Utility Corridor K, which is located approximately 500 feet north of the RE Crimson Project boundary. Corridor K is approximately 2.1 miles wide and contains segments of the West-wide Section 368 Energy Corridor, specifically Corridor 30-52, which varies in width. The BLM California Desert District Utility Corridor J is located 2.8 miles to the east of the RE Crimson Project boundary, which is approximately 2.1 miles wide.

1.1 BLM Applicable Land Use Plans and Prior NEPA Documents

CDCA Plan (1980, as amended). The CDCA Plan covers 25 million acres including the Project site. It is anticipated that the BLM's EIS for the Project will analyze consistency with the CDCA Plan, as amended.

Western Energy Plan Solar PEIS (2009). The Solar PEIS for solar energy development provided a blueprint for utility-scale solar energy permitting in Arizona, California, Colorado, Nevada, New Mexico and Utah by establishing SEZs with access to existing or planned transmission, incentives for development within those zones, and a process through which to consider additional zones and solar projects. Though the project is considered a "pending project" in the Solar PEIS Record of Decision (ROD).

DRECP Land Use Plan Amendment (2016; LUPA). The DRECP was conceived to be a joint Habitat Conservation Plan and Natural Communities Conservation Plan between the BLM, California Energy Commission (CEC), California Department of Fish and Wildlife, and U.S. Fish and Wildlife Service that would streamline renewable energy permitting. On March 10, 2015, the DRECP process was bifurcated, with the BLM Land Use Plan Amendment (LUPA) and Habitat Conservation land proceeding ahead of the state Natural Community Conservation Planning portion of the process. The LUPA was codified in September 2016 and is anticipated to be applicable to the National Environmental Policy Act, Section 106, and right-ofway (ROW) grant or lease processes for the Project. The Project is considered a “pending project” (LUPA page 69); however, it is grandfathered from compliance with the DRECP.

2. Site Assessment

Ownership and ROWs within BLM California Desert District Utility Corridor J, CDCA Utility Corridor K and West-wide Section 368 Energy Corridor, specifically Corridor 30-52, in the vicinity of the Project site (including the Preferred Solar Farm Site, Access Road, and short Transmission Corridor) were determined by examining a title search, conducting a search of the BLM LR2000 database and public room maps. This information is attached to this report in Appendix A.

Table 1 and Figures 1 through 4 provide the location and summarize the existing ownership, uses and known locations of CDCA Utility Corridor K, BLM Utility Corridor J and West-wide Section 368 Energy Corridor, specifically Corridor 30-52. Figure 5 identifies the known mining claims and wells in the vicinity of the project. Figure 6 identifies the BLM approved and pending renewable energy projects, Figure 7 shows RE Crimson in relation to the Blythe Airport compatibility zone. Finally, Figure 8 represents the locations of the existing easements adjacent or in close proximity to the Project.

The entire project site and the vast majority of surrounding land is administered by the BLM. Several state-owned sections lie to the west and a partial section lies to the south of the Project site. The remaining surrounding lands are privately owned. See Figures 1 and 2 for a visual representation of ownership. The Project site is not located on lands specifically designated for grazing or recreation by the BLM.

The records search did not identify any wells on the Project site. Numerous mining claims were identified in the Project vicinity with four claims encroaching on the northwest central portion of the Project site. They are listed as Mary No. 145, 146, 147, and 148 and opened by American Gold Reserve, Inc. The current status is listed as closed with the last assessment year of 1991. See Figure 5.

The nearest groundwater wells are located approximately 2.5 miles west of the Project site and supply water to the prison facilities. One Blythe Energy and four SCE transmission lines are identified (See Table 1). The Blythe Energy easement travels west to east north of the Project site and then turns southeast and runs adjacent to the Project boundary. One SCE easement exits the south side of the CRS and passes through the northeast corner of the proposed Project site connecting with the northwest to southeast trending transmission line easement that parallels Power Line Road east of the Project site. The second SCE easement exits the south side of the CRS and proceeds in a northwest direction and connects with the transmission line easement parallel to the east-west portion of Power Line Road. This second SCE easement will be crossed by the Project’s proposed gen-tie line and the short facility access road just west of the CRS.

Three other easements within the Project Study Area, but not within the Project site, were identified; however, neither ownership nor use were found. They originate at the northern end of the CRS and aerial photos show transmission infrastructure corresponding to these ROWs, so are assumed to be for these transmission lines. Their locations do not encroach on the proposed Project.

No pending applications for transmission or utility infrastructure were found during our search of the readily available data. Pending applications for renewable energy projects were identified during our research. Three pending projects are proposed to the northwest along Interstate 10 and one is shown to the southwest. One project, Desert Quartzite, is identified just east of the RE Crimson project boundary. See Figure 6.

Table 1 – Summary of Known Easements in the Proposed Project Area

Owner	Location Relative to the Preferred Project Area	Use(s)	Width	BML Serial File Number
SCE	Travels east to west approximately 0.6 miles north of the Project site. The ROW turns south southeast, west of the CRS in T7S, R21E, Section 7, Lot 3 and travels south southeast through lots 10 and 11 of Section 7 before turning east then north to connect to the southern portion of the CRS. The proposed RE Crimson gen-tie line and project access road traverse across the ROW in lots 10 and 11 of Section 7.	Existing 500-kilovolt (kV) overhead transmission and access road for Devers Palo Verde1	160 feet	CACA 004163
SCE	Travels east to west approximately 0.6 miles north of the Project site. The ROW turns south southeast, west of the CRS in T7S, R21E, Section 7, Lot 3 and travels south southeast through lots 10 & 11 of Section 7, east of the DPV1 ROW, before turning east then north to connect to the southern portion of the CRS. The proposed RE Crimson gen-tie line and project access road traverse across the ROW in lots 10 & 11 of Section 7.	Existing 500-kV overhead transmission and access road for Devers Palo Verde2	130 feet	CAC 017905
FPL Energy/Cabazon Wind LLC	Travels east to west approximately 0.66 miles north of the Project site. After passing the CRS the ROW turns southeast in T7S, R21E, Section 8 and runs adjacent to the Project site for approximately 2 miles and continues on for several more miles. Notes: Blythe Energy	Existing 220-kV overhead transmission	95 feet	CACA 046331
SCE	This ROW originates in T7S, R21E, Section 7 at the southern end of the CRS and continues northeast through T7S, R21E, Section 8 until it connects to the existing SCE/Blythe Energy ROW located to the east of the Project. This ROW travels through the northeast corner of the Project site.	Existing 500-kV overhead transmission for DPV2	160 feet	CACA 053059
Unknown*	Located in T7S, R21E, Section 7 the ROW originates at the northern end of the CRS and continues north until it connects with the existing SCE 500-kV ROW located north of the Project boundary.	transmission	100-180 feet	Not readily found
Unknown*	Located in T7S, R21E, Section 7 the ROW originates at the northern end of the CRS and continues north for 0.4 miles then turns 90 degrees to the east in T7S, R21E, Section 6 and continues east for several miles.	transmission	150 feet	Not readily found
Unknown*	Located in T7S, R21E, Section 7 the ROW originates at the northern end of the CRS and continues north for 0.3 miles then turns northeast in T7S, R21E, Section 6 then turns again due east and continues east for several miles.	transmission	225 feet	Not readily found
CDCA	Located 500 feet–to 2000 feet (depending from where you measure) north of the Project boundary. Roughly centered on Interstate 10.	Utility corridor K	2 miles	Numerous Holdings
Sonoran West Holdings	Approximately .01 acres	Met Station	N/A	05196701

Owner	Location Relative to the Preferred Project Area	Use(s)	Width	BML Serial File Number
Energy corridor Section 368 of the Energy Policy Act of 2005	Located 500 feet north of the Project boundary. Roughly centered on Interstate 10 and located within CDCA utility corridor K.	Energy Corridor 30-52	2 miles	Numerous Holdings
CDCA	Located 2.8 miles east of the Project boundary. ROW follows along the west bank of the Colorado River.	Utility corridor J	2 miles	Numerous Holdings
American Gold	Four separate mining claims are located northwest of the Project site. One mining claim is located in Section 12 as it crosses into the Project boundary by approximately 105 acres. The four mining claims are located at T7S, R20E, sections 1, 2, 11, 12.	Mining claims from 2010 USGS data	2 miles x 2 miles	203354, 55, 56, and 57
*Three lines exiting north side of CRS potentially IID lines. Not able to make definitive determination from readily available sources. Sources: CEC Electric Transmission Line geospatial data layer Title Report survey provided to AECOM by Recurrent Energy. Argonne National Laboratory and federal agencies in support of the West-wide Energy Corridors Project. BLM LR2000 Database. https://glorecords.blm.gov/details/lsr/default.aspx?dm_id=64515&sid=ja5ijksl.f2v#resultsTabIndex=0 Mining claim information comes from a USGS dataset dated 12-31-2010.				

3. Conflict Analysis

3.1 Analysis of Conflicts with Existing Uses

The Project would not place PV arrays or Project-related infrastructure on either CDCA Utility Corridor K, and West-wide Section 368 Energy Corridor - Corridor 30-52, or BLM Utility Corridor J. The CDCA Utility Corridor K and West-wide Section 368 Energy Corridor - Corridor 30-52 run in an east-west direction just north of the northernmost point of the Project, while BLM Utility Corridor J generally runs in a northeast to southwest direction approximately 2.8 miles east of the Project. The Preferred Project site includes a 2,489-acre fenced area that would encompass PV arrays and supporting infrastructure such as inverters, maintenance facility, battery storage facility, and interior roads. As proposed, none of the Project will be within or conflict with these utility corridors.

An SCE transmission line easement crosses the northeast portion of the proposed Project site. It is 160 feet wide and exits on the south side of the CRS where it proceeds northeast through the northeast portion of the site. RE Crimson will keep this easement available until it is determined whether this will be used again for interconnecting into the CRS. See Figure 8.

An SCE easement also exits on the south side of the CRS but proceeds northwest. It is also 160 feet wide and this second easement will be crossed by the gen-tie line and access road for the RE Crimson project. The access road will not be fenced, and it is not anticipated that construction and use of the access road and gen-tie will affect access to this SCE transmission easement or to the CRS.

There are currently three existing transmission line easements exiting the north side of the CRS. They proceed north and then two combine on a larger tower configuration and proceed east. The third turns west just north of Power Line Road and continues west. No Project activities or structures will encroach upon or interfere with these easements.

As seen in Figure 7, the Project does not conflict with the Blythe Airport Land Use Compatibility zones as it is located several miles outside the limits of Zone E.

3.2 Analysis of Conflicts with Future Uses

CDCA Utility Corridor K, and West-wide Section 368 Energy Corridor - Corridor 30-52 runs in an east-west direction just north of the Project site. BLM Utility Corridor J runs southwest to northeast approximately 2.8 miles east of the Project site. No conflicts would occur with the future gen-tie or solar site and these existing transmission corridors, because these Project elements would be located outside of their ROWs.

There are several pending applications for ROWs identified in this area. These are not expected to conflict with the Project or the utility corridors previously discussed. The project will be constructed on parts of eight different Sections adjacent to and south of the CRS. Pending ROWs are as follow.

Table 2 – Pending ROWs

ROW #	Ownership	Use/File Notes
CACA-051967	Sonoran West Solar Holdings, LLC.	Current RE Crimson project lands
CACA-056459	BLM South Coast Field Office	Application covers Sonoran West Application
CACA-056171	BLM Holdings	Withdrawn lands
CACA-053213	Renewable Resources Group	Blythe Mesa transmission line
CACA-049397	OptiSolar/First Solar/Desert Quartzite	Portion of NE of CRS in Section 7
CACA-052706	SCE	1 acre associated with CRS
CACA-054658	SCE	1 acre associated with CRS

There is approximately 1,000 feet between the southern fence line of the CRS and a portion of the northern fence line of the Project. There are currently three transmission lines exiting south out of the CRS that all make turns northeast and northwest within this open space and presumably this space can accommodate additional transmission lines should the need arise. Distance from the CRS western fence line varies from approximately 800 feet in the south to approximately 1,300 feet in the north. Aerial imagery (Google Earth 6/16/2017) shows room for expansion and room for additional racks within the southwest portion of the CRS. The RE Crimson permitting boundary is adjacent and parallel to the eastern CRS exterior perimeter road. There is little available space along this side of the substation to accommodate additional transmission interconnect if it was required.

There are also currently three transmission lines exiting north out of the CRS that make turns and continue east and west after crossing Power Line Road approximately 1,300 feet north of the CRS. The Project will not conflict with these transmission line ROWs.

The gen-tie line from RE Crimson is proposed to interconnect from the north into the CRS. Aerial imagery also shows room for expansion and room for additional racks within the northwest portion of the CRS. The RE Crimson gen-tie line is not anticipated to cause a conflict. The Project engineering staff will work closely with SCE to determine the configuration that allows the greatest flexibility for the future build out of the substation. The kV capacity of future transmission lines will determine the types of structures, clearance requirements and approach angles to the CRS. Certain future uses, such as underground utilities constructed with a direct push or other non-trench method may be compatible with the PV arrays.

3.3 Analysis of Compatibility with Corridor Designation

The RE Crimson Site, short gen-tie corridor, and access road all fall outside the designated CDCA and BLM Utility corridors and therefore do not conflict.

BLM's Record of Decision for the Designation of Energy Corridors on BLM-Administered Lands in the 11 Western States (2009) explains that the Section 368 corridors were sited "to avoid, to the maximum extent possible, significant known resource and environmental conflicts" and "to promote renewable energy development in the West." These goals are fulfilled by situating the Project, a 350-MW renewable energy project to fulfill California's Renewable Portfolio Standard, proximate to the utility corridors. As proposed, the Project would allow the existing utility corridors to accommodate existing, currently proposed, and future ROWs without conflict.

4. Sources

BLM Plat Maps. Available at:

https://glorecords.blm.gov
https://www.blm.gov/services/land-records
https://www.blm.gov/maps
https://www.blm.gov/learn/blm-library/agency-publications/survey-notes-and-plats
https://www.archives.gov/research/guide-fed-records/groups/049.html. and
https://glorecords.blm.gov/details/lsr/default.aspx?dm_id=64515&sid=ja5ijksl.f2v#resultsTabIndex=0

General Source – Data.gov. Available at: https://catalog.data.gov/dataset.

Mining Claims – USGS, 2010. Available at: https://pubs.usgs.gov/ds/2007/290/California/.

Pending Renewable Energy projects – BLM, 2018. Available at: https://navigator.blm.gov/home

Regional Land Ownership and CDCA Utility Corridors – BLM Navigator. Available at: https://navigator.blm.gov/.

ROW, Easement and Mining Claim Data – LR2000 database. Available at: https://reports.blm.gov/report/LR2000/24/Pub-MC-Geo-Report.

This layer depicts areas which have been designated (per the requirements of Section 368 of the Energy Policy Act of 2005) as West-wide Section 358 Energy Corridors in Bureau of Land Management and U.S. Forest Service management plans in connection with the final PEIS, Designation of Energy Corridors on Federal Land in the 11 Western States, November 2008, and subsequently identified as corridors of concern by the plaintiffs in a lawsuit following designation of the Section 368 corridors. The nature of the concern is briefly stated in the settlement agreement reached by the participants. See http://corridoreis.anl.gov/news/index.cfm#settlement for more information. http://corridoreis.anl.gov/maps/.

Title Reports – First American Title Insurance Company
National Commercial Services
4370 La Jolla Village Dr., Suite 660
San Diego, CA 92122

Transmission Data – Rextag, 2018. Available at: https://www.rextag.com.

Transmission Line Data – https://catalog.data.gov/dataset/blm-rea-mir-2011-transmission-lines

Well Data – AECOM, 2018. Document Title.

West-wide 368 Corridor – Argonne National Laboratory and federal agencies in support of the West-wide Energy Corridors project, 2018.

Figures

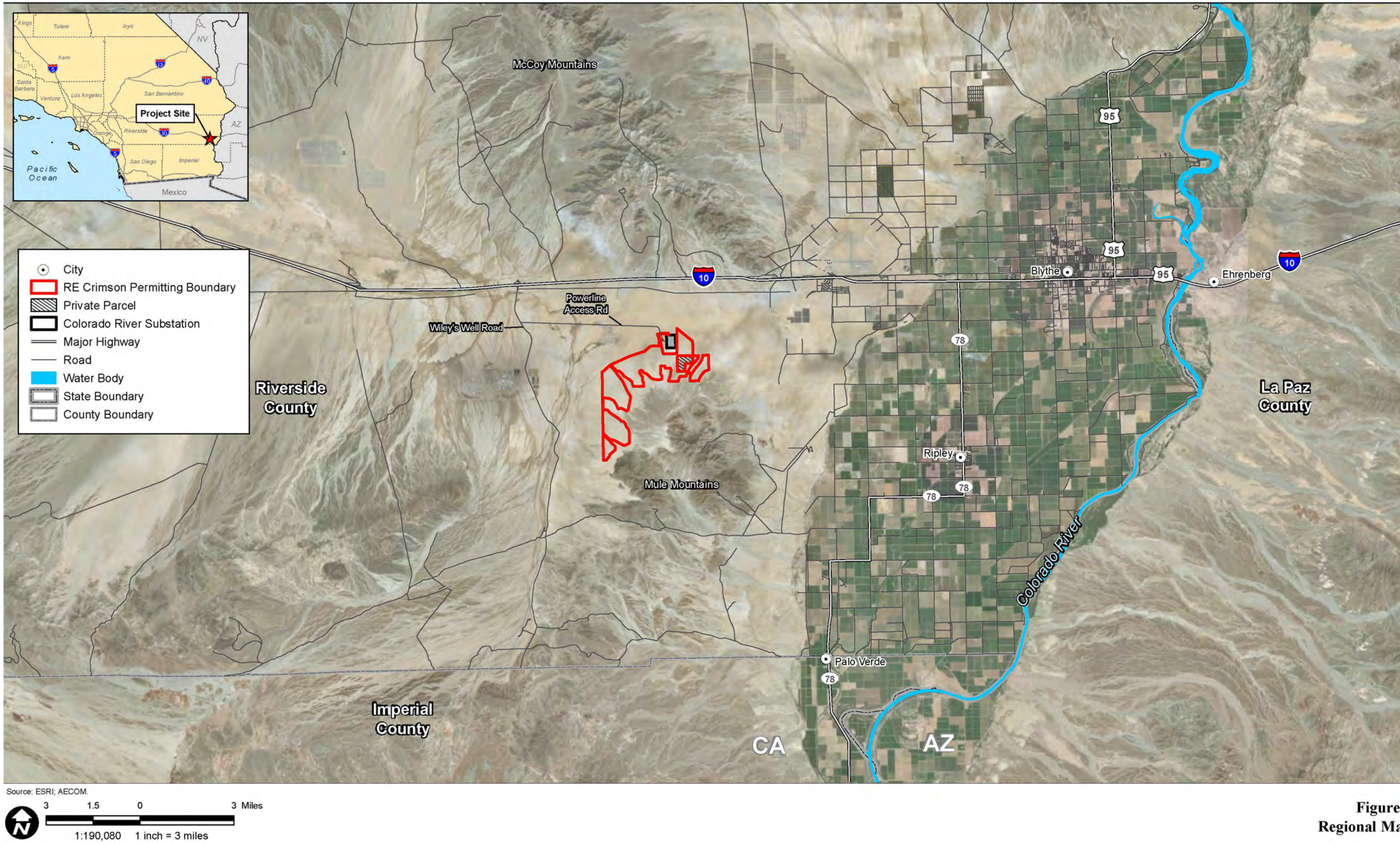
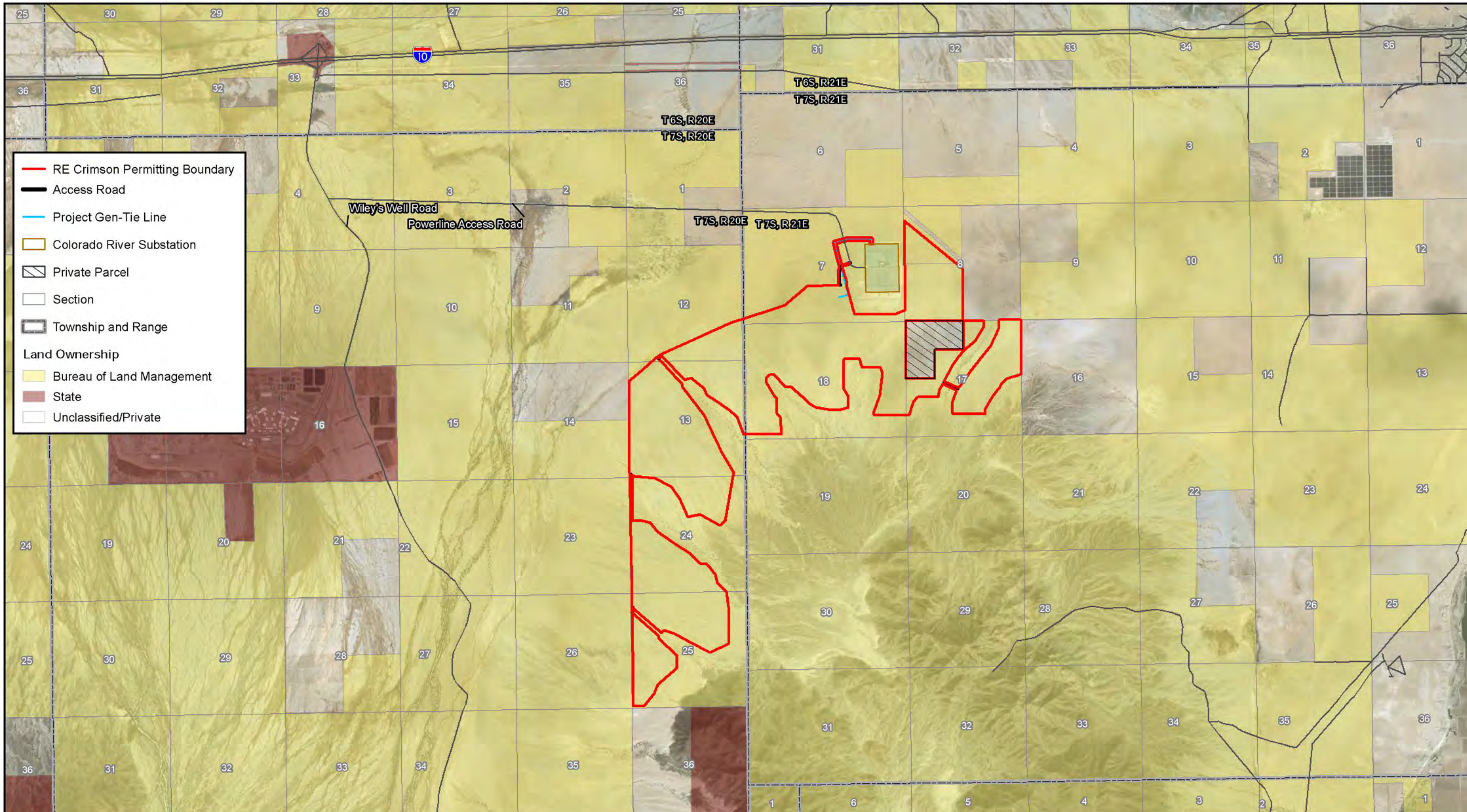


Figure 1
Regional Map

RE Crimson Solar Project Corridor Conflict Analysis

Path: U:\Projects\Recurrent Energy\60487757_Crimson\900-Work\920-GIS\map_docs\mxd\Corridor_Conflict\regional_map.mxd, 5/14/2018, jason.sokol



Source: ESRI; AECOM; BLM 2017, 2018

4,000 2,000 0 4,000 Feet

1:54,000 1 inch = 4,500 feet

Figure 2
Regional Land Ownership

RE Crimson Solar Project Corridor Conflict Analysis
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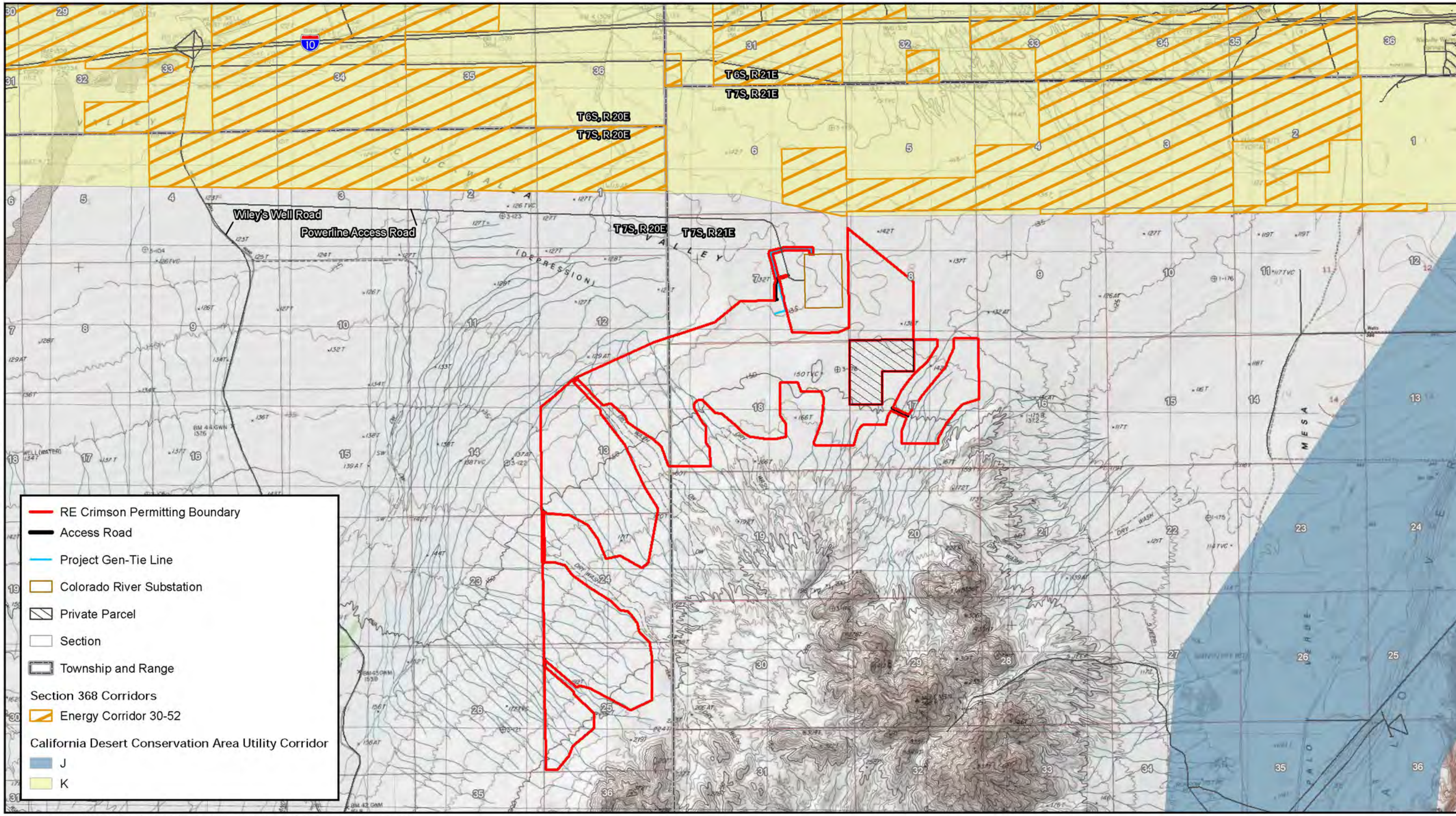

Source: ESRI; AECOM; BLM 2018; USGS 7.5' Quadrangle Roosevelt Mine, Calif. 1983 Hopkins Well, Calif. 1984

4,000 2,000 0 4,000 Feet

1:48,000 1 inch = 4,000 feet

Figure 3
USGS 24,000 Quad with Project and CDCA Corridor Areas

RE Crimson Solar Project Corridor Conflict Analysis

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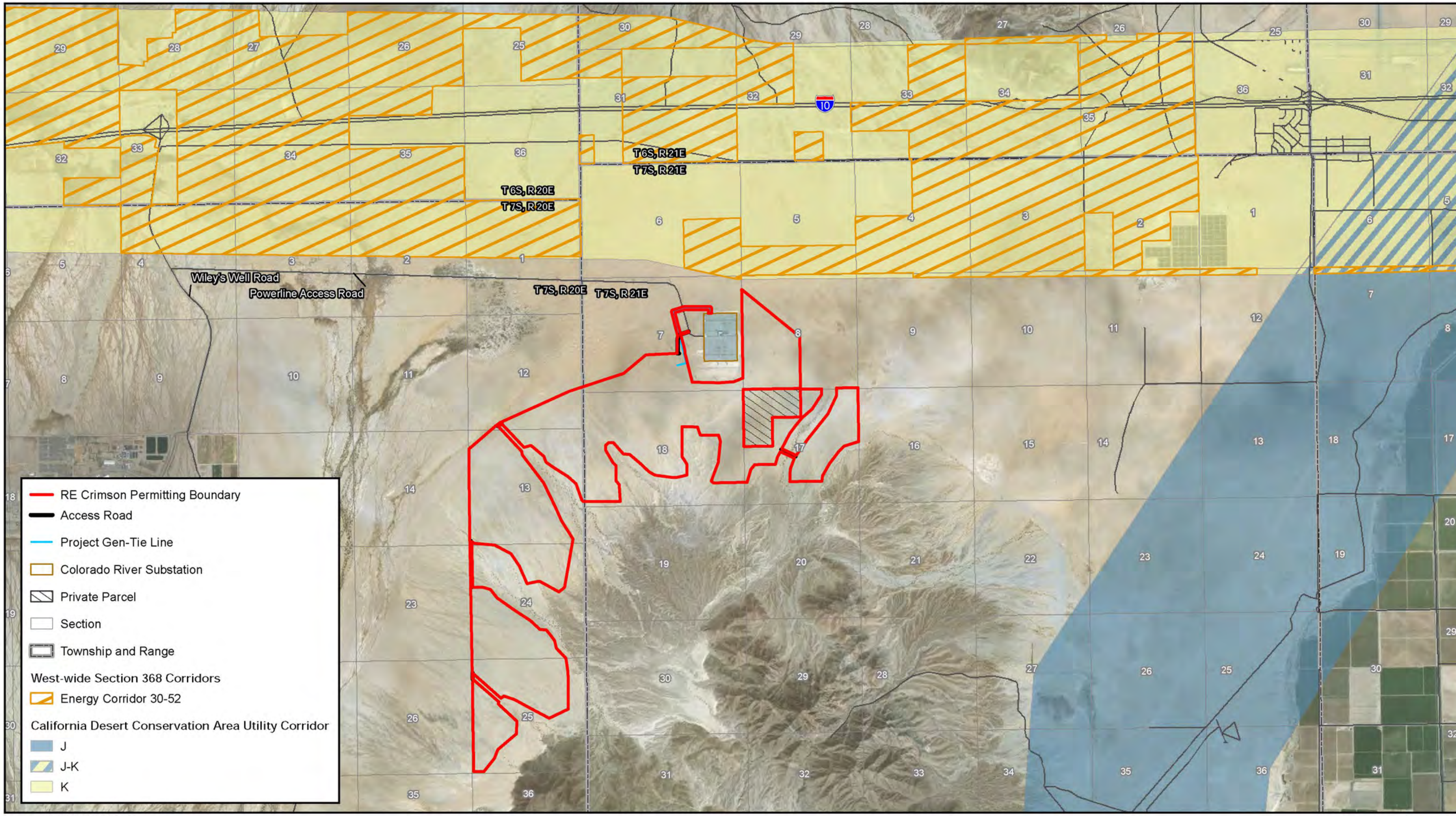

Source: ESRI; AECOM; BLM 2018

4,500 2,250 0 4,500 Feet

1:54,000 1 inch = 4,500 feet

Figure 4
Aerial with Project and CDCA Corridor Areas

RE Crimson Solar Project Corridor Conflict Analysis

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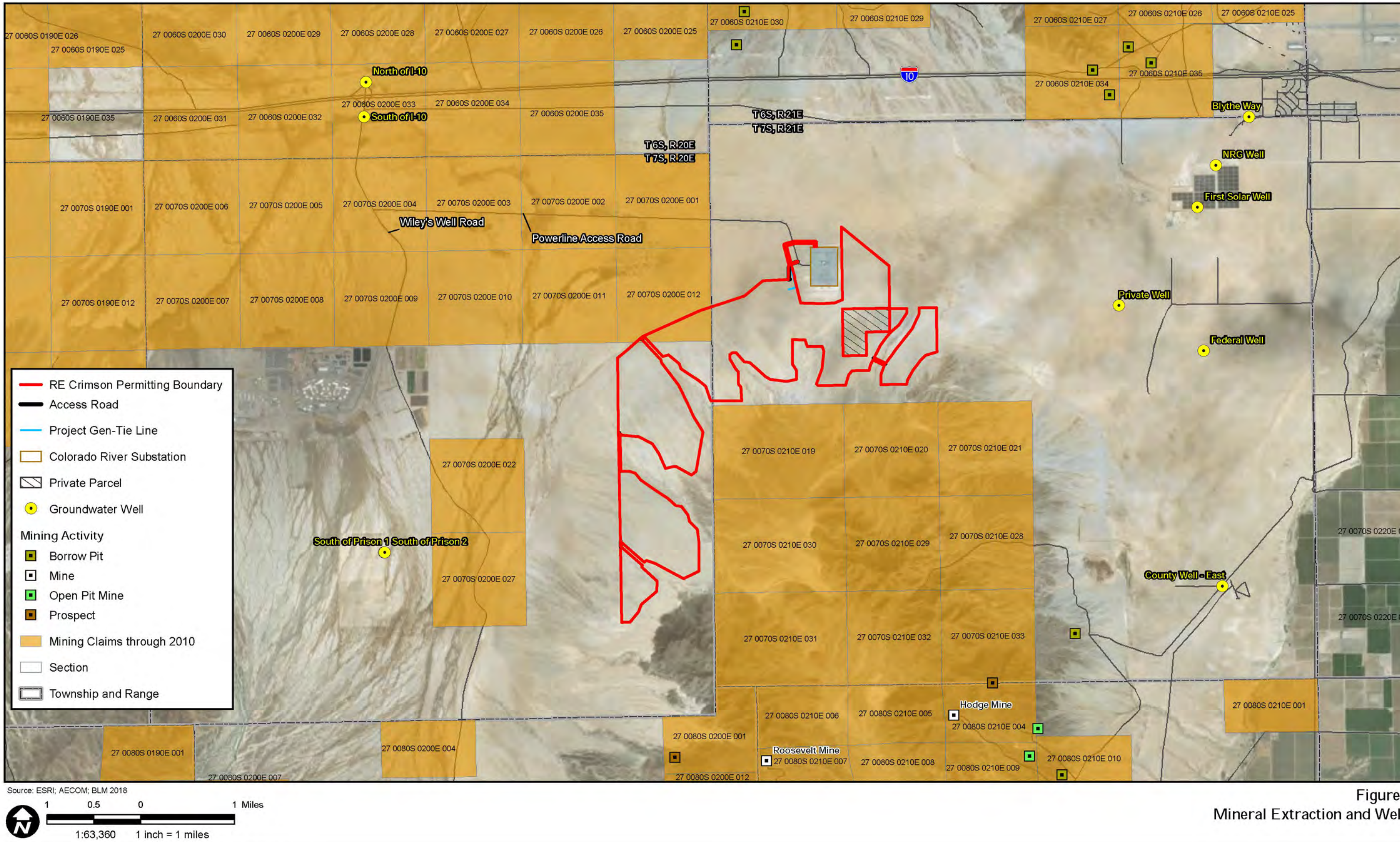
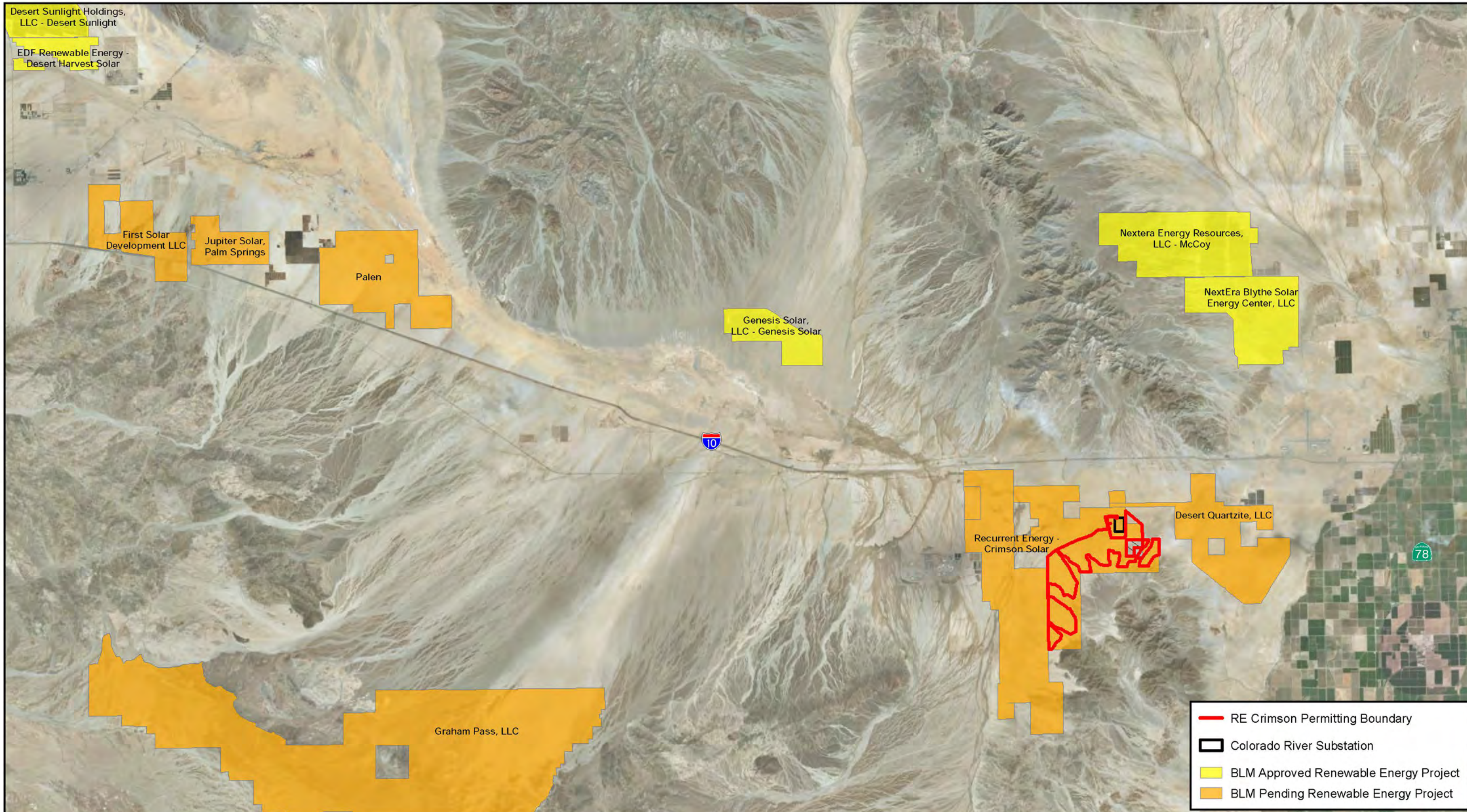


Figure 5
Mineral Extraction and Wells

RE Crimson Solar Project Corridor Conflict Analysis

Document Path: U:\Projects\Recurrent Energy\60487757_Crimson\900-Work\920-GIS\map_docs\mxd\Corridor_Conflict\Mining_and_Wells.mxd



Source: ESRI; AECOM; BLM 2018

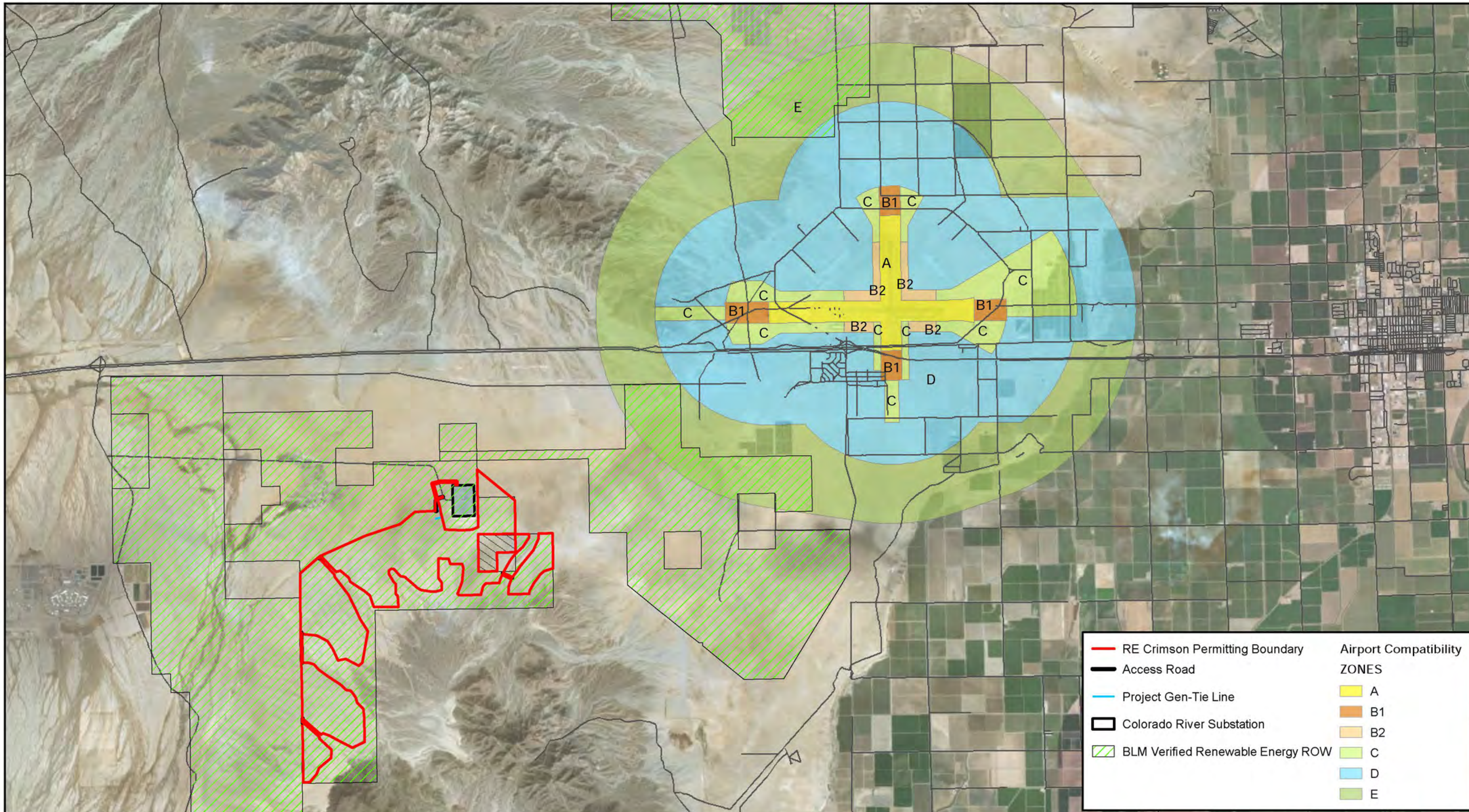
3 1.5 0 3 Miles

1:190,080 1 inch = 3 miles

Figure 6
BLM Approved/Pending Renewable Energey Projects

RE Crimson Solar Project Corridor Conflict Analysis

Document Path: U:\Projects\Recurrent Energy\60487757_Crimson\900-Work\920-GIS\map_docs\mxd\Corridor_Conflict\BLM_Pending_Renewable_Projects.mxd



Source: ESRI; AECOM; BLM 2018; Riverside County 2018

7,000 3,500 0 7,000 Feet

1:84,000 1 inch = 7,000 feet

Figure 7
Blythe Airport Compatibility Zones

RE Crimson Solar Project Corridor Conflict Analysis

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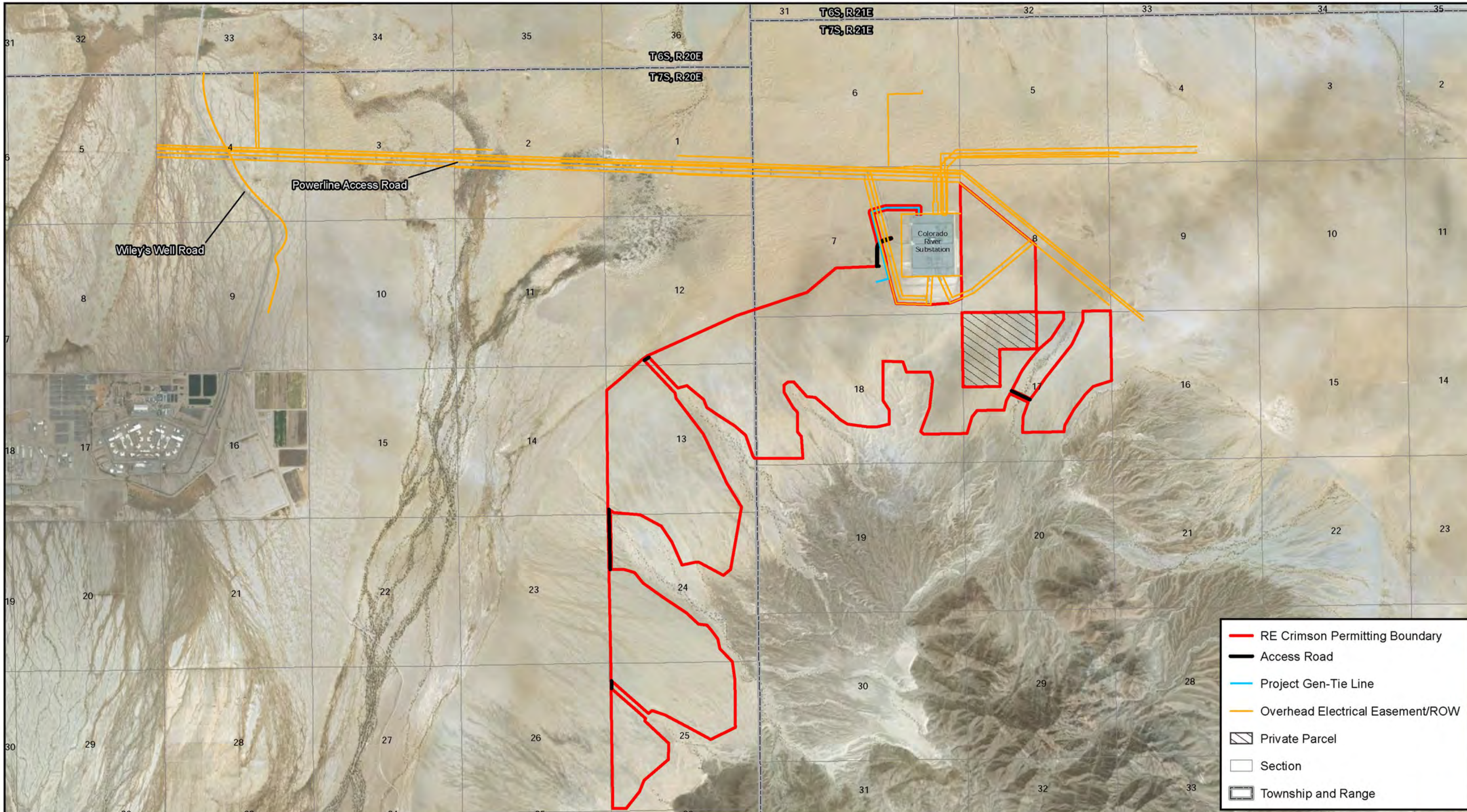

Source: ESRI; AECOM; BLM, Recurrent Energy 2018.

3,500 1,750 0 3,500 Feet

1:42,000 1 inch = 3,500 feet

Figure 8
Surrounding Right-of-Way and Easements

RE Crimson Solar Project Corridor Conflict Analysis

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Appendix A Summary of Existing Easements and Mining Claims in the Project Study Area

Date and Time Run:
5/4/2018 3:04:10 PM

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MINING CLAIMS

MINING CLAIM GEOGRAPHIC REPORT

Serial Number	Lead Serial Number	Mer Twn Rng Sec	Quad	Claim Name	Claimant Name	Case Type	Status	Loc Date	Last Assmt Yr
CAMC203354	CAMC203339	27 0070S 0200E 012	NE	MARY NO 145	AMERICAN GOLD RESERVE INC	PLACER	CLOSED	01/15/1988	1991
CAMC203355	CAMC203339	27 0070S 0200E 012	SE	MARY NO 146	AMERICAN GOLD RESERVE INC	PLACER	CLOSED	01/15/1988	1991
CAMC203356	CAMC203339	27 0070S 0200E 012	SW	MARY NO 147	AMERICAN GOLD RESERVE INC	PLACER	CLOSED	01/15/1988	1991
CAMC203357	CAMC203339	27 0070S 0200E 012	NW	MARY NO 148	AMERICAN GOLD RESERVE INC	PLACER	CLOSED	01/15/1988	1991

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CUSTOMER INFORMATION REPORT

(CASE RECORDATION, MINING CLAIMS, STATUS)

Admin State **CA**

Customer	Address	City	State	Zip+4	Cust Catg	Interest Relationship	Casetype	Serial Number Full	Sys ID	Disposition
ARCO	BOX 147	BAKERSFIELD	CA	93302	C	LESSEE	311111	CACA 010410	CR	CLOSED
BLM CALIFORNIA SO	2800 COTTAGE WAY	SACRAMENTO	CA	95825-1846	A	ADMIN MGT ENTITY	311211	CACA 016374	CR	CLOSED
BLM CALIFORNIA SO	2800 COTTAGE WAY	SACRAMENTO	CA	95825-1846	A	APPLICANT	231170	CACA 05095101	CR	CLOSED
BLM CALIFORNIA SO	2800 COTTAGE WAY	SACRAMENTO	CA	95825-1846	A	HOLDING AGENCY	231170	CACA 050951	CR	AUTHORIZED
BLM PALM SPGS-SOUTH COAST FO	1201 BIRD CENTER DR	PALM SPRINGS	CA	92262-8001	A	APPLICANT	285003	CACA 056459	CR	PENDING
BOULEVARD ASSOCIATES LLC	700 UNIVERSE BLVD	JUNO BEACH	FL	33408	C	APPLICANT	283103	CACA 048879	CR	CLOSED
BULL FROG GREEN ENERGY LLC	3567 CALLE PALMITO	CARLSBAD	CA	92009	C	APPLICANT	283103	CACA 049097	CR	CLOSED
SONORAN WESTSOLAR HOLDINGS LLC	3000 OAK RD STE 300	WALNUT CREEK	CA	94597-7775	C	APPLICANT	283103	CACA 051967	CR	PENDING

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BUREAU OF LAND MANAGEMENT

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ARCO	BOX 147	BAKERSFIELD	CA	93302	C	LESSEE	311111	CACA 010410	CR	CLOSED
BLM CALIFORNIA SO	2800 COTTAGE WAY	SACRAMENTO	CA	95825-1846	A	ADMIN MGT ENTITY	311211	CACA 016374	CR	CLOSED
BLM CALIFORNIA SO	2800 COTTAGE WAY	SACRAMENTO	CA	95825-1846	A	APPLICANT	231170	CACA 05095101	CR	CLOSED
BLM CALIFORNIA SO	2800 COTTAGE WAY	SACRAMENTO	CA	95825-1846	A	HOLDING AGENCY	231170	CACA 050951	CR	AUTHORIZED
BLM PALM SPGS-SOUTH COAST FO	1201 BIRD CENTER DR	PALM SPRINGS	CA	92262-8001	A	APPLICANT	285003	CACA 056459	CR	PENDING
BOULEVARD ASSOCIATES LLC	700 UNIVERSE BLVD	JUNO BEACH	FL	33408	C	APPLICANT	283103	CACA 048879	CR	CLOSED
BULL FROG GREEN ENERGY LLC	3567 CALLE PALMITO	CARLSBAD	CA	92009	C	APPLICANT	283103	CACA 049097	CR	CLOSED
SONORAN WESTSOLAR HOLDINGS LLC	3000 OAK RD STE 300	WALNUT CREEK	CA	94597-7775	C	APPLICANT	283103	CACA 051967	CR	PENDING

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BUREAU OF LAND MANAGEMENT

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BLM CALIFORNIA SO	2800 COTTAGE WAY	SACRAMENTO	CA	95825-1846	A	HOLDING AGENCY	231170	CACA 050951	CR	AUTHORIZED
BLM PALM SPGS-SOUTH COAST FO	1201 BIRD CENTER DR	PALM SPRINGS	CA	92262-8001	A	APPLICANT	285003	CACA 056459	CR	PENDING
BOULEVARD ASSOCIATES LLC	700 UNIVERSE BLVD	JUNO BEACH	FL	33408	C	APPLICANT	283103	CACA 048879	CR	CLOSED
BULL FROG GREEN ENERGY LLC	3567 CALLE PALMITO	CARLSBAD	CA	92009	C	APPLICANT	283103	CACA 049097	CR	CLOSED
HARPER OIL CO	BOX 5928 T A	DENVER	CO	80217	C	LESSEE	311111	CACA 008890	CR	CLOSED
RIDGELINE ENERGY LLC	1300 N NORTHLAKE WAY FLOOR 2	SEATTLE	WA	98103-8987	C	APPLICANT	283103	CACA 051951	CR	CLOSED
SONORAN WESTSOLAR HOLDINGS LLC	3000 OAK RD STE 300	WALNUT CREEK	CA	94597-7775	C	APPLICANT	283103	CACA 051967	CR	PENDING

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CUSTOMER INFORMATION REPORT

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BLM CALIFORNIA SO	2800 COTTAGE WAY	SACRAMENTO	CA	95825-1846	A	HOLDING AGENCY	231170	CACA 050951	CR	AUTHORIZED
BLM PALM SPGS-SOUTH COAST FO	1201 BIRD CENTER DR	PALM SPRINGS	CA	92262-8001	A	APPLICANT	285003	CACA 056459	CR	PENDING
BOULEVARD ASSOCIATES LLC	700 UNIVERSE BLVD	JUNO BEACH	FL	33408	C	APPLICANT	283103	CACA 048879	CR	CLOSED
BRIGHTSOURCE ENERGY	1999 HARRISON ST STE 500	OAKLAND	CA	94612	C	APPLICANT	292006	CACA 053166	CR	CLOSED
BULL FROG GREEN ENERGY LLC	3567 CALLE PALMITO	CARLSBAD	CA	92009	C	APPLICANT	283103	CACA 049097	CR	CLOSED
HARPER OIL CO	BOX 5928 T A	DENVER	CO	80217	C	LESSEE	311111	CACA 008890	CR	CLOSED
RIDGELINE ENERGY LLC	1300 N NORTHLAKE WAY FLOOR 2	SEATTLE	WA	98103-8987	C	APPLICANT	283103	CACA 051951	CR	CLOSED
SONORAN WESTSOLAR HOLDINGS LLC	3000 OAK RD STE 300	WALNUT CREEK	CA	94597-7775	C	APPLICANT	283103	CACA 051967	CR	PENDING

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CUSTOMER INFORMATION REPORT

(CASE RECORDATION, MINING CLAIMS, STATUS)

Admin State **CA**

Customer	Address	City	State	Zip+4	Cust Catg	Interest Relationship	Casetype	Serial Number Full	Sys ID	Disposition
BLM CALIFORNIA SO	2800 COTTAGE WAY	SACRAMENTO	CA	95825-1846	A	ADMIN MGT ENTITY	311211	CACA 019611	CR	CLOSED
BLM CALIFORNIA SO	2800 COTTAGE WAY	SACRAMENTO	CA	95825-1846	A	APPLICANT	231170	CACA 05095101	CR	CLOSED
BLM CALIFORNIA SO	2800 COTTAGE WAY	SACRAMENTO	CA	95825-1846	A	HOLDING AGENCY	231170	CACA 050951	CR	AUTHORIZED
BLM PALM SPGS-SOUTH COAST FO	1201 BIRD CENTER DR	PALM SPRINGS	CA	92262-8001	A	APPLICANT	285002	CACA 056171	CR	PENDING
BLM PALM SPGS-SOUTH COAST FO	1201 BIRD CENTER DR	PALM SPRINGS	CA	92262-8001	A	APPLICANT	285003	CACA 056459	CR	PENDING
BOULEVARD ASSOCIATES LLC	700 UNIVERSE BLVD	JUNO BEACH	FL	33408	C	APPLICANT	283103	CACA 048879	CR	CLOSED
BRIGHTSOURCE ENERGY	1999 HARRISON ST STE 500	OAKLAND	CA	94612	C	APPLICANT	283103	CACA 053138	CR	WITHDRAWN
BUCKHORN PETRO CO	BOX 5928 T A	DENVER	CO	80217	C	LESSEE	311111	CACA 008891	CR	CLOSED
BULL FROG GREEN ENERGY LLC	3567 CALLE PALMITO	CARLSBAD	CA	92009	C	APPLICANT	283103	CACA 049097	CR	CLOSED
DESERT QUARTZITE, LLC	135 MAIN ST FL 6	SAN FRANCISCO	CA	94105-8113	C	APPLICANT	283103	CACA 049397	CR	PENDING
FIRST SOLAR DEVELOPMENT LLC	135 MAIN ST FL 6	SAN FRANCISCO	CA	94105-8113	C	AGENT	283103	CACA 049397	CR	PENDING
FPL ENERGY CABAZON WIND LLC	700 UNIVERSE BLVD	JUNO BEACH	FL	33408	C	HOLDER/BILLEE	285003	CACA 046331	CR	AUTHORIZED
IMPERIAL IRRIGATION DISTRICT	PO BOX 937	IMPERIAL	CA	92251	A	HOLDER/BILLEE	285003	CACA 044491	CR	AUTHORIZED
RENEWABLE RESOURCES GROUP	5700 WILSHIRE BLVD STE 330	LOS ANGELES	CA	90036-3626	C	APPLICANT	285003	CACA 053213	CR	PENDING
RIDGELINE ENERGY LLC	1300 N NORTHLAKE WAY FLOOR 2	SEATTLE	WA	98103-8987	C	APPLICANT	283103	CACA 051951	CR	CLOSED
SONORAN WESTSOLAR HOLDINGS LLC	3000 OAK RD STE 300	WALNUT CREEK	CA	94597-7775	C	APPLICANT	283103	CACA 051967	CR	PENDING
SONORAN WESTSOLAR HOLDINGS LLC	3000 OAK RD STE 300	WALNUT CREEK	CA	94597-7775	C	APPLICANT	289001	CACA 05196701	CR	AUTHORIZED
SOUTHERN CALIFORNIA EDISON	2131 WALNUT GROVE AVE	ROSEMEAD	CA	91770-3769	C	APPLICANT	281001	CACA 054658	CR	PENDING
SOUTHERN CALIFORNIA EDISON CO ATTN GOV LAND	2 INNOVATION WAY	POMONA	CA	91768-2560	C	APPLICANT	289001	CACA 052706	CR	PENDING
SOUTHERN	2	POMONA	CA	91768-2560	C	HOLDER	285003	CACA	CR	AUTHORIZED

UNITED STATES DEPARTMENT OF THE INTERIOR
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Customer	Address	City	State	Zip+4	Cust Catg	Interest Relationship	Casetype	Serial Number Full	Sys ID	Disposition
CALIFORNIA EDISON CO ATTN GOV LAND	INNOVATION WAY							017905		
SOUTHERN CALIFORNIA EDISON CO ATTN GOV LAND	2 INNOVATION WAY	POMONA	CA	91768-2560	C	HOLDER	285003	CACA 053059	CR	AUTHORIZED
SOUTHERN CALIFORNIA EDISON CO ATTN GOV LAND	2 INNOVATION WAY	POMONA	CA	91768-2560	C	HOLDER/BILLEE	285003	CACA 004163	CR	AUTHORIZED

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CUSTOMER INFORMATION REPORT

(CASE RECORDATION, MINING CLAIMS, STATUS)

Admin State **CA**

Customer	Address	City	State	Zip+4	Cust Catg	Interest Relationship	Casetype	Serial Number Full	Sys ID	Disposition
BLM CAL DESERT DO	22835 CALLE SANJUAN DELOSLAGOS	MORENO VALLEY	CA	92553	A	ACQUIRING AGENCY	211000	CACA 035027	CR	AUTHORIZED
BLM CALIFORNIA SO	2800 COTTAGE WAY	SACRAMENTO	CA	95825-1846	A	ADMIN MGT ENTITY	311211	CACA 019611	CR	CLOSED
BLM CALIFORNIA SO	2800 COTTAGE WAY	SACRAMENTO	CA	95825-1846	A	APPLICANT	231170	CACA 05095101	CR	CLOSED
BLM CALIFORNIA SO	2800 COTTAGE WAY	SACRAMENTO	CA	95825-1846	A	HOLDING AGENCY	231170	CACA 050951	CR	AUTHORIZED
BLM PALM SPGS-SOUTH COAST FO	1201 BIRD CENTER DR	PALM SPRINGS	CA	92262-8001	A	APPLICANT	285003	CACA 056459	CR	PENDING
BOULEVARD ASSOCIATES LLC	700 UNIVERSE BLVD	JUNO BEACH	FL	33408	C	APPLICANT	283103	CACA 048879	CR	CLOSED
BRIGHTSOURCE ENERGY	1999 HARRISON ST STE 500	OAKLAND	CA	94612	C	APPLICANT	283103	CACA 053138	CR	WITHDRAWN
BUCKHORN PETRO CO	BOX 5928 T A	DENVER	CO	80217	C	LESSEE	311111	CACA 008891	CR	CLOSED
BULL FROG GREEN ENERGY LLC	3567 CALLE PALMITO	CARLSBAD	CA	92009	C	APPLICANT	283103	CACA 049097	CR	CLOSED
FPL ENERGY CABAZON WIND LLC	700 UNIVERSE BLVD	JUNO BEACH	FL	33408	C	HOLDER/BILLEE	285003	CACA 046331	CR	AUTHORIZED
RIDGELINE ENERGY LLC	1300 N NORTHLAKE WAY FLOOR 2	SEATTLE	WA	98103-8987	C	APPLICANT	283103	CACA 051951	CR	CLOSED
SONORAN WESTSOLAR HOLDINGS LLC	3000 OAK RD STE 300	WALNUT CREEK	CA	94597-7775	C	APPLICANT	283103	CACA 051967	CR	PENDING
SOUTHERN CALIFORNIA EDISON	2131 WALNUT GROVE AVE	ROSEMEAD	CA	91770-3769	C	APPLICANT	285003	CACA 00416301	CR	AUTHORIZED
SOUTHERN CALIFORNIA EDISON CO ATTN GOV LAND	2 INNOVATION WAY	POMONA	CA	91768-2560	C	HOLDER	285003	CACA 017905	CR	AUTHORIZED
SOUTHERN CALIFORNIA EDISON CO ATTN GOV LAND	2 INNOVATION WAY	POMONA	CA	91768-2560	C	HOLDER	285003	CACA 053059	CR	AUTHORIZED
SOUTHERN CALIFORNIA EDISON CO ATTN GOV LAND	2 INNOVATION WAY	POMONA	CA	91768-2560	C	HOLDER/BILLEE	285003	CACA 004163	CR	AUTHORIZED

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BLM CALIFORNIA SO	2800 COTTAGE WAY	SACRAMENTO	CA	95825-1846	A	APPLICANT	231170	CACA 05095101	CR	CLOSED
BLM CALIFORNIA SO	2800 COTTAGE WAY	SACRAMENTO	CA	95825-1846	A	HOLDING AGENCY	231170	CACA 050951	CR	AUTHORIZED
BLM PALM SPGS-SOUTH COAST FO	1201 BIRD CENTER DR	PALM SPRINGS	CA	92262-8001	A	APPLICANT	285003	CACA 056459	CR	PENDING
BOULEVARD ASSOCIATES LLC	700 UNIVERSE BLVD	JUNO BEACH	FL	33408	C	APPLICANT	283103	CACA 048879	CR	CLOSED
BRIGHTSOURCE ENERGY	1999 HARRISON ST STE 500	OAKLAND	CA	94612	C	APPLICANT	283103	CACA 053138	CR	WITHDRAWN
BUCKHORN PETRO CO	BOX 5928 T A	DENVER	CO	80217	C	LESSEE	311111	CACA 008891	CR	CLOSED
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RIDGELINE ENERGY LLC	1300 N NORTHLAKE WAY FLOOR 2	SEATTLE	WA	98103-8987	C	APPLICANT	283103	CACA 051951	CR	CLOSED
SONORAN WESTSOLAR HOLDINGS LLC	3000 OAK RD STE 300	WALNUT CREEK	CA	94597-7775	C	APPLICANT	283103	CACA 051967	CR	PENDING
SOUTHERN CALIFORNIA EDISON CO ATTN GOV LAND	2 INNOVATION WAY	POMONA	CA	91768-2560	C	HOLDER	285003	CACA 017905	CR	AUTHORIZED

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BLM CALIFORNIA SO	2800 COTTAGE WAY	SACRAMENTO	CA	95825-1846	A	APPLICANT	231170	CACA 05095101	CR	CLOSED
BLM CALIFORNIA SO	2800 COTTAGE WAY	SACRAMENTO	CA	95825-1846	A	HOLDING AGENCY	231170	CACA 050951	CR	AUTHORIZED
BLM PALM SPGS-SOUTH COAST FO	1201 BIRD CENTER DR	PALM SPRINGS	CA	92262-8001	A	APPLICANT	285003	CACA 056459	CR	PENDING
BOULEVARD ASSOCIATES LLC	700 UNIVERSE BLVD	JUNO BEACH	FL	33408	C	APPLICANT	283103	CACA 048879	CR	CLOSED
BUCKHORN PETRO CO	BOX 5928 T A	DENVER	CO	80217	C	LESSEE	311111	CACA 008891	CR	CLOSED
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RIDGELINE ENERGY LLC	1300 N NORTHLAKE WAY FLOOR 2	SEATTLE	WA	98103-8987	C	APPLICANT	283103	CACA 051951	CR	CLOSED
SONORAN WESTSOLAR HOLDINGS LLC	3000 OAK RD STE 300	WALNUT CREEK	CA	94597-7775	C	APPLICANT	283103	CACA 051967	CR	PENDING

Appendix P
Noise

1. Noise Analysis, March 2019
2. ESA Noise Calculations, August 2019

P.1 Noise Analysis, March 2019

RE Crimson Solar Project

by Sonoran West Solar Holdings, LLC

Noise Analysis

Project Number: 60487757

March 2019

Sonoran West Solar Holdings, LLC
Recurrent Energy LLC
353 Sacramento Street, 21st Floor
San Francisco, CA 94111

Quality information

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Revision History

Revision	Revision date	Details	Authorized	Name	Position
A	April 24, 2018	Response to CDFW & BLM Comments	Jennifer Guigliano	Christopher Kaiser	Author
B	March 8, 2019	Response to CDFW Comments and Construction Scope Changes	Jennifer Guigliano	Christopher Kaiser	Author

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1. Project Overview

1.1 Introduction

Sonoran West Solar Holdings, LLC (Applicant), a wholly owned subsidiary of Recurrent Energy LLC (RE), proposes to construct and operate the RE Crimson Solar Project (Project). This Project is a utility-scale solar photovoltaic (PV) and energy storage project that would be located in the Riverside East Solar Energy Zone/Development Leasing Area and within a Development Focus Area on federal lands managed by the Bureau of Land Management (BLM) within the California Desert Conservation Area planning area in unincorporated eastern Riverside County, approximately 13 miles west of Blythe, California (CA) (BLM CACA-051967). The Project would interconnect to the regional electrical grid at the Southern California Edison (SCE) 230-kilovolt (kV) Colorado River Substation (CRS), and would generate up to 350 megawatts (MW) of renewable energy using PV technology with up to 350 MW of integrated energy storage capacity.

The Project applicant is proposing to construct the project using a traditional construction approach consisting of desert tortoise exclusion fencing, a mow and roll approach to site preparation, compacted roads, and trenching for electrical lines; however, the applicant is actively investigating alternative low-environmental impact design (LEID) elements and the potential for those to reduce Project impacts. LEID elements include several potential design changes including:

1. Minimizing grading during site preparation and maintaining more onsite vegetation to facilitate post-construction residual habitat value and post-operations/site reclamation success.
2. Avoiding or limiting trenching by placing electrical wiring aboveground.
3. Placing transformer/inverter groups on elevated support structures in lieu of cement foundations.

The LEID elements would further minimize grading, trenching, and vegetation removal beyond traditional design approaches for PV projects with the objective of reducing overall long-term impacts for the Project. Although the incorporation of LEID elements could result in slight modifications to the panel block locations due to topographic constraints, the permitting boundary or limits of development would be the same with LEID elements incorporated. The comparative impacts of the tradition design approach versus design with LEID elements incorporated is not known; therefore, to facilitate appropriate analysis of the Project and allow for the incorporation of LEID elements where practicable and environmentally beneficial, the environmental technical analysis are based on the elements that result in the worst-case scenario for construction and operations.

The Project site consists of approximately 2,489 acres of BLM-administered land. A vicinity map showing the Permitting (Development) Boundary is presented on Figure 1-1. The block layouts may vary slightly with the incorporation LEID elements, but would remain within the Permitting Boundary. The total area for the Project (i.e., Permitting Boundary; 2,489 acres), includes a 2,465 acre solar field development area with approximately 1,859 acre of solar panels (array blocks) and 24 acres for linear facilities including access/perimeter roads with a 30 to 60 foot corridor width and gen-tie and powerline corridors at 150 feet.

The purpose of this study is to provide scientific and technical data regarding the existing noise environment within the study area and the proposed Project's potential effects on the area's noise environment. The Project information supporting this analysis is based primarily on the Applicant's RE Crimson Solar Project Plan of Development (POD) submitted to the BLM in January 2016 and updated in 2017 (RE 2017). If warranted, Applicant measures are proposed or recommended in this study to address adverse changes to the existing ambient noise environment as a result of the Project. This study is submitted to the BLM (the federal lead agency) and the California Department of Fish and Wildlife (CDFW), the state lead agency, to support their independent review and evaluation of the environmental impacts of the Project pursuant to applicable Federal, State, and local laws. The POD is part of the BLM Right-of-Way (ROW) grant application process which for this Project includes preparation of an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA). The proposed Project is also expected to require a Streambed Alteration Agreement and an Incidental Take Permit from the State through CDFW which would require compliance with the California Environmental Quality Act (CEQA) (e.g., Environmental Impact Report [EIR]). Therefore, it is currently assumed that a joint EIS/EIR will be prepared by the BLM and CDFW.

1.2 Design Option Scenarios

1.2.1 Traditional Design

An estimated 2 million panels would be arranged on the site in the form of solar arrays. Structures supporting the PV modules would consist of steel piles (e.g., cylindrical pipes, H-beams, or similar), which would be driven into the soil using pneumatic techniques, such as a hydraulic attachment on the boom of a backhoe tractor.

The proposed traditional design is laid out primarily in 2-MW increments, each 2-MW increment would include an inverter-transformer station constructed on a concrete pad or steel skid, and would be centrally located within the PV module arrays. Each inverter-transformer station would contain up to four inverters, a transformer, a battery enclosure, and a switchboard. Underground cables would be installed to convey the direct current (DC) electricity from the panels to the inverters to convert the DC to alternating current (AC). Between 300 and 500 wooden poles would be installed across the entire site to convey energy to a central substation location which would transform voltage from 34.5 kV to 230 kV.

Energy storage may be achieved by either a battery or flywheel storage system capable of storing up to 350 MW of electricity. The storage system would consist of banks of batteries or flywheels housed in electrical enclosures located indoors within the Project energy storage facilities.

Access to the Project site would be provided via the existing paved Wiley's Well Road and Powerline Road to the CRS from Interstate 10 (I-10) to the north. The Project's on-site roadway system would include a perimeter road, access roads, and internal roads. These roads would be surfaced with gravel, compacted dirt, or another commercially available surface and would accommodate the Project operations and maintenance (O&M) activities.

1.2.2 Low Environmental Impact Design Elements

As presented above, the applicant has proposed potential LEID elements for the Project for consideration with the objective of evaluating alternative design approaches that may reduce environmental impacts or negative effects from the project. These elements include changes to the grading approach, trenching and wiring, and elevation of inverter pads. To facilitate adequate analysis of potential design alternatives for the technical study, changes to the design were assessed for the potential LEID elements to determine the worst-case scenario. The design details with the incorporation of potential LEID elements are identical to those provided above for the traditional design, except for the following differences should LEID elements be incorporated:

- Solar blocks may be laid out in larger, 3- to 4-MW block sizes, requiring fewer inverter/transformer structures.
- Inverter/transformer equipment areas may be mounted on steel skids and installed on steel piers above the ground surface.
- Approximately 300 to 400 wooden AC transmission poles would be required in addition to the poles referenced under the traditional design to eliminate most trenching, which would result in the installation of up to 900 wooden poles in total.
- Access to the Project site would still be provided via the existing paved Wiley's Well Road and Powerline Road to the CRS via I-10; however, if the incorporation of elements results in fewer solar blocks, slightly fewer roads would be compacted and graded on-site.

1.3 Integrated Energy Storage System

The planned energy storage system (ESS) will be capable of storing up to 350 megawatts (MW), or 1,400 megawatt-hours (MWh) of energy. The two energy storage systems under consideration consist of a flywheel energy storage system (FESS), which stores kinetic energy using banks of rotors that are spun continuously in a low-friction environment, and a battery energy storage system (BESS), which relies on banks of high-capacity batteries stored in a temperature-controlled environment.

The ESS would either be dispersed throughout the project site or concentrated in one central location on the site. If selected, the singular "concentrated" energy storage system would be located at the northern end of the Project site near the site access gate and Project substation. The final system chosen for installation will depend on market conditions and the availability of commercial options at the time of construction.

1.4 Construction Details

Construction of the Project will occur in three planned phases and will require approximately 23 months to complete with construction expected to begin in late-2020. Both the traditional design and incorporation of LEID elements are expected to feature similar quantities of anticipated noise-intensive equipment and total workforce size; thus, construction assumptions in this noise analysis consider only construction details associated with the traditional design, which were determined to be representative of both approaches and providing a worst-case scenario for the construction noise impact assessment.[1]

A total of 25 percent (%) of field staff is anticipated to travel to the Project site via carpool. The construction workforce is estimated to account for an average of 168 (roundtrip) vehicle trips per day (assumed 22 work days per month), with a maximum of 320 (roundtrip) vehicle trips per day during peak construction (PV module system installation). In addition to trips made by construction workers, approximately 9,883 truck deliveries of equipment, materials, and water are estimated to be required over the course of the construction period.

1.4.1 Preconstruction Activities

Prior to the start of construction, several activities would be undertaken to prepare the site for crews and construction including:

1. Geotechnical and Hazards investigations. The applicant would conduct a geotechnical investigation utilizing subsurface scientific testing and analysis, and would use ground penetrating radar to identify potential subsurface unexploded ordnance and Munitions and Explosives of Concern that may need to be stabilized or removed prior to construction

2. Surveying, Staking, Flagging, and Preconstruction Resource Surveys. Prior to construction the site boundary would be staked to demarcate the limits of disturbance, following which biologists would conduct preconstruction surveys to flag areas for avoidance as appropriate.

3. Fence Installation. The Project will be fenced with security fencing (chainlink topped with barbed wire) and desert tortoise exclusion fencing. The security fencing would be up to 8-feet tall. The exclusion fencing would be buried at least 12 inches below ground surface.

4. Resource Clearance Surveys. Following fence installation, likely in a phased approach, the project development area would be cleared for special status species.

5. Staging Area Establishment. One or more secure staging areas would be established in support of construction activities.

Site preparation activities may vary in order depending upon the incorporation of LEID components, the timeline for start of construction (e.g., survey windows), and other factors. In general, pre-construction activities have limited ground-disturbing impacts; but are necessary before full mobilization to support construction of the Project.

1.4.2 Phase 1 – Site Preparation and Grading

Phase 1 of construction will begin with the grubbing, grading, re-contouring, compacting, and graveling of access roads, followed by grading at the substation site. For Traditional Design, additional grading would be carried out at

[1] For simplification of noise model referencing, the Traditional Design was referred to as Option A and design with the incorporation of LEID elements is referred to as Option B.

inverter and transformer pad locations where necessary. This construction phase will last approximately 19 months and will require an average daily workforce of approximately 251 workers on the Project site. Construction equipment operating on the site will include dozers, graders, skid steers, front-end loaders, vibratory rollers, scrapers, water pumps, water trucks, and gravel trucks. The detailed construction noise analysis spreadsheets are in Appendix A and include construction equipment assumptions.

1.4.3 Phase 2 – PV System Installation

Phase 2 of construction will begin with the pouring of foundations and the installation of the PV module support structure, which would consist of steel piles (e.g., cylindrical pipes, H-beams, or similar) being driven into the soil. To achieve ground preservation beneath the arrays, the incorporation of LEID elements will require individually sized piles to achieve a uniform elevation between module rows; thus, the duration of pile driving activities during this phase will last longer than those anticipated for Traditional Design. Additionally, the incorporation of LEID elements that would reduce ground disturbance (e.g., no or reduced grading) is expected to require the use of track-mounted pile drivers, as opposed to the backhoe-mounted pneumatic pile drivers proposed in Traditional Design, to reduce tire passes over natural vegetation. Construction of the structural support systems will be followed by the installation of the PV modules. This construction phase will last approximately 19 months and require an average daily workforce of approximately 320 workers on the Project site. Construction equipment operating on the site will include post machines, skid steers, flatbed trucks, cranes, vibratory rollers, dump trucks, water trucks, forklifts, generators, air compressors, cable trenchers and mini-trenchers.

1.4.4 Phase 3 – Inverter, Transformer, Substation, and Electrical Collector System Commissioning

Phase 3 of construction will include the stringing of cable along module rows to a trunk cable system and the installation of AC and DC collector poles at inverter/transformer pad sites. If inverter/transformer pads will be elevated on piers as an LEID element, additional pile driving will be required during this phase for elevated pad installation. This construction phase will last approximately 18 months and require an average daily workforce of approximately 102 workers on the Project site. Construction equipment operating on the site will include graders, water trucks, cranes, tractors, scrapers, backhoes, aerial lifts, forklifts, trenchers, generators, and flatbed trucks.

1.4.5 Site Deliveries During Construction Phases

Deliveries of materials and resources will occur throughout all construction phases. Water deliveries will occur a maximum of 14 times per day throughout all three construction phases, module and foundation deliveries will occur at a rate of approximately 10 times per day between construction Phases 1 and 2, tracker system delivery will occur at a rate of approximately 9 times per day during Phase 2, and inverter delivery will occur at a rate of approximately 2 times per day between Phases 2 and 3.

1.4.6 Summary of Project Construction Activities and Schedule

The currently estimated timeframes and average/maximum workforce numbers for each of the construction phases and associated activities during the proposed 23-month construction schedule are presented in Table 1-1.

TABLE 1-1
CONSTRUCTION OVERVIEW FOR ASSUMED 17-MONTH SCHEDULE

Construction Phase	Timeframe	Working Days	Max./Avg. Workforce	Activity Description
1	Month 1 through Month19	399	334 / 251	Site grading and construction of Project site construction/access roads
2	Month 4 through Month 23	399	427 / 320	Substation foundation construction
				Tracker and rack support structure construction
				PV module installation/mounting
3	Month 5 through Month 22	378	180 / 102	Cable runs, pole installation, inverter/transformer pad construction
				Substation completion and commissioning

Notes:
Avg. = Average
Max. = Maximum

1.5 Operations and Maintenance

The solar modules and BESS are expected to be in operation during daylight and non-daylight hours, respectively, for 7 days per week, 365 days per year. Operational activities include solar module washing, maintenance of transformers, inverters, power conditioning systems, or other electrical equipment, road and fence repairs, vegetation/pest management, and site security. Solar modules would be washed as needed to maintain optimal electricity production (up to four times each year) using light utility vehicles with tow-behind water trailers. If LEID elements are incorporated into the design, the Project may also be visited regularly by a biological resource monitor, who will monitor applicable O&M activities and conduct periodic site assessments for the first 5 years of Project operation as part of a residual habitat study.

1.6 Decommissioning

The Applicant is expected to receive authorizations and permits with 30-year terms. At the end of the term, including any extensions, the Project would cease operation. At that time, the facilities would be decommissioned and dismantled and the site restored. Decommissioning activities would require approximately 9,883 truck trips, a workforce of approximately 320 workers, and would take approximately 17 months to complete. Upon decommissioning, the Project site could be converted to other uses in accordance with applicable land use regulations in effect at that time.

It is anticipated that during project decommissioning, project structures would be removed from the ground on the project sites. Aboveground and any underground equipment would be removed including module posts and support structures, gen-tie poles that are not shared with third parties and the overhead collection system within the project sites, inverters, transformers, electrical wiring, equipment on the inverter pads, and related equipment and concrete pads, and any O&M facilities and related equipment and infrastructure. The substation would be removed if it is owned by the project operator, however if a public or private utility assumes ownership of the substation, the substation may remain onsite to be used as part of the utility service to supply other applications.

Equipment would be de-energized prior to removal. Equipment would be shipped offsite by truck (after first being placed in secure transport enclosures as necessary) to be salvaged, recycled or disposed of at an appropriately licensed disposal facility. Removal of the solar modules would include disassembly and removal of the racks on which the solar modules are attached, and removal of the structures supporting the racks, and their placement in secure transport enclosures and a trailer for storage; the racks and structures supporting the racks would then be recycled or disposed of at an appropriately licensed disposal facility. Solar modules would be removed from the site and either transported to another solar electrical generating facility or a recycling facility, or disposed of at an appropriately licensed disposal facility. In conjunction with any solar modules which may be transported to another solar electrical generating facility, such solar modules may undergo a refurbishing process to extend their estimated 30-year lifespan. The demolition debris and removed equipment may be cut or dismantled into pieces to be safely lifted or carried with the equipment being used. The fence and gates would be removed and all materials would be recycled to the extent feasible. It is anticipated the project roads would be restored to their pre-construction condition unless the landowner elects to retain the improved roads for access throughout that landowner's property. The area would be thoroughly cleaned and all debris removed. As discussed above, most materials would be recycled to the extent feasible, with minimal disposal to occur in landfills in compliance with all applicable laws.

2. Existing Baseline Conditions

2.1 Assessment Methodology

To quantify the acoustical baseline conditions of the Project site and its vicinity, existing outdoor ambient sound levels were measured at a set of representative receiver locations in December 2016. The following were considered during selection of the representative receiver locations: the location of the Project site, the proposed access route to the Project site along Wiley's Well Road from I-10, as well as the location of potentially sensitive receptors that could be impacted by generated noise associated with Project construction and operation activities. Observed meteorological settings and other environmental conditions were also documented as part of this field measurement survey. The selected long-term (LT) and short-term (ST) measurement locations, as well as receiver (R) locations, are shown on Figure 1-1, and in higher detail on Figures 2-1 and 2-2. The nearest noise sensitive receptors (NNSR) are located near these measurement locations, approximately 2.9 miles west of the western Project boundary and approximately 2.9 miles southwest of the southern Project boundary. The NNSRs are representative of Chuckawalla Valley State Prison (CVSP) alongside Ironwood State Prison (ISP), and Wiley's Well Campground which is a component of the greater Mule Mountains Long-Term Visitor Area (LTVA). Both NNSRs were confirmed to be occupied with human receptors during the December 2016 survey. No additional noise sensitive receptors were identified within a 3-mile radius of the Project boundary.

2.1.1 Acoustical Terminology

For purposes of document brevity, a summary of relevant fundamental concepts and an explanation of terms related to noise and vibration is presented in Appendix B. For an expanded introduction to noise fundamentals beyond what is presented in Appendix B, refer to an industry-accepted reference text such as Noise & Vibration Control Engineering (Beranek & Ver 1992).

Key acoustical terminology used in this report is as follows:

- **CNEL**: Community Noise Equivalent Level, a 24-hour noise level metric;
- **dB**: decibels; measurement of sound level magnitude;
- **dBA**: decibels, A weighted;
- **L_{dn}**: day-night average sound level;
- **L_{eq}**: energy average sound level during a measured time interval;
- **L_{max}/L_{min}**: root-mean-square of maximum and minimum sound levels, respectively, measured during a monitoring interval;
- **L_{10},L_{50},L_{90}**: Measured noise levels exceeded 10, 50, and 90 percent of the time, respectively;
- **PWL**: sound power level;
- **SPL**: sound pressure level, and
- **PPV**: peak particle velocity, typically expressed in inches per second (in/s).

2.2 Baseline Field Survey

2.2.1 Instrumentation

Measurements were conducted using one Larson Davis (LD) Model LxT (serial number 4485) and two Model 820 (serial numbers 1573 and 1655) sound level meters (SLM), rated by the American National Standards Institute (ANSI) as Type 1 per IEC 61672-1:2013, ANSI S1.4, and ANSI S1.43. The SLM microphones were fitted with standard 3.5-inch-diameter, spherical-shaped, open-cell foam windscreen and positioned roughly 5 feet above grade and at least 10 feet from any vertical acoustically reflecting surfaces. The SLMs were set using slow time-response and an A-weighted decibel scale. SLM calibration was field-checked before and after each measurement period with an LD Model CAL200 (SN 5768) acoustic calibrator. Where not already described, sound level measurements performed for this field survey were conducted in accordance with applicable portions of International Organization for Standardization (ISO) 1996-1, 1996-2, 1996-3 (ISO 1982, 1987a, 1987b) standards.

A Kestrel Model 3500 (SN 2058303) handheld anemometer was used to determine average wind speed, temperature, barometric pressure, and relative humidity before each round of community measurements. Field data sheets including meteorological observations are included in Appendix C.

2.2.2 Survey Duration

LT monitors were deployed on the evening of December 4, 2016, and were left unattended (with exception of periodic power and operation checks) for a 24-hour period, so that the time-varying sound levels of an entire representative diurnal cycle could be measured. Short-term (ST) measurements were attended by the field investigator so that noteworthy observations regarding perceived sound-producing events, processes, or activities (both natural and man-made) could be documented and, thus, help explain concurrent variances in the measured SPL. Observations and investigator notes were made on field data sheets, included as Appendix C.

2.3 Baseline Field Survey Results

The dominant noise sources at and around the vicinity the measurement locations were vehicular traffic from local roadways and I-10, traffic and mechanical noise associated with the operation of CVSP, and distant electric generator noise from Wiley's Well Campground. ST SPL measurements were conducted during daytime (7 a.m. to 7 p.m.) and evening (7:01 p.m. to 10 p.m.) time periods and were located adjacent to both LT locations. ST measurements lasted for a duration of 20 consecutive minutes on each occurrence. Appendix C presents photographs and additional measurement data detail. Tables 2-1 and 2-2 present a summary of noise measurement results.

TABLE 2-1
SUMMARY OF MEASURED A-WEIGHTED DECIBEL NOISE LEVELS AND METRICS AT LONG-TERM MONITORS

Meas. ID	Date	Start Time	Duration (Hrs)	L_{eq}	L_{dn}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}
LT1	4-Dec	16:00	24	27	32	68	18	26	22	21
LT2	4-Dec	16:30	24	41	47	79	30	39	36	34

TABLE 2-2
SUMMARY OF MEASURED A-WEIGHTED DECIBEL NOISE LEVELS AND METRICS AT SHORT-TERM MONITORS

Meas. ID	Period	Date	Time	Duration (Minutes)	L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}
ST1	Daytime	5-Dec	15:40	20	27	52	19	25	22	20
	Evening	4-Dec	19:15	20	24	40	21	24	23	22
ST2	Daytime	5-Dec	14:05	20	34	41	27	35	33	31
	Evening	4-Dec	20:05	20	38	42	35	39	38	38

Measurement LT1 and ST1 were conducted at the northern end of Wiley's Well Campground, approximately 90 feet east of the northernmost campsite. The primary noise sources at this location during daytime hours were associated with campground visitors, including electric generators, car radios, and visitor speech. Additional noise sources included bicyclist passbys, and rustling refuse (plastic). Additional noise sources at this location included intermittent aircraft overflights, vehicles traveling on Wiley's Well Road, distant booming (presumed to be military training exercises), dog barking, and birdcalls.

Measurement LT2 and ST2 were conducted on the graded-dirt portion of Wiley's Well Road along the western right-of-way fence line, approximately 2,950 feet east of the nearest building presumed to contain prison inmates, and approximately 1,950 feet from the CVSP paved access road. The primary noise sources at this location during daytime hours were vehicular traffic entering and exiting CVSP on the access road and mechanical noise emanating from the general direction of CVSP. During evening hours, the mechanical noise was the dominant noise source, with intermittently audible individual vehicles on I-10. Additional noise sources at this location included intermittent aircraft overflights, vehicles traveling on Wiley's Well Road, and birdcalls.

3. Impact Assessment

3.1 Regulatory Framework

The following subsections summarize the federal, state, and local noise regulations, ordinances, standards, and guidance that are relevant to the assessment of noise impacts from the Project to the existing ambient outdoor sound environment.

3.1.1 Federal

3.1.1.1 National Environmental Policy Act of 1969

The National Environmental Policy Act of 1969 (NEPA) establishes a public, interdisciplinary framework for federal agencies reviewing projects under their jurisdiction to consider environmental impacts. NEPA's basic policy is to assure that all branches of government give proper consideration to the environment prior to undertaking any major federal action that significantly affects the environment.

The BLM, as lead Federal agency for the Project, is responsible for preparation of an Environmental Impact Statement (EIS) in compliance with NEPA to evaluate the environmental impacts of the portions of this Project on federal lands. The RE Crimson Solar Project and the Project gen-tie line are located on lands administered and managed by the BLM. NEPA compliance is required for these portions of the Project through preparation of a Draft and Final EIS, for which information from this Noise Technical Report would support. BLM is also responsible for Native American consultation, including government to government consultation.

The President's Council on Environmental Quality developed guidelines and procedures to assist federal agencies with NEPA procedures so that environmental justice concerns are effectively identified and addressed, including guidelines for public participation, alternatives, and mitigation.

3.1.1.2 Occupational Safety and Health Act

On-site occupational noise exposure levels set by the Occupational Safety and Health Act of 1970 are regulated by the Occupational Safety and Health Administration (OSHA) and in California via California Occupational Safety and Health Administration (Cal-OSHA). The maximum time-weighted average noise exposure level of workers is 90 dB, dBA, over an 8-hour work shift, and 115 dBA for time periods of 15 minutes or less (29 Code of Federal Regulations [CFR] § 1910.95).

3.1.2 State of California

3.1.2.1 California Environmental Quality Act Impact Determination

Per California Environmental Quality Act (CEQA) guidance, Appendix G (as listed for Noise), the Project would be considered as having a significant impact when there would be:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, exposure of people residing or working in the project area to excessive noise levels; or

f) For a project within the vicinity of a private airstrip, exposure of people residing or working in the project area to excessive noise levels.

3.1.2.2 California Vehicle Code

Noise limits for highway vehicles are regulated under the California Vehicle Code, §§ 23130 and 23130.5. The limits are enforceable on the highways by the California Highway Patrol and the County Sheriff's Office.

3.1.2.3 California Department of Transportation – Vibration

The California Department of Transportation (Caltrans) Transportation and Construction Vibration Guidance Manual (Caltrans 2013) provides guidance for the analysis of vibratory impacts generated by transportation and construction projects by providing thresholds for structural damage and human perception/annoyance. Table 3-1 below shows a curated list of damage and annoyance thresholds from the Caltrans manual, as applicable to various receiver and vibratory source types.

As shown in Table 3-1, vibratory activities have potential to result in structural damage when vibration levels exceed 0.25 to 2 PPV in/sec as applicable to the source type and receiver characterization, and potential for human annoyance when vibration levels exceed 0.1 to 0.9 PPV in/sec as applicable to the source type.

TABLE 3-1
MAXIMUM VIBRATION LEVELS FOR CONSTRUCTION EQUIPMENT FOR POTENTIAL DAMAGE AND ANNOYANCE
(PPV IN/SEC)

<table>
<tr><th rowspan="2">Structure Type</th><th colspan="2">Potential Damage Thresholds</th><th colspan="2">"Strongly Perceptible" Annoyance Criteria</th></tr>
<tr><th>Transient Sources</th><th>Continuous/Frequent Intermittent Sources</th><th>Transient Sources</th><th>Continuous/Frequent Intermittent Sources</th></tr>
<tr><td>Historic and some old buildings</td><td>0.5</td><td>0.25</td><td rowspan="4">0.9</td><td rowspan="4">0.1</td></tr>
<tr><td>Older residential structures</td><td>0.5</td><td>0.3</td></tr>
<tr><td>New residential structures</td><td>1.0</td><td>0.5</td></tr>
<tr><td>Modern industrial and commercial buildings</td><td>2.0</td><td>0.5</td></tr>
</table>

Notes:

Transient sources generate a single vibratory event, such as blasting.

Continuous/frequent sources include pile driving equipment and other construction activities generating multiple vibration-intensive events across a given period.

PPV in/sec = peak particle velocity in inches per second

3.1.3 Riverside County

The Project is located within unincorporated Riverside County; hence, relevant portions of the Riverside County General Plan Noise Element and the Noise Ordinance would apply with respect to defining appropriate noise impact assessment criteria (Riverside County 2015a; 2015b).

3.1.3.1 Riverside County General Plan

The Noise Element of the Riverside County General Plan (Riverside County 2015a) includes noise compatibility guidance, which is based on the California State Planning Law. Noise Element policies N 2.3 and N 4.1 prohibit stationary and facility-related noise levels received at sensitive land uses when exceeding the following noise level standards:

- From 7:00 a.m. to 10:00 p.m., 65 Leq (10 minutes); and
- From 10:00 p.m. to 7:00 a.m., 45 Leq (10 minutes).

Application notes found in Appendix I of the Riverside County General Plan Noise Element (Riverside County 2015b) indicate that "temporary construction activities are not covered by the standard"; hence, the 10-minute Leq limits identified above would not apply to on-site Project construction noise.

Table N-1 of the Noise Element, Land Use Compatibility for Community Noise Exposure indicates maximum acceptable levels for the siting of new land uses. This table indicates that land uses associated with utilities are normally acceptable in locations exposed to existing noise levels up to 75 dBA day-night average sound level (Ldn) or CNEL, conditionally acceptable with existing levels up to 80 dBA Ldn or CNEL, and unacceptable with existing levels beyond 80 dBA Ldn or CNEL.

3.1.3.2 Ordinance No. 847

Riverside County's Ordinance No. 847 lists maximum nighttime and daytime sound levels for occupied properties by General Plan land use designation (Riverside County 2007). The most restrictive limit that would apply at the nearest occupied receptors are classified as Rural Residential. Table 1 of this ordinance indicates the maximum dBA level allowed in Rural Residential designations is a daytime and nighttime limit of 45 dBA Lmax when measured at the exterior of an occupied property.

Section 2 of Ordinance No. 847 does, however, exempt from its provisions the following construction activities:

- Private construction projects located one-quarter of a mile or more from an inhabited dwelling; or
- Private construction projects located within one-quarter of a mile from an inhabited dwelling, provided that:
  - Construction does not occur between the hours of 6 p.m. and 6 a.m. during the months of June through September, and
  - Construction does not occur between the hours of 6 p.m. and 7 a.m. during the months of October through May.

3.2 Impact Thresholds

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies

The impact indicator for this impact threshold is determined by Riverside County's Ordinance No. 847 as described below:

- A daytime or nighttime noise limit of 45 dBA Lmax, only if the distance between the Project site and the nearest receptor is less than one-quarter of a mile away from the nearest inhabited dwelling, and construction occurs:
  - Between the hours of 6 a.m. and 6 p.m. during the months of June through September; or
  - Between the hours of 7 a.m. and 6 p.m. during the months of October through May.

Similarly, impacts would also occur if noise levels exceed General Plan policy thresholds for stationary and facility-related noise levels as described below:

- From 7:00 a.m. to 10:00 p.m., 65 Leq (10 minutes); and
- From 10:00 p.m. to 7:00 a.m., 45 Leq (10 minutes).

Noise impacts associated with this threshold may also occur if the Project is located in an area with existing noise levels exceeding 75 dBA Ldn or CNEL as indicated in the Noise Element of the General Plan.

Additionally, impacts associated with construction and operation noise to Project employees and contractors would occur if they are exposed to levels in excess of OSHA 29 CFR maximum limits of 90 dBA across an 8-hour work period, or levels of 115 dBA for any period less than 15 minutes.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels

The impact indicator for this impact threshold is determined by the structure-specific and activity-specific Caltrans vibration thresholds as provided in Table 3-1.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project

The impact indicator for this impact threshold is determined by a quantified increase in the outdoor ambient sound level due to Project operation. For purposes of this assessment, a permanent increase in ambient sound level at a sensitive receiver of greater than 10 dBA CNEL would be considered substantial, and thus, a significant impact. Additionally, a permanent increase in ambient sound level at a sensitive receiver of greater than 5 and up to 10 dBA CNEL could be considered substantial in some cases and thus, significant, depending on factors such as the resulting noise level, duration and frequency of noise, the number of people affected, and the land use of the affect receptor sites. This significance criteria is consistent with the California Energy Commission's (CEC) interpretation of noise impact threshold criteria as stated in the Rio Mesa Solar Generating Facility Preliminary Staff Assessment (CEC 2012).

Section 2.k. of Riverside County's Ordinance No. 847 exempts motor vehicles (other than off-highway) from its stationary and facility-related noise level thresholds; thus, this analysis assesses traffic noise impacts from Project operations solely on the basis of outdoor ambient noise level increase as presented above.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project

The impact indicator for this impact threshold is determined by a quantified increase in the outdoor ambient sound level due to Project construction. Similar to indicator for threshold c) above, this assessment considers a temporary increase in ambient sound level at a sensitive receiver of greater than 10 dBA would be considered substantial, and thus, a significant impact. Additionally, a permanent increase in ambient sound level at a sensitive receiver of greater than 5 and up to 10 dBA CNEL could be considered substantial in some cases, and thus, significant, depending on factors such as the resulting noise level, duration and frequency of noise, the number of people affected, and the land use of the affect receptor sites. This significance criteria is consistent with CEC interpretation in the Rio Mesa PSA (CEC 2012). The Rio Mesa PSA also states that construction noise is usually considered insignificant when construction activity is temporary and the use of heavy equipment is limited to daytime hours.

Also similar to the impact indicator for threshold c) above, Section 2.k. of Riverside County's Ordinance No. 847 exempts motor vehicles (other than off-highway) from its stationary and facility-related noise level thresholds; thus, this analysis assesses traffic noise impact from Project construction solely on the basis of outdoor ambient noise level increase as presented above.

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, exposure of people residing or working in the project area to excessive noise levels

If the Project is located within the airport land use plan, or within 2 miles of a public airport, the impact indicator for this impact threshold would be assessed using land use siting regulations provided in the Riverside County Airport Land Use Compatibility Plan (Riverside County 2004) and OSHA noise regulations.

f) For a project within the vicinity of a private airstrip, exposure of people residing or working in the project area to excessive noise levels

If the Project is located within 2 miles of a private airstrip, the impact indicator for this impact threshold would be assessed using the land use compatibility table for community noise exposure table in the General Plan and OSHA noise regulations.

4. Methodologies

4.1 Project Construction

4.1.1 On-site Noise

Project construction noise was estimated by considering the quantities of contributing sound sources and calculating their aggregate sound propagation to the studied representative receptor locations. Since Project construction phases will overlap during certain months, the construction noise analysis assumed a single "worst-case" period when all three construction phases would be simultaneously underway.

The key assumptions for this analysis included in this method are as follows:

- Free-field conditions, including the following attenuation factors:
  - Ground absorption effects (but no greater than 4.8 dBA reduction, regardless of distance traversed by the sound path, consistent with ISO 9613-2 (ISO 1996); and
  - Atmospheric absorption of -1 dBA per 1,000 feet of distance traveled.

- For a given construction activity, all pieces of concerned equipment and vehicles are assumed to operate—on average—from the same source point location at the general geographic centroid of the Project site.
    - Each piece of equipment or vehicle is assigned a reference Lmax value at a reference distance (e.g., 50 feet), and an "acoustical usage factor" (AUF) that the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) User's Guide (FHWA 2006) describes as an estimated portion of a construction operation time period when the Lmax value can be expected. These reference sound level and AUF values are presented for each construction phase in Appendix A.
- Apart from the aforementioned approximated effect of atmospheric absorption (i.e., -1 dBA per 1,000 feet), this construction noise analysis considers three cases of meteorological conditions for each of the phases. From an available set of six single-digit numerical codes (1 through 6), these cases are Conservation of Clean Air and Water in Europe (Bies and Hansen 1996) meteorological categories as follows:
    - Category 2 ("CAT-2") – Pasquill stability category D, with wind speed greater than 3 meters per second (mps) and traveling away from the receptor position. In other words, this category describes the scenario where a receptor position is "upwind" of a noise source (i.e., noise propagates "against the current" of wind flow toward the receptor location) and would thus be considered the quietest or most favorable case.
    - Category 4 ("CAT-4") – Pasquill stability category D, with winds varying plus or minus (+/-) 0.5 mps. This scenario represents "calm" conditions at a receptor position, with essentially no meteorological influence.
    - Category 6 ("CAT-6") – Pasquill stability category D, with wind speed greater than 3 mps and traveling toward the receptor position. In other words, this category describes the scenario where a receptor position is "downwind" of a noise source (i.e., noise propagates "with the current" of wind flow toward the receptor location) and hence the loudest or least favorable of the three cases.

The estimated aggregate SPL from concurrent construction activities was predicted at each of two representative noise-sensitive receptors.

This predicted aggregate Project construction noise SPL at each representative noise-sensitive receptor was then logarithmically added to the baseline ambient sound level, then compared arithmetically with the baseline ambient sound level in order to determine if the difference (i.e., between construction noise and the baseline) exceeds substantial increase significance criteria.

4.1.2 Construction Traffic

Noise levels generated by construction traffic on Wiley's Well Road and the attached Colorado River Substation access road were modeled using the FHWA's Traffic Noise Model Version 2.5, the most recent version approved by the FHWA at the time of this analysis. The screening-level noise analysis assumed a vehicle speed of 45 miles-per-hour, a paved roadway width of 43 feet, and construction phase-specific traffic mixes and volumes. While the model has the capability to account for roadway gradients, and shielding effects from terrain and buildings/barriers, this analysis assumed flat topography between the roadway and the NNSR and omitted existing structures that may offer additional shielding.

Both peak-hour and 24-hour CNEL were predicted using the estimated quantities of employee vehicles and delivery trucks entering and exiting the Project site on a daily basis.

For peak-hour predictions, this analysis assumed that an estimated maximum of 427 employees associated with Phase 2 would arrive within a single hour (7 a.m. to 8 a.m.). Proceeding with the assumption that approximately 25% of these employees will carpool, a total of 320 standard vehicles was modeled on the roadway. A total of two water trucks (medium trucks) and three delivery trucks (heavy trucks) was also modeled as entering the site during this 1-hour time period.

For 24-hour CNEL predictions, this analysis considered the maximum daily estimates of 320 standard vehicles, 14 medium trucks (water trucks), and 20 heavy trucks (material deliveries) along the roadway. The predictive model assumed that all vehicles would be utilizing the roadway between the hours of 7 a.m. and 7 p.m., and the daily vehicle quantity estimates were doubled to account for both arrivals and departures to and from the Project site.

4.1.3 Vibration

Construction activities can generate groundborne vibration of varying degrees based on the construction activity and equipment being used. Vibration associated with construction activities would occur temporarily during pile driving activities. The Caltrans manual (Caltrans 2013) provides an equation for pile-driving vibration level prediction at a receiver location, which is expressed as:

$$PPV\ (in/sec) = PPV_{ref}(\frac{25}{D})^n$$

Where:

PPV_{ref} = Reference level of a pile driver;

D = Distance of the receiver from the pile-driving activity; and

n = Value related to the vibration attenuation rate through the subject soil type.

Vibration levels generated by pile-driving activities for this analysis were predicted using the reference level reported in the Federal Transit Administration (FTA) Transit Noise and Impact Assessment Manual (FTA 2006) of 1.518 PPV in/sec at 25 feet, and an "n" value reported in the Caltrans Manual of 1.1, representative of conservatively hard soil types. This expression provides the means for the assessment of compliance with structural damage thresholds and human receptor annoyance levels at any given receptor distance.

4.2 Project Operation

The CadnaA® Noise Prediction Model (Versions 2017 and 2019) was used to estimate the propagation of sound from aggregate project operations and thereby predict SPL at various distances from the project, including specific locations such as the representative noise-sensitive receptors selected for the ambient sound survey. CadnaA® is a Windows-based software program that predicts and assesses noise levels near industrial noise sources based on ISO 9613-2 algorithms for noise propagation calculations (ISO 1996). The software can accept sound power levels (in dB referenced to 1 picoWatt) in octave-band center frequency resolution to describe the multiple sound propagation sources of the site processes or activity to be modeled. The calculations account for classical sound wave divergence plus attenuation factors resulting from air absorption, basic ground effects, and barrier/shielding. The advantage of using CadnaA® is that it can handle the three-dimensional sound propagation complexity of considering realistic intervening natural and man-made topographical barrier effects, including those resulting from terrain features and from structures such as major buildings, storage tanks, and large equipment.

4.2.1 Model Parameters and Scenarios

Daytime Operation

The Project configuration was imported into a CadnaA® model space from available project CAD files provided by the Applicant. Due to the layout pattern of PV modules that surround the transformer and inverters associated with a standard grouping or "block" of electricity generation (e.g., 2.5 MW each) each grouping of geographically adjoining full and partial PV blocks was modeled as a contiguous area source and reflected the layout of each design option scenario. Traditional Design was modeled to include a total of 144 2.5-MW transformer units evenly spread about the block layout areas. Designing with the incorporation of LEID elements was modeled to include a total of 90 4.5-MW transformer units, also evenly spread about the block layout areas. Both design scenarios included approximately 720 inverter units. Although only four inverters are anticipated per transformer pad in both design scenarios, the available inverter sound level references used in this analysis were for a 500-kV unit; thus, 720 inverters were deemed necessary to reach the total specified Project MW capacity. Both design scenarios also included substation operation at their proposed Project locations.

These noise sources are shown in detail in Table 4-1.

TABLE 4-1
PROJECT DAYTIME OPERATION SOUND-GENERATING SOURCES

Individual Noise Source Type	Sound Power Level (dB, unweighted PWL)
500-kW Inverter	84
2.5-MVA Transformer (Traditional Design)	84
4.5-MVA Transformer (LEID)	87
Substation Transformer	115

Nighttime Operation

During nighttime hours, when solar energy is no longer actively converted and stored, the integrated ESS would release stored energy to the electrical grid. Batteries associated with a BESS are operationally silent; however, cabinet heating, ventilation and air conditioning (HVAC) units and power conversion systems (PCS) associated with BESS operation will generate noise levels much greater than those associated with the operation of FESS systems. As a result, a BESS was analyzed as an operation noise “worst case scenario”.

The anticipated BESS system will likely be modularly comprised of shipping containers, each outfitted with a single AC unit and PCS. The AC unit and PCS are the primary noise sources associated with each module, Table 4-2 presents sound pressure level (SPL) ratings of anticipated equipment.

TABLE 4-2
PROJECT NIGHTTIME OPERATION SOUND-GENERATING SOURCES

Individual Noise Source Type	Sound Pressure Level at 1-Meter Distance (dBA, SPL)
PCS[1]	70
HVAC Cabinet[2]	68
Substation Transformer	106

Notes:

[1] Per Sungrow SC250KU Technical Data, 1m distance
[2] Per Blackshields AC3000P Data Sheet, presumed 1m distance

Similar to the predictive modeling carried out for construction noise, a total of three meteorological cases were considered as distinct CadnaA® analysis runs for both design options and operational periods. However, modeled meteorological conditions used in the operations analysis reflect annual average meteorological data gathered from weather station records in the Project vicinity, and are summarized below:

- Daytime Operations (Solar Energy Generation):
    - **Calm** - Varying calm winds at ±0.5 meters per second (m/s);
    - **Prevailing A** - Prevailing winds from 170 degrees (°) at 5 m/s; and
    - **Prevailing B** - Secondary prevailing winds from 350° at 6 m/s.

- Nighttime Operations (BESS):
  - **Calm** - Varying calm winds at ±0.5 meters per second (m/s);
  - **Prevailing A** - Prevailing winds from 180° at 5 m/s; and
  - **Prevailing B** - Secondary prevailing winds from 338° at 5 m/s.

Prevailing wind data were compiled using wind speeds recorded over the past 2 years (July 2015 to July 2017) by the weather station located at Blythe Airport during typical daylight hours (5 a.m. to 8 p.m.) and twilight/nighttime hours (8 p.m. to 5 a.m.). These data were curated into wind-rose format by Iowa State University's Iowa Environmental Mesonet (Iowa State University 2017), included in Appendix A.

Additional model configuration settings and assumptions are as follows:

- **Outdoor temperature**. 10° Celsius (°C);
- **Relative humidity**. 70%;
- **Average ground absorption**. 0.3 (representing a conservative blend of hard, reflective surfaces that tend toward zero, and highly absorptive ground cover that approaches unity);
- **Terrain**. Topography of the Project site and the immediate vicinity was modeled using terrain data with 3-meter resolution elevation steps; and
- **Horizontal tracker actuators**. While the Project may involve module arrays featuring single-axis trackers, the drive motors are expected to operate intermittently throughout the day and are, therefore, not considered a significant aggregate noise source to model.

5. Results and Findings

5.1 Project Construction

5.1.1 On-site Construction

Table 5-1 presents predicted SPLs from daytime Project on-site construction during a worst-case period at the two indicated NNSRs under the three meteorological conditions.

TABLE 5-1
PREDICTED PROJECT CONSTRUCTION NOISE LEVELS

Modeled Receiver ID	Existing Daytime Leq, dBA	Meteorological Scenario	Predicted Hourly Leq, dBA
R1 (Wiley's Well Campground)	33.8	Category 2 (Receiver Upwind)	18
		Aggregate Level	34
		Difference	0
		Category 4 (Calm)	30
		Aggregate Level	35
		Difference	+1
		Category 6 (Receiver Downwind)	35
		Aggregate Level	37
		Difference	+3
R2 (CVSP)	44.8	Category 2 (Receiver Upwind)	7
		Aggregate Level	45
		Difference	0
		Category 4 (Calm)	19
		Aggregate Level	45
		Difference	0
		Category 6 (Receiver Downwind)	24
		Aggregate Level	45
		Difference	0

For the modeled worst-case construction period and meteorological conditions, predicted construction noise levels did not exceed 35 dBA Leq at the receiver locations. Subsequent aggregate construction noise and existing daytime noise level comparisons confirm that temporary noise levels are not predicted to increase over existing levels by more than 3 dBA in any construction phase or meteorological scenario combination.

5.1.2 Construction Traffic

Due to the expected travel route for commuting construction personnel and deliveries of construction materials and equipment, there would be a notable increase in roadway traffic on Wiley’s Well Road and Powerline Road. These roads are closest to the NNSR associated with CVSP. Wiley’s Well Campground was omitted from this specific analysis, as it is located approximately 6.5 miles from the modeled roadway and, thus, not expected to receive any influence from construction traffic noises at this distance.

Wiley’s Well Road is used primarily for employee and visitor access to CVSP and ISP, and sparingly used throughout the day by recreational vehicles south of the CVSP/ISP entry driveway. The nearest segment of the roadway that would be used during Project construction is approximately 10,000 feet from the CVSP. The location of baseline noise measurement LT2 was located along Wiley’s Well Road, south of the CVSP/ISP entry driveway and is thus not strongly affected by existing traffic noise associated with CVSP operations. Therefore, the daytime Leq and CNEL values calculated at this measurement location are considered a conservative estimate of levels sensitive receivers from within CVSP would experience on a typical daily basis.

A comparison of the existing measured levels with predicted construction traffic noise levels for peak-hour construction traffic and 24-hour construction traffic is provided below in Table 5-2.

TABLE 5-2
CONSTRUCTION TRAFFIC NOISE PREDICTION AND COMPARISON

Comparison Metric	Measured Existing Noise Level at LT2	Predicted Construction Traffic Noise Level at CVSP	Aggregate	Difference
Peak-Hour Leq	45 dBA (Daytime Leq)	2 dBA (Peak-Hour Leq)	45 dBA (Leq)	0 dB
24-Hour CNEL	48 dBA (Measured CNEL)	5 dBA (Calculated CNEL)	48 dBA (CNEL)	0 dB

This table demonstrates that the 10,000-foot distance between CVSP and the nearest segment of the roadway being used during Project construction reduces construction traffic noise levels to extremely low levels after traveling the approximate 1.9 mile distance.

5.1.3 Vibration

Pile driving has the potential to generate the highest groundborne vibration levels and is the primary concern for vibratory impacts on structures and human receptors. As discussed in Section 3.1.2, pile driving or other intermittent or continuous vibratory construction potential damage thresholds range from 0.25 PPV in/sec for historic and certain older buildings, to 0.5 PPV in/sec for modern industrial/commercial buildings, with human receptors experiencing "strongly perceptible" vibration at 0.1 PPV in/sec. Table 5-3 shows maximum distances within which potential structure-specific damage or receiver annoyance may occur as a result of Project pile-driving activities.

TABLE 5-3
PREDICTED MAXIMUM DISTANCES RESULTING IN POTENTIAL VIBRATION IMPACTS

Structure Type	Maximum Distance (feet) for Potential Structural Damage	Maximum Distance (feet) for "Strongly Perceptible" Human Response
Historic and some old buildings	129	300
Older residential structures	109	300
New residential structures	69	300
Modern industrial and commercial buildings	69	300

5.2 Project Operation

5.2.1 On-Site Operational Activities

Table 5-4 presents predicted SPL from on-site Project operation during daylight periods at the two indicated NNSRs. Similar to tables of predicted Project construction noise from Section 5.1.1, predicted operation noise levels are compared with measured existing baseline ambient outdoor sound levels associated with these NNSRs to demonstrate that Project operation noise is expected to be significantly quieter than existing outdoor ambient sound levels at both locations.

TABLE 5-4
COMPARISON OF PREDICTED DAYTIME PROJECT OPERATIONS NOISE LEVELS WITH EXISTING AMBIENT NOISE LEVELS (dBA, L_{EQ})

Design Option	Met. Scenario	Receiver 1 (Wiley's Well Campground)				Receiver 2 (CVSP)			
		Existing Daytime	Predicted Project Ops	Aggregate	Difference	Existing Daytime	Predicted Project Ops	Aggregate	Difference
A	Calm	34	1	34	0	45	9	45	0
	Prev. A		0	34	0		14	45	0
	Prev. B		6	34	0		7	45	0
B	Calm		2	34	0		9	45	0
	Prev. A		0	34	0		15	45	0
	Prev. B		6	34	0		7	45	0

Notes:
Met. = Meteorological
Prev. A = Prevailing A
Prev. B = Prevailing B
Ops = Operations

As expected at a distance of approximately 2.9 miles from the nearest Project noise source, predicted daytime Project operation noise levels at both modeled receivers are well-below measured existing outdoor ambient sound levels for both Project design options across all three meteorological scenarios. Figures 5-1 through 5-6 display predicted Project operation noise isopleths (also known as "contours") generated by the associated design scenario for the each three meteorological conditions listed in Table 5-4.

Table 5-5 presents predicted SPL from on-site Project operation during nighttime periods at the two indicated NNSRs.

TABLE 5-5
COMPARISON OF PREDICTED NIGHTTIME PROJECT OPERATIONS NOISE LEVELS WITH EXISTING AMBIENT NOISE LEVELS (dBA, L_{EQ})

BESS Design Option	Met. Scenario	Receiver 1 (Wiley's Well Campground)				Receiver 2 (CVSP)			
		Existing Nighttime	Predicted Project Ops	Aggregate	Difference	Existing Nighttime	Predicted Project Ops	Aggregate	Difference
Dispersed	Calm	21	8	22	0	40	16	40	0
	Prev. A		3	21	0		22	40	0
	Prev. B		15	21	1		12	40	0
Concentrated	Calm		3	21	0		9	40	0
	Prev. A		0	21	0		4	40	0
	Prev. B		11	21	0		4	40	0

Notes:
Met. = Meteorological
Prev. A = Prevailing A
Prev. B = Prevailing B
Ops = Operations

5.2.2 As expected at a distance of approximately 2.9 miles from the nearest Project noise source, predicted nighttime Project operation noise levels at both modeled receivers are well-below measured existing outdoor ambient sound levels for both Project design options across all three meteorological scenarios. Figures 5-7 through 5-12 display predicted Project operation noise isopleths (also known as “contours”) generated by the associated design scenario for the each three meteorological conditions listed in Table 5-5.Operations Traffic

Operations traffic for the Project involves only a small quantity of vehicles. As discussed in Section 5.1.2, predicted construction traffic noise levels at CVSP, which included assumptions of over 300 vehicles and medium/heavy trucks, were 5 dBA CNEL and 2 dBA for the peak-hour Leq. Because operations and maintenance activities would result in significantly less traffic on the same modeled roadway, it can be assumed that traffic noise from Project operations would be less than what was predicted for the construction traffic noise.

5.3 Decommissioning

Decommissioning impacts are anticipated to be similar to those determined for the construction phase of the Project. The actual impacts would be dependent upon the proposed decommissioning action and final use of the site.

6. Impact Assessment

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies

a.1 Riverside County’s Ordinance No. 847

A significant impact or substantial adverse effect would occur if noise levels generated by Project operation exceed the County Ordinance Rural Residential maximum noise level threshold of 45 dBA Lmax. Additionally, a significant impact would occur if Project construction noise exceeded Riverside County’s ordinance daytime and nighttime noise limit of 45 dBA Lmax; however, this limit only applies when the distance between the Project source and the nearest receptor is less than one-quarter of a mile away from the nearest inhabited dwelling.

Project Construction

Project construction activities will occur, at the closest boundaries, approximately 2.9 miles from the nearest noise sensitive receiver; thus, construction noise is exempt from the County Ordinance, and impacts from Project construction would be less than significant per CEQA and would not have substantial adverse effects per NEPA.

Project Operation

Predicted Project operation noise levels presented in Tables 5-4 and 5-5, for each design scenario and BESS layout under the various meteorological conditions, range from 0 to 22 dBA Leq. These predicted levels are well below Riverside County’s threshold of 45 dBA Lmax. Therefore, impacts from Project operation would be less than significant per CEQA and would not have substantial adverse effects per NEPA.

a.2 Riverside County General Plan

A significant impact or substantial adverse effect would occur if the Project exposed people to levels in excess of General Plan policy thresholds for stationary and facility-related noise levels as described below:

- From 7:00 a.m. to 10:00 p.m., 65 Leq (10 minutes); and
- From 10:00 p.m. to 7:00 a.m., 45 Leq (10 minutes).

Predicted Project operation noise ranges from 0 to 22 dBA Leq. These predicted levels are well below the General Plan policy thresholds. Therefore, impacts from Project operation would be less than significant per CEQA and would not have substantial adverse effects per NEPA.

A significant impact or substantial adverse effect would occur if the Project is located within an area where existing noise levels exceed 75 dBA Ldn or CNEL.

As shown in Table 2-1, existing Ldn values calculated from long-term measurement locations LT1 and LT2 range from 32 to 47 dBA Ldn. These levels are considered representative of the general Project vicinity because dominant noise sources in the area are very sparse and largely predictable. The range of existing Ldn values is well below all maximum-acceptable levels identified in the General Plan. Therefore, the Project would not expose persons to noise levels determined as not acceptable by the General Plan and, thus, the impact would be less than significant per CEQA and would not have substantial adverse effects per NEPA.

a.3 Occupational Safety and Health Act

A significant impact or substantial adverse effect would occur if Project construction and operation exposed employees and/or contractors to levels in excess of OSHA 29 CFR maximum limits of 90 dBA across an 8-hour work period, or levels of 115 dBA for any period less than 15 minutes.

Sound levels within the Project boundary during construction may exceed the OSHA thresholds near certain operating or idling powered mobile and stationary equipment, but these levels will diminish with distance from these sources. Consistent with OSHA/Cal-OSHA guidance and regulatory compliance requirements, Project contractors will need to post warnings with respect to areas that may be noise level hazards and provide construction workers with OSHA-approved hearing protection devices as part of an applicable hearing conservation program. With execution of these federally mandated programs, the Project would not expose employees and/or contractors to construction and operation noise levels in excess of OSHA thresholds; thus, the impact would be less than significant per CEQA and would not have substantial adverse effects per NEPA.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels

A significant impact or substantial adverse effect would occur if vibration levels exceed those listed in the structure-specific and activity-specific Caltrans vibration thresholds provided in Table 3-1.

Groundborne noise and vibration generated by Project operation is anticipated to be very minimal and below perceptible levels at distances greater than 10 feet. Groundborne vibration generated by Project construction activities such as pile driving, as discussed in Section 5.1.3, have the greatest potential for impacts when occurring within 300 feet of receivers. Because the nearest receivers are located approximately 2.9 miles (15,200 feet) away from the nearest proposed pile-driving location, vibration impacts are not expected. Thus, the impact would be less than significant per CEQA and would not have substantial adverse effects per NEPA.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project

A significant impact or substantial adverse effect would occur if the project resulted in a permanent increase in ambient sound level at a sensitive receiver of greater than 10 dBA over existing levels. Additionally, a permanent increase in ambient sound level at a sensitive receiver of greater than 5 and up to 10 dBA CNEL could be considered substantial in some cases, and thus, significant, depending on factors such as the resulting noise level, duration and frequency of noise, the number of people affected, and the land use of the affect receptor sites.

Project Operation – Energy Generation and BESS

As discussed in Section 5.2.1, the modeled NNSRs are predicted to experience daytime Project-associated operation noise levels between 0 and 15 dBA. Because measured existing daytime noise levels at both of the NNSRs range from 34 to 45 dBA Leq, Project operations would not be capable of substantially increasing ambient noise levels above existing levels at the receiver locations. During nighttime periods, NNSRs are predicted to experience Project-associated BESS operation noise levels between 0 and 22 dBA, approximately 6 to 36 dBA lower than respective existing noise levels.

Thus, its contribution would result in a 0 to 1 dBA increase over existing levels, and the impact from would be less than significant per CEQA and would not have substantial adverse effects per NEPA.

Project Operation – Traffic

As discussed in Section 5.2.2, traffic associated with Project operations, which would consist of only a small quantity of vehicles on a daily basis, would not be capable of substantially increasing ambient noise levels above existing levels at the receiver locations because they are greater than 10,000 feet away. Thus, contribution from Project operations traffic would result in a 0 dBA increase over existing levels, and the impact would be less than significant per CEQA and would not have substantial adverse effects per NEPA.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project

A significant impact or substantial adverse effect would occur if Project construction or operation noise levels temporarily exceed existing ambient noise levels at the NNSR by greater than 10 dBA. Additionally, a permanent increase in ambient sound level at a sensitive receiver of greater than 5 and up to 10 dBA CNEL could be considered substantial in some cases, and thus, significant, depending on factors such as the resulting noise level, duration and frequency of noise, the number of people affected, and the land use of the affect receptor sites.

As discussed in Section 5.1.1, noise levels generated by Project construction would temporarily raise existing ambient noise levels by approximately 3 dBA. This increase is well below the 10-dBA limit. Additionally, construction activities on site will be temporary and will limit the use of heavy equipment to daytime hours; thus, the impact would be less than significant per CEQA and would not have substantial adverse effects per NEPA.

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, exposure of people residing or working in the project area to excessive noise levels

A significant impact or substantial adverse effect would occur if the Project exposed on-site employees or contractors to existing public airport noise levels in excess of OSHA noise regulations.

The Project site is not located within an airport land use plan and is located greater than 2 miles southwest of the nearest public airport (Blythe Airport). Therefore, there would be no impact or adverse effect.

f) For a project within the vicinity of a private airstrip, exposure of people residing or working in the project area to excessive noise levels

A significant impact would or substantial adverse effect occur if the Project exposed on-site employees or contractors to existing private airport noise levels in excess of OSHA noise regulations.

No private airstrips were identified within a 2-mile radius of the Project site; therefore, there would be no impact or adverse effect.

7. Recommended Mitigation Measures

No mitigation measures are needed for the proposed Project. All noise impacts analyzed resulted in either no impact, or a less than significant impact without mitigation.

8. References

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Figures

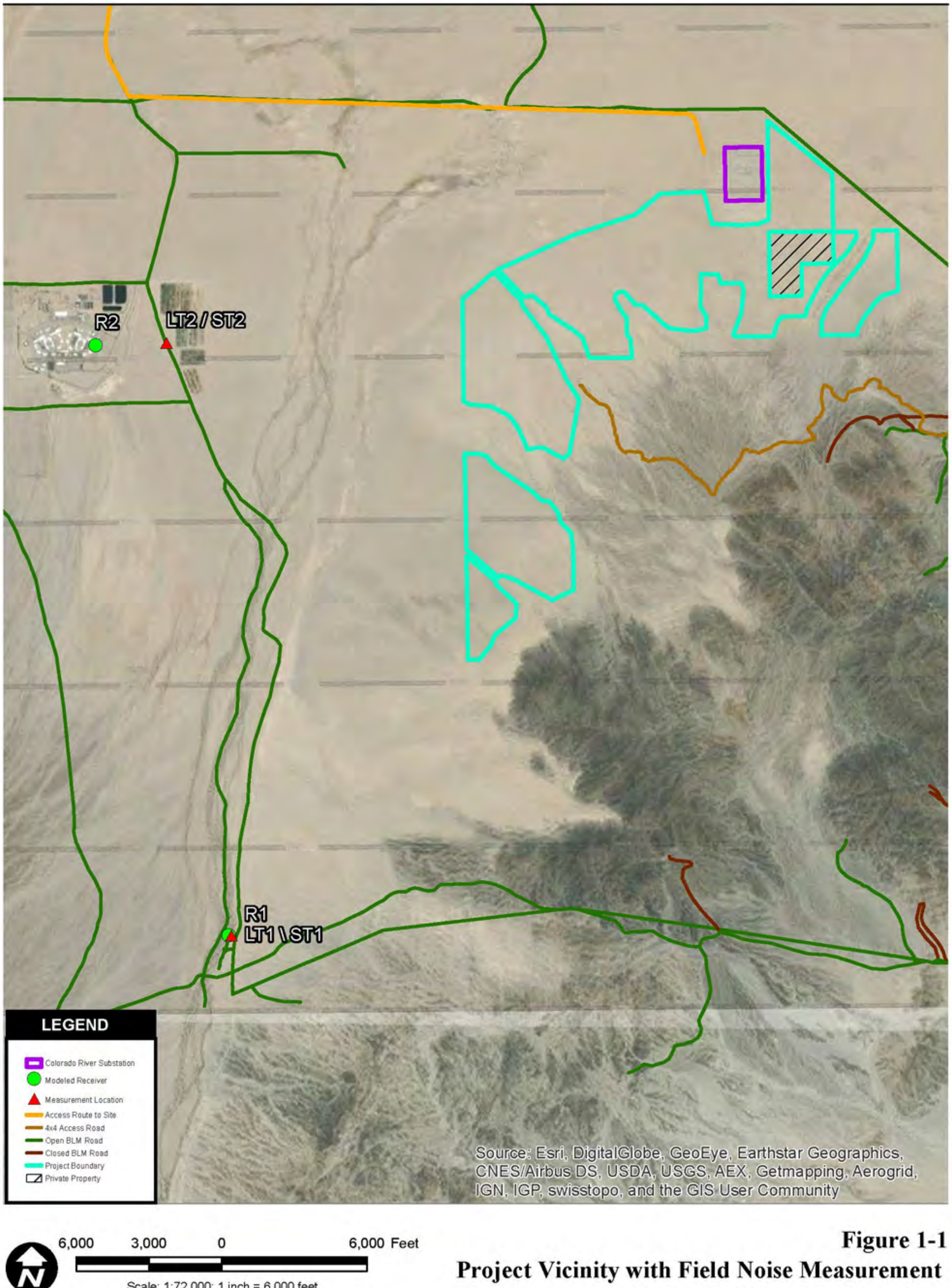

Figure 1-1
Project Vicinity with Field Noise Measurement and Modeled Receiver Locations

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Figure 2-1
Baseline Measurement Location LT1 and Modeled Representative Receiver R1

RE Crimson

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Figure 2-2
Baseline Measurement Location LT2 and Modeled Representative Receiver R2

RE Crimson

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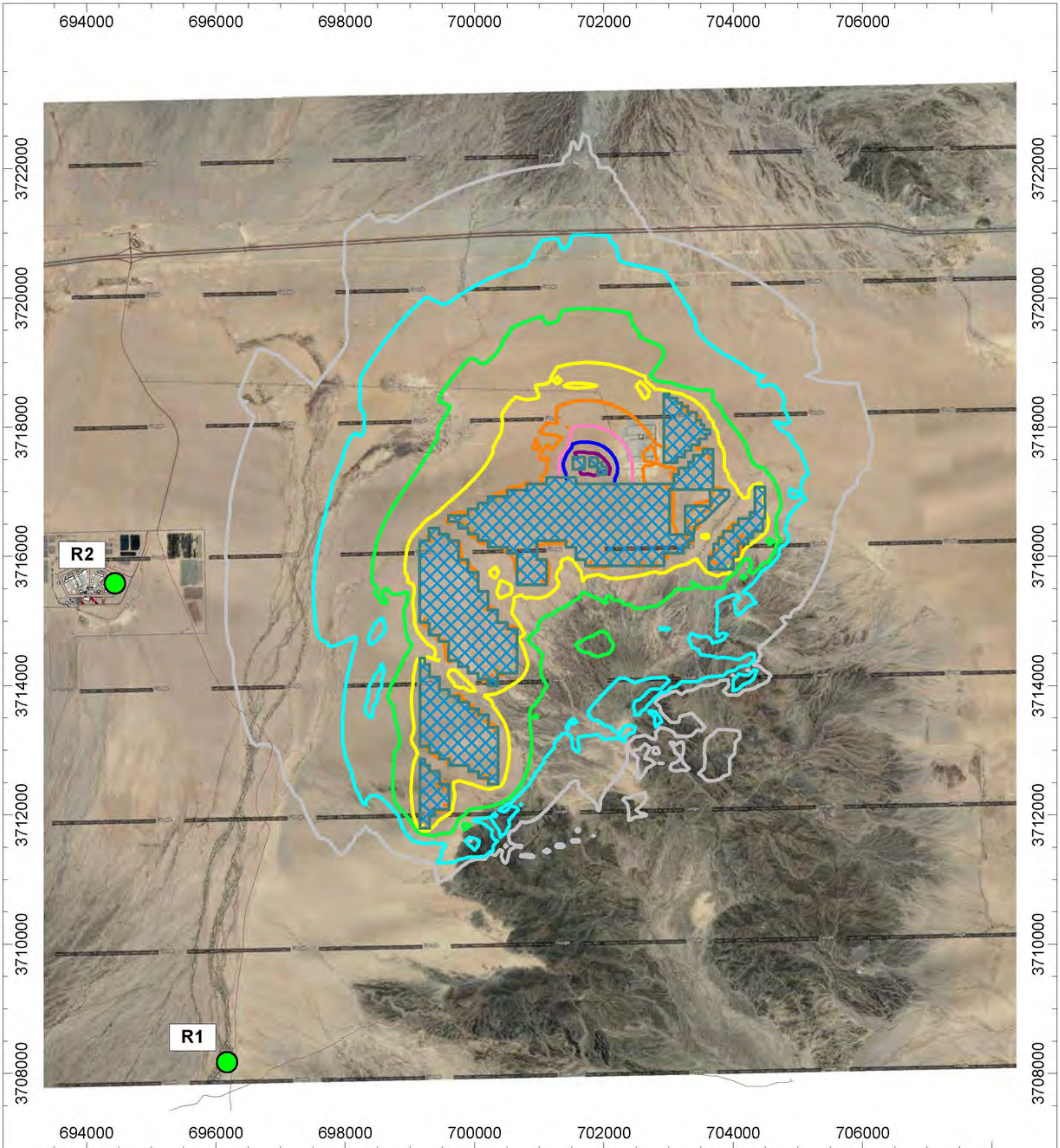

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Figure 5-1 - Design Option A
Calm Wind Conditions - ±0.5 m/s
Predicted Project Operation Noise Contours

RE Crimson Solar Project - Riverside County, CA
Sonoran West Solar Holdings, LLC

dBA, Leq

- 15 dBA
- 20 dBA
- 25 dBA
- 30 dBA
- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA

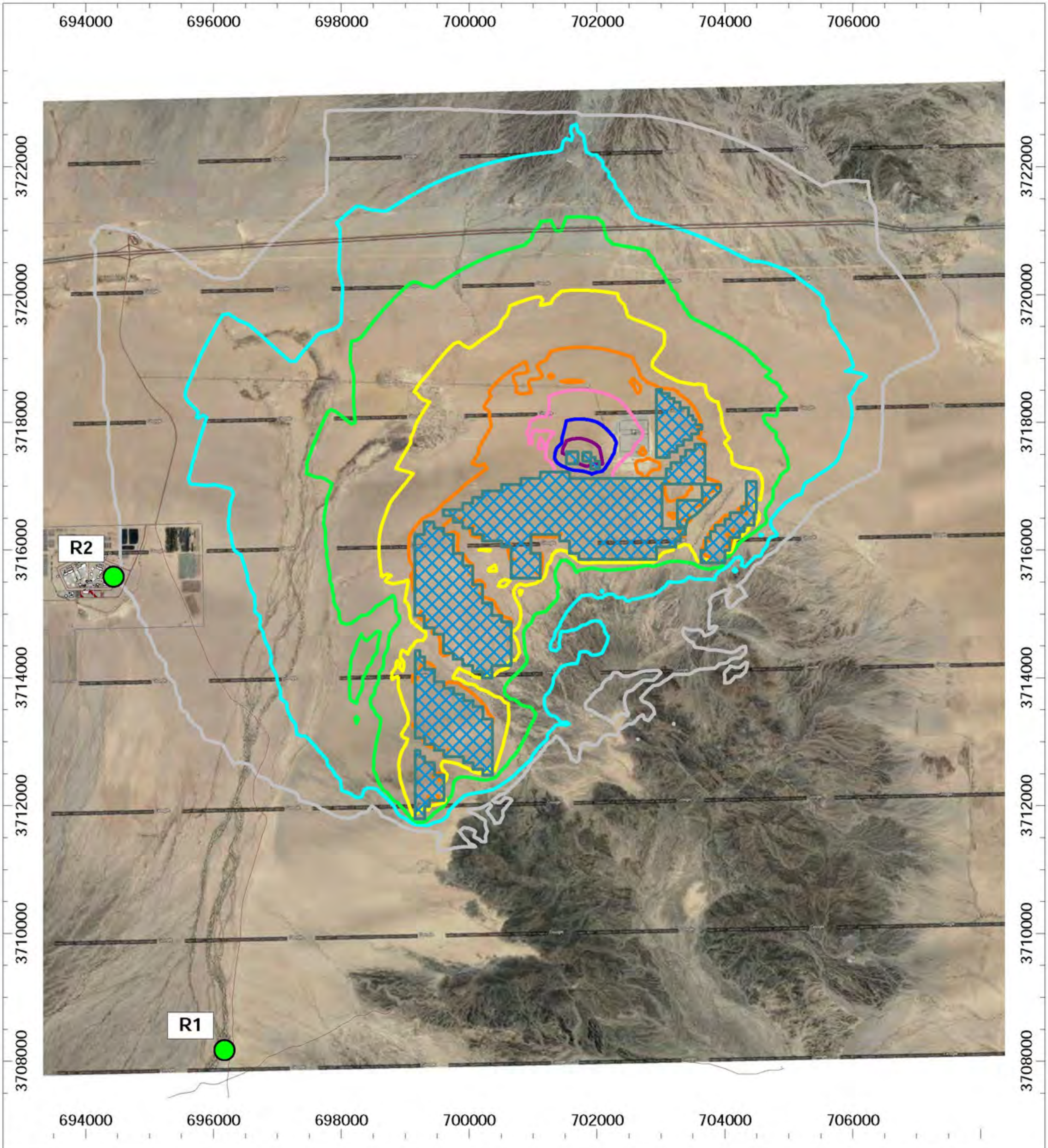

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Figure 5-2 - Design Option A
Prevailing Wind A - 170° at 5 m/s
Predicted Project Operation Noise Contours

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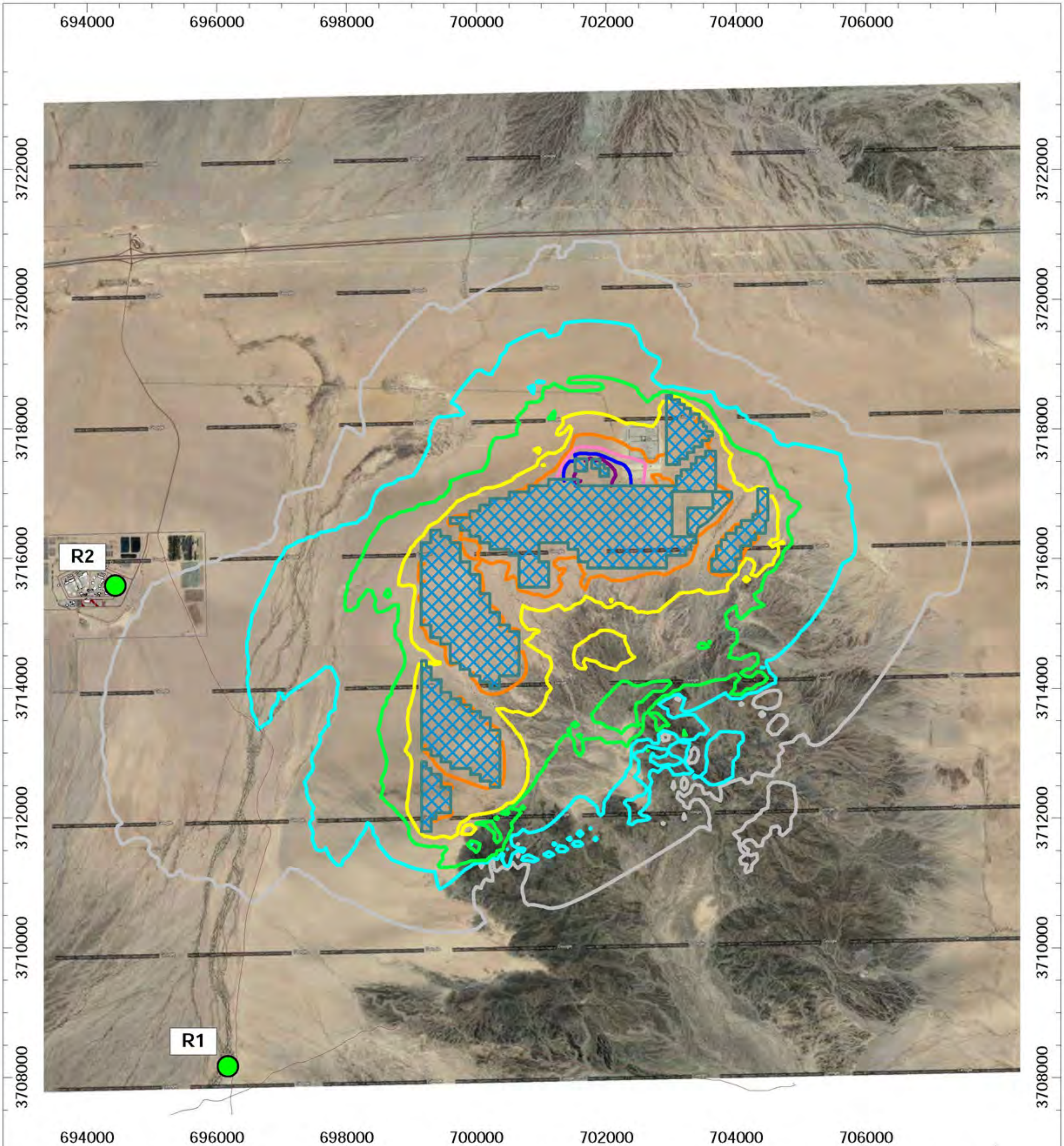

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Figure 5-3 - Design Option A
Prevailing Wind B - 350° at 6 m/s
Predicted Project Operation Noise Contours

dBA, Leq

15 dBA
20 dBA
25 dBA
30 dBA
35 dBA
40 dBA
45 dBA
50 dBA

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Sonoran West Solar Holdings, LLC

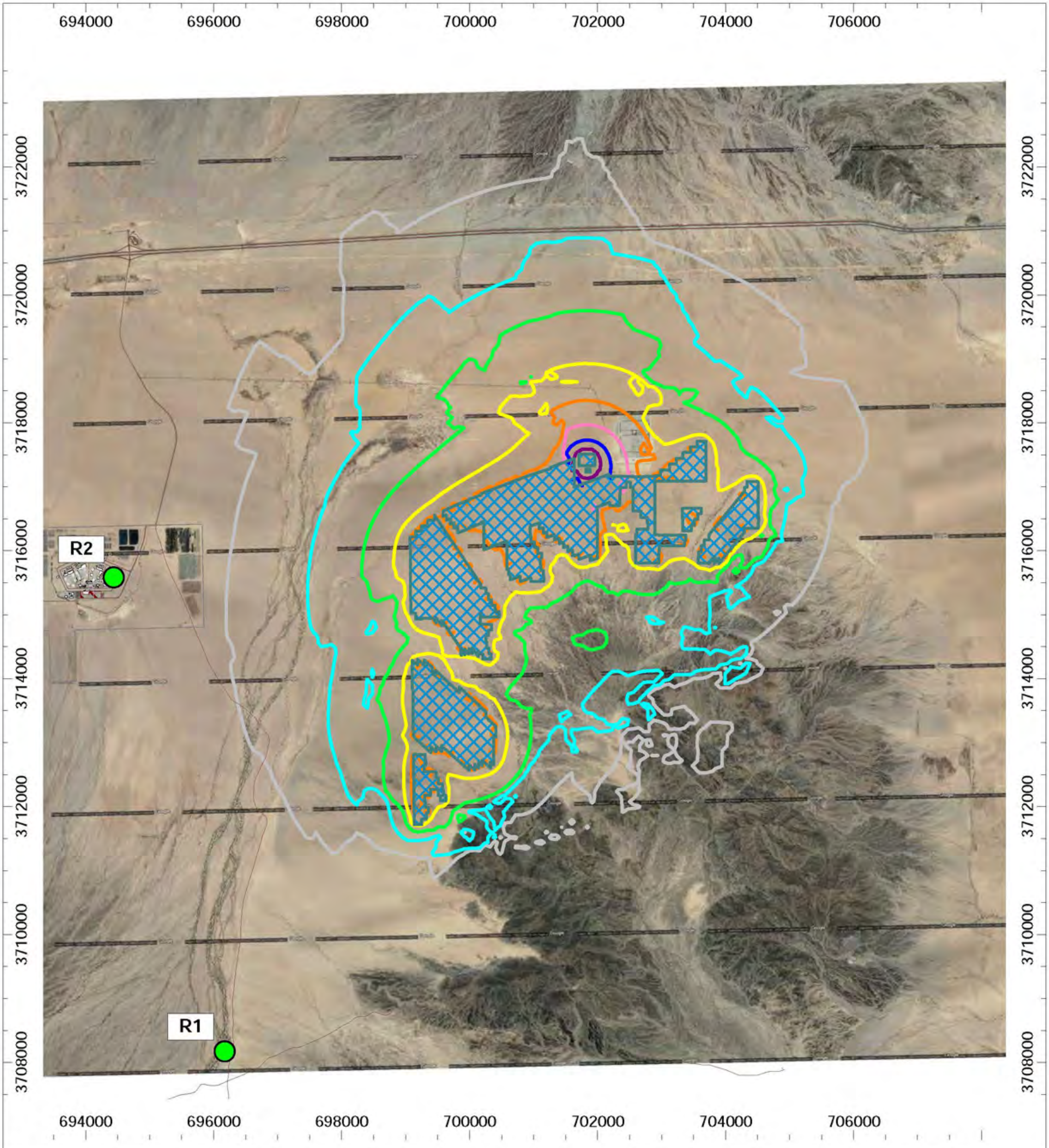

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Figure 5-4 - Design Option B
Calm Wind Conditions - ±0.5 m/s
Predicted Project Operation Noise Contours

RE Crimson Solar Project - Riverside County, CA
Sonoran West Solar Holdings, LLC

dBA, Leq

15 dBA
20 dBA
25 dBA
30 dBA
35 dBA
40 dBA
45 dBA
50 dBA

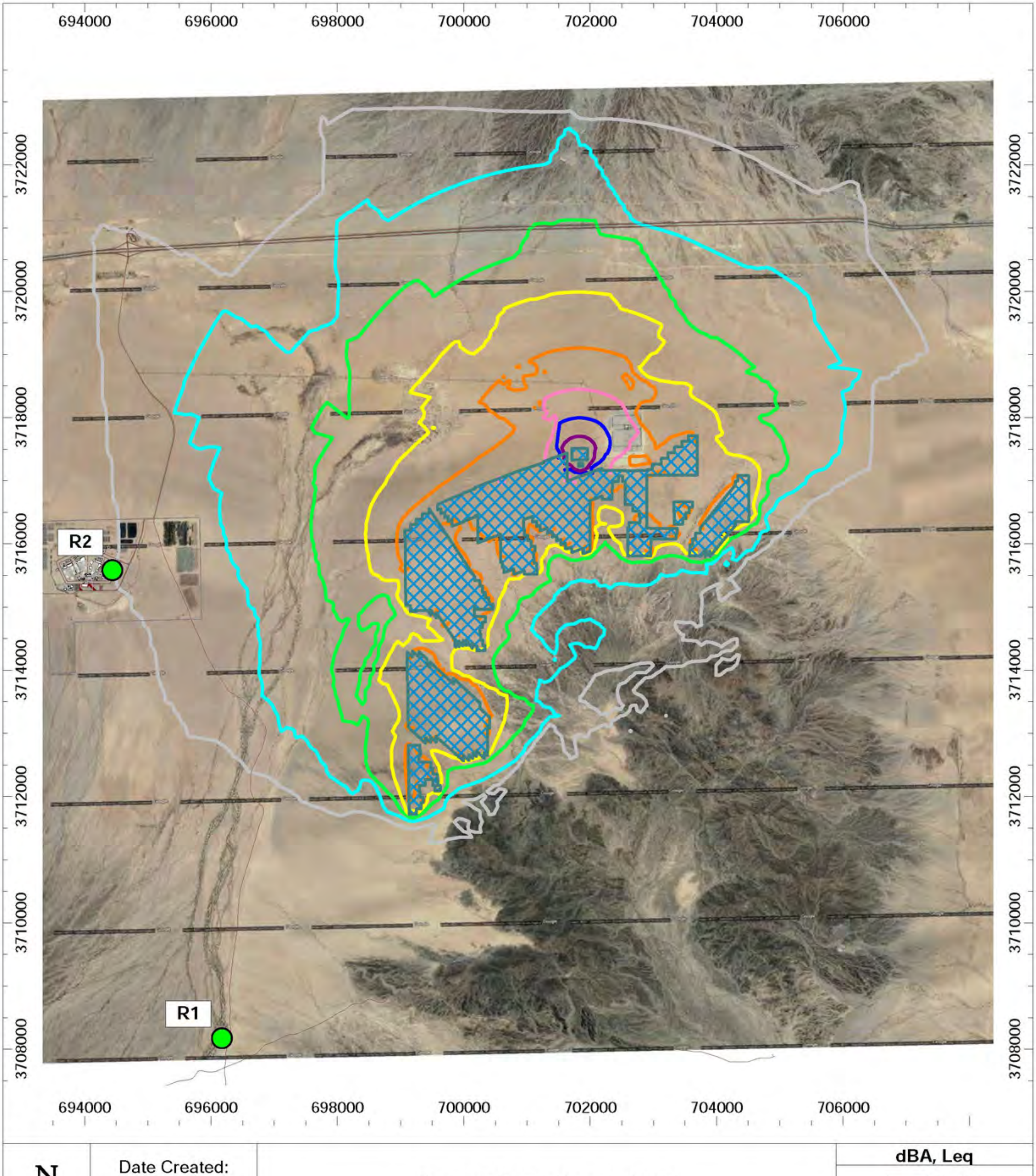

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Figure 5-5 - Design Option B
Prevailing Wind A - 170° at 5 m/s
Predicted Project Operation Noise Contours

dBA, Leq

- 15 dBA
- 20 dBA
- 25 dBA
- 30 dBA
- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA

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Sonoran West Solar Holdings, LLC

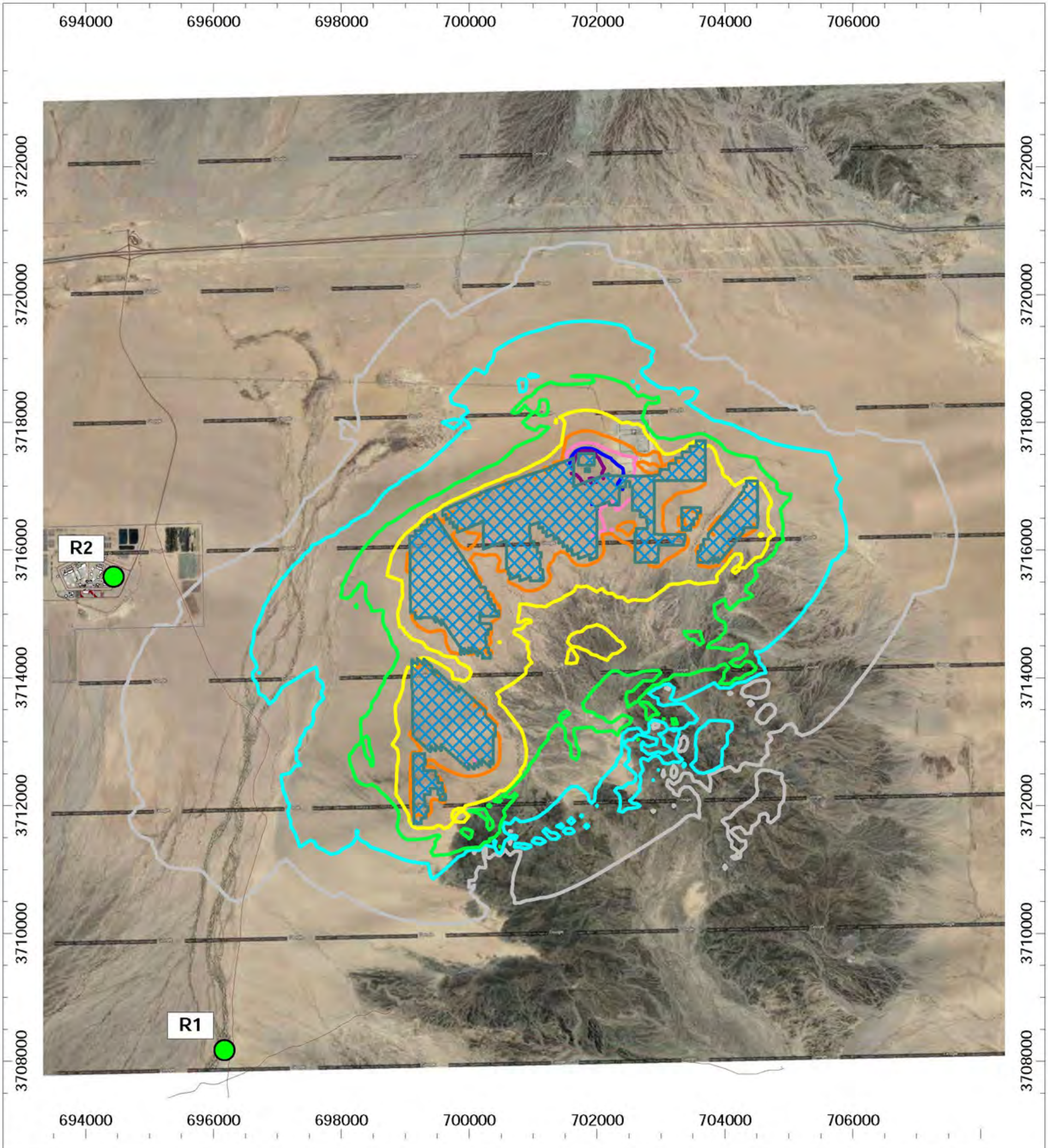

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Figure 5-6 - Design Option B
Prevailing Wind B - 350° at 6 m/s
Predicted Project Operation Noise Contours

RE Crimson Solar Project - Riverside County, CA
Sonoran West Solar Holdings, LLC

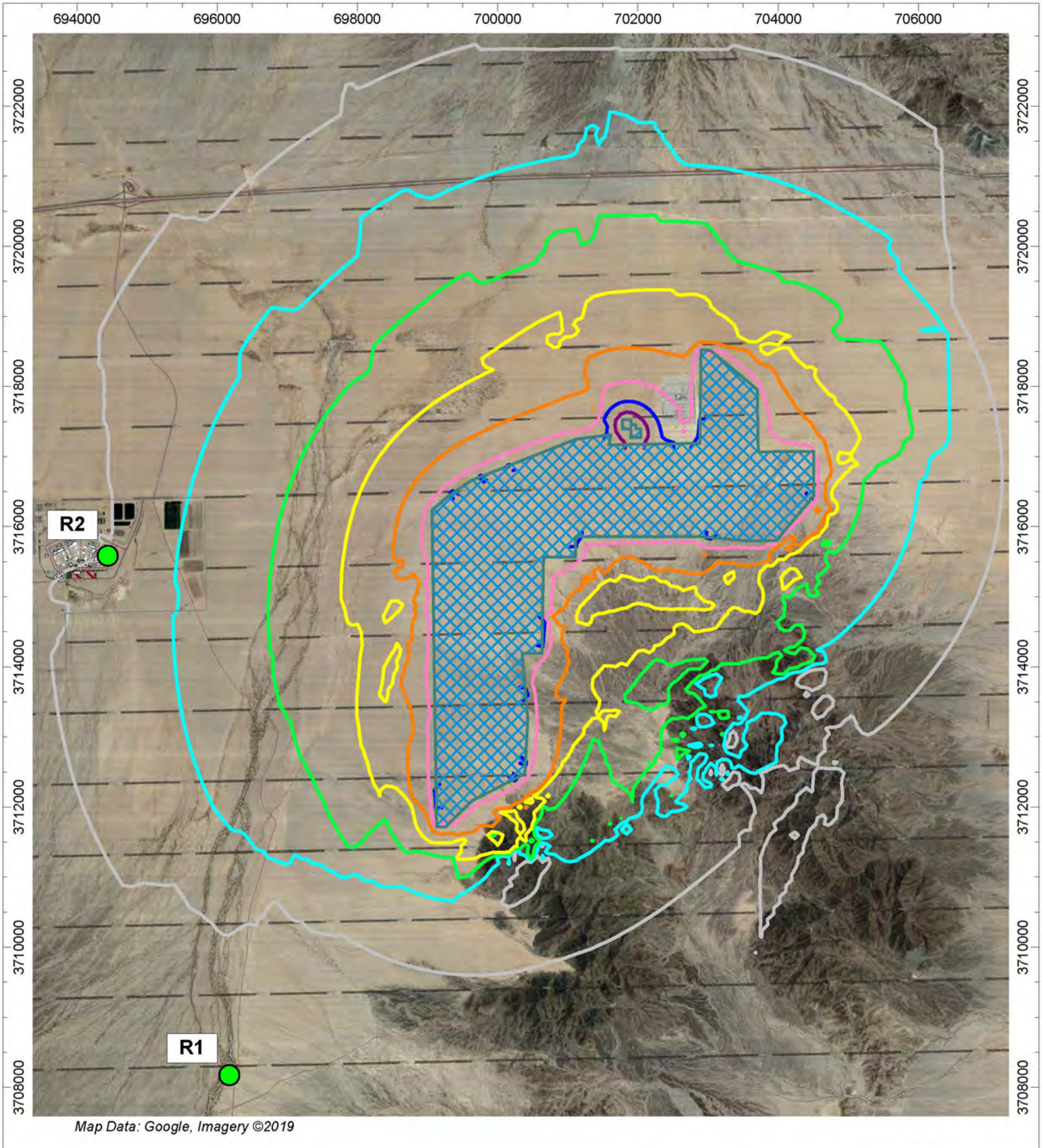

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Figure 5-7 - Dispersed BESS Operations

Calm Wind Conditions - ±0.5 m/s
Predicted Project Operation Noise Contours

RE Crimson Solar Project - Riverside County, CA
Sonoran West Solar Holdings, LLC

Noise Contour (dBA, SPL)
15 dBA
20 dBA
25 dBA
30 dBA
35 dBA
40 dBA
45 dBA
50 dBA

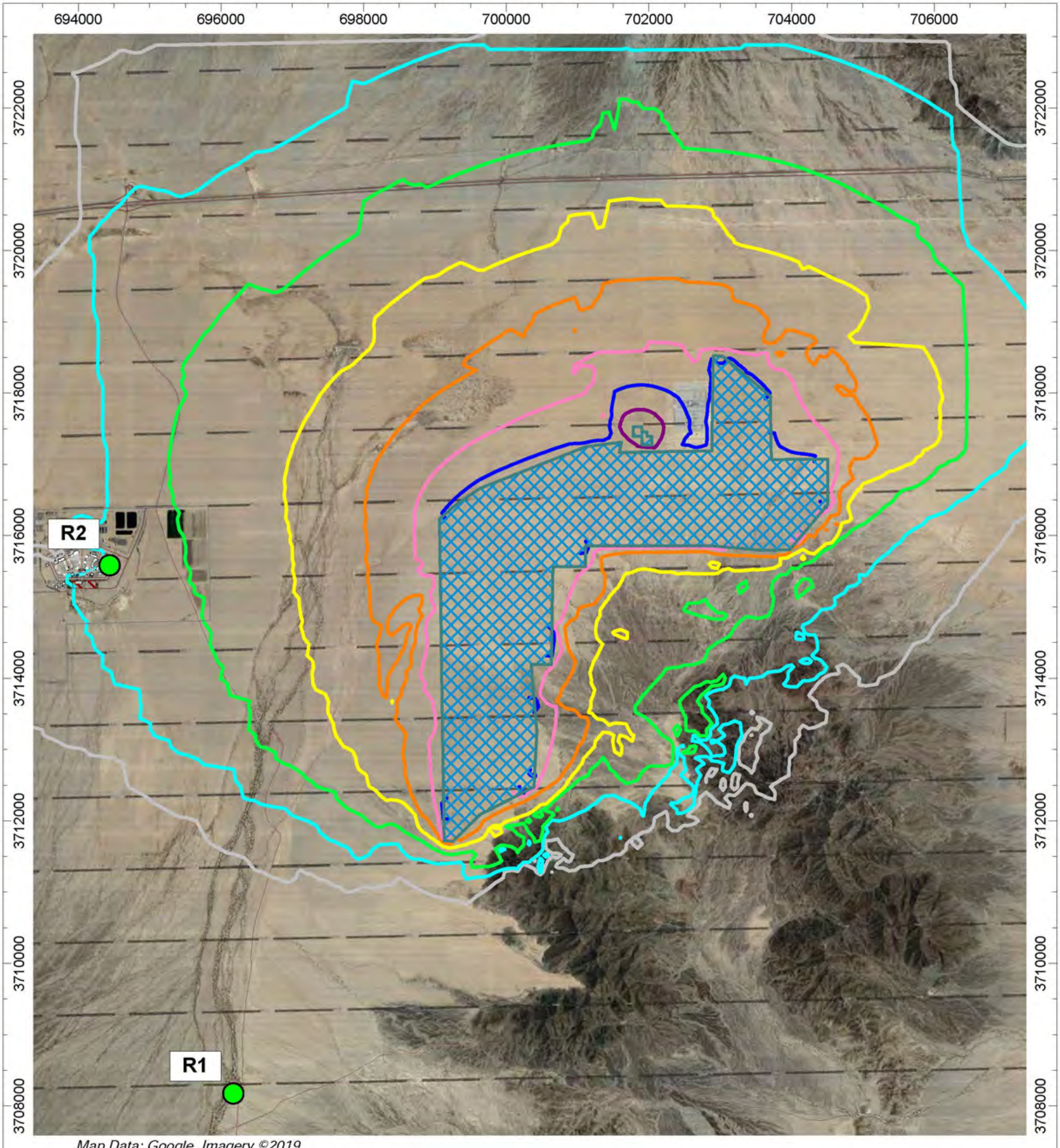

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Figure 5-8 - Dispersed BESS Operations

Prevailing Wind A - 180° at 5 m/s
Predicted Project Operation Noise Contours

RE Crimson Solar Project - Riverside County, CA
Sonoran West Solar Holdings, LLC

Noise Contour (dBA, SPL)

- 15 dBA
- 20 dBA
- 25 dBA
- 30 dBA
- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA

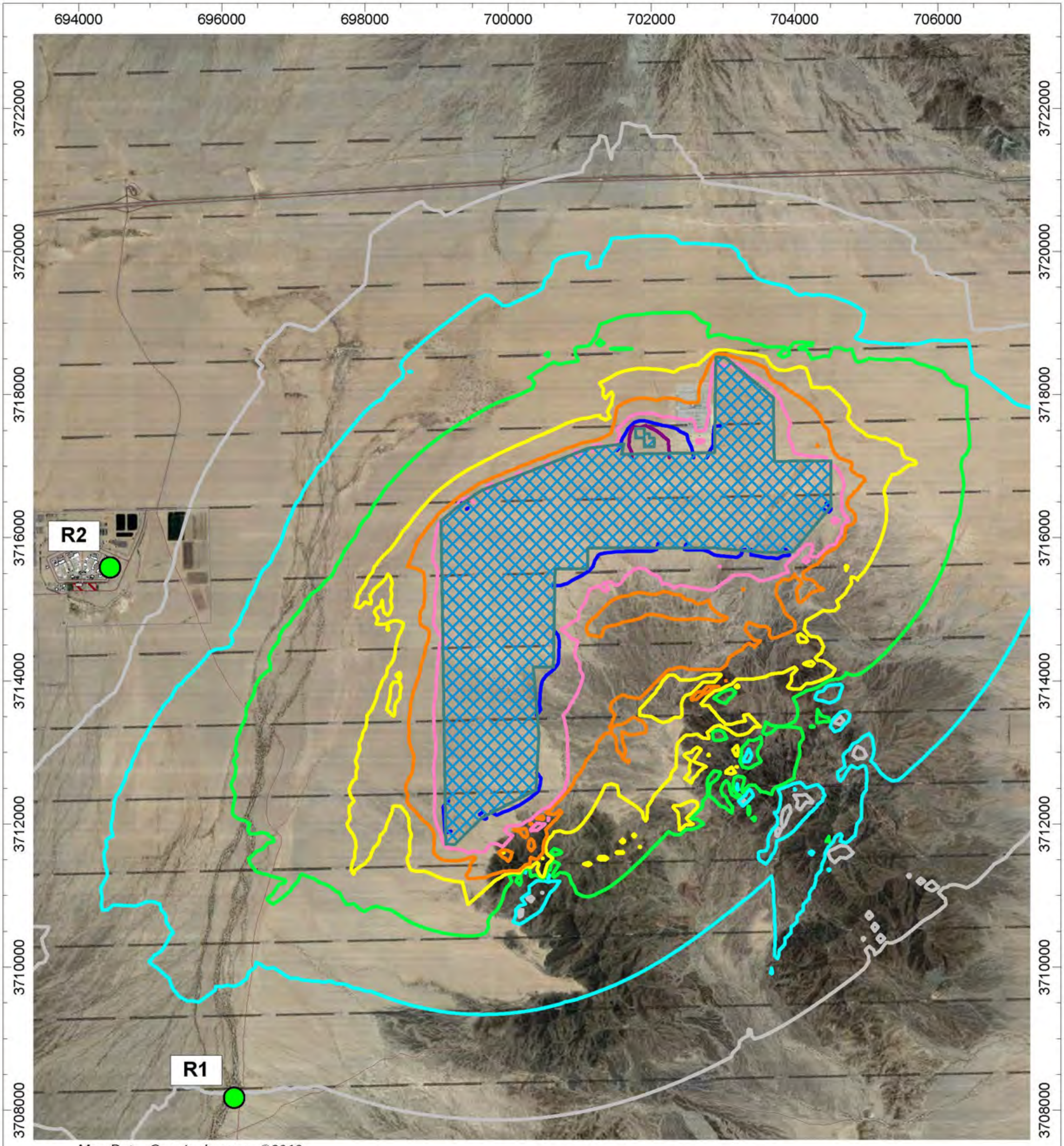

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Figure 5-9 - Dispersed BESS Operations

Prevailing Wind B - 338° at 5 m/s
Predicted Project Operation Noise Contours

RE Crimson Solar Project - Riverside County, CA
Sonoran West Solar Holdings, LLC

Noise Contour (dBA, SPL)

- 15 dBA
- 20 dBA
- 25 dBA
- 30 dBA
- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA

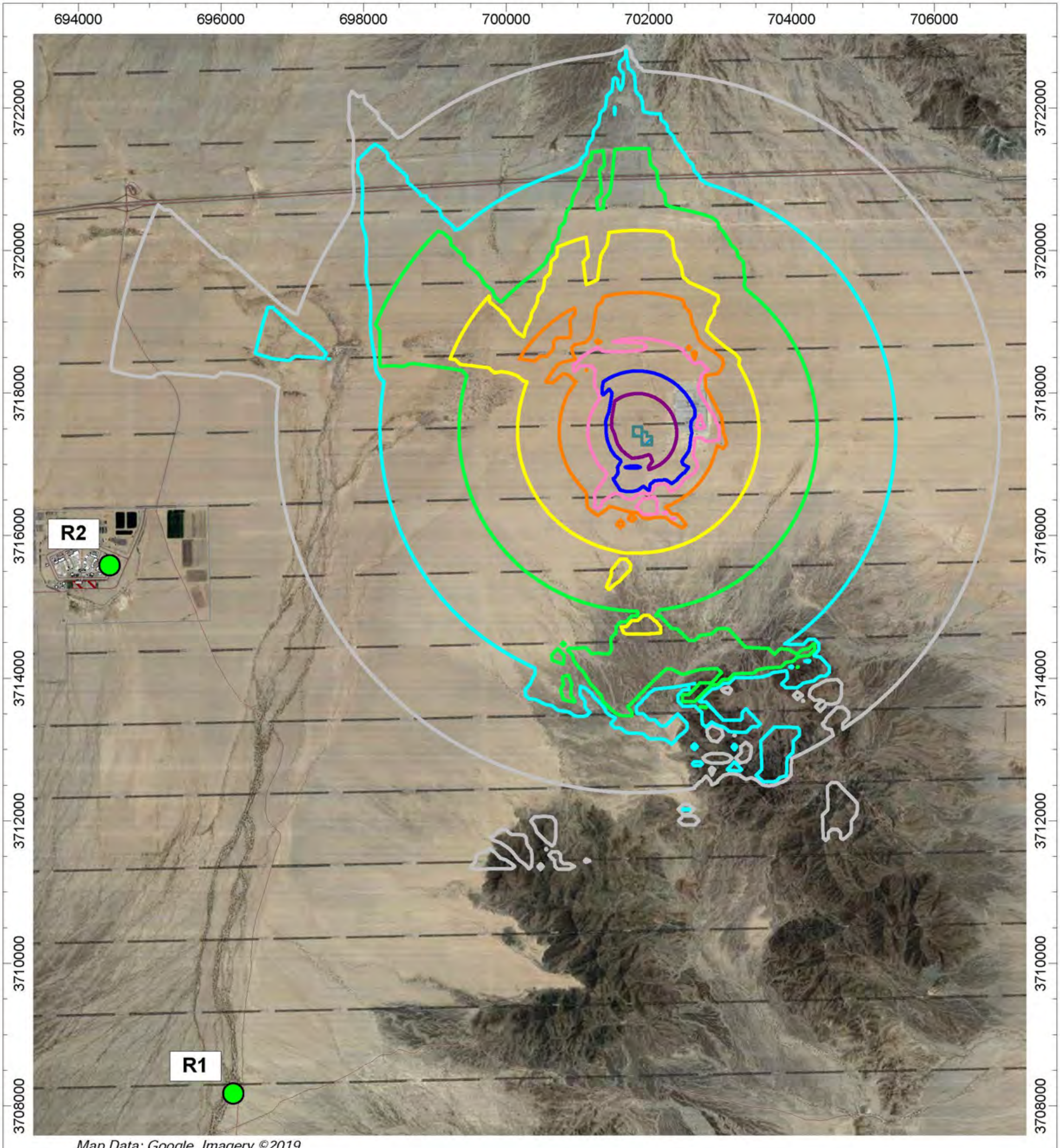

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Figure 5-10 - Concentrated BESS Operations

Calm Wind Conditions - ±0.5 m/s
Predicted Project Operation Noise Contours

RE Crimson Solar Project - Riverside County, CA
Sonoran West Solar Holdings, LLC

Noise Contour (dBA, SPL)

- 15 dBA
- 20 dBA
- 25 dBA
- 30 dBA
- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA

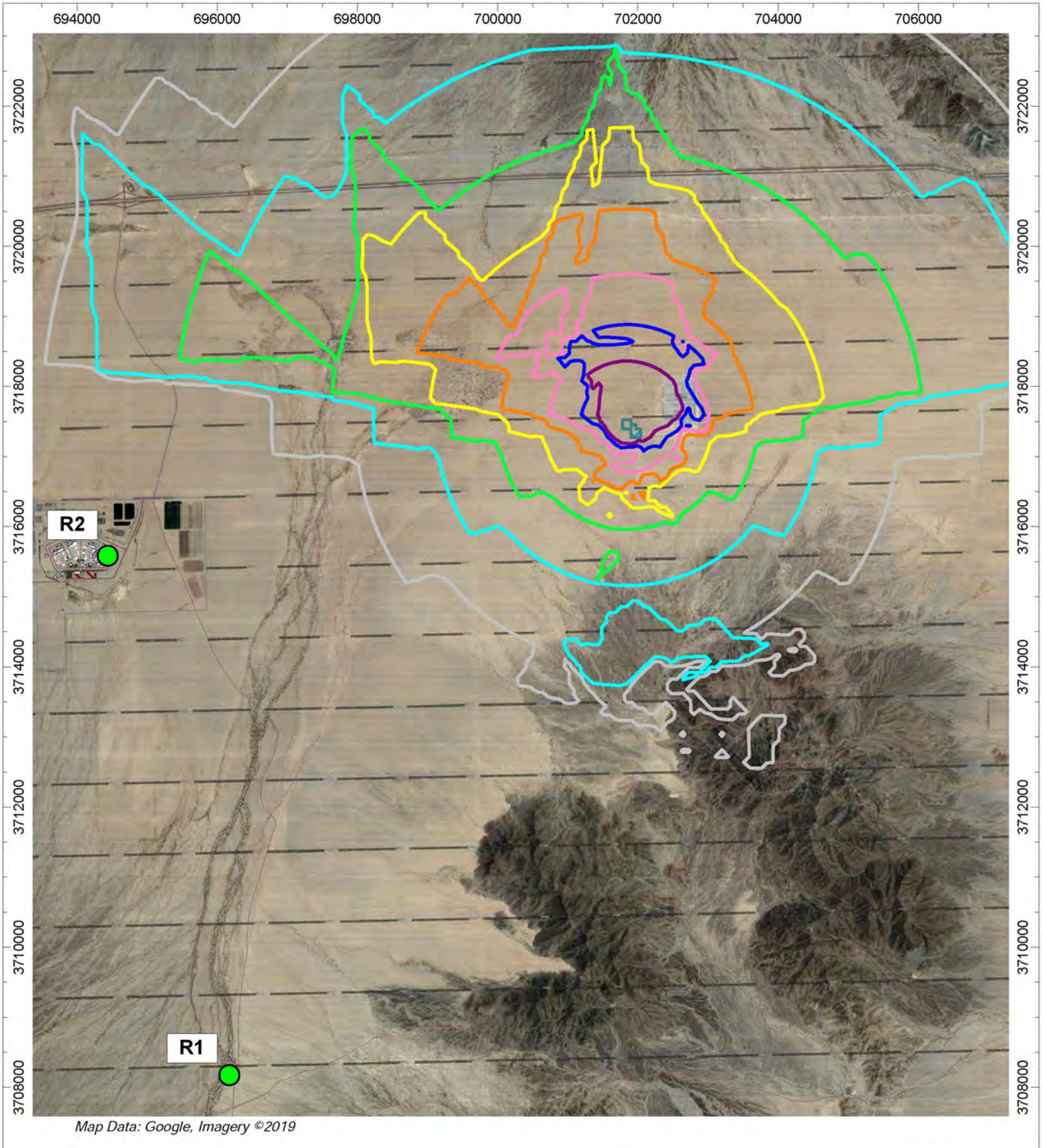

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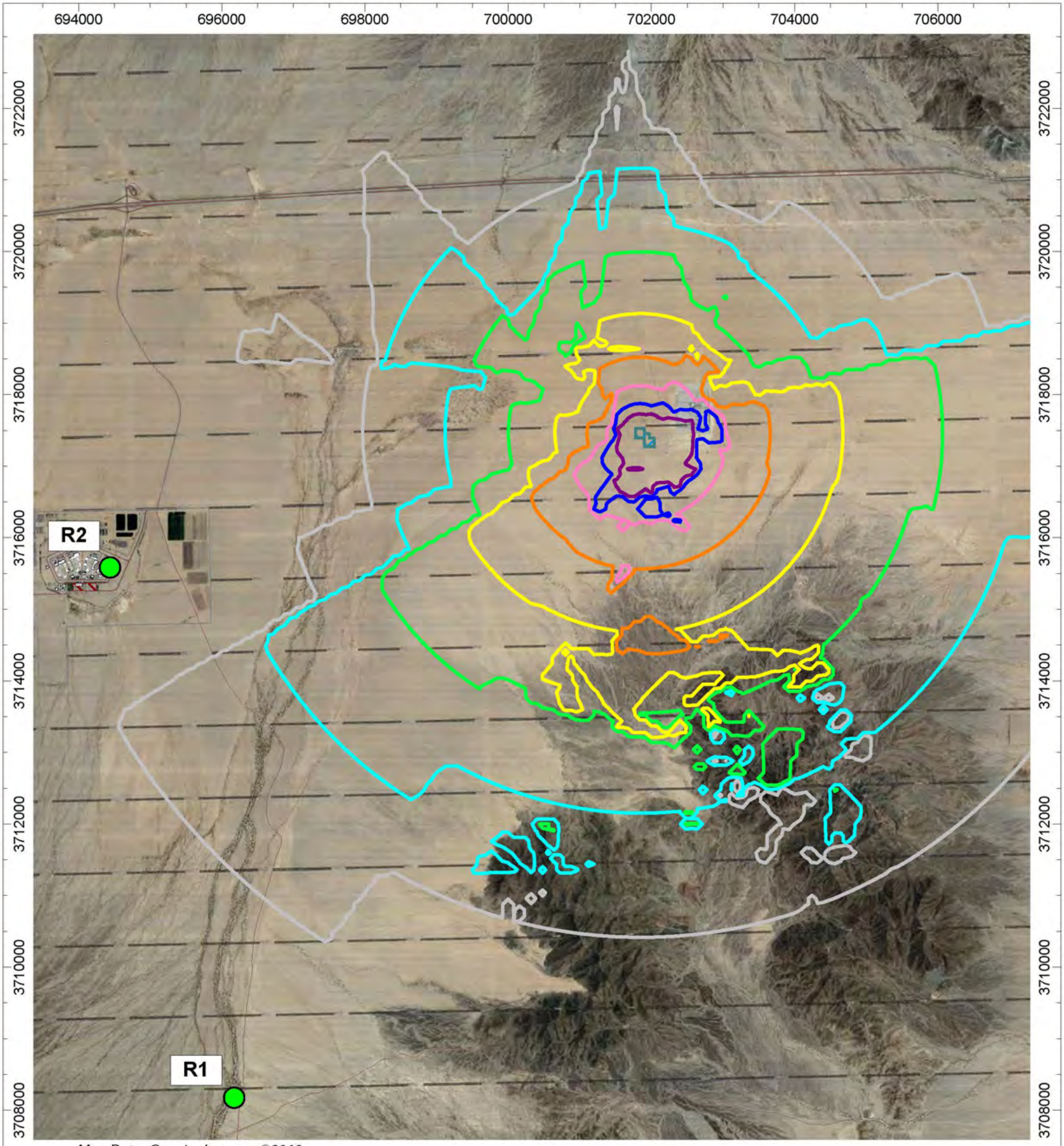
Figure 5-11 - Concentrated BESS Operations

Prevailing Wind A - 180° at 5 m/s
Predicted Project Operation Noise Contours

RE Crimson Solar Project - Riverside County, CA
Sonoran West Solar Holdings, LLC

Noise Contour (dBA, SPL)
15 dBA
20 dBA
25 dBA
30 dBA
35 dBA
40 dBA
45 dBA
50 dBA



Map Data: Google, Imagery ©2019

N	Date Created: 03/07/2019	**Figure 5-12 - Concentrated BESS Operations** **Prevailing Wind B - 338° at 5 m/s** **Predicted Project Operation Noise Contours**	**Noise Contour (dBA, SPL)** 15 dBA 20 dBA 25 dBA 30 dBA 35 dBA 40 dBA 45 dBA 50 dBA
	Created by: CK		
AECOM Imagine it. Delivered. **Acoustics & Noise Control Practice**		**RE Crimson Solar Project - Riverside County, CA** **Sonoran West Solar Holdings, LLC**	

Appendix A

Modeled Sources

Construction Traffic Noise Data

Distance to Nearest CVSP Receiver (ft):	10000

Estimated Maximum Vehicles
(Between Site Prep & PV Install)

Vehicle Type	Quantity
Module Delivery	10
Foundation Delivery	10
Water Deliveries - 10,000-gal	14
Employee Auto	427

Construction Traffic TNM Inputs

Peak-Hour Leq, dBA

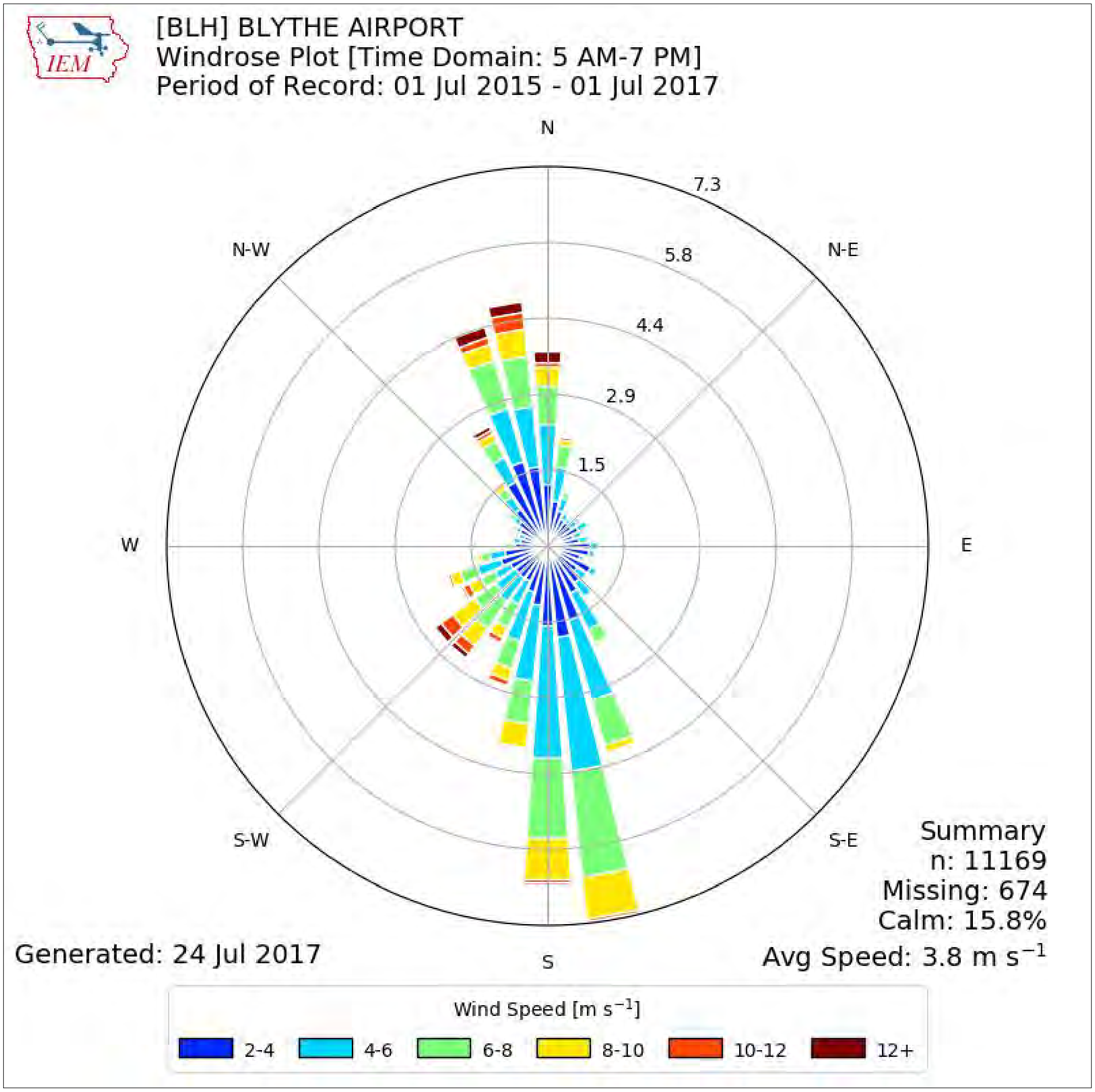
Vehicle Type	Quantity	Speed	Predicted Leq at 500'	Peak Hour Leq Extrapolated to CVSP
Auto	320	45	42.0	1.2
MT	2	45		
HT	3	45		

CNEL (7 a.m. to 7 p.m.)

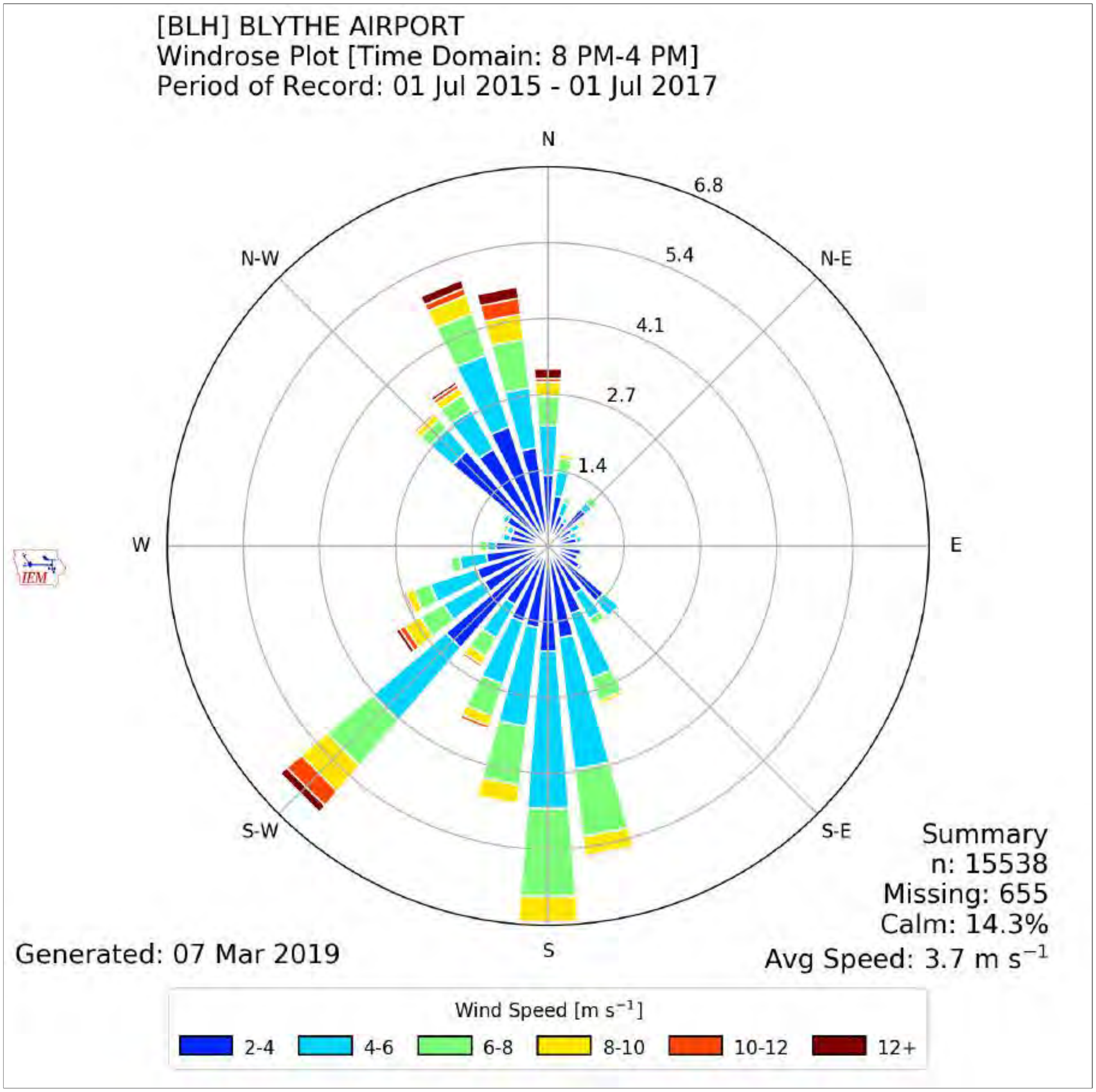
Vehicle Type	Quantity	Speed	Calculated CNEL at 500'	Calculated CNEL Extrapolated to CVSP
Auto	641	45	45.5	4.7
MT	28	45		
HT	40	45		

Construction Equipment Quantities and Reference Sound Pressure Levels

Equipment	RCNM acoustical usage factor (%)	RCNM or FTA 2018 Lmax @ 50ft (Measured)	Quantity in Use	Hourly Leq, dBA @ 50 ft
Month 17 of Construction (Highest Equipment Quantities For Entire Construction Period)				
5 CY Dump Truck	0.4	76	1	72.0
Air Compressor	0.4	80	2	79.0
Backhoe/Excavator	0.4	80	7	84.5
Cable Trencher	0.4	80	1	76.0
Compactor	0.2	82	1	75.0
Crane	0.16	83	5	82.0
Crawler Tractor	0.4	84	1	80.0
Dozer (D6)	0.4	85	1	81.0
Forklift	0.4	80	23	89.6
Generator (45 kW)	0.5	82	5	86.0
Loader	0.4	80	2	79.0
Man Lift	0.2	75	1	68.0
Motor Grader	0.4	85	4	87.0
Post Machine	0.2	95	14	99.5
Roller/Vibrator/Padder	0.2	85	3	82.8
Scraper	0.4	85	4	87.0
Skid Steer	0.4	84	23	93.6
Tractor	0.4	84	1	80.0
Truck, flatbed (onroad)	0.4	74	6	77.8
Water Pull	0.4	84	2	83.0
Water Pump	0.5	77	2	77.0
Water Truck	0.4	74	14	81.5
Wire Truck	0.4	74	1	70.0
			Aggregate Leq, dBA at 50 Feet:	101.8



Source: Iowa State Universty, Iowa Environmental Mesonet



Source: Iowa State Universty, Iowa Environmental Mesonet

Individual Modeled Source Power Levels for Project Operation

Design Option	Source	31.5	63	125	250	500	1000	2000	4000	8000	Total PWL
		Unweighted Octave-Band (Hertz) Power Level									
A/B	Inverter - 500kW	-	75	82	74	73	70	65	62	67	84
A	Standard Transformer - 2.5MVA	72	78	80	75	75	69	64	59	52	84
B	Standard Transformer - 4MVA	75	81	83	78	78	72	67	62	55	87
A/B	Substation Transformer - 350MVA	103	109	111	106	106	100	95	90	83	115
A/B	Power Conversion System - 250 kW	75	81	83	78	78	72	67	62	55	87
A/B	HVAC Unit	70	73	79	80	79	77	76	70	68	86

Appendix B

Fundamentals of Noise

FUNDAMENTALS OF NOISE

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity and that interferes with or disrupts normal activities. Although prolonged exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise, and its appropriateness in the setting; the time of day and the type of activity during which the noise occurs; and the sensitivity of the individual.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the pitch of the sound and is measured in Hertz (Hz), while intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above approximately 110 dB begin to be felt inside the human ear as discomfort and eventually pain at 120 dB and higher levels. The minimum change in the sound level of individual events that an average human ear can detect is about 1 to 2 dB. A 3 to 5 dB change is readily perceived. An increase in sound level of about 10 dB is usually perceived by the average person as a doubling (or if decrease of 10 dB, halving) of the sound's loudness.

Due to the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically; however, some simple rules are useful in dealing with sound levels. For instance, if a sound's energy is doubled, the sound level increases by 3 dB, regardless of the initial sound level. By way of example: 60 dB + 60 dB = 63 dB, and 80 dB + 80 dB = 83 dB.

Sound level is usually expressed by reference to a known standard. This report refers to SPL and sound power level (PWL). In expressing sound pressure on a logarithmic scale, the sound pressure is compared to a reference value of 20 micropascals. SPL depends not only on the power of the source, but also on the distance from the source and on the acoustical characteristics of the space surrounding the source. PWL, on the other hand, is independent of these environmental factors. To help distinguish the two descriptors, one may use a lighting analogy: the wattage of a light bulb when turned on inside a large room may be a constant 100 watts, but the brightness or intensity of the light changes with receptor distance and other parameters. For example, if the room walls were painted white, which is reflective, they would make the room appear brighter. On the other hand, walls painted black (a light-absorptive color) would decrease apparent brightness.

Hz is a measure of how many times each second the crest of a sound pressure wave passes a fixed point. For example, when a drummer beats a drum, the skin of the drum vibrates a number of times per second. When the drum skin vibrates 100 times per second it generates a sound pressure wave that is oscillating at 100 Hz, and this pressure oscillation is perceived by the ear/brain as a tonal pitch of 100 Hz. Sound frequencies between 20 and 20,000 Hz are within the range of sensitivity of the best human ear.

Sound from a tuning fork contains a single frequency (a pure tone), but most sounds one hears in the environment do not consist of a single frequency and instead are composed of a broad band of frequencies differing in sound level. The method commonly used to quantify environmental sounds consists of evaluating all frequencies of a sound according to a weighting system that reflects the typical frequency-dependent sensitivity of average healthy human hearing. This is called "A-weighting," and the sound level measured is in A-weighted decibels (dBA). In practice, the level of a noise source is measured using a sound level meter that includes a filter corresponding to the dBA curve of decibel adjustment per octave band center frequency to a flat, or unweighted SPL.

Although sound level value may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a mixture of noise from distant sources that creates a relatively steady background noise in which no particular source is identifiable. A single descriptor called the equivalent sound level (L_{eq}) may be used to describe sound that is changing in level. L_{eq} is the energy-averaged sound level during a measured time interval. It is the equivalent constant sound level that would have to be produced by a given source to equal the acoustic energy contained in the fluctuating sound level measured. In addition to the energy-average level, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the maximum sound level (L_{max}) and minimum sound level

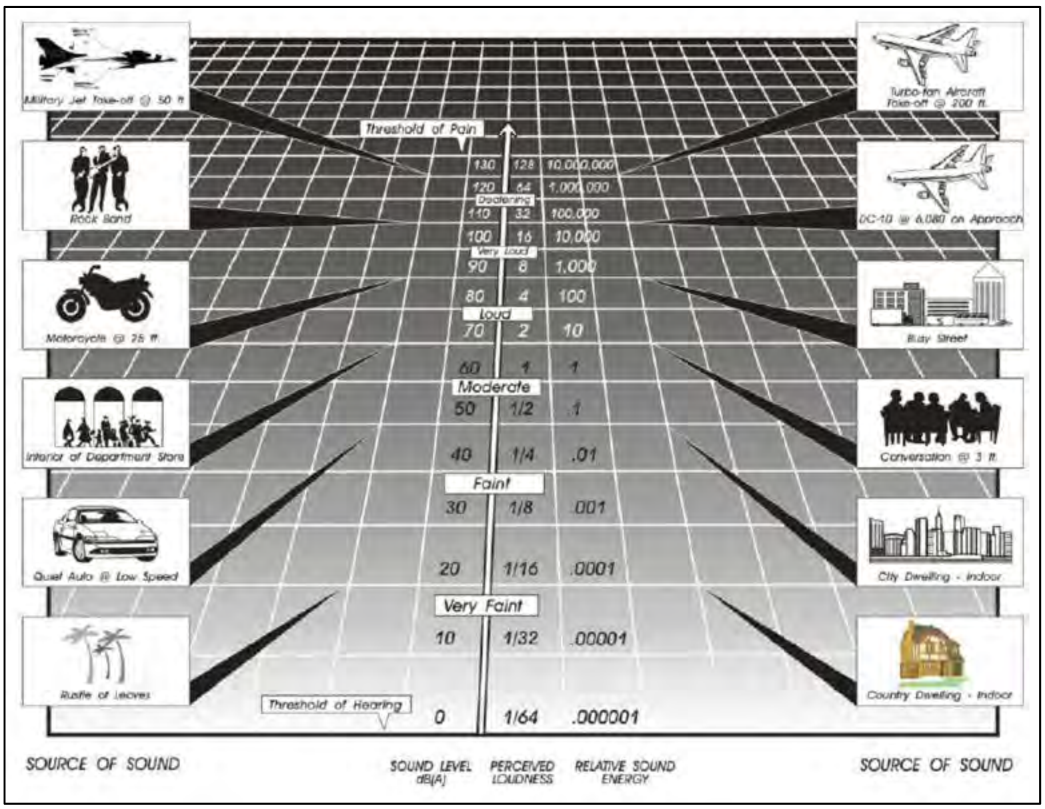
(L_{min}) indicators that represent the root-mean-square maximum and minimum noise levels measured during the monitoring interval. The L_{min} value obtained for a particular monitoring location is often called the acoustic floor for that location.

To describe the time-varying character of environmental noise, the statistical noise descriptors L_{10}, L_{50}, and L_{90} are commonly used. They are the noise levels exceeded 10 percent, 50 percent, and 90 percent of the measured time interval. Sound levels associated with the L_{10} typically describe transient or short-term events. Half of the sounds during the measurement interval are softer than L_{50} and half are louder, so it is often called the "median" sound level. Levels associated with L_{90} often describe background noise conditions and/or continuous, steady-state sound sources.

One common way to assess average noise level over a complete diurnal cycle is a sound descriptor known as the day-night average noise level (L_{dn}), defined as the A-weighted average sound level for a 24-hour day with a 10-dB penalty added to nighttime sound levels (10:00 p.m. to 7:00 a.m.) in order to compensate for increased sensitivity to noise during usually quieter nighttime hours. Note that because of the applied nighttime penalty, this L_{dn} value is different from an L_{eq} representing a continuous 24-hour period.

Sound levels of typical noise sources and environments are given in Figure A-1 to provide a frame of reference for the range of decibel values one may hear.

FIGURE A-1
SOUND PRESSURE LEVELS OF TYPICAL NOISE SOURCES
AND NOISE ENVIRONMENTS



Source: County of Riverside General Plan (2014).

Appendix C

Baseline Measurement Survey Data

Date	Time	Leq	Lmin	Lmax	L(10)	L(50)	L(90)
2016-12-04	16:00	43.8	25.6	57.2	47.3	37.3	28.1
2016-12-04	16:05	24.8	21.5	31.2	26.8	24.1	22.4
2016-12-04	16:10	24.7	21.8	30.8	26.7	24.0	22.4
2016-12-04	16:15	24.2	20.5	41.1	25.7	22.4	21.1
2016-12-04	16:20	23.4	20.5	37.4	24.7	22.1	21.1
2016-12-04	16:25	37.4	21.7	49.7	40.2	28.0	22.8
2016-12-04	16:30	30.3	21.4	40.8	34.3	25.0	22.2
2016-12-04	16:35	24.2	20.8	29.2	25.7	23.9	22.4
2016-12-04	16:40	26.0	21.0	34.0	29.5	23.6	21.8
2016-12-04	16:45	29.3	21.9	31.8	30.6	29.4	28.2
2016-12-04	16:50	39.8	29.0	54.9	40.2	30.7	29.3
2016-12-04	16:55	34.7	29.1	47.6	36.5	31.3	29.6
2016-12-04	17:00	30.8	29.2	36.0	31.5	30.4	29.4
2016-12-04	17:05	30.3	29.4	32.0	31.1	30.3	29.4
2016-12-04	17:10	30.3	29.3	31.6	30.9	30.4	29.4
2016-12-04	17:15	25.7	20.6	31.1	30.4	22.4	21.2
2016-12-04	17:20	27.5	21.0	35.5	31.1	25.7	22.2
2016-12-04	17:25	24.7	21.1	33.8	27.6	22.8	21.8
2016-12-04	17:30	24.2	21.6	31.1	26.2	23.2	22.1
2016-12-04	17:35	24.1	21.9	26.1	25.0	24.1	23.0
2016-12-04	17:40	23.4	20.7	29.3	24.8	23.2	21.6
2016-12-04	17:45	21.1	20.0	23.6	21.9	21.2	20.2
2016-12-04	17:50	21.3	20.0	23.4	22.3	21.2	20.2
2016-12-04	17:55	20.8	19.8	24.1	21.8	20.8	20.1
2016-12-04	18:00	23.5	20.0	30.5	25.8	22.9	21.1
2016-12-04	18:05	28.8	19.4	39.4	34.2	21.0	19.5
2016-12-04	18:10	37.4	32.9	41.6	40.5	36.6	33.7
2016-12-04	18:15	35.1	22.6	42.1	37.3	33.8	32.3
2016-12-04	18:20	22.2	20.5	37.4	22.7	21.5	20.6
2016-12-04	18:25	22.2	20.3	25.6	23.8	21.7	20.5
2016-12-04	18:30	25.1	20.2	33.5	29.8	21.8	20.7
2016-12-04	18:35	21.4	20.2	23.2	22.0	21.4	20.6
2016-12-04	18:40	26.0	20.7	32.7	30.4	23.3	21.7
2016-12-04	18:45	23.0	21.9	25.4	23.9	22.9	22.2
2016-12-04	18:50	23.3	21.5	26.5	24.5	23.2	22.2
2016-12-04	18:55	23.4	22.3	24.9	24.1	23.5	23.0
2016-12-04	19:00	24.5	22.9	27.0	25.8	24.4	23.2
2016-12-04	19:05	24.5	22.9	27.0	25.8	24.4	23.2
2016-12-04	19:10	24.0	22.2	27.5	25.7	23.6	22.6
2016-12-04	19:15	23.4	21.4	27.9	25.6	22.8	22.0
2016-12-04	19:20	23.0	20.9	29.0	25.0	22.4	21.3
2016-12-04	19:25	22.6	20.6	37.0	22.9	21.9	21.1
2016-12-04	19:30	23.0	20.7	27.8	24.2	22.7	21.3
2016-12-04	19:35	22.1	19.7	26.1	23.5	21.8	20.3
2016-12-04	19:40	21.1	18.6	24.3	22.8	20.9	19.2
2016-12-04	19:45	21.1	18.6	24.3	22.8	20.9	19.2
2016-12-04	19:50	24.3	18.7	32.0	29.2	20.6	18.9
2016-12-04	19:55	21.0	18.3	26.8	24.8	18.9	18.3
2016-12-04	20:00	21.6	18.3	34.8	24.6	19.0	18.3
2016-12-04	20:05	25.5	18.5	34.3	31.1	19.6	18.5
2016-12-04	20:10	22.6	18.3	30.6	27.1	18.9	18.3
2016-12-04	20:15	18.8	18.1	21.7	19.8	18.6	18.1
2016-12-04	20:20	19.8	18.3	25.2	21.2	19.4	18.3
2016-12-04	20:25	19.5	18.5	28.6	20.6	19.3	18.5
2016-12-04	20:30	20.5	18.3	26.3	22.9	19.2	18.3
2016-12-04	20:35	18.9	18.5	21.2	19.6	18.7	18.5
2016-12-04	20:40	18.9	18.3	23.3	19.7	18.7	18.3
2016-12-04	20:45	18.5	18.1	21.7	19.0	18.5	18.1

Summary - LT1	
24-hour Leq	31.0
Leq day	33.8
Leq eve	21.6
Leq night	21.4
CNEL	32.5
Leq day	32.9
Leq night	21.4
LDN	32.4

Date	Time	Leq	Lmin	Lmax	L(10)	L(50)	L(90)
2016-12-04	20:50	20.2	18.1	26.3	22.6	18.9	18.2
2016-12-04	20:55	18.8	18.2	23.9	19.6	18.6	18.2
2016-12-04	21:00	18.6	18.0	21.2	19.1	18.6	18.1
2016-12-04	21:05	18.6	18.2	21.1	18.9	18.5	18.2
2016-12-04	21:10	18.7	18.2	23.9	19.0	18.5	18.2
2016-12-04	21:15	23.6	18.7	42.9	19.9	19.2	18.7
2016-12-04	21:20	21.1	18.6	27.3	24.3	19.7	18.6
2016-12-04	21:25	19.1	18.4	23.4	19.8	19.0	18.4
2016-12-04	21:30	18.7	18.3	24.2	19.0	18.5	18.3
2016-12-04	21:35	18.8	18.3	20.5	19.6	18.6	18.3
2016-12-04	21:40	24.4	18.3	32.7	28.2	21.9	18.4
2016-12-04	21:45	21.0	18.3	28.2	24.7	18.8	18.3
2016-12-04	21:50	19.0	18.2	23.5	19.9	18.7	18.2
2016-12-04	21:55	19.1	18.4	23.5	19.9	19.1	18.4
2016-12-04	22:00	19.1	18.3	23.7	19.9	18.7	18.3
2016-12-04	22:05	18.7	18.2	22.9	19.4	18.6	18.2
2016-12-04	22:10	19.7	18.3	24.7	21.3	19.3	18.3
2016-12-04	22:15	18.8	18.2	22.2	20.1	18.6	18.2
2016-12-04	22:20	18.7	18.2	22.3	19.4	18.6	18.2
2016-12-04	22:25	19.7	18.2	25.3	21.3	19.0	18.2
2016-12-04	22:30	18.7	17.9	26.8	19.9	18.7	18.1
2016-12-04	22:35	18.0	17.8	19.0	18.8	18.2	17.8
2016-12-04	22:40	18.7	17.8	22.8	19.9	18.6	18.0
2016-12-04	22:45	23.4	18.9	34.6	27.2	21.1	19.3
2016-12-04	22:50	20.4	18.9	23.4	21.7	20.2	19.2
2016-12-04	22:55	21.4	20.3	24.1	22.2	21.4	20.4
2016-12-04	23:00	23.0	21.2	24.3	23.8	23.1	22.0
2016-12-04	23:05	24.9	21.4	32.4	28.7	22.8	21.7
2016-12-04	23:10	21.6	20.0	24.9	22.8	21.4	20.3
2016-12-04	23:15	21.2	20.0	22.9	21.9	21.3	20.3
2016-12-04	23:20	20.4	18.9	22.6	21.7	20.4	19.3
2016-12-04	23:25	20.1	18.7	22.6	21.8	19.8	18.9
2016-12-04	23:30	20.7	19.7	21.7	21.6	20.7	20.1
2016-12-04	23:35	19.5	18.0	21.9	20.8	19.6	18.3
2016-12-04	23:40	18.0	17.7	20.6	18.9	18.3	17.7
2016-12-04	23:45	18.2	17.7	21.0	18.9	18.5	18.0
2016-12-04	23:50	18.4	17.9	20.2	18.9	18.5	18.1
2016-12-04	23:55	18.4	18.0	19.4	18.9	18.5	18.1
2016-12-05	00:00	18.1	17.7	20.5	18.9	18.3	17.7
2016-12-05	00:05	18.0	17.7	20.2	18.9	18.3	17.7
2016-12-05	00:10	18.1	17.7	23.9	18.9	18.3	17.7
2016-12-05	00:15	18.1	17.9	19.2	18.9	18.4	17.9
2016-12-05	00:20	18.2	17.7	24.2	18.9	18.4	18.0
2016-12-05	00:25	18.5	18.0	20.2	18.9	18.5	18.1
2016-12-05	00:30	18.3	18.0	20.0	18.9	18.5	18.1
2016-12-05	00:35	18.5	18.0	22.1	19.0	18.5	18.1
2016-12-05	00:40	18.4	18.0	20.2	18.9	18.5	18.1
2016-12-05	00:45	21.1	17.9	30.5	23.9	18.9	18.1
2016-12-05	00:50	18.1	17.7	19.0	18.8	18.1	17.7
2016-12-05	00:55	17.8	17.6	19.0	17.9	17.6	17.6
2016-12-05	01:00	17.8	17.6	18.3	17.9	17.6	17.6
2016-12-05	01:05	17.9	17.7	19.3	18.5	17.7	17.7
2016-12-05	01:10	19.8	17.7	28.0	22.0	18.7	17.7
2016-12-05	01:15	18.0	17.8	18.6	18.6	18.0	17.8
2016-12-05	01:20	18.2	17.8	19.2	18.9	18.4	17.8
2016-12-05	01:25	19.8	18.0	27.3	22.4	18.6	18.1
2016-12-05	01:30	18.8	18.2	22.8	19.7	18.6	18.2
2016-12-05	01:35	18.4	18.0	19.6	18.9	18.5	18.1

Date	Time	Leq	Lmin	Lmax	L(10)	L(50)	L(90)
2016-12-05	01:40	18.2	17.8	18.8	18.8	18.5	18.0
2016-12-05	01:45	18.2	17.8	21.1	18.9	18.5	18.0
2016-12-05	01:50	18.1	17.8	20.7	18.9	18.4	17.8
2016-12-05	01:55	18.4	17.8	21.0	19.0	18.5	18.0
2016-12-05	02:00	18.2	17.8	19.2	18.9	18.4	17.8
2016-12-05	02:05	18.2	17.8	19.0	18.9	18.4	17.8
2016-12-05	02:10	21.1	18.0	31.7	24.2	18.9	18.2
2016-12-05	02:15	18.3	18.0	26.3	18.9	18.5	18.0
2016-12-05	02:20	18.2	18.0	19.0	18.9	18.5	18.1
2016-12-05	02:25	18.2	18.0	20.0	18.9	18.5	18.1
2016-12-05	02:30	18.2	18.0	19.1	18.9	18.5	18.1
2016-12-05	02:35	18.4	18.0	24.1	18.9	18.5	18.1
2016-12-05	02:40	27.7	17.7	38.7	33.6	18.6	17.7
2016-12-05	02:45	18.7	17.8	24.0	20.2	18.5	17.8
2016-12-05	02:50	18.0	17.8	18.3	18.3	18.2	17.8
2016-12-05	02:55	18.1	17.8	18.6	18.6	18.1	17.8
2016-12-05	03:00	18.1	18.0	18.5	18.5	18.5	18.0
2016-12-05	03:05	22.4	17.8	34.1	27.0	18.5	17.8
2016-12-05	03:10	20.9	18.2	29.5	23.5	19.5	18.2
2016-12-05	03:15	18.3	17.8	19.5	18.9	18.5	18.0
2016-12-05	03:20	18.3	17.8	19.5	18.9	18.5	18.1
2016-12-05	03:25	18.6	18.0	32.5	18.9	18.5	18.1
2016-12-05	03:30	18.5	17.9	20.3	18.9	18.5	18.1
2016-12-05	03:35	18.3	17.8	21.6	18.9	18.5	18.1
2016-12-05	03:40	18.3	17.9	22.2	18.9	18.5	18.1
2016-12-05	03:45	18.2	17.9	18.7	18.7	18.5	18.1
2016-12-05	03:50	18.1	17.8	21.0	18.9	18.4	17.8
2016-12-05	03:55	18.2	17.8	21.5	18.9	18.5	18.0
2016-12-05	04:00	18.5	17.9	19.5	18.9	18.5	18.1
2016-12-05	04:05	24.4	18.5	32.5	29.3	20.0	18.7
2016-12-05	04:10	18.9	17.7	20.7	19.9	18.9	17.7
2016-12-05	04:15	18.8	18.3	19.5	19.5	18.6	18.3
2016-12-05	04:20	18.5	18.2	19.8	18.9	18.5	18.2
2016-12-05	04:25	18.6	17.8	30.2	18.9	18.5	18.0
2016-12-05	04:30	18.2	17.9	19.3	18.9	18.5	18.1
2016-12-05	04:35	18.6	18.0	23.7	19.0	18.5	18.1
2016-12-05	04:40	19.0	18.0	25.8	19.9	18.7	18.1
2016-12-05	04:45	18.8	18.3	21.4	19.6	18.7	18.3
2016-12-05	04:50	19.0	18.4	20.3	19.8	18.9	18.4
2016-12-05	04:55	20.2	18.5	25.0	21.6	19.9	19.0
2016-12-05	05:00	19.0	18.4	22.6	19.8	18.7	18.4
2016-12-05	05:05	20.0	18.4	30.4	21.7	19.2	18.4
2016-12-05	05:10	34.0	18.4	47.7	36.0	27.4	18.5
2016-12-05	05:15	21.1	18.3	26.2	23.9	20.2	18.7
2016-12-05	05:20	20.0	18.4	25.1	22.1	19.4	18.4
2016-12-05	05:25	19.5	18.4	24.0	20.8	18.9	18.4
2016-12-05	05:30	19.4	18.6	22.7	20.0	19.4	18.6
2016-12-05	05:35	19.8	18.9	22.0	20.7	19.6	19.1
2016-12-05	05:40	21.4	19.0	29.6	24.1	20.1	19.2
2016-12-05	05:45	21.6	18.8	30.8	24.6	19.9	19.0
2016-12-05	05:50	18.7	18.2	19.6	19.0	18.5	18.2
2016-12-05	05:55	19.0	18.2	22.3	19.9	18.6	18.2
2016-12-05	06:00	21.1	18.5	28.5	24.7	19.3	18.5
2016-12-05	06:05	21.1	18.7	25.6	22.7	20.8	19.2
2016-12-05	06:10	25.2	19.5	36.3	29.2	21.7	19.6
2016-12-05	06:15	23.1	18.1	29.3	26.6	21.2	18.4
2016-12-05	06:20	21.1	18.0	32.6	22.9	18.8	18.2
2016-12-05	06:25	19.8	18.7	27.1	20.6	19.6	19.0

Date	Time	Leq	Lmin	Lmax	L(10)	L(50)	L(90)
2016-12-05	06:30	20.3	19.2	22.2	20.9	20.3	19.3
2016-12-05	06:35	26.3	19.2	40.4	30.2	20.5	19.2
2016-12-05	06:40	20.6	18.3	32.6	20.9	19.4	18.3
2016-12-05	06:45	31.2	18.8	43.1	35.5	28.0	19.5
2016-12-05	06:50	25.5	19.1	35.6	30.5	19.9	19.2
2016-12-05	06:55	21.2	19.7	27.3	22.4	20.9	19.9
2016-12-05	07:00	23.0	19.8	28.5	24.7	23.2	20.2
2016-12-05	07:05	24.5	22.8	28.1	25.5	24.4	23.4
2016-12-05	07:10	29.2	19.5	44.4	31.0	22.6	20.4
2016-12-05	07:15	35.4	20.5	46.9	40.9	23.6	21.3
2016-12-05	07:20	24.2	20.4	31.1	26.9	23.0	21.5
2016-12-05	07:25	25.7	20.5	33.4	29.3	23.8	21.5
2016-12-05	07:30	29.6	20.5	42.3	32.6	24.6	21.3
2016-12-05	07:35	26.9	21.5	34.1	30.4	23.9	22.0
2016-12-05	07:40	25.0	21.0	37.0	24.7	22.4	21.3
2016-12-05	07:45	26.9	20.4	38.0	31.6	23.1	21.2
2016-12-05	07:50	21.7	19.9	28.7	23.1	21.5	20.3
2016-12-05	07:55	22.9	20.1	29.9	24.9	22.1	20.5
2016-12-05	08:00	26.9	21.3	34.4	31.0	24.3	22.2
2016-12-05	08:05	21.3	20.2	26.3	22.4	21.0	20.2
2016-12-05	08:10	25.8	20.4	35.3	31.6	21.9	21.0
2016-12-05	08:15	26.2	21.7	33.7	28.7	25.3	23.1
2016-12-05	08:20	27.2	20.0	36.6	31.1	24.6	20.9
2016-12-05	08:25	22.8	19.6	30.2	25.1	21.5	20.2
2016-12-05	08:30	26.6	20.2	32.9	29.5	25.7	21.8
2016-12-05	08:35	34.0	21.9	42.8	38.5	30.0	24.3
2016-12-05	08:40	32.1	21.6	43.1	36.6	27.4	22.4
2016-12-05	08:45	34.2	21.0	48.1	33.7	25.7	22.1
2016-12-05	08:50	29.8	21.1	38.5	32.7	28.8	22.8
2016-12-05	08:55	36.8	25.1	46.2	39.5	34.9	29.4
2016-12-05	09:00	31.4	22.9	50.1	33.5	27.0	24.2
2016-12-05	09:05	29.4	22.4	42.4	31.6	27.0	23.6
2016-12-05	09:10	28.6	22.8	41.5	31.1	26.5	23.8
2016-12-05	09:15	25.5	20.7	33.5	27.8	24.4	21.8
2016-12-05	09:20	25.5	21.6	35.2	28.3	23.9	22.3
2016-12-05	09:25	29.4	22.1	43.6	31.6	25.6	23.0
2016-12-05	09:30	28.9	22.7	38.1	31.9	26.5	24.0
2016-12-05	09:35	28.8	21.6	38.5	32.4	25.8	23.0
2016-12-05	09:40	24.0	20.9	33.0	26.1	23.2	21.7
2016-12-05	09:45	24.1	20.7	32.9	26.3	22.6	21.3
2016-12-05	09:50	25.6	20.4	34.8	28.9	23.7	21.4
2016-12-05	09:55	23.2	20.1	30.4	25.5	22.6	20.6
2016-12-05	10:00	35.7	20.2	48.6	39.2	23.1	21.0
2016-12-05	10:05	44.4	22.1	55.2	49.3	35.1	22.8
2016-12-05	10:10	49.7	21.3	63.3	54.9	41.2	22.0
2016-12-05	10:15	34.0	21.7	44.1	38.1	31.2	25.9
2016-12-05	10:20	32.5	22.2	41.2	35.7	30.6	23.9
2016-12-05	10:25	28.9	22.3	40.4	32.2	26.5	23.5
2016-12-05	10:30	27.7	24.0	33.4	30.2	26.8	25.2
2016-12-05	10:35	37.7	23.2	44.9	42.2	31.9	23.7
2016-12-05	10:40	32.1	23.9	42.2	37.4	26.7	25.1
2016-12-05	10:45	25.9	23.2	31.4	27.4	25.5	24.3
2016-12-05	10:50	27.0	23.1	39.7	28.1	25.2	23.8
2016-12-05	10:55	28.4	25.9	34.9	30.0	27.9	26.6
2016-12-05	11:00	27.3	25.9	39.6	27.9	26.8	26.1
2016-12-05	11:05	37.6	25.9	53.7	37.0	29.4	26.4
2016-12-05	11:10	26.6	22.5	36.5	29.3	25.2	23.2
2016-12-05	11:15	34.5	21.9	50.3	38.2	25.8	23.0

Date	Time	Leq	Lmin	Lmax	L(10)	L(50)	L(90)
2016-12-05	11:20	25.6	21.9	40.3	27.9	24.0	22.4
2016-12-05	11:25	24.1	21.4	31.9	25.8	23.6	22.2
2016-12-05	11:30	27.9	21.8	35.6	31.9	25.2	22.6
2016-12-05	11:35	36.3	24.1	48.7	37.7	30.9	26.1
2016-12-05	11:40	28.6	22.2	39.2	31.5	25.4	23.0
2016-12-05	11:45	24.7	21.4	37.7	26.8	23.4	22.0
2016-12-05	11:50	29.0	21.7	38.4	32.2	26.7	22.5
2016-12-05	11:55	28.6	21.6	37.2	32.1	27.2	22.3
2016-12-05	12:00	23.8	21.2	32.8	25.6	22.8	22.1
2016-12-05	12:05	26.3	22.1	35.1	29.5	23.9	22.8
2016-12-05	12:10	27.1	22.0	38.5	29.4	25.6	23.3
2016-12-05	12:15	26.4	23.0	32.4	28.4	25.8	24.1
2016-12-05	12:20	24.2	21.2	31.7	25.7	24.3	21.9
2016-12-05	12:25	23.6	21.8	27.2	24.8	23.6	22.5
2016-12-05	12:30	26.8	22.9	38.8	29.3	24.9	23.4
2016-12-05	12:35	25.5	23.3	36.5	25.9	24.7	24.0
2016-12-05	12:40	25.2	22.9	31.1	26.5	25.0	23.8
2016-12-05	12:45	25.5	23.1	35.8	27.4	24.8	23.7
2016-12-05	12:50	40.9	22.9	54.0	46.4	24.9	23.7
2016-12-05	12:55	47.4	23.0	67.6	41.5	25.4	23.8
2016-12-05	13:00	25.2	22.5	37.2	25.9	24.1	23.1
2016-12-05	13:05	34.9	22.5	46.2	37.6	29.8	24.1
2016-12-05	13:10	23.1	21.7	31.7	24.0	22.7	22.1
2016-12-05	13:15	28.2	21.6	36.7	32.3	24.9	22.5
2016-12-05	13:20	24.7	22.2	29.1	26.6	24.1	22.8
2016-12-05	13:25	25.9	22.3	32.0	28.6	24.9	23.1
2016-12-05	13:30	33.4	22.1	49.1	34.9	29.4	23.3
2016-12-05	13:35	26.9	21.8	34.1	29.5	26.1	22.7
2016-12-05	13:40	35.0	22.0	45.6	39.9	28.9	24.0
2016-12-05	13:45	31.9	22.1	42.0	35.8	29.0	23.9
2016-12-05	13:50	25.3	20.6	33.4	27.8	24.2	21.4
2016-12-05	13:55	28.1	20.7	39.0	31.8	22.9	21.2
2016-12-05	14:00	21.9	20.5	28.2	22.9	21.7	20.9
2016-12-05	14:05	28.3	20.2	39.6	30.9	24.1	20.7
2016-12-05	14:10	25.6	20.7	34.2	28.8	23.9	21.5
2016-12-05	14:15	20.9	19.6	28.0	21.7	20.6	19.9
2016-12-05	14:20	21.3	19.8	25.6	22.5	21.0	20.2
2016-12-05	14:25	23.9	20.3	31.8	26.8	22.4	20.7
2016-12-05	14:30	26.4	20.8	34.8	30.2	23.9	22.0
2016-12-05	14:35	25.1	21.2	33.4	27.1	24.2	22.0
2016-12-05	14:40	23.8	20.6	31.9	26.9	22.3	21.2
2016-12-05	14:45	30.8	21.0	50.6	29.8	22.8	21.5
2016-12-05	14:50	33.4	21.5	43.7	38.2	27.1	22.9
2016-12-05	14:55	24.6	20.7	36.7	26.3	23.5	21.5
2016-12-05	15:00	25.2	20.2	36.0	28.1	22.9	20.9
2016-12-05	15:05	24.2	20.4	35.5	27.0	21.7	20.9
2016-12-05	15:10	28.1	20.5	37.4	32.4	21.9	20.7
2016-12-05	15:15	26.3	21.5	31.7	29.4	25.4	22.5
2016-12-05	15:20	24.3	20.7	31.5	27.0	23.2	21.4
2016-12-05	15:25	22.0	20.2	24.5	23.1	21.9	20.8
2016-12-05	15:30	21.9	19.9	37.2	22.9	20.9	20.2
2016-12-05	15:35	22.8	20.1	35.7	24.2	21.6	20.5
2016-12-05	15:40	23.7	20.2	34.1	25.5	22.2	20.8
2016-12-05	15:45	31.3	19.6	52.0	25.6	21.7	20.1
2016-12-05	15:50	22.3	19.4	34.6	23.1	20.7	19.4
2016-12-05	15:55	22.2	19.2	26.8	23.9	21.9	20.0

Date	Time	Leq	Lmin	Lmax	L(10)	L(50)	L(90)
2016-12-04	16:30	32.7	30.4	35.8	34.0	32.4	31.2
2016-12-04	16:35	55.3	30.1	74.2	45.5	34.5	30.9
2016-12-04	16:40	32.5	31.2	34.4	33.6	32.4	31.3
2016-12-04	16:45	33.3	31.3	37.8	35.0	32.8	32.0
2016-12-04	16:50	36.9	31.0	44.9	41.2	34.1	31.4
2016-12-04	16:55	54.9	30.8	75.8	43.7	34.7	31.7
2016-12-04	17:00	51.0	30.4	71.9	41.2	31.9	30.8
2016-12-04	17:05	31.9	30.4	33.6	32.8	31.9	31.0
2016-12-04	17:10	31.7	30.5	34.4	33.2	31.4	30.5
2016-12-04	17:15	30.2	29.5	31.5	30.9	30.1	29.5
2016-12-04	17:20	33.6	29.7	41.2	36.7	31.2	30.1
2016-12-04	17:25	31.6	29.5	38.2	33.5	30.4	29.5
2016-12-04	17:30	31.2	30.2	33.5	31.9	31.3	30.3
2016-12-04	17:35	31.5	30.3	35.6	32.3	31.3	30.3
2016-12-04	17:40	31.2	30.2	32.8	32.0	31.2	30.2
2016-12-04	17:45	30.3	29.6	31.7	30.9	30.4	29.6
2016-12-04	17:50	30.7	29.9	31.9	31.5	30.6	30.1
2016-12-04	17:55	31.9	30.5	38.0	33.3	31.5	30.5
2016-12-04	18:00	34.3	31.5	44.9	35.9	33.7	32.1
2016-12-04	18:05	32.6	30.8	36.9	33.8	32.5	31.3
2016-12-04	18:10	32.5	31.3	34.8	33.6	32.5	31.4
2016-12-04	18:15	32.3	31.0	33.9	33.2	32.3	31.3
2016-12-04	18:20	32.4	31.3	35.3	33.5	32.4	31.4
2016-12-04	18:25	32.2	31.1	33.5	32.9	32.2	31.3
2016-12-04	18:30	32.3	30.7	34.6	33.5	32.3	31.3
2016-12-04	18:35	32.9	31.9	35.6	34.0	32.6	32.1
2016-12-04	18:40	34.2	32.0	37.0	35.6	33.8	32.7
2016-12-04	18:45	40.7	32.6	59.9	36.5	34.2	33.2
2016-12-04	18:50	32.7	31.6	34.9	33.7	32.6	32.0
2016-12-04	18:55	32.5	31.6	34.1	33.4	32.4	31.6
2016-12-04	19:00	32.7	31.5	34.2	33.7	32.7	31.7
2016-12-04	19:05	32.6	31.6	33.8	33.6	32.6	31.7
2016-12-04	19:10	33.6	31.9	35.9	34.7	33.5	32.6
2016-12-04	19:15	32.8	31.9	33.8	33.7	32.7	32.1
2016-12-04	19:20	35.6	32.1	42.4	37.9	33.9	32.5
2016-12-04	19:25	34.9	32.3	39.8	36.9	34.3	33.1
2016-12-04	19:30	34.2	32.4	35.7	35.4	34.1	33.0
2016-12-04	19:35	35.2	33.2	37.7	36.6	35.1	33.7
2016-12-04	19:40	36.2	34.8	39.9	37.4	35.9	35.2
2016-12-04	19:45	39.8	35.5	43.5	41.5	39.7	37.3
2016-12-04	19:50	40.5	36.4	45.9	42.6	40.1	38.0
2016-12-04	19:55	39.8	35.0	51.3	42.6	36.8	35.6
2016-12-04	20:00	39.1	35.3	46.6	41.2	37.7	35.9
2016-12-04	20:05	38.4	35.5	41.8	39.8	38.5	36.2
2016-12-04	20:10	39.3	37.8	41.3	40.5	39.1	38.2
2016-12-04	20:15	39.0	36.4	40.8	40.3	39.0	37.5
2016-12-04	20:20	37.4	35.9	39.4	38.5	37.3	36.3
2016-12-04	20:25	37.8	35.9	46.3	38.7	37.4	36.3
2016-12-04	20:30	37.4	35.5	42.6	38.5	37.1	35.9
2016-12-04	20:35	37.0	35.1	38.8	38.2	36.8	35.5
2016-12-04	20:40	35.6	33.5	37.7	36.7	35.5	34.2
2016-12-04	20:45	34.6	33.1	39.1	35.7	34.3	33.3
2016-12-04	20:50	36.0	33.7	42.9	37.7	35.0	34.2
2016-12-04	20:55	37.2	35.1	39.6	38.6	37.0	35.3
2016-12-04	21:00	37.4	35.1	44.6	39.5	36.6	35.3
2016-12-04	21:05	36.7	34.4	41.5	38.6	36.1	34.9
2016-12-04	21:10	38.5	35.7	46.5	41.5	37.5	36.3
2016-12-04	21:15	39.4	35.7	43.5	41.3	39.2	36.9

Summary - LT2	
24-hour Leq	43.1
Leq day	44.8
Leq eve	40.3
Leq night	40.1
CNEL	47.6
Leq day	44.2
Leq night	40.1
LDN	47.4

Date	Time	Leq	Lmin	Lmax	L(10)	L(50)	L(90)
2016-12-04	21:20	39.0	36.5	43.9	40.5	38.6	37.1
2016-12-04	21:25	41.9	37.2	45.0	43.7	41.6	39.3
2016-12-04	21:30	42.6	37.4	49.0	46.2	40.6	38.2
2016-12-04	21:35	40.2	36.0	46.4	42.8	38.8	36.5
2016-12-04	21:40	41.6	37.2	45.7	43.7	41.3	37.8
2016-12-04	21:45	41.2	36.2	45.6	43.1	41.0	37.3
2016-12-04	21:50	44.0	40.6	47.3	45.7	44.0	42.0
2016-12-04	21:55	43.9	40.0	48.6	45.8	43.6	41.0
2016-12-04	22:00	44.6	38.2	54.6	46.1	42.6	40.0
2016-12-04	22:05	42.0	37.0	47.0	44.5	41.3	38.4
2016-12-04	22:10	47.7	36.3	61.2	50.3	41.6	38.1
2016-12-04	22:15	36.8	34.1	43.6	38.0	36.2	34.8
2016-12-04	22:20	36.6	34.7	40.4	38.2	36.4	35.2
2016-12-04	22:25	37.9	33.9	42.3	40.7	36.7	34.6
2016-12-04	22:30	35.9	33.6	41.8	38.0	35.0	34.0
2016-12-04	22:35	33.7	32.1	36.1	34.9	33.5	32.3
2016-12-04	22:40	33.2	31.9	35.6	34.0	33.1	32.2
2016-12-04	22:45	32.8	31.4	35.1	33.9	32.6	31.5
2016-12-04	22:50	32.3	31.3	33.7	33.3	32.3	31.3
2016-12-04	22:55	32.6	31.2	34.2	33.7	32.5	31.3
2016-12-04	23:00	31.3	30.4	32.4	31.9	31.4	30.5
2016-12-04	23:05	32.3	30.5	34.4	33.4	32.4	30.6
2016-12-04	23:10	32.6	31.9	33.5	33.0	32.5	32.1
2016-12-04	23:15	33.2	32.0	34.9	34.2	33.2	32.2
2016-12-04	23:20	32.6	31.2	35.0	33.7	32.6	31.7
2016-12-04	23:25	34.2	31.0	39.5	36.9	32.9	31.4
2016-12-04	23:30	38.4	35.9	41.2	39.9	38.2	36.7
2016-12-04	23:35	37.3	33.8	41.8	40.3	36.4	34.6
2016-12-04	23:40	34.5	32.8	37.0	35.7	34.4	33.3
2016-12-04	23:45	35.2	32.9	37.4	36.7	35.1	33.5
2016-12-04	23:50	34.5	30.9	37.5	36.9	34.6	31.4
2016-12-04	23:55	32.7	31.1	36.0	33.9	32.5	31.4
2016-12-05	00:00	33.8	32.0	35.8	35.3	33.6	32.3
2016-12-05	00:05	34.3	33.1	36.4	35.0	34.4	33.4
2016-12-05	00:10	33.5	31.3	37.1	35.0	33.4	31.8
2016-12-05	00:15	32.4	31.3	34.6	33.5	32.5	31.5
2016-12-05	00:20	31.8	30.9	35.0	32.8	31.7	31.1
2016-12-05	00:25	32.7	31.1	34.9	34.1	32.7	31.4
2016-12-05	00:30	32.7	31.3	34.1	33.7	32.6	31.7
2016-12-05	00:35	33.8	31.9	35.8	34.8	33.8	32.9
2016-12-05	00:40	32.3	30.9	34.3	33.5	32.2	31.2
2016-12-05	00:45	31.4	29.9	35.4	33.1	30.8	30.2
2016-12-05	00:50	30.2	29.6	31.3	30.9	30.3	29.6
2016-12-05	00:55	30.9	30.0	32.7	31.9	30.8	30.2
2016-12-05	01:00	32.0	30.7	33.7	33.5	31.8	31.1
2016-12-05	01:05	33.0	32.1	34.4	33.8	33.1	32.2
2016-12-05	01:10	32.8	31.9	34.5	33.7	32.7	32.1
2016-12-05	01:15	32.4	31.4	33.5	33.0	32.5	32.0
2016-12-05	01:20	33.5	32.1	35.9	34.4	33.4	32.4
2016-12-05	01:25	31.8	30.5	34.9	32.8	31.6	30.7
2016-12-05	01:30	31.5	30.5	32.7	32.0	31.4	30.7
2016-12-05	01:35	31.4	30.6	33.0	32.0	31.4	30.7
2016-12-05	01:40	31.4	30.5	34.4	31.9	31.3	30.5
2016-12-05	01:45	33.0	31.2	36.5	34.0	32.8	32.0
2016-12-05	01:50	35.2	33.7	37.1	36.0	35.2	34.2
2016-12-05	01:55	35.9	33.3	38.6	37.0	35.7	34.2
2016-12-05	02:00	34.2	33.0	36.6	35.3	33.9	33.2
2016-12-05	02:05	37.2	34.7	39.8	38.5	37.0	35.4

Date	Time	Leq	Lmin	Lmax	L(10)	L(50)	L(90)
2016-12-05	02:10	38.4	35.0	45.8	40.4	37.8	35.8
2016-12-05	02:15	39.9	36.5	42.7	41.7	39.6	37.8
2016-12-05	02:20	41.2	39.0	44.3	42.6	41.0	39.5
2016-12-05	02:25	40.5	38.3	44.7	41.9	40.0	39.0
2016-12-05	02:30	41.6	38.3	45.2	43.3	41.4	39.4
2016-12-05	02:35	39.5	36.1	43.8	41.6	39.0	37.1
2016-12-05	02:40	38.4	36.1	41.3	40.4	37.8	36.5
2016-12-05	02:45	36.6	35.2	38.6	37.6	36.4	35.4
2016-12-05	02:50	39.0	36.8	42.4	40.0	38.8	37.6
2016-12-05	02:55	39.2	37.3	42.4	40.7	38.9	37.8
2016-12-05	03:00	40.3	37.9	44.4	42.0	39.8	38.4
2016-12-05	03:05	42.0	38.7	47.3	43.9	41.6	39.6
2016-12-05	03:10	39.5	37.8	41.1	40.7	39.5	38.3
2016-12-05	03:15	39.4	37.2	42.2	40.7	39.3	38.2
2016-12-05	03:20	39.6	36.2	42.4	41.2	39.5	37.4
2016-12-05	03:25	38.9	35.3	43.8	41.3	38.4	36.5
2016-12-05	03:30	40.4	37.8	43.6	41.9	40.2	38.5
2016-12-05	03:35	38.9	35.7	42.6	40.7	38.5	36.7
2016-12-05	03:40	39.4	35.4	43.2	41.3	39.2	36.5
2016-12-05	03:45	38.7	35.0	43.3	40.9	38.2	35.5
2016-12-05	03:50	40.6	36.8	48.7	42.8	39.6	37.6
2016-12-05	03:55	40.2	37.7	45.8	41.8	39.9	38.4
2016-12-05	04:00	39.0	35.9	43.4	40.6	38.7	37.0
2016-12-05	04:05	36.4	34.7	40.3	37.7	36.0	35.2
2016-12-05	04:10	35.0	32.8	37.4	36.4	34.8	33.5
2016-12-05	04:15	33.2	31.8	35.3	34.3	33.0	32.2
2016-12-05	04:20	32.5	31.4	33.5	33.2	32.5	32.0
2016-12-05	04:25	36.5	32.0	40.5	38.8	35.8	33.0
2016-12-05	04:30	35.3	32.4	42.0	37.8	34.0	32.5
2016-12-05	04:35	33.0	30.2	38.3	35.7	31.9	30.3
2016-12-05	04:40	31.8	29.9	35.4	33.7	31.2	30.2
2016-12-05	04:45	30.9	30.0	33.5	31.9	30.7	30.1
2016-12-05	04:50	35.6	31.2	41.9	38.9	34.0	31.7
2016-12-05	04:55	35.7	33.4	39.8	37.6	35.2	33.9
2016-12-05	05:00	36.9	32.8	41.2	39.0	36.8	33.5
2016-12-05	05:05	40.2	36.0	44.3	42.4	40.1	36.9
2016-12-05	05:10	39.8	36.2	45.0	42.4	39.1	36.8
2016-12-05	05:15	40.2	36.0	43.5	41.9	39.9	38.1
2016-12-05	05:20	54.5	36.3	75.7	45.1	40.3	37.6
2016-12-05	05:25	44.9	40.1	50.4	47.5	44.3	41.3
2016-12-05	05:30	46.8	42.8	52.3	49.5	45.9	43.6
2016-12-05	05:35	44.7	40.4	48.6	46.9	44.4	41.9
2016-12-05	05:40	46.3	41.6	49.9	48.7	46.0	43.2
2016-12-05	05:45	45.0	40.3	49.0	46.9	44.8	42.5
2016-12-05	05:50	42.3	37.5	45.5	44.4	42.1	39.5
2016-12-05	05:55	41.5	37.3	46.0	43.5	41.2	39.1
2016-12-05	06:00	41.1	36.5	47.4	43.4	40.7	37.6
2016-12-05	06:05	42.9	38.6	50.4	45.0	42.5	39.9
2016-12-05	06:10	43.8	39.0	50.5	46.8	42.6	40.4
2016-12-05	06:15	40.4	35.6	49.4	43.0	38.8	36.2
2016-12-05	06:20	41.9	37.4	46.9	44.4	41.1	39.1
2016-12-05	06:25	42.7	36.4	47.6	45.5	42.1	38.9
2016-12-05	06:30	40.3	37.2	46.3	42.4	39.6	37.8
2016-12-05	06:35	38.6	36.5	43.5	40.2	38.0	37.1
2016-12-05	06:40	39.0	36.2	42.5	40.7	38.6	37.2
2016-12-05	06:45	41.3	37.9	45.6	43.0	41.1	38.7
2016-12-05	06:50	38.4	35.2	46.0	40.3	37.6	36.1
2016-12-05	06:55	39.4	35.5	46.4	40.9	38.6	36.2

Date	Time	Leq	Lmin	Lmax	L(10)	L(50)	L(90)
2016-12-05	07:00	39.2	35.6	42.9	40.9	38.9	36.9
2016-12-05	07:05	40.4	35.9	45.4	42.8	39.6	37.3
2016-12-05	07:10	40.1	36.9	42.4	41.6	40.2	37.7
2016-12-05	07:15	42.0	37.0	48.1	45.0	40.8	37.5
2016-12-05	07:20	41.9	37.8	46.3	43.8	41.6	39.4
2016-12-05	07:25	41.9	38.3	47.4	44.0	41.2	39.1
2016-12-05	07:30	45.1	39.4	51.0	47.9	44.0	41.1
2016-12-05	07:35	41.2	38.9	45.4	42.8	40.8	39.4
2016-12-05	07:40	49.1	41.2	67.9	46.8	44.4	42.2
2016-12-05	07:45	43.9	40.7	47.4	45.3	43.8	41.5
2016-12-05	07:50	42.7	39.4	46.8	44.6	42.2	40.7
2016-12-05	07:55	39.5	37.4	43.1	41.2	39.2	37.9
2016-12-05	08:00	38.5	36.3	45.3	39.7	37.9	37.0
2016-12-05	08:05	37.3	35.2	39.1	37.9	37.3	36.2
2016-12-05	08:10	39.4	36.4	41.9	40.9	39.3	37.0
2016-12-05	08:15	40.8	37.7	45.6	43.2	40.2	38.4
2016-12-05	08:20	39.4	36.3	46.6	41.5	38.6	37.0
2016-12-05	08:25	37.4	35.5	40.6	38.9	37.2	36.1
2016-12-05	08:30	41.4	35.1	51.3	44.5	37.7	35.8
2016-12-05	08:35	55.5	35.5	75.9	53.1	38.4	36.3
2016-12-05	08:40	37.1	34.9	41.2	38.5	36.7	35.5
2016-12-05	08:45	39.8	35.9	48.7	41.9	38.4	37.1
2016-12-05	08:50	40.9	36.2	50.6	45.1	37.8	36.8
2016-12-05	08:55	39.3	36.2	44.2	40.9	38.9	37.2
2016-12-05	09:00	38.7	34.7	45.9	42.5	36.6	35.3
2016-12-05	09:05	55.9	35.0	76.7	43.4	36.9	35.7
2016-12-05	09:10	35.9	34.1	46.0	36.9	35.4	34.3
2016-12-05	09:15	37.4	34.9	46.4	38.9	36.6	35.3
2016-12-05	09:20	35.8	34.6	37.3	36.8	35.8	35.1
2016-12-05	09:25	45.8	34.7	57.1	52.1	37.8	35.3
2016-12-05	09:30	38.1	35.4	45.4	40.2	37.4	36.0
2016-12-05	09:35	40.0	35.5	47.0	43.6	37.7	36.3
2016-12-05	09:40	37.6	34.5	43.8	39.3	37.2	35.6
2016-12-05	09:45	37.4	34.8	43.1	39.2	36.9	35.6
2016-12-05	09:50	37.6	35.4	44.9	38.9	37.4	36.2
2016-12-05	09:55	38.0	34.8	43.3	39.8	37.4	36.2
2016-12-05	10:00	47.2	35.2	59.8	53.0	38.8	36.8
2016-12-05	10:05	50.7	35.4	64.1	53.9	41.0	36.7
2016-12-05	10:10	51.2	35.0	61.7	55.7	43.8	36.6
2016-12-05	10:15	37.5	34.8	40.7	39.4	37.1	36.0
2016-12-05	10:20	38.3	35.0	42.5	40.4	37.8	36.0
2016-12-05	10:25	47.1	32.9	59.2	51.3	37.8	34.1
2016-12-05	10:30	41.0	31.8	53.5	44.1	36.0	33.4
2016-12-05	10:35	48.7	31.4	57.7	54.2	33.7	32.1
2016-12-05	10:40	37.3	31.3	50.8	40.0	33.8	31.9
2016-12-05	10:45	45.6	30.7	64.8	36.3	32.2	31.1
2016-12-05	10:50	32.7	30.7	38.6	34.3	32.3	31.2
2016-12-05	10:55	34.3	30.7	43.7	37.2	32.5	31.1
2016-12-05	11:00	31.3	30.6	33.0	31.9	31.4	30.6
2016-12-05	11:05	32.5	30.6	38.0	33.9	32.3	31.0
2016-12-05	11:10	33.0	30.9	37.8	35.2	32.4	31.3
2016-12-05	11:15	33.4	31.3	40.4	35.4	32.8	31.6
2016-12-05	11:20	47.7	31.4	60.8	51.9	35.6	32.4
2016-12-05	11:25	53.3	32.8	73.8	43.3	36.3	33.7
2016-12-05	11:30	53.2	33.8	72.3	42.9	36.3	34.7
2016-12-05	11:35	44.9	33.5	55.8	50.0	38.4	34.5
2016-12-05	11:40	38.4	33.6	44.2	40.8	37.6	35.0
2016-12-05	11:45	40.2	31.9	52.1	45.6	34.8	33.0

Date	Time	Leq	Lmin	Lmax	L(10)	L(50)	L(90)
2016-12-05	11:50	39.2	34.5	48.7	41.9	37.3	35.3
2016-12-05	11:55	38.6	33.3	49.8	40.5	38.2	34.4
2016-12-05	12:00	37.0	33.4	50.7	37.9	35.1	33.9
2016-12-05	12:05	37.7	33.4	51.2	38.6	35.6	34.2
2016-12-05	12:10	37.2	33.1	50.4	39.5	35.6	34.1
2016-12-05	12:15	38.0	33.0	48.5	40.3	36.6	34.3
2016-12-05	12:20	35.2	32.0	42.2	36.7	34.8	33.1
2016-12-05	12:25	34.1	32.4	36.0	35.3	34.0	33.0
2016-12-05	12:30	37.3	33.7	45.7	39.7	35.8	34.3
2016-12-05	12:35	37.7	32.0	45.2	40.4	36.6	32.9
2016-12-05	12:40	36.9	31.2	51.0	38.9	34.5	32.3
2016-12-05	12:45	48.6	30.8	61.7	50.4	34.0	31.5
2016-12-05	12:50	42.8	31.0	55.5	48.5	35.5	32.9
2016-12-05	12:55	38.6	32.1	46.8	42.5	37.1	32.9
2016-12-05	13:00	31.8	30.5	34.8	32.9	31.6	30.6
2016-12-05	13:05	44.4	30.9	55.8	48.4	34.0	31.3
2016-12-05	13:10	35.2	30.2	48.3	32.9	31.3	30.2
2016-12-05	13:15	54.2	31.6	75.2	47.8	33.9	32.0
2016-12-05	13:20	34.3	31.1	41.9	36.7	33.1	32.0
2016-12-05	13:25	36.5	31.4	46.3	39.0	35.2	31.9
2016-12-05	13:30	39.2	33.2	48.7	43.9	36.1	34.3
2016-12-05	13:35	36.2	30.6	44.8	39.7	34.5	31.5
2016-12-05	13:40	37.7	32.1	44.8	40.9	36.0	33.5
2016-12-05	13:45	42.4	33.1	51.5	47.2	38.3	34.6
2016-12-05	13:50	36.0	32.5	41.2	37.9	35.5	33.4
2016-12-05	13:55	40.3	31.8	53.2	43.7	35.9	33.3
2016-12-05	14:00	38.3	32.4	47.3	41.1	35.8	33.8
2016-12-05	14:05	36.2	33.0	41.3	38.5	35.6	34.2
2016-12-05	14:10	36.0	32.4	41.2	38.5	34.9	33.2
2016-12-05	14:15	32.9	30.4	38.1	34.9	32.3	31.1
2016-12-05	14:20	33.0	31.1	38.2	34.8	32.3	31.2
2016-12-05	14:25	36.5	30.3	49.4	39.2	34.3	31.4
2016-12-05	14:30	46.3	29.9	59.3	51.2	31.6	30.2
2016-12-05	14:35	45.8	30.8	65.1	39.4	32.7	31.3
2016-12-05	14:40	34.7	30.2	44.6	38.5	31.6	30.3
2016-12-05	14:45	32.2	29.8	44.2	32.0	30.6	30.0
2016-12-05	14:50	33.8	29.7	44.4	35.8	31.9	29.9
2016-12-05	14:55	32.0	29.8	40.1	34.3	30.9	30.1
2016-12-05	15:00	33.5	30.3	43.4	36.0	31.5	30.3
2016-12-05	15:05	32.2	30.2	36.7	33.8	31.7	30.7
2016-12-05	15:10	38.3	29.9	47.4	44.2	30.9	30.2
2016-12-05	15:15	33.2	29.7	43.1	35.5	31.4	30.1
2016-12-05	15:20	31.7	30.2	37.0	33.5	31.0	30.2
2016-12-05	15:25	51.3	30.1	71.8	39.8	32.1	30.5
2016-12-05	15:30	31.4	30.3	32.6	32.2	31.3	30.3
2016-12-05	15:35	31.3	29.6	34.2	32.7	31.0	29.6
2016-12-05	15:40	34.2	29.7	43.6	37.7	32.0	30.3
2016-12-05	15:45	31.9	30.2	35.7	33.5	31.6	30.4
2016-12-05	15:50	32.7	30.0	37.3	34.3	32.3	30.6
2016-12-05	15:55	57.3	32.2	79.4	47.0	35.0	32.8
2016-12-05	16:00	36.3	32.8	44.7	39.3	34.8	33.4
2016-12-05	16:05	33.3	31.6	35.1	34.4	33.1	32.2
2016-12-05	16:10	33.8	31.7	36.7	35.4	33.5	32.1
2016-12-05	16:15	32.8	29.6	38.8	35.2	31.6	29.6
2016-12-05	16:20	34.1	29.7	44.0	37.6	31.4	30.0
2016-12-05	16:25	31.6	30.3	33.9	32.9	31.4	30.3

ST1 (Evening)

Date	Time	Leq	Lmin	Lmax	L(10)	L(50)	L(90)
2016-12-04	19:15	26.4	23.3	29.3	28.4	26.0	23.6
2016-12-04	19:16	23.2	22.6	24.6	23.6	23.1	22.9
2016-12-04	19:17	22.9	22.2	23.5	23.3	22.8	22.5
2016-12-04	19:18	25.2	22.4	38.0	24.6	23.7	22.8
2016-12-04	19:19	22.6	21.7	23.3	23.0	22.6	22.1
2016-12-04	19:20	22.4	21.8	23.6	22.9	22.3	22.0
2016-12-04	19:21	22.6	21.5	26.3	23.0	22.5	22.0
2016-12-04	19:22	22.3	20.9	25.1	23.7	21.9	21.2
2016-12-04	19:23	24.1	21.0	28.3	26.1	23.3	22.0
2016-12-04	19:24	22.9	21.4	25.5	23.9	22.7	21.9
2016-12-04	19:25	22.1	21.2	23.3	22.6	22.0	21.6
2016-12-04	19:26	23.9	21.6	36.3	23.5	22.4	21.9
2016-12-04	19:27	22.6	21.4	28.2	23.1	22.3	21.9
2016-12-04	19:28	22.9	20.8	34.5	22.4	21.6	21.2
2016-12-04	19:29	26.2	21.6	40.5	24.0	22.7	21.9
2016-12-04	19:30	22.1	21.0	24.0	22.6	22.1	21.4
2016-12-04	19:31	22.9	21.5	25.3	23.7	22.8	22.1
2016-12-04	19:32	23.0	21.5	26.6	23.7	22.9	22.3
2016-12-04	19:33	23.6	22.7	25.0	24.1	23.5	23.1
2016-12-04	19:34	24.5	23.3	28.9	25.4	24.2	23.6

ST2 (Evening)

Date	Time	Leq	Lmin	Lmax	L(10)	L(50)	L(90)
2016-12-04	20:05	36.0	34.9	37.5	36.4	35.9	35.5
2016-12-04	20:06	37.6	36.2	40.0	38.4	37.3	36.8
2016-12-04	20:07	39.4	37.6	41.7	40.5	39.2	38.4
2016-12-04	20:08	38.9	38.3	39.7	39.4	38.9	38.6
2016-12-04	20:09	38.5	37.4	39.0	38.8	38.5	38.1
2016-12-04	20:10	38.2	37.4	38.8	38.6	38.2	37.9
2016-12-04	20:11	39.4	38.2	40.3	40.0	39.5	38.5
2016-12-04	20:12	40.1	38.8	41.1	40.7	40.0	39.5
2016-12-04	20:13	38.9	37.9	39.8	39.6	38.9	38.2
2016-12-04	20:14	38.4	37.8	38.9	38.6	38.4	38.1
2016-12-04	20:15	39.0	37.9	40.3	39.7	38.9	38.2
2016-12-04	20:16	38.9	37.9	40.0	39.5	38.9	38.2
2016-12-04	20:17	39.2	37.7	40.0	39.8	39.4	38.1
2016-12-04	20:18	38.8	37.7	40.0	39.5	38.8	38.1
2016-12-04	20:19	37.0	35.7	38.3	37.7	37.1	36.2
2016-12-04	20:20	36.7	36.0	37.4	37.1	36.7	36.3
2016-12-04	20:21	37.3	36.4	38.4	37.8	37.3	36.7
2016-12-04	20:22	37.9	36.4	39.5	38.6	38.0	36.8
2016-12-04	20:23	37.0	36.0	38.4	37.7	36.8	36.3
2016-12-04	20:24	36.9	35.8	37.9	37.5	37.0	36.2

ST1 (Daytime)

Date	Time	Leq	Lmin	Lmax	L(10)	L(50)	L(90)
2016-12-05	14:05	35.5	33.0	37.7	36.4	35.7	33.8
2016-12-05	14:06	36.4	33.8	41.4	39.7	35.2	34.4
2016-12-05	14:07	36.8	33.0	40.6	39.8	34.8	33.8
2016-12-05	14:08	35.9	31.7	40.0	38.5	35.4	32.1
2016-12-05	14:09	34.4	33.2	35.4	35.1	34.5	33.6
2016-12-05	14:10	34.3	32.4	39.6	36.4	33.8	32.8
2016-12-05	14:11	36.9	31.7	41.3	39.3	36.4	33.0
2016-12-05	14:12	33.0	30.6	34.5	34.0	33.3	31.3
2016-12-05	14:13	35.2	31.6	38.0	37.0	35.1	32.6
2016-12-05	14:14	36.5	31.4	40.3	39.5	36.1	32.3
2016-12-05	14:15	34.5	31.9	37.5	36.4	34.2	32.5
2016-12-05	14:16	30.3	28.3	32.1	31.2	30.5	28.8
2016-12-05	14:17	30.4	27.2	33.2	32.5	29.9	28.3
2016-12-05	14:18	29.7	27.2	32.7	31.9	29.2	27.9
2016-12-05	14:19	31.1	29.4	33.0	31.9	31.1	30.0
2016-12-05	14:20	31.3	29.4	33.0	32.4	31.3	29.8
2016-12-05	14:21	30.0	28.5	31.4	30.8	30.0	29.0
2016-12-05	14:22	29.9	28.4	32.0	30.9	29.7	29.0
2016-12-05	14:23	31.2	28.5	35.1	34.0	29.8	29.0
2016-12-05	14:24	34.1	30.5	38.0	36.7	33.2	30.9

ST2 (Daytime)

Date	Time	Leq	Lmin	Lmax	L(10)	L(50)	L(90)
2016-12-05	15:40	22.5	20.1	26.6	23.7	22.4	20.6
2016-12-05	15:41	22.3	20.2	25.4	23.3	22.1	20.9
2016-12-05	15:42	22.9	20.3	30.7	24.1	22.4	20.7
2016-12-05	15:43	26.6	21.2	33.5	29.9	24.7	21.9
2016-12-05	15:44	21.9	19.9	25.5	22.9	21.6	20.6
2016-12-05	15:45	20.6	19.1	28.1	21.5	20.1	19.3
2016-12-05	15:46	23.7	19.5	30.2	26.7	22.6	19.7
2016-12-05	15:47	23.4	20.2	28.1	25.3	22.9	21.1
2016-12-05	15:48	21.4	19.5	30.1	22.6	20.5	19.8
2016-12-05	15:49	37.4	20.2	51.5	35.7	24.4	21.2
2016-12-05	15:50	22.7	20.0	26.3	24.6	22.2	20.8
2016-12-05	15:51	20.5	19.0	24.9	21.5	20.0	19.4
2016-12-05	15:52	27.9	19.2	38.8	32.2	20.1	19.4
2016-12-05	15:53	21.1	18.8	27.8	23.2	19.9	19.0
2016-12-05	15:54	20.9	19.0	24.7	22.4	20.5	19.4
2016-12-05	15:55	23.2	19.8	35.7	23.5	21.5	20.5
2016-12-05	15:56	21.2	18.9	24.0	22.2	21.1	19.8
2016-12-05	15:57	21.2	19.1	24.2	23.2	20.1	19.4
2016-12-05	15:58	23.5	21.3	25.7	24.8	23.3	22.3
2016-12-05	15:59	24.3	22.5	27.9	25.4	23.9	23.2

AECOM Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: RE CRIMSON | Project #: | Date: 12/4/16 | Page 1 of 1

Measurement Location: WILEYS WELL LTVA | Analyst: CK

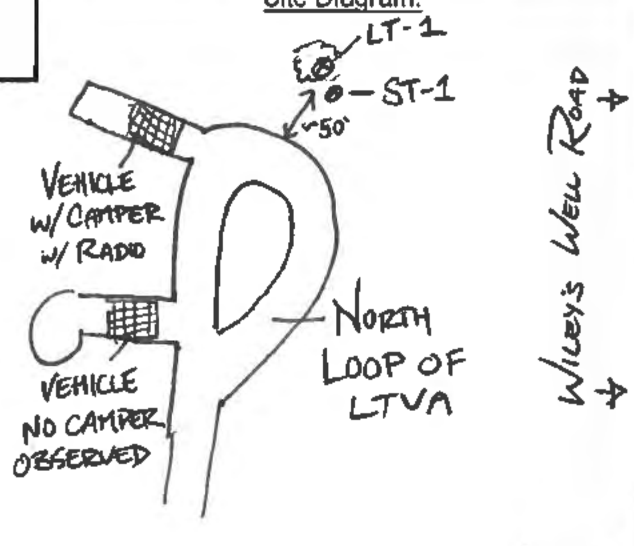
Sound Level Meter	Field Calibration	Meteorological Data
Model #: LD LXT	Model #: CAL200	Model #: K3500 — Time Obs/Meas: 19:20
Serial #: 4485	Serial #: 5768	Serial #: 2058303
Weighting: A / C / Flat	Calibration Level (dB): 94 / 114	Precipitation: Yes (explain) / No
Response: Slow / Fast / Impl	Pre-Test .11 dBA	Wind: Steady / Gusty / Calm
Windscreen: Yes / No (explain)	Post-Test .14 dBA	Avg Wind Speed/Direction: 2 / SSE m/s / MPH
Topo: Flat / Hilly	GPS Coordinates (at SLM location)#: ~~33.56232, 114.84370~~ SEE NOTES	Temp (°F): 53.9 RH (%): 28.4
Terrain: Hard / Soft / Mixed / Agg / Snow		Bar Psr (Hg): 993.8 Cloud Cover (%): 0

Loc. ID	Start Time (hh:mm)	Stop Time (hh:mm)	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST1	19:15	19:35							EVENING: DISTANT GENERATOR FROM
									SOUTH LOOP SITE. RUSTLING FROM SITES
									(NOT CONSTANT). 19:24 DIST FW. 19:27-
									SOUNDS LIKE A RADIO FROM N LOOP SITE.
									19:29 - CAMPER APPROACHES AND INQUIRES,
									("GENERATORS OFF @ 20:00"). 19:31 - DIST FW.
									19:33 - DISTANT FW, → TIL END.
	15:40	16:00							AFTERNOON: RADIO ON FROM NEAREST
									CAMP SITE. 15:42 FW FLYOVER. 15:45 -
									PLASTIC RUSTLING FROM SOUTHERN SITE.
									15:46 FW, AND DISTANT BOOMING. 15:49 - LOUD
									TRASH CAN LID CLOSE TO SOUTH, DIST FW.
									15:51 DIST BOOMS, 15:52 - BICYCLIST DOES A LOOP.
									DAYTIME CAL: .14 → .14 | 15:55 RADIO LOUDER
									DAYTIME MET: 69.7F, 24.8%, 995.3, 90%CC, NO WIND

Roadway Name/Dir.		
Speed (post/obs*)		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:



33.495024; -114.887922

- note coordinate system if other than NAD84 * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes / No

Additional Notes/Comments:

DAYTIME, MOMENTARY

GENERATOR @ EVENING

Noise Sources (circle all that apply): distant aircraft/roadway traffic/rail ops/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects/mechanical

Additional Notes and Sketches on Reverse or Indicated Separate Sheet(s)

AECOM Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: RE CRIMSON | Project #: | Date: 12/4/16 | Page 1 of 1

Measurement Location: WILEYS WELL RD - E OF CVSP | Analyst: CK

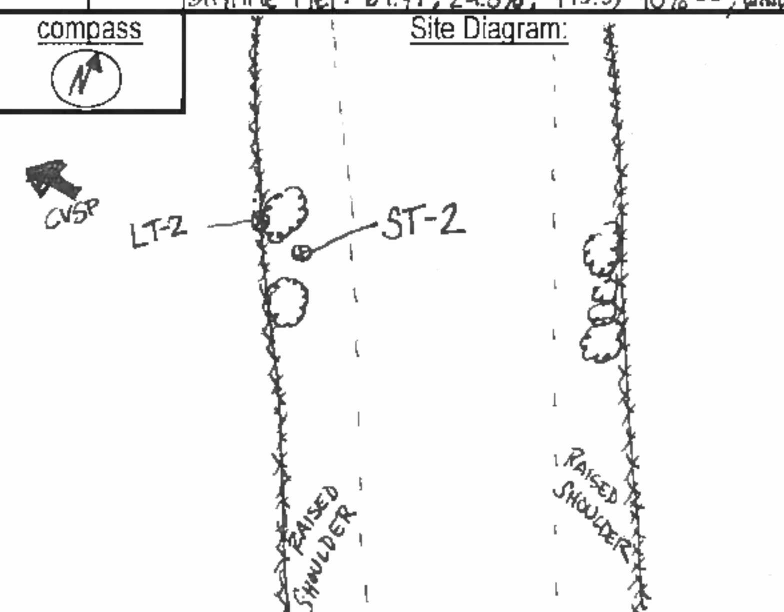
Sound Level Meter	Field Calibration	Meteorological Data
Model #: LD LXT	Model #: CAL200	Model #: K3500 — Time Obs/Meas: 19:20
Serial #: 4485	Serial #: 5768	Serial #: 2058303
Weighting: A / C / Flat	Calibration Level (dB): 94 / 114	Precipitation: Yes (explain) / No
Response: Slow / Fast / Impl	Pre-Test .11 dBA	Wind: Steady / Gusty / Calm
Windscreen: Yes / No (explain)	Post-Test .14 dBA	Avg Wind Speed/Direction: 2/SSE m/s / MPH
Topo: Flat / Hilly	GPS Coordinates (at SLM location)#: 33.56231, -114.89570	Temp (°F): 53.9 — RH (%): 28.4
Terrain: Hard / Soft / Mixed / Agg / Snow		Bar Psr (Hg): 993.8 — Cloud Cover (%): 0

Loc. ID	Start Time (hh:mm)	Stop Time (hh:mm)	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST2	20:05	20:25							EVENING: DOMINANT SOURCE IS CVSP, PINK-NOISE-LIKE MECH ORIGINATING FROM ITS DIRECTION. HWY NOISE INAUDIBLE. SOME INDIVIDUAL HEAVY TRUCKS OR MOTORCYCLES AUDIBLE
	14:05	14:25							DAYTIME: SAME AS ABOVE. 14:05 FW OVERFLIGHT. INTERMITTENT VEHICLE TRAFFIC EXITING CVSP. 14:07-14:08 - LOUD TRUCK (WASTE?) ENTERING FACILITY. 14:11 - LOUD VEHICLE LEAVING FACILITY 14:14 - " ", MOMENTARY BIRD CAW, 14:19 BIRD CAW. 14:24 - HELO
									DAYTIME CAL: .14 →
									DAYTIME MET: 69.7F, 24.8%, 995.3, 90% CC, NO WIND

Roadway Name/Dir.		
Speed (post/obs*)		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:



- note coordinate system if other than NAD84 * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes / No

Additional Notes/Comments:

Noise Sources (circle all that apply): distant aircraft/roadway traffic/rail ops/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects/mechanical

Additional Notes and Sketches on Reverse or Indicated Separate Sheet(s)

AECOM Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: RE CRIMSON Project #: Date: 12/4/16 Page 1 of 1
Measurement Location: LT-1 WW LTVA Analyst: CK

Sound Level Meter	Field Calibration	Meteorological Data
Model #: LD 870	Model #: CAL200	Model #: K3500 Time Obs/Meas:
Serial #: 1655	Serial #: 8768	Serial #: 2058303
Weighting: A / C / Flat	Calibration Level (dB): 94 / 114	Precipitation: Yes (explain) / No
Response: Slow / Fast / Impl	Pre-Test 114.0 dBA	Wind: Steady / Gusty / Calm
Windscreen: Yes / No (explain)	Post-Test 113.8 dBA	Avg Wind Speed/Direction: — m/s / MPH
Topo: Flat / Hilly	GPS Coordinates (at SLM location)#	Temp (°F): 62.9 RH (%): 26.5
Terrain: Hard / Soft / Mixed / Agg / Snow	33.495024; -114.887922	Bar Psr (Hg): 997.9 Cloud Cover (%): 5

Loc. ID	Start Time (hh:mm)	Stop Time (hh:mm)	Metrics L_{eq}	L_{min}	L_{max}	Statistics L_{10}	L_{50}	L_{90}	Notes/Events
LT1	16:00	16:00							

Roadway Name/Dir.		
Speed (post/obs*)		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:

SEE ST SHEET

- note coordinate system if other than NAD84 * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes / No

Additional Notes/Comments:

CAMPGROUND ACTIVITY CAMPER RADIO

Noise Sources (circle all that apply): distant aircraft/roadway traffic/rail ops/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects/mechanical

Additional Notes and Sketches on Reverse or Indicated Separate Sheet(s)

AECOM Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: RECRIMSON　Project #: ____　Date: 12/4/16　Page 1 of 1
Measurement Location: LT-2 - CVSP/WW ROAD　Analyst: CK

Sound Level Meter	Field Calibration	Meteorological Data
Model #: LD 820	Model #: CAL200	Model #: K3500　Time Obs/Meas: 16:27
Serial #: 1573	Serial #: 5768	Serial #: 2058303
Weighting: A / C / Flat	Calibration Level (dB): 94 / 114	Precipitation: Yes (explain) / No
Response: Slow / Fast / Impl	Pre-Test 114.0 dBA	Wind: Steady / Gusty / Calm
Windscreen: Yes / No (explain)	Post-Test 114.0 dBA	Avg Wind Speed/Direction: —— m/s / MPH
Topo: Flat / Hilly Terrain: Hard / Soft / Mixed / Agg / Snow	GPS Coordinates (at SLM location)# 33.56231; -114.89570	Temp (°F): 62.9　RH (%): 26.5 Bar Psr (Hg): 29.7.9　Cloud Cover (%): 5

Loc. ID	Start Time (hh:mm)	Stop Time (hh:mm)	Metrics L_{eq}	Metrics L_{min}	Metrics L_{max}	Statistics L_{10}	Statistics L_{50}	Statistics L_{90}	Notes/Events
LT2	16:30	16:30							

Roadway Name/Dir.		
Speed (post/obs*)		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:

SEE ST SHEET

- note coordinate system if other than NAD84　* - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes / No

Additional Notes/Comments:

MECH FROM CVSP

Noise Sources (circle all that apply): distant aircraft/roadway traffic/rail ops/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects/mechanical

Additional Notes and Sketches on Reverse or Indicated Separate Sheet(s)

PHOTO LOG

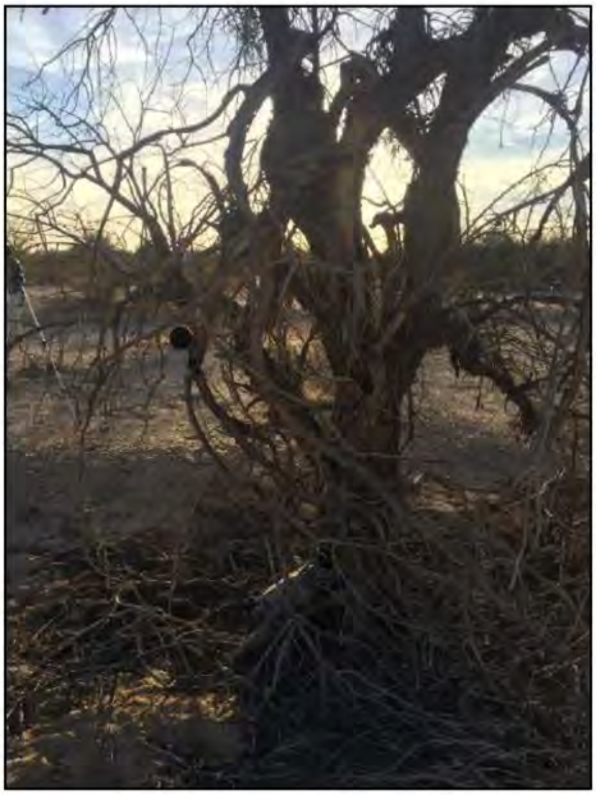
	**Photo 1** **Measurement ID:** LT1 **Date Taken:** 12/5/2016 Latitude: 33.495040° Longitude: -114.887935° Camera Facing: Southwest **Notes:** Wiley's Well Campground
	**Photo 2** **Measurement ID:** LT1 **Date Taken:** 12/5/2016 Latitude: 33.495040° Longitude: -114.887935° Camera Facing: Northeast **Notes:** Wiley's Well Campground SLM windscreen circled in red

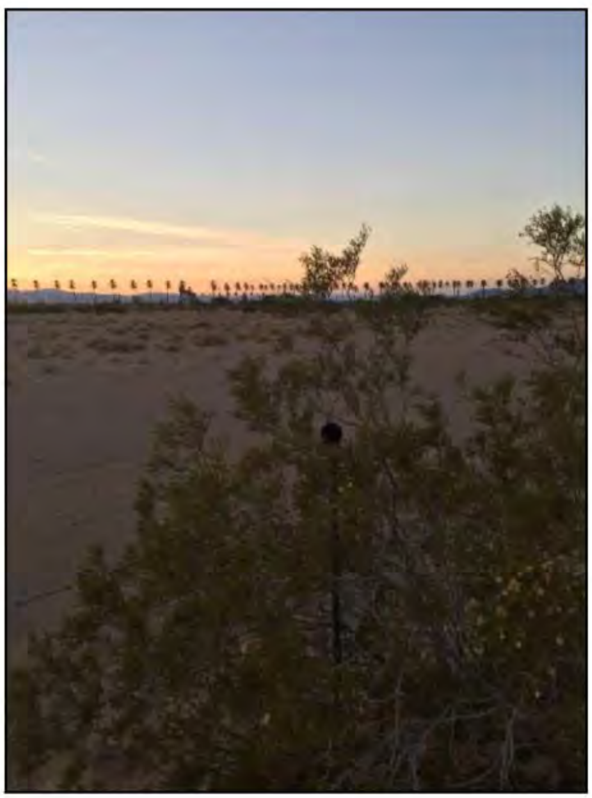
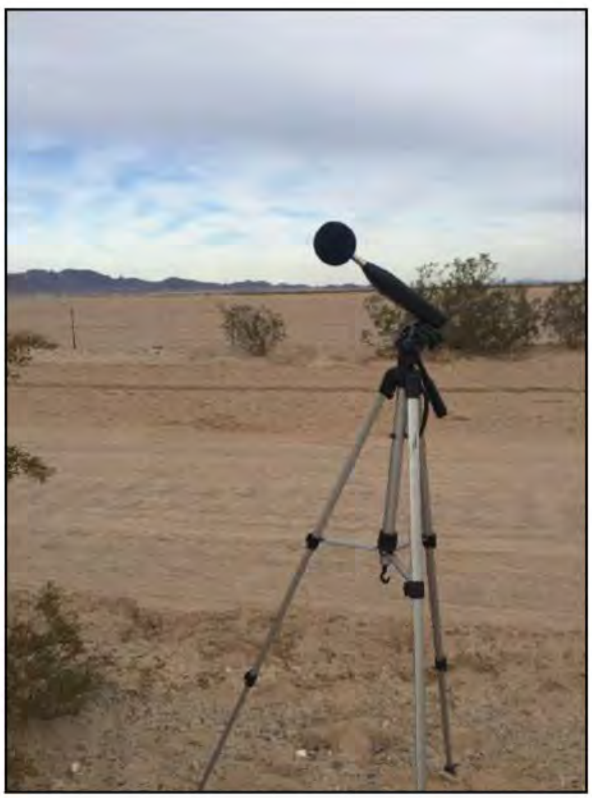
	**Photo 3** **Measurement ID:** LT2 **Date Taken:** 12/4/2016 Latitude: 33.562355° Longitude: -114.895735° Camera Facing: Southeast **Notes:** Wiley's Well Road
	**Photo 4** **Measurement ID:** LT2 **Date Taken:** 12/4/2016 Latitude: 33.562355° Longitude: -114.895735° Camera Facing: West **Notes:** Wiley's Well Road

	**Photo 5** **Measurement ID:** ST1 **Date Taken:** 12/4/2016 Latitude: 33.495012° Longitude: -114.887926° Camera Facing: Northeast **Notes:** Wiley's Well Campground
	**Photo 6** **Measurement ID:** ST1 **Date Taken:** 12/4/2016 Latitude: 33.495012° Longitude: -114.887926° Camera Facing: West **Notes:** Wiley's Well Campground Campground visitor vehicle visible in background

	**Photo 7** **Measurement ID:** ST2 **Date Taken:** 12/5/2016 Latitude: 33.562339° Longitude: -114.895713° Camera Facing: Northwest **Notes:** Wiley's Well Road
	**Photo 8** **Measurement ID:** ST2 **Date Taken:** 12/5/2016 Latitude: 33.562339° Longitude: -114.895713° Camera Facing: Northeast **Notes:** Wiley's Well Road

P.2 ESA Noise Calculations, August 2019

ESA
S. Shirayama

8 August 2019
TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: Crimson Solar Project
RUN: Peak Hour

Roadway	Points												
Name	Name	No.	Segment										
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Roadway2	point1	1	941	45	26	45	24	45	0	0	0	0
	point2	2										

ESA
S. Shirayama

8 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Crimson Solar Project
RUN: Peak Hour
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	No Barrier LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Noise Reduction Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
50	1	1	0.0	67.9	66	67.9	10	Snd Lvl	67.9	0.0	8	-8.0
100	4	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
150	6	1	0.0	60.1	66	60.1	10	----	60.1	0.0	8	-8.0
200	7	1	0.0	57.2	66	57.2	10	----	57.2	0.0	8	-8.0
250	8	1	0.0	55.0	66	55.0	10	----	55.0	0.0	8	-8.0
300	9	1	0.0	53.3	66	53.3	10	----	53.3	0.0	8	-8.0
350	10	1	0.0	51.9	66	51.9	10	----	51.9	0.0	8	-8.0
400	11	1	0.0	50.6	66	50.6	10	----	50.6	0.0	8	-8.0
450	12	1	0.0	49.6	66	49.6	10	----	49.6	0.0	8	-8.0
500	13	1	0.0	48.7	66	48.7	10	----	48.7	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	10	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Trips for Revised Construction Traffic Noise Analysis

	Vehicle Amounts for Phases 1 through 3		
	worker (auto)	Water and concrete (medium truck)	Panels and other equipment (heavy truck)
	334	25	10
	427	49	10
	180	9	10
		9	9
			10
			2
			2
Total Vehicles	941	92	53
Daily Trips	1882	184	106
Peak Hour	941	26	24

Revised Construction Traffic Noise Levels

At Distance (ft.)	Peak Hour Leq	
500	48.7	See TNM 2.5 output sheet for Peak Hour Leq at 500 feet
10,000	29.2	Assumes attenuation from line source with soft site.

Appendix Q
Paleontological Resources

Paleontological Analysis, November 2018

RE Crimson Solar Project

by Sonoran West Solar Holdings, LLC

Paleontological Analysis

Project Number: 60487757

November 2018

Sonoran West Solar Holdings, LLC
Recurrent Energy LLC
353 Sacramento Street, 21st Floor
San Francisco, CA 94111

Quality information

Prepared by	Checked by	Approved by
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Revision History

Revision	Revision date	Details	Authorized	Name	Position

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Table of Contents

Figures

Tables

Appendices

1. Project Overview

1.1 Introduction

Sonoran West Solar Holdings, LLC (Applicant), a wholly-owned subsidiary of Recurrent Energy LLC (RE), proposes to construct and operate the RE Crimson Solar Project (Project). This Project is a utility-scale solar photovoltaic (PV) and energy storage project that would be located in the Riverside East Solar Energy Zone/Development Leasing Area and within a Development Focus Area on federal lands managed by the Bureau of Land Management (BLM) within the California Desert Conservation Area planning area in unincorporated eastern Riverside County, approximately 13 miles west of Blythe, California (CA) (BLM CACA-051967). The Project would interconnect to the regional electrical grid at the Southern California Edison (SCE) 230-kilovolt (kV) Colorado River Substation (CRS), and would generate up to 350 megawatts (MW) of renewable energy using PV technology with up to 350 MW of integrated energy storage capacity.

The Project applicant is proposing to construct the project using a traditional construction approach consisting of desert tortoise exclusion fencing, a mow and roll approach to site preparation, compacted roads, and trenching for electrical lines; however, the applicant is actively investigating alternative low-environmental impact design (LEID) elements and the potential for those to reduce Project impacts. LEID elements include several potential design changes including:

1. Minimizing grading during site preparation and maintaining more onsite vegetation to facilitate post-construction residual habitat value and post-operations/site reclamation success;
2. Avoiding or limiting trenching by placing electrical wiring aboveground; and
3. Placing transformer/inverter groups on elevated support structures in lieu of cement foundations.

The LEID elements would further minimize grading, trenching, and vegetation removal beyond traditional design approaches for PV projects with the objective of reducing overall long-term impacts for the Project. Although the incorporation of LEID elements could result in slight modifications to the panel block locations due to topographic constraints, the permitting boundary or limits of development would be the same with LEID elements incorporated. The comparative impacts of the traditional design approach versus design with LEID elements incorporated is not known; therefore, to facilitate appropriate analysis of the Project and allow for the incorporation of LEID elements where practicable and environmentally beneficial, the environmental technical analyses are based on the elements that result in the worst-case development/impact scenario for construction and operations.

The Project site consists of approximately 2,489 acres of BLM-administered land. A vicinity map showing the Permitting (Development) Boundary is presented on Figure 1-1. The block layouts may vary slightly with the incorporation LEID elements, but would remain within the Permitting Boundary. The total area for the Project (i.e., Permitting Boundary; 2,489 acres), includes a 2,465-acre solar field development area with approximately 1,859 acres of solar panels (array blocks) and 24 acres for linear facilities including access/perimeter roads with a 30- to 60-foot corridor width and gen-tie and powerline corridors at 150 feet.

The purpose of this study is to present the existing conditions associated with the Project site as it relates to paleontological resources and to assess the potential Project impacts on the resources. The Project information supporting this analysis is based primarily on the applicant's RE Crimson Solar Project Plan of Development (POD) submitted to the BLM in January 2016 and updated in 2017 (RE 2017). If warranted, applicant measures are proposed or recommended in this study to address potentially adverse effects on paleontological resources as a result of the Project. This study is submitted to the BLM (the federal lead agency) and the California Department of Fish and Wildlife (CDFW), the state lead agency, to support their independent review and evaluation of the environmental impacts of the Project pursuant to applicable Federal, State, and local laws. The POD is part of the BLM Right-of-Way (ROW) grant application process which for this Project includes preparation of an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA). The proposed Project is also expected to require a Streambed Alteration Agreement and an Incidental Take Permit from the State through CDFW which would require compliance with the California Environmental Quality Act (CEQA) (e.g., Environmental Impact Report [EIR]). Therefore, it is currently assumed that a joint EIS/EIR will be prepared by the BLM and CDFW.

1.2 Design Option Scenarios

The RE Crimson Project would be constructed and operated using a traditional construction approach as noted above with the potential incorporation of LEID elements based on feasibility and potential to reduce environmental impacts associated with the Project. A summary of the proposed traditional design approach is presented below followed by more information on the potential LEID elements that are being actively considered by RE. A more detailed description of the Project is included in the April 2017 POD (Recurrent Energy 2017).

1.2.1 Traditional Design

An estimated 2 million panels would be arranged on the site in the form of solar arrays (fixed-tilt or tracking systems). Structures supporting the PV modules would consist of steel piles (e.g., cylindrical pipes, H-beams, or similar), which would be driven into the soil using pneumatic techniques, such as a hydraulic attachment on the boom of a backhoe tractor.

The proposed traditional design is laid out primarily in 2-MW increments, each 2-MW increment would include an inverter-transformer station constructed on a concrete pad or steel skid, and would be centrally located within the PV module arrays. Each inverter-transformer station would contain up to four inverters, a transformer, a battery enclosure, and a switchboard. Underground cables would be installed to convey the direct current (DC) electricity from the panels to the inverters to convert the DC to alternating current (AC). Between 300 and 500 wooden poles (approximately 30 to 50 feet tall) would be installed across the entire site to convey energy to a central substation location which would transform voltage from 34.5 kV to 230 kV.

Energy storage may be achieved by either a battery or flywheel storage system capable of storing up to 350 MW of electricity. The storage system would consist of banks of batteries or flywheels housed in electrical enclosures located indoors within the Project energy storage facilities.

Access to the Project site would be provided via the existing paved Wiley's Well Road and Powerline Road to the CRS from Interstate 10 (I-10) to the north. The Project's on-site roadway system would include a perimeter road, access roads, and internal roads. These roads would be graded and surfaced with gravel, compacted dirt, or another commercially available surface and would accommodate the Project operations and maintenance (O&M) activities.

1.2.2 Low Environmental Impact Design Elements

As presented above, the applicant has proposed potential LEID elements for the Project for consideration with the objective of evaluating alternative design approaches that may reduce environmental impacts or negative effects from the project. These elements include changes to the grading approach, trenching and wiring, and elevation of inverter pads. To facilitate adequate analysis of potential design alternatives for the technical study, changes to the design were assessed for the potential LEID elements to determine the worst-case scenario. The design details with the incorporation of potential LEID elements are identical to those provided above for the traditional design, except for the following differences should LEID elements be incorporated:

- Solar blocks may be laid out in larger, 3- to 4-MW block sizes, requiring fewer inverter/transformer structures.
- Inverter/transformer equipment areas may be mounted on steel skids and installed on steel piers above the ground surface.
- Approximately 300 to 400 wooden AC transmission poles would be required in addition to the poles referenced under the traditional design to eliminate most trenching, which would result in the installation of up to 900 wooden poles in total.
- Access to the Project site would still be provided via the existing paved Wiley's Well Road and Powerline Road to the CRS via I-10; however, if the incorporation of elements results in fewer solar blocks, slightly fewer roads would be compacted and graded on-site.

1.3 Construction Details

Construction of the Project will occur in three planned phases and will require approximately 17 months to complete with construction expected to begin in late-2020. The construction timeline may vary depending upon incorporation of LEID elements and associated changes required to the construction approach. Project phasing is summarized below with key activities. More details are provided in the Project Description included in the POD. In general, a reduction in ground-disturbing activities reduces the potential for impacting paleontological resources. LEID elements that have the potential to reduce ground-disturbance would therefore have the potential to reduce the potential for adverse effects on paleontological resources. Therefore, the following discussions include information on the relative differences in ground disturbance associated with traditional design versus LEID construction practices.

1.3.1 Pre-Construction Activities

Prior to the start of construction, several activities would be undertaken to prepare the site for crews and construction including:

1. Geotechnical and Hazards investigations. The applicant would conduct a geotechnical investigation utilizing subsurface scientific testing and analysis, and would use ground penetrating radar to identify potential subsurface unexploded ordnance and Munitions and Explosives of Concern that may need to be stabilized or removed prior to construction.

2. Surveying, Staking, Flagging, and Preconstruction Resource Surveys. Prior to construction, the site boundary would be staked to demarcate the limits of disturbance, following which biologists would conduct preconstruction surveys to flag areas for avoidance, as appropriate.

3. Fence Installation. The Project will be fenced with security fencing (chainlink topped with barbed wire) and desert tortoise exclusion fencing. The security fencing would be up to 8 feet tall. The exclusion fencing would be buried at least 12 inches below ground surface.

4. Resource Clearance Surveys. Following fence installation, likely in a phased approach, the project development area would be cleared for special status species.

5. Staging Area Establishment. One or more secure staging areas would be established in support of construction activities.

Site preparation activities may vary in order, depending upon the incorporation of LEID components, the timeline for start of construction (e.g., biological resource survey windows), and other factors. In general, pre-construction activities have limited ground-disturbing impacts; but are necessary before full mobilization to support construction of the Project.

1.3.2 Phase 1 – Site Preparation and Grubbing

Phase 1 of construction will begin with the grubbing, grading, re-contouring, and compacting of the site, and graveling of access roads, followed by grading at the substation site. For traditional design, additional grading would be carried out at inverter and transformer pad locations where necessary. This construction phase will last approximately 16 weeks. The incorporation of LEID elements could result in reduced ground disturbance, if feasible, with reduced grading of solar field areas and/or the reduction or elimination of trenching.

1.3.3 Phase 2 – PV System Installation

Phase 2 of construction will begin with the pouring of foundations and the installation of the PV module support structure, which would consist of steel piles (e.g., cylindrical pipes, H-beams, or similar) being driven into the soil. To achieve ground preservation beneath the arrays, the incorporation of LEID elements will require individually sized piles to achieve a uniform elevation between module rows; thus, the duration of pile driving activities during this phase will last longer than those anticipated for traditional design. Additionally, the incorporation of LEID elements that would reduce ground disturbance (e.g., no or reduced grading) is expected to require the use of track-mounted pile drivers, as opposed to the backhoe-mounted pneumatic pile drivers proposed in traditional design, to reduce tire passes over natural vegetation. Construction of the structural support systems will be followed by the installation of the PV modules. This construction phase will last approximately 46 weeks. Construction equipment operating on the site will include track-mounted pile drivers, skid steers with auger/hoe attachments, flatbed trucks, water trucks, forklifts, trenchers, and welding units.

1.3.4 Phase 3 – Inverter, Transformer, Substation, and Electrical Collector System Commissioning

Phase 3 of construction will include the stringing of cable along module rows to a trunk cable system and the installation of AC and DC collector poles at inverter/transformer pad sites. If inverter/transformer pads will be elevated on piers as an LEID element, additional pile driving will be required during this phase for elevated pad installation. If trenching were to be reduced or eliminated and associated wires were racked a reduced ground-disturbance would occur. This construction phase will last approximately 32 weeks. Construction equipment operating on the site will include a track-mounted pile driver, a dozer, a grader, a front-end loader, a vibratory roller, a flatbed truck, a water truck, skid steers with auger/hoe attachments, cranes, backhoes, aerial lifts, trenchers, and concrete trucks.

1.4 Operations and Maintenance

The solar modules are expected to be in operation during daylight hours for 7 days per week, 365 days per year. Operational activities include solar module washing, maintenance of transformers, inverters, or other electrical equipment, road and fence repairs, vegetation/pest management, and site security. Solar modules would be washed as needed to maintain optimal electricity production (up to four times per year) using light utility vehicles with tow-behind water trailers. If LEID elements are incorporated into the design, the Project may also be visited regularly by a biological resource monitor, who will monitor applicable O&M activities and conduct periodic site assessments for the first 5 years of Project operation as part of a residual habitat study.

1.5 Decommissioning

The Applicant is expected to receive authorizations and permits with 30-year terms. At the end of the term, including any extensions, the Project would cease operation. At that time, the facilities would be decommissioned and dismantled and the site restored. Decommissioning activities would require approximately 9,883 truck trips, a workforce of approximately 320 workers, and would take approximately 17 months to complete. Upon decommissioning, the Project site could be converted to other uses in accordance with applicable land use regulations in effect at that time.

It is anticipated that during project decommissioning, project structures would be removed from the ground on the project sites. Aboveground and any underground equipment would be removed including module posts and support structures, gen-tie poles that are not shared with third parties and the overhead collection system within the project sites, inverters, transformers, electrical wiring, equipment on the inverter pads, and related equipment and concrete pads, and any O&M facilities and related equipment and infrastructure. The substation would be removed if it is owned by the project operator, however if a public or private utility assumes ownership of the substation, the substation may remain onsite to be used as part of the utility service to supply other applications.

Equipment would be de-energized prior to removal. Equipment would be shipped offsite by truck (after first being placed in secure transport enclosures as necessary) to be salvaged, recycled or disposed of at an appropriately licensed disposal facility. Removal of the solar modules would include disassembly and removal of the racks on which the solar modules are attached, and removal of the structures supporting the racks, and their placement in secure transport enclosures and a trailer for storage; the racks and structures supporting the racks would then be recycled or disposed of at an appropriately licensed disposal facility. Solar modules would be removed from the site and either transported to another solar electrical generating facility or a recycling facility, or disposed of at an appropriately licensed disposal facility. In conjunction with any solar modules which may be transported to another solar electrical generating facility, such solar modules may undergo a refurbishing process to extend their estimated 30-year lifespan. The demolition debris and removed equipment may be cut or dismantled into pieces to be safely lifted or carried with the equipment being used. The fence and gates would be removed and all materials would be recycled to the extent feasible. It is anticipated the project roads would be restored to their pre-construction condition unless the landowner elects to retain the improved roads for access throughout that landowner's property. The area would be thoroughly cleaned and all debris removed. As discussed above, most materials would be recycled to the extent feasible, with minimal disposal to occur in landfills in compliance with all applicable laws.

2. Environmental Setting

2.1 Project Study Area

The Project Study Area is situated between the Mule Mountains, the Palo Verde Mesa, and the Chuckwalla State Prison in Riverside County, California, approximately 13 miles west of the City of Blythe, California (CA). It is located largely on BLM-administered public lands (Figure 1-1). The Mule Mountains are to the south and east of the Study Area, while the Chuckwalla State Prison is to the west of the Study Area. The total area for the Project (i.e., Permitting Boundary) is 2,489 acres, including 2,465 for solar field development and 24 acres for linear facilities (access/perimeter roads and gen-tie line). The Project area has been refined since the paleontological surveys were conducted. The total paleontological survey area included a larger and slightly different Project boundary (i.e., solar fields plus linear facilities including the transmission line and access roads) plus a small perimeter buffer for a total of 2,890 acres.

In 2012, this same general area was surveyed for paleontological resources as part of the previously proposed BrightSource Sonoran West project. The survey area defined for RE Crimson did not include repeat surveys over areas previously surveyed as part of that effort. The results of the Sonoran West survey are detailed in Section 3.2.

2.2 Geographic and Physiographic Setting

The Project footprint is located in an area approximately 15 miles west of the Colorado River in southeastern California (Figure 1-1). The Project footprint includes parcels on the northern and western sides of the Mule Mountains. Chuckwalla State Prison is to the west. The recently constructed CRS is to the north and east of the Project. Some references consider the Project to lie within the Colorado Desert physiographic province; others consider it to lie within the Mojave Desert physiographic province. The salient difference between the two is that the Mojave Desert is high desert, whereas the Colorado Desert is low desert (Norris and Webb 1990). Given that the elevation of the Project varies from 442 to 688 feet above mean sea level, for the purposes of this document, the Project is considered part of the Colorado Desert physiographic province.

The Project footprint is located within Sections 12, 13, 24, and 25, Township 7 South, Range 20 East, and Sections 7, 8, 16, 17, and 18, Township 7 South, Range 21 East, found on the Roosevelt Mine 7.5 minute' United States Geological Survey Quadrangle.

2.3 Geologic Setting

The Project site is situated on the eastern end of the Chuckwalla Valley and the western edge of the Palo Verde Mesa which lies above the northern and western side of the current Colorado River Valley. As in most of the Mojave and Colorado deserts, the geology of the Project site is dominated by mountains, alluvial fans, and basins. Shlemon (1980) characterized the Quaternary history of the region as epochs of alluviation preceded and followed by relative landscape stability and soil formation.

Geologic mapping of the Project area has not been performed in great detail. Jennings (1967) compiled the map of the entire state of California at a scale of 1:250,000. Metzger et al. (1973) mapped the geology of the Palo Verde Mesa at a scale of 1:125,000. They mapped all of the sedimentary deposits in the Project footprint as QTa: older alluvium of Pliocene and Pleistocene age. Jennings (1967) mapped the Needles 30 by 60 minute quadrangle at a scale of 1:100,000. Stone (1990) mapped the Blythe 30 by 60 minute quadrangle at a scale of 1:100,000 and Stone (2006) mapped the west half of the Blythe 30 by 60 minute quadrangle at the same scale. The geology of the Project site ranges from modern alluvial deposits to Triassic metamorphic deposits.

The Project site is shown on the geologic map prepared by Stone (2006) and is illustrated on Figure 2-1. In the mapping of Stone (2006), the Quaternary geological units are not assigned formational names, but have map unit designations. The majority of the project area is covered by surficial deposits consisting of Holocene alluvial fan/valley sediments (Qa6) that do not exhibit the desert varnish seen in older deposits. Grain sizes range from sand to sandy-gravel, with the coarser deposits found closer to the Mule Mountains (Stone, 2006). The eastern edge of the Project site and some of the northern edge of the Mule Mountain is mapped as having surficial deposits consisting of Holocene and Pleistocene alluvial fan deposits (Qa3) with surfaces characterized by smooth varnished desert pavement. Along the northern and northwestern sides of the Mule Mountains are deposits that Stone (2006) describes as a Pleistocene or Pliocene Mule Mountain alluvial deposit (QTmm) made of sand or pebbly sand that is weakly to moderately indurated with lenses of coarser deposits consisting of locally derived gravels. Holocene wash deposits (Qw) are characterized as “Unconsolidated, angular to subangular gravel and sand derived from local mountain ranges” and are coarser-grained, containing boulders and cobbles up against the mountains (Stone, 2006). The eolian sand deposits (Qs) are characterized as unconsolidated sands that form sheets or dunes.

2.4 Paleontological Records and Literature Search

A Paleontological Records Search encompassing the RE Crimson Project Study Area was commissioned from the Natural History Museum of Los Angeles County in 2012 as part of the previously proposed BrightSource Sonoran West project (Stewart and Williams, 2013). At that time, that institution found no fossil locality records in or near the area, but did have records of finds in deposits of the same age some distance to the north. The museum stated that excavations in the igneous rocks exposed in the Mule Mountains would not encounter any vertebrate fossils. It was further concluded that excavations in Quaternary deposits of the proposed Project area might well uncover significant vertebrate fossils. Any substantial excavations in the sedimentary deposits in the proposed Project area, therefore, should be monitored closely to quickly and professionally recover any fossil remains discovered while not impeding development. Any fossils recovered during mitigation should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.

In 2016, published and unpublished paleontological literature was searched for information pertinent to paleontology in the vicinity of the RE Crimson Solar Project. The only paleontological literature that reported paleontological resources in the study area were related to the BrightSource Rio Mesa (URS, 2011; Stewart, 2013; Stewart et al., 2012) and BrightSource Sonoran West (Stewart and Williams, 2013) projects which were investigated by URS (an AECOM company); thus, an updated records search for the Crimson Project was deemed unnecessary.

One published and several unpublished reports were found during the literature review. The confidential paleontological resources technical report for the BrightSource Rio Mesa project (URS 2011) reported extensive paleontological resources from late-Pleistocene sediments southeast, east, and northeast of the Mule Mountains. These fossils were found in paleosols (fossil soils) developed on Pleistocene terraces of the Colorado River. Stewart et al. (2012) detailed some of these discoveries and documented that the source of vertebrate fossils lying exposed on the desert floor can be the sediments that lie slightly below the surface. Deflation is a major erosional process in that region. Vertebrate fossils identified in these two documents included eggshells and partial skeletons of the tortoise *Gopherus* sp., mandibles of *Lepus*, and unspecified remains of *Sylvilagus, Equus, Mammuthus*, and a canid. One radiocarbon AMS date from the Rio Mesa project was published here. Spectrometry radiocarbon dating of a tortoise eggshell yielded a 2 sigma (95 percent confidence interval) result of 13,620 to 13,790 calendar years before present.

2.5 Previous Paleontological Survey

A paleontological survey of the BrightSource Sonoran West project was begun in late 2012 but never completed. It included both private and BLM land north and northwest of the Mule Mountains. The project was placed on hold and then AECOM was told to cease completion of the survey. The findings of the partial survey are included in the tech report. The report on the truncated survey (Stewart and Williams, 2013) revealed 1,057 vertebrate fossils found in paleosols north and northwest of the Mule Mountains. The vertebrate fossils (species and common names) recovered include:

- *Hesperotestudo* — tortoise (bones and eggshells)
- *Dipsosaurus* cf. *D. dorsalis* — desert iguana
- *Phrynosoma* — horned lizard
- *Coluber* or *Masticophis* — racer or coachwhip
- *Crotalis cerastes* — sidewinder
- *Crotalis atrox* — western diamondback
- Falconiformes — hawk or falcon

- *Taxidea taxis* badger
- *Canis latrans* coyote
- *Vulpes macrotis* kit fox
- *Ammospermophilus leucurus* antelope ground squirrel
- *Thomomys* pocket gopher
- *Dipodomys deserti* desert kangaroo rat
- *Lepus californicus* black-tailed jackrabbit
- *Sylvilagus* cottontail rabbit
- *Odocoilleus* deer
- *Antilocapra* pronghorn

The fossils found required revision of the age of some of the geologic units in Stones 1990 and 2006 mapping. The widespread unit of Holocene alluvial fan/valley sediments (Qa6) was demonstrated to be much older (late Pleistocene). The fossiliferous parts of the area surveyed were divided into 18 localities. The final report for the partial survey of the Sonoran West project is included as part of the confidential appendices (Appendix B).

3. Field Survey

3.1 Field Survey Method

As noted in Section 2.5 above, the area around the RE Crimson Project was part of surveys previously conducted for the proposed BrightSource Sonoran West project. The parts covered by the Sonoran West survey had little overlap with the RE Crimson Project footprint. RE commissioned a paleontological resource survey of the RE Crimson Project Study Area in 2016 as part of the approval process by the BLM. Surveys conducted in 2016 did not include regions that were previously surveyed in the 2012 BrightSource Sonoran West surveys. Prior to any field work, the Palm Springs BLM field office issued Paleontological Field Work Authorization (FWA) #16-02 authorizing surveys of the site and approving the proposed methodologies. This FWA was issued under BLM Scientific Paleontological Permit CA-16-07P to AECOM. The survey began on August 22, 2016, and ended on September 30, 2016. During most of the survey, the team consisted of four paleontologists: Dr. Michael Williams, Patrick Riseley, Cynthia Stoddard, and Dr. Joe Stewart. The site was surveyed by walking transects with spacing at 10 meters (m), 15 m, or 20 m, based on surface conditions and visibility. Geographic Positioning Systems (GPSs) were used to facilitate transects and collect data points, including both Trimble and Garmin units. The intent of the survey was to record all vertebrate fossils encountered within the Project footprint and buffer; no collection of specimens occurred. The UTM coordinates were recorded for each specimen or close grouping of specimens, and a locality number was assigned. For those specimens possibly worthy of curation, the specimens were surrounded with stones, making relocation simpler. The stones will be scattered once the fossils have been revisited and collected. Very small specimens were placed in a glass vial with the specimen number and surrounded by stones. As eolian movement of sand was sporadically active while the survey took place, it was observed that some of the earlier marked specimens were no longer visible except for the stone circles.

Numerous bones of non-fossil reptiles and mammals were observed during the 2012 and 2016 surveys. Several methods were employed to distinguish ancient specimens from those less-than-ancient. The presence of a thin brown layer of caliche on a bone was used as an indicator that the specimen had adequate antiquity to be considered a paleontological resource. Tortoise eggshell fragments having such caliche were dated at 13,620 to 13,790 calendar years before present through Accelerator Mass Spectroscopy (AMS) radiocarbon dating (Stewart et al., 2012). Some vertebrate specimens had an additional layer of gray caliche incorporating sand grains. The gray caliche, which often incorporated sand grains, was taken to be an indicator of antiquity well in excess of 10,000 years. As for rodent skeletal elements, particularly rodent and rabbit phalanges, metapodials, calcanea, and caudal vertebrae not showing any caliche, specimens that collapsed when pinched were considered as having insufficient antiquity. Also those that developed longitudinal cracks when pinched were considered to have insufficient antiquity, as the collagen was causing the longitudinal break orientation. Permineralized specimens of these elements resisted crushing pressure, and when they did break, it was across the smallest cross-section, rather than longitudinally. It appears probable that some early Holocene specimens have a thin layer of brown caliche. Its presence probably does not guarantee a Pleistocene age for a given specimen. It is important to bear in mind, however, that SVP guidelines (2010) define paleontological resources as being older than middle Holocene (older than about 5,000 radiocarbon years). Thus, early Holocene remains can also qualify as significant paleontological resources. Therefore, any specimens showing caliche were considered to have adequate antiquity to qualify as potential significant paleontological resources, and were recorded. In a study of burials of different ages near Khartoum, Sudan showed that a thin layer of calcium carbonate was found on pre-Mesolithic, Mesolithic, and Neolithic bones, but not in any burials younger than 6,250 BP (Dal Sasso et al., 2014). All eggshell fragments encountered were examined with a 10x loupe to determine whether they were of avian or tortoise origin. None of the avian eggshell fragments encountered had any antiquity. The tortoise eggshell fragments were examined to determine whether they were modern or ancient. Modern tortoise eggshell is translucent and has a blueish opalescence. The ancient eggshell fragments were opaque or hardly translucent and showed traces of caliche.

3.2 Field Survey Results

The 2016 survey of the RE Crimson Solar Project footprint and buffer recorded 957 fossil localities (Confidential Appendix B - Figure 3-1). Figure 3-1 also shows some specimens that were collected in the 2012 Sonoran West survey and that lie close to the Project footprint. Of the 957 fossil localities identified, 548 localities have identifiable specimens that potentially warrant collection (Confidential Appendix B - Table 3-1 and Figure 3-2). Typically multiple specimens were identified at each locality. Some of the localities produced identifiable microvertebrates, and multiple specimens were seen on the surface; screening of the loose sediment would be expected to yield many more. Three sedimentary units (Qa3, Qa6, and QTmm) produced significant paleontological resources. Thus, the sedimentary units on the Project Site are considered to have a high sensitivity for paleontological resources.

Even though the specimens were not collected for further analysis, fossil identification was possible in some cases. Fossils identified in the field include: anurans, tortoise bones and eggshells, lizard, snake, possible bird, large and small leporids (*Lepus* and *Sylvilagus*), rodents (mostly *Dipodomys*), artiodactyls, and horse. The limited information presently available for the RE Crimson fauna provides new information beyond what was previously identified during the previous paleontological surveys for the Sonoran West and Rio Mesa projects. No late-Pleistocene tortoise eggshell fossils were found in the Sonoran West survey, but in the RE Crimson survey, several were found and some are extensive enough to allow for radiocarbon dating. Two toad fossils were found at Rio Mesa and none at Sonoran West, whereas two specimens have been identified at RE Crimson and they include two elements not preserved at Rio Mesa. Four horse teeth were found in the RE Crimson survey, whereas none were found at Sonoran West. Only one camel fossil specimen has previously been reported in the Mule Mountains area (Rio Mesa), but it appears another smaller camel fossil has been found at RE Crimson. Only one identified bighorn fossil has previously been found in the Mule Mountain area (Rio Mesa), but it appears that another bighorn fossil has been identified at RE Crimson. During previous surveys, three sites at Rio Mesa that produced a concentration of microvertebrate fossils were identified, but none were found at Sonoran West. Ten microvertebrate sites were identified during the RE Crimson survey and it is expected that these sites have the potential to yield important paleontological information.

Many of the fossils found during the RE Crimson survey were clearly weathering out of paleosols. In other places, a paleosol was not clearly identifiable, but abundant caliche fragments were littered about the surface. When these are found on fairly level ground, it is a clear sign of the deflation of a paleosol. Likewise, when articulated elements held together by caliche are found on the ground surface, it is a clear sign that they were exhumed after spending thousands of years subsurface. Furthermore, a fossil tree trunk was located. It may have implications for the age of nearby deposits.

Late-Pleistocene terrestrial vertebrate fossils are very rarely found in California in the abundance that they occur in the Mule Mountains (i.e., in the vicinity of the RE Crimson, Sonoran West, and Rio Mesa solar project study areas). In Riverside County, the only comparable accumulation of small vertebrates is at Diamond Valley Reservoir. Rancho La Brea produces a great abundance of small vertebrate fossils in Los Angeles County, and it is designated a National Natural Landmark. Other than these two locations, other comparable occurrences in California have not been identified except in caves. Thus, the Mule Mountains area preserves the only known concentration of Pleistocene desert small vertebrate fossils in California, other than cave deposits. Cave deposits are usually the result of raptors eating their prey in caves, thus, they can be brought in from a considerable distance. The Mule Mountains specimens mostly lived and died very near to where they were found any many died underground exactly where found.

In all of California, the only place that fossil tortoise eggshells have been found is in two of the three aforementioned solar project survey areas around the Mule Mountains.

The paleosol geology at RE Crimson is thought to be different from the paleosol geology at Rio Mesa. At Rio Mesa, the paleosols were underlain by ancient terraces of the Colorado River. At RE Crimson and Sonoran West, it is interpreted that different sediments underlie the paleosols. However, it is not yet known what the underlying sediments are or their age. Late-Pleistocene terrace deposits almost certainly do not extend as far west as most of the RE Crimson Project study area. The re Crimson paleosols are not exactly duplicated at the Rio Mesa project; thus, both are considered to be unique in some respects.

4. Potential Fossil Yield Classification Ratings

The latest version (BLM, 2016) of the Potential Fossil Yield Classification (PFYC) system was consulted for definitions and criteria for the following geologic formation fossil-yield potential ratings. This version of the PFYC system is provided in Appendix A herein. In summary, the PFYC ratings are used to classify geologic formations for their potential to contain significant fossils and thus they can be used to predict the potential for Project activities involving ground disturbance to impact significant paleontological resources. The PFYC rating system ranges from Very Low (Class 1) to Very High (Class 5) potential. Class U is used for geologic units of Unknown Potential. In the order of ages assigned by Stone, 2006, the geologic units encountered in the Crimson Project area and associated PFYC ratings as determined by this assessment are itemized below.

As shown on Figures 2-1 and 3-1, the Project Site is underlain almost exclusively by map unit Qa6, Holocene alluvial fan/valley sediments. This assessment has assigned a classification of Class 4 – High for this geologic formation at the Project location. In addition, the Project Site is to a lesser extent underlain by map units Qa3 (Holocene and Pleistocene alluvial fan deposits) and QTmm (Alluvial deposits of the Mule Mountains) both of which are also rated Class 4 – High. Accordingly, the entire Project Site as currently configured is considered to have high paleontological sensitivity.

Holocene alluvial fan/valley sediments (Qa6)

As shown on Figures 2-1 and 3-1, this map unit covers the majority of the Project Site. As described by Stone (2006), these are young alluvial fan and alluvial valley sediments that do not exhibit the desert varnish seen in older deposits. The grain sizes range from sand to sandy-gravel, with the coarser deposits found closer to the Mule Mountains. Stone stated that this unit is probably equivalent primarily to deposits forming geomorphic surface Q4a of Bull (1991), which both Bull and Stone estimated to range in age from 0.1 to 2 ka (Holocene). It covers the majority of the Project Site area. Stone did not mention paleosols in his discussion of this unit. The 2016 survey revealed that a few rocks with desert varnish are to be found in this unit. We noted in our 2016 survey 532 localities in this unit that have significant paleontological resources.

AECOM's 2016 field survey results indicate that Stone's (2006) categorization of Qa6 as Holocene age needs to be updated and modified as evidenced by the following three 2016 survey results. First, AECOM's 2016 survey located four fossil teeth of *Equus* in this unit. Second, it is a paleosol with stage II development of calcium carbonate. Third, a tortoise eggshell in equivalent sediments east of the Mule Mountains yielded a radiocarbon date of approximately 14,000 calendar years. Most of the 950 vertebrate fossil sites AECOM documented were in this unit. Furthermore, these conclusions are mirrored by those of Stewart and Williams (2013). Stone (2006) did not mention paleosols in his discussion of Qa6. Given these findings, the name assigned by Stone (2006) to this geologic unit is considered to be a misnomer. This geologic unit should be rated Class 4 – High (i.e., high paleontological sensitivity).

Holocene and Pleistocene alluvial fan deposits (Qa3)

As shown on Figures 2-1 and 3-1, this map unit is located in the northeastern portion of the Study Area. Qa3 deposits lie on the eastern edge of the Project. Stone (2006) describes them as Holocene and Pleistocene alluvial fan deposits (Qa3) with surfaces characterized by smooth varnished desert pavement. He stated that this unit is probably equivalent to deposits forming geomorphic surfaces of Q3a to Q2a of Bull (1991). Those units were interpreted by both Bull and Stone to range from 8 to 730 ka. As these sediments are thought to be older than the Qa6 unit, they must be considerably older than the 8 ka minimum of Qa3. The minimum would be closer 20 ka. Many vertebrate fossils were found in areas mapped as this unit. Shallow disturbances revealed a paleosol lithology in these areas. We noted in our 2016 survey five localities in this unit that have significant paleontological resources. Stewart and Williams (2013) also reported vertebrate fossils from this unit. Stone (2006) did not mention paleosols in his description of this unit. Colorado River gravel and cobbles were much more common in this area than in areas to the west. This is probably more a result of proximity to the drainage than to age differences. This geologic unit should be rated Class 4 – High.

Alluvial deposits of the Mule Mountains (QTmm)

The southern edge of the northern part of the Project area and the eastern edge of the western part intersect sediments mapped as Pleistocene or Pliocene alluvial deposits of the Mule Mountains (QTmm) by Stone (2006). Stone did not give any equivalent geomorphic surface classification from Bull (1991). Stone (2006) described the Pleistocene or Pliocene Mule Mountain alluvial deposit as sand or pebbly sand that is weakly to moderately indurated with lenses of coarser deposits consisting of locally derived gravels. Stone (2006) stated that this unit might mark a former course of the ancestral Colorado River. What AECOM observed in these areas was a reddish paleosol formed on sediments having angular clasts of the gray to greenish-gray Jurassic volcanic rocks of the Mule Mountains (Figure 4-1). Fossils are not abundant in this unit. Where this unit was well weathered (paleosol winnowed), the surface was largely covered by these large volcanic clasts. Some highly mineralized vertebrate fossils were found among these clasts. Tortoise eggshells were also seen in this paleosol on the western side of the Project (Figure 4-1). That discovery confirms reports of tortoise eggshells in this unit (Stewart and Williams, 2013). These eggshells may be too old to date by radiocarbon. The paleosols in these sediments seem to be older and more indurated than those encountered in units Qa6 and Qa3 and they also seem to incorporate less sand. Based on the surveys performed, fossils appear to be less common than those present in units Qa6 and Qa3, but those present are significant. We noted in our 2016 survey 11 localities in this unit that have significant paleontological resources. This geologic unit should be rated Class 4 – High.

Holocene alluvium of modern washes (Qw)

As shown on Figures 2-1 and 3-1, this geologic formation is located in the desert washes between multiple portions of the Project footprint. As currently configured, the Project would impact this unit only through the construction of solar field access roads. This unit consists of angular to subangular gravel and sand derived from the local mountains. Stone stated that the Qw unit is equivalent to deposits forming geomorphic surface Q4b of Bull (1991). Bull (1991, Table 2.13) seems to indicate that that geomorphic surface ranges from 0 to 0.1 kilo annum (ka) (thousand years ago). The only paleontological resources found in these sediments were washed in from adjacent higher, older sediments. Because of their young age, this geologic unit should be rated Class 2 – Low.

5. Regulatory Framework

The following subsections summarize the federal, state, and local regulations, ordinances, standards, and guidance that are relevant to the assessment of potential impacts to paleontological resources from the Project associated with surface and subsurface ground disturbing activities.

5.1 Federal

Paleontological resources found on public lands are recognized by BLM as constituting a fragile and nonrenewable scientific record of the history of life on earth. They represent an important component of America’s natural heritage. BLM manages paleontological resources under the following laws, regulations and policies: BLM Manual 8270, Paleontological Resources Management; BLM Handbook 8270-1, General Procedural Guidance for Paleontological Resources Management; the Federal Land Policy and Management Act of 1976; the National Environmental Policy Act of 1969; Secretarial Order 3104; the Federal Cave Resources Protection Act of 1988; Archaeological Resources Protection Act of 1979; Antiquities Act of 1906; and other various laws and regulations. The following subsections provide more information on applicable federal acts.

5.1.1 Antiquities Act of 1906

The Antiquities Act protects paleontological resources on federal lands, requires inventory of effects and mitigation if appropriate.

5.1.2 National Environmental Policy Act of 1969

NEPA establishes a public, interdisciplinary framework for federal decision-making and ensures that Federal agencies take environmental factors into account when considering federal actions.

5.1.3 Federal Land Policy and Management Act (FLPMA) of 1976

The FLPMA recognizes significant paleontological resources as scientific resources, and requires Federal agencies to manage public lands in a manner that protects the quality of scientific resources and, where appropriate, preserves and protects certain public lands in their natural condition. Permits that authorize the collection of significant fossils on BLM lands are authorized under FLPMA.

5.1.4 Paleontological Resource Protection Act (PRPA) of 2009

The PRPA sets forth standards for the management and protection of The proposed rule would address the management, collection, and curation of paleontological resources from federal lands using scientific principles and expertise, including collection in accordance with permits; curation in an approved repository; and maintenance of confidentiality of specific locality data. The Paleontological Resources Preservation Act authorizes civil and criminal penalties for illegal collecting, damaging, otherwise altering or defacing, or for selling paleontological resources, and the proposed rule further details the processes related to the civil penalties, including hearing requests and appeals of the violation or the amount of the civil penalties.

5.2 State of California

5.2.1 California Environmental Quality Act (CEQA) Impact Determination

The California Environmental Quality Act of 1970 (CEQA) requires all agencies of State government that regulate activities of private individuals, corporations, and public agencies, which are found to affect the quality of the environment, shall regulate such activities so that major consideration is given to preventing environmental damage. The procedures, types of activities, persons, and public agencies required to comply with CEQA are defined in the *Guidelines for Implementation of CEQA* (State CEQA Guidelines), as amended (Title 14, Section 15000 et seq. of the California Code of Regulations). One of the questions listed in the CEQA Environmental Checklist is: "Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?" (State CEQA Guidelines Section 15023 and Appendix G, Section XIV, Part A). A paleontological investigation is mandated if the answer to the question of the presence of paleontological resources is "yes" or "possibly."

5.3 Riverside County

Paleontological resources are addressed in the Multipurpose Open Space Element of the County of the Riverside General Plan. The Open Space Element (adopted October 7, 2003) includes the policies identified below concerning paleontological resources.

> OS 19.8. "Whenever existing information indicates that a site proposed for development may contain biological, paleontological, or other scientific resources, a report shall be filed stating the extent and potential significance of the resource that may exist within the proposed development and appropriate measures through which the impacts of development may be mitigated."
>
> OS 19.9. "This policy requires that when existing information indicates that a site proposed for development may contain paleontological resources, a paleontologist shall monitor grading activities with the authority to halt grading to collect uncovered paleontological resources, curate any resources collected with an appropriate repository, and file a report with the Planning Department documenting and paleontological resources that are found during the course of site grading."

The SABER Policy (Safeguard Artifacts Being Excavated in Riverside County), enacted in October 2011 by the Riverside County Board of Supervisors, mandates that any paleontological resources found or unearthed in the County of Riverside be curated at the Western Science Center in the City of Hemet. This policy will be included as an amendment to the multi-purpose element of the General Plan Update.

Furthermore, the policies of the County of Riverside recognize the guidelines of the Society of Vertebrate Paleontology (SVP).

5.4 Professional Standards

5.4.1 Society of Vertebrate Paleontology Impact Mitigation Guidelines

SVP is a professional society for vertebrate paleontologists. It has published Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources (SVP, 2010). These guidelines define significant paleontological resources, describe the procedure for assessing project sensitivity for significant paleontological evaluating resources, and describe actions that must be taken to monitor for, and to preserve, paleontological resources during project construction. Significant paleontological resources are defined as identifiable vertebrate fossils, whether small or large, and uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. Paleontological resources are considered to be older than about 5,000 radiocarbon years.

5.4.2 Bureau of Land Management Guidelines

6. Findings

6.1 Impact Thresholds

There are no federal standards that define significance thresholds for paleontological resources impacts under NEPA. The BLM does not specify a significance threshold for impacts to paleontological resources, but does define significant paleontological resources. See section 5.4.2. FLPMA recognizes the importance of protecting significant paleontological resources and requires federal agencies such as the BLM to manage lands in a manner that protects resources. Accordingly, if the Project would or possibly could destroy a significant paleontological resource a program is mandated to mitigate these impacts.

6.2 Impact Analysis

The total area for the Project (i.e., Permitting Boundary) is 2,489 acres, including a 2,465-acre solar field development area with approximately 1,859 acres of solar panels (array blocks) and 24 acres for linear facilities including access and perimeter roads with a 30- to 60-foot corridor width and gen-tie and powerline corridors at 150 feet in width.

Construction of the proposed Project using the traditional design methods would have a potentially adverse impact to significant paleontological resources (including, but not limited to vertebrate fossils) on the surface and subsurface due to the following primary construction activities:

- Pre-construction investigations such as geotechnical investigation involving surface and subsurface disturbance;
- Overall Project Site preparation, including site grading and mow-and-till operations, as applicable;
- Access road grading;
- Trenching for buried electrical lines;
- Borings for electrical pole foundations (34.5 kV and 230 kV) and water supply wells, as applicable; and
- Grading for equipment pad foundations.

Paleontological resources could be adversely impacted during the Project construction activities listed above by being crushed by equipment and earth-moving activities, displacement and alteration of context, and/or unauthorized collection by construction workers.

As discussed in Section 4 and shown on Figures 2-1 and 3-1, the Project Site is underlain almost exclusively by map unit Qa6, Holocene alluvial fan/valley sediments (Unit 6). This assessment has assigned a classification of Class 4 – High for this map unit at the Project location. In addition, the Project Site is to a lesser extent underlain by geologic formations Qa3 (Holocene and Pleistocene alluvial fan deposits) and QTmm (Alluvial deposits of the Mule Mountains) both of which are also rated Class 4 – High. Accordingly, the entire Project Site as currently configured is considered to have high paleontological sensitivity. These three sedimentary geologic units have high sensitivity for paleontological resources and would be expected to experience significant disturbance and impacts during Project construction activities if not properly mitigated. During the field surveys for this Project, hundreds of significant vertebrate fossils were found lying on the surface. Field identifications indicate that some included species that have never been reported from this area. Located specimens should be recovered before geotechnical crews or construction personnel drive across these surfaces in order to avoid impacts.

It is not currently known what geologic units underlie the surficial units. There may be geologic units bearing sensitive paleontological resources that have not yet been detected in the Project area. If so, these units should be sampled for paleontological resources when encountered (e.g., during a site geotechnical investigation or during site preparation/grading and trenching activities, as applicable).

7. Project Alternatives Impact Assessment

7.1 Construction Impacts

The following assessment of potential impacts to paleontological resources includes consideration of the differences between the traditional design and the project with the incorporation of LEID elements based on the currently known details of each alternative construction method which in some cases is limited. The level of detail known is specified in the POD (April 2017).

Impacts Common to Two Designs

The common elements of the two Project alternatives that have the potential to result in impacts to paleontological resources are as follows:

- Geotechnical drilling;
- Construction of the O&M building and supporting facilities;
- Construction of the battery storage area;
- Construction of the access road, perimeter road, and internal road network;
- 300 to 500 wood poles installed under either plan (12 to 14 inches in diameter, buried 6 to 10 feet deep);
- Dead-end structures for power lines with footings up to 20 feet deep; and
- Ten gen-tie structures with foundations reaching 20 feet in depth.

Traditional Design

- Extensive trenching for burial of onsite low-voltage (34.5-kV) power lines. Trench widths are 3 to 6 feet, and depths range from 1.6 to 10 feet.

Low Environmental Impact Design

- 300 to 400 additional wooden poles (up to 900 poles in total);
- No grading in the solar fields outside of roads and preparation of the solar fields by hand trimming in place of a mow-and-roll technique; and
- No trenching for the installation of cables and electric lines.

Comparison

Both designs have a high potential to impact paleontological resources in the Project area. These potential impacts can be offset by the implementation of the mitigation measures described below. The impacts of the extra trenching and grading necessary for the traditional design would have the potential to result in greater impacts to sensitive paleontological resources than a design with some or all of the LEID elements incorporated. Although the traditional design would involve more grading and trenching impacts, the incorporation of the LEID element that would remove trenching to place cables and wires above ground would increase impacts associated with the subsurface disturbance resulting from the necessary installation of an additional 300 to 400 wooden power poles with subsurface foundations up to 10 feet deep. The relative amount of surface and subsurface disturbance for the two design alternatives has not yet been quantified. Assuming the Applicant-Proposed Mitigation Measures presented in Section 8 below are implemented, it is expected that implementation of either alternative has the potential to result in new information regarding paleontological resources in the Project region associated with data recovery, evaluation, and curation of resources that would likely not otherwise have been studied and recovered. With implementation of the mitigation measures presented in Section 8, impacts to paleontological resources would be expected to be mitigated to acceptable levels.

7.2 Operations and Maintenance

Impacts to paleontological resources are not expected during operations and maintenance (O&M) activities as resources would have been addressed during the construction phase and operation of the facility consists of mainly passive activities that do not involve ground-disturbing activities. There is a low potential that additional resources could be discovered during ground-disturbing O&M activities should they occur. O&M impacts would be addressed by the applicable applicant proposed measures identified in Section 8 below.

7.3 Decommissioning

Decommissioning impacts are anticipated to be similar to or less than those determined for the construction phase of the Project. The actual impacts would be dependent upon the proposed decommissioning action and final use of the site; however, it is anticipated that paleontological resources would be addressed during the construction phase and that little potential new resources would be discovered that would require additional management during decommissioning. Applicable construction phase APMs would be implemented during the decommissioning phase to minimize associated impacts, including monitoring of ground-disturbing activities by a qualified paleontologist.

8. Applicant-Proposed Mitigation Measures

The following Applicant Proposed Measures are recommended to reduce the potential for substantial adverse effects or significant impacts to paleontological resources associated with Project construction. These measures will be reviewed and approved by the BLM prior to implementation:

PALEO-1: Pre-construction phase measures shall include the following:

- Prior to the start of any Project-related construction activities, the applicant shall retain a BLM-approved paleontologist to create and implement a Project-specific Paleontological Resource Monitoring and Mitigation Plan to be approved by the BLM. The qualified paleontologist shall be responsible for implementing all the paleontological conditions of approval and for using qualified personnel to assist in this work.

- Prior to the start of Project-related construction activities, a Worker Environmental Awareness Program (WEAP) shall be developed by the qualified paleontologist. The WEAP shall address the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources. The training program shall also include the set of reporting procedures that workers are to follow if paleontological resources are encountered during Project activities. The WEAP may be combined with other environmental training programs for the project.

- If specimens located during the 2016 survey have not been collected, then all significant specimens shall be collected, identified, reported, and curated prior to initiation of geotechnical work, grubbing, or grading. Any paleontological fieldwork occurring on lands administered by the BLM would require a Paleontological Resources Use Permit issued by the BLM state office.

- Microfauna sites identified in the 2016 survey shall be tested for significant paleontological resources (process at least 5 gallons of sediment from each microfauna site) prior to initiation of grubbing or grading.

PALEO-2: Construction phase measures shall be defined within a Project-specific Paleontological Monitoring and Mitigation Plan prepared during the pre-construction phase and shall include the following:

- All ground-disturbing activities shall be monitored by a BLM-approved paleontologist. If no significant fossils are found, then the frequency of monitoring shall be adjusted at the discretion of the qualified paleontologist after an adequate amount of time is spent observing the geologic deposits in the project area. The adequate amount of time will be addressed in the PRMP prepared and approved by the BLM and determined by the qualified paleontologist on site.

- If fossil eggshell specimens are recovered from deep augering (8 to 20 feet), some shall be radiocarbon dated to determine the age of subsurface deposits.

- One standard sediment sample as defined by SVP (2010) shall be processed from each of the seven legal township sections impacted. These samples may be collected during construction activities and utilize materials excavated for construction of the Project. Separate sampling is not required.

- Recovered significant fossils shall be prepared, identified, reported, and curated in an approved paleontological repository.

PALEO-3: The Applicant shall ensure preparation of a paleontological resources monitoring report by the qualified paleontologist. The report shall be completed following the analysis of any recovered fossil materials and related information. The report shall include, but not be limited to, a description and inventory list of recovered fossil materials (if any); a map showing the location of paleontological resources found in the field; determinations of scientific significance; and a statement by the qualified paleontologist that project impacts to paleontological resources have been mitigated.

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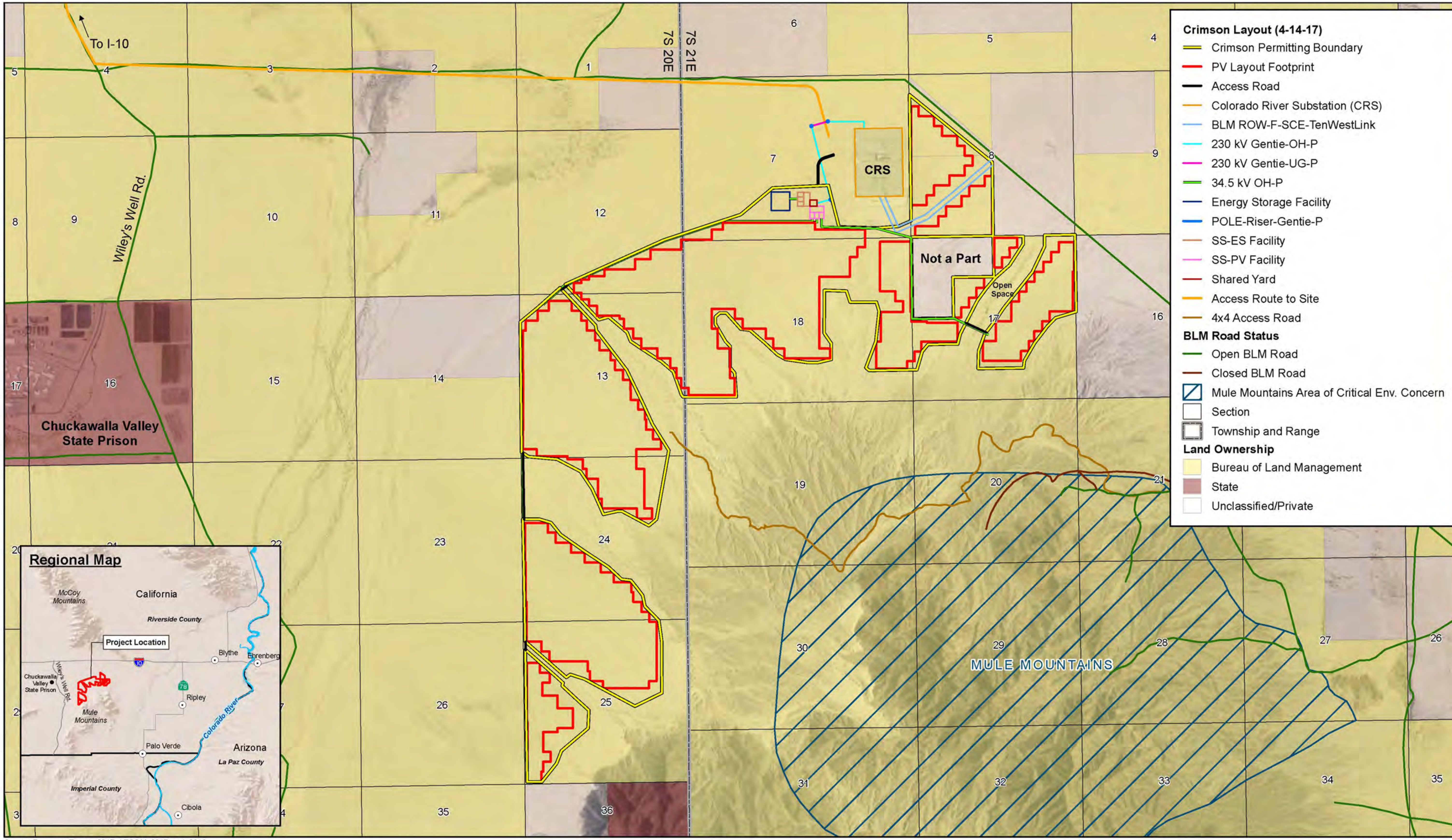
Figures



Source: Recurrent Energy, 2017. AECOM, 2017. esri, 2016.

3,000 0 3,000 Feet

Scale: 1:36,000 1 in = 3,000 feet

FIGURE 1-1
SITE VICINITY

DATE: 8/29/2017

RE Crimson Solar - Riverside County, CA

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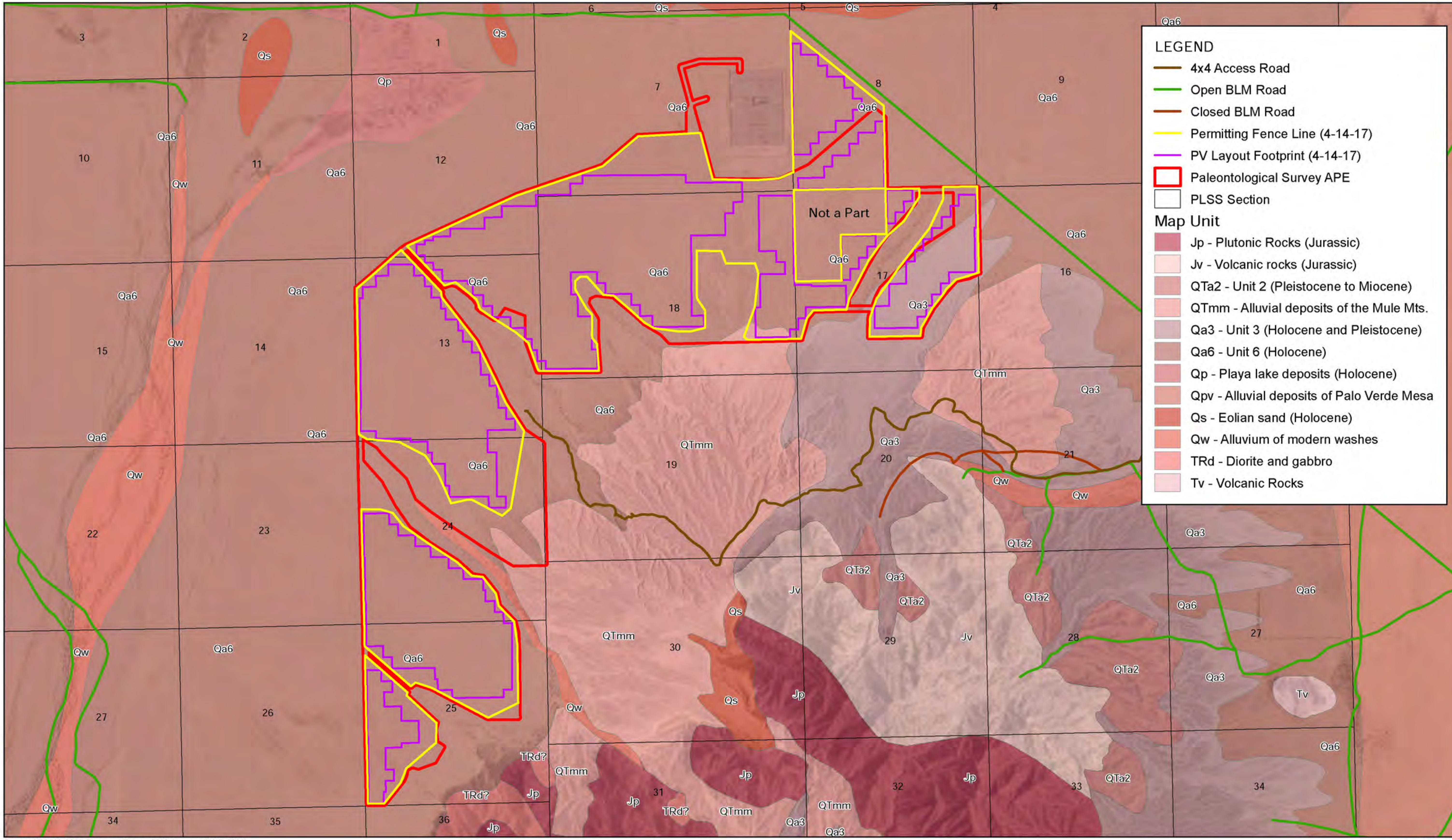

Source: AECOM, 2016; Recurrent Energy, 2016; Imagery (NAIP, 2014).

1,325 0 1,325 2,650 Feet

Scale: 1:32,160 1 in = 2,680 feet

FIGURE 2-1
PROJECT STUDY AREA AND GEOLOGY
DATE: 8/24/2017

RE Crimson Solar - Riverside County, CA

Path: U:\Projects\Recurrent Energy\60487757_Crimson\900-Work\920-GIS\map_docs\mxd\Paleo\Paleo_Report_082117\Fig2-1_StudyArea_Geology.mxd, augellop, 8/24/2017, 8:23:49 PM

Source: AECOM, 2016.

FIGURE 4-1
REDDISH PALEOSOL OF ALLUVIAL DEPOSITS OF THE MULE MOUNTAINS (QTmm)

Not to scale

DATE: 8/21/2017

RE Crimson Solar - Riverside County, CA

Path: U:\Projects\Recurrent Energy\60487757_Crimson\900-Work\920-GIS\map_docs\mxd\Paleo\Paleo_Report_082117\Fig5-2_Paleosol_Photo.mxd, jason.sokol, 8/21/2017, 5:42:02 PM

Appendix A

Bureau of Land Management Potential Fossil Yield Classification System

Potential Fossil Yield Classification System

Introduction. The Potential Classification Yield Classification (PFYC) system allows Bureau of Land Management (BLM) employees to make initial assessments of paleontological resources in order to plan for multiple uses of public lands, consider disposal or acquisition of lands, analyze potential effects of a proposed action under the National Environmental Policy Act (NEPA), or conduct other BLM resource-related activities. The PFYC system can also highlight the areas for paleontological research efforts or predict illegal collecting. The system provides a consistent and streamlined approach to determine if a potential action may affect paleontological resources on public lands.

The PFYC system provides baseline guidance for assessing paleontological resources. The classification should be considered early in an analysis and should be used to assist in determining the need for further assessment or actions. When considering proposed actions, the PFYC system should be used in conjunction with a map of known fossil localities.

Occurrences of paleontological resources are known to be correlated with mapped geologic units (i.e., formations). The PFYC is created from available geologic maps and assigns a class value to each geological unit, representing the potential abundance and significance of paleontological resources that occur in that geological unit. PFYC assignments should be considered as only a first approximation of the potential presence of paleontological resources, subject to change based on ground verification.

In the PFYC system, geologic units are assigned a class based on the relative abundance of significant paleontological resources and their sensitivity to adverse impacts. This classification is applied to the geologic formation, member, or other mapped unit. The classification is not intended to be applied to specific paleontological localities or small areas within units. Although significant localities may occasionally occur in a geologic unit that has been assigned a lower PFYC classification, widely scattered important fossils or localities do not necessarily indicate a higher class assignment. Instead, the overall abundance of scientifically important localities is intended to be the major determinant for the assigned classification.

The descriptions for the class assignments below serve as guidelines rather than as strict definitions. Knowledge of the geology and the paleontological potential for individual geological units are considered when developing PFYC assignments. These assignments must be developed using scientific expertise with input from a BLM paleontologist, but may include collaboration and peer review from outside researchers who are knowledgeable about both the geology and the nature of paleontological resources that may be found in each geological unit. Each state has unique geologic maps and so also has unique PFYC assignments. It is possible, and occasionally desirable, to have different assignments for a similar geologic unit across separate states.

Class 1 **– Very Low**. Geologic units that are not likely to contain recognizable paleontological resources. Units assigned to Class 1 typically have one or more of the following characteristics:

- Geologic units are igneous or metamorphic, excluding air-fall and reworked volcanic ash units.
- Geologic Units are Precambrian in age.

(1) Management concerns for paleontological resources in Class 1 units are usually negligible or not applicable.

(2) Paleontological mitigation is unlikely to be necessary except in very rare or isolated circumstances that result in the unanticipated presence of paleontological resources, such as unmapped geology contained within a mapped geologic unit. For example, young fissure-fill deposits often contain fossils but are too limited in extent to be represented on a geological map; a lava flow that preserves evidence of past life, or caves that contain important paleontological resources. Such exceptions are the reason that no geologic unit is assigned a Class 0.

Overall, the probability of impacting significant paleontological resources is very low and further assessment of paleontological resources is usually unnecessary. An assignment of Class 1 normally does not trigger further analysis unless paleontological resources are known or found to exist. However, standard stipulations should be put in place prior to authorizing any land use action in order to accommodate an unanticipated discovery.

Class 2 – **Low**. Geologic units that are not likely to contain paleontological resources. Units assigned to Class 2 typically have one or more of the following characteristics:

- Field surveys have verified that significant paleontological resources are not present or are very rare.
- Units are generally younger than 10,000 years before present.
- Recent aeolian deposits.
- Sediments exhibit significant physical and chemical changes (i.e., diagenetic alteration) that make fossil preservation unlikely.

(1) Except where paleontological resources are known or found to exist, management concerns for paleontological resources are generally low and further assessment is usually unnecessary except in occasional or isolated circumstances.

(2) Paleontological mitigation is only necessary where paleontological resources are known or found to exist.

The probability of impacting significant paleontological resources is low. Localities containing important paleontological resources may exist, but are occasional and should be managed on a case-by-case basis. An assignment of Class 2 may not trigger further analysis unless paleontological resources are known or found to exist. However, standard stipulations should be put in place prior to authorizing any land use action in order to accommodate unanticipated discoveries.

Class 3 – **Moderate**. Sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence. Units assigned to Class 3 have some of the following characteristics:

- Marine in origin with sporadic known occurrences of paleontological resources.
- Paleontological resources may occur intermittently, but abundance is known to be low.
- Units may contain significant paleontological resources, but these occurrences are widely scattered.
- The potential for an authorized land use to impact a significant paleontological resource is known to be low-to-moderate.

(1) Management concerns for paleontological resources are moderate because the existence of significant paleontological resources is known to be low. Common invertebrate or plant fossils may be found in the area, and opportunities may exist for casual collecting.

(2) Paleontological mitigation strategies will be proposed based on the nature of the proposed activity.

This classification includes units of moderate or infrequent occurrence of paleontological resources. Management considerations cover a broad range of options that may include record searches, pre-disturbance surveys, monitoring, mitigation, or avoidance. Surface-disturbing activities may require assessment by a qualified paleontologist to determine whether significant paleontological resources occur in the area of a proposed action, and whether the action could affect the paleontological resources.

Class 4 – **High**. Geologic units that are known to contain a high occurrence of paleontological resources. Units assigned to Class 4 typically have the following characteristics:

- Significant paleontological resources have been documented, but may vary in occurrence and predictability.
- Surface disturbing activities may adversely affect paleontological resources.
- Rare or uncommon fossils, including nonvertebrate (such as soft body preservation) or unusual plant fossils, may be present.
- Illegal collecting activities may impact some areas.

(1) Management concerns for paleontological resources in Class 4 are moderate to high, depending on the proposed action.

(2) Paleontological mitigation strategies will depend on the nature of the proposed activity, but field assessment by a qualified paleontologist is normally needed to assess local conditions.

The probability for impacting significant paleontological resources is moderate to high, and is dependent on the proposed action. Mitigation plans must consider the nature of the proposed disturbance, such as removal or penetration of protective surface alluvium or soils, potential for future accelerated erosion, or increased ease of access that could result in looting. Detailed field assessment is normally required and on-site monitoring or spot-checking may be necessary during land disturbing activities. In some cases avoidance of known paleontological resources may be necessary.

Class 5 – **Very High**. Highly fossiliferous geologic units that consistently and predictably produce significant paleontological resources. Units assigned to Class 5 have some or all of the following characteristics:

- Significant paleontological resources have been documented and occur consistently.
- Paleontological resources are highly susceptible to adverse impacts from surface disturbing activities.
- Unit is frequently the focus of illegal collecting activities.

(1) Management concerns for paleontological resources in Class 5 areas are high to very high.

(2) A field survey by a qualified paleontologist is almost always needed. Paleontological mitigation may be necessary before or during surface disturbing activities.

The probability for impacting significant paleontological resources is high. The area should be assessed prior to land tenure adjustments. Pre-work surveys are usually needed and on-site monitoring may be necessary during land use activities. Avoidance or resource preservation through controlled access, designation of areas of avoidance, or special management designations should be considered.

Class U **– Unknown Potential.** Geologic units that cannot receive an informed PFYC assignment. Characteristics of Class U may include:

- Geological units may exhibit features or preservational conditions that suggest significant paleontological resources could be present, but little information about the actual paleontological resources of the unit or area is known.
- Geological units represented on a map are based on lithologic character or basis of origin, but have not been studied in detail.
- Scientific literature does not exist or does not reveal the nature of paleontological resources.
- Reports of paleontological resources are anecdotal or have not been verified.
- Area or geologic unit is poorly or under-studied.
- BLM staff has not yet been able to assess the nature of the geologic unit.

(1) Until a provisional assignment is made, geologic units that have an unknown potential have medium to high management concerns.

(2) Lacking other information, field surveys are normally necessary, especially prior to authorizing a ground-disturbing activity.

An assignment of “Unknown” may indicate the unit or area is poorly studied, and field surveys are needed to verify the presence or absence of paleontological resources. Literature searches or consultation with professional colleagues may allow an unknown unit to be provisionally assigned to another Class, but the geological unit should be formally assigned to a Class after adequate survey and research is performed to make an informed determination.

***Class W* – Water.** Includes any surface area that is mapped as water. Most bodies of water do not normally contain paleontological resources. However, shorelines should be carefully considered for uncovered or transported paleontological resources. Reservoirs are a special concern because important paleontological resources are often exposed during low water intervals. In karst areas sinkholes and cenotes may trap animals and contain paleontological resources. Dredging river systems may result in the disturbance of sediments that contain paleontological resources.

***Class I* – Ice.** Includes any area that is mapped as ice or snow. Receding glaciers, including exposed lateral and terminal moraines should be considered for their potential to reveal recently exposed paleontological resources. Other considerations include melting snow fields that may contain paleontological resources with possible soft-tissue preservation.

Special Notes. When developing PFYC assignments, the following should be considered:

- Standard stipulations should always be put in place prior to authorizing any land use action in order to accommodate an unanticipated discovery.
- Class 1 & 2 and Class 4 & 5 units may be combined for broad applications, such as large-scale planning, programmatic assessments, or when geologic mapping at an appropriate scale is not available. Resource assessment, mitigation, and other management considerations will need to be addressed when actual land disturbing activities are proposed.
- Where large projects impact multiple geologic units with different PFYC Classes, field survey and monitoring should be applied appropriately. For example, the authorized officer may determine that on-the-ground (pedestrian) surveys are necessary for the Class 4 and 5 formations, but not for Class 2 formations along a specific project.
- Based on information gained by surveys, the BLM may adjust PFYC assignments appropriately. Actual survey and monitoring intensities, as well as the extent of discoveries, should be included in any assessment, mitigation, or permit report so the BLM may reevaluate PFYC assignments.
- A geologic unit may receive a higher or lower classification in specific areas where the occurrence of fossils is known to be higher or lower than in other areas where the unit is exposed.
- Some areas are difficult to evaluate, such as talus, colluvium, tailings, fill, borrow, and other mapped features. A PFYC assignment should be made for each area using available information, or the area should be assigned to Class U as appropriate.
- The BLM-wide PFYC assignments are maintained and periodically updated by the BLM paleontology team and may be obtained by contacting the BLM state or regional paleontologist assigned to an area.

Appendix B

Confidential Paleontological Site Survey Information

Appendix B.1

Confidential RE Crimson 2016 Site Survey Information

Appendix B.2

Confidential Sonoran West Final Paleontological Report

Appendix R
Socioeconomics and Environmental Justice

Socioeconomics Technical Report, November 2018

RE Crimson Solar Project

by Sonoran West Solar Holdings, LLC

Socioeconomics Technical Report

Project Number: 60487757

November 2018

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Table of Contents

Figures

Appendices

1. Project Overview

1.1 Introduction

Sonoran West Solar Holdings, LLC (Applicant), a wholly owned subsidiary of Recurrent Energy LLC (RE), proposes to construct and operate the RE Crimson Solar Project (Project). This Project is a utility-scale solar photovoltaic (PV) and energy storage project that would be located in the Riverside East Solar Energy Zone (SEZ)/Designated Leasing Area and within a Development Focus Area (DFA) on federal lands managed by the Bureau of Land Management (BLM) within the California Desert Conservation Area planning area in unincorporated eastern Riverside County, approximately 13 miles west of Blythe, California (CA) (BLM CACA-051967). The Project would interconnect to the regional electrical grid at the Southern California Edison (SCE) 230-kilovolt (kV) Colorado River Substation (CRS), and would generate up to 350 megawatts (MW) of renewable energy using PV technology with up to 350 MW of integrated energy storage capacity.

The purpose of this study is to provide scientific and technical data regarding the existing socioeconomic environment within the study area and the proposed Project's potential effects on the area's socioeconomic environment. The Project information supporting this analysis is based primarily on the Applicant's RE Crimson Solar Project Plan of Development (POD) submitted to the BLM in January 2016 and updated in 2017 (RE 2017). If warranted, Applicant measures are proposed or recommended in this study to address adverse changes to the existing socioeconomic environment as a result of the Project. This study is submitted to the BLM (the federal lead agency) and the California Department of Fish and Wildlife (CDFW), the state lead agency, to support their independent review and evaluation of the environmental impacts of the Project pursuant to applicable Federal, State, and local laws. The POD is part of the BLM Right-of-Way (ROW) grant application process which for this Project includes preparation of an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA). The proposed Project is also expected to require a Streambed Alteration Agreement and an Incidental Take Permit from the State through CDFW which would require compliance with the California Environmental Quality Act (CEQA) (e.g., Environmental Impact Report [EIR]). Therefore, it is currently assumed that a joint EIS/EIR will be prepared by the BLM and CDFW.

1.2 Project Description

The Project is located in unincorporated eastern Riverside County, approximately 13 miles west of Blythe, just north of Mule Mountain and just south of Interstate 10 (I-10), including portions of Sections 1, 2, 11, 12, 13, 24, 25 within Township 7 South, Range 20 East, and portions of Sections 6, 7, 8, 17, 18 within Township 7 South, Range 21 East (Figure 1-1). The Project site consists of approximately 2,489 acres of BLM- administered land within the Riverside East SEZ and within the Desert Renewable Energy Conservation Plan (DRECP) DFA as presented in the Final EIS and approved in the Record of Decision and associated Land Use Plan Amendment in September 2016 (http://www.drecp.org/). The Project is not sited within the adjacent Section 368 Federal Energy Corridor pursuant to the Westwide Energy Corridor Final Programmatic EIS, except for a short gen-tie line that would interconnect the Project to the CRS.

The Project site is situated at the eastern edge of the Chuckwalla Hydrologic Area and supports a broad alluvial fan that includes many braided washes and channels that converge into a primary channel flowing into an intra-state playa lake northwest of the Project site. This playa lake is not a Traditional Navigable Water; therefore, the channels in the Project area do not qualify as federal jurisdictional waters.

The site is surrounded primarily by BLM-managed lands and some private parcels. The site is located at the northern foot of the Mule Mountain Area of Critical Environmental Concern, which is an important cultural resource for local Native American Tribes. The SCE high-voltage transmission line and CRS are located directly north of the Project site, and Interstate 10 (I-10) is north of and parallel to those facilities. East of the Project site is First Solar's proposed Desert Quartzite project. Further northeast of the Desert Quartzite project is the site of the recently approved Blythe Mesa Solar Project by RRG Renewables.

The Project applicant is proposing to construct the project using a traditional construction approach consisting of desert tortoise exclusion fencing, a mow-and-roll approach to site preparation, compacted roads, and trenching for electrical lines; however, the applicant is actively investigating alternative low-environmental impact design (LEID) elements and the potential for those to reduce Project impacts. LEID elements include several potential design changes including:

1. Minimizing grading during site preparation and maintaining more onsite vegetation to facilitate post-construction residual habitat value and post-operations/site reclamation success;

2. Avoiding or limiting trenching by placing electrical wiring aboveground; and

3. Placing transformer/inverter groups on elevated support structures in lieu of cement foundations.

The LEID elements would further minimize grading, trenching, and vegetation removal beyond traditional design approaches for PV projects with the objective of reducing overall long-term impacts for the Project. Although the incorporation of LEID elements could result in slight modifications to the panel block locations due to topographic constraints, the permitting boundary or limits of development would be the same with LEID elements incorporated. The comparative impacts of the tradition design approach versus design with LEID elements incorporated is not known; therefore, to facilitate appropriate analysis of the Project and allow for the incorporation of LEID elements where practicable and environmentally beneficial, the technical analyses are based on the elements that result in the worst-case scenario for construction and operations.

A vicinity map showing the Permitting (Development) Boundary is presented on Figure 1-1. The block layouts may vary slightly with the incorporation of the LEID elements, but would remain within the Permitting Boundary. The total area for the Project (i.e., Permitting Boundary) is 2,489 acres, including a 2,465-acre solar field development area with approximately 1,859 acres of solar panels (array blocks) and 24 acres for linear facilities including access/perimeter roads with a 30-to 60-foot corridor width and gen-tie and powerline corridors at 150 feet.

1.3 Design Option Scenarios

1.3.1 Traditional Design

An estimated 2 million panels would be arranged on the site in the form of solar arrays. Structures supporting the PV modules would consist of steel piles (e.g., cylindrical pipes, H-beams, or similar), which would be driven into the soil using pneumatic techniques, such as a hydraulic attachment on the boom of a backhoe tractor.

The proposed traditional design is laid out primarily in 2-MW increments, each 2-MW increment would include an inverter-transformer station constructed on a concrete pad or steel skid, and would be centrally located within the PV module arrays. Each inverter-transformer station would contain up to four inverters, a transformer, a battery enclosure, and a switchboard. Underground cables would be installed to convey the direct current (DC) electricity from the panels to the inverters to convert the DC to alternating current (AC). Between 300 and 500 wooden poles would be installed across the entire site to convey energy to a central substation location which would transform voltage from 34.5 kV to 230 kV.

Energy storage may be achieved by either a battery or flywheel storage system capable of storing up to 350 MW of electricity. The storage system would consist of banks of batteries or flywheels housed in electrical enclosures located indoors within the Project energy storage facilities.

Access to the Project site would be provided via the existing paved Wiley's Well Road and Powerline Road to the CRS from I-10 to the north. The Project's on-site roadway system would include a perimeter road, access roads, and internal roads. These roads would be surfaced with gravel, compacted dirt, or another commercially available surface and would accommodate the Project operations and maintenance (O&M) activities.

1.3.2 Low Environmental Impact Design Elements

As presented above, the applicant has proposed potential LEID elements for the Project for consideration with the objective of evaluating alternative design approaches that may reduce environmental impacts or negative effects from the project. These elements include changes to the grading approach, trenching and wiring, and elevation of inverter pads. To facilitate adequate analysis of potential design alternatives for the technical study, changes to the design were assessed for the potential LEID elements to determine the worst-case scenario. The design details with the incorporation of potential LEID elements are identical to those provided above for the traditional design, except for the following differences should LEID elements be incorporated:

- Solar blocks may be laid out in larger, 3- to 4-MW block sizes, requiring fewer inverter/transformer structures.
- Inverter/transformer equipment areas may be mounted on steel skids and installed on steel piers above the ground surface.
- Approximately 300 to 400 wooden AC transmission poles would be required in addition to the poles referenced under the traditional design to eliminate most trenching, which would result in the installation of up to 900 wooden poles in total.
- Access to the Project site would still be provided via the existing paved Wiley's Well Road and Powerline Road to the CRS via I-10; however, if the incorporation of elements results in fewer solar blocks, slightly fewer roads would be compacted and graded on-site.

1.4 Construction Details

Construction of the Project will occur in three planned phases and will require approximately 17 months to complete with construction expected to begin in late 2020. Incorporation of all potential LEID elements features a larger quantity of anticipated construction equipment, as well as a larger total workforce size. Where applicable, construction assumptions in this analysis will work to assess the worst-case scenario for the socioeconomics analysis.[1]

1.4.1 Preconstruction Activities

Prior to the start of construction, several activities would be undertaken to prepare the site for crews and construction including:

1. Geotechnical and Hazards investigations. The Applicant would conduct a geotechnical investigation utilizing subsurface scientific testing and analysis, and would use ground-penetrating radar to identify potential subsurface unexploded ordnance and Munitions and Explosives of Concern that may need to be stabilized or removed prior to construction.
2. Surveying, Staking, Flagging, and Preconstruction Resource Surveys. Prior to construction, the site boundary would be staked to demarcate the limits of disturbance, following which biologists would conduct preconstruction surveys to flag areas for avoidance as appropriate.
3. Fence Installation. The Project will be fenced with security fencing (chain link topped with barbed wire) and desert tortoise exclusion fencing. The security fencing would be up to 8 feet tall. The exclusion fencing would be buried at least 12 inches below ground surface.
4. Resource Clearance Surveys. Following fence installation, likely in a phased approach, the Project development area would be cleared for special status species.
5. Staging Area Establishment. One or more secure staging areas would be established in support of construction activities.

Site preparation activities may vary in order depending upon the incorporation of LEID components, the timeline for start of construction (e.g., survey windows), and other factors. In general, pre-construction activities have limited ground-disturbing impacts; but are necessary before full mobilization to support construction of the Project.

[1] For simplification of emission model referencing, the Traditional Design was referred to as Option A, and design with the incorporation of LEID elements is referred to as Option B.

1.4.2 Phase 1 – Site Preparation and Grading

Phase 1 of construction will begin with the grubbing, grading, re-contouring, compacting, and graveling of access roads, followed by grading at the substation site. For Traditional Design, additional grading would be carried out at inverter and transformer pad locations where necessary. This construction phase will last approximately 16 weeks and will require an average daily workforce of approximately 203 workers on the Project site; the projected maximum daily workforce is 271 workers. Construction equipment operating on the site will include dozers, graders, skid steers with auger/hoe attachments, front-end loaders, vibratory rollers, water trucks, and gravel trucks.

1.4.3 Phase 2 – PV System Installation

Phase 2 of construction will begin with the pouring of foundations and the installation of the PV module support structure, which would consist of steel piles (e.g., cylindrical pipes, H-beams, or similar) being driven into the soil. To achieve ground preservation beneath the arrays, the incorporation of LEID elements will require individually sized piles to achieve a uniform elevation between module rows; thus, the duration of pile driving activities during this phase will last longer than those anticipated for Traditional Design. Additionally, the incorporation of LEID elements that would reduce ground disturbance (e.g., no or reduced grading) is expected to require the use of track-mounted pile drivers, as opposed to the backhoe-mounted pneumatic pile drivers proposed in Traditional Design, to reduce tire passes over natural vegetation. Construction of the structural support systems will be followed by the installation of the PV modules. This construction phase will last approximately 46 weeks and require an average daily workforce of approximately 320 workers on the Project site the projected maximum daily workforce is 427 workers. Construction equipment operating on the site will include track-mounted pile drivers, skid steers with auger/hoe attachments, flatbed trucks, water trucks, forklifts, trenchers, and welding units.

1.4.4 Phase 3 – Inverter, Transformer, Substation, and Electrical Collector System Commissioning

Phase 3 of construction will include the stringing of cable along module rows to a trunk cable system and the installation of AC and DC collector poles at inverter/transformer pad sites. If inverter/transformer pads will be elevated on piers as an LEID element, additional pile driving will be required during this phase for elevated pad installation. This construction phase will last approximately 32 weeks and require an average daily workforce of approximately 137 workers on the Project site the projected maximum daily workforce is 182 workers. Construction equipment operating on the site will include a track-mounted pile driver, a dozer, a grader, a front-end loader, a vibratory roller, a flatbed truck, a water truck, skid steers with auger/hoe attachments, cranes, backhoes, aerial lifts, trenchers, and concrete trucks.

1.4.5 Site Deliveries during Construction Phases

Deliveries of materials and resources will occur throughout all construction phases. Water deliveries will occur a maximum of 14 times per day throughout all three construction phases, module and foundation deliveries will occur at a rate of approximately 10 times per day between construction Phases 1 and 2, tracker system delivery will occur at a rate of approximately 9 times per day during Phase 2, and inverter delivery will occur at a rate of approximately 2 times per day between Phases 2 and 3.

1.4.6 Summary of Project Construction Activities and Schedule

The currently estimated timeframes and average/maximum workforce numbers for each of the construction phases and associated activities during the proposed 17-month construction schedule are presented in Table 1.

TABLE 1.
CONSTRUCTION OVERVIEW

	LEID		Traditional Design		
Construction Phase	**Working Days**	**Max./Avg. Workforce**	**Working Days**	**Max./Avg. Workforce**	**Activity Description**
1	75	271 / 203	78	334 / 251	Site grading and construction of Project site construction/access roads
2	232	427 / 320	232	427 / 320	Substation foundation construction
					Tracker and rack support structure construction
					PV module installation/mounting
3	158	182 / 137	116	82 / 62	Cable runs, pole installation, inverter/transformer pad construction
					Substation completion and commissioning

1.5 Operations and Maintenance

The solar modules are expected to be in operation during daylight hours for 7 days per week, 365 days per year. Operational activities include solar module washing, maintenance of transformers, inverters, or other electrical equipment, road and fence repairs, vegetation/pest management, and site security. Solar modules would be washed as needed to maintain optimal electricity production (up to four times each year) using light utility vehicles with tow-behind water trailers. It is projected that the equivalent of 5 full-time job equivalent (FTEs) workers will be needed to support ongoing annual O&M activities for both the Traditional and LEID scenarios. If LEID elements are incorporated into the design, the Project may also be visited regularly by a biological resource monitor, who will monitor applicable O&M activities and conduct periodic site assessments for the first 5 years of Project operation as part of a residual habitat study.

1.6 Decommissioning

The Applicant is expected to receive authorizations and permits with 30-year terms. At the end of the term, including any extensions, the Project would cease operation. At that time, the facilities would be decommissioned and dismantled and the site restored. Decommissioning activities would require approximately 9,883 truck trips, an average workforce of approximately 320 workers, and would take approximately 17 months to complete. Upon decommissioning, the Project site could be converted to other uses in accordance with applicable land use regulations in effect at that time.

It is anticipated that during project decommissioning, project structures would be removed from the ground on the project sites. Aboveground and any underground equipment would be removed including module posts and support structures, gen-tie poles that are not shared with third parties and the overhead collection system within the project sites, inverters, transformers, electrical wiring, equipment on the inverter pads, and related equipment and concrete pads, and any O&M facilities and related equipment and infrastructure. The substation would be removed if it is owned by the project operator, however if a public or private utility assumes ownership of the substation, the substation may remain onsite to be used as part of the utility service to supply other applications.

Equipment would be de-energized prior to removal. Equipment would be shipped offsite by truck (after first being placed in secure transport enclosures as necessary) to be salvaged, recycled or disposed of at an appropriately licensed disposal facility. Removal of the solar modules would include disassembly and removal of the racks on which the solar modules are attached, and removal of the structures supporting the racks, and their placement in secure transport enclosures and a trailer for storage; the racks and structures supporting the racks would then be recycled or disposed of at an appropriately licensed disposal facility. Solar modules would be removed from the site and either transported to another solar electrical generating facility or a recycling facility, or disposed of at an appropriately licensed disposal facility. In conjunction with any solar modules which may be transported to another solar electrical generating facility, such solar modules may undergo a refurbishing process to extend their estimated 30-year lifespan. The demolition debris and removed equipment may be cut or dismantled into pieces to be safely lifted or carried with the equipment being used. The fence and gates would be removed and all materials would be recycled to the extent feasible. It is anticipated the project roads would be restored to their pre-construction condition unless the landowner elects to retain the improved roads for access throughout that landowner's property. The area would be thoroughly cleaned and all debris removed. As discussed above, most materials would be recycled to the extent feasible, with minimal disposal to occur in landfills in compliance with all applicable laws.

Decommissioning activities would be very similar to construction and would be expected to have similar impacts. Upon decommissioning, the Project site could be converted to other uses in accordance with applicable land use regulations in effect at that time.

2. Socioeconomic Conditions

This section of the report describes the demographic and socioeconomic characteristics of the communities and populations potentially affected by the proposed Project; these characteristics serve as the foundation for evaluating potential socioeconomic impacts.

2.1 Analysis Area and Regionally Affected Environment

The socioeconomic analysis area for this project, or Project Region, consists of Riverside County, as a majority of the project workforce is expected to be from within the County. Construction for the Project will occur in three planned phases and will require approximately 17 months to complete with construction expected to begin in late-2020 and be completed by the end of 2021. Depending on the construction phase and associated activities, the average workforce will range from approximately 137 to 320 persons per day (see Table 1). The expected residence of the construction workforce is the primary determinant of the Project's socioeconomic impacts to the local and regional economies and as such, the analysis consists of Riverside County as well as the City of Blythe, both of whom are responsible for planning and providing public facilities and services. For other cities/towns adjacent to the project site, there was not sufficient demographic data readily available that could support the interpretation of potential socioeconomic impacts.

2.1.1 Population

Table 2 lists the population levels for the City of Blythe and Riverside County in 5-year increments from 2000 to 2015, as well as the observed average annual growth rate over this period of time (Southern California Association of Governments [SCAG] 2016a). In 2000, the City of Blythe's population was 20,465, but dropped to 19,128 by 2015. However, the City's population did increase from 2000 to 2005, though this increase was followed by an overall decline in population through 2015. Blythe's average annual population growth rate between 2000 and 2015 was -0.4 percent (%). In contrast, Riverside County's population experienced an increase from 1,545,400 in 2000 to 2,361,000 by 2015. The County's overall population grew at an average annual rate of 3.5% over this period of time.

TABLE 2.
POPULATION FOR THE PROJECT REGION, 2000–2015[2]

Area	2000	2005	2010	2015	Avg. Annual Growth (2000-2015)
City of Blythe	20,465	21,511	20,817	19,128	-0.4%
Riverside County	1,545,400	1,895,700	2,189,600	2,361,000	3.5%

Source: SCAG 2016a

Table 3 lists recent population projections for the City of Blythe and Riverside County (SCAG 2016b). While the City of Blythe experienced a decline in population over the past decade, the City is expected to see this trend reversed over the next two decades. The City is projected to grow at an average annual rate of 0.8% from 2020 to 2040, with the population reaching 24,600 by 2040. Riverside County is projected to have a higher rate of growth than the City of Blythe, though this rate is significantly less that what was observed from 2000 to 2015. The projected 1.4% average annual increase from 2020 to 2040 would result in a population of 3,183,700 by 2040 in Riverside County.

TABLE 3.
POPULATION FORECASTS FOR THE PROJECT REGION, 2020–2040

Area	2020 Population	2035 Population	2040 Population	Avg. Annual Growth (2020-2040)
City of Blythe	21,200	24,200	24,600	0.8%
Riverside County	2,479,800	3,055,100	3,183,700	1.4%

Source: SCAG 2016b

[2] SCAG statistics are consistent with population estimates from other sources. SCAG statistics differ from U.S. Census estimates by less than 0.5% and from the State of California Department of Finance estimates by less than 0.1% for the same time intervals.

2.1.2 Housing

Table 4 depicts household, housing unit and vacancy rate characteristics for the City of Blythe and Riverside County (U.S. Census Bureau 2015a). In 2015, the City of Blythe had 4,915 households with an average household size of 2.63 while Riverside County had 699,232 households with an average household size of 3.24. With respect to housing units, the City of Blythe had a total of 6,263 units of which 1,348 were vacant and 4,915 were occupied. Of the occupied units, 2,474 were owner-occupied while 2,441 were renter-occupied. In Riverside County, there were 815,322 housing units of which 116,090 were vacant and 699,232 were occupied. Of the occupied units 457,220 were owner-occupied while 257,820 were renter-occupied.

TABLE 4.
HOUSEHOLD, HOUSING UNITS, AND VACANCY RATES BY TENURE, 2015

	Category	City of Blythe	Riverside County
Households	Number of Households	4,915	699,232
	Avg. Household Size	2.63	3.24
Housing Units	Number of Units	6,263	815,322
	Number of Vacant Units	1,348	116,090
	Number of Occupied Units	4,915	699,232
	Owner-occupied Units	2,474	457,220
	Renter-occupied Units	2,441	257,820
Vacancy Rate by Tenure	Owner-occupied Vacancy Rate	3.1%	2.3%
	Renter-occupied Vacancy Rate	9.1%	6.4%

Source: U.S. Census Bureau 2015a

Table 5 lists the number of projected households for the City of Blythe and Riverside County from 2020 to 2040 (SCAG 2016b). Over this period of time, the number of households in the City of Blythe and Riverside County are estimated to grow at annual rates of 1% and 1.6%, respectively. By 2040, this rate of growth would result in 6,200 households in the City of Blythe and 1,054,300 households in Riverside County.

TABLE 5.
HOUSEHOLD FORECASTS FOR THE PROJECT REGION, 2020–2040

Area	2020 Households	2035 Households	2040 Households	Avg. Annual Growth (2020–2040)
City of Blythe	5,200	6,100	6,200	1%
Riverside County	802,400	1,009,000	1,054,300	1.6%

Source: SCAG 2016b

2.1.3 Employment and Income

The City of Blythe and Riverside County both recorded lower household incomes and a higher percentage of their population as unemployed compared to statewide levels (U.S. Census Bureau 2015b). As shown in **Table 6**, the City of Blythe's median household income was $42,798--significantly lower than the countywide median of $56,603. Similarly, the City's unemployment rate of 7.4 % was higher than the countywide unemployment rate of 6.7%.

TABLE 6.
MEDIAN HOUSEHOLD INCOME AND UNEMPLOYMENT RATES FOR THE REGION, 2015

Area	Median Household Income[1]	Unemployment rate[2]
City of Blythe	$42,798	7.4%
Riverside Country	$56,603	6.7%
California	$61,818	6.2%

Source: U.S. Census Bureau 2015b[1]; State of California Department of Finance 2016[2]

Table 7 includes employment by occupation for the region (U.S. Census Bureau 2015c). In the City of Blythe, 5,159 individuals age 16 and older are employed. Service occupations account for the largest source of employment at 27.8% followed by the Management, Business, Science, and Arts occupations at 23.5%, and Sales and Office occupations at 22.1%. Another 14.7% of the employed population has Production, Transportation, and Material Moving occupations. The remaining 12% of the employed population have Natural Resources, Construction and Maintenance occupations.

In Riverside County, Management, Business, Science and Arts occupations account for the largest share of employment at 29%. Sales and Office occupations are the second largest share of employment at 25.1% followed by Service occupations at 21.7%. Production, Transportation, and Material Moving occupations represent 13% of countywide employment while Natural Resources, Construction and Maintenance occupations account for the smallest share of employment at 11.3%.

Because construction, installation and maintenance and repair skills are especially relevant to the proposed Project, **Table 7** reports employment in these and other Natural Resources, Construction, and Maintenance occupations. Riverside County has approximately 92,400 individuals employed across the latter two occupations, while the City of Blythe has 480 individuals employed across these occupations.

TABLE 7.
EMPLOYED POPULATION AND EMPLOYMENT BY OCCUPATION FOR THE PROJECT REGION, 2015

Occupation	Riverside County	Percentage	City of Blythe	Percentage
Civilian employed population 16 years and over	920,603		5,159	
Management, Business, Science, and Arts	266,607	29%	1,212	23.5%
Service	199,363	21.7%	1,434	27.8%
Sales and Office	230,934	25.1%	1,140	22.1%
Production, Transportation, and Material Moving	119,404	13%	756	14.7%
Natural Resources, Construction and Maintenance	104,295	11.3%	617	12%
Farming, fishing, and forestry occupations	11,824	1.3%	137	2.7%
Construction and extraction occupations	58,503	6.4%	238	4.6%
Installation, maintenance, and repair occupations	33,968	3.7%	242	4.7%

Source: U.S. Census Bureau 2015c

Table 8 reports the forecasted employment for the City of Blythe and Riverside County from 2020 to 2040 (SCAG 2016b). Over these two decades, the number of employed individuals in the City of Blythe is estimated to grow at an average annual rate of 1.5%, with 6,600 employed individuals by 2040. A slightly higher employment growth rate is forecasted for Riverside County; the average annual growth of 1.9% between 2020 and 2040 would result in 1,174,300 employed individuals in Riverside County by 2040.

TABLE 8.
EMPLOYMENT FORECASTS FOR THE PROJECT REGION, 2020–2040

Area	2020 Employment	2035 Employment	2040 Employment	Avg. Annual Growth (2020-2040)
City of Blythe	5,100	6,400	6,600	1.5%
Riverside County	848,700	1,111,800	1,174,300	1.9%

Source: SCAG 2016b

3. Regulatory Background

Social and economic conditions are not subject to direct regulation or management, although NEPA requires they be addressed. Social and economic conditions are also commonly recognized and addressed as a concern in a wide variety of federal, state, and local planning and management processes.

3.1 Federal

National Environmental Policy Act (NEPA): Projects that require action by a federal agency or that receive federal funding are subject to NEPA (42 United States Code [USC] 4321 et seq.). The Proposed Project includes PV technology with up to 350 MW of integrated energy storage capacity. Therefore, the Proposed Project is subject to NEPA review because those agencies and other federal agencies must take action to approve various right-of-way grants, easements and permits associated with the Proposed Project. NEPA Section 102(2)(A) requires that federal agencies use "the natural and social sciences...in planning and decision making." Under NEPA, an EIS must discuss social and economic effects if they are related to the natural or physical effects. Consequently, an EIS must include an analysis of the proposed Project's economic, social, and demographic impacts as they relate to effects on the natural or physical environment in the affected area. These economic, social, and demographic effects are not to be analyzed in isolation from the physical environment.

Federal Land Policy and Management Act (FLPMA) of 1976: FLPMA (43 USC 1701 et seq.) is BLM's organic act that establishes the agency's multiple-use mandate to serve present and future generations. Regulations implementing FLPMA require BLM to collect and analyze social, economic, and institutional information (43 CFR 1610.4-3 and 1610.4-6).

BLM Land Use Planning Handbook H-1601-1, Appendix D: Handbook H-1601-1 Appendix D (Social Science Considerations in Land Use Planning) provides guidance on integrating social science information into the planning process.

3.2 State

California Environmental Quality Act: CEQA Guidelines Appendix G: Environmental Checklist Form is widely used by California agencies and jurisdictions to identify potentially significant impacts. As appropriate to the project under review, agencies and jurisdictions add and delete topics to be considered. One topic identified as having the potential to be affected is population and housing. The effects on the environment of population increases or of developing new housing would be considered in the CEQA analysis.

CEQA Guidelines Section 15131 (Economic and Social Effects) notes that "economic or social information may be included in an EIR"; however, "economic or social effects of a project shall not be treated as significant effects on the environment." The focus of the analysis in the EIR is to be on physical changes, and the Public Resources Code Section 21060.5 defines "environment" as "the physical conditions that exist with the area which will be affected by a proposed project…"

CEQA Guidelines Section 15131, states the following:

Economic or social information may be included in an EIR or may be presented in whatever form the agency desires.

. a) Economic or social effects of a project shall not be treated as significant effects on the environment. An EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes resulting from the project to physical changes caused in turn by the economic or social changes. The intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes.

. b) Economic or social effects of a project may be used to determine the significance of physical changes caused by the project. For example, if the construction of a new freeway or rail line divides an existing community, the construction would be the physical change, but the social effect on the community would be the basis for determining that the effect would be significant.

. c) Economic, social, and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce or avoid the significant effects on the environment identified in the EIR. If information on these factors is not contained in the EIR, the information must be added to the record in some other manner to allow the agency to consider the factors in reaching a decision on the project.

3.3 Local

Each county and local General Plan is required by the state to include seven mandatory elements: Circulation, Conservation, Housing, Land Use, Noise, Open Space, and Safety. General Plans may include non-mandatory elements, such as socioeconomics, at the discretion of the local jurisdiction. Local plans are considered by the BLM in determining the proposed Project's consistency with local plans, goals, and policies. There are no local regulations, plans, or standards known to apply to the proposed Project with respect to socioeconomics.

4. Socioeconomic Impacts

Construction projects can generate positive socioeconomic effects through wages paid to workers and the purchase of materials, goods, and services required to implement projects. The injection into the economy of this money has a multiplier effect, supporting additional new spending by the initial recipients (workers, suppliers, and business owners). Wages earned at the businesses providing goods, materials, and services to workers and to the project are used by business owners and employees for their own subsequent purchases. This direct and secondary economic activity can be a positive contribution to the local community's economic well-being. In addition, taxes and fees imposed on projects would generate government revenue. While expenditures on wages, equipment and materials, and governmental fees and taxes contribute to the local and regional economy and to government fiscal resources, it is up to the Lead agencies to determine whether significance criteria related to these topics will be included in the EIR/EIS. Regardless, affected Federal, state and local entities may have an interest in knowing the potential short turn and longer-term socioeconomic impacts that could result from project implementation.

While there are positive short-term and long-term benefits that can be gained through project construction, it is also important to evaluate if a project could result in (1) induced population growth resulting from development of buildings or infrastructure and (2) whether housing and people would be displaced, requiring construction of replacement housing. These are changes that could in themselves create environmental impacts as a result of implementing a project. For example, construction of replacement housing for persons displaced by a project could have its own environmental impacts, which would be an outcome of approving the original project creating the displacement.[3]

The socioeconomic impact assessment in this Technical Study considers both the positive socioeconomic effects, modeled using the industry standard impact analysis for planning (IMPLAN) modeling software, as well as the potential for environmental impacts that could stem from project implementation using the data summarized in Section 2 of this report (i.e., population, household, housing and employment characteristics).

4.1 Impacts on Regional Employment and Economies

This section provides an overview of economic impacts associated with Project construction. Two construction scenarios were evaluated: (1) Traditional Design Construction Project; and (2) LEID Construction Project. The primary differences between scenarios include changes to the grading approach, trenching and wiring, and elevation of inverter pads associated with the LEID scenario.

4.1.1 Potential for Project Construction Impacts

Total construction costs, including pre-construction and development fees, amount to $335,147,080 for the Traditional Design Construction Project and $345,917,819 for the LEID Construction Project. Further information on the elements of Project construction is in Section 1.4 of this document.

The IMPLAN economic input-output software and supporting regional data products were used to estimate the future construction-related economic impact *to Riverside County*; it should be noted that some construction spending and associated economic impacts would occur outside of Riverside County. Both the estimated direct economic impacts and the secondary impacts for the Project are shown in **Tables 9 and 10**. The secondary effect includes indirect economic impacts (i.e., from construction-related sales to other businesses in the applicable county) and induced economic impacts (i.e., spending from all employees of the directly affected industry as well as employees of indirectly impacted industries in the supply chain in the applicable county). Employment is reported in annual full-time job equivalents (FTEs). The IMPLAN modeling assumes that current relationships between sectors and county economies will remain constant in the future. Further, all impacts are measured in 2017 levels. Definitions for the primary IMPLAN terminology are in Appendix A.

[3] For both the Traditional Design and LEID scenarios, no construction or demolition of housing is anticipated.

4.1.1.1 Traditional Design Construction Scenario

Table 9 shows the estimated direct employment, income, and output from the Traditional Design Construction Project.

Over the construction period, the Traditional Design scenario is projected to result in a total of 3,720 FTEs, $177,276,704 in labor income, and $478,068,374 in output for Riverside County; the total impacts comprise the direct and secondary effects. The direct effect generates 2,554 FTEs, $128,371,242 in labor income, and $325,339,576 of output. The secondary effect (including indirect and induced effects) supports another 1,166 FTEs, $48,905,462 in labor income, and $152,728,799 in output.

TABLE 9.
TRADITIONAL DESIGN IMPACT CONSTRUCTION SCENARIO ECONOMIC IMPACTS

Impact Type	Employment (FTE)	Labor Income	Output
Direct Effect	2,554	$128,371,242	$325,339,576
Secondary Effect*	1166	$48,905,462	$152,728,799
Total Effect	3,720	$177,276,704	$478,068,374

Source: IMPLAN. *Includes indirect and induced effects.

4.1.1.2 Low Impact Construction Scenario

Table 10 shows the estimated direct employment, income, and output from the LEID Construction Project. Over the construction period, the LEID scenario is projected to result in a total of 3,816 FTEs, $181,841,899 in labor income, and $490,382,488 in output for Riverside County; the total impacts comprise the direct and secondary effects. The direct effect generates 2,620 FTEs, $131,677,365 in labor income, and $333,721,358 of output. The secondary effect (including indirect and induced effects) supports another 1196 FTEs, $50,164,534 in labor income, and $156,661,130 in output.

TABLE 10.
LOW ENVIRONMENTAL IMPACT DESIGN CONSTRUCTION SCENARIO ECONOMIC IMPACTS

Impact Type	Employment (FTE)	Labor Income	Output
Direct Effect	2,620	$131,677,365	$333,721,358
Secondary Effect*	1196	$50,164,534	$156,661,130
Total Effect	3,816	$181,841,899	$490,382,488

Source: IMPLAN. *Includes indirect and induced effects.

4.1.2 Potential for Project Operations and Maintenance Impacts

The Project, regardless of construction scenario selected, will require similar levels of maintenance throughout the year to ensure continued effective operations. O&M activities include solar module washing, maintenance of transformers, inverters, or other electrical equipment, road and fence repairs, vegetation/pest management, and site security.

Both the Traditional Design and LEID scenarios are expected to require the equivalent of 5 FTE to support ongoing O&M annually; this FTE estimate does not account for the potential LEID biological monitor for the first 5 years.

. **Table 11** shows the estimated annual direct employment, income, and output from O&M activities.

On an annual basis, both the Traditional Design and LEID scenarios are expected to result in a total of 9 FTEs, $508,934 in labor income, and $1,577,010 in output for Riverside County; the total impacts comprise the direct, indirect, and the induced effects. The direct effect generates 5 FTEs, $350,884 in new labor income, and

$1,106,256 of output. The secondary effect (including indirect and induced effects) supports another 4 FTEs, $158,049 in labor income, and $470,755 in output.

4.1.3 Potential for Project Decommissioning Impacts

Decommissioning impacts are anticipated to be similar to those determined for the construction phase of the Project. The actual impacts would be dependent upon the proposed decommissioning action and final use of the site. Applicable construction phase APMs would be implemented during the decommissioning phase to minimize associated impacts.

TABLE 11.
ANNUAL OPERATION AND MANAGEMENT ECONOMIC IMPACTS

Impact Type	Employment	Labor Income	Output
Direct Effect	5	$350,884	$1,106,256
Secondary Effect*	4	$158,049	$470,755
Total Effect	9	$508,934	$1,577,010

Source: IMPLAN. *Includes indirect and induced effects.

4.2 Summary of Impacts

As noted in Section 3, social and economic conditions are not subject to direct regulation or management under NEPA and CEQA; these types of impacts are not treated as significant effects on the environment, and significance conclusions are not drawn from their assessed impact. Regardless, affected federal, state and local entities may have an interest in knowing the potential short-term and longer-term socioeconomic impacts that could result from project implementation. However, project implementation could create socioeconomic effects that could in turn result in environmental impacts.

The Traditional Design and LEID construction scenarios are very similar in terms of overall economic impacts (i.e., employment, labor income, and output) and are expected to have a similar, beneficial effect on the regional economy; the LEID's higher construction-related direct spending results in slightly greater economic impacts. Regional communities and local business could profit from either scenario, as temporary workers and permanent staff will spend some fraction of their income within the immediate proximity of the Project. The reoccurring O&M impacts are similar across the scenarios and would affect only a handful of individuals.

The construction of both the Traditional Design and LEID scenarios requires a mix of skills. Many skills are available locally; other skills are specialized to the electrical industry. Workers with specialized skills often relocate temporarily from elsewhere to work on a project. From a regional perspective, Riverside County has over 92,000 individuals employed in sectors directly related to construction, installation, and repair and maintenance, while the City of Blythe has nearly 500 individuals employed in these sectors. These individuals provide a large labor pool for the Project to draw from. The unemployed population in the City of Blythe as well as in the County of Riverside could also play a role in filling the short-term and longer-term labor demands associated with the Project. During the 17-month construction period, both the Traditional Design and LEID construction scenarios could exert an upward pressure on the demand for housing. If it is the case that workers temporarily relocate to the region, Riverside County and the City of Blythe, in particular, currently have sufficient housing (currently approximately 1,350 vacant units in the City of Blythe) to absorb this demand without displacing existing residents. Because labor demand for the Project is temporary, and most workers are not expected to permanently relocate to the region, the proposed Project is not expected to result in a substantial long-term increase in population, development of new housing, or the provision of public services.

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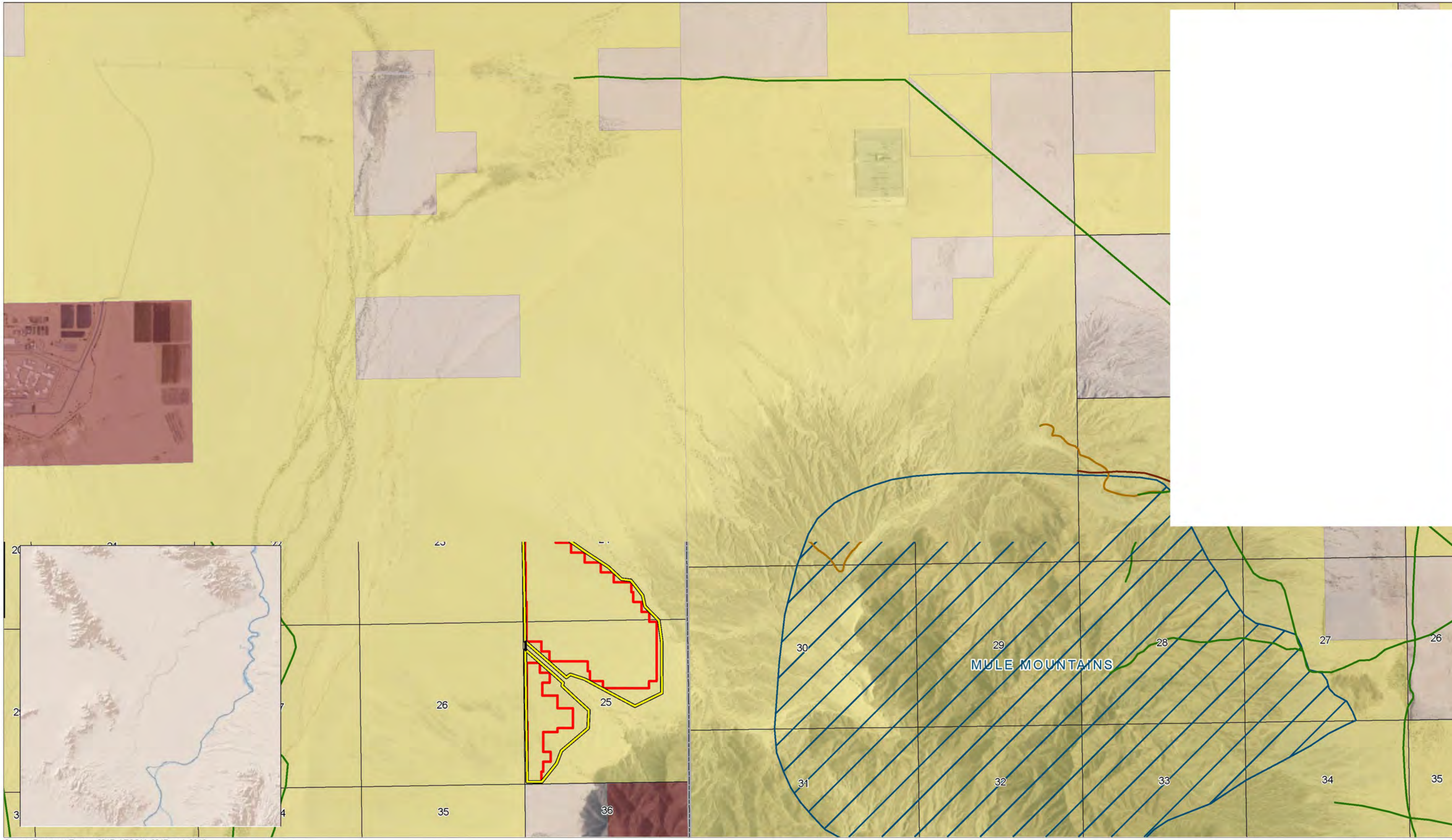
Figures



Source: Recurrent Energy, 2017. AECOM, 2017. esri, 2016.

3,000 0 3,000 Feet

Scale: 1:36,000 1 in = 3,000 feet

FIGURE 1-1
SITE VICINITY

DATE: 8/29/2017

RE Crimson Solar - Riverside County, CA

Path: U:\Projects\Recurrent Energy\60487757_Crimson\900-Work\920-GIS\map_docs\mxd\Project_Features\Fig1-1_Site_Vicinity.mxd, jason.sokol, 8/29/2017, 3:00:55 PM

Appendix A

IMPLAN Economic Impact Terminology

These definitions are reported directly from the IMPLAN glossary on their website.

Direct Effects: The set of expenditures applied to the predictive model (i.e., I/O multipliers) for impact analysis. It is a series (or single) of production changes or expenditures made by producers/consumers as a result of an activity or policy. These initial changes are determined by an analyst to be a result of this activity or policy. Applying these initial changes to the multipliers in an IMPLAN model will then display how the region will respond, economically to these initial changes.

Indirect Effects: The impact of local industries buying goods and services from other local industries. The cycle of spending works its way backward through the supply chain until all money leaks from the local economy, either through imports or by payments to value added. The impacts are calculated by applying Direct Effects to the Type I Multipliers.

Induced Effects: The response by an economy to an initial change (direct effect) that occurs through re-spending of income received by a component of value added. IMPLAN's default multiplier recognizes that labor income (employee compensation and proprietor income components of value added) is not a leakage to the regional economy. This money is recirculated through the household spending patterns causing further local economic activity.

Employment (Jobs): The annual average of monthly jobs in that industry (this is the same definition used by QCEW, BLS, and BEA nationally). Thus, 1 job lasting 12 months = 2 jobs lasting 6 months each = 3 jobs lasting 4 months each. A job can be either full-time or part-time.

Labor Income: All forms of employment income, including Employee Compensation (wages and benefits) and Proprietor Income.

Output: Output represents the value of industry production. In IMPLAN these are annual production estimates for the year of the data set and are in producer prices. For manufacturers this would be sales plus/minus change in inventory. For service sectors production = sales. For Retail and wholesale trade, output = gross margin and not gross sales.

Appendix S
Transportation and Public Access

Traffic Impact Analysis, July 2019

RE Crimson Solar Project

by Sonoran West Solar Holdings, LLC

Traffic Impact Analysis

Project Number: 60487757

July 2019

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Recurrent Energy LLC
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Quality information

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Revision History

Revision	Revision date	Details	Authorized	Name	Position
1	March 4, 2019	Project Description change to construction numbers			
2	July 16, 2019	Revision to accommodate the project description change to the number of water truck trips			

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Figures

Appendices

1. Project Overview

1.1 Introduction

Sonoran West Solar Holdings, LLC (Applicant), a wholly owned subsidiary of Recurrent Energy LLC (RE), proposes to construct and operate the RE Crimson Solar Project (Project). This Project is a utility-scale solar photovoltaic (PV) and energy storage project that would be located in the Riverside East Solar Energy Zone/Development Leasing Area and Development Focus Area on federal lands managed by the Bureau of Land Management (BLM) within the California Desert Conservation Area planning area in unincorporated eastern Riverside County, approximately 13 miles west of Blythe, California (CA) (BLM CACA-051967). The Project would interconnect to the regional electrical grid at the Southern California Edison (SCE) 230-kilovolt (kV) Colorado River Substation (CRS). It would generate up to 350 megawatts (MW) of renewable energy using PV technology and would include up to 350 MW of integrated energy storage capacity. A regional map presented on Figure 1-1 shows the proposed Project in context to the regional transportation circulation system within eastern Riverside County, and the proposed project development area is presented on Figure 1-2.

The total area for the Project (i.e., Permitting Boundary) is 2,489 acres, including a 2,465 acre solar field development area with approximately 1,859 acre of solar panels (array blocks) and 24 acres for linear facilities including access/perimeter roads with a 30 to 60 foot corridor width and gen-tie and powerline corridors at 150 feet. Site access will be via Interstate 10 (I-10) at Wiley's Well Road Interchange, south on Wiley's Well Road, and then east on existing paved Power Line Road to the CRS. The Project's on-site roadway system would include a perimeter road, access roads, and internal roads. Project construction is anticipated to be completed within a 24-month schedule, and is expected to start in late 2020. This analysis is based on an assumed approximately 24-month construction timeframe. The construction workforce is estimated to account for an average of 167 (roundtrip) vehicle trips per day (assumed 22 work days per month), with a maximum of 320 (roundtrip) vehicle trips per day during peak construction (PV system installation). In addition to trips made by construction workers, approximately 38,168 truck deliveries of equipment, materials, and water are estimated to be required over the course of the construction period. It is assumed that the majority of the workers arrive at the Project site by 7:00 AM, and it was also assumed that 20 percent (%) (64 vehicles) arrive during the 7:00-9:00 AM peak hour; similarly, 20% (64 vehicles) of worker vehicles are assumed to depart the site at 5:00 PM during the 4:00-6:00 PM peak hour, while the balance of trips departs before 4:00 PM. A total of 25% of field staff is anticipated to travel to the Project site via carpool. Although traffic is not congested in this area of Riverside County, staff carpooling is encouraged to further minimize construction related traffic.

Construction activities will include site preparation and grading, solar array foundation installation (which may include pile driving), equipment installation, on-site substation and operations and maintenance building construction, gen-tie poles and conductor installation along the gen-tie route, equipment testing, and site cleanup and restoration. Typical construction equipment considered in this analysis includes pickups, water trucks, flatbed trucks, gravel trucks, concrete trucks, freight trucks, graders, dozers, loaders, tractors, tractor discs, backhoes, skid steers with auger hoes, rollers/vibrators, trenchers, pile drivers, forklifts, cranes and aerial lift.

During project operations, it is expected that there would be minimal operations and maintenance (O&M) worker requirements as compared to project construction manpower needs. For discussion and evaluation purposes, it is assumed that operational workforce would comprise up to 10 permanent workers with rare and infrequent occurrences exceeding these numbers. Due to the anticipated minimal O&M worker needs, no further traffic analysis is warranted and conducted over and beyond the peak project construction phase traffic impact analysis presented in Section 3.3.

The Applicant is expected to receive authorizations and permits with 30-year terms. At the end of the term, including any extensions, the Project would cease operation. At that time, the facilities would be decommissioned and dismantled and the site restored. Upon decommissioning, the Project site could be converted to other uses in accordance with applicable land use regulations in effect at that time. Decommissioning activities would be very similar to construction and would be expected to have similar impacts. The actual impacts would be dependent upon the proposed decommissioning action and final use of the site. Applicable construction phase Applicant's Proposed Measures (APMs) would be implemented during the decommissioning phase to minimize associated impacts.

The purpose of this study is to provide scientific and technical data regarding the existing Traffic and Transportation within the study area and the proposed Project's potential to change the area's Traffic and Transportation system. The study area for the traffic analysis is defined as the roadway circulation system leading to and from I-10, Wiley's Well Road and Power Line Road toward the Project site (Figures 1-1 and 1-2). The Project information supporting this analysis is based primarily on the Applicant's RE Crimson Solar Project Plan of Development (POD) submitted to the BLM in April 2017, as amended. The POD will continue to be updated by the Applicant to provide current and accurate Project information. If warranted, Applicant measures are proposed or recommended in this study to address adverse changes to Traffic and Transportation system as a result of the Project. This study is submitted to the BLM (the federal lead agency) and the California Department of Fish and Wildlife (CDFW), the state lead agency, to support their independent review and evaluation of the environmental impacts of the Project pursuant to applicable Federal, State, and local laws. The POD is part of the BLM Right-of-Way (ROW) grant application process which for this Project includes preparation of an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA). The proposed Project is also expected to require a Streambed Alteration Agreement and an Incidental Take Permit from the State through CDFW which would require compliance with the California Environmental Quality Act (CEQA) (e.g., Environmental Impact Report [EIR]). Therefore, it is currently assumed that a joint EIS/EIR will be prepared by the BLM and CDFW.

The traffic study contained herein was based on the worst-case scenario regardless of Project Options and had taken into consideration the overlap of various phases of project construction activities.

2. Existing Baseline Conditions

2.1 Existing Roadway Network

This section describes key roadways segments and intersections, existing daily roadway and peak hour intersection traffic volume information, and level of service (LOS) analysis results for existing conditions in the Project study area.

The description and characteristics of several regionally and locally significant roadways that traverse and serve the study area are discussed below.

2.1.1 North-south Facilities

2.1.1.1 Wiley's Well Road

Wiley's Well is a north-south local roadway generally serving as the primary access road to the Chuckawalla and Ironwood State Prison Facility. It provides for one lane in each direction with generally undeveloped shoulders and no curbs and gutters. The average daily traffic (ADT) is 2,177 vehicles per day.

2.1.2 East-west Facilities

2.1.2.1 Interstate 10 (I-10 Freeway)

I-10 is a four-lane, east-west, interstate freeway located to the north of the Project site and is under the operational jurisdiction of the California Department of Transportation (Caltrans). I-10 originates in Santa Monica and runs through Los Angeles, San Bernardino County, Riverside County, and beyond through the transcontinental United States to the east. In the vicinity of the Project, access to I-10 is provided via freeway ramp connections at Wiley's Well Road Interchange. The posted speed limit is 70 miles per hour, and trucks comprise 38% of traffic on I-10.

2.1.2.2 Power Line Road

Power Line Road is a two-lane, east-west roadway generally functioning as a local access and service road for transmission line facilities as well as providing vehicular access to the Project site. Power Line Road intersects with Wiley's Well Road at a currently unsignalized intersection. Traffic volume on Power Line Road is low with latest traffic data collected showing 37 ADT.

2.2 Study Intersections and Roadway Segments

Based on the result of the traffic study field review and in consultation with Riverside County Transportation and Land Management Agency (RCTLMA), the following study locations were identified for analysis in the traffic study. Table 2-1 lists the study intersection locations. The existing intersection geometrics are shown on Figure 2-1.

TABLE 2-1
STUDY INTERSECTIONS

ID	Intersection	Jurisdiction
1	Wiley's Well Road/I-10 WB Ramps	Caltrans
2	Wiley's Well Road /I-10 EB Ramps	Caltrans
3	Wiley's Well Road/Power Line Road	Riverside County

Notes
All study intersections are currently unsignalized.
ID = Identification
EB = Eastbound
WB = Westbound

In addition to the study intersections described above, Table 2-2 lists the study roadway segments that serve and provide access to the Project site.

2.3 Existing Traffic Volume

In order to support this analysis, traffic data were collected during a typical weekday in May 2017 (Thursday, May 25, 2017) for the three study intersection and the three local roadway segments. I-10 segment traffic count data were collected from the Caltrans database. The traffic counts include 24-hour roadway segment counts and AM and PM peak hour study intersection counts which are used in this traffic impact analysis. The specific traffic count dates are included on the traffic count sheets provided in Appendix A. For analysis purposes, peak hour intersection data were collected during the 7-9 AM and 4-6 PM peak hours. These peak hours are the standard adjacent street traffic peak hours used in the Institute of Transportation Engineers (ITE) Trip Generation Manual and the majority of traffic analyses performed in Riverside County.

TABLE 2-2
STUDY ROADWAY SEGMENTS

ID	Roadway	Segment Location	Cross-section Classification	Jurisdiction
1	I-10	West of Wiley's Well Road	4-Lane Freeway	Caltrans
2	I-10	East of Wiley's Well Road	4-Lane Freeway	Caltrans
3	Wiley's Well Road	Between I-10 WB Ramps and I-10 EB Ramps	2-Lane Undivided	Riverside County
4	Wiley's Well Road	Between I-10 EB Ramps and Power Line Road	2-Lane Undivided	Riverside County
5	Power Line Road	East of Wiley's Well Road	2-Lane Undivided	Riverside County

2.4 Existing Level of Service Analysis

This section presents LOS information for existing conditions at study area intersections and roadway segments. LOS descriptions and letter grade categories are presented in Table 3-1 (Intersection Level of Service Descriptions) in Section 3.2 (Impact Thresholds) of this report.

2.4.1 Intersection Analysis

Table 2-3 displays intersection LOS and average delay results for the key study area intersections under existing conditions. All intersections in the Project study area are currently unsignalized.

TABLE 2-3
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
EXISTING CONDITIONS[1]

Intersection	AM Peak Hour LOS	AM Peak Hour Average Delay (sec/veh)	PM Peak Hour LOS	PM Peak Hour Average Delay (sec/veh)
Wiley's Well Road/I-10 WB Ramps	B	10.1	A	8.6
Wiley's Well Road /I-10 EB Ramps	B	10.2	B	11.1
Wiley's Well Road/Power Line Road	A	0.00	A	0.00

Notes
[1]Source: AECOM (August 2017).
sec/veh = Seconds per vehicle

Figure 2-2 shows existing AM/PM peak hour traffic volumes for the key study area intersections. The 24-hour traffic data and AM/PM peak hour intersection turning movement counts are provided in Appendix A.

The detailed LOS calculation worksheets for existing conditions are provided in Appendix B.

As shown in Table 2-3, all three study area intersections are currently operating at acceptable LOS B or better under existing conditions. These findings are consistent with the current low volume traffic at the study intersections.

2.4.2 Roadway Analysis

The analysis described below summarizes the result of the roadway segment LOS analysis conducted for existing conditions. Table 2-4 displays roadway segment volume and segment LOS under existing conditions.

TABLE 2-4
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
EXISTING CONDITIONS[1]

Roadway	Segment	Cross-section Classification	Existing ADT[1]	Roadway Capacity	Truck Percent	LOS
I-10[2]	West of Wiley's Well Road	4-lane freeway	24,200	68,900	38%	B
I-10[2]	East of Wiley's Well Road	4-lane freeway	26,000	68,900	38%	B
Wiley's Well Road[3]	Between I-10 WB Ramps and I-10 EB Ramps	2-Lane Undivided	1,754	11,700	14%	A
Wiley's Well Road[3]	Between I-10 EB Ramps and Power Line Road	2-Lane Undivided	2,177	11,700	7%	A
Power Line Road[3]	East of Wiley's Well Road	2-Lane Undivided	37	11,700	8%	A

[1]ADT.
[2] LOS based on Highway Capacity Software Basic Freeway Segments Analysis
[3] LOS based on Highway Capacity Software Two-Lane Segment Analysis

As shown in Table 2-4, all study roadway segment are currently operating at acceptable LOS B or better under existing conditions.

3. Impact Assessment

3.1 Regulatory Framework

3.1.1 Federal

3.1.1.1 National Environmental Policy Act of 1969

NEPA establishes a public, interdisciplinary framework for Federal agencies reviewing projects under their jurisdiction to consider environmental impacts. NEPA's basic policy is to assure that all branches of government give proper consideration to the environment prior to undertaking any major federal action that significantly affects the environment.

The BLM, as lead Federal agency for the Project, is responsible for preparation of an EIS in compliance with NEPA to evaluate the environmental impacts of the Project.

3.1.1.2 Title 49, Code of Federal Regulations, §§ 171 177

Title 49, Code of Federal Regulations, §§ 171 177 governs the transportation of hazardous materials, the types of materials defined as hazardous, and the marking of the transportation vehicles. The administering agencies for this are the California Highway Patrol (CHP) and the U.S. Department of Transportation (DOT), Pipeline and Hazardous Materials Safety Administration. The Project will conform to this law by requiring that shippers of hazardous materials use the required markings on their transportation vehicles.

3.1.2 State of California

3.1.2.1 California Environmental Quality Act

The State CEQA Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Article 9, Contents of Environmental Impact Reports [Sections 15120-15132]) include the requirement that the environmental analysis for an EIR must evaluate impacts associated with the project and identify mitigation for any potentially significant impacts. All phases of a proposed project, including development and operation, are to be evaluated in the analysis.

Specific to traffic and transportation, Appendix G of the CEQA Guidelines, Environmental Checklist Form includes the following guidance:

XVI. TRANSPORTATION/TRAFFIC -- Would the project: a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?; b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?; c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?; d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?; e) Result in inadequate emergency access?; f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

As discussed previously, it is planned that CEQA compliance for the Project will be achieved through a combined NEPA/CEQA document, which will be prepared jointly by the BLM and Riverside County.

3.1.2.2 California Vehicle Code, § 353

California Vehicle Code, § 353 defines hazardous materials as any substance, material, or device posing an unreasonable risk to health, safety, or property during transportation, as defined by regulations adopted pursuant to § 2402.7. The administering agency for this statute is the CHP. The Project will comply with these codes by continuing to classify all hazardous materials in accordance with their clarification.

3.1.2.3 California Vehicle Code, §§ 2500 2505

California Vehicle Code, §§ 2500 2505 authorizes the Commissioner of Highway Patrol to issue licenses for the transportation of hazardous materials including explosives. The administering agency for these statutes is the CHP. The Project will comply with these codes by requiring that contractors and employees be properly licensed and endorsed when operating vehicles used to transport hazardous materials.

3.1.2.4 California Vehicle Code, §§ 13369, 15275, 15278

California Vehicle Code, §§ 13369, 15275, 15278 addresses the licensing of drivers and the classification of license required for the operation of particular types of vehicles and requires a commercial driver’s license to operate commercial vehicles. Requires an endorsement issued by the Department of Motor Vehicles (DMV) to drive any commercial vehicle identified in § 15278. The administering agency for these statutes is the DMV. The Project will comply with these codes by requiring that contractors and employees be properly licensed and endorsed when operating such vehicles.

3.1.2.5 California Vehicle Code, §§ 31303 31309

California Vehicle Code, §§ 31303 31309 requires that the transportation of hazardous materials be on the state or interstate highway that offers the shortest possible overall transit time. The administering agency for these statutes is the CHP. The Project will comply with this law by requiring that shippers of hazardous materials use the shortest route possible to and from the Project site.

3.1.2.6 California Vehicle Code, §§ 31600 31620

California Vehicle Code, §§ 31600 31620 regulates the transportation of explosive materials. The administering agency for the above statutes is the CHP. It must be noted that the Project does not propose to use explosive materials specifically defined in § 12000 of the Health and Safety Code. However, the Project will comply with this law by requiring that shippers of other potentially explosive materials have the required licenses from the CHP.

3.1.2.7 California Vehicle Code, §§ 32000 32053

California Vehicle Code, §§ 32000 32053 authorizes the CHP to inspect and license motor carriers transporting hazardous materials of the type requiring placards. The administering agency for this regulation is the CHP. The Project will comply with this law by requiring that motor carriers of hazardous materials be properly licensed by the CHP.

3.1.2.8 California Vehicle Code, §§ 32100 32109

California Vehicle Code, §§ 32100 32109 requires that shippers of inhalation hazards in bulk packaging comply with rigorous equipment standards, inspection requirements, and route restrictions. The administering agency for this regulation is the CHP. If applicable, the Project will comply with this law by requiring shippers of these types of material to comply with all route restrictions, equipment standards, and inspection requirements.

3.1.2.9 California Vehicle Code, §§ 34000 34100

California Vehicle Code, §§ 34000 34100 establishes special requirements for vehicles having a cargo tank and for hazardous waste transport vehicles and containers, as defined in § 25167.4 of the Health and Safety Code. The commissioner shall provide for the establishment, operation, and enforcement of random on- and off-highway inspections of cargo tanks and hazardous waste transport vehicles and containers and ensure that they are designed, constructed, and maintained in accordance with the regulations adopted by the commissioner pursuant to this code and Chapter 6.5 (commencing with § 25100) of Division 20 of the Health and Safety Code. The administering agency for this regulation is the CHP. The Project will comply with this law by requiring that shippers of hazardous materials maintain their hazardous material transport vehicles in a manner that ensures the vehicles will pass CHP inspections.

3.1.2.10 California Vehicle Code, §3500

California Vehicle Code, §3500 regulates the safe operation of vehicles, including those vehicles that are used for the transportation of hazardous materials. The administering agency for this regulation is the CHP. The Project will comply with this law by requiring shippers of hazardous materials to have the necessary permits, inspections, and licenses issued by the CHP for the safe operation of the hazardous materials transport vehicles.

3.1.2.11 California Vehicle Code, § 35550

California Vehicle Code, § 35550 imposes weight guidelines and restrictions on vehicles traveling on freeways and highways. The section holds that “a single axle load shall not exceed 20,000 pounds. The load on any one wheel or wheels supporting one end of an axle is limited to 10,500 pounds. The front steering axle load is limited to 12,500 pounds.” Furthermore, California Vehicle Code § 35551 defines the maximum overall gross weight as 80,000 pounds and adds that “the gross weight of each set of tandem axles shall not exceed 34,000 pounds.” The administering agency for this statute is Caltrans. The Project will comply with this code by requiring compliance with weight restrictions and by requiring heavy haulers to obtain permits, if required, prior to delivery of any heavy haul load.

3.1.2.12 California Vehicle Code, § 35780

California Vehicle Code, § 35780 requires a Single-Trip Transportation Permit to transport oversized or excessive loads over state highways. The permit can be acquired through Caltrans. The Project will comply with this code by requiring that heavy haulers obtain a Single-Trip Transportation Permit for oversized loads for each vehicle, prior to delivery of any oversized load.

3.1.2.13 California Streets and Highways Code, § 117

Unless otherwise specifically provided in the instrument conveying title, the acquisition by the department of any ROW over any real property for state highway purposes, includes the right of the department to issue, under Chapter 3 (commencing with § 660), permits for the location in the ROW of any structures or fixtures necessary to telegraph, telephone, or electric power lines or of any ditches, pipes, drains, sewers, or underground structures. The administering agency for this statute is Caltrans. If applicable, the Project will comply with this code by acquiring the necessary permits and approval from Caltrans with regard to use of public rights-of-way.

3.1.2.14 California Streets and Highways Code, §§ 660, 670, 672, 1450, 1460, 1470, 1480 et seq.

California Streets and Highways Code, §§ 660, 670, 672, 1450, 1460, 1470, 1480 et seq. defines highways and encroachment, requires encroachment permits for projects involving excavation in state highways and county/city streets. This law is generally enforced at the local level. The administering agencies for this regulation are Caltrans and County of Riverside Public Works Department. The Project will apply for encroachment permits for any excavation in state and county roadways prior to construction.

3.1.2.15 California Health and Safety Code, S§ 25160 et seq.

California Health and Safety Code, S§ 25160 et seq. addresses the safe transport of hazardous wastes, requires a manifest for hazardous waste shipments, require a person who transports hazardous waste in a vehicle to have a valid registration issued by the Department of Toxic Substances Control (DTSC) in his or her possession while transporting the hazardous waste. The administering agency for this regulation is the DTSC. The Project will comply with this law by requiring that shippers of hazardous wastes are properly licensed by the DTSC and hazardous waste transport vehicles are in compliance with DTSC requirements.

3.1.2.16 California Manual on Uniform Traffic Control Devices, Part 6

California Manual on Uniform Traffic Control Devices, Part 6 requires a temporary traffic control plan be provided for “continuity of function (movement of traffic, pedestrians, bicyclists, transit operations), and access to property/utilities” during any time the normal function of a roadway is suspended. The administering agencies for this regulation are Caltrans and County of Riverside Public Works Department. If applicable, the Applicant will file a Traffic Control Plan prior to the start of construction.

3.1.3 Local

3.1.3.1 County of Riverside, General Plan, Circulation Element

County of Riverside, General Plan, Circulation Element (County of Riverside, 2003) requires LOS C, D or E (depending on location) or better operating conditions for County of Riverside intersections and roadways. The primary administering agency for this policy is the RCTLMA Public Works Department.

3.1.3.2 County of Riverside, Ordinance No. 500.1

This ordinance of the County of Riverside amending Ordinance No. 500 reduces the permissible weight of vehicles on unimproved County highways. The primary administering agency for this policy is the RCTLMA Public Works Department.

3.1.3.3 County of Riverside, Ordinance 524.1

This ordinance of the County of Riverside amending Ordinance No. 524 regulates oversize and overweight vehicles and loads. The primary administering agency for this policy is the RCTLMA Public Works Department.

3.2 Impact Thresholds

The traffic analyses conducted for this study were performed in accordance with County of Riverside traffic impact analysis guidelines and the Riverside County Congestion Management Program (CMP) requirements. Detailed information on intersection analysis methodologies, standards, and thresholds are discussed in the following sections.

3.2.1 Level of Service Descriptions

LOS is an indicator of operating conditions on a roadway or at an intersection and is defined in categories ranging from A to F. These categories can be viewed much like school grades, with A representing the best traffic flow conditions and F representing poor conditions. LOS A indicates free-flowing traffic, and LOS F indicates substantial congestion with stop-and-go traffic and long delays at intersections. Table 3-1 provides definitions of level of service for signalized and stop-controlled intersections.

Table 3-2 describes the Link/Volume capacity LOS for Riverside County roadways.

3.2.2 Threshold of Significance

Significance criteria were developed based on Appendix G of the CEQA Guidelines, which identifies potentially significant project impacts. A significant traffic-related project impact would occur if the project significantly changed the operating conditions on the surrounding roadway network. A freeway/roadway segment and intersection LOS analysis was conducted to assess operational performance of the traffic study area freeways/roadways and intersections during construction and operation of the Project. For LOS, the applicable significance threshold was based on the Riverside County Transportation Commission (RCTC) 2010 CMP and County of Riverside requirements.

3.2.2.1 State Highway Level of Service Standard

According to the Caltrans Guide for the Preparation of Traffic Impact Studies, “Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State Highway Facilities; however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the target LOS. If an existing state highway facility is operating at less than the appropriate target LOS, the existing LOS should be maintained.

TABLE 3-1
INTERSECTION LEVEL OF SERVICE DESCRIPTIONS

LOS	Description of Operation	Signalized Intersection Delay (Seconds)	Stop-controlled Intersection Delay (Seconds)
A	Describes operations with very low delay. This occurs when progression is extremely favorable, and most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	<10.0	<10.0
B	Describes operations with generally good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	10.1–20.0	10.1–15.0
C	Describes operations with higher delays, which may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.	20.1–35.0	15.1–25.0
D	Describes operations with high delay, resulting from some combination of unfavorable progression, long cycle lengths, or high volumes. The influence of congestion becomes more noticeable, and individual cycle failures are noticeable.	35.1–55.0	25.1–35.0
E	Considered the limit of acceptable delay. Individual cycle failures are frequent occurrences.	55.1–80.0	35.1- 50.0
F	Describes a condition of excessively high delay, considered unacceptable to most drivers. This condition often occurs when arrival flow rates exceed the LOS D capacity of the intersection. Poor progression and long cycle lengths may also be major contributing causes to such delay.	>80.0	>50.0

Notes
< = less than
> = greater than

Based on the above requirements, the following conditions apply in the determination of significant state highway impacts:

- Desired minimum LOS is LOS D;
- When pre-Project (Base) LOS A, B, C, and D becomes LOS E or F with Project, the impact is considered significant; and
- When pre-Project (Base) LOS E becomes LOS F with Project, the impact is considered significant.

TABLE 3-2
ROADWAY LINK/VOLUME CAPACITY LEVEL OF SERVICE
FOR RIVERSIDE COUNTY ROADWAYS

Roadway Classification	Number of Lanes	Roadway Link/Volumes		
		LOS C	LOS D	LOS E
Collector	2	10,400	11,700	13,000
Secondary	4	20,700	23,300	25,900
Major	4	27,300	30,700	34,100

Roadway Classification	Number of Lanes	Roadway Link/Volumes LOS C	LOS D	LOS E
Mountain	2	12,900	14,500	16,100
Mountain	3	16,700	18,800	20,900
Mountain	4	29,800	33,500	37,200
Urban	4	28,700	32,300	35,900
Urban	6	43,100	48,500	53,900
Urban	8	57,400	64,600	71,800
Expressway	4	32,700	36,800	40,900
Expressway	6	49,000	55,200	61,300
Expressway	8	65,400	73,500	81,700
Freeway	4	61,200	68,900	76,500
Freeway	6	94,000	105,800	117,500
Freeway	8	128,400	144,500	160,500
Freeway	10	160,500	180,500	200,600
Ramp	1	16,000	18,000	20,000

Source: County of Riverside, 2003.

3.2.2.2 CMP Level of Service Standards

The following discussion of LOS standards was excerpted from RCTC 2011 CMP:

- CMP System of Streets and Highways, and
- Establishment of Minimum LOS.

With the intent of the legislation in mind, the RCTC Technical Advisory Committee (TAC) CMP Subcommittee approved a “two-tiered” approach to establish the minimum LOS standard. Tier 1 involves the “locally established minimum traffic LOS – or – ceiling,” while Tier 2 involves the CMP minimum LOS standard – or – floor.”

Most local agencies in Riverside County and Caltrans have adopted LOS standards of C or D (representing the “ceiling” in Tier 2) for roadway segments in an effort to maintain a desired LOS for the local circulation system. To address the CMP legislative requirements and establish minimum LOS along the regional system of roadways and highways within the County (representing the “floor” in Tier 2), RCTC approved a minimum traffic LOS standard of E.

In accordance with CMP statutes, certain facilities (roadway segments and intersections) had been identified (see Table 4 1 and Exhibit 4 1 of 2011 Riverside County CMP Document) to be exempt from CMP requirements as having been documented at LOS F since 1991. No study roadways and intersections fall under this exemption.

Within the traffic study area, only I-10 has been identified as a key element of the CMP system.

A CMP significant traffic impact occurs when:

- Pre-Project (Base) LOS A, B, C, and D becomes LOS E or F with Project; and
- Pre-Project (Base) LOS E becomes LOS F with Project.

3.2.2.3 Local Level of Service Standards

According to the County of Riverside General Plan Circulation Element, to achieve the true intent of community center design, LOS designations are typically lower (LOS E) to minimize the impacts of accommodating uncongested roadways and to maximize pedestrian use. Higher level of service designations (LOS A, B, C) require wider road widths, and as a result, would create circulation systems that are more accommodating to automobiles than pedestrians.

The County of Riverside strives to maintain the following County-wide target LOS:

- LOS C along all County-maintained roads and conventional state highways. As an exception, LOS D may be allowed in Community Development areas, only at intersections of any combination of secondary highways, major highways, expressways, conventional state highways, or freeway ramp intersections.
- LOS E may be allowed in designated community centers to the extent that it would support transit-oriented development and walkable communities.

Based on the above requirements, the following conditions apply in the determination of significant local impacts:

- Desired LOS is LOS C, D, or E (with specific conditions);
- When pre-Project (Base) LOS A, B, C, and D becomes LOS E or F with Project, the impact is considered significant; and
- When pre-Project (Base) LOS E becomes LOS F with Project, the impact is considered significant.

Significance issues for the other transportation elements include:

1. Additional Vehicular Traffic: Would the additional traffic generated by the project adversely affect operating conditions (i.e., LOS) on local and regional roadways?
2. Public Transit: Would the additional traffic generated by the project impede public transit operations in the vicinity of the project?
3. Bicycle and Pedestrian Circulation: Would the additional traffic generated by the project obstruct bicycle and pedestrian access to and from the project site or along adjacent bicycle and pedestrian routes?
4. Parking Facilities: Would the additional traffic generated by the project consume parking in proximity to the project site?
5. Goods Movement: Would the additional traffic generated by the project hinder goods movement along local and regional roadways?
6. Safety: Would the traffic generated by the project impose any safety concerns, such as a significant increase in crashes?
7. Air, Rail, and Waterborne Traffic: Would the traffic generated by the project interfere with air, rail, or waterborne traffic, or access to these transportation modes?

3.3 Impact Assessment and Findings

3.3.1 Year 2020 (Peak Project Construction) Conditions

This section provides an analysis of Future Year 2020 traffic conditions both with and without the proposed Project construction traffic. The analysis reviewed the trip generation potential of all project construction phases including overlaps and it was determined that Phase 2 is the worst-case construction condition. The Future Year 2020 conditions were selected for analysis because they coincide with the peak construction traffic period for the assumed worst-case 48-week Phase 2 (PV Panel System Installation) construction schedule. The traffic analysis conducted includes the following construction scenarios:

- Year 2020 Base Traffic Conditions (No Project); and
- Year 2020 Base Traffic Conditions Plus Project Construction.

The peak Project construction scenario considered the varying levels of Project construction activity and the associated amount of solar photovoltaic equipment installation per month and evaluated the worst case overlap of construction worker traffic and material and equipment deliveries.

3.3.2 Year 2020 Base (No Project) Traffic Conditions

For analysis purposes, and to establish Year 2020 baseline or no project conditions, it was conservatively assumed that to account for ambient traffic growth for yet to be developed cumulative development projects that could potentially occur within the Project study area, an annual traffic growth of two percent per year was used to develop Year 2020 baseline conditions from existing intersection traffic count data. Figure 3-1 shows the Year 2020 Base (No Project) Traffic Volume.

3.3.2.1 Intersection Analysis

Table 3-3 displays the results of intersection LOS and average delay analysis under Year 2020 Base conditions. The detailed LOS calculation worksheets for the Year 2020 Base conditions are provided in Appendix C.

TABLE 3-3
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
YEAR 2020 BASE CONDITIONS[1]

	AM Peak Hour		PM Peak Hour	
Intersection	**LOS**	**Average Delay (sec/veh)**	**LOS**	**Average Delay (sec/veh)**
Wiley's Well Road/I-10 WB Ramps	B	10.3	A	8.6
Wiley's Well Road/I-10 EB Ramps	B	10.3	B	11.3
Wiley's Well Road/Power Line Road	A	0.0	B	0.0

[1]Source: AECOM (August 2017).

As shown in Table 3-3, all three study area intersections are forecast to operate at LOS B or better under Year 2020 Base conditions.

3.3.2.2 Roadway Analysis

The analysis described below summarizes the result of the roadway segment level of service analysis conducted for Year 2020 Base conditions. Table 3-4 displays roadway segment volume and segment LOS under Year 2020 Base conditions.

TABLE 3-4
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
YEAR 2020 BASE CONDITIONS[1]

Roadway	Segment	Cross-section Classification	2020 No Project ADT[1]	Roadway Capacity	Truck Percent	LOS
I-10[2]	West of Wiley's Well Road	4-lane freeway	25,652	68,900	38%	B
I-10[2]	East of Wiley's Well Road	4-lane freeway	27,560	68,900	38%	B
Wiley's Well Road[3]	Between I-10 WB Ramps and I-10 EB Ramps	2-Lane Undivided	1,859	11,700	14%	A
Wiley's Well Road[3]	Between I-10 EB Ramps and Power Line Road	2-Lane Undivided	2,308	11,700	7%	A
Power Line Road[3]	East of Wiley's Well Road	2-Lane Undivided	39	11,700	8%	A

[1]ADT.
[2] LOS based on Highway Capacity Software Basic Freeway Segments Analysis
[3] LOS based on Highway Capacity Software Two-Lane Segment Analysis

As shown in Table 3-4, all study roadway segment are forecast to operate at acceptable LOS B or better under Year 2020 Base conditions.

3.3.3 Year 2020 Project Construction Conditions

The traffic impact analysis is based on construction worker daily trip and construction-related truck delivery data provided by the Applicant (Sonoran West Solar Holdings, LLC, 2017, updated 2018 and March and July 2019). The traffic analysis is based on worst-case construction worker trips and truck delivery volumes which vary by construction activity and month for the assumed 24-month construction schedule.

During the construction phase of the proposed Project, the construction workforce is expected to peak at approximately 640 daily trips while the construction delivery traffic during construction is estimated to peak at 20 vehicles (10 Module + 10 Foundation) resulting in 120 daily trips (the trip generation assessment for the construction deliveries have been Passenger Car Equivalent adjusted for this analysis, 20 delivery vehicles multiplied 3 = 60 PCE or 120 daily one-way trips).

Additionally, during Phase 2 of the Project construction schedule, there will be an estimated 52 water truck delivery vehicles to the site and when multiplied by 3 would equal 156 PCE or 312 daily one-way trips.

The traffic study contained herein was based on the worst-case scenario and had taken into consideration the overlap of various phases of project construction activities.

Table 3-5 summarizes the peak Project construction trip generation used in the evaluation of Project construction impacts in this study. Figure 3-2 shows Year 2020 Construction Traffic Volumes and Figure 3-3 shows the Year 2020 Base with Project Construction Traffic Volumes.

3.3.3.1 Intersection Analysis

Table 3-6 displays the results of intersection LOS and average delay analysis under Year 2020 Project Construction conditions. The detailed LOS calculation worksheets for the Year 2020 Project Construction conditions are provided in Appendix D.

TABLE 3-5
PEAK MONTH PROJECT CONSTRUCTION TRIP GENERATION

Category	Actual Number of Vehicles	Daily Trips (One-Way Trips)	AM Peak Hour Trips (7:00–9:00 AM)		PM Peak Hour Trips (4:00–6:00 PM)		Non-Peak Hour Trips	
			In	Out	In	Out	In	Out
Workers (staff and craft)[1]	320	640	64	0	0	64	256	256
Module Delivery	10	60[2]	6	6	0	0	24	24
Foundation Delivery	10	60[2]	6	6	0	0	24	24
Water truck deliveries[3]	52	312[3]	22	22	22	22	112	112
Total	392	1072	98	34	22	86	416	416

[1] A total of 25% of field staff is anticipated to travel to the Project site via carpool. The construction workforce is estimated to account for an average of 167 (roundtrip) vehicle trips per day (assumed 22 work days per month), with a maximum of 320 (roundtrip) vehicle trips per day during peak construction (PV system installation). In addition to trips made by construction workers, approximately 38,168 truck deliveries of equipment, materials, and water are estimated to be required over the course of the construction period. It is assumed that the majority of the workers arrive at the Project site by 7:00 AM, and it was also conservatively

assumed that 20% (64 vehicles) arrive during 7:00-9:00 AM peak hour; similarly, 20% (64 vehicles) of worker vehicles are assumed to depart the site at 5:00 PM during the 4:00-6:00 PM peak hour while the balance of trips depart before 4:00 PM.

[2]Construction deliveries (PV system installation) were converted to Passenger Car Equivalent (PCE), assuming one Truck equals three Passenger Cars. Both Module and Foundation system deliveries will occur at a similar rate of approximately 10 deliveries per day during Phase 2, during the Peak Project Construction Month, there are 10 (actual) trucks delivering on-site each day converted to 30 PCE resulting in 60 daily (combined in/out) one-way trips. It was assumed that up to 20% of the deliveries (six PCE vehicles) occur during the AM peak hour and the remaining deliveries are expected to occur during non-peak traffic period (avoiding the 4:00-6:00 PM peak hour). These deliveries (Module and Foundation) were accounted for in separate line items in the table above. [3] Water truck deliveries (PV system installation) were converted to PCE, assuming one Truck equals three Passenger Cars. In the event that on-site groundwater is not available and trucking water to the Project site is necessary. During Phase 2 (PV System installation), there are an estimated 52 (actual) trucks delivering on-site each day converted to 156 PCE resulting in 312 daily (combined in/out) one-way trips. It was assumed that the water truck deliveries would occur throughout the day including at least 7 trucks (3 PCE) during the 7:00-9:00 AM and 4:00-6:00 PM peak hour periods.

As shown in Table 3-6, all three study area intersections are forecast to operate at LOS C or better during both the AM and PM peak hour under Year 2020 Project Construction conditions. There is no substantial difference in intersection delay and no degradation in LOS when compared with Year 2020 Base Conditions.

TABLE 3-6
PEAK HOUR INTERSECTION LEVEL OF SERVICE RESULTS
YEAR 2020 PROJECT CONSTRUCTION CONDITIONS[1]

	AM Peak Hour		PM Peak Hour	
Intersection	**LOS**	**Average Delay (sec/veh)**	**LOS**	**Average Delay (sec/veh)**
Wiley's Well Road/I-10 WB Ramps	B	11.9	A	9.1
Wiley's Well Road /I-10 EB Ramps	B	11.4	B	13.0
Wiley's Well Road/Power Line Road	A	8.5	C	15.0

[1]Source: AECOM (July 2019).

3.3.3.2 Roadway Analysis

The information presented below summarizes the result of the roadway segment level of service analysis conducted for Year 2020 Project Construction conditions. Table 3-7 displays the roadway segment volume and segment LOS under Year 2020 Project Construction conditions. As shown in Table 3-7, all study roadway segment are forecast to operate at acceptable LOS B or better under Year 2020 Project Construction conditions. There is no change in roadway segment LOS when compared with Year 2020 Base Conditions with the exception of the segment of Powerline Road which is still forecast to operate at acceptable LOS B from LOS A.

TABLE 3-7
ROADWAY SEGMENT LEVEL OF SERVICE RESULTS
YEAR 2020 PROJECT CONSTRUCTION CONDITIONS

Roadway	Segment	Cross-section Classification	2020 + Project Const. ADT[1]	Roadway Capacity	Truck Percent	LOS
I-10[2]	West of Wiley's Well Road	4-lane freeway	25,772	68,900	38%	B
I-10[2]	East of Wiley's Well Road	4-lane freeway	28,512	68,900	38%	B

Wiley's Well Road[3]	Between I-10 WB Ramps and I-10 EB Ramps	2-Lane Undivided	2,395	11,700	14%	A
Wiley's Well Road[3]	Between I-10 EB Ramps and Power Line Road	2-Lane Undivided	3,330	11,700	7%	A
Power Line Road[3]	East of Wiley's Well Road	2-Lane Undivided	1,072	11,700	8%	B

[1]ADT.

[2] LOS based on Highway Capacity Software Basic Freeway Segments Analysis

[3] LOS based on Highway Capacity Software Two-Lane Segment Analysis

3.3.4 Year 2021 Project Operations Conditions

This section provides a discussion of Future Year 2021 traffic conditions both with and without the proposed Project operations traffic. After the construction period, the workforce for O&M and security purposes is estimated to be up to 10 full-time workers and up to 40 temporary staff resulting in a maximum of 50 staff onsite on limited occurrences. Depending on results of the water supply assessment, during operations, potable water could be potentially be trucked into the site (from Blythe or other sources from the east) or on-site groundwater will be utilized, including treatment, as necessary. During operation and maintenance, one or two small above ground portable sanitary waste facilities may be installed to retain wastewater for employee use. If installed, these facilities would remain on-site for the duration of the Project. It is expected that each facility would have a capacity of approximately 2,000 gallons. These facilities would be installed in accordance with state requirements and emptied as needed by a contracted wastewater service vehicle. No wastewater would be generated during panel washing as water would be absorbed into the surrounding soil or would evaporate.

Only limited deliveries will be necessary for replacement of photovoltaic modules and equipment during Project operation. When compared to construction activities, Project operations traffic will be miniscule (small percentile of peak construction phase traffic) and would not create any significant delay or change in LOS from Year 2021 Base conditions. Based on the low anticipated employee trips (10 daily round trips) and deliveries (up to 10 daily round trips), no significant Project traffic impact is anticipated during Project operations.

3.3.5 Area Roadway Considerations

3.3.5.1 Truck Traffic Impacts to Roadway Surfaces

The proposed Project would involve considerable truck traffic for deliveries of materials and equipment, and water deliveries from an off-site source (if needed) over the proposed 24-month construction schedule (Table 3-5). The proposed access route for workers and truck traffic to the Project site is primarily via I-10 to Wiley's Well Road to Power Line Road towards the site (Figures 1-1 and 1-2).

As discussed in Section 2.1, I-10 is a four-lane, east-west, interstate highway under the jurisdiction of Caltrans. This facility is designed with the appropriate Traffic Indices (TI index) – a measure of truck loading effects over pavements, to carry interstate and interregional goods movement with substantial truck traffic and any short-term Project-related truck traffic on the applicable portions of this highway would not exceed its inherent design limits and would not be expected to result in degradation of the roadway surfaces.

The planned east-west access to the Project site from Wiley's Well Road is along Power Line Road, which is paved and then transitions to generally unpaved roadways to the Project site. These local roadways are under the jurisdiction of Riverside County. Prior to construction, the Applicant will coordinate with the Riverside County Transportation Department to discuss road maintenance requirements and plans to ensure that road conditions along Wiley's Well Road and Power Line Road are kept safe for Project-related traffic to traverse, including potential adverse roadway conditions (e.g., flash flooding and erosion) following infrequent storm events in the area.

4. Applicant Recommended Mitigation Measures

4.1 Mitigation Measures

During Project construction, no study roadway segments and study intersections will be significantly impacted by the Project. It is anticipated that the study intersections and roadways will return to pre-project operating conditions in terms of roadway and intersection operating levels of performance upon completion of Project construction.

During Project operations, no study roadway segments or intersections will be significantly impacted by the Project as discussed in Section 3.3.4. The following proposed mitigation measures are offered pro-actively to address short term Project-related added traffic to the roadway network during the construction phase.

4.1.1 TRA-1 Traffic Control and Monitoring Control Plan

The Applicant will develop and implement a standard traffic and monitoring control plan consistent with the size and scope of the project construction activity designed to minimize impact to traffic flow.

Proposed measures where applicable include, but are not limited to, the following:

1. Use proper signs and traffic control measures in accordance with Caltrans and Riverside County requirements. All traffic signs, equipment, and control measures shall conform to the provisions specified in the Caltrans Manual of Uniform Traffic Control Device. Specific jurisdictional requirements will be identified during the plan review and approval process.
2. Schedule traffic lane or road closures during off-peak hours whenever possible (e.g., during construction at road crossings, culverts or any Project activity that may encroach in the traveled way).
3. Limit vehicular traffic to designated access roads, construction laydown and worker parking areas, and the Project construction site.
4. Provide orientation and briefing to employees and contractors on the desired construction route.
5. Encourage worker carpooling to minimize drive-alone worker trips.

5. References

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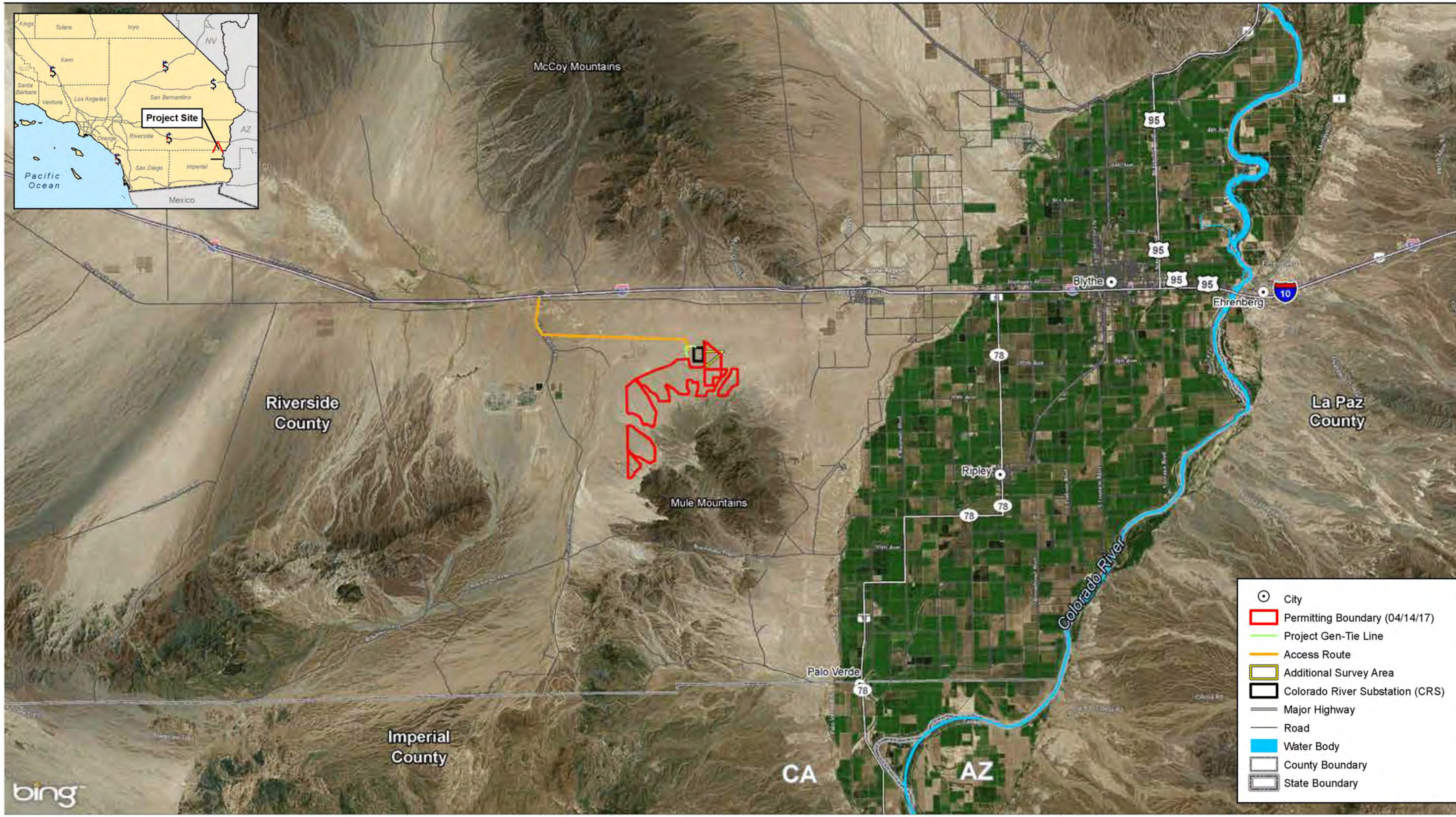
Figures



RE Crimson Solar - Riverside County, CA

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SOURCE: ESRI.

REGIONAL MAP

AECOM

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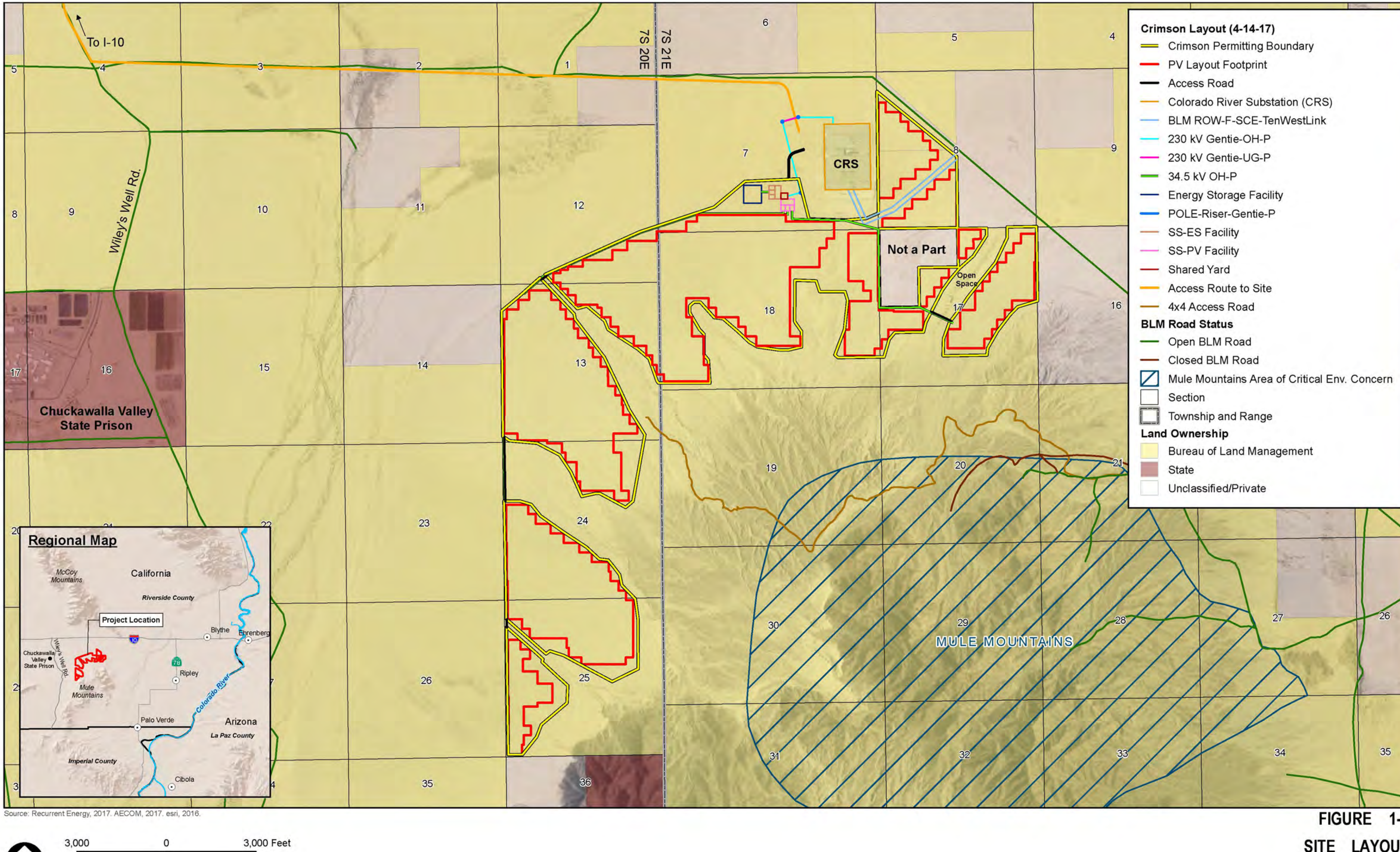
1:190,080 1 inch = 3 miles

CREATED BY: JS	DATE: 5/23/2017	FIG. NO:
PM: JG	PROJ. NO: 60487757	1-1



Source: Recurrent Energy, 2017. AECOM, 2017. esri, 2016.

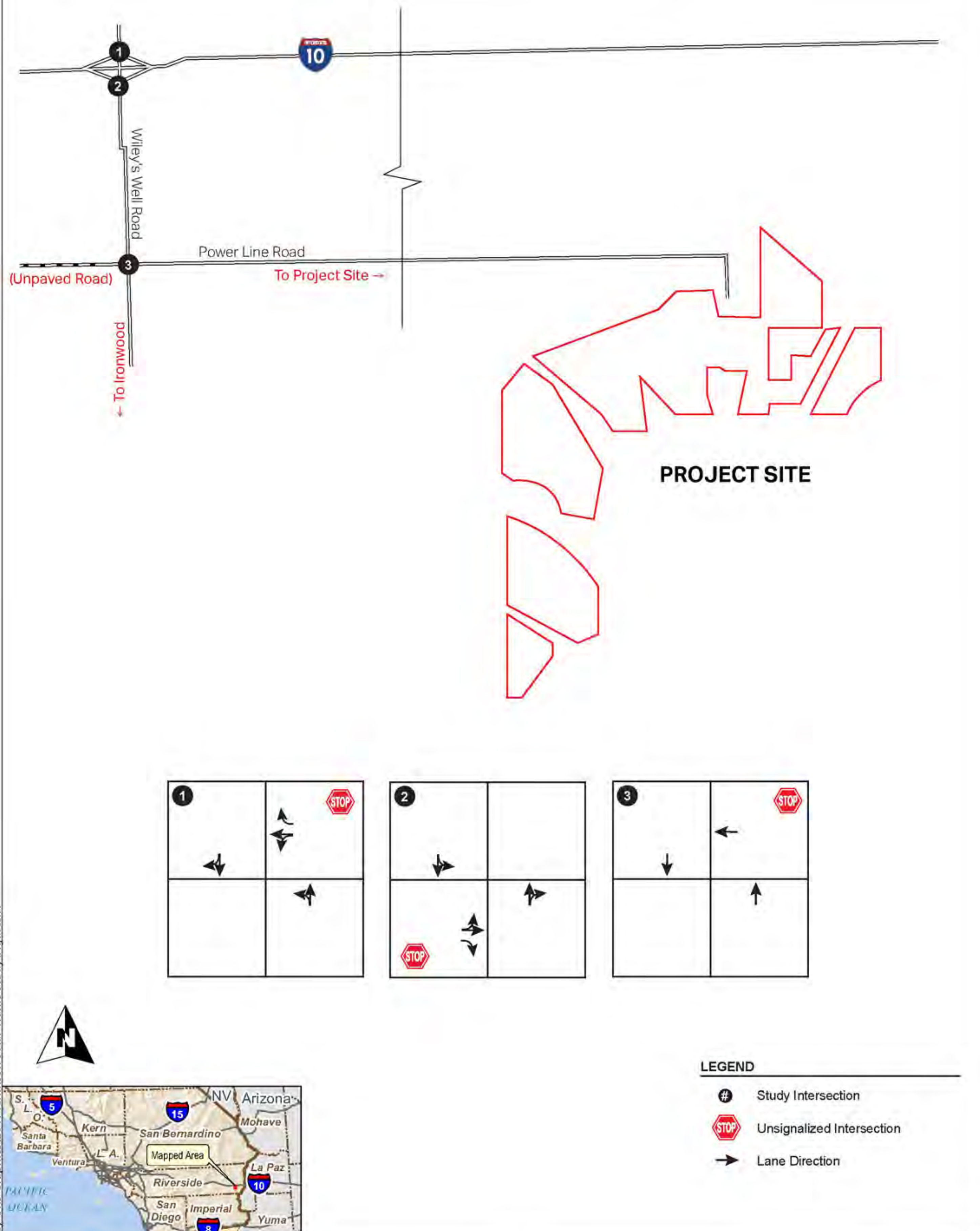
FIGURE 1-2

SITE LAYOUT

DATE: 8/29/2017

RE Crimson Solar - Riverside County, CA

Path: U:\Projects\Recurrent Energy\60487757_Crimson\900-Work\920-GIS\map_docs\mxd\Project_Features\Site_Layout_11x17_Fig1-1.mxd, jason.sokol, 8/29/2017, 2:42:02 PM



AECOM

Traffic Impact Analysis
RE Crimson Solar Project
Riverside County, CA

Figure 2-1. Existing Intersection Geometrics

2017

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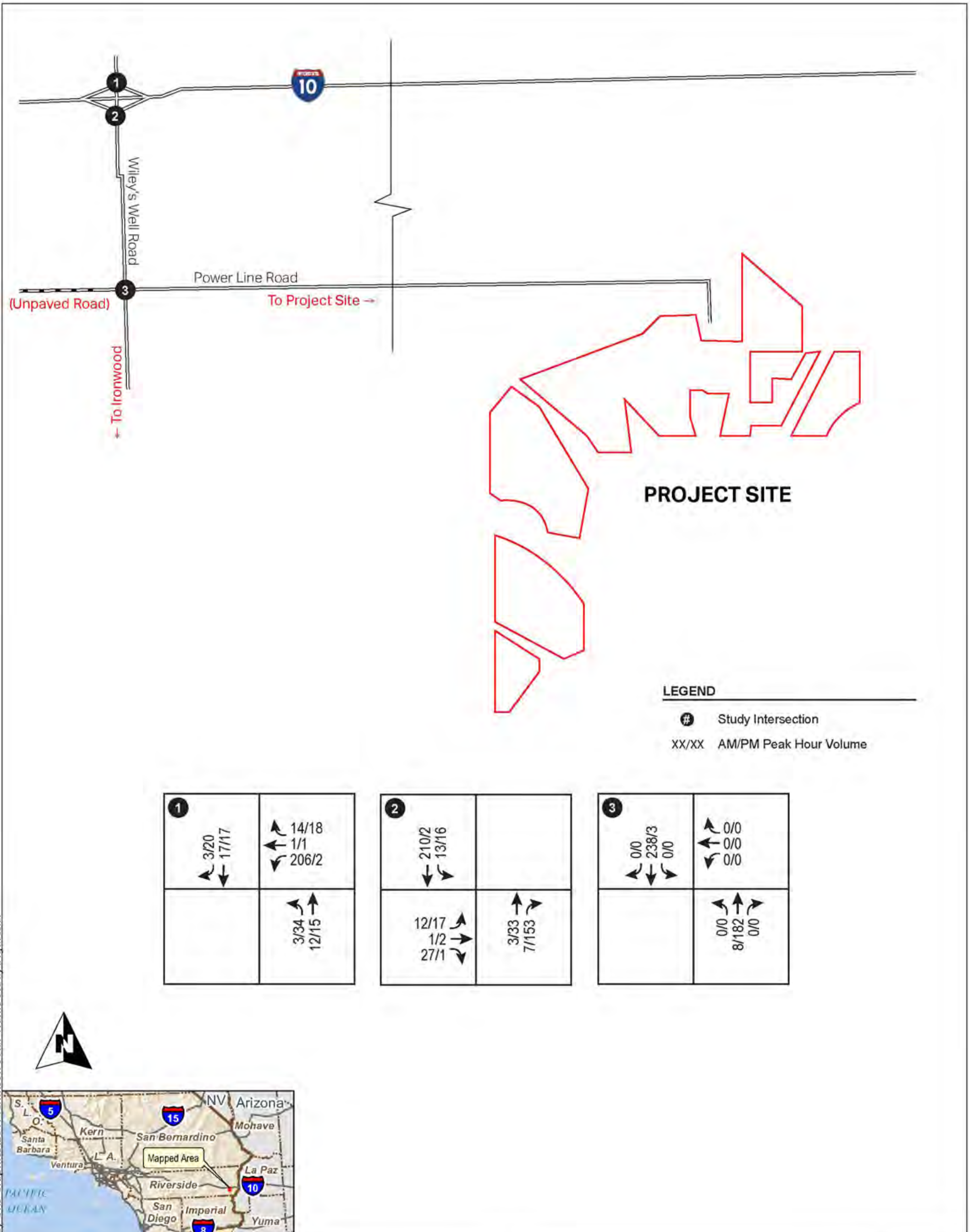

AECOM

Traffic Impact Analysis
RE Crimson Solar Project
Riverside County, CA

Figure 2-2. Existing AM/PM Peak Hour Traffic Volumes

2017

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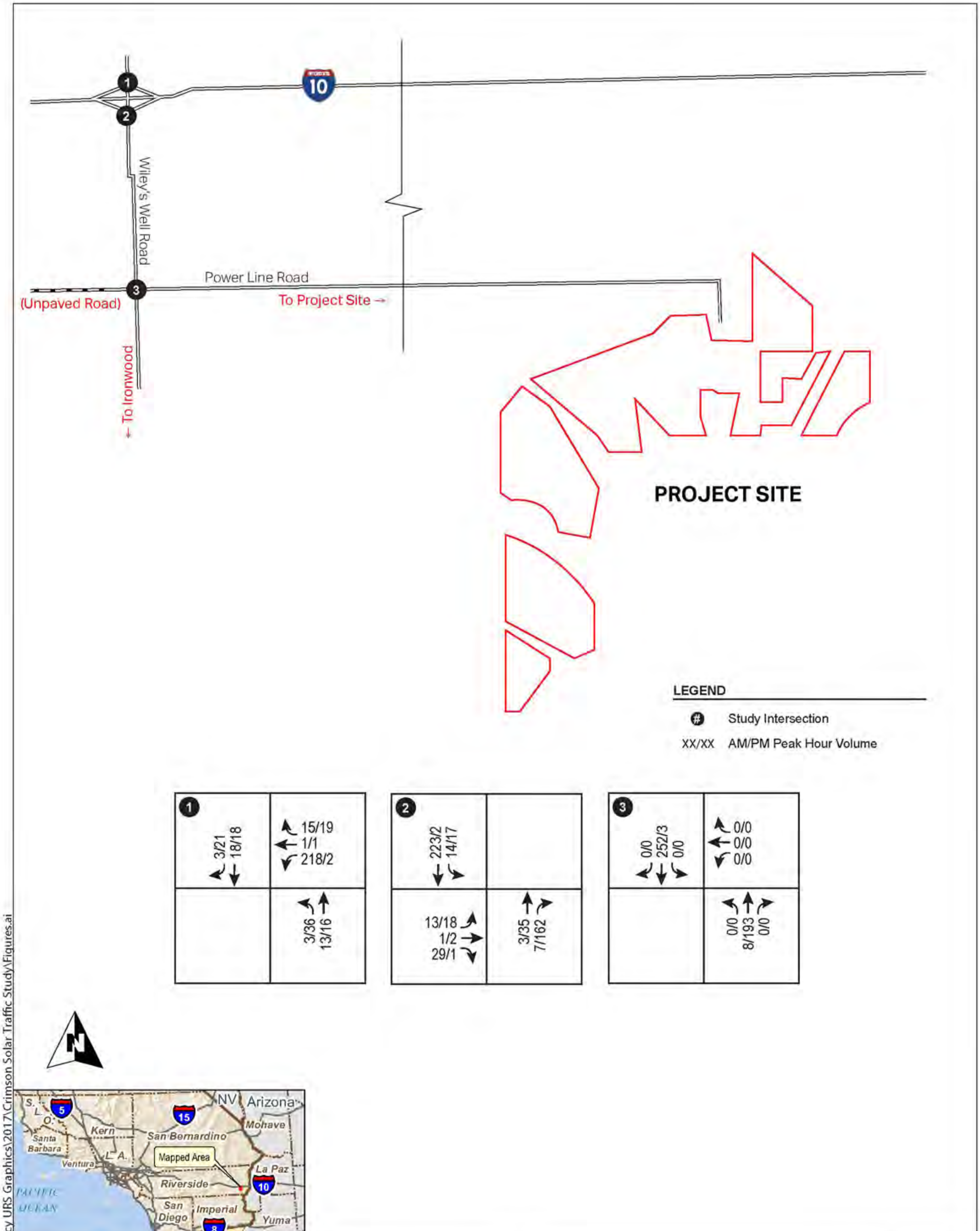

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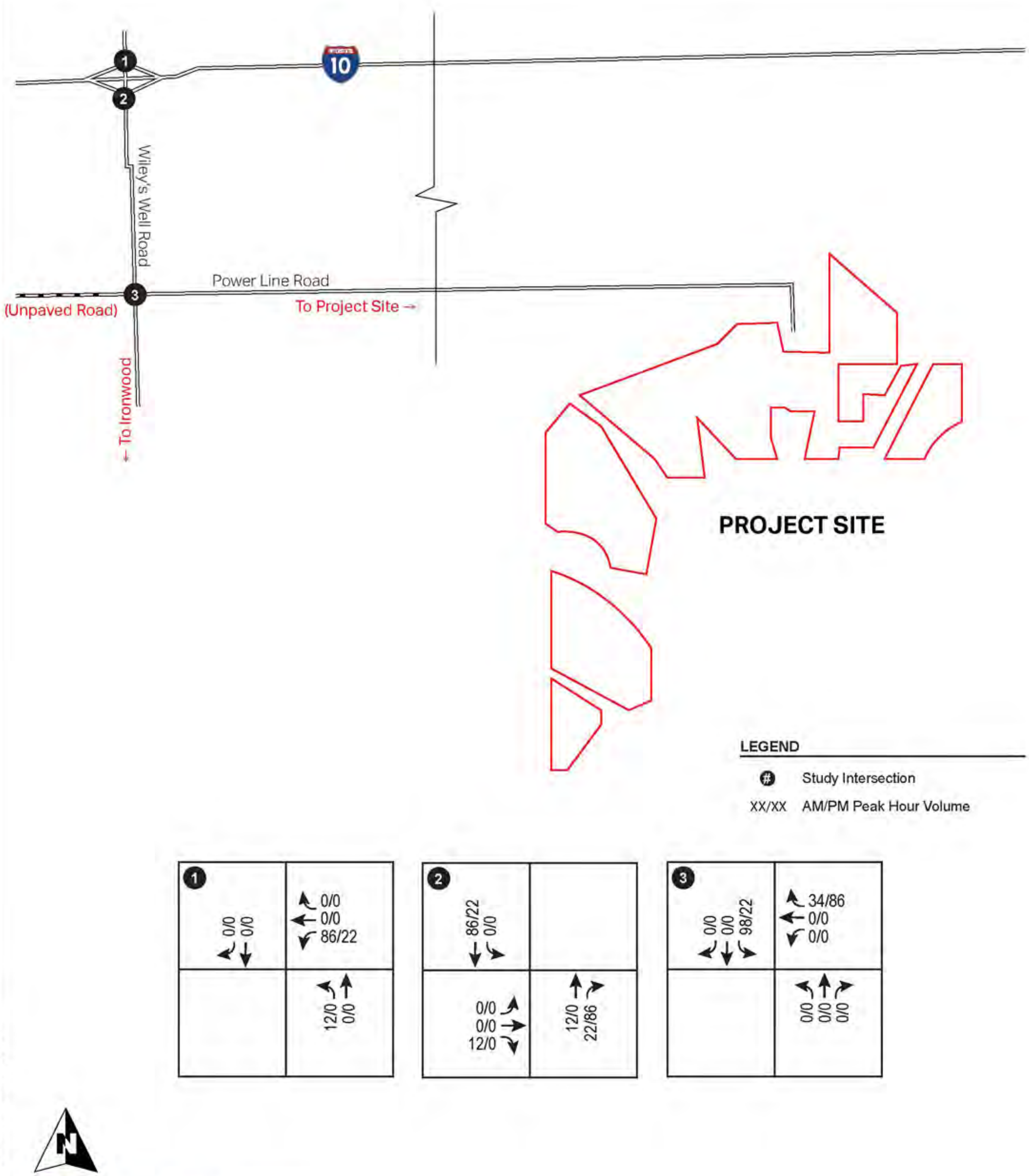
AECOM

Traffic Impact Analysis
RE Crimson Solar Project
Riverside County, CA

Figure 3-1. Year 2020 Base No Project Traffic Volumes

2017



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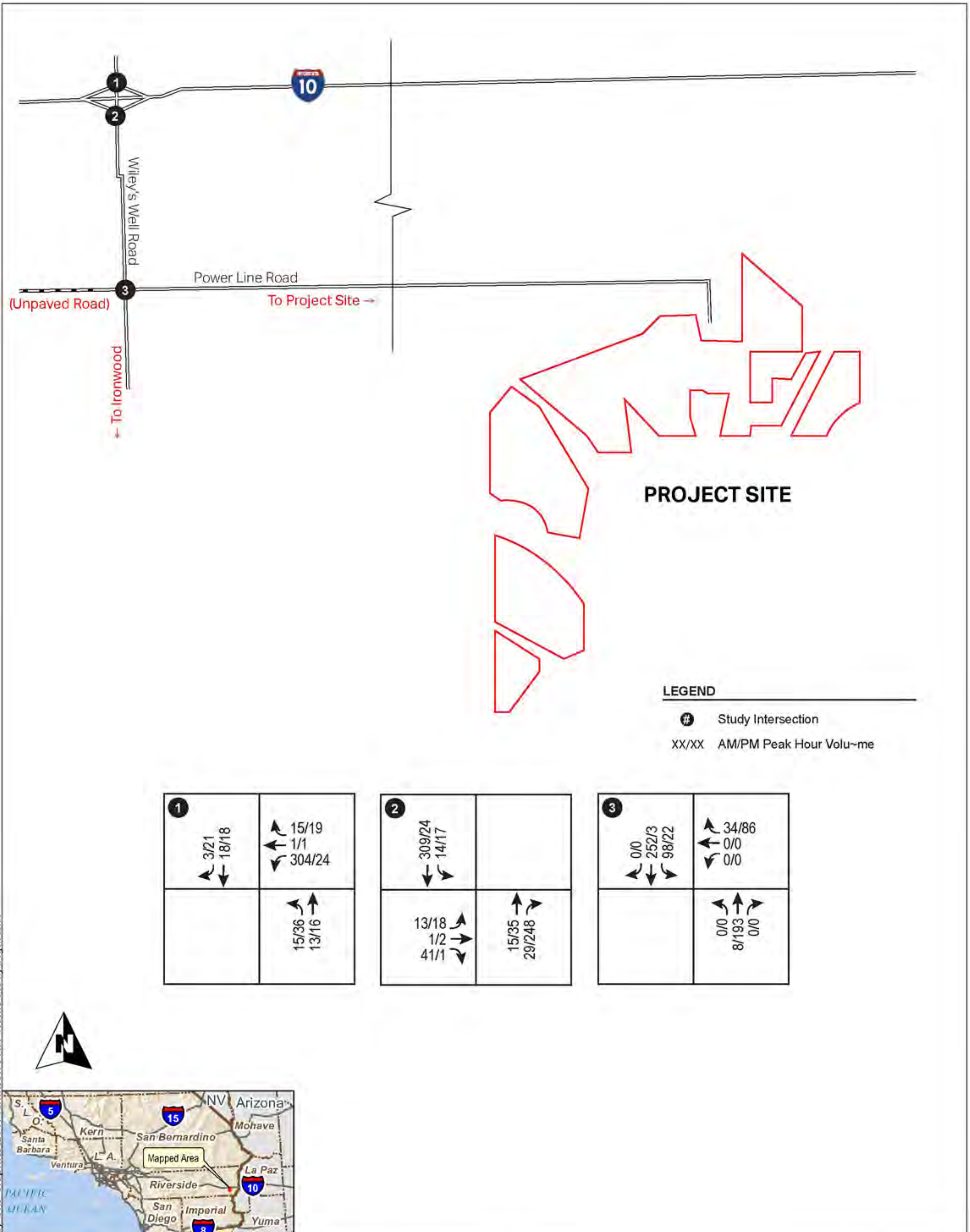
Traffic Impact Analysis
RE Crimson Solar Project
Riverside County, CA

Figure 3-2. Year 2020 Construction Added Traffic Volumes

2019



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AECOM

Traffic Impact Analysis
RE Crimson Solar Project
Riverside County, CA

Figure 3-3. Year 2020 Base with Project Construction Traffic Volumes

2019

Appendix A

Traffic Counts

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

County of Riverside
N/S: Wiley's Well Road
E/W: I-10 Westbound Ramps
Weather: Clear

File Name : CRVWW10WAM
Site Code : 19517333
Start Date : 5/25/2017
Page No : 1

Groups Printed- Total Volume

	Wiley's Well Road Southbound				I-10 Westbound Ramps Westbound				Wiley's Well Road Northbound				I-10 Westbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	4	4	8	13	1	2	16	0	1	0	1	0	0	0	0	25
07:15 AM	0	3	1	4	42	0	2	44	2	4	0	6	0	0	0	0	54
07:30 AM	0	6	0	6	73	0	2	75	0	4	0	4	0	0	0	0	85
07:45 AM	0	4	2	6	72	1	3	76	0	1	0	1	0	0	0	0	83
Total	0	17	7	24	200	2	9	211	2	10	0	12	0	0	0	0	247
08:00 AM	0	4	0	4	19	0	7	26	1	3	0	4	0	0	0	0	34
08:15 AM	0	2	7	9	9	0	3	12	3	2	0	5	0	0	0	0	26
08:30 AM	0	3	5	8	5	0	5	10	1	1	0	2	0	0	0	0	20
08:45 AM	0	2	6	8	3	0	3	6	0	1	0	1	0	0	0	0	15
Total	0	11	18	29	36	0	18	54	5	7	0	12	0	0	0	0	95
Grand Total	0	28	25	53	236	2	27	265	7	17	0	24	0	0	0	0	342
Apprch %	0	52.8	47.2		89.1	0.8	10.2		29.2	70.8	0		0	0	0		
Total %	0	8.2	7.3	15.5	69	0.6	7.9	77.5	2	5	0	7	0	0	0	0	

	Wiley's Well Road Southbound				I-10 Westbound Ramps Westbound				Wiley's Well Road Northbound				I-10 Westbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	3	1	4	42	0	2	44	**2**	**4**	0	**6**	0	0	0	0	54
07:30 AM	0	**6**	0	**6**	**73**	0	2	75	0	4	0	4	0	0	0	0	**85**
07:45 AM	0	4	**2**	6	72	**1**	3	**76**	0	1	0	1	0	0	0	0	83
08:00 AM	0	4	0	4	19	0	**7**	26	1	3	0	4	0	0	0	0	34
Total Volume	0	17	3	20	206	1	14	221	3	12	0	15	0	0	0	0	256
% App. Total	0	85	15		93.2	0.5	6.3		20	80	0		0	0	0		
PHF	.000	.708	.375	.833	.705	.250	.500	.727	.375	.750	.000	.625	.000	.000	.000	.000	.753

Counts Unlimited, Inc.
PO Box 1178
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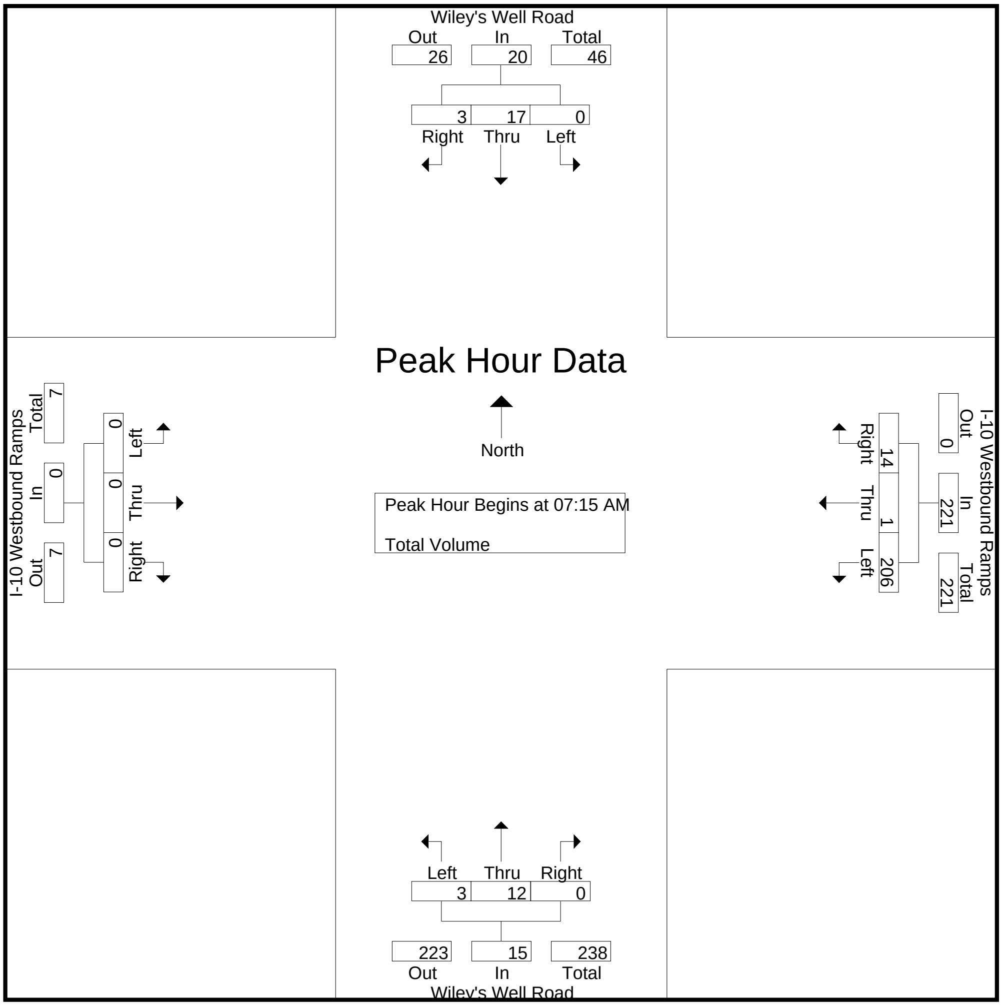
(951) 268-6268

County of Riverside
N/S: Wiley's Well Road
E/W: I-10 Westbound Ramps
Weather: Clear

File Name : CRVWW10WAM
Site Code : 19517333
Start Date : 5/25/2017
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				07:15 AM				07:15 AM				07:00 AM			
+0 mins.	0	**4**	0	4	42	0	2	44	**2**	**4**	0	**6**	0	0	0	0
+15 mins.	0	2	**7**	**9**	**73**	0	2	75	0	4	0	4	0	0	0	0
+30 mins.	0	3	5	8	72	**1**	3	**76**	0	1	0	1	0	0	0	0
+45 mins.	0	2	6	8	19	0	**7**	26	1	3	0	4	0	0	0	0
Total Volume	0	11	18	29	206	1	14	221	3	12	0	15	0	0	0	0
% App. Total	0	37.9	62.1		93.2	0.5	6.3		20	80	0		0	0	0	
PHF	.000	.688	.643	.806	.705	.250	.500	.727	.375	.750	.000	.625	.000	.000	.000	.000

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County of Riverside
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Groups Printed- Total Volume

	Wiley's Well Road Southbound				I-10 Westbound Ramps Westbound				Wiley's Well Road Northbound				I-10 Westbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	3	4	7	0	0	5	5	18	5	0	23	0	0	0	0	35
04:15 PM	0	3	4	7	0	1	4	5	9	6	0	15	0	0	0	0	27
04:30 PM	0	8	6	14	0	0	2	2	6	2	0	8	0	0	0	0	24
04:45 PM	0	3	6	9	2	0	7	9	1	2	0	3	0	0	0	0	21
Total	0	17	20	37	2	1	18	21	34	15	0	49	0	0	0	0	107
05:00 PM	0	1	5	6	3	0	6	9	3	8	0	11	0	0	0	0	26
05:15 PM	0	4	4	8	4	0	4	8	3	3	0	6	0	0	0	0	22
05:30 PM	0	4	2	6	1	0	5	6	2	1	0	3	0	0	0	0	15
05:45 PM	0	5	4	9	4	0	2	6	0	1	0	1	0	0	0	0	16
Total	0	14	15	29	12	0	17	29	8	13	0	21	0	0	0	0	79
Grand Total	0	31	35	66	14	1	35	50	42	28	0	70	0	0	0	0	186
Apprch %	0	47	53		28	2	70		60	40	0		0	0	0		
Total %	0	16.7	18.8	35.5	7.5	0.5	18.8	26.9	22.6	15.1	0	37.6	0	0	0	0	

	Wiley's Well Road Southbound				I-10 Westbound Ramps Westbound				Wiley's Well Road Northbound				I-10 Westbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	3	4	7	0	0	5	5	**18**	5	0	**23**	0	0	0	0	**35**
04:15 PM	0	3	4	7	0	**1**	4	5	9	**6**	0	15	0	0	0	0	27
04:30 PM	0	**8**	**6**	**14**	0	0	2	2	6	2	0	8	0	0	0	0	24
04:45 PM	0	3	6	9	**2**	0	**7**	**9**	1	2	0	3	0	0	0	0	21
Total Volume	0	17	20	37	2	1	18	21	34	15	0	49	0	0	0	0	107
% App. Total	0	45.9	54.1		9.5	4.8	85.7		69.4	30.6	0		0	0	0		
PHF	.000	.531	.833	.661	.250	.250	.643	.583	.472	.625	.000	.533	.000	.000	.000	.000	.764

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County of Riverside
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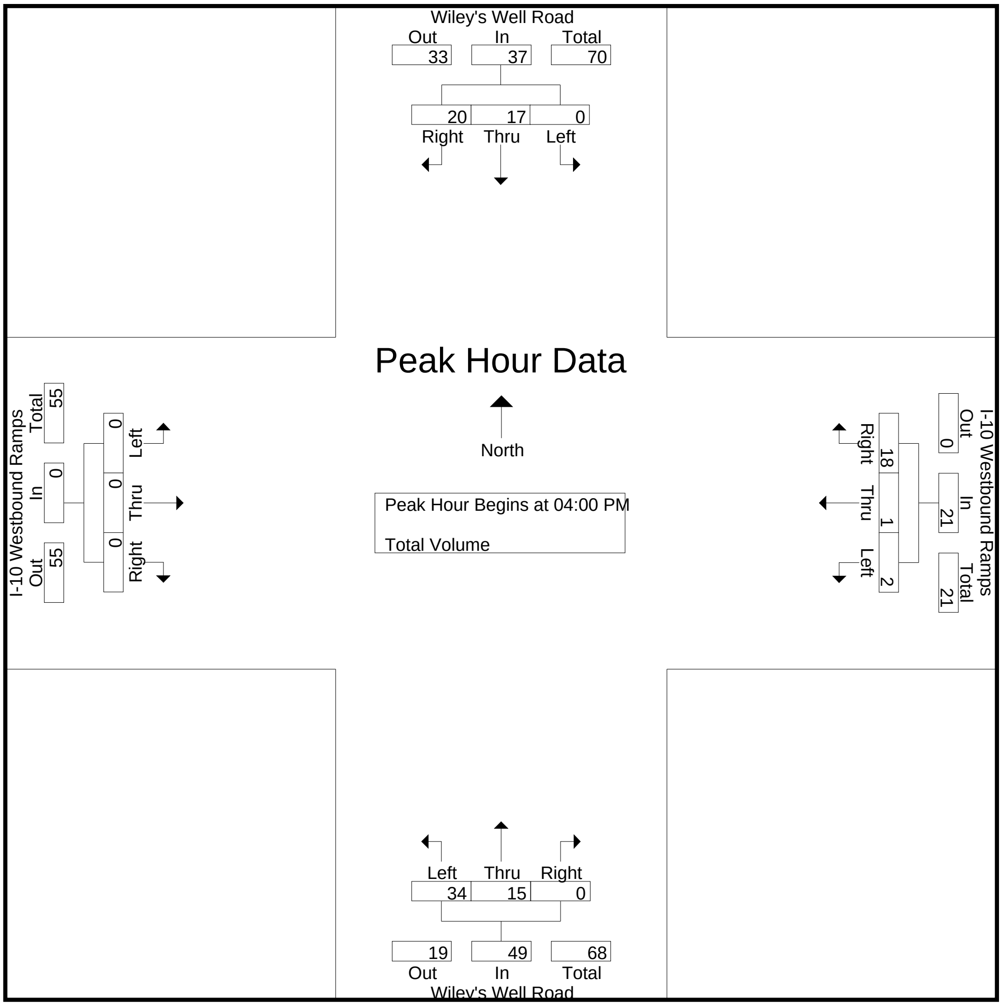
E/W: I-10 Westbound Ramps
Weather: Clear

File Name : CRVWW10WPM
Site Code : 19517333
Start Date : 5/25/2017
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:45 PM				04:00 PM				04:00 PM			
+0 mins.	0	3	4	7	2	0	**7**	**9**	**18**	5	0	**23**	0	0	0	0
+15 mins.	0	3	4	7	3	0	6	9	9	**6**	0	15	0	0	0	0
+30 mins.	0	**8**	**6**	**14**	**4**	0	4	8	6	2	0	8	0	0	0	0
+45 mins.	0	3	6	9	1	0	5	6	1	2	0	3	0	0	0	0
Total Volume	0	17	20	37	10	0	22	32	34	15	0	49	0	0	0	0
% App. Total	0	45.9	54.1		31.2	0	68.8		69.4	30.6	0		0	0	0	
PHF	.000	.531	.833	.661	.625	.000	.786	.889	.472	.625	.000	.533	.000	.000	.000	.000

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County of Riverside
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Weather: Clear

File Name : CRVWW10EAM
Site Code : 19517333
Start Date : 5/25/2017
Page No : 1

Groups Printed- Total Volume

	Wiley's Well Road Southbound				I-10 Eastbound Ramps Westbound				Wiley's Well Road Northbound				I-10 Eastbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	3	15	0	18	0	0	0	0	0	0	2	2	1	1	6	8	28
07:15 AM	3	42	0	45	0	0	0	0	0	1	1	2	5	1	10	16	63
07:30 AM	4	76	0	80	0	0	0	0	0	0	1	1	4	0	8	12	93
07:45 AM	3	73	0	76	0	0	0	0	1	1	1	3	1	0	6	7	86
Total	13	206	0	219	0	0	0	0	1	2	5	8	11	2	30	43	270
08:00 AM	3	19	0	22	0	0	0	0	0	1	4	5	2	0	3	5	32
08:15 AM	1	10	0	11	0	0	0	0	0	3	0	3	2	2	1	5	19
08:30 AM	2	7	0	9	0	0	0	0	0	1	4	5	1	1	0	2	16
08:45 AM	2	2	0	4	0	0	0	0	0	0	3	3	1	1	0	2	9
Total	8	38	0	46	0	0	0	0	0	5	11	16	6	4	4	14	76
Grand Total	21	244	0	265	0	0	0	0	1	7	16	24	17	6	34	57	346
Apprch %	7.9	92.1	0		0	0	0		4.2	29.2	66.7		29.8	10.5	59.6		
Total %	6.1	70.5	0	76.6	0	0	0	0	0.3	2	4.6	6.9	4.9	1.7	9.8	16.5	

	Wiley's Well Road Southbound				I-10 Eastbound Ramps Westbound				Wiley's Well Road Northbound				I-10 Eastbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	3	42	0	45	0	0	0	0	0	**1**	1	2	**5**	**1**	**10**	**16**	63
07:30 AM	**4**	**76**	0	**80**	0	0	0	0	0	0	1	1	4	0	8	12	**93**
07:45 AM	3	73	0	76	0	0	0	0	**1**	1	1	3	1	0	6	7	86
08:00 AM	3	19	0	22	0	0	0	0	0	1	**4**	**5**	2	0	3	5	32
Total Volume	13	210	0	223	0	0	0	0	1	3	7	11	12	1	27	40	274
% App. Total	5.8	94.2	0		0	0	0		9.1	27.3	63.6		30	2.5	67.5		
PHF	.813	.691	.000	.697	.000	.000	.000	.000	.250	.750	.438	.550	.600	.250	.675	.625	.737

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County of Riverside
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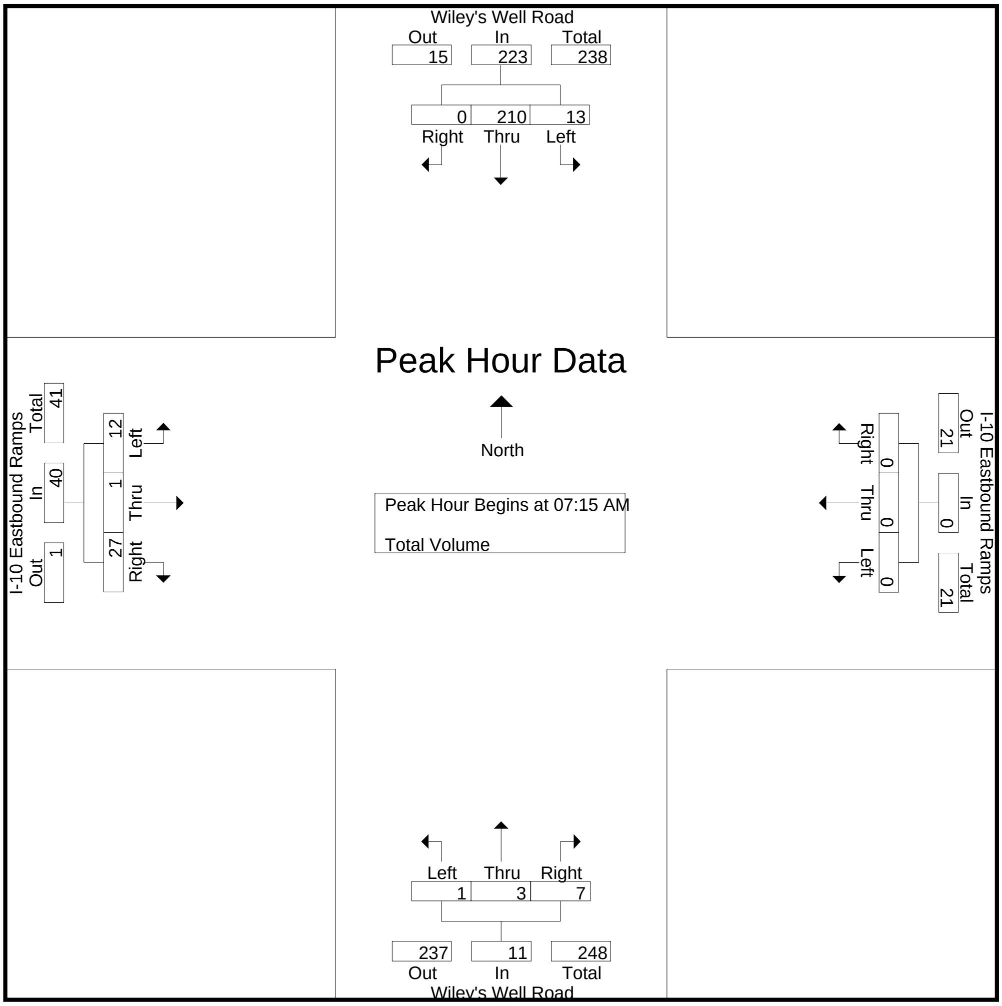
File Name : CRVWW10EAM
Site Code : 19517333
Start Date : 5/25/2017
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:45 AM				07:00 AM			
+0 mins.	3	42	0	45	0	0	0	0	**1**	1	1	3	1	**1**	6	8
+15 mins.	**4**	**76**	0	**80**	0	0	0	0	0	1	**4**	**5**	**5**	1	**10**	**16**
+30 mins.	3	73	0	76	0	0	0	0	0	**3**	0	3	4	0	8	12
+45 mins.	3	19	0	22	0	0	0	0	0	1	4	5	1	0	6	7
Total Volume	13	210	0	223	0	0	0	0	1	6	9	16	11	2	30	43
% App. Total	5.8	94.2	0		0	0	0		6.2	37.5	56.2		25.6	4.7	69.8	
PHF	.813	.691	.000	.697	.000	.000	.000	.000	.250	.500	.563	.800	.550	.500	.750	.672

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County of Riverside
N/S: Wiley's Well Road
E/W: I-10 Eastbound Ramps
Weather: Clear

File Name : CRVWW10EPM
Site Code : 19517333
Start Date : 5/25/2017
Page No : 1

Groups Printed- Total Volume

	Wiley's Well Road Southbound				I-10 Eastbound Ramps Westbound				Wiley's Well Road Northbound				I-10 Eastbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	2	0	0	2	0	0	0	0	0	18	103	121	5	0	1	6	129
04:15 PM	3	0	0	3	0	0	0	0	0	9	21	30	7	0	0	7	40
04:30 PM	8	0	0	8	0	0	0	0	0	5	24	29	3	1	0	4	41
04:45 PM	3	2	0	5	0	0	0	0	0	1	5	6	2	1	0	3	14
Total	16	2	0	18	0	0	0	0	0	33	153	186	17	2	1	20	224
05:00 PM	1	3	0	4	0	0	0	0	0	4	13	17	8	1	0	9	30
05:15 PM	4	3	0	7	0	0	0	0	0	0	3	3	6	0	3	9	19
05:30 PM	6	0	0	6	0	0	0	0	0	1	6	7	2	1	0	3	16
05:45 PM	5	4	0	9	0	0	0	0	0	0	2	2	1	1	1	3	14
Total	16	10	0	26	0	0	0	0	0	5	24	29	17	3	4	24	79
Grand Total	32	12	0	44	0	0	0	0	0	38	177	215	34	5	5	44	303
Apprch %	72.7	27.3	0		0	0	0		0	17.7	82.3		77.3	11.4	11.4		
Total %	10.6	4	0	14.5	0	0	0	0	0	12.5	58.4	71	11.2	1.7	1.7	14.5	

	Wiley's Well Road Southbound				I-10 Eastbound Ramps Westbound				Wiley's Well Road Northbound				I-10 Eastbound Ramps Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	2	0	0	2	0	0	0	0	0	**18**	**103**	**121**	5	0	**1**	6	**129**
04:15 PM	3	0	0	3	0	0	0	0	0	9	21	30	**7**	0	0	**7**	40
04:30 PM	**8**	0	0	**8**	0	0	0	0	0	5	24	29	3	**1**	0	4	41
04:45 PM	3	**2**	0	5	0	0	0	0	0	1	5	6	2	1	0	3	14
Total Volume	16	2	0	18	0	0	0	0	0	33	153	186	17	2	1	20	224
% App. Total	88.9	11.1	0		0	0	0		0	17.7	82.3		85	10	5		
PHF	.500	.250	.000	.563	.000	.000	.000	.000	.000	.458	.371	.384	.607	.500	.250	.714	.434

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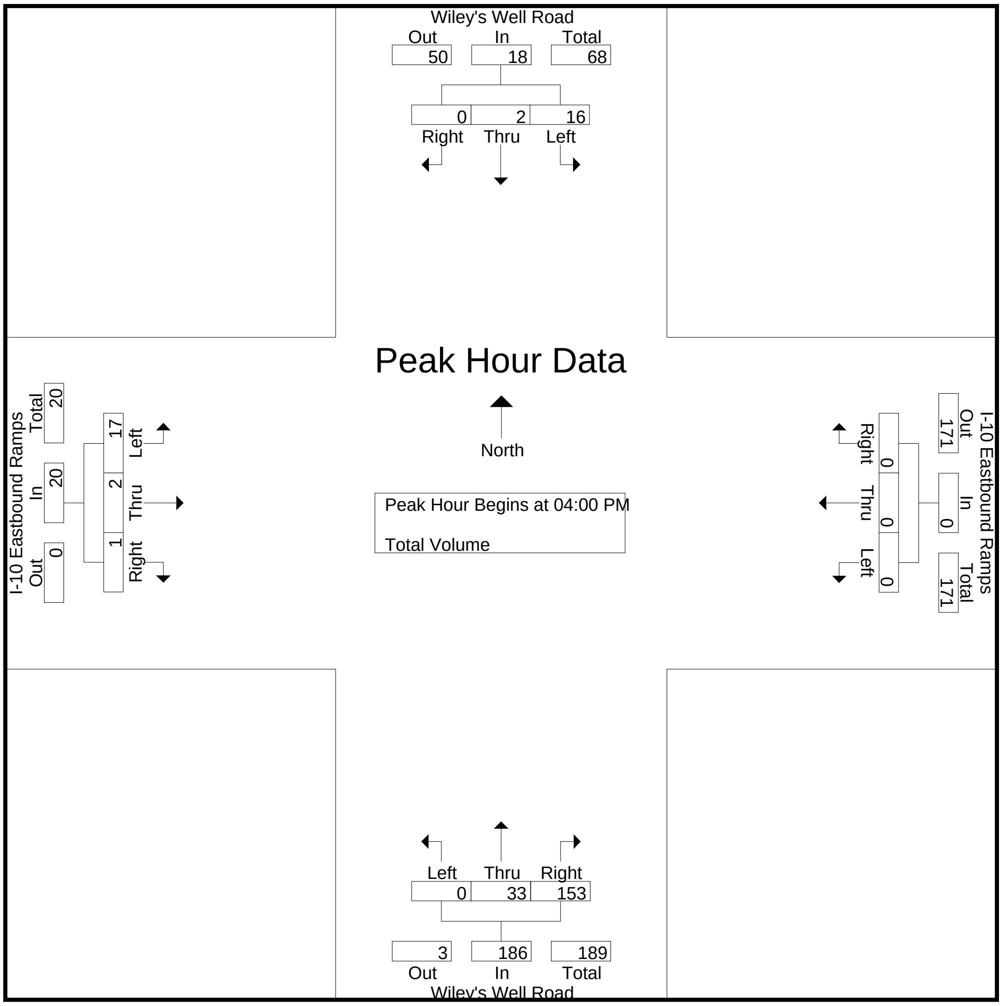
County of Riverside
N/S: Wiley's Well Road
E/W: I-10 Eastbound Ramps
Weather: Clear

File Name : CRVWW10EPM
Site Code : 19517333
Start Date : 5/25/2017
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				04:00 PM				04:00 PM				04:30 PM			
+0 mins.	1	3	0	4	0	0	0	0	0	**18**	**103**	**121**	3	**1**	0	4
+15 mins.	4	3	0	7	0	0	0	0	0	9	21	30	2	1	0	3
+30 mins.	**6**	0	0	6	0	0	0	0	0	5	24	29	**8**	1	0	**9**
+45 mins.	5	**4**	0	**9**	0	0	0	0	0	1	5	6	6	0	**3**	9
Total Volume	16	10	0	26	0	0	0	0	0	33	153	186	19	3	3	25
% App. Total	61.5	38.5	0		0	0	0		0	17.7	82.3		76	12	12	
PHF	.667	.625	.000	.722	.000	.000	.000	.000	.000	.458	.371	.384	.594	.750	.250	.694

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County of Riverside
N/S: Wiley's Well Road
E/W: Powerline Road
Weather: Clear

File Name : CRVWWPOPM
Site Code : 19517333
Start Date : 5/25/2017
Page No : 1

Groups Printed- Total Volume

	Wiley's Well Road Southbound				Powerline Road Westbound				Wiley's Well Road Northbound				Powerline Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	1	0	1	0	0	0	0	0	118	0	118	0	0	0	0	119
04:15 PM	0	0	0	0	0	0	0	0	0	28	0	28	0	0	0	0	28
04:30 PM	0	0	0	0	0	0	0	0	0	31	0	31	0	0	0	0	31
04:45 PM	0	2	0	2	0	0	0	0	0	5	0	5	0	0	0	0	7
Total	0	3	0	3	0	0	0	0	0	182	0	182	0	0	0	0	185
05:00 PM	0	3	0	3	0	0	0	0	0	16	0	16	0	0	0	0	19
05:15 PM	0	5	0	5	0	0	0	0	0	3	0	3	0	0	0	0	8
05:30 PM	0	0	0	0	0	0	1	1	0	6	0	6	0	0	0	0	7
05:45 PM	0	4	0	4	0	0	1	1	0	1	0	1	0	0	0	0	6
Total	0	12	0	12	0	0	2	2	0	26	0	26	0	0	0	0	40
Grand Total	0	15	0	15	0	0	2	2	0	208	0	208	0	0	0	0	225
Apprch %	0	100	0		0	0	100		0	100	0		0	0	0		
Total %	0	6.7	0	6.7	0	0	0.9	0.9	0	92.4	0	92.4	0	0	0	0	

	Wiley's Well Road Southbound				Powerline Road Westbound				Wiley's Well Road Northbound				Powerline Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	1	0	1	0	0	0	0	0	**118**	0	**118**	0	0	0	0	**119**
04:15 PM	0	0	0	0	0	0	0	0	0	28	0	28	0	0	0	0	28
04:30 PM	0	0	0	0	0	0	0	0	0	31	0	31	0	0	0	0	31
04:45 PM	0	**2**	0	**2**	0	0	0	0	0	5	0	5	0	0	0	0	7
Total Volume	0	3	0	3	0	0	0	0	0	182	0	182	0	0	0	0	185
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.375	.000	.375	.000	.000	.000	.000	.000	.386	.000	.386	.000	.000	.000	.000	.389

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County of Riverside
N/S: Wiley's Well Road
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Weather: Clear

File Name : CRVWWPOAM
Site Code : 19517333
Start Date : 5/25/2017
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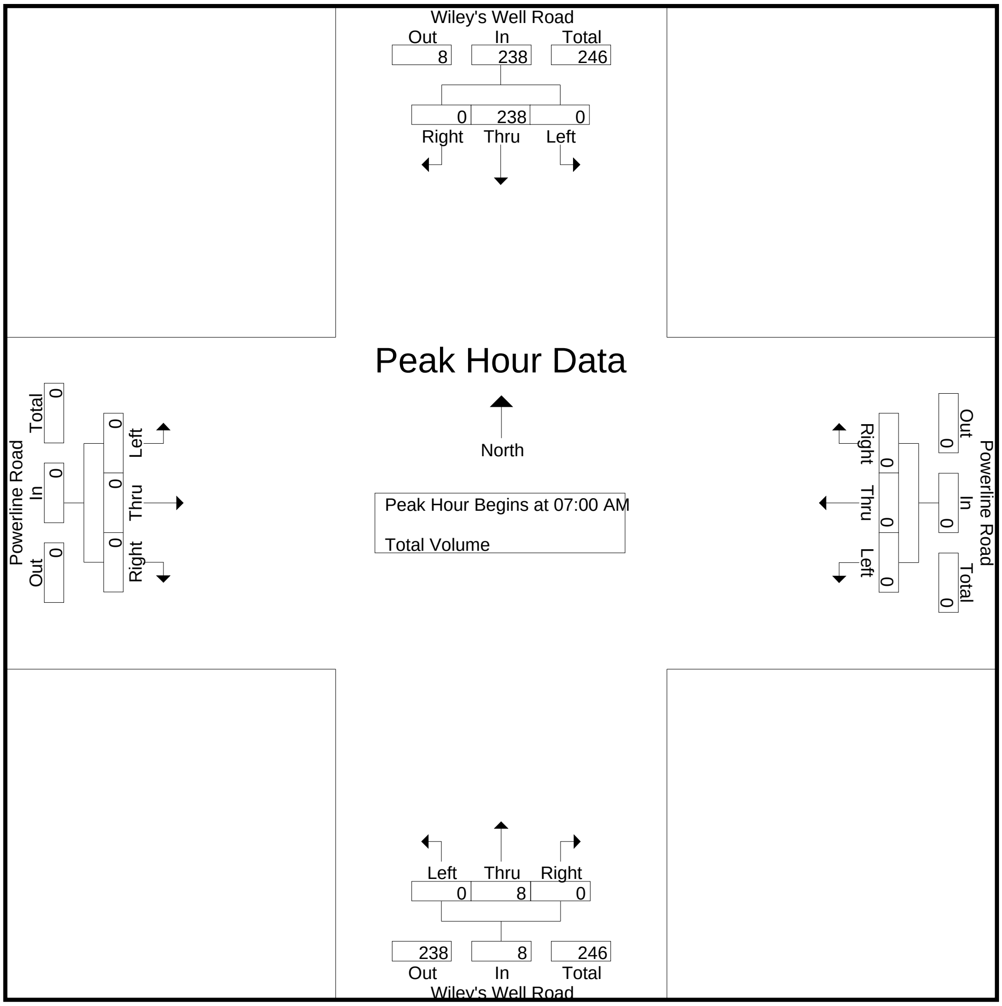

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:45 AM				07:00 AM			
+0 mins.	0	18	0	18	0	0	0	0	0	2	0	2	0	0	0	0
+15 mins.	0	53	0	53	0	0	0	0	0	3	0	3	0	0	0	0
+30 mins.	0	80	0	80	0	0	0	0	0	**5**	0	**5**	0	0	0	0
+45 mins.	0	**87**	0	**87**	0	0	0	0	0	3	0	3	0	0	0	0
Total Volume	0	238	0	238	0	0	0	0	0	13	0	13	0	0	0	0
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0	
PHF	.000	.684	.000	.684	.000	.000	.000	.000	.000	.650	.000	.650	.000	.000	.000	.000

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County of Riverside
N/S: Wiley's Well Road
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Weather: Clear

File Name : CRVWWPOPM
Site Code : 19517333
Start Date : 5/25/2017
Page No : 1

Groups Printed- Total Volume

	Wiley's Well Road Southbound				Powerline Road Westbound				Wiley's Well Road Northbound				Powerline Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	1	0	1	0	0	0	0	0	118	0	118	0	0	0	0	119
04:15 PM	0	0	0	0	0	0	0	0	0	28	0	28	0	0	0	0	28
04:30 PM	0	0	0	0	0	0	0	0	0	31	0	31	0	0	0	0	31
04:45 PM	0	2	0	2	0	0	0	0	0	5	0	5	0	0	0	0	7
Total	0	3	0	3	0	0	0	0	0	182	0	182	0	0	0	0	185
05:00 PM	0	3	0	3	0	0	0	0	0	16	0	16	0	0	0	0	19
05:15 PM	0	5	0	5	0	0	0	0	0	3	0	3	0	0	0	0	8
05:30 PM	0	0	0	0	0	0	1	1	0	6	0	6	0	0	0	0	7
05:45 PM	0	4	0	4	0	0	1	1	0	1	0	1	0	0	0	0	6
Total	0	12	0	12	0	0	2	2	0	26	0	26	0	0	0	0	40
Grand Total	0	15	0	15	0	0	2	2	0	208	0	208	0	0	0	0	225
Apprch %	0	100	0		0	0	100		0	100	0		0	0	0		
Total %	0	6.7	0	6.7	0	0	0.9	0.9	0	92.4	0	92.4	0	0	0	0	

	Wiley's Well Road Southbound				Powerline Road Westbound				Wiley's Well Road Northbound				Powerline Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	1	0	1	0	0	0	0	0	**118**	0	**118**	0	0	0	0	**119**
04:15 PM	0	0	0	0	0	0	0	0	0	28	0	28	0	0	0	0	28
04:30 PM	0	0	0	0	0	0	0	0	0	31	0	31	0	0	0	0	31
04:45 PM	0	**2**	0	**2**	0	0	0	0	0	5	0	5	0	0	0	0	7
Total Volume	0	3	0	3	0	0	0	0	0	182	0	182	0	0	0	0	185
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.375	.000	.375	.000	.000	.000	.000	.000	.386	.000	.386	.000	.000	.000	.000	.389

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County of Riverside
N/S: Wiley's Well Road
E/W: Powerline Road
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File Name : CRVWWPOPM
Site Code : 19517333
Start Date : 5/25/2017
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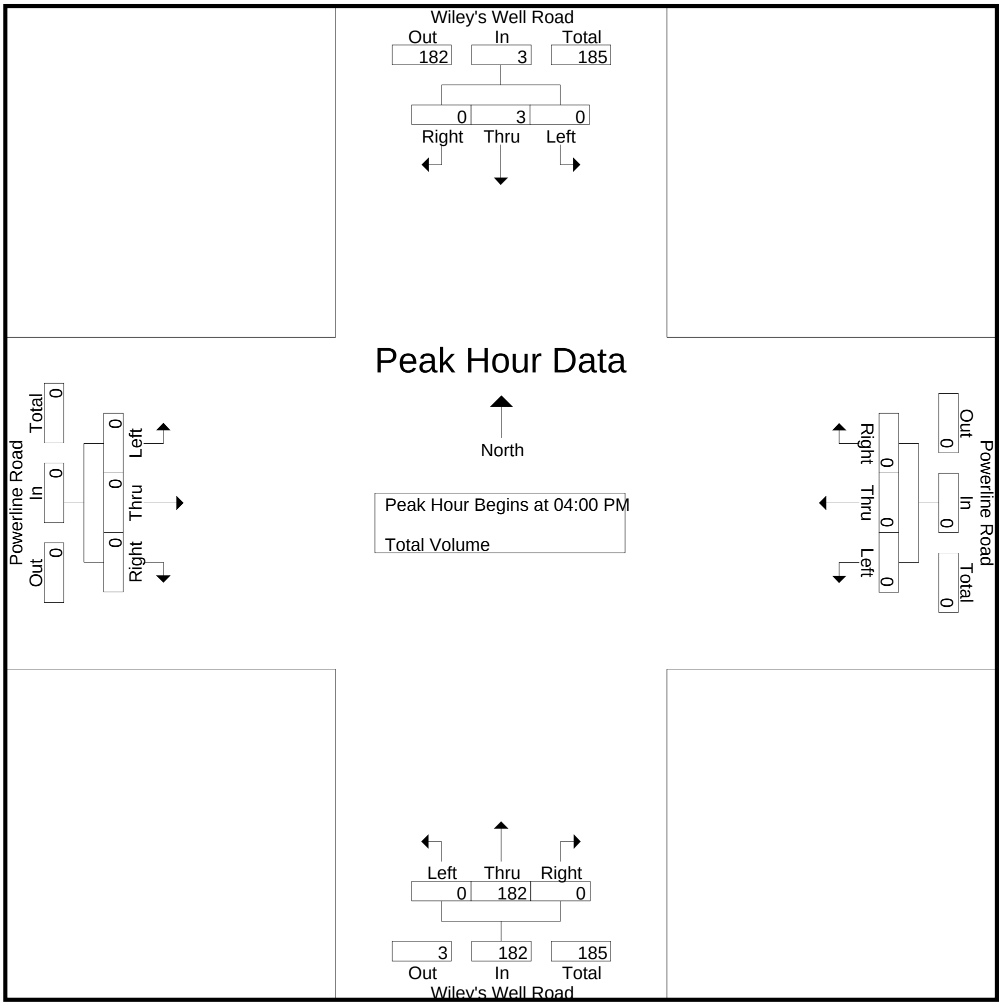

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	3	0	3	0	0	0	0	0	**118**	0	**118**	0	0	0	0
+15 mins.	0	**5**	0	**5**	0	0	0	0	0	28	0	28	0	0	0	0
+30 mins.	0	0	0	0	0	0	**1**	**1**	0	31	0	31	0	0	0	0
+45 mins.	0	4	0	4	0	0	1	1	0	5	0	5	0	0	0	0
Total Volume	0	12	0	12	0	0	2	2	0	182	0	182	0	0	0	0
% App. Total	0	100	0		0	0	100		0	100	0		0	0	0	
PHF	.000	.600	.000	.600	.000	.000	.500	.500	.000	.386	.000	.386	.000	.000	.000	.000

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City of Blythe
Wiley's Well Road
B/ Interstate 10 Westbound - Eastbound Ramps
24 Hour Directional Classification Count

BLY001RD
Site Code: 195-17333

Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/25/17	1	3	1	0	0	1	0	0	1	0	0	0	0	7
01:00	0	2	0	0	2	0	0	0	0	0	0	0	0	4
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	1	5	0	0	2	1	0	0	0	0	0	0	0	9
04:00	0	1	0	0	0	0	0	0	1	0	0	0	0	2
05:00	0	14	2	0	0	0	0	0	0	0	0	**1**	0	17
06:00	1	**15**	5	0	2	1	0	0	1	0	0	0	0	25
07:00	1	6	0	0	3	**2**	0	**1**	0	0	0	0	0	13
08:00	2	5	5	0	0	1	0	0	0	0	0	0	0	13
09:00	**3**	12	6	0	1	2	0	1	1	0	0	0	0	26
10:00	0	13	3	0	2	0	0	1	**4**	0	0	0	0	23
11:00	0	14	**8**	0	**4**	0	0	0	0	0	0	1	0	**27**
12 PM	0	17	5	0	**2**	0	0	1	0	0	0	0	0	25
13:00	0	**46**	10	0	2	0	0	1	**2**	0	0	0	0	**61**
14:00	0	36	**15**	0	2	0	0	**3**	1	0	0	0	0	57
15:00	1	23	2	0	0	1	0	0	1	0	**1**	0	0	29
16:00	2	33	10	0	0	2	0	0	1	0	0	0	0	48
17:00	**4**	9	2	0	1	**4**	0	0	2	0	0	0	0	22
18:00	0	6	3	0	0	0	0	0	1	0	0	0	0	10
19:00	0	4	0	**1**	0	0	0	0	1	0	0	0	0	6
20:00	0	4	0	0	0	0	0	1	1	0	0	0	0	6
21:00	2	12	1	0	0	1	0	0	1	0	0	0	0	17
22:00	0	18	12	0	0	0	0	0	0	0	0	0	0	30
23:00	2	5	2	0	0	2	0	0	1	0	0	0	0	12
Total	20	305	92	1	23	18	0	9	20	0	1	2	0	491
Percent	4.1%	62.1%	18.7%	0.2%	4.7%	3.7%	0.0%	1.8%	4.1%	0.0%	0.2%	0.4%	0.0%	
AM Peak	09:00	06:00	11:00		11:00	07:00		07:00	10:00			05:00		11:00
Vol.	3	15	8		4	2		1	4			1		27
PM Peak	17:00	13:00	14:00	19:00	12:00	17:00		14:00	13:00		15:00			13:00
Vol.	4	46	15	1	2	4		3	2		1			61
Grand Total	20	305	92	1	23	18	0	9	20	0	1	2	0	491
Percent	4.1%	62.1%	18.7%	0.2%	4.7%	3.7%	0.0%	1.8%	4.1%	0.0%	0.2%	0.4%	0.0%	

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City of Blythe
Wiley's Well Road
B/ Interstate 10 Westbound - Eastbound Ramps
24 Hour Directional Classification Count

BLY001RD
Site Code: 195-17333

Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/25/17	1	5	2	0	0	1	0	0	0	0	0	0	0	9
01:00	0	4	0	0	1	0	0	0	**1**	0	0	0	0	6
02:00	1	3	0	0	0	1	0	0	0	0	0	0	0	5
03:00	1	21	5	0	1	0	0	0	1	0	0	0	0	29
04:00	0	12	8	0	1	0	0	0	0	0	0	0	0	21
05:00	**2**	**229**	**59**	0	**38**	1	**1**	1	1	0	0	0	**1**	**333**
06:00	0	52	9	0	7	1	0	1	1	0	0	0	0	71
07:00	1	159	44	0	11	1	1	1	1	0	0	0	0	219
08:00	0	26	17	0	2	0	0	0	1	0	0	0	0	46
09:00	0	16	7	**2**	0	0	0	1	1	0	0	0	0	27
10:00	2	16	7	0	4	**2**	0	**3**	0	**1**	0	0	0	35
11:00	0	28	8	0	9	0	0	1	0	0	0	**1**	0	47
12 PM	1	11	5	0	6	2	0	0	0	0	0	0	0	25
13:00	0	**60**	**18**	0	**21**	0	0	1	0	0	0	0	0	**100**
14:00	1	11	5	0	3	1	**1**	**2**	0	0	0	0	0	24
15:00	3	16	6	0	3	0	0	0	0	0	0	0	0	28
16:00	**4**	10	5	0	2	**4**	0	0	1	0	0	0	0	26
17:00	0	17	8	0	1	0	0	0	**3**	**1**	**1**	0	0	31
18:00	1	6	3	0	1	1	0	0	1	0	0	0	0	13
19:00	0	6	2	**1**	0	0	0	0	0	0	0	0	0	9
20:00	1	5	3	0	1	1	0	1	0	0	0	0	0	12
21:00	1	39	5	0	2	1	0	0	1	0	0	0	0	49
22:00	0	2	2	0	0	0	0	0	0	0	0	0	0	4
23:00	1	4	1	0	0	1	0	0	0	0	0	0	0	7
Total	21	758	229	3	114	18	3	12	13	2	1	1	1	1176
Percent	1.8%	64.5%	19.5%	0.3%	9.7%	1.5%	0.3%	1.0%	1.1%	0.2%	0.1%	0.1%	0.1%	
AM Peak	05:00	05:00	05:00	09:00	05:00	10:00	05:00	10:00	01:00	10:00		11:00	05:00	05:00
Vol.	2	229	59	2	38	2	1	3	1	1		1	1	333
PM Peak	16:00	13:00	13:00	19:00	13:00	16:00	14:00	14:00	17:00	17:00	17:00			13:00
Vol.	4	60	18	1	21	4	1	2	3	1	1			100
Grand Total	21	758	229	3	114	18	3	12	13	2	1	1	1	1176
Percent	1.8%	64.5%	19.5%	0.3%	9.7%	1.5%	0.3%	1.0%	1.1%	0.2%	0.1%	0.1%	0.1%	

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City of Blythe
Wiley's Well Road
B/ Interstate 10 Westbound - Eastbound Ramps
24 Hour Directional Classification Count

BLY001RD
Site Code: 195-17333

Northbound, Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/25/17	2	8	3	0	0	2	0	0	1	0	0	0	0	16
01:00	0	6	0	0	3	0	0	0	1	0	0	0	0	10
02:00	1	5	0	0	0	1	0	0	0	0	0	0	0	7
03:00	2	26	5	0	3	1	0	0	1	0	0	0	0	38
04:00	0	13	8	0	1	0	0	0	1	0	0	0	0	23
05:00	2	**243**	**61**	0	**38**	1	**1**	1	1	0	0	1	**1**	**350**
06:00	1	67	14	0	9	2	0	1	2	0	0	0	0	96
07:00	2	165	44	0	14	**3**	1	2	1	0	0	0	0	232
08:00	2	31	22	0	2	1	0	0	1	0	0	0	0	59
09:00	**3**	28	13	**2**	1	2	0	2	2	0	0	0	0	53
10:00	2	29	10	0	6	2	0	**4**	**4**	**1**	0	0	0	58
11:00	0	42	16	0	13	0	0	1	0	0	0	**2**	0	74
12 PM	1	28	10	0	8	2	0	1	0	0	0	0	0	50
13:00	0	**106**	**28**	0	**23**	0	0	2	2	0	0	0	0	**161**
14:00	1	47	20	0	5	1	**1**	**5**	1	0	0	0	0	81
15:00	4	39	8	0	3	1	0	0	1	0	**1**	0	0	57
16:00	**6**	43	15	0	2	**6**	0	0	2	0	0	0	0	74
17:00	4	26	10	0	2	4	0	0	**5**	**1**	1	0	0	53
18:00	1	12	6	0	1	1	0	0	2	0	0	0	0	23
19:00	0	10	2	**2**	0	0	0	0	1	0	0	0	0	15
20:00	1	9	3	0	1	1	0	2	1	0	0	0	0	18
21:00	3	51	6	0	2	2	0	0	2	0	0	0	0	66
22:00	0	20	14	0	0	0	0	0	0	0	0	0	0	34
23:00	3	9	3	0	0	3	0	0	1	0	0	0	0	19
Total	41	1063	321	4	137	36	3	21	33	2	2	3	1	1667
Percent	2.5%	63.8%	19.3%	0.2%	8.2%	2.2%	0.2%	1.3%	2.0%	0.1%	0.1%	0.2%	0.1%	
AM Peak	09:00	05:00	05:00	09:00	05:00	07:00	05:00	10:00	10:00	10:00		11:00	05:00	05:00
Vol.	3	243	61	2	38	3	1	4	4	1		2	1	350
PM Peak	16:00	13:00	13:00	19:00	13:00	16:00	14:00	14:00	17:00	17:00	15:00			13:00
Vol.	6	106	28	2	23	6	1	5	5	1	1			161
Grand Total	41	1063	321	4	137	36	3	21	33	2	2	3	1	1667
Percent	2.5%	63.8%	19.3%	0.2%	8.2%	2.2%	0.2%	1.3%	2.0%	0.1%	0.1%	0.2%	0.1%	

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City of Blythe
Willey's Well Road
B/ Interstate 10 Eastbound Ramps - Power Line Road
24 Hour Directional Classification Count

BLY002
Site Code: 195-17333

Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/25/17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	2	0	0	**1**	0	0	0	0	0	3
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
05:00	0	12	2	0	0	0	0	0	0	0	0	0	0	14
06:00	0	**41**	**8**	0	1	0	0	0	0	0	0	0	0	**50**
07:00	0	2	2	0	2	0	0	0	0	0	0	0	0	6
08:00	0	9	2	0	1	0	0	1	0	0	0	0	0	13
09:00	**1**	2	2	**1**	**4**	**1**	0	0	0	0	0	0	0	11
10:00	0	8	6	0	4	0	0	0	0	0	0	0	0	18
11:00	0	17	8	0	4	0	0	0	0	0	0	0	0	29
12 PM	0	34	9	0	3	0	0	0	0	0	0	0	0	46
13:00	0	93	24	0	9	0	0	0	0	0	0	0	0	126
14:00	0	**173**	**45**	0	**16**	0	0	0	0	0	0	0	0	**234**
15:00	0	61	15	0	6	0	0	0	0	0	0	0	0	82
16:00	0	137	36	0	13	0	0	0	0	0	0	0	0	186
17:00	0	21	6	0	2	0	0	0	0	0	0	0	0	29
18:00	0	15	4	0	0	0	0	0	0	0	0	0	0	19
19:00	0	11	4	0	0	0	0	0	0	0	0	0	0	15
20:00	0	13	4	0	1	0	0	0	0	0	0	0	0	18
21:00	0	34	9	0	3	0	0	0	0	0	0	0	0	46
22:00	0	90	24	0	8	0	0	0	0	0	0	0	0	122
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	774	210	1	79	1	0	2	0	0	0	0	0	1068
Percent	0.1%	72.5%	19.7%	0.1%	7.4%	0.1%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	06:00	06:00	09:00	09:00	09:00		03:00						06:00
Vol.	1	41	8	1	4	1		1						50
PM Peak		14:00	14:00		14:00									14:00
Vol.		173	45		16									234
Grand Total	1	774	210	1	79	1	0	2	0	0	0	0	0	1068
Percent	0.1%	72.5%	19.7%	0.1%	7.4%	0.1%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	

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City of Blythe
Willey's Well Road
B/ Interstate 10 Eastbound Ramps - Power Line Road
24 Hour Directional Classification Count

BLY002
Site Code: 195-17333

Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/25/17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
03:00	0	15	7	0	0	0	0	**1**	**1**	0	0	0	0	24
04:00	0	12	7	0	2	0	0	0	0	0	0	0	0	21
05:00	**2**	**314**	**68**	0	**6**	0	0	0	0	0	0	0	0	**390**
06:00	0	68	12	0	3	0	0	0	0	0	0	0	0	83
07:00	1	198	32	0	2	**1**	0	1	0	0	0	0	0	235
08:00	0	36	5	0	0	0	0	0	0	0	0	0	0	41
09:00	0	11	3	**1**	3	0	0	0	0	0	0	0	0	18
10:00	0	11	5	0	3	0	0	0	0	0	0	0	0	19
11:00	0	20	7	1	6	0	0	0	0	0	0	0	0	34
12 PM	0	9	2	0	4	0	0	**1**	0	0	0	0	0	16
13:00	0	**60**	**23**	0	**23**	0	0	1	0	0	0	0	0	**107**
14:00	0	1	3	0	1	0	0	0	0	0	0	0	0	5
15:00	0	1	0	0	3	0	0	0	0	0	0	0	0	4
16:00	0	0	1	0	1	0	0	0	0	0	0	0	0	2
17:00	0	7	5	0	1	0	0	0	0	0	0	0	0	13
18:00	0	1	0	0	2	0	0	0	0	0	0	0	0	3
19:00	0	0	4	0	1	0	0	0	0	0	0	0	0	5
20:00	0	0	3	0	1	0	0	0	0	0	0	0	0	4
21:00	**2**	49	13	0	4	0	0	0	0	0	0	0	0	68
22:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	5	818	201	2	66	1	0	4	1	0	0	0	0	1098
Percent	0.5%	74.5%	18.3%	0.2%	6.0%	0.1%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	05:00	05:00	05:00	09:00	05:00	07:00		03:00	03:00					05:00
Vol.	2	314	68	1	6	1		1	1					390
PM Peak	21:00	13:00	13:00		13:00			12:00						13:00
Vol.	2	60	23		23			1						107
Grand Total	5	818	201	2	66	1	0	4	1	0	0	0	0	1098
Percent	0.5%	74.5%	18.3%	0.2%	6.0%	0.1%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	

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City of Blythe
Willey's Well Road
B/ Interstate 10 Eastbound Ramps - Power Line Road
24 Hour Directional Classification Count

BLY002
Site Code: 195-17333

Northbound, Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/25/17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
03:00	0	15	7	0	2	0	0	**2**	**1**	0	0	0	0	27
04:00	0	13	7	0	2	0	0	0	0	0	0	0	0	22
05:00	**2**	**326**	**70**	0	6	0	0	0	0	0	0	0	0	**404**
06:00	0	109	20	0	4	0	0	0	0	0	0	0	0	133
07:00	1	200	34	0	4	**1**	0	1	0	0	0	0	0	241
08:00	0	45	7	0	1	0	0	1	0	0	0	0	0	54
09:00	1	13	5	**2**	7	1	0	0	0	0	0	0	0	29
10:00	0	19	11	0	7	0	0	0	0	0	0	0	0	37
11:00	0	37	15	1	**10**	0	0	0	0	0	0	0	0	63
12 PM	0	43	11	0	7	0	0	**1**	0	0	0	0	0	62
13:00	0	153	47	0	**32**	0	0	1	0	0	0	0	0	233
14:00	0	**174**	**48**	0	17	0	0	0	0	0	0	0	0	**239**
15:00	0	62	15	0	9	0	0	0	0	0	0	0	0	86
16:00	0	137	37	0	14	0	0	0	0	0	0	0	0	188
17:00	0	28	11	0	3	0	0	0	0	0	0	0	0	42
18:00	0	16	4	0	2	0	0	0	0	0	0	0	0	22
19:00	0	11	8	0	1	0	0	0	0	0	0	0	0	20
20:00	0	13	7	0	2	0	0	0	0	0	0	0	0	22
21:00	**2**	83	22	0	7	0	0	0	0	0	0	0	0	114
22:00	0	92	24	0	8	0	0	0	0	0	0	0	0	124
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	6	1592	411	3	145	2	0	6	1	0	0	0	0	2166
Percent	0.3%	73.5%	19.0%	0.1%	6.7%	0.1%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	05:00	05:00	05:00	09:00	11:00	07:00		03:00	03:00					05:00
Vol.	2	326	70	2	10	1		2	1					404
PM Peak	21:00	14:00	14:00		13:00			12:00						14:00
Vol.	2	174	48		32			1						239
Grand Total	6	1592	411	3	145	2	0	6	1	0	0	0	0	2166
Percent	0.3%	73.5%	19.0%	0.1%	6.7%	0.1%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	

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City of Blythe
Power Line Road
E/ Wiley's Well Road
24 Hour Directional Classification Count

BLY003
Site Code: 195-17333

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/25/17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	**3**	0	0	0	0	0	0	0	0	0	0	0	**3**
05:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	**1**	0	0	0	0	0	0	0	0	1
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 PM	0	1	**2**	0	0	0	0	0	0	0	0	0	0	3
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
16:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
17:00	0	**4**	0	0	0	0	0	0	0	0	0	0	0	**4**
18:00	0	0	0	0	**1**	0	0	0	0	0	0	0	0	1
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	16	2	0	2	0	0	0	0	0	0	0	0	20
Percent	0.0%	80.0%	10.0%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		04:00			09:00									04:00
Vol.		3			1									3
PM Peak		17:00	12:00		18:00									17:00
Vol.		4	2		1									4
Grand Total	0	16	2	0	2	0	0	0	0	0	0	0	0	20
Percent	0.0%	80.0%	10.0%	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

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City of Blythe
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24 Hour Directional Classification Count

BLY003
Site Code: 195-17333

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/25/17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	**3**	**1**	0	0	0	0	0	0	0	0	0	0	**4**
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 PM	**1**	**2**	0	0	0	0	0	0	0	0	0	0	0	**3**
13:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1
14:00	0	0	0	0	**1**	0	0	0	0	0	0	0	0	1
15:00	0	0	**1**	0	0	0	0	0	0	0	0	0	0	1
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
18:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
19:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	13	3	0	1	0	0	0	0	0	0	0	0	19
Percent	10.5%	68.4%	15.8%	0.0%	5.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		10:00	10:00											10:00
Vol.		3	1											4
PM Peak	12:00	12:00	15:00		14:00									12:00
Vol.	1	2	1		1									3
Grand Total	2	13	3	0	1	0	0	0	0	0	0	0	0	19
Percent	10.5%	68.4%	15.8%	0.0%	5.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

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24 Hour Directional Classification Count

BLY003
Site Code: 195-17333

Eastbound, Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/25/17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
05:00	0	**4**	0	0	0	0	0	0	0	0	0	0	0	**4**
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	**1**	0	0	0	0	0	0	0	0	1
10:00	0	3	**1**	0	0	0	0	0	0	0	0	0	0	4
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 PM	**1**	3	**2**	0	0	0	0	0	0	0	0	0	0	**6**
13:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1
14:00	0	0	0	0	**1**	0	0	0	0	0	0	0	0	1
15:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
16:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
17:00	0	**6**	0	0	0	0	0	0	0	0	0	0	0	6
18:00	0	2	1	0	1	0	0	0	0	0	0	0	0	4
19:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
20:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	29	5	0	3	0	0	0	0	0	0	0	0	39
Percent	5.1%	74.4%	12.8%	0.0%	7.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		05:00	10:00		09:00									05:00
Vol.		4	1		1									4
PM Peak	12:00	17:00	12:00		14:00									12:00
Vol.	1	6	2		1									6
Grand Total	2	29	5	0	3	0	0	0	0	0	0	0	0	39
Percent	5.1%	74.4%	12.8%	0.0%	7.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

Dist	Route	County		Postmile	Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month	Ahead AADT
8	10	RIV		46.89	COOK STREET	9000	110000	99000	8700	108000	97000
8	10	RIV		50.447	WASHINGTON STREET	8700	108000	97000	7800	96000	86000
8	10	RIV	R	52.342	JEFFERSON STREE/INDIO BOULEVARD	7800	96000	86000	6500	75000	70000
8	10	RIV	R	54.738	INDIO, MONROE STREET	6500	75000	70000	6000	68000	64000
8	10	RIV	R	55.744	INDIO, JACKSON STREET	6000	68000	64000	5500	63000	59000
8	10	RIV	R	56.946	INDIO, NORTH JCT. RTE. 111	5500	63000	59000	5000	58000	54000
8	10	RIV	R	57.831	INDIO, JCT. RTE. 86 SOUTH	5000	58000	54000	2400	27000	25400
8	10	RIV	R	58.89	DILLON ROAD	2400	27000	25400	2200	24900	23300
8	10	RIV	R	81.548	COTTONWOOD SPRINGS ROAD	2200	24900	23300	2950	25500	23300
8	10	RIV	R	86.073	CHIRIACO SUMMIT	2950	25500	23300	3000	26000	24000
8	10	RIV	R	90.119	HAYFIELD ROAD	3000	26000	24000	3000	26000	24000
8	10	RIV	R	95.049	EAGLE MOUNTAIN RAILROAD OH/RED CLOUD RD	3000	26000	24000	3000	26000	24000
8	10	RIV	R	102.014	EAGLE MOUNTAIN ROAD	3000	26000	24000	3000	26000	24000
8	10	RIV	R	105.087	JCT. RTE. 177 NORTH	3000	26000	24000	2800	24200	22300
8	10	RIV	R	114.402	CORN SPRINGS ROAD	2800	24200	22300	2800	24200	22300
8	10	RIV	R	129.935	FORD DRY LAKE/ CHUCKAWALLA ROAD	2800	24200	22300	2800	24200	22300
8	10	RIV	R	135.049	WILEY'S WELL SAFETY RD SIDE RA, WILEY'S WELL RD	2800	24200	22300	3000	26000	23800
8	10	RIV	R	145.118	MESA DRIVE	3000	26000	23800	2900	25000	23000
8	10	RIV	R	149.15	JCT. RTE. 78 SOUTH	2900	25000	23000	3200	27500	25200
8	10	RIV	R	152.152	BLYTHE, LOVEKIN BOULEVARD	3150	27500	24800	3050	26500	24200
8	10	RIV	R	153.155	BLYTHE, SEVENTH AVENUE	3050	26500	24200	3300	28500	26000
8	10	RIV	R	154.167	JCT. RTE. 95 NORTH	3300	28500	26000	3300	30000	26500
8	10	RIV	R	156.1	RIVIERA DRIVE	3300	30000	26500	3300	30000	26500
8	10	RIV	R	156.132	WB OFF TO RIVIERA DRIVE	3350	31000	27000	3350	31000	27000
8	10	RIV	R	156.492	ARIZONA STATE LINE	3350	31000	27000			
4	12	SON		9.23	SEBASTOPOL, JCT. RTE. 116				1950	29000	24000
4	12	SON		9.54	SEBASTOPOL EAST CITY LIMITS	1800	23300	22500	1800	23300	22500
4	12	SON	R	12.94	WRIGHT/FULTON ROADS	1850	23800	23000	3300	42500	41000
4	12	SON	R	14.45	SANTA ROSA, STONY POINT ROAD	3300	42000	41000	5400	69000	67000
4	12	SON	R	15.3	SANTA ROSA, DUTTON AVENUE	5400	69000	67000	6300	80000	78000
4	12	SON	R	16.039	SANTA ROSA, JCT. RTE. 101	6300	80000	78000	6500	78000	74000

RTE	DIST	CNTY	POST MILE	LEG	DESCRIPTION	VEHICLE AADT TOTAL	TRUCK AADT TOTAL	TRUCK % TOT VEH	TRUCK AADT By Axle 2	TRUCK AADT By Axle 3	TRUCK AADT By Axle 4	TRUCK AADT By Axle 5+	% TRUCK AADT TOTAL By Axle 2	% TRUCK AADT TOTAL By Axle 3	% TRUCK AADT TOTAL By Axle 4	% TRUCK AADT TOTAL By Axle 5+	EAL 2-WAY (1000)	YEAR VER/ EST
010	08	RIV	R149.15	B	JCT. RTE. 78 SOUTH	23,000	8,672	37.70	1,046	176	132	7,318	12.06	2.03	1.52	84.40	2,597	12E
010	08	RIV	R149.15	A	JCT. RTE. 78 SOUTH	25,200	9,197	36.50	1,216	204	112	7,665	13.22	2.22	1.22	83.33	2,722	12E
010	08	RIV	R154.167	B	JCT. RTE. 95 NORTH	26,000	9,211	35.43	1,218	205	112	7,676	13.22	2.22	1.22	83.33	2,726	04E
010	08	RIV	R154.167	A	JCT. RTE. 95 NORTH	26,500	9,581	36.15	1,299	215	121	7,946	13.56	2.24	1.26	82.94	2,824	04E
010	08	RIV	R156.492	B	ARIZONA STATE LINE	27,000	9,742	36.08	1,321	218	123	8,080	13.56	2.24	1.26	82.94	2,872	04E
012	04	SON	9.23	A	SEBASTOPOL, JCT. RTE. 116	24,000	972	4.05	809	100	22	41	83.25	10.24	2.28	4.24	55	99V
012	04	SON	9.54	B	SEBASTOPOL EAST CITY LIMITS	22,500	942	4.19	683	118	18	123	72.45	12.51	1.94	13.09	80	99V
012	04	SON	R14.45	A	SANTA ROSA, STONY POINT RD	67,000	2,017	3.01	1,022	359	140	496	50.69	17.79	6.92	24.60	260	02V
012	04	SON	R16.039	B	SANTA ROSA, JCT. RTE. 101	78,000	2,651	3.40	1,490	546	143	472	56.20	20.60	5.40	17.80	286	96V
012	04	SON	R16.039	A	SANTA ROSA, JCT. RTE. 101	74,000	1,783	2.41	1,021	265	79	418	57.25	14.89	4.42	23.45	216	05V
012	04	SON	T17.53	B	SANTA ROSA, FARMERS LANE	62,000	1,488	2.40	966	281	31	210	64.90	18.90	2.10	14.10	137	96V
012	04	SON	20.1	A	SANTA ROSA, CALISTOGA RD	29,000	1,334	4.60	671	224	51	388	50.30	16.80	3.80	29.10	185	96V
012	04	SON	27.03	B	KENWOOD, WARM SPRINGS RD	15,700	643	4.10	421	92	19	111	65.40	14.30	3.00	17.30	64	96V
012	04	SON	30.65	A	ARNOLD DRIVE	14,700	597	4.06	336	110	44	107	56.28	18.44	7.31	17.97	65	02V
012	04	SON	37.505	B	SONOMA, FIRST RD WEST	14,000	497	3.55	323	60	31	83	64.92	12.03	6.27	16.78	50	02V
012	04	SON	41.36	B	JCT. RTE. 121	5,600	190	3.39	90	17	14	69	47.58	8.81	7.49	36.12	31	02V

Appendix B

Existing LOS Worksheets

Crimson Solar Project
Existing AM Peak Hour Conditions

Scenario Report

Scenario:	XAM
Command:	XAM
Volume:	XAM
Geometry:	EXISTING
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Paths
Routes:	Default Routes
Configuration:	Existing

Crimson Solar Project
Existing AM Peak Hour Conditions

Turning Movement Report

Volume Type	Northbound Left	Northbound Thru	Northbound Right	Southbound Left	Southbound Thru	Southbound Right	Eastbound Left	Eastbound Thru	Eastbound Right	Westbound Left	Westbound Thru	Westbound Right	Total Volume
#1 Wiley's Well Road/I-10 WB Ramps													
Base	3	12	0	0	17	3	0	0	0	206	1	14	256
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3	12	0	0	17	3	0	0	0	206	1	14	256
#2 Wiley's Well Road/I-10 EB Ramps													
Base	0	3	7	13	210	0	12	1	27	0	0	0	273
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	3	7	13	210	0	12	1	27	0	0	0	273
#3 Wiley's Well Road/Power Line Road													
Base	0	8	0	0	238	0	0	0	0	0	0	0	246
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	8	0	0	238	0	0	0	0	0	0	0	246

Crimson Solar Project
Existing AM Peak Hour Conditions

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/Veh	Base V/C	Future LOS	Future Del/Veh	Future V/C	Change in
# 1 Wiley's Well Road/I-10 WB Ramp	B	10.1	0.000	B	10.1	0.000	+ 0.000 D/V
# 2 Wiley's Well Road/I-10 EB Ramp	B	10.2	0.000	B	10.2	0.000	+ 0.000 D/V
# 3 Wiley's Well Road/Power Line R	A	0.0	0.000	A	0.0	0.000	+ 0.000 D/V

```
------------------------------------------------------------------------------
                             Crimson Solar Project
                       Existing AM Peak Hour  Conditions
------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #1 Wiley's Well Road/I-10 WB Ramps
******************************************************************************
Average Delay (sec/veh):      8.8   Worst Case Level Of Service:       B[ 10.1]
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 25 May 2017 << AM
Base Vol:        3   12     0     0   17     3     0    0     0   206    1    14
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     3   12     0     0   17     3     0    0     0   206    1    14
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.75 0.75  0.75  0.75 0.75  0.75  0.75 0.75  0.75  0.75 0.75  0.75
PHF Volume:      4   16     0     0   23     4     0    0     0   274    1    19
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:      4   16     0     0   23     4     0    0     0   274    1    19
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:   27 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx    48   50    16
Potent Cap.: 1601 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   966  845  1069
Move Cap.:   1601 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   964  843  1069
Volume/Cap:  0.00 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.28 0.00  0.02
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:        0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   0.1
Stopped Del:  7.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   8.4
LOS by Move:    A    *     *     *    *     *     *    *     *     *    *     A
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   964 xxxx xxxxx
SharedQueue:  0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   1.2 xxxx xxxxx
Shrd StpDel:  7.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx  10.2 xxxx xxxxx
Shared LOS:     A    *     *     *    *     *     *    *     *     B    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx             10.1
ApproachLOS:        *                *                *                 B
```

```
---------------------------------------------------------------------------------
                         Crimson Solar Project
                   Existing AM Peak Hour  Conditions
---------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
*********************************************************************************
Intersection #2 Wiley's Well Road/I-10 EB Ramps
*********************************************************************************
Average Delay (sec/veh):      1.8   Worst Case Level Of Service:      B[ 10.2]
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign       Yield Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0   0  1  0  0  0   0  1  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 25 May 2107 << AM
Base Vol:       0    3     7    13  210     0    12    1    27     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    3     7    13  210     0    12    1    27     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.74 0.74  0.74  0.74 0.74  0.74  0.74 0.74  0.74  0.74 0.74  0.74
PHF Volume:     0    4     9    18  285     0    16    1    37     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0    4     9    18  285     0    16    1    37     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx    14 xxxx xxxxx   329  334   285  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  1618 xxxx xxxxx   670  590   759  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  1618 xxxx xxxxx   664  583   759  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.01 xxxx  xxxx  0.02 0.00  0.05  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx   0.0 xxxx xxxxx xxxxx xxxx   0.2 xxxxx xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx   7.2 xxxx xxxxx xxxxx xxxx  10.0 xxxxx xxxx xxxxx
LOS by Move:   *    *     *     A    *     *     *    *     A     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx   657 xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx   0.0 xxxx xxxxx   0.1 xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx   7.2 xxxx xxxxx  10.6 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     A    *     *     B    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             10.2            xxxxxx
ApproachLOS:        *                *                 B                *
```

```
-------------------------------------------------------------------------------
                             Crimson Solar Project
                       Existing AM Peak Hour  Conditions
-------------------------------------------------------------------------------
                       Level Of Service Computation Report
             2000 HCM Unsignalized Method (Base Volume Alternative)
*******************************************************************************
Intersection #3 Wiley's Well Road/Power Line Road
*******************************************************************************
Average Delay (sec/veh):      0.0   Worst Case Level Of Service:      A[  0.0]
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  0  0   0  0  1  0  0   0  0  0  0  0   0  0  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 25 May 2017 << AM
Base Vol:       0    8     0     0  238     0     0    0     0     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    8     0     0  238     0     0    0     0     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.69 0.69  0.69  0.69 0.69  0.69  0.69 0.69  0.69  0.69 0.69  0.69
PHF Volume:     0   12     0     0  344     0     0    0     0     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0   12     0     0  344     0     0    0     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:         *                *                *                *
```

Crimson Solar Project

Existing PM Peak Hour Conditions

Scenario Report

Scenario: XPM

Command: XPM
Volume: XPM
Geometry: EXISTING
Impact Fee: Default Impact Fee
Trip Generation: Default Trip Generation
Trip Distribution: Default Trip Distribution
Paths: Default Paths
Routes: Default Routes
Configuration: Existing

Crimson Solar Project
Existing PM Peak Hour Conditions

Turning Movement Report

Volume Type	Northbound Left	Northbound Thru	Northbound Right	Southbound Left	Southbound Thru	Southbound Right	Eastbound Left	Eastbound Thru	Eastbound Right	Westbound Left	Westbound Thru	Westbound Right	Total Volume
#1 Wiley's Well Road/I-10 WB Ramps													
Base	34	15	0	0	17	20	0	0	0	2	1	18	107
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	34	15	0	0	17	20	0	0	0	2	1	18	107
#2 Wiley's Well Road/I-10 EB Ramps													
Base	0	33	153	16	2	0	17	2	1	0	0	0	224
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	33	153	16	2	0	17	2	1	0	0	0	224
#3 Wiley's Well Road/Power Line Road													
Base	0	182	0	0	3	0	0	0	0	0	0	0	185
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	182	0	0	3	0	0	0	0	0	0	0	185

Crimson Solar Project
Existing PM Peak Hour Conditions

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/Veh	Base V/C	Future LOS	Future Del/Veh	Future V/C	Change in
# 1 Wiley's Well Road/I-10 WB Ramp	A	8.6	0.000	A	8.6	0.000	+ 0.000 D/V
# 2 Wiley's Well Road/I-10 EB Ramp	B	11.1	0.000	B	11.1	0.000	+ 0.000 D/V
# 3 Wiley's Well Road/Power Line R	A	0.0	0.000	A	0.0	0.000	+ 0.000 D/V

```
-------------------------------------------------------------------------------
                          Crimson Solar Project
                    Existing PM Peak Hour  Conditions
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #1 Wiley's Well Road/I-10 WB Ramps
********************************************************************************
Average Delay (sec/veh):      4.0   Worst Case Level Of Service:       A[  8.6]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 25 May 2017 << PM
Base Vol:      34   15     0     0   17    20     0    0     0     2    1    18
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   34   15     0     0   17    20     0    0     0     2    1    18
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.76 0.76  0.76  0.76 0.76  0.76  0.76 0.76  0.76  0.76 0.76  0.76
PHF Volume:    45   20     0     0   22    26     0    0     0     3    1    24
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    45   20     0     0   22    26     0    0     0     3    1    24
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:   48 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   144  157    20
Potent Cap.: 1572 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   853  739  1064
Move Cap.:   1572 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   834  717  1064
Volume/Cap:  0.03 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.00 0.00  0.02
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:        0.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   0.1
Stopped Del:  7.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   8.5
LOS by Move:    A    *     *     *    *     *     *    *     *     *    *     A
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   791 xxxx xxxxx
SharedQueue:  0.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
Shrd StpDel:  7.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.6 xxxx xxxxx
Shared LOS:     A    *     *     *    *     *     *    *     *     A    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx              8.6
ApproachLOS:        *                *                *                 A
```

```
-----------------------------------------------------------------------------
                          Crimson Solar Project
                    Existing PM Peak Hour  Conditions
-----------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
*****************************************************************************
Intersection #2 Wiley's Well Road/I-10 EB Ramps
*****************************************************************************
Average Delay (sec/veh):      1.6   Worst Case Level Of Service:      B[ 11.1]
*****************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Yield Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0   0  1  0  0  0   0  1  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 25 May 2017 << PM
Base Vol:       0   33   153    16    2     0    17    2     1     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0   33   153    16    2     0    17    2     1     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.43 0.43  0.43  0.43 0.43  0.43  0.43 0.43  0.43  0.43 0.43  0.43
PHF Volume:     0   76   353    37    5     0    39    5     2     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0   76   353    37    5     0    39    5     2     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   429 xxxx xxxxx   331  507     5  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  1142 xxxx xxxxx   668  471  1085  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  1142 xxxx xxxxx   651  456  1085  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.03 xxxx  xxxx  0.06 0.01  0.00  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx   0.1 xxxx xxxxx xxxxx xxxx   0.0 xxxxx xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx   8.3 xxxx xxxxx xxxxx xxxx   8.3 xxxxx xxxx xxxxx
LOS by Move:    *    *     *     A    *     *     *    *     A     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx   623 xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx   0.1 xxxx xxxxx   0.2 xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx   8.3 xxxx xxxxx  11.2 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     A    *     *     B    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             11.1            xxxxxx
ApproachLOS:        *                *                 B                *
```

```
--------------------------------------------------------------------------------
                            Crimson Solar Project
                      Existing PM Peak Hour  Conditions
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #3 Wiley's Well Road/Power Line Road
********************************************************************************
Average Delay (sec/veh):      0.0   Worst Case Level Of Service:       A[  0.0]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  0  0   0  0  1  0  0   0  0  0  0  0   0  0  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 25 May 2017 << PM
Base Vol:       0  182    0     0    3    0     0    0    0     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  182    0     0    3    0     0    0    0     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.39 0.39  0.39  0.39 0.39  0.39  0.39 0.39  0.39  0.39 0.39  0.39
PHF Volume:     0  468    0     0    8    0     0    0    0     0    0     0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0     0
Final Vol.:     0  468    0     0    8    0     0    0    0     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:        *                *                *                *
```

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	NOEL V CASIL
Agency or Company:	
Date Performed:	4/18/2018
Analysis Time Period:	DAILY
Freeway/Direction:	I-10
From/To:	WEST OF WILEY'S WELL ROAD
Jurisdiction:	CALTRANS DISTRICT 8
Analysis Year:	EXISTING

Description: CRIMSON SOLAR PROJECT

Flow Inputs and Adjustments

Annual average daily traffic, AADT	42952	veh/day
Peak-hour proportion of AADT, K	0.12	
Peak-hour direction percent, D	57	%
Volume, DDHV	2938	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	0	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	1.000	
Driver population factor, fp	1.00	
Flow rate, vp	816	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed	68.5	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	816	pc/h/ln

Average passenger-car speed, S	68.5	mi/h
Number of lanes, N	4	
Density, D	11.9	pc/mi/ln

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	NOEL V CASIL
Agency or Company:	
Date Performed:	4/18/2018
Analysis Time Period:	DAILY
Freeway/Direction:	I-10
From/To:	EAST OF WILEY'S WELL ROAD
Jurisdiction:	CALTRANS DISTRICT 8
Analysis Year:	EXISTING

Description: CRIMSON SOLAR PROJECT

Flow Inputs and Adjustments

Annual average daily traffic, AADT	45760	veh/day
Peak-hour proportion of AADT, K	0.12	
Peak-hour direction percent, D	57	%
Volume, DDHV	3130	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	0	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	1.000	
Driver population factor, fp	1.00	
Flow rate, vp	869	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed	68.5	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	869	pc/h/ln

Average passenger-car speed, S	68.5	mi/h
Number of lanes, N	4	
Density, D	12.7	pc/mi/ln

Overall results are not computed when free-flow speed is less than 55 mph.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	NOEL V CASIL
Agency/Co.	AECOM
Date Performed	4/18/2018
Analysis Time Period	AM PEAK (WORST CASE)
Highway	WILEY'S WELL ROAD
From/To	BET I-10 WB RAMP AND EB RAMP
Jurisdiction	RIVERSIDE COUNTY
Analysis Year	EXISTING
Description	CRIMSON SOLAR PROJECT

Input Data

Highway class	Class 1		Peak-hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	14	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Grade: Length		mi	% No-passing zones	0	%
Up/down		%	Access points/mi	0	/mi

Analysis direction volume, Vd	13	veh/h
Opposing direction volume, Vo	49	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.911		0.911	
Grade adj. factor,(note-1) fG	1.00		1.00	
Directional flow rate,(note-2) vi	16	pc/h	61	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed volume,(note-3) Vf	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access points,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	60.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSd	58.7	mi/h

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.986		0.986	
Grade adjustment factor,(note-1) fG	1.00		1.00	
Directional flow rate,(note-2) vi	15	pc/h	56	pc/h

Adjustment for no-passing zones, fnp	8.4	
Percent time-spent-following, PTSFd	16.0	%

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.01	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h

Notes:
1. If the highway is extended segment (level) or rolling terrain, fG = 1.0
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only.
4. Exhibit 20-21 provides factors a and b.
5. Use alternative Equation 20-14 if some trucks operate at crawl speeds on a specific downgrade.

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	0.0	mi
Length of passing lane including tapers, Lpl	0.0	mi
Average travel speed, ATSd (from above)	58.7	mi/h
Percent time-spent-following, PTSFd (from above)	16.0	
Level of service,(note-1) LOSd (from above)	A	

Average Travel Speed

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	1.70	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-1.70	mi
Adj. factor for the effect of passing lane on average speed, fpl	1.08	
Average travel speed including passing lane,(note-2) ATSpl		

Percent Time-Spent-Following

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	13.00	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-13.00	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	0.58	
Percent time-spent-following including passing lane,(note-3) PTSFpl		%

Level of Service and Other Performance Measures (note-4)

Level of service including passing lane, LOSpl

Notes:
1. If LOSd = F, passing lane analysis cannot be performed.
2. If Ld < 0, use alternative Equation 20-22.
3. If Ld < 0, use alternative Equation 20-20.
4. v/c, VMT15 , and VMT60 are calculated on Directional Two-Lane Highway Segment Worksheet.

HCS2000: Two-Lane Highways Release 4.1d

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	NOEL V CASIL
Agency/Co.	AECOM
Date Performed	4/18/2018
Analysis Time Period	AM PEAK (WORST CASE)
Highway	WILEY'S WELL ROAD
From/To	BET I-10 EB RAMP AND POWERLINE
Jurisdiction	RIVERSIDE COUNTY
Analysis Year	EXISTING
Description	CRIMSON SOLAR PROJECT

Input Data

Highway class	Class 1		Peak-hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	7	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Grade: Length		mi	% No-passing zones	0	%
Up/down		%	Access points/mi	0	/mi

Analysis direction volume, Vd	16	veh/h
Opposing direction volume, Vo	41	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.953		0.953	
Grade adj. factor,(note-1) fG	1.00		1.00	
Directional flow rate,(note-2) vi	19	pc/h	49	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed volume,(note-3) Vf	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access points,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	60.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSd	58.8	mi/h

```
_________________________Percent Time-Spent-Following_________________________

Direction                                    Analysis(d)        Opposing (o)

PCE for RVs, ER                                  1.0                  1.0
Heavy-vehicle adjustment factor, fHV             0.993                0.993
Grade adjustment factor,(note-1) fG              1.00                 1.00
Directional flow rate,(note-2) vi                18     pc/h          47      pc/h

Adjustment for no-passing zones, fnp                      8.4
Percent time-spent-following, PTSFd                       17.0   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                                     A
Volume to capacity ratio, v/c                             0.01
Peak 15-min vehicle-miles of travel, VMT15                0       veh-mi
Peak-hour vehicle-miles of travel, VMT60                  0       veh-mi
Peak 15-min total travel time, TT15                       0.0     veh-h
______________________________________________________________________________

Notes:
1. If the highway is extended segment (level) or rolling terrain, fG = 1.0
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only.
4. Exhibit 20-21 provides factors a and b.
5. Use alternative Equation 20-14 if some trucks operate at crawl speeds
   on a specific downgrade.

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                                0.0     mi
Length of two-lane highway upstream of the passing lane, Lu         0.0     mi
Length of passing lane including tapers, Lpl                        0.0     mi
Average travel speed, ATSd (from above)                             58.8    mi/h
Percent time-spent-following, PTSFd (from above)                    17.0
Level of service,(note-1) LOSd (from above)                         A

_____________________________Average Travel Speed______________________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde            1.70    mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld         -1.70   mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                           1.08
Average travel speed including passing lane,(note-2) ATSpl

_________________________Percent Time-Spent-Following_________________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde           13.00   mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld           -13.00  mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                            0.58
Percent time-spent-following
    including passing lane,(note-3) PTSFpl                                  %

___________Level of Service and Other Performance Measures (note-4)___________
```

Level of service including passing lane, LOSpl

Notes:
1. If LOSd = F, passing lane analysis cannot be performed.
2. If Ld < 0, use alternative Equation 20-22.
3. If Ld < 0, use alternative Equation 20-20.
4. v/c, VMT15 , and VMT60 are calculated on Directional Two-Lane Highway Segment Worksheet.

HCS2000: Two-Lane Highways Release 4.1d

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	NOEL V CASIL
Agency/Co.	AECOM
Date Performed	4/18/2018
Analysis Time Period	PM PEAK (WORST CASE)
Highway	POWER LINE ROAD
From/To	EAST OF WILEY'S WELL ROAD
Jurisdiction	RIVERSIDE COUNTY
Analysis Year	EXISTING
Description	CRIMSON SOLAR PROJECT

Input Data

Highway class	Class 1		Peak-hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Grade: Length		mi	% No-passing zones	0	%
Up/down		%	Access points/mi	0	/mi

Analysis direction volume, Vd	4	veh/h
Opposing direction volume, Vo	2	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.947		0.947	
Grade adj. factor,(note-1) fG	1.00		1.00	
Directional flow rate,(note-2) vi	5	pc/h	2	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed volume,(note-3) Vf	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access points,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	60.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSd	59.2	mi/h

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.992		0.992	
Grade adjustment factor,(note-1) fG	1.00		1.00	
Directional flow rate,(note-2) vi	5	pc/h	2	pc/h

Adjustment for no-passing zones, fnp	8.4	
Percent time-spent-following, PTSFd	12.1	%

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.00	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h

Notes:
1. If the highway is extended segment (level) or rolling terrain, fG = 1.0
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only.
4. Exhibit 20-21 provides factors a and b.
5. Use alternative Equation 20-14 if some trucks operate at crawl speeds on a specific downgrade.

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	0.0	mi
Length of passing lane including tapers, Lpl	0.0	mi
Average travel speed, ATSd (from above)	59.2	mi/h
Percent time-spent-following, PTSFd (from above)	12.1	
Level of service,(note-1) LOSd (from above)	A	

Average Travel Speed

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	1.70	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-1.70	mi
Adj. factor for the effect of passing lane on average speed, fpl	1.08	
Average travel speed including passing lane,(note-2) ATSpl		

Percent Time-Spent-Following

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	13.00	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-13.00	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	0.58	
Percent time-spent-following including passing lane,(note-3) PTSFpl		%

Level of Service and Other Performance Measures (note-4)

Level of service including passing lane, LOSpl

Notes:

1. If LOSd = F, passing lane analysis cannot be performed.
2. If Ld < 0, use alternative Equation 20-22.
3. If Ld < 0, use alternative Equation 20-20.
4. v/c, VMT15 , and VMT60 are calculated on Directional Two-Lane Highway Segment Worksheet.

Appendix C

Year 2020 Base Level of Service Worksheets

Crimson Solar Project
Near Term AM Peak Hour Conditions - No Project

Scenario Report

Scenario:	NTAMNP
Command:	NTAMNP
Volume:	XAM
Geometry:	EXISTING
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Paths
Routes:	Default Routes
Configuration:	Near Term

Crimson Solar Project
Near Term AM Peak Hour Conditions - No Project

Turning Movement Report
PM Peak Hour

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1 Wiley's Well Road/I-10 WB Ramps													
Base	3	13	0	0	18	3	0	0	0	218	1	15	271
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3	13	0	0	18	3	0	0	0	218	1	15	271
#2 Wiley's Well Road/I-10 EB Ramps													
Base	0	3	7	14	223	0	13	1	29	0	0	0	289
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	3	7	14	223	0	13	1	29	0	0	0	289
#3 Wiley's Well Road/Power Line Road													
Base	0	8	0	0	252	0	0	0	0	0	0	0	261
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	8	0	0	252	0	0	0	0	0	0	0	261

Crimson Solar Project
Near Term AM Peak Hour Conditions - No Project

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/Veh	Base V/C	Future LOS	Future Del/Veh	Future V/C	Change in
# 1 Wiley's Well Road/I-10 WB Ramp	B	10.3	0.000	B	10.3	0.000	+ 0.000 D/V
# 2 Wiley's Well Road/I-10 EB Ramp	B	10.3	0.000	B	10.3	0.000	+ 0.000 D/V
# 3 Wiley's Well Road/Power Line R	A	0.0	0.000	A	0.0	0.000	+ 0.000 D/V

```
--------------------------------------------------------------------------------
                             Crimson Solar Project
                 Near Term AM Peak Hour Conditions - No Project
--------------------------------------------------------------------------------

                      Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #1 Wiley's Well Road/I-10 WB Ramps
********************************************************************************
Average Delay (sec/veh):      8.9   Worst Case Level Of Service:       B[ 10.3]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 25 May 2017 << AM
Base Vol:       3   12     0     0   17     3     0    0     0   206    1    14
Growth Adj:  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06
Initial Bse:    3   13     0     0   18     3     0    0     0   218    1    15
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.75 0.75  0.75  0.75 0.75  0.75  0.75 0.75  0.75  0.75 0.75  0.75
PHF Volume:     4   17     0     0   24     4     0    0     0   290    1    20
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     4   17     0     0   24     4     0    0     0   290    1    20
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:   28 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx    51   53    17
Potent Cap.: 1598 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   962  842  1068
Move Cap.:   1598 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   960  839  1068
Volume/Cap:  0.00 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.30 0.00  0.02
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:        0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   0.1
Stopped Del:  7.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   8.4
LOS by Move:    A    *     *     *    *     *     *    *     *     *    *     A
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   960 xxxx xxxxx
SharedQueue:  0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   1.3 xxxx xxxxx
Shrd StpDel:  7.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx  10.4 xxxx xxxxx
Shared LOS:     A    *     *     *    *     *     *    *     *     B    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            10.3
ApproachLOS:        *                *                *                B
```

```
--------------------------------------------------------------------------------
                              Crimson Solar Project
                 Near Term AM Peak Hour Conditions - No Project
--------------------------------------------------------------------------------
                         Level Of Service Computation Report
               2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #2 Wiley's Well Road/I-10 EB Ramps
********************************************************************************
Average Delay (sec/veh):      1.9   Worst Case Level Of Service:      B[ 10.3]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign       Yield Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0   0  1  0  0  0   0  1  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 25 May 2107 << AM
Base Vol:        0    3     7    13  210     0    12    1    27     0    0     0
Growth Adj:   1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06
Initial Bse:     0    3     7    14  223     0    13    1    29     0    0     0
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.74 0.74  0.74  0.74 0.74  0.74  0.74 0.74  0.74  0.74 0.74  0.74
PHF Volume:      0    4    10    19  302     0    17    1    39     0    0     0
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:      0    4    10    19  302     0    17    1    39     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx    14 xxxx xxxxx   349  354   302  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  1617 xxxx xxxxx   652  575   742  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  1617 xxxx xxxxx   647  568   742  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.01 xxxx  xxxx  0.03 0.00  0.05  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx   0.0 xxxx xxxxx xxxxx xxxx   0.2 xxxxx xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx   7.3 xxxx xxxxx xxxxx xxxx  10.1 xxxxx xxxx xxxxx
LOS by Move:   *    *     *     A    *     *     *    *     B     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx   640 xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx   0.0 xxxx xxxxx   0.1 xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx   7.3 xxxx xxxxx  10.8 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     A    *     *     B    *     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx               10.3           xxxxxx
ApproachLOS:       *                *                  B                *
```

```
--------------------------------------------------------------------------------
                            Crimson Solar Project
                Near Term AM Peak Hour Conditions - No Project
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #3 Wiley's Well Road/Power Line Road
********************************************************************************
Average Delay (sec/veh):      0.0   Worst Case Level Of Service:       A[  0.0]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  0  0   0  0  1  0  0   0  0  0  0  0   0  0  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 25 May 2017 << AM
Base Vol:       0    8     0     0  238     0     0    0     0     0    0     0
Growth Adj:  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06
Initial Bse:    0    8     0     0  252     0     0    0     0     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.69 0.69  0.69  0.69 0.69  0.69  0.69 0.69  0.69  0.69 0.69  0.69
PHF Volume:     0   12     0     0  365     0     0    0     0     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0   12     0     0  365     0     0    0     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:         *                *                *                *
```

Crimson Solar Project
Near Term PM Peak Hour Conditions - No Project

Scenario Report

Scenario:	NTPMNP
Command:	NTPMNP
Volume:	XPM
Geometry:	EXISTING
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Paths
Routes:	Default Routes
Configuration:	Near Term

Crimson Solar Project
Near Term PM Peak Hour Conditions - No Project

Turning Movement Report
PM Peak Hour

Volume Type	Northbound Left	Northbound Thru	Northbound Right	Southbound Left	Southbound Thru	Southbound Right	Eastbound Left	Eastbound Thru	Eastbound Right	Westbound Left	Westbound Thru	Westbound Right	Total Volume
#1 Wiley's Well Road/I-10 WB Ramps													
Base	36	16	0	0	18	21	0	0	0	2	1	19	113
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	36	16	0	0	18	21	0	0	0	2	1	19	113
#2 Wiley's Well Road/I-10 EB Ramps													
Base	0	35	162	17	2	0	18	2	1	0	0	0	237
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	35	162	17	2	0	18	2	1	0	0	0	237
#3 Wiley's Well Road/Power Line Road													
Base	0	193	0	0	3	0	0	0	0	0	0	0	196
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	193	0	0	3	0	0	0	0	0	0	0	196

Crimson Solar Project
Near Term PM Peak Hour Conditions - No Project

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/Veh	Base V/C	Future LOS	Future Del/Veh	Future V/C	Change in
# 1 Wiley's Well Road/I-10 WB Ramp	A	8.6	0.000	A	8.6	0.000	+ 0.000 D/V
# 2 Wiley's Well Road/I-10 EB Ramp	B	11.3	0.000	B	11.3	0.000	+ 0.000 D/V
# 3 Wiley's Well Road/Power Line R	A	0.0	0.000	A	0.0	0.000	+ 0.000 D/V

```
-------------------------------------------------------------------------------
                           Crimson Solar Project
               Near Term PM Peak Hour Conditions - No Project
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
*******************************************************************************
Intersection #1 Wiley's Well Road/I-10 WB Ramps
*******************************************************************************
Average Delay (sec/veh):      4.0   Worst Case Level Of Service:       A[  8.6]
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 25 May 2017 << PM
Base Vol:      34   15     0     0   17    20     0    0     0     2    1    18
Growth Adj:  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06
Initial Bse:   36   16     0     0   18    21     0    0     0     2    1    19
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.76 0.76  0.76  0.76 0.76  0.76  0.76 0.76  0.76  0.76 0.76  0.76
PHF Volume:    47   21     0     0   24    28     0    0     0     3    1    25
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    47   21     0     0   24    28     0    0     0     3    1    25
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:   51 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   153  166    21
Potent Cap.: 1568 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   844  730  1063
Move Cap.:   1568 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   824  707  1063
Volume/Cap:  0.03 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.00 0.00  0.02
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:        0.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   0.1
Stopped Del:  7.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   8.5
LOS by Move:    A    *     *     *    *     *     *    *     *     *    *     A
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   781 xxxx xxxxx
SharedQueue:  0.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
Shrd StpDel:  7.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.6 xxxx xxxxx
Shared LOS:     A    *     *     *    *     *     *    *     *     A    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx             8.6
ApproachLOS:        *                *                *                A
```

```
--------------------------------------------------------------------------------
                             Crimson Solar Project
                  Near Term PM Peak Hour Conditions - No Project
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
               2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #2 Wiley's Well Road/I-10 EB Ramps
********************************************************************************
Average Delay (sec/veh):      1.6   Worst Case Level Of Service:      B[ 11.3]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign       Yield Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0   0  1  0  0  0   0  1  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 25 May 2017 << PM
Base Vol:        0   33   153   16    2     0   17    2     1    0    0     0
Growth Adj:   1.06 1.06  1.06 1.06 1.06  1.06 1.06 1.06  1.06 1.06 1.06  1.06
Initial Bse:     0   35   162   17    2     0   18    2     1    0    0     0
User Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:      0.43 0.43  0.43 0.43 0.43  0.43 0.43 0.43  0.43 0.43 0.43  0.43
PHF Volume:      0   81   374   39    5     0   42    5     2    0    0     0
Reduct Vol:      0    0     0    0    0     0    0    0     0    0    0     0
Final Vol.:      0   81   374   39    5     0   42    5     2    0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   454 xxxx xxxxx   350  537     5  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  1117 xxxx xxxxx   651  453  1084  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  1117 xxxx xxxxx   633  437  1084  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.03 xxxx  xxxx  0.07 0.01  0.00  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx   0.1 xxxx xxxxx xxxxx xxxx   0.0 xxxxx xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx   8.3 xxxx xxxxx xxxxx xxxx   8.3 xxxxx xxxx xxxxx
LOS by Move:    *    *     *     A    *     *     *    *     A     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx   605 xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx   0.1 xxxx xxxxx   0.2 xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx   8.3 xxxx xxxxx  11.4 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     A    *     *     B    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             11.3            xxxxxx
ApproachLOS:        *                *                 B                *
```

```
------------------------------------------------------------------------------
                            Crimson Solar Project
                 Near Term PM Peak Hour Conditions - No Project
------------------------------------------------------------------------------
                       Level Of Service Computation Report
             2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #3 Wiley's Well Road/Power Line Road
******************************************************************************
Average Delay (sec/veh):      0.0   Worst Case Level Of Service:       A[  0.0]
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  0  0   0  0  1  0  0   0  0  0  0  0   0  0  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 25 May 2017 << PM
Base Vol:       0  182    0     0    3    0     0    0    0     0    0    0
Growth Adj:  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06
Initial Bse:    0  193    0     0    3    0     0    0    0     0    0    0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.39 0.39  0.39  0.39 0.39  0.39  0.39 0.39  0.39  0.39 0.39  0.39
PHF Volume:     0  496    0     0    8    0     0    0    0     0    0    0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Final Vol.:     0  496    0     0    8    0     0    0    0     0    0    0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:        *                *                *                *
```

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	NOEL V CASIL
Agency or Company:	
Date Performed:	4/18/2018
Analysis Time Period:	DAILY
Freeway/Direction:	I-10
From/To:	WEST OF WILEY'S WELL ROAD
Jurisdiction:	CALTRANS DISTRICT 8
Analysis Year:	2020 BASE

Description: CRIMSON SOLAR PROJECT

Flow Inputs and Adjustments

Annual average daily traffic, AADT	45148	veh/day
Peak-hour proportion of AADT, K	0.12	
Peak-hour direction percent, D	57	%
Volume, DDHV	3088	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	0	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	1.000	
Driver population factor, fp	1.00	
Flow rate, vp	858	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed	68.5	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	858	pc/h/ln

Average passenger-car speed, S	68.5	mi/h
Number of lanes, N	4	
Density, D	12.5	pc/mi/ln

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	NOEL V CASIL
Agency or Company:	
Date Performed:	4/18/2018
Analysis Time Period:	DAILY
Freeway/Direction:	I-10
From/To:	EAST OF WILEY'S WELL ROAD
Jurisdiction:	CALTRANS DISTRICT 8
Analysis Year:	2020 BASE

Description: CRIMSON SOLAR PROJECT

Flow Inputs and Adjustments

Annual average daily traffic, AADT	48506	veh/day
Peak-hour proportion of AADT, K	0.12	
Peak-hour direction percent, D	57	%
Volume, DDHV	3318	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	0	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	1.000	
Driver population factor, fp	1.00	
Flow rate, vp	922	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed	68.5	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	922	pc/h/ln

Average passenger-car speed, S	68.5	mi/h
Number of lanes, N	4	
Density, D	13.5	pc/mi/ln

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Two-Lane Highways Release 4.1d

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	NOEL V CASIL
Agency/Co.	AECOM
Date Performed	4/18/2018
Analysis Time Period	AM PEAK (WORST CASE)
Highway	WILEY'S WELL ROAD
From/To	BET I-10 WB RAMP AND EB RAMP
Jurisdiction	RIVERSIDE COUNTY
Analysis Year	2020 BASE
Description	CRIMSON SOLAR PROJECT

Input Data

Highway class	Class 1		Peak-hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	14	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Grade: Length		mi	% No-passing zones	0	%
Up/down		%	Access points/mi	0	/mi

Analysis direction volume, Vd 14 veh/h
Opposing direction volume, Vo 52 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.911		0.911	
Grade adj. factor,(note-1) fG	1.00		1.00	
Directional flow rate,(note-2) vi	17	pc/h	65	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed volume,(note-3) Vf	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access points,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	60.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSd	58.7	mi/h

```
_________________________Percent Time-Spent-Following__________________________

Direction                                  Analysis(d)        Opposing (o)

PCE for RVs, ER                                1.0                1.0
Heavy-vehicle adjustment factor, fHV           0.986              0.986
Grade adjustment factor,(note-1) fG            1.00               1.00
Directional flow rate,(note-2) vi              16     pc/h        60      pc/h

Adjustment for no-passing zones, fnp                    8.4
Percent time-spent-following, PTSFd                     16.4   %

________________Level of Service and Other Performance Measures________________

Level of service, LOS                                   A
Volume to capacity ratio, v/c                           0.01
Peak 15-min vehicle-miles of travel, VMT15              0       veh-mi
Peak-hour vehicle-miles of travel, VMT60                0       veh-mi
Peak 15-min total travel time, TT15                     0.0     veh-h
_______________________________________________________________________________

Notes:
1. If the highway is extended segment (level) or rolling terrain, fG = 1.0
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only.
4. Exhibit 20-21 provides factors a and b.
5. Use alternative Equation 20-14 if some trucks operate at crawl speeds
   on a specific downgrade.

_____________________________Passing Lane Analysis______________________________

Total length of analysis segment, Lt                              0.0     mi
Length of two-lane highway upstream of the passing lane, Lu       0.0     mi
Length of passing lane including tapers, Lpl                      0.0     mi
Average travel speed, ATSd (from above)                           58.7    mi/h
Percent time-spent-following, PTSFd (from above)                  16.4
Level of service,(note-1) LOSd (from above)                       A

_____________________________Average Travel Speed_______________________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde          1.70    mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld       -1.70   mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                         1.08
Average travel speed including passing lane,(note-2) ATSpl

_________________________Percent Time-Spent-Following__________________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde         13.00   mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld         -13.00  mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                          0.58
Percent time-spent-following
    including passing lane,(note-3) PTSFpl                                %

___________Level of Service and Other Performance Measures (note-4)___________
```

Level of service including passing lane, LOSpl

Notes:

1. If LOSd = F, passing lane analysis cannot be performed.
2. If Ld < 0, use alternative Equation 20-22.
3. If Ld < 0, use alternative Equation 20-20.
4. v/c, VMT15 , and VMT60 are calculated on Directional Two-Lane Highway Segment Worksheet.

Phone: Fax:
E-Mail:

```
_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 NOEL V CASIL
Agency/Co.              AECOM
Date Performed          4/18/2018
Analysis Time Period    AM PEAK (WORST CASE)
Highway                 WILEY'S WELL ROAD
From/To                 BET I-10 EB RAMP AND POWERLINE
Jurisdiction            RIVERSIDE COUNTY
Analysis Year           2020 BASE
Description  CRIMSON SOLAR PROJECT

__________________________________Input Data__________________________________

Highway class  Class 1              Peak-hour factor, PHF    0.88
Shoulder width       6.0     ft     % Trucks and buses       7       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       0.0     mi     Truck crawl speed        0.0     mi/hr

Grade:  Length               mi     % No-passing zones       0       %
        Up/down              %      Access points/mi         0       /mi

Analysis direction volume, Vd  17      veh/h
Opposing direction volume, Vo  43      veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)        Opposing (o)
PCE for trucks, ET                        1.7                  1.7
PCE for RVs, ER                           1.0                  1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.953                0.953
Grade adj. factor,(note-1) fG             1.00                 1.00
Directional flow rate,(note-2) vi         20      pc/h         51      pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM                -      mi/h
Observed volume,(note-3) Vf                       -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS              60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access points,(note-3) fA              0.0     mi/h

Free-flow speed, FFSd                           60.0    mi/h

Adjustment for no-passing zones, fnp            0.7     mi/h
Average travel speed, ATSd                      58.7    mi/h
```

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.993		0.993	
Grade adjustment factor,(note-1) fG	1.00		1.00	
Directional flow rate,(note-2) vi	19	pc/h	49	pc/h

Adjustment for no-passing zones, fnp	8.4	
Percent time-spent-following, PTSFd	17.3	%

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.01	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h

Notes:
1. If the highway is extended segment (level) or rolling terrain, fG = 1.0
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only.
4. Exhibit 20-21 provides factors a and b.
5. Use alternative Equation 20-14 if some trucks operate at crawl speeds on a specific downgrade.

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	0.0	mi
Length of passing lane including tapers, Lpl	0.0	mi
Average travel speed, ATSd (from above)	58.7	mi/h
Percent time-spent-following, PTSFd (from above)	17.3	
Level of service,(note-1) LOSd (from above)	A	

Average Travel Speed

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	1.70	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-1.70	mi
Adj. factor for the effect of passing lane on average speed, fpl	1.08	
Average travel speed including passing lane,(note-2) ATSpl		

Percent Time-Spent-Following

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	13.00	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-13.00	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	0.58	
Percent time-spent-following including passing lane,(note-3) PTSFpl		%

Level of Service and Other Performance Measures (note-4)

Level of service including passing lane, LOSpl

Notes:
1. If LOSd = F, passing lane analysis cannot be performed.
2. If Ld < 0, use alternative Equation 20-22.
3. If Ld < 0, use alternative Equation 20-20.
4. v/c, VMT15 , and VMT60 are calculated on Directional Two-Lane Highway Segment Worksheet.

HCS2000: Two-Lane Highways Release 4.1d

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	NOEL V CASIL
Agency/Co.	AECOM
Date Performed	4/18/2018
Analysis Time Period	PM PEAK (WORST CASE)
Highway	POWER LINE ROAD
From/To	EAST OF WILEY'S WELL ROAD
Jurisdiction	RIVERSIDE COUNTY
Analysis Year	2020 BASE
Description	CRIMSON SOLAR PROJECT

Input Data

Highway class	Class 1		Peak-hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Grade: Length		mi	% No-passing zones	0	%
Up/down		%	Access points/mi	0	/mi

Analysis direction volume, Vd 4 veh/h
Opposing direction volume, Vo 2 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.947		0.947	
Grade adj. factor,(note-1) fG	1.00		1.00	
Directional flow rate,(note-2) vi	5	pc/h	2	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed volume,(note-3) Vf	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access points,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	60.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSd	59.2	mi/h

```
_________________________Percent Time-Spent-Following__________________________

Direction                               Analysis(d)        Opposing (o)

PCE for RVs, ER                             1.0                 1.0
Heavy-vehicle adjustment factor, fHV        0.992               0.992
Grade adjustment factor,(note-1) fG         1.00                1.00
Directional flow rate,(note-2) vi           5      pc/h         2       pc/h

Adjustment for no-passing zones, fnp                 8.4
Percent time-spent-following, PTSFd                  12.1   %

________________Level of Service and Other Performance Measures________________

Level of service, LOS                                A
Volume to capacity ratio, v/c                        0.00
Peak 15-min vehicle-miles of travel, VMT15           0       veh-mi
Peak-hour vehicle-miles of travel, VMT60             0       veh-mi
Peak 15-min total travel time, TT15                  0.0     veh-h
_______________________________________________________________________________

Notes:
1. If the highway is extended segment (level) or rolling terrain, fG = 1.0
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only.
4. Exhibit 20-21 provides factors a and b.
5. Use alternative Equation 20-14 if some trucks operate at crawl speeds
   on a specific downgrade.

_____________________________Passing Lane Analysis_____________________________

Total length of analysis segment, Lt                          0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  0.0     mi
Length of passing lane including tapers, Lpl                  0.0     mi
Average travel speed, ATSd (from above)                       59.2    mi/h
Percent time-spent-following, PTSFd (from above)              12.1
Level of service,(note-1) LOSd (from above)                   A

_____________________________Average Travel Speed______________________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     1.70    mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -1.70   mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                     1.08
Average travel speed including passing lane,(note-2) ATSpl

_________________________Percent Time-Spent-Following__________________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    13.00   mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -13.00  mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                      0.58
Percent time-spent-following
    including passing lane,(note-3) PTSFpl                            %

___________Level of Service and Other Performance Measures (note-4)___________
```

Level of service including passing lane, LOSpl

Notes:
1. If LOSd = F, passing lane analysis cannot be performed.
2. If Ld < 0, use alternative Equation 20-22.
3. If Ld < 0, use alternative Equation 20-20.
4. v/c, VMT15 , and VMT60 are calculated on Directional Two-Lane Highway
   Segment Worksheet.

Appendix D

Year 2020 Project Construction Worksheets

Crimson Solar Project
Near Term AM Peak Hour Conditions - with Project Construction

---

Scenario Report

Scenario:	NTAMWP
Command:	NTAMWP
Volume:	XAM
Geometry:	EXISTING
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Paths
Routes:	Default Routes
Configuration:	Near Term

Crimson Solar Project
Near Term AM Peak Hour Conditions - with Project Construction

Trip Generation Report

Forecast for AM Peak Hour

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1	Worker and W	1.00	Construction W	64.00	0.00	64	0	64	48.5
1	Worker and W	1.00	Water Trucks	22.00	22.00	22	22	44	33.3
	Zone 1 Subtotal					86	22	108	81.8
2	Deliveries	1.00	Module Deliver	6.00	6.00	6	6	12	9.1
2	Deliveries	1.00	Foundation Del	6.00	6.00	6	6	12	9.1
	Zone 2 Subtotal					12	12	24	18.2
TOTAL						98	34	132	100.0

Crimson Solar Project
Near Term AM Peak Hour Conditions - with Project Construction

Trip Distribution Report

Percent Of Trips Construction

Zone	To Gates 1	3
1	0.0	100.0
2	100.0	0.0

Crimson Solar Project
Near Term AM Peak Hour Conditions - with Project Construction

Turning Movement Report
AM Peak Hour

Volume Type	Northbound Left	Northbound Thru	Northbound Right	Southbound Left	Southbound Thru	Southbound Right	Eastbound Left	Eastbound Thru	Eastbound Right	Westbound Left	Westbound Thru	Westbound Right	Total Volume
#1 Wiley's Well Road/I-10 WB Ramps													
Base	3	13	0	0	18	3	0	0	0	218	1	15	271
Added	12	0	0	0	0	0	0	0	0	86	0	0	98
Total	15	13	0	0	18	3	0	0	0	304	1	15	369
#2 Wiley's Well Road/I-10 EB Ramps													
Base	0	3	7	14	223	0	13	1	29	0	0	0	289
Added	0	12	22	0	86	0	0	0	12	0	0	0	132
Total	0	15	29	14	309	0	13	1	41	0	0	0	421
#3 Wiley's Well Road/Power Line Road													
Base	0	8	0	0	252	0	0	0	0	0	0	0	261
Added	0	0	0	98	0	0	0	0	0	0	0	34	132
Total	0	8	0	98	252	0	0	0	0	0	0	34	393

Crimson Solar Project
Near Term AM Peak Hour Conditions - with Project Construction

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 1 Wiley's Well Road/I-10 WB Ramp	B	10.3	0.000	B	11.9	0.000	+ 1.621 D/V
# 2 Wiley's Well Road/I-10 EB Ramp	B	10.3	0.000	B	11.4	0.000	+ 1.069 D/V
# 3 Wiley's Well Road/Power Line R	A	0.0	0.000	A	8.5	0.000	+ 8.512 D/V

```
--------------------------------------------------------------------------------
                               Crimson Solar Project
         Near Term AM Peak Hour Conditions - with Project Construction
--------------------------------------------------------------------------------
                         Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #1 Wiley's Well Road/I-10 WB Ramps
********************************************************************************
Average Delay (sec/veh):     10.6   Worst Case Level Of Service:      B[ 11.9]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 25 May 2017 << AM
Base Vol:        3   12     0     0   17     3     0    0     0   206    1    14
Growth Adj:   1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06
Initial Bse:     3   13     0     0   18     3     0    0     0   218    1    15
Added Vol:      12    0     0     0    0     0     0    0     0    86    0     0
PasserByVol:     0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    15   13     0     0   18     3     0    0     0   304    1    15
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.75 0.75  0.75  0.75 0.75  0.75  0.75 0.75  0.75  0.75 0.75  0.75
PHF Volume:     20   17     0     0   24     4     0    0     0   404    1    20
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     20   17     0     0   24     4     0    0     0   404    1    20
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:    28 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx    83   85    17
Potent Cap.: 1598 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   923  809  1068
Move Cap.:   1598 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   914  798  1068
Volume/Cap:  0.01 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.44 0.00  0.02
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:         0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   0.1
Stopped Del:   7.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   8.4
LOS by Move:     A    *     *     *    *     *     *    *     *     *    *     A
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   914 xxxx xxxxx
SharedQueue:  0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.3 xxxx xxxxx
Shrd StpDel:  7.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx  12.0 xxxx xxxxx
Shared LOS:     A    *     *     *    *     *     *    *     *     B    *     *
ApproachDel:      xxxxxx           xxxxxx           xxxxxx            11.9
ApproachLOS:           *                *                *               B
```

```
--------------------------------------------------------------------------------
                              Crimson Solar Project
         Near Term AM Peak Hour Conditions - with Project Construction
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #2 Wiley's Well Road/I-10 EB Ramps
********************************************************************************
Average Delay (sec/veh):      1.7   Worst Case Level Of Service:      B[ 11.4]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign       Yield Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0   0  1  0  0  0   0  1  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 25 May 2107 << AM
Base Vol:       0    3     7    13  210     0    12    1    27     0    0     0
Growth Adj:  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06
Initial Bse:    0    3     7    14  223     0    13    1    29     0    0     0
Added Vol:      0   12    22     0   86     0     0    0    12     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0   15    29    14  309     0    13    1    41     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.74 0.74  0.74  0.74 0.74  0.74  0.74 0.74  0.74  0.74 0.74  0.74
PHF Volume:     0   21    40    19  419     0    17    1    55     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0   21    40    19  419     0    17    1    55     0    0     0
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx    61 xxxx xxxxx   497  517   419  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  1556 xxxx xxxxx   536  465   639  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  1556 xxxx xxxxx   531  460   639  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.01 xxxx  xxxx  0.03 0.00  0.09  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx   0.0 xxxx xxxxx xxxxx xxxx   0.3 xxxxx xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx   7.3 xxxx xxxxx xxxxx xxxx  11.2 xxxxx xxxx xxxxx
LOS by Move:    *    *     *     A    *     *     *    *     B     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx   525 xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx   0.0 xxxx xxxxx   0.1 xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx   7.3 xxxx xxxxx  12.1 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     A    *     *     B    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx              11.4            xxxxxx
ApproachLOS:        *                *                  B                *
```

```
--------------------------------------------------------------------------------
                             Crimson Solar Project
         Near Term AM Peak Hour Conditions - with Project Construction
--------------------------------------------------------------------------------

                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Wiley's Well Road/Power Line Road
********************************************************************************
Average Delay (sec/veh):      2.6   Worst Case Level Of Service:       A[  8.5]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  0  0   0  1  0  0  0   0  0  0  0  0   0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 25 May 2017 << AM
Base Vol:       0    8     0     0  238     0     0    0     0     0    0     0
Growth Adj:  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06
Initial Bse:    0    8     0     0  252     0     0    0     0     0    0     0
Added Vol:      0    0     0    98    0     0     0    0     0     0    0    34
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0    8     0    98  252     0     0    0     0     0    0    34
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.69 0.69  0.69  0.69 0.69  0.69  0.69 0.69  0.69  0.69 0.69  0.69
PHF Volume:     0   12     0   142  365     0     0    0     0     0    0    49
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0   12     0   142  365     0     0    0     0     0    0    49
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx    12 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx    12
Potent Cap.: xxxx xxxx xxxxx  1620 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx  1074
Move Cap.:   xxxx xxxx xxxxx  1620 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx  1074
Volume/Cap:  xxxx xxxx  xxxx  0.09 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.05
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx   0.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   0.1
Stopped Del:xxxxx xxxx xxxxx   7.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   8.5
LOS by Move:    *    *     *     A    *     *     *    *     *     *    *     A
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx   0.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx   7.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     A    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx              8.5
ApproachLOS:        *                *                *                 A
```

Crimson Solar Project
Near Term PM Peak Hour Conditions - with Project Construction

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Scenario Report

Scenario: NTPMWP

Command: NTPMWP
Volume: XPM
Geometry: EXISTING
Impact Fee: Default Impact Fee
Trip Generation: Default Trip Generation
Trip Distribution: Default Trip Distribution
Paths: Default Paths
Routes: Default Routes
Configuration: Near Term

Crimson Solar Project
Near Term PM Peak Hour Conditions - with Project Construction

Trip Generation Report

Forecast for PM Peak Hour

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1	Worker and W	1.00	Construction W	0.00	64.00	0	64	64	59.3
1	Worker and W	1.00	Water Trucks	22.00	22.00	22	22	44	40.7
	Zone 1 Subtotal					22	86	108	100.0
TOTAL						22	86	108	100.0

Crimson Solar Project
Near Term PM Peak Hour Conditions - with Project Construction

Trip Distribution Report

Percent Of Trips Construction

Zone	To Gates 1	To Gates 3
1	0.0	100.0
2	100.0	0.0

Crimson Solar Project
Near Term PM Peak Hour Conditions - with Project Construction

Turning Movement Report
PM Peak Hour

Volume Type	Northbound Left	Northbound Thru	Northbound Right	Southbound Left	Southbound Thru	Southbound Right	Eastbound Left	Eastbound Thru	Eastbound Right	Westbound Left	Westbound Thru	Westbound Right	Total Volume
#1 Wiley's Well Road/I-10 WB Ramps													
Base	36	16	0	0	18	21	0	0	0	2	1	19	113
Added	0	0	0	0	0	0	0	0	0	22	0	0	22
Total	36	16	0	0	18	21	0	0	0	24	1	19	135
#2 Wiley's Well Road/I-10 EB Ramps													
Base	0	35	162	17	2	0	18	2	1	0	0	0	237
Added	0	0	86	0	22	0	0	0	0	0	0	0	108
Total	0	35	248	17	24	0	18	2	1	0	0	0	345
#3 Wiley's Well Road/Power Line Road													
Base	0	193	0	0	3	0	0	0	0	0	0	0	196
Added	0	0	0	22	0	0	0	0	0	0	0	86	108
Total	0	193	0	22	3	0	0	0	0	0	0	86	304

Crimson Solar Project
Near Term PM Peak Hour Conditions - with Project Construction

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/Veh	Base V/C	Future LOS	Future Del/Veh	Future V/C	Change in
# 1 Wiley's Well Road/I-10 WB Ramp	A	8.6	0.000	A	9.1	0.000	+ 0.468 D/V
# 2 Wiley's Well Road/I-10 EB Ramp	B	11.3	0.000	B	13.0	0.000	+ 1.711 D/V
# 3 Wiley's Well Road/Power Line R	A	0.0	0.000	C	15.0	0.000	+15.038 D/V

```
--------------------------------------------------------------------------------
                             Crimson Solar Project
         Near Term PM Peak Hour Conditions - with Project Construction
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #1 Wiley's Well Road/I-10 WB Ramps
********************************************************************************
Average Delay (sec/veh):      4.9   Worst Case Level Of Service:       A[  9.1]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 25 May 2017 << PM
Base Vol:      34   15     0     0   17    20     0    0     0     2    1    18
Growth Adj:  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06
Initial Bse:   36   16     0     0   18    21     0    0     0     2    1    19
Added Vol:      0    0     0     0    0     0     0    0     0    22    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   36   16     0     0   18    21     0    0     0    24    1    19
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.76 0.76  0.76  0.76 0.76  0.76  0.76 0.76  0.76  0.76 0.76  0.76
PHF Volume:    47   21     0     0   24    28     0    0     0    32    1    25
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    47   21     0     0   24    28     0    0     0    32    1    25
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:   51 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   153  166    21
Potent Cap.: 1568 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   844  730  1063
Move Cap.:   1568 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   824  707  1063
Volume/Cap:  0.03 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.04 0.00  0.02
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:        0.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   0.1
Stopped Del:  7.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   8.5
LOS by Move:    A    *     *     *    *     *     *    *     *     *    *     A
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   818 xxxx xxxxx
SharedQueue:  0.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.1 xxxx xxxxx
Shrd StpDel:  7.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.6 xxxx xxxxx
Shared LOS:     A    *     *     *    *     *     *    *     *     A    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx             9.1
ApproachLOS:        *                *                *                A
```

```
--------------------------------------------------------------------------------
                          Crimson Solar Project
         Near Term PM Peak Hour Conditions - with Project Construction
--------------------------------------------------------------------------------
                   Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #2 Wiley's Well Road/I-10 EB Ramps
********************************************************************************
Average Delay (sec/veh):      1.2   Worst Case Level Of Service:      B[ 13.0]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign       Yield Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0   0  1  0  0  0   0  1  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 25 May 2017 << PM
Base Vol:       0   33   153    16    2     0    17    2     1     0    0     0
Growth Adj:  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06
Initial Bse:    0   35   162    17    2     0    18    2     1     0    0     0
Added Vol:      0    0    86     0   22     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0   35   248    17   24     0    18    2     1     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.43 0.43  0.43  0.43 0.43  0.43  0.43 0.43  0.43  0.43 0.43  0.43
PHF Volume:     0   81   572    39   56     0    42    5     2     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0   81   572    39   56     0    42    5     2     0    0     0
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   652 xxxx xxxxx   500  786    56  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   944 xxxx xxxxx   534  326  1017  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   944 xxxx xxxxx   516  313  1017  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.04 xxxx  xxxx  0.08 0.02  0.00  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx   0.1 xxxx xxxxx xxxxx xxxx   0.0 xxxxx xxxx xxxxx
Stopped Del:xxxxx xxxx xxxxx   9.0 xxxx xxxxx xxxxx xxxx   8.5 xxxxx xxxx xxxxx
LOS by Move:    *    *     *     A    *     *     *    *     A     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx   483 xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx   0.1 xxxx xxxxx   0.3 xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx   9.0 xxxx xxxxx  13.2 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     A    *     *     B    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx               13.0           xxxxxx
ApproachLOS:        *                *                  B                *
```

```
--------------------------------------------------------------------------------
                             Crimson Solar Project
         Near Term PM Peak Hour Conditions - with Project Construction
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Wiley's Well Road/Power Line Road
********************************************************************************
Average Delay (sec/veh):      4.9   Worst Case Level Of Service:      C[ 15.0]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  0  0   0  1  0  0  0   0  0  0  0  0   0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 25 May 2017 << PM
Base Vol:       0  182    0     0    3    0     0    0    0     0    0     0
Growth Adj:  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06  1.06 1.06  1.06
Initial Bse:    0  193    0     0    3    0     0    0    0     0    0     0
Added Vol:      0    0    0    22    0    0     0    0    0     0    0    86
PasserByVol:    0    0    0     0    0    0     0    0    0     0    0     0
Initial Fut:    0  193    0    22    3    0     0    0    0     0    0    86
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.39 0.39  0.39  0.39 0.39  0.39  0.39 0.39  0.39  0.39 0.39  0.39
PHF Volume:     0  496    0    57    8    0     0    0    0     0    0   221
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0     0
Final Vol.:     0  496    0    57    8    0     0    0    0     0    0   221
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   496 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   496
Potent Cap.: xxxx xxxx xxxxx  1078 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   578
Move Cap.:   xxxx xxxx xxxxx  1078 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   578
Volume/Cap:  xxxx xxxx  xxxx  0.05 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.38
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Queue:      xxxxx xxxx xxxxx   0.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   1.8
Stopped Del:xxxxx xxxx xxxxx   8.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  15.0
LOS by Move:    *    *     *     A    *     *     *    *     *     *    *     C
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx   0.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx   8.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     A    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            15.0
ApproachLOS:        *                *                *                C
```

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	NOEL V CASIL
Agency or Company:	
Date Performed:	7/16/2019
Analysis Time Period:	DAILY
Freeway/Direction:	I-10
From/To:	WEST OF WILEY'S WELL ROAD
Jurisdiction:	CALTRANS DISTRICT 8
Analysis Year:	2020 BASE + PROJECT

Description: CRIMSON SOLAR PROJECT

Flow Inputs and Adjustments

Annual average daily traffic, AADT	45268	veh/day
Peak-hour proportion of AADT, K	0.12	
Peak-hour direction percent, D	57	%
Volume, DDHV	3096	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	0	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	1.000	
Driver population factor, fp	1.00	
Flow rate, vp	860	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed	68.5	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	860	pc/h/ln
Free-flow speed, FFS	68.5	mi/h

Average passenger-car speed, S	68.5	mi/h
Number of lanes, N	4	
Density, D	12.6	pc/mi/ln
Level of Service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1d

Phone: Fax:
E-mail:

Operational Planning Analysis

Analyst:	NOEL V CASIL
Agency or Company:	
Date Performed:	7/16/2019
Analysis Time Period:	DAILY
Freeway/Direction:	I-10
From/To:	EAST OF WILEY'S WELL ROAD
Jurisdiction:	CALTRANS DISTRICT 8
Analysis Year:	2020 BASE + PROJECT

Description: CRIMSON SOLAR PROJECT

Flow Inputs and Adjustments

Annual average daily traffic, AADT	49458	veh/day
Peak-hour proportion of AADT, K	0.12	
Peak-hour direction percent, D	57	%
Volume, DDHV	3383	veh/h
Peak-hour factor, PHF	0.90	
Trucks and buses	0	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicles PCE, ER	1.2	
Heavy Vehicle adjustment, fHV	1.000	
Driver population factor, fp	1.00	
Flow rate, vp	940	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed	68.5	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	940	pc/h/ln
Free-flow speed, FFS	68.5	mi/h

Average passenger-car speed, S	68.5	mi/h
Number of lanes, N	4	
Density, D	13.7	pc/mi/ln
Level of Service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Two-Lane Highways Release 4.1d

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	NOEL V CASIL
Agency/Co.	AECOM
Date Performed	7/16/2019
Analysis Time Period	AM PEAK (WORST CASE)
Highway	WILEY'S WELL ROAD
From/To	BET I-10 WB RAMP AND EB RAMP
Jurisdiction	RIVERSIDE COUNTY
Analysis Year	2020 BASE + PROJECT

Description CRIMSON SOLAR PROJECT

Input Data

Highway class	Class 1		Peak-hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	14	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length		mi	% No-passing zones	0	%
Up/down		%	Access points/mi	0	/mi

Analysis direction volume, Vd	26	veh/h
Opposing direction volume, Vo	138	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.911		0.911	
Grade adj. factor,(note-1) fG	1.00		1.00	
Directional flow rate,(note-2) vi	32	pc/h	172	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed volume,(note-3) Vf	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access points,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	60.0	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSd	56.9	mi/h

```
_________________________Percent Time-Spent-Following_________________________

Direction                                     Analysis(d)        Opposing (o)
PCE for trucks, ET                                1.1                1.1
PCE for RVs, ER                                   1.0                1.0
Heavy-vehicle adjustment factor, fHV              0.986              0.986
Grade adjustment factor,(note-1) fG               1.00               1.00
Directional flow rate,(note-2) vi                 30     pc/h        159     pc/h
Base percent time-spent-following,(note-4) BPTSFd  11.8   %
Adjustment for no-passing zones, fnp                       10.2
Percent time-spent-following, PTSFd                        22.1   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                                      A
Volume to capacity ratio, v/c                              0.02
Peak 15-min vehicle-miles of travel, VMT15                 0       veh-mi
Peak-hour vehicle-miles of travel, VMT60                   0       veh-mi
Peak 15-min total travel time, TT15                        0.0     veh-h
______________________________________________________________________________

Notes:
1. If the highway is extended segment (level) or rolling terrain, fG = 1.0
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only.
4. Exhibit 20-21 provides factors a and b.
5. Use alternative Equation 20-14 if some trucks operate at crawl speeds
   on a specific downgrade.

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                                 0.0     mi
Length of two-lane highway upstream of the passing lane, Lu          0.0     mi
Length of passing lane including tapers, Lpl                         0.0     mi
Average travel speed, ATSd (from above)                              56.9    mi/h
Percent time-spent-following, PTSFd (from above)                     22.1
Level of service,(note-1) LOSd (from above)                          A

_____________________________Average Travel Speed_____________________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde             1.70    mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld          -1.70   mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                            1.08
Average travel speed including passing lane,(note-2) ATSpl

_________________________Percent Time-Spent-Following_________________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde            13.00   mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld            -13.00  mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                             0.58
Percent time-spent-following
    including passing lane,(note-3) PTSFpl                                   %

___________Level of Service and Other Performance Measures (note-4)___________
```

Level of service including passing lane, LOS_{pl}	
Peak 15-min total travel time, TT_{15}	veh-h

Notes:

1. If LOS_d = F, passing lane analysis cannot be performed.
2. If L_d < 0, use alternative Equation 20-22.
3. If L_d < 0, use alternative Equation 20-20.
4. v/c, VMT_{15} , and VMT_{60} are calculated on Directional Two-Lane Highway Segment Worksheet.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	NOEL V CASIL
Agency/Co.	AECOM
Date Performed	7/16/2019
Analysis Time Period	AM PEAK (WORST CASE)
Highway	WILEY'S WELL ROAD
From/To	BET I-10 EB RAMP AND POWERLINE
Jurisdiction	RIVERSIDE COUNTY
Analysis Year	2020 BASE + PROJECT
Description	CRIMSON SOLAR PROJECT

Input Data

Highway class	Class 1		Peak-hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	7	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length		mi	% No-passing zones	0	%
Up/down		%	Access points/mi	0	/mi

Analysis direction volume, Vd	51	veh/h
Opposing direction volume, Vo	141	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.953		0.953	
Grade adj. factor,(note-1) fG	1.00		1.00	
Directional flow rate,(note-2) vi	61	pc/h	168	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed volume,(note-3) Vf	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access points,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	60.0	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSd	56.7	mi/h

```
_________________________Percent Time-Spent-Following_________________________

Direction                                  Analysis(d)        Opposing (o)
PCE for trucks, ET                             1.1                1.1
PCE for RVs, ER                                1.0                1.0
Heavy-vehicle adjustment factor, fHV           0.993              0.993
Grade adjustment factor,(note-1) fG            1.00               1.00
Directional flow rate,(note-2) vi              58     pc/h        161     pc/h
Base percent time-spent-following,(note-4) BPTSFd  17.8   %
Adjustment for no-passing zones, fnp               10.3
Percent time-spent-following, PTSFd                28.1   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              A
Volume to capacity ratio, v/c                      0.04
Peak 15-min vehicle-miles of travel, VMT15         0       veh-mi
Peak-hour vehicle-miles of travel, VMT60           0       veh-mi
Peak 15-min total travel time, TT15                0.0     veh-h
______________________________________________________________________________

Notes:
1. If the highway is extended segment (level) or rolling terrain, fG = 1.0
2. If vi (vd or vo ) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only.
4. Exhibit 20-21 provides factors a and b.
5. Use alternative Equation 20-14 if some trucks operate at crawl speeds
   on a specific downgrade.

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.0     mi
Length of two-lane highway upstream of the passing lane, Lu  0.0     mi
Length of passing lane including tapers, Lpl                 0.0     mi
Average travel speed, ATSd (from above)                      56.7    mi/h
Percent time-spent-following, PTSFd (from above)             28.1
Level of service,(note-1) LOSd (from above)                  A

_____________________________Average Travel Speed_____________________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     1.70    mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -1.70   mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    1.08
Average travel speed including passing lane,(note-2) ATSpl

_________________________Percent Time-Spent-Following_________________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    13.00   mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -13.00  mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     0.58
Percent time-spent-following
    including passing lane,(note-3) PTSFpl                           %

___________Level of Service and Other Performance Measures (note-4)___________
```

Level of service including passing lane, LOSpl
Peak 15-min total travel time, TT15 veh-h

Notes:
1. If LOSd = F, passing lane analysis cannot be performed.
2. If Ld < 0, use alternative Equation 20-22.
3. If Ld < 0, use alternative Equation 20-20.
4. v/c, VMT15 , and VMT60 are calculated on Directional Two-Lane Highway Segment Worksheet.

HCS2000: Two-Lane Highways Release 4.1d

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	NOEL V CASIL
Agency/Co.	AECOM
Date Performed	7/16/2019
Analysis Time Period	AM PEAK (WORST CASE)
Highway	POWER LINE ROAD
From/To	EAST OF WILEY'S WELL ROAD
Jurisdiction	RIVERSIDE COUNTY
Analysis Year	2020 BASE + PROJECT
Description	CRIMSON SOLAR PROJECT

Input Data

Highway class	Class 1		Peak-hour factor, PHF	0.88	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length		mi	% No-passing zones	0	%
Up/down		%	Access points/mi	0	/mi

Analysis direction volume, Vd	102	veh/h
Opposing direction volume, Vo	36	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.947		0.947	
Grade adj. factor,(note-1) fG	1.00		1.00	
Directional flow rate,(note-2) vi	122	pc/h	43	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed volume,(note-3) Vf	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access points,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	60.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSd	58.0	mi/h

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.992		0.992	
Grade adjustment factor,(note-1) fG	1.00		1.00	
Directional flow rate,(note-2) vi	117	pc/h	41	pc/h
Base percent time-spent-following,(note-4) BPTSFd	26.9	%		
Adjustment for no-passing zones, fnp	8.4			
Percent time-spent-following, PTSFd	35.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.07	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h

Notes:
1. If the highway is extended segment (level) or rolling terrain, fG = 1.0
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only.
4. Exhibit 20-21 provides factors a and b.
5. Use alternative Equation 20-14 if some trucks operate at crawl speeds on a specific downgrade.

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	0.0	mi
Length of passing lane including tapers, Lpl	0.0	mi
Average travel speed, ATSd (from above)	58.0	mi/h
Percent time-spent-following, PTSFd (from above)	35.3	
Level of service,(note-1) LOSd (from above)	B	

Average Travel Speed

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	1.70	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-1.70	mi
Adj. factor for the effect of passing lane on average speed, fpl	1.08	
Average travel speed including passing lane,(note-2) ATSpl		

Percent Time-Spent-Following

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	13.00	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-13.00	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	0.58	
Percent time-spent-following including passing lane,(note-3) PTSFpl		%

Level of Service and Other Performance Measures (note-4)

Level of service including passing lane, LOS_{pl}
Peak 15-min total travel time, TT_{15} veh-h

Notes:
1. If LOS_d = F, passing lane analysis cannot be performed.
2. If L_d < 0, use alternative Equation 20-22.
3. If L_d < 0, use alternative Equation 20-20.
4. v/c, VMT_{15} , and VMT_{60} are calculated on Directional Two-Lane Highway
   Segment Worksheet.

Appendix T
Visual Resources

Visual Resources Technical Report, February 2019

RE Crimson Solar Project

by Sonoran West Solar Holdings, LLC

Visual Resources Technical Report

Project Number: 60487757

February 2019

Sonoran West Solar Holdings, LLC
Recurrent Energy LLC
353 Sacramento Street, 21st Floor
San Francisco, CA 94111

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Revision History

Revision	Revision date	Details	Authorized	Name	Position

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Table of Contents

Figures

1. Project Overview

1.1 Introduction

Sonoran West Solar Holdings, LLC (Applicant), a wholly owned subsidiary of Recurrent Energy LLC (RE), proposes to construct and operate the RE Crimson Solar Project (Project). This Project is a utility-scale solar photovoltaic (PV) and energy storage project that would be located in unincorporated eastern Riverside County, approximately 13 miles west of Blythe, California (CA) (BLM CACA-051967) just north of Mule Mountain and just south of Interstate 10 (I-10). The Project site includes portions of Sections 1, 2, 11, 12, 13, 24, 25 within Township 7 South, Range 20 East, and portions of Sections 6, 7, 8, 17, 18 within Township 7 South, Range 21 East (Figure 1-1).

The Project site is located on Bureau of Land Management (BLM)-administered land within the Riverside East Solar Energy Zone and within the Desert Renewable Energy Conservation Plan (DRECP) Development Focus Area as presented in the Final Environmental Impact Statement (EIS) and approved in the Record of Decision (ROD) and associated Land Use Plan Amendment in September 2016 (http://www.drecp.org/; BLM 2016). The Project site is also within the California Desert Conservation Area (CDCA) planning area.

The Project site is surrounded primarily by BLM-managed lands and some private parcels. The Project site is located at the northern foot of the Mule Mountain Area of Critical Environmental Concern, which is an important cultural resource for local Native American Tribes. The Southern California Edison (SCE) high-voltage transmission line and Colorado River Substation (CRS) are located directly north of the Project site, and I-10 is north of and parallel to those facilities. East of the Project site is First Solar's proposed Desert Quartzite project. Further northeast of the Desert Quartzite project is the site of the recently approved Blythe Mesa Solar Project by RRG Renewables.

The Project would interconnect to the regional electrical grid at the SCE 230-kilovolt (kV) CRS, and would generate up to 350 megawatts (MW) of renewable energy using PV technology with up to 350 MW of integrated energy storage capacity. The Permitting (Development) Boundary is presented in Figure 1-2. The total area for the Project (i.e., Permitting Boundary) is 2,489 acres, including a 2,465-acre solar field development area with approximately 1,859 acre of solar panels (array blocks) and 24 acres for linear facilities including access/perimeter roads with a 30- to 60-foot corridor width and gen-tie and powerline corridors at 150 feet.

The Project's Plan of Development (POD) includes a traditional PV design, as well as consideration of several potential low environmental impact design (LEID) elements. The traditional PV design approach consists of desert tortoise exclusion fencing, a mow and roll approach to site preparation, compacted roads, and trenching for electrical lines; however, the applicant has also been actively investigating alternative LEID elements and the potential for those to reduce Project impacts. LEID elements include several potential design changes including:

1. Minimizing grading during site preparation and maintaining more onsite vegetation to facilitate post-construction residual habitat value and post-operations/site reclamation success.
2. Avoiding or limiting trenching by placing electrical wiring aboveground.
3. Placing transformer/inverter groups on elevated support structures in lieu of cement foundations.

The LEID elements would further minimize grading, trenching, and vegetation removal beyond traditional design approaches for PV projects with the objective of reducing overall long-term impacts for the Project. Although the incorporation of LEID elements could result in slight modifications to the panel block locations due to topographic constraints, the Permitting Boundary or limits of development would be the same with LEID elements incorporated and the construction and operation of the two design options would be similar.

An estimated 2 million panels would be arranged on the site in the form of solar arrays. Structures supporting the PV modules would consist of steel piles (e.g., cylindrical pipes, H-beams, or similar), which would be driven into the soil using pneumatic techniques, such as a hydraulic attachment on the boom of a backhoe tractor. The proposed traditional design is laid out primarily in 2-MW increments; each 2-MW increment would include an inverter-transformer station constructed on a concrete pad or steel skid, and would be centrally located within the PV module arrays. Each inverter-transformer station would contain up to four inverters, a transformer, a battery enclosure, and a switchboard. Underground cables would be installed to convey the direct current (DC) electricity from the panels to the inverters to convert the DC to alternating current (AC). Between 300 and 500 wooden poles would be installed across the entire site to convey energy to a central substation location which would transform voltage from 34.5 kV to 230 kV. Energy storage may be achieved by either a battery or flywheel storage system capable of storing up to 350 MW of electricity. The storage system would consist of banks of batteries or flywheels housed in electrical enclosures located indoors within the Project energy storage facilities.

Access to the Project site would be provided via the existing paved Wiley's Well Road and Powerline Road to the CRS from I-10 to the north. The Project's on-site roadway system would include a perimeter road, access roads, and internal roads. These roads would be surfaced with gravel, compacted dirt, or another commercially available surface and would accommodate the Project operations and maintenance (O&M) activities.

1.2 Project Description

The Project would construct, operate, and eventually decommission a clean, renewable source of solar electricity that helps meet California's growing demand for power and helps fulfill national and state renewable energy and greenhouse gas (GHG) goals. Solar energy provides a sustainable, renewable source of power that helps reduce fossil fuel dependence and GHG emissions. The Project will generate up to 350 MW of clean electricity to assist the State of California in achieving its 50 percent (%) renewable portfolio standard for 2030 by providing a significant new source of wholesale renewable energy. The Project would assist California utilities in meeting their obligations under the California Public Utilities Commission's Energy Storage Framework and Design Program, including the procurement target of 1,325 MWs by 2020, by providing up to 350 MW of storage capacity. Additionally, the Project would facilitate grid interconnection of intermittent and variable PV generation while minimizing line losses associated with off-site storage by collocating substantial electrical storage capacity at the PV facility site.

This study is submitted to the BLM (the federal lead agency) and the California Department of Fish and Wildlife (CDFW; the state lead agency) to support their independent review and evaluation of the environmental impacts of the Project pursuant to applicable federal, state, and local laws. The POD is part of the BLM Right-of-Way (ROW) grant application process which for this Project includes preparation of an EIS in accordance with the National Environmental Policy Act (NEPA). The Project is also expected to require a Streambed Alteration Agreement and an Incidental Take Permit from CDFW which would require compliance with California Environmental Quality Act (CEQA) (e.g., Environmental Impact Report [EIR]). Therefore, it is currently assumed that a joint EIS/EIR will be prepared by the BLM and CDFW.

1.3 Summary of Project Construction Activities and Schedule Traditional Design

The Project applicant is proposing to construct the project using a traditional construction approach. Construction of the Project would occur in three planned phases and require approximately 17 months to complete with construction expected to begin in late-2020.

Preconstruction Activities

Prior to the start of construction, several activities would be undertaken to prepare the Project site for crews and construction including:

1. Geotechnical and Hazards Investigations. The applicant would conduct a geotechnical investigation utilizing subsurface scientific testing and analysis, and would use ground penetrating radar to identify potential subsurface unexploded ordnance and Munitions and Explosives of Concern that may need to be stabilized or removed prior to construction.

2. Surveying, Staking, Flagging, and Preconstruction Resource Surveys. Prior to construction, the Project site boundary would be staked to demarcate the limits of disturbance, following which biologists would conduct preconstruction surveys to flag areas for avoidance as appropriate.

3. Fence Installation. The Project site would be fenced with security fencing (chain-link topped with barbed wire) and desert tortoise exclusion fencing. The security fencing would be up to 8 feet tall. The exclusion fencing would be buried at least 12 inches below ground surface.

4. Resource Clearance Surveys. Following fence installation, likely in a phased approach, the Project development area would be surveyed and cleared for special status species.

5. Staging Area Establishment. One or more secure staging areas would be established in support of construction activities.

In general, pre-construction activities have limited ground-disturbing impacts; but are necessary before full mobilization to support construction of the Project.

Phase 1 – Site Preparation and Grading

Phase 1 of construction would begin with the grubbing, grading, re-contouring, compacting, and graveling of access roads, followed by grading at the substation site. Additional grading would be carried out at inverter and transformer pad locations where necessary. This construction phase would last approximately 16 weeks and require an average daily workforce of approximately 203 workers on the Project site. Construction equipment operating on the site would include dozers, graders, skid steers with auger/hoe attachments, front-end loaders, vibratory rollers, water trucks, and gravel trucks.

Phase 2 – PV System Installation

Phase 2 of construction would begin with the pouring of foundations and the installation of the PV module support structure, which would consist of steel piles (e.g., cylindrical pipes, H-beams, or similar) being driven into the soil. Construction of the structural support systems would be followed by the installation of the PV modules. This construction phase would last approximately 46 weeks and require an average daily workforce of approximately 320 workers on the Project site. Construction equipment operating on the site would include track-mounted pile drivers, skid steers with auger/hoe attachments, flatbed trucks, water trucks, forklifts, trenchers, and welding units.

Phase 3 – Inverter, Transformer, Substation, and Electrical Collector System Commissioning

Phase 3 of construction would include the stringing of cable along module rows to a trunk cable system and the installation of AC and DC collector poles at inverter/transformer pad sites. This construction phase would last approximately 32 weeks and require an average daily workforce of approximately 137 workers on the Project site. Construction equipment operating on the site would include a track-mounted pile driver, a dozer, a grader, a front-end loader, a vibratory roller, a flatbed truck, a water truck, skid steers with auger/hoe attachments, cranes, backhoes, aerial lifts, trenchers, and concrete trucks.

Construction Deliveries

Deliveries of materials and resources would occur throughout all construction phases. Water deliveries would occur a maximum of 14 times per day throughout all three construction phases, module and foundation deliveries would occur at a rate of approximately 10 times per day between construction Phases 1 and 2, tracker system delivery would occur at a rate of approximately 9 times per day during Phase 2, and inverter delivery would occur at a rate of approximately 2 times per day between Phases 2 and 3.

1.4 Operations and Maintenance

The solar modules are expected to be in operation during daylight hours for 7 days per week, 365 days per year. Operational activities include solar module washing, maintenance of transformers, inverters, or other electrical equipment, road and fence repairs, vegetation/pest management, and site security. Solar modules would be washed as needed to maintain optimal electricity production (up to four times each year) using light utility vehicles with tow behind water trailers.

1.5 Decommissioning

The Applicant is expected to receive authorizations and permits with 30+-year terms. At the end of the term, including any extensions, the Project would cease operation. At that time, the facilities would be decommissioned and dismantled and the site restored in accordance with an approved decommissioning plan. Upon decommissioning, the Project site could be converted to other uses in accordance with applicable land use regulations in effect at that time.

2. Regulatory Setting

2.1 Federal

2.1.1 National Environmental Policy Act (42 USC 4371)

NEPA Section 101(b)(2) states that it is the "continuous responsibility" of the federal government to "use all practicable means" to "assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings." Section 1502.6 states that analyses should be prepared using "an interdisciplinary approach which will ensure the integrated use of natural and social science and environmental design arts" (Section 102(2)(A)).

2.1.2 Federal Land Policy and Management Act

Section 102 (a)(8) of Federal Land Policy and Management Act (FLPMA) states that "the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values.

2.1.3 Bureau of Land Management

2.1.3.1 Land Use Planning Handbook

The handbook (BLM 2005) states that visual resource management classes shall be designated for all BLM land based on consideration of Visual Resource Inventory (VRI) data and management considerations for other land uses. Resource use and management activities shall be managed according to the Visual Resource Management (VRM) objectives established in the land use plan.

2.1.3.2 Visual Resource Management System

Visual resources on BLM-administered lands are managed under the VRM System (BLM 1986). The system provides the framework by which to manage visual values by classifying all BLM-administered lands into one of four VRM classes. Visual values are established through the VRI process, which classifies scenery based on the assessment of three components: scenic quality, visual sensitivity, and distance zones. Each VRM class is defined by a specific management objective that describes the acceptable level of change to visual resources. Change in the resource is measured though implementation of the contrast rating procedure and by assessing change in visual resource inventory values. The BLM has completed the VRI for the Project area (BLM 2010). The Project primarily occupies lands managed per VRM Class IV Objectives; however, a small portion of the Project is located on lands managed per VRM Class II objectives (Figure 2-1). The VRM Class II and IV objective is defined as follows:

- VRM Class II: To retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- VRM Class IV: To provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance and repeating the basic landscape elements.

2.1.3.3 California Desert Conservation Area Plan

The Riverside East Solar Energy Zone (SEZ) is located within the CDCA Plan area. The CDCA Plan of 1980 (as amended) designates all BLM-administered public lands in the CDCA, except for a few small and scattered parcels, geographically into four multiple-use classes: Class C (Controlled Use), Class L (Limited Use), Class M (Moderate

Use), and Class I (Intensive Use). The classifications were based on the sensitivity of resources and type of uses for each geographic area. Each multiple-use class describes a different type and level or degree of use that is permitted within that geographic area. Land use actions and resource management activities on public lands within a multiple-use class delineation must meet the guidelines for each class. The Project is located on lands designated as Class M. Lands within Class M are managed in a controlled balance between higher intensity use and protection. A wide variety of uses, such as mining, livestock grazing, recreation, and energy and utility development are allowed. Any damage caused by permitted uses must be mitigated.

The CDCA outlines the following actions to manage for the alteration of the natural character of the landscape that could occur as part of the multiple-use activities described in the plan:

(1) The appropriate levels of management, protection, and rehabilitation on all public lands in the CDCA will be identified, commensurate with visual resource management objectives in the multiple-use class guidelines.

(2) Proposed activities will be evaluated to determine the extent of change created in any given landscape and to specify appropriate design or mitigation measures using the BLM's contrast rating process.

The CDCA Plan stipulates that solar energy development and new electric transmission facilities are allowed on Class L, M, or I lands provided that NEPA requirements are met.

The Imperial Sand Dunes Recreation Area Management Plan (RAMP)/CDCA Plan Amendment established VRM classes for the Imperial Sand Dunes RAMP area within the CDCA. However, formal VRM classes were never established for most of the CDCA, including the Project area.

A Section 368 federally designated, 2-mile (3-kilometer)-wide energy corridor on BLM-administered lands overlaps the SEZ along I-10. There are also two north-south corridors within the SEZ that were designated as part of the CDCA Plan. One corridor is located in the western portion of the SEZ and one is located in the eastern portion.

2.1.3.4 Approved Resource Management Plan/Record of Decision for the Solar PEIS

The ROD for the Programmatic EIS (PEIS) for Solar Energy Development in Six Southwestern States (Solar PEIS) provides for ongoing implementation of the BLMs Solar Energy Program. As part of the Solar Energy Program, the BLM identified locations, referred to as SEZs, within this planning area considered suitable for utility production of solar energy (BLM 2012). The ROD contains information on anticipated land management plan revisions, including those that would be required for the Palm Springs-South Coast planning area. Appendix C of the ROD contains Design Features that would be required for projects constructed within the SEZ.

The Project is considered a "First in-line pending" application. The BLM defines "pending" applications as any applications filed within proposed variance and/or exclusion areas before the publication of the Supplement to the Draft Solar PEIS (October 28, 2011), and any applications filed within proposed SEZs before June 30, 2009. Pending applications will not be subject to any new program elements adopted by the Solar PEIS ROD (BLM 2012).

2.1.4 Federal Aviation Administration

The Federal Aviation Administration has established an interim policy for proposals by sponsors of federally obligated airports to construct solar energy systems on airport property (78 FR 63276). The Project is not located on a federally obligated airport, thus evaluation of airport glint glare is not required.

2.2 State

2.2.1 California Environmental Quality Act

In accordance with Appendix G of the CEQA Guidelines, a project would result in a significant impact on aesthetics and visual quality if the project would meet at least one of the following criteria:

- Have a substantial adverse effect on a scenic vista;

- Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings; and/or
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area or create substantial shadow on a sensitive use.

The project would be considered to result in a beneficial visual impact if the project would eliminate a dominant feature in the landscape that currently detracts from scenic qualities or blocks scenic vistas, or if the project would provide new scenic views that are not currently available.

Nighttime lighting associated with the project would be minimal and only associated with safety and security. Security lighting typically includes shields and visors to direct light downward toward the area of desired illumination while minimizing potential for light spill or glare into adjacent areas. Nighttime lighting is not considered to be a substantial new source of light that could affect views; thus, further analysis of light is not necessary.

Typically, glare associated with solar development is most concerning for aircraft operation safety. As stated in Section 2.1.4 above, the Project is not located on a federally obligated airport and outside the airport land use compatibility zone and therefore is not required to evaluate airport glint glare. Other viewers of the project site, such as recreationalists on local trails would not be highly sensitive to glare as their views of the project site are intermittent and often obscured by intervening vegetation or topography. Motorists along I-10 have distant views (one mile or greater) of the project site and as shown in the photo simulation for KOP 2, the solar panels are not a visible element from the interstate due to distance and intervening vegetation. The distance and lack of views of the solar panels, as well as the design and anti-reflective coatings on the panels minimize potential for glare. Therefore, additional analysis of glare is not considered necessary.

2.3 Riverside County

2.3.1 Riverside County General Plan and Palo Verde Valley Area Plan

The Riverside County General Plan and Palo Verde Valley Area Plan contain policies to protect the scenic quality of views from designated and eligible scenic highways. Per the County of Riverside General Plan, I-10 is eligible for designation as a Riverside County Scenic Highway, and provides motorists with desert views across the mesa to the mountains. Policies applicable to the Project that pertain to the protection of visual resources are provided below (County of Riverside 2008). The County of Riverside considers scenic resources to include areas visible to the public that are generally considered visually attractive, including scenic corridors, natural landmarks, and prominent or unusual features. Scenic vistas are considered points that provide a view of the countryside and are accessible to the general public (County of Riverside 2008). Relevant policies include the following:

- PVVAP 10.1: "Protect the scenic highways in the Palo Verde Valley planning area from change that would diminish the aesthetic value of adjacent properties in accordance with the Scenic Corridors sections of the General Plan Land Use, Multipurpose Open Space, and Circulation Elements."
- C 19.1: "Preserve scenic routes that have exceptional or unique visual features in accordance with Caltrans' Scenic Highways Plan."
- OS 21.1: "Identify and conserve the skylines, view corridors, and outstanding scenic vistas within Riverside County."
- OS 22.4: "Impose conditions on development within scenic highway corridors requiring dedication of scenic easements consistent with the Scenic Highways Plan, when it is necessary to preserve unique or special visual features.

2.3.2 Riverside County Airport Land Use Compatibility Plan

The Riverside County Airport Land Use Compatibility Plan (Riverside County Airport Land Use Commission 2004) identifies several countywide policies that apply to projects proposed within the Airport Land Use Compatibility Zones and relate to glare, which require review by the Airport Land Use Commission. The Blythe Airport is located approximately 5 miles northeast of the Project Area. The project is not within an airport compatibility zone.

3. Methods

3.1 Analysis Area

The study area for the visual resources assessment was defined by a 20-mile radius surrounding the Project area. This area was selected based on the assumption that: 1) visibility of the project would attenuate at this distance when observed from inferior or at-grade observer positions; and 2) visual contrast of the Project would be weak when viewed from higher elevations at this distance.

The study area was refined based on the results of viewshed analyses prepared for major Project components (see below). Potential Project visibility is determined based on the relationship between topography, height of the Project, and average eye height of the viewer. The results identify locations within the study area where the Project could potentially be seen, and locations where it is shielded by existing topography. The analysis is conservative, as it does not account for the potential screening of Project features by vegetation or structures. The resulting viewshed map illustrates a conservative area where Project components could potentially be seen; however, it does not represent any measure of actual visibility.

Three viewshed models were prepared for the Project, with each representing potential visibility of: the gen-tie (Figure 3-1); the PV solar arrays (Figure 3-2); and the substation and switchyards (Figure 3-3). The viewshed origin included the following assumptions:

- Gen-tie = Maximum pole height of 110 feet;
- Solar Arrays = Panel height of 12 feet;
- Substations = Average height of 34 feet;
- Switchyard = Average height of 28 feet; and
- Digital elevation model = 10 meters.

The viewshed models indicated potential visibility of all Project components extended across the Chuckwalla Valley, with geographic extent limited by surrounding high elevation landforms of the McCoy, Palo Verde, and Chuckwalla Mountains.

3.2 Baseline Conditions Assessment

Baseline (existing) conditions are evaluated at two spatial scales: Landscape-level scale, in which the regional landscape setting and Scenic Quality Rating Units (SQRUs) are defined; and project-scale, in which the project area is assessed from Key Observation Points (KOPs). The purpose of this framework is to understand potential impacts in a manner that is scalable, whereby KOPs are used to identify specific impact mechanisms that can be evaluated within the larger scale context of the VRI of the BLM Palm Springs Field Office (FO) planning area.

3.2.1 Visual Resource Inventory

As part of its land use planning process, the BLM maintains an inventory of visual values within the planning area. Visual values are established through the VRI process, which classifies visual resources into one of four VRI classes based on the assessment of three components: scenic quality, visual sensitivity, and distance zones. These VRI classes and their components provide baseline measurements of existing conditions within the planning area. The VRI for the Project area was completed in 2010 (BLM 2010).

Scenic quality is defined as the visual appeal of a tract of land and is determined using a systematic process to classify lands into one of three scenic quality categories: A, B, or C (BLM 1986). Class A represents the highest scenic quality, and C represents the lowest scenic quality. The first step in this process entails dividing the landscape into SQRUs based on conspicuous changes in physiography or land use. Scenic quality within each SQRU is then ranked based on the assessment of seven key factors: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modification. Each key factor is scored, and the value of each is added to derive an overall score for the unit.

Visual sensitivity is defined as a measure of public concern for scenic quality (BLM 1986). Visual sensitivity within the planning area is determined by the Sensitivity Level Analysis (SLA), and is completed in two steps: 1) Delineating Sensitivity Level Rating Units (SLRUs), and 2) Rating visual sensitivity within each SLRU. SLRUs represent a geographic area where public sensitivity to change of the visual resources is shared among constituents. The unit boundaries may be defined by a single factor driving the sensitivity consideration, or factors driving sensitivity may extend across numerous SLRUs. Units are thus derived, in part, by the consideration of factors analyzed in the SLA. For example, constituents of a residential area are assumed to share a high sensitivity to change in visual resources of views from their homes. In such an example, an SLRU defining the general viewshed of this community would be established based on knowledge and assumptions of shared sensitivity of this area. Visual sensitivity ratings within each SLRU are estimated as high, medium, or low based on the categories and criteria described below.

Type of Users. Visual sensitivity is expected to vary by type of user. For example, recreational sightseers may be highly sensitive to any changes in visual quality, whereas workers who pass through the area on a regular basis may not be as sensitive to change. This category is rated as follows:

- **High**. Maintenance of visual quality is a major concern for most users,
- **Moderate**. Maintenance of visual quality is a moderate concern for most users, and
- **Low**. Maintenance of visual quality is a low concern for most users (BLM 1986).

Amount of Use. Visual sensitivity is expected to vary by amount of use. For example, areas seen and used by large numbers of people are potentially more sensitive. Protection of visual values usually becomes more important as the number of viewers increase. This category is rated high for high levels of use, moderate for moderate levels of use, and low for low levels of use as defined below (BLM 1986):

- **High.** Roads and highways (greater than 45,000 visits per year), rivers and trails (greater than 20,000 visits per year), and recreation sites (greater than 10,000 visitor days per year);
- **Moderate.** Roads and highways (5,000–45,000 visits per year), rivers and trails (2,000–20,000 visits per year), and recreation sites (2,000–10,000 visitor days per year); and
- **Low.** Roads and highways (fewer than 5,000 visits per year), rivers and trails (less than 2,000 visits per year), and recreation sites (fewer than 2,000 visitor days per year).

Public Interest. The visual quality of an area may be of concern to local, state, or national groups. Indicators of this concern are usually expressed in public meetings, letters, newspaper or magazine articles, newsletters, land-use plans, or public controversy created in response to proposed activities that is perceived to result in change to the landscape character. This category is rated High where maintenance of visual quality is a major public issue, Moderate where maintenance of visual quality is a moderate public issue, and Low where maintenance of visual quality is a minor public issue (BLM 1986).

Adjacent Land Uses. The interrelationship with land uses in adjacent lands can affect the visual sensitivity of an area. For example, an area within the viewshed of a residential area may be very sensitive, whereas an area surrounded by commercially developed lands may not be visually sensitive. This category is rated High where maintenance of visual quality to sustain adjacent land use objectives is very important, Moderate where maintenance of visual quality to sustain adjacent land use objectives is moderately important, and Low where maintenance of visual quality to sustain adjacent land use objectives is slightly important (BLM 1986).

Special Areas. Management objectives for special areas such as Natural Areas, Wilderness Areas, or Wilderness Study Areas frequently require special consideration for the protection of the visual values. This designation does not necessarily indicate high scenic quality, but rather the potential for management objectives to be aimed at preservation of the natural landscape setting. This category is rated High where maintenance of visual quality to sustain Special Area management objectives is very important, Moderate where maintenance of visual quality to sustain Special Area management objectives is moderately important, and Low where maintenance of visual quality to sustain Special Area management objectives is slightly important (BLM 1986).

Other Factors. Additional information, such as research or studies that includes indicators of visual sensitivity, should be included in the sensitivity level analysis when available.

Distance zones represent the distance from which the landscape is most commonly viewed and are established by buffering common travel routes and viewer locations at distances of 3 miles, 5 miles, and 15 miles. Because of the relationship between distance and viewer perception, distance zones can also be used to estimate visual thresholds, as a viewer's ability to detect attributes of form, line, color, and texture is expected to decrease with distance. Distance zones are defined as follows (BLM 1986):

- **Foreground-Middleground**. The area that can be seen from a particular location to a distance to 5 miles. The outer boundary of this distance zone is described as the point where the texture and form of individual plants are no longer apparent in the landscape. In some areas, atmospheric conditions can reduce visibility and shorten the distance normally covered by each zone.
- **Background**. The area includes locations that can be seen between a distance of 5 and 15 miles. The background zone does not include areas in the background that are so far distant that the only thing discernible is the form or outline. In order to be included within this distance zone, vegetation should be visible at least as patterns of light and dark.
- **Seldom-seen Zone**. The areas that are generally not visible within the foreground-middleground and background, or portions which are visible but beyond the background distance of 15 miles.

3.3 Impact Assessment

Impacts to visual resources were assessed using a combination of: 1) the Visual Contrast Rating Procedure (BLM 1986), and 2) the VRI analysis. The results of these analyses were collectively used to inform a conformance determination to VRM Class II and IV Objectives assigned to the Project area.

3.3.1 Contrast Rating

The Visual Contrast Rating Procedure assumes the extent to which a project results in adverse effects to visual resources is a function of the visual contrast between the project and the existing landscape (BLM 1986). This procedure was implemented at each KOP, and focused on identifying changes in form, line, color, and texture, considering the following environmental factors: distance, viewer geometry, duration of view, motion, atmospheric conditions, light conditions, scale, and spatial relationships (BLM 1986; 2013). Viewer exposure was assumed to be year-round; therefore, seasonality was not considered as a differentiating environmental factor in the analysis. Visual contrast was defined per BLM (1986), as follows:

- **None.** The element contrast is not visible or perceived.
- **Weak**. The element contrast can be seen but does not attract attention.
- **Moderate**. The element contrast begins to attract attention and begins to dominate the characteristic landscape.
- **Strong**. The element contrast demands attention, would not be overlooked, and is dominant in the landscape.

3.3.2 Visual Resource Inventory Analysis

An analysis was conducted to identify potential change in VRI values of scenic quality and visual sensitivity for portions of BLM-administered lands within the Palm Springs FO planning area as a result of the RE Crimson Solar Project. This analysis identified the expected change in VRI values by comparing scenic quality and visual sensitivity classifications under the operational phase of the Project to original ratings provided in the BLM's VRI of the Palm Springs FO (BLM 2010). Because no additional major roads are required or proposed by the Project, it is assumed that there would be no change in visual distance zones, as primary viewer platforms would remain the same (I-10). The analysis was restricted to SQRUs and SLRUs that overlap with the Project area and/or the viewshed.

4. Existing Baseline Conditions

4.1 Existing Baseline Visual Resources

The landscape setting of the Project area is generally characterized by large expanses of desert with lush agricultural croplands to the east in the irrigated Imperial Valley and surrounding mountain ranges rising from the desert floor. The Project area includes the broad, flat Chuckwalla Valley to the west and the western edge of the Colorado River Valley is approximately 4.5 miles to the east. The rugged ranges of the McCoy Mountains are to the northeast, Palen Mountains to the northwest, Chuckwalla Mountains to the west, and Mule Mountains to the south. These mountains are recognized as unique features by County of Riverside and form a backdrop that provides scale, variety, interest, and enclosure to this broad landscape (County of Riverside 2014).

The Project site itself is nearly completely vacant and undeveloped land. Sparse desert scrub vegetation covers most of the site, including sparsely vegetated desert dunes and more heavily vegetated desert washes. The larger washes containing the microphyll woodland vegetation community will be almost entirely avoided by the Project. Of the onsite native desert vegetation communities, creosote bush, white bur, sage scrub is the most widespread. Terrain onsite generally slopes down from higher land at the base of the Mule Mountains to the south.

The Project site is not located within a Desert Wildlife Management Area (DWMA), Area of Critical Environmental Concern (ACEC), a designated Wilderness Area, or Herd Management Area; however, it is north of the Mule Mountains ACEC, and east of the Chuckwalla Valley Dune thicket and Chuckwalla DWMA.

The Bradshaw Trail, also known as the "Gold Road to La Paz," is a 65-mile backcountry byway extending from approximately 35 miles southeast of Indio, California, to approximately 15 miles southwest of Blythe, California. The route traverses mostly public land between the Chuckwalla Mountains and the Chocolate Mountain Aerial Gunnery Range. The trail is characterized as a dirt road that is periodically graded by the Riverside County Transportation Department. Four-wheel-drive vehicles are recommended because of stretches of soft sand and dry wash. The Bradshaw Trail connects to State Route 78 approximately 12 miles south of the intersection with I-10. Portions of the Bradshaw Trail intersect the Project viewshed in the foreground/middleground and background distance zones. Multiple recreation-based viewing opportunities exist along the Bradshaw Trail. While there are viewing opportunities along recreational trails in the project viewshed, these locations were not identified as scenic vistas. Some locations along trails in the area can provide trail-based recreationalists scenic views across the project viewshed, dependent upon elevation and intervening vegetation and topography. However, these views are typical of the area and do not have uniquely high quality, distinctive scenery, or other exceptional visual features.

The SCE high-voltage transmission line and CRS are located directly north of the Project site. I-10 is approximately 1 mile north of the northern Project boundary.

Though the Project area is characterized by large areas of undeveloped land, industrial, commercial, and residential development is present in adjacent areas. Recent solar developments, existing and proposed, are also near and adjacent to the Project site. Approximately 3 miles east of the Project site is First Solar's proposed Desert Quartzite project. Further northeast of the Desert Quartzite project is the site of the recently approved Blythe Mesa Solar Project. Development in the immediate area includes:

- The Blythe Energy Center, a 520-MW combine cycle power plant located approximately 7.5 miles to the northeast of the Project site;

- The Blythe Solar Project, a 21-MW PV solar facility and gen-tie located approximately 7 miles to the northeast of the Project site;
- The SCE Colorado River Substation, located immediately north of the Project;
- Multiple existing high-voltage transmission lines to the north and east of the Project site;
- I-10, running in an east/west direction and located approximately 1.75 miles to the north of the Project site;
- The Blythe Municipal Airport, located approximately 5.5miles northeast of the Project;
- Chuckwalla and Ironwood Prisons, located approximately 3 miles west of the Project site; and
- The communities of Blythe (12 miles), Ripley (9 miles), and Nicholls Warm Springs/Mesa Verde (4.5 miles), located generally to the east of the Project site.

Results of the baseline conditions assessment are described below, including planning-level VRI values (scenic quality, visual sensitivity, and distance zones), and KOPs.

4.2 Visual Resource Inventory Values: BLM Palm Springs Field Office

The Project area is located in an area designated as VRI Class II, indicating high scenic value. Results of the BLM's VRI for the Palm Springs FO planning area (BLM 2010) that are within or partially within the Project area are summarized below.

4.2.1 Scenic Quality

Permit Area

The Permit Area overlaps Chuckwalla Valley SQRU (SQRU 021) (Figure 4-1). The Chuckwalla Valley extends from Blythe, northwest to Midland, and west to Desert Center. Scenic Quality was ranked as Class B (Table 4-1). This unit is characterized as a broad, enclosed landscape bordered by the rugged Mule, McCoy, Palen, Big Maria, and Chuckwalla Mountains. The valley bottom is characterized as vast, low, and gently rolling. Some variety in vegetation exists and is considered somewhat visually dominant. The area appears natural, despite some cultural modification (BLM 2010).

TABLE 4-1
SCENIC QUALITY RATING: CHUCKWALLA VALLEY (SQRU 021)[1]

Criteria	Rating	Rationale
Landform	1	Vast, low, gently rolling valley bottom
Vegetation	3	Some variety in vegetation; one or two major types
Water	0	None present
Color	2	Subtle variation
Adjacent scenery	4	Dramatic mountains surrounding area
Scarcity	2	Fairly distinctive but not unusual
Cultural modification	0	Some cultural modification but overall natural- appearing
Total score	12	

Scenic quality rating[2]	B	12–18 points

[1] Source: BLM 2010 (Note that text is taken directly from this report; no additional rationale was provided, as this inventory is considered complete).

[2] Refer to Section 3.2.1 for description of ratings.

Adjacent Scenic Quality Rating Units

The Permit Area is located adjacent to the following SQRUs: Mule Mountains, Little Chuckwalla Mountains, and McCoy Mountains (Figure 4-1). Palo Verde SQRU is located around the Mule Mountains. The adjacent areas were evaluated to better understand how the landscape of the Permit Area, and its associated SQRU (Chuckwalla Valley) affected scenic quality of these adjacent units (as evaluated through the “Adjacent Scenery” key factor). Scenic quality for each unit is summarized below.

Mule Mountains (SQRU 038)

The Mule Mountains (SQRU 038) is located south of the Project area, in the Mule Mountains. This unit is characterized by interesting detail in landform created by a linear series of rough, serrated formations that appear prominent against the surrounding valley. Some evidence of mining exists; however, it is not dominant and does not detract from scenic quality. Overall scenic quality was ranked as Class B (Table 4-2) (BLM 2010).

TABLE 4-2
SCENIC QUALITY RATING: MULE MOUNTAINS (SQRU 038)[1]

Criteria	Rating	Rationale
Landform	3.5	Interesting detail feature
Vegetation	1	Sparse
Water	0	Not present or noticeable
Color	2.5	Subtle variation
Adjacent scenery	3	Moderate views of adjacent units
Scarcity	2.5	Common
Cultural modification	0	Not very noticeable
Total score	12.5	
Scenic quality rating[2]	B	12–18 points

[1] Source: BLM 2010 (Note that text is taken directly from this report; no additional rationale was provided as this inventory is considered complete).

[2] Refer to Section 3.2.1 for description of ratings.

Little Chuckwalla Mountains (SQRU 039)

SQRU 039 is located east of the Project area, adjacent to the Little Chuckwalla Mountains Wilderness Area to the west. The unit transitions from the rough formations of the Little Chuckwalla Mountains toward the Chuckwalla Valley to the east. Overall, the area appears natural, with no evidence of cultural modification. Vegetation is sparse. Overall scenic quality was ranked as Class B (Table 4-3) (BLM 2010).

TABLE 4-3
SCENIC QUALITY RATING: LITTLE CHUCKWALLA MOUNTAINS (SQRU 039)[1]

Criteria	Rating	Rationale
Landform	3.5	Some interest
Vegetation	1	Sparse
Water	0	Not present or noticeable
Color	3.5	Interesting contrast
Adjacent scenery	3	Moderate views
Scarcity	2.5	Not scarce
Cultural modification	0	None present
Total score	13.5	
Scenic quality rating[2]	B	12–18 points

[1] Source: BLM 2010 (Note that text is taken directly from this report; no additional rationale was provided as this inventory is considered complete).

[2] Refer to Section 3.2.1 for description of ratings.

McCoy Mountains (SQRU 026)

SQRU 26 is located in the McCoy Mountains, north of the Project area. The unit is characterized as a naturally appearing, rugged, and highly eroded mountain range. Vegetation is sparse, with little variety. Colors are generally monotone, with some contrast between the grey tones of the rock and brown tones of the soil. Adjacent scenery of neighboring Joshua Tree National Park, and the Palen, McCoy, and Big Maria Wilderness Areas, enhance scenic quality of this unit. Evidence of surface mining and milling exists and is considered discordant. Scenic quality was ranked as C (Table 4-5) (BLM 2010).

TABLE 4-5
SCENIC QUALITY RATING: McCOY MOUNTAINS (SQRU 026)[1]

Criteria	Rating	Rationale
Landform	3	Rugged Mountains, deep canyons
Vegetation	1	Little variety; not noticeable
Water	0	None present
Color	2	Some contrast between soil and rock
Adjacent scenery	4	Dramatic adjacent National Park and Wilderness
Scarcity	2	Somewhat distinctive but not unusual
Cultural modification	-2	Landscape significantly modified by surface mining/milling
Total score	10	
Scenic quality rating[2]	C	11 points or less

[1] Source: BLM 2010 (Note that text is taken directly from this report; no additional rationale was provided as this inventory is considered complete).

[2] Refer to Section 3.2.1 for description of ratings.

4.2.2 Visual Sensitivity

Permit Area

The Permit Area is located in Bradshaw Trail Backcountry Byway SLRU (SLRU 49) (Figure 4-2). This unit encompasses the eastern portion of the Chuckwalla Valley, extending from approximately the McCoy Mountains, south to the Palm Springs FO planning area boundary, and east to the Little Chuckwalla Mountains. Visual sensitivity was classified as high, primarily due to presence of the Byway, high off highway vehicle (OHV) use, and importance of maintaining scenic quality to sustain land use objectives of neighboring Wilderness Areas, ACECs, and military ranges (Table 4-6) (BLM 2010).

TABLE 4-6
VISUAL SENSITIVITY: BRADSHAW TRAIL SLRU (SLRU 49)[1]

Criteria	Rating[2]	Rationale
Type of use	M	OHV, camping in the area, rural travelers
Amount of use	H	Indication of high OHV use, popular trail
Public interest	H	Backcountry Byway, historic trails
Adjacent land use	H	Military range, wilderness, various Areas of Critical Environmental Concern
Special areas	H	Part of California Desert Conservation Area
Other factors	NP	National designation
Overall rating	H	Backcountry Byway with high OHV use.

1 Source: BLM 2010 (Note that text is taken directly from this report; no additional rationale was provided as this inventory is considered complete).

2 Refer to Section 3.2.1 for description of ratings.

Adjacent Sensitivity Level Units

Adjacent Visual Sensitivity Units include McCoy Mountains (SLRU 26), Mule Mountain (SLRU 46) and Little Chuckwalla Mountains (SLRU 39). These SLRUs were evaluated to understand the influence of existing adjacent land use on visual sensitivity of areas surrounding the Permit Area.

<u>Mule Mountains (SLRU 46)</u>

Mule Mountains (SLRU 46) is a small unit located south of the Project area in the Mule Mountains. Visual sensitivity was ranked as medium, largely due to low recreation use and limited access. The area is recognized for its proximity to the Mule Mountains Long Term Visitor Area, its designation as an ACEC, and its inclusion in the CDCA (Table 4-7) (BLM 2010).

TABLE 4-7
VISUAL SENSITIVITY: MULE MOUNTAINS (SLRU 46)[1]

Criteria	Rating[2]	Rationale
Type of use	L	Not very accessible
Amount of use	L	Low use
Public interest	M	Proximity to Long Term Visitor Area
Adjacent land use	M	Valley, Mule Mountains
Special areas	H	ACEC; part of CDCA
Other factors	NP	Not present
Overall rating	M	Some concern

[1] Source: BLM 2010 (Note that text is taken directly from this report; no additional rationale was provided as this inventory is considered complete).

[2] Refer to Section 3.2.1 for description of ratings.

McCoy Mountains (SLRU 26)

SLRU 26 is located north of the Project area, in the McCoy Mountains. Visual sensitivity of this unit was ranked as medium, as it is not considered a primary recreation destination (Table 4-8). Maintenance of scenic quality is of moderate importance as it is a visual backdrop for the I-10 corridor and is part of the CDCA (BLM 2010).

TABLE 4-8
VISUAL SENSITIVITY: MCCOY MOUNTAINS (SLRU 26)[1]

Criteria	Rating[2]	Rationale
Type of use	L	Mining, some recreation
Amount of use	L	Not a significant recreational attraction
Public interest	M	Part of CDCA
Adjacent land use	M	Visual backdrop for Blythe and I-10 corridor
Special areas	H	Part of CDCA
Other factors	NP	Not present
Overall rating	M	Part of the CDCA and an important visual backdrop along the I-10 corridor

[1] Source: BLM 2010 (Note that text is taken directly from this report; no additional rationale was provided as this inventory is considered complete).

[2] Refer to Section 3.2.1 for description of ratings.

Little Chuckwalla Mountains (SLRU 39)

SLRU 39 is a small unit located southwest of the Project area in the Little Chuckwalla Mountains. Visual sensitivity is classified as medium (Table 4-9), largely because it is located in the viewshed of I-10 and is part of the CDCA.

Maintenance of scenic quality is also considered important to sustain neighboring Wilderness Areas and the Chuckwalla Valley. The area is characterized by limited access and low use (BLM 2010).

TABLE 4-9
VISUAL SENSITIVITY: LITTLE CHUCKWALLA MOUNTAINS (SLRU 39)[1]

Criteria	Rating[2]	Rationale
Type of use	L	Possible 4x4
Amount of use	L	Not much access
Public interest	M	Seen from highway
Adjacent land use	M	Wilderness, valley
Special areas	H	Part of CDCA
Other factors	NP	Not present
Overall rating	M	Not a lot of use

1 Source: BLM 2010 (Note that text is taken directly from this report; no additional rationale was provided as this inventory is considered complete).

2 Refer to Section 3.2.1 for description of ratings.

4.2.3 Distance Zones

The Project is located in the foreground-middleground distance zone, indicating visibility of this area from locations within 3 to 5 miles from viewing platforms. The primary viewing platform is I-10 (BLM 2010).

4.3 Key Observation Points

Five KOPs were established to evaluate baseline conditions and potential impacts to visual resources at the Project level (Figure 4-3). Table 4-10 below summarizes environmental factors that could influence Project visibility and visual contrast level. Text that follows describes existing landscape character and scenic quality attributes as viewed from each KOP. KOPs were selected to represent common and sensitive views of the project area.

Visual resources and viewer groups located within the analysis area were identified by desktop review of relevant planning documents and selected in cooperation with the BLM Palm Springs FO. All KOPs were approved by BLM. Three of the KOPs are at sensitive cultural sites and are considered confidential, and therefore are not fully described in the text. The three cultural KOPs were specifically identified by the BLM in response to local tribal input. Because of the confidential nature of three of the KOPs specific location is not provided; however, all KOPs can be assumed to be accessible due to their location on public land.

TABLE 4-10
KEY OBSERVATION POINTS

KOP	Location	Distance From Project (Approximate Miles)	Viewer Geometry	Duration of View
KOP 1	Not Identified	0.5-15	At grade	Sustained (Potential)
KOP 2	Interstate 10	5.0	At grade	Temporary/intermittent
KOP 3	Not Identified	0.5	Superior	Sustained (Potential)

KOP 4	Not Identified	1.0	Superior	Sustained (Potential)
KOP 5	Wiley's Well Road	4.0	At grade	Temporary/intermittent

Key Observation Point 1

The landscape at KOP 1 is characterized by the broad, flat Palo Verde Valley, including the open desert environment of the valley, adjacent agricultural fields to the east, and the rugged Mule Mountains to the west and south (Figure 4-4). The valley appears large in scale, with enclosure provided by the bold forms and rugged silhouette of the McCoy Mountains to the north and the Big Maria Mountains to the northwest. The exposed gravelly loam soils of the valley are a dominant feature, appearing coarse due to the angular rocky substrate. Vegetation is composed of discrete oval-shaped shrubs that appear stippled across the landscape. Predominant color appears as muted grey to pink tones intermixed with the green tones of the vegetation. Viewer geometry relative to the Project is generally at grade at this location.

Key Observation Point 2

I-10 is a major east-west four-lane interstate highway that runs from Arizona through California. It is located north of the Project site and traverses through the center of the Riverside East SEZ. Though Riverside County has designated I-10 as an eligible County Scenic Highway, it is not designated as an eligible scenic highway by Caltrans' California Scenic Highways Program. Annual average daily traffic on I-10 north of the Project (Wiley's Well Road to Mesa Drive) is estimated at 20,200 (see http://www.interstate-guide.com/i-010_aadt.html).

This KOP is representative of roadway travelers traveling east- and westbound along I-10 (Figure 4-5). Viewer geometry relative to the Project is generally at grade; however, superior viewer positions do exist as westbound travelers descend from the Domee Rock Mountains toward the City of Blythe, the Palo Verde Mesa, and the Chuckwalla Valley. From I-10, the landscape appears large in scale and enclosed. The flat valley creates a broad horizontal line, interrupted only by the discrete and rugged landforms of the surrounding mountains. When traveling westbound, the landscape appears natural. A 500 kV transmission line parallels I-10 from Palm Springs; despite the modification to the landscape from this feature, the landscape appears largely intact. When traveling eastbound, the City of Blythe is dominant in the foreground-middle ground.

Key Observation Point 3

KOP 3 is located at the base of the Mule Mountains along a single-track roadway. The landscape is characterized by the rugged, exposed rocks of the Mule Mountains, a gravel road and adjacent fencing (Figure 4-6). Views to the north and east from this location are large in scale and panoramic, including the broad agricultural landscapes of the Town of Ripley, and the open desert landscape leading north toward the McCoy Mountains. Views to the west/northwest are enclosed by the rugged topography and higher elevation ridges of the Mule Mountains. Viewer geometry relative to the Project is generally superior. The primary viewers at this location are expected to include ORV users, and individuals exploring the mountains.

Key Observation Point 4

KOP 4 is located in the Mule Mountains. The landscape is characterized by superior views of the broad Chuckwalla Valley and McCoy and Big Maria Mountains to the north (Figure 4-7). The landscape appears large in scale and enclosed. Views directly north of this KOP are dominated by the existing SCE CRS, multiple existing high voltage transmission lines in the foreground-middleground, and I-10 in the background. Viewer geometry relative to the Project is superior. This KOP represents a viewshed from within the Mule Mountains.

Key Observation Point 5

KOP 5 is located along Wiley's Well Road, south of I-10. This KOP is representative of a dirt roadway extending south from I-10 to the Bradshaw Trail. From this KOP, the landscape appears broad and flat, characterized by a distinct horizontal line created by the valley floor. Views extend to the background distance zone, with some enclosure provided by the McCoy and Mule Mountains to the east (Figure 4-8). The Mule Mountain Long Term

Visitor Area is located to the south. Recreators may use this facility for seasonal long-term (September 15 to April 15) or short-term (14 days) visitation (see http://www.blm.gov/ca/st/en/fo/elcentro/recreation/ltvas.html).

5. Impact Assessment

5.1 Visual Contrast Rating

Potential impacts to visual resources that may result from construction and/or operation of the Project were assessed at five KOPs established in the study area. The impact assessment was based on visual simulations of the operational phase prepared for each of the KOPs.

Visual contrast of the Project was assessed from each KOP. Relevant environmental factors and results of the visual contrast rating and are described below and summarized in Table 5-1. Overall Project visibility was determined to be greatest at KOPs situated at close proximity and at an elevated vantage point relative to the Project. Because of the low stature of the solar panels, the gently sloping or rolling topography of the valley floor would block views of this feature from KOPs situated at grade.

Key Observation Point 1

When viewed from KOP 1, visual contrast of the Project during construction and operational phases would be weak (Figure 5-1). Though no high elevation or prominent topography or vegetation exists between the Project area and the view point, the low-stature solar array would be screened by the gently rolling topography and vegetation of the valley. Where vegetation is sparse or open, the profile of the panels would be visible and could result in strong visual contrast. Visual contrast would primarily be the result of the discrete, horizontal line and smooth surface of the panel against the surrounding vegetation.

Key Observation Point 2

Construction of the Project would result in weak-moderate visual contrast when viewed from KOP 2, I-10 (Figure 5-2). Primary sources of contrast would result from the density and movement of construction vehicles, workers, and activities such as site preparation and grading, solar array installation, equipment installation, on-site substation and operations and maintenance building construction, and gen-tie tower and conductor installation. Such activity would contrast at a moderate level against the primarily natural setting of the Chuckwalla Valley and the Palo Verde Mesa. Contrast of graded areas would increase incrementally as construction progressed and could contrast with the flat and uniform appearance, smooth texture, and distinct tan color where desert pavement was removed. Overall visual contrast of cleared areas would be weak, as views of the ground-plane would be largely shielded by vegetation for viewers situated at-grade along I-10 relative to the Project. For viewers situated at a higher elevations along I-10, visual contrast of the Project would be weak to moderate. Viewer exposure would be transient, and experienced at high speeds while traveling along I-10.

Key Observation Point 3

Visual contrast of the Project during construction and operational phases would range from none to moderate when viewed from KOP 3 (Figure 5-3). The moderate stature elevation of the Mule Mountains would screen views of the majority of the Project. Views directed to the north could perceive moderate contrast of the Project's eastern edge; however the Project would appear subordinate due to the scale of the surrounding landscape.

Key Observation Point 4

Visual contrast of the Project when viewed from KOP 4 would be strong due to the scale of the Project, and the elevated vantage point of this KOP (Figure 5-4). Visual contrast during the construction phase would primarily result from the density and movement of construction vehicle, workers, and flat, uniform appearance, smooth texture, and distinct tan color of graded areas.

During operation of the Project, strong visual contrast would result from the broad, flat form and dark, reflective surface of the solar panels against the exiting muted tones of the landscape. From this elevated viewer platform, the scale of the solar panels would dominate the landscape. Other Project features, including the gen-tie, would be visible; however, these features would contrast at a weak level against the existing landscape, largely due to the presence of multiple other transmission structures with similar form, line, and axis within the study area.

Viewer exposure to visual contrast of the Project during construction and operational phases would be intermittent to sustained, depending on the prevailing use of the area.

Key Observation Point 5

Visual contrast of the Project from Wiley's Well Road during construction and operational phases would be none to weak (Figure 5-5). The low visibility of the Project from this location is primarily due to screening of construction-related actions and solar arrays by the low rolling topography of the Chuckwalla Valley. Visibility of taller structures, such as the gen-tie, would also result in none to weak visual contrast, largely due to the location of these features relative to this observation point and the difficulty in discerning the narrow vertical line of these features at this distance. In addition, the presence of other existing transmission lines in and surrounding the Project site would reduce the contrast created by the proposed collector poles and gen-tie structures.

TABLE 5-1
LANDSCAPE CHANGE AND VIEWER EXPOSURE

			Landscape Change			Viewer Exposure	
KOP Number	**KOP Name**	**Approximate Distance (Miles)**	**Overall Visual Contrast**	**Source of Contrast**	**Scale Dominance**	**Viewer Geometry**	**Duration of View**
1	Not Identified	0.5 to >15	Weak – Strong[1]	Form, Line, texture of Panel	Sub- to Codominant	At Grade	Variable
2	Interstate 10 (a-h)	0.5 to >15	Weak -Moderate[2]	Form; color; texture	Dominant	Oblique/superior	Intermittent
3	Not Identified	0.5 to >15	None-Moderate	Line	Subdominant	At Grade	Variable
4	Not Identified	0.5 to >15	Strong	Form, Texture	Dominant	Superior	Sustained
5	Wiley's Well Rd	0.5 to >15	None-Weak	Line, Texture	Subdominant	At Grade	Intermittent

[1] Visual contrast is none/weak where screened by vegetation.

[2] Visual contrast may increase to a moderate level depending on the vantage point within this resource.

5.2 Visual Resource Inventory Analysis

The VRI analysis was implemented for the Chuckwalla Valley SQRU (SQRU 21) and for the Bradshaw Trail National Backcountry Byway SLRU (SLRU 49). Additional inferences were made for adjacent SQRUs (Mule Mountains, Little Chuckwalla Mountains, and McCoy Mountains) and SLRUs (Mule Mountains, McCoy Mountains, and Little Chuckwalla Mountains). This assessment summarizes impacts to scenic quality and visual sensitivity based on estimated changes to key factor rating scores documented in the BLM's VRI for the Palm Springs FO (BLM 2010). This assessment is completed per requirements of FLPMA, and to allow the BLM to document potential change in the distribution of scenic values across the planning area.

For scenic quality, the primary key factors that could reduce scenic quality ratings are "cultural modification", "vegetation", and "adjacent scenery." Potential visual contrast of the Project could appear discordant, thereby reducing the score for "cultural modification." Vegetation clearing and grading could result in unnatural lines or patterns in vegetation. Likewise, if the land use objectives associated with a particular SQRU were identified as being reliant on the scenic quality of the Permit Area, the overall score for "Adjacent Scenery" could be reduced under operational conditions. The results of the scenic quality analysis are provided in Table 5-2.

For visual sensitivity, the primary factor that is evaluated under the Projects operational scenario in the VRI analysis is "Adjacent Land Use," which measures the importance of maintaining visual quality to sustain adjacent land use objectives. The VRI analysis addresses long-term impacts to visual resources that may result from the Project under operational conditions.

5.2.1 Scenic Quality

Potential impacts to scenic quality are described below and summarized in Table 5-2.

TABLE 5-2
SCENIC QUALITY RATING UNIT IMPACT SUMMARY

Scenic Quality Rating Unit[1]	Existing Rating[1]	Estimated Post-Project Rating	Rationale
Chuckwalla Valley (SQRU 21)	B	C	Reduction in Cultural Modification from 0 to -4. Landscape would appear industrial during operation of the Project. Note that Project would be located inside this SQRU.
McCoy Mountains (SQRU 26)	C	C	The Project would not be visible from the majority of this SQRU; contribution of "Adjacent Scenery" to this SQRU is not expected to be diminished due to operation of the Project.
Mule Mountains (SQRU 38)	B	C	Adjacent Scenery not expected to contribute to scenic quality following construction and operation of the Project, as adjacent areas would appear industrial in character. A reduction of 3 to 0 in the score for that key factor is expected. (Note that Project would be located outside this SQRU)
Little Chuckwalla Mountains (SQRU 39)	C	C	Same as above.

1 Source: BLM 2010.

2 Refer to Section 3.2.1 for description of ratings.

Chuckwalla Valley Scenic Quality Rating Unit (SQRU 21)

The Project is located in SQRU 21 (Chuckwalla Valley). The results of the contrast rating completed at the KOPs indicate that the Project, under operational conditions, would dominate the landscape when viewed from superior viewer positions. When viewed from these higher elevation vantage points, moderate-strong contrast of the Project could extend to background distance zones. Visibility of the Project is limited in areas situated at similar elevation due to the low profile of the solar arrays. The solar arrays, considered the dominant visual element of the Project, would be discordant with existing naturally appearing character attributes of the Chuckwalla Valley, thereby potentially reducing the ranking of cultural modification in SQRU 21 from 0 (neutral) to -4. A reduction in value could reduce the overall scenic quality rating score from 12 to 8 and the overall scenic quality rating classification from B to C. The expected level of cultural modification within this portion of SQRU 21 is not expected to warrant splitting the SQRU in planning records, as transmission lines and other solar developments are present throughout the unit.

McCoy Mountains Scenic Quality Rating Unit (SQRU 26)

The Project is located south of the McCoy Mountains SQRU (SQRU 26). Based on the viewshed models prepared for all Project components, the Project would not be visible from the majority of this SQRU. The dramatic landscape of the Big Maria Mountains Wilderness (East of the McCoy Mountains) was recognized in the scenic quality assessment as a major contribution to overall visual quality of this SQRU, with a value of 4 assigned to "Adjacent Scenery." Operation of the Project is not expected to detract from the quality of existing adjacent scenery in the Big Maria Mountains Wilderness Area. Consequently, no change in scenic quality rating is expected to result in SQRU 26 as a result of the Project.

Mule Mountains Scenic Quality Rating Unit (SQRU 38)

The Project is located northeast of SQRU 38 (Mule Mountains). "Adjacent Scenery" moderately enhances scenic quality of this unit, with a value of 3 assigned to this key factor. The Project would be visible from the northern portion of this SQRU, where the Project could appear as a dominant element of "Adjacent Scenery." The Project could appear discordant, thereby reducing the overall contribution of the portion of the adjacent scenery to the overall score. A conservative reduction of 1 point the value for "Adjacent Scenery" due to visual contrast of the Project would decrease the overall scenic quality score from 12.5 to 11.5. This reduction in the scenic quality score would change the existing scenic quality classification of B to C.

Little Chuckwalla Mountains Scenic Quality Rating Unit (SQRU 39)

The Project is located east of SQRU 39 (Little Chuckwalla Mountains). "Adjacent Scenery" moderately enhances scenic quality of this unit, with a value of 3 assigned to this key factor. Based on the viewshed models, the Project could be visible from the northeastern edge of this SQRU. However, "Adjacent Scenery" is expected to be dominated by the rugged topography of the Mule, McCoy and Little Chuckwalla Mountains. Consequently, no change in the inventoried value for "Adjacent Scenery" is expected and no change in the scenic quality classification of B is expected to result from operation of the Project.

5.2.2 Visual Sensitivity

Permit Area

Operation of the Project could alter visual sensitivity within SLRU 49 (Bradshaw Trail National Backcountry Byway SLRU). This SLRU extends from the Imperial County/Riverside County border to approximately 10 miles north of the Bradshaw Trail, including the Chuckwalla Valley, Palo Verde Mesa, and Palo Verde Valley.

The sensitivity level analysis for this unit indicated a high score for "Amount of Use", "Public Interest", and "Special Areas". These ratings reflect the recreation use in the area and the presence of the Back Country Byway, historic trail, and inclusion in the CDCA. Operation of the Project is no expected to impact these values, and visual sensitivity toward change in a landscape character would remain high.

The sensitivity level analysis for this unit also indicated a high score for "Adjacent Land Use," because of the importance of maintaining scenic quality for adjacent land use, including a military range, Wilderness Areas, and

ACECs. Operation of the Project could alter the landscape character of the Palo Verde Valley, thereby affecting the viewshed of these neighboring areas.

5.3 Impact Assessment Summary and Findings

Moderate to strong visual contrast was identified under certain conditions at four KOPs analyzed: KOP 1, KOP 2, KOP 3, and KOP 4. Moderate to Strong contrast at each of these sites is expected to be experienced intermittently from specific locations where the line of site and higher elevation vantage point align. From many locations represented by these KOPs, views of the Project would be blocked, or result in a weak visual contrast.

Strong visual contrast at KOP 4 is expected to be sustained given the high elevations vantage point of this location, and the unfettered views across the valley.

This conclusion is consistent with the expected visual contrast levels described in the Final Solar PEIS, which analyzed potential impacts of several solar facilities (BLM 2012). Based on this expected level of contrast and scale dominance, scenic quality of two of the affected SQRUs could be reduced. The key factor for "Adjacent Land Use" within Bradshaw Trail Backcountry Byway SLRU could also be affected, as operation of the Project would alter the viewshed of adjacent land uses.

An overall impact determination is provided below. This determination summarizes the expected impact in terms of its magnitude/intensity, direction, geographic extent, and context. Criteria used in this assessment draw from the contrast rating, and VRI analysis (Table 5-3).

The rating scales provided below provide a guideline to place the effects of the Project in an appropriate context and to reach summary conclusions about the level of impact, taking into account the impact factors of intensity, duration, extent, and context.

Impacts may be beneficial or adverse. Impacts are generally assumed to be adverse, unless specifically noted as beneficial:

- **Major**. Impacts would be high intensity, resulting from strong visual contrast, scale dominance, prolonged viewer duration, and within the foreground-middleground distance zone. Long-term or permanent impacts would be regional or extended in geographic extent. Impacts would affect areas defined as having outstanding or high visual values (important or unique).
- **Moderate**. Impacts would be medium-high intensity, resulting from moderate to strong visual contrast, prolonged or intermittent viewer duration, and within the foreground-middleground or background distance zone; however viewer exposure to high intensity impacts would be intermittent and experience from background distance zone. Project related visual contrast would be co-dominant with existing features. Temporary or long-term impacts would be local or regional in geographic extent. Impacts would affect areas defined as having high visual value (common or important).
- **Minor**. Impacts would be of low intensity, resulting from weak visual contrast, prolonged or intermittent viewer duration, and within the foreground-middleground or background distance zone. Project related visual contrast would be subordinate to existing features. Temporary or long-term impacts would be local geographic extent. Impacts would affect areas defined as having low to high visual value (common).
- **No effect**. No effect would occur if the facilities would be isolated, screened by prevailing vegetation or topography, not noticed in the view, most often seen from background distance zones, or where no visually sensitive resources would be affected.

TABLE 5-3
IMPACT CRITERIA FOR VISUAL RESOURCES

Magnitude or Intensity	**Low.** Project components result in low to no visual contrast against the existing landscape, viewer duration is prolonged or transient, and experienced from foreground-middleground or background distance zones. Project-related impacts are subordinate.	**Medium.** Project components result in moderate to strong visual contrast against the existing landscape, viewer duration is prolonged or transient, and views are experienced from foreground-middleground or background distance zones. Project-related impacts are co-dominant.	**High.** Project components result in strong visual contrast against the existing landscape, viewer duration is prolonged, and views are experienced from foreground-middleground distance zones. Project-related impacts are dominant.
Duration	**Temporary**. Changes to landscape character would last less than 3 years or for the duration of Project construction.	**Long-term.** Changes to landscape character would extend for the life of the Project.	**Permanent**. Changes to landscape character would last longer than the estimated life of the Project.
Geographic Extent (Viewshed limiting factors)	**Local.** The geographic extent of the affected area would not extend beyond the foreground-middleground distance zone (3–5 miles); key factor used to rank scenic quality in affected SQRU(s) could be changed; however, no change to VRI values for affected SQRUs would result.	**Regional.** The geographic extent of the affected area would extend to the background distance zone (15 miles) and/or VRI scores for affected SQRU(s) would be altered.	**Extended.** The geographic extent of the affected area would extend beyond the background distance zone (15 miles) and VRI scores for affected SQRU(s) would be altered.
Context	**Common.** The affected area is ranked as VRI Class IV (low visual value). The affected area is not recognized for its scenic value.	**Important.** The affected area is ranked as VRI Class II (high visual value) or III (moderate visual value). The affected area may be recognized for its scenic quality, though scenic resources are not protected by existing legislation.	**Unique.** The affected area is ranked as VRI Class I. The affected area is managed by legislation aimed at the protection of visual resources.

Impacts to visual resources from the Project are expected to be of **medium-high intensity, long-term, regional, and affecting important resources**. Impacts would be experienced from locations in the foreground-middleground, where viewer duration is prolonged. However, because most locations analyzed represent viewer experience of recreators or roadway travelers, predominant viewer exposure is expected to be transient. The duration of impacts is considered long-term, extending for the life of the Project. The geographic extent of impacts is considered regional, as the distribution of VRI values would be altered within the Palm Springs FO planning area. Affected resources are considered important, as portions of the Project area were ranked as VRI Class II (high visual value), and adjacent areas include areas of special designations such as ACECs and cultural sites. Overall, the Project is expected to result in **moderate impacts to visual resources**.

5.4 Cumulative Impacts

The following reasonably foreseeable future actions are located within 15 miles of the proposed RE Crimson Solar Project, and therefore have the potential to affect cumulative impacts in the vicinity of the Project:

- 14 solar energy projects are at some stage in permitting or development.
- 3 electrical transmission lines are approved, constructed, or operational.

- 1 power plant
- One communication tower
- Residential development

The Project combined with other planned energy and infrastructure projects, has the potential to result in strong visual contrast that extends across a large geographic area. Collectively, cumulative impacts could change the landscape from one that is primarily natural appearing, to industrial.

The Solar Draft PEIS (BLM 2012) evaluated potential cumulative impacts of an 80% build out of the SEZ to a suite of sensitive viewer receptors. Consistent with the findings for this Project-level assessment of direct and indirect impacts, the Solar Draft PEIS concludes that potential visual impacts could affect a broad geography extending out to 25 miles. Cumulative impacts, as measured by visual contrast, are expected to be strongest where viewed from superior viewer positions, such as the higher elevations mountain ranges within the SEZ. From these viewer positions, facilities would appear large in scale and aerial extent, occupying the majority of lowland areas within the SEZ. Also consistent with this Project-specific analyses, visual contrast would be reduced when viewed from low oblique angles within the valley, and geographic extent of impacts would be smaller. Though variations in perceived visual contrast exist depending on specific viewer positions, impacts would be expected to involve major modification of the existing character of the landscape and would likely dominate the views from nearby locations. Additional impacts would occur as a result of the construction, operation, and decommissioning of related facilities, such as access roads and electric transmission lines within the SEZ. While the primary visual impacts associated with solar energy development within the SEZ would occur during daylight hours, lighting required for utility-scale solar energy facilities would be a potential source of visual impacts at night, both within the SEZ and on surrounding lands.

In summary, cumulative impacts would be high intensity, resulting from strong visual contrast and scale dominance of energy and infrastructure projects. Viewer duration could be prolonged, and within the foreground-middleground distance zone. Long-term or permanent impacts would be regional or extended in geographic extent. Impacts would affect areas defined as having outstanding or high visual values (important or unique). The contribution of the Project to overall cumulative impacts would be moderate.

5.5 Plan Conformance Determination

This section discusses conformance of the Project with existing federal, state and local land management objectives based on the results of the visual resource impact analysis.

5.5.1 Federal

5.5.1.1 Visual Resource Management System

Potential impacts to visual resources that may result from construction and operation of the Project would be consistent with that permitted under the Class IV VRM Objective assigned to the Project footprint. Projects sited in VRM Class IV management areas *"may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance and repeating the basic landscape elements* (BLM 1986)".

The Project would not meet VRM Class II objectives: *"to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the* casual observer*. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape*."

5.5.1.2 California Desert Conservation Area Plan

As discussed in Section 2.0, the Project is located in an area designated as Moderate Multiple Use (BLM 1980). The CDCA outlines the following actions to manage for the alteration of the natural character of the landscape that could occur as part of the multiple-use activities described in the plan:

(1) The appropriate levels of management, protection, and rehabilitation on all public lands in the CDCA will be identified, commensurate with visual resource management objectives in the multiple-use class guidelines.

(2) Proposed activities will be evaluated to determine the extent of change created in any given landscape and to specify appropriate design or mitigation measures using the Bureau's contrast rating process.

The CDCA Plan stipulates that solar energy development and new electric transmission facilities are allowed on Class L, M, or I lands provided that NEPA requirements are met.

The Project conforms to the land management objectives defined in the CDCA.

5.5.2 State of California

5.5.2.1 California Environmental Quality Act

In accordance with Appendix G of the CEQA Guidelines, a project would result in a significant impact on aesthetics and visual quality if the project would meet at least one of the following criteria:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings; and/or
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area or create substantial shadow on a sensitive use.

The results of this study indicate that the ***Project could result in potentially adverse effects to the degradation of visual character or quality of the site.***

5.5.3 County of Riverside

5.5.3.1 County of Riverside General Plan and Palo Verde Valley Area Plan

The County of Riverside General Plan and Palo Verde Valley Area Plan contain the following policies:

- PVVAP 10.1: "Protect the scenic highways in the Palo Verde Valley planning area from change that would diminish the aesthetic value of adjacent properties in accordance with the Scenic Corridors sections of the General Plan Land Use, Multipurpose Open Space, and Circulation Elements."
- C 19.1: "Preserve scenic routes that have exceptional or unique visual features in accordance with Caltrans' Scenic Highways Plan."
- OS 21.1: "Identify and conserve the skylines, view corridors, and outstanding scenic vistas within Riverside County."
- OS 22.1: "Design developments within designated scenic highway corridors to balance the objectives of maintaining scenic resources with accommodating compatible land uses."
- OS 22.4: "Impose conditions on development within scenic highway corridors requiring dedication of scenic easements consistent with the Scenic Highways Plan, when it is necessary to preserve unique or special visual features."

The Project is in conformance with these policies/land use objectives. Operation of the Project would not result in adverse impacts to scenic resources as observed from I-10.

6. References

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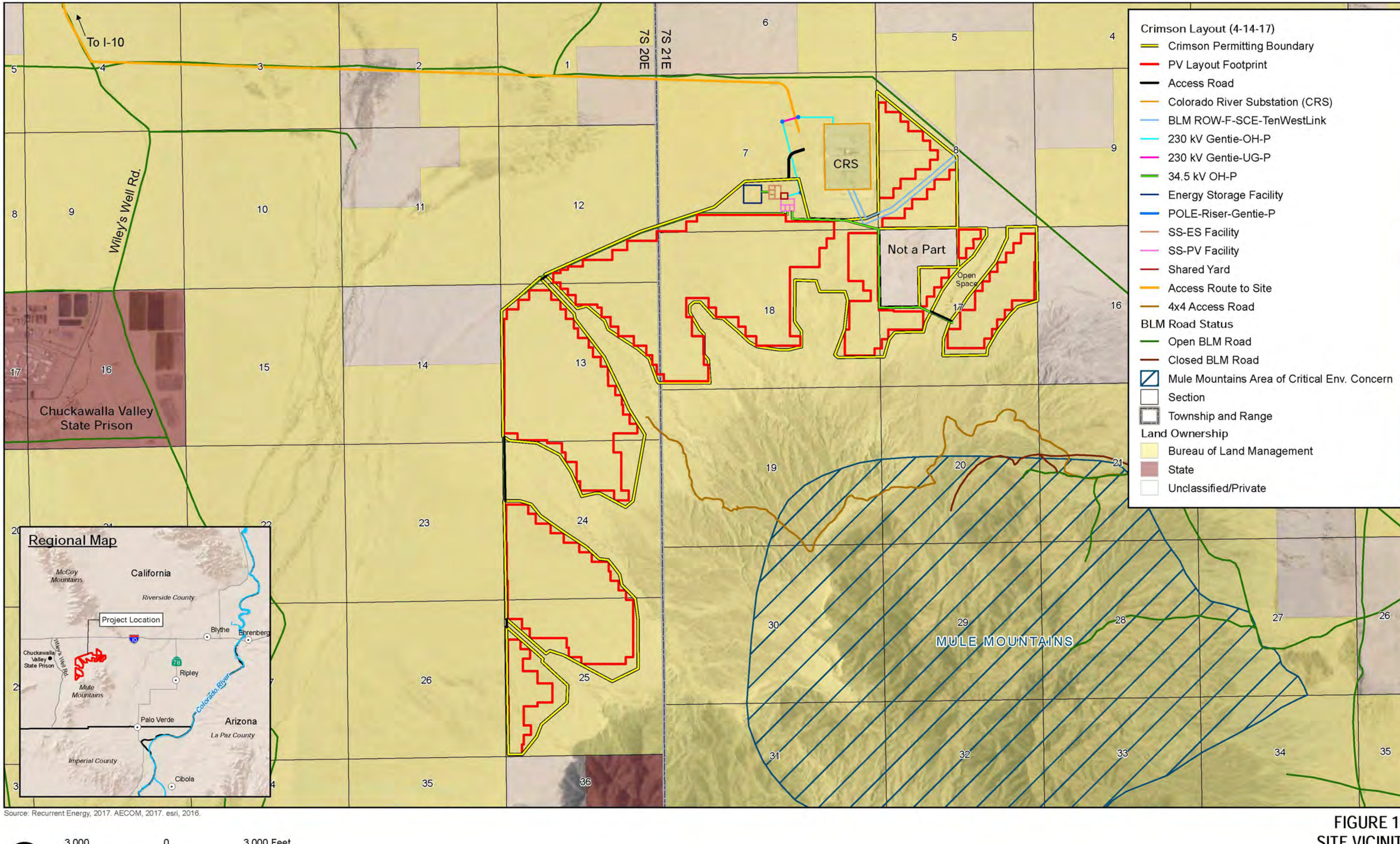
7. Acronyms

AC	alternating current
ACEC	Area of Critical Environmental Concern
CDCA	California Desert Conservation Area
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CRS	Colorado River Substation
DC	direct current
DRECP	Desert Renewable Energy Conservation Plan
DWMA	Desert Wildlife Management Area
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
FLPMA	Federal Land Policy and Management Act
FO	field office
GHG	greenhouse gas
KOP	Key Observation Point
kV	kilovolt
LEID	low environmental impact design
MW	megawatts
NEPA	National Environmental Policy Act
O&M	operations and maintenance
PEIS	Programmatic Environmental Impact Statement
POD	Plan of Development
Project Site	location of the RE Crimson Solar Project
PV	photovoltaic
RAMP	Recreation Area Management Plan

Figures



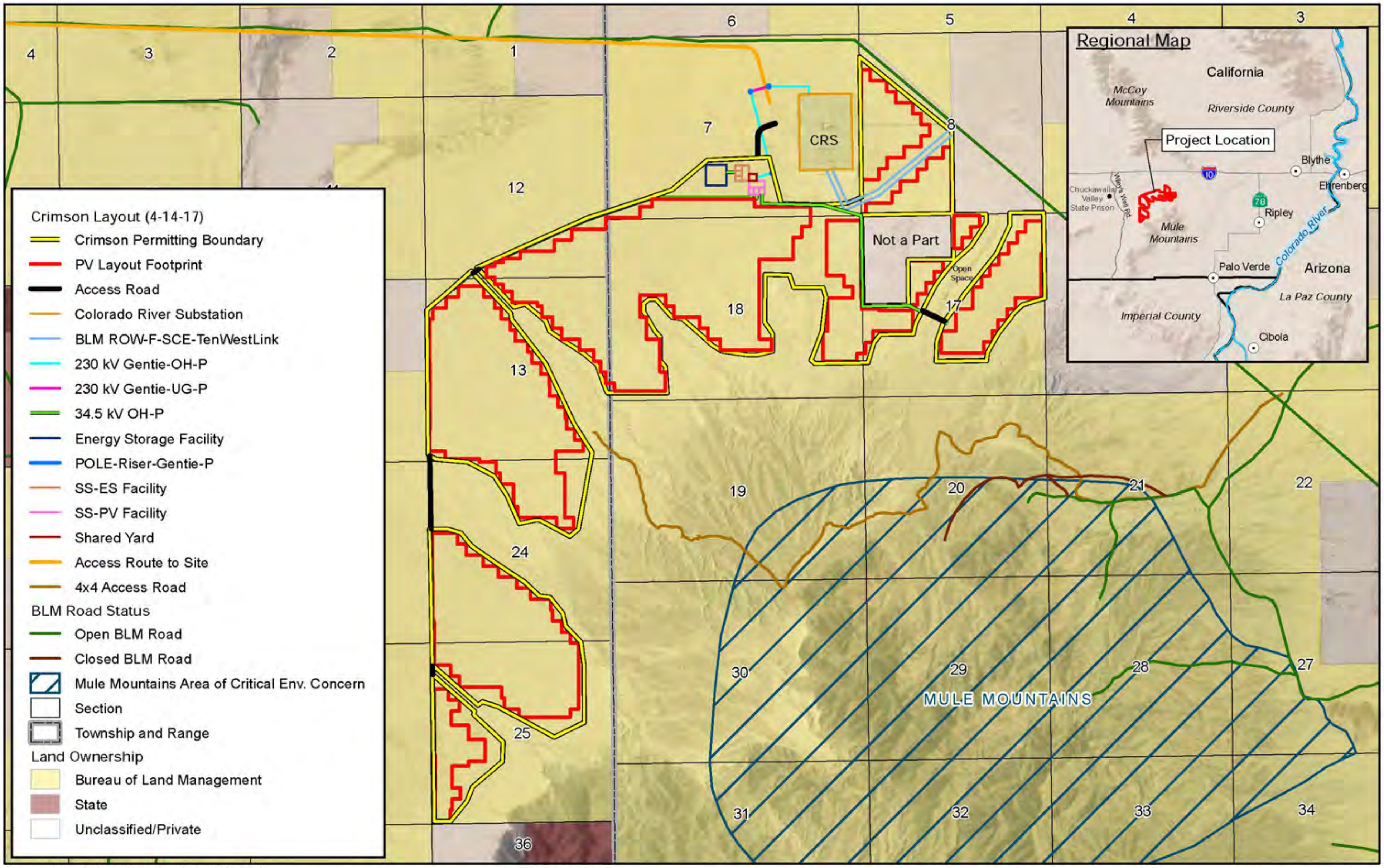
Source: Recurrent Energy, 2017. AECOM, 2017. esri, 2016.

FIGURE 1-1
SITE VICINITY

DATE: 8/29/2017

RE Crimson Solar - Riverside County, CA

Path: U:\Projects\Recurrent Energy\60487757_Crimson\900-Work\920-GIS\map_docs\mxd\Project_Features\Fig1-1_Site_Vicinity.mxd, jason.sokol, 8/29/2017, 3:00:55 PM



Source: Aeriall (NAIP, 2016), Boundaries (RE, 2017).

4,000 0 4,000 Feet

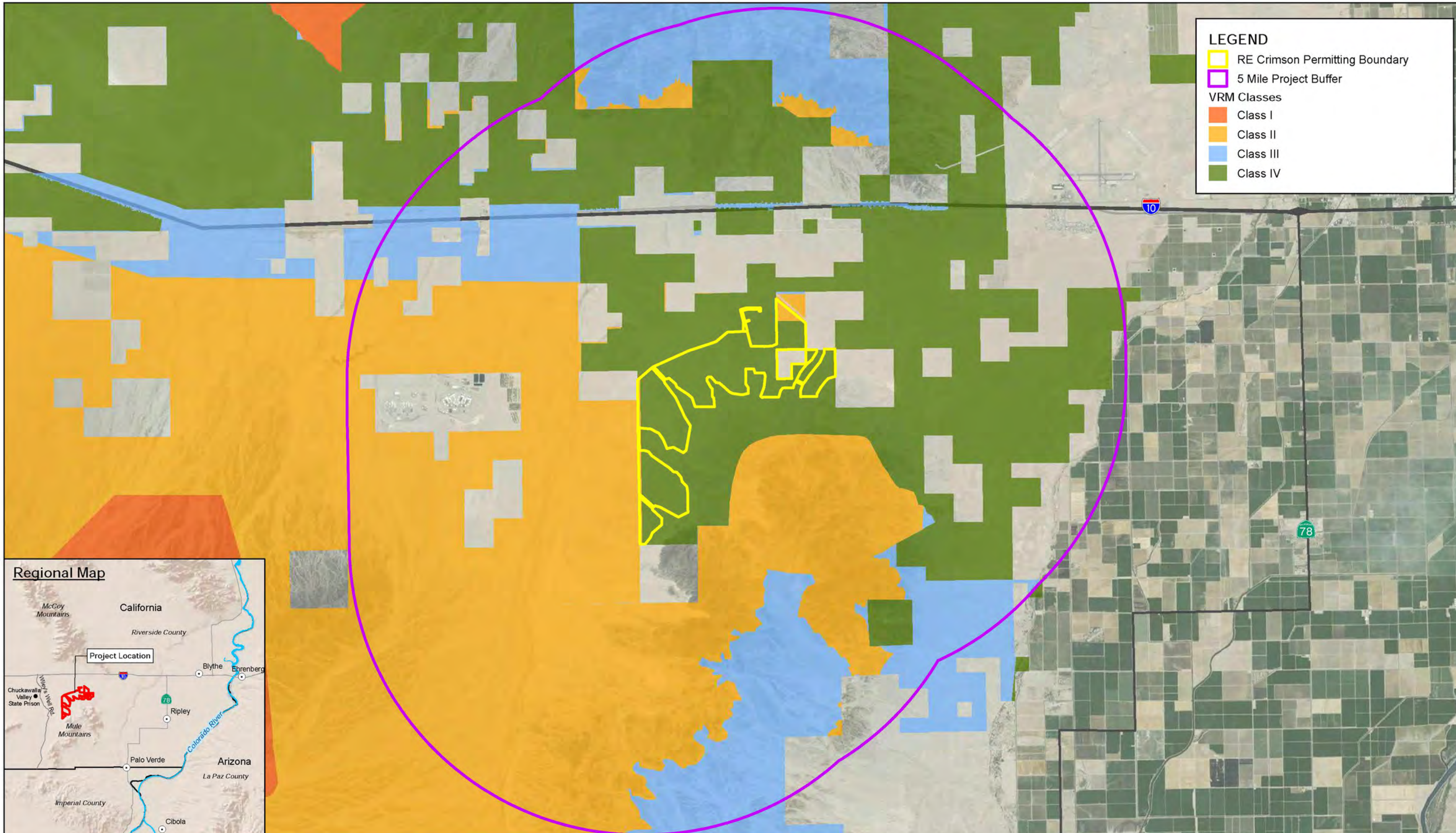
1:48,000 1 in = 4,000 feet

FIGURE 1-2
SITE LAYOUT

DATE: 8/29/2017

RE Crimson Solar - Riverside County, CA

Path: U:\Projects\Recurrent Energy\60487757_Crimson\900-Work\920-GIS\map_docs\mxd\Project_Features\Site_Layout_8x11_Fig1-2.mxd, jason.sokol, 8/29/2017, 6:51:12 PM



Source: Recurrent Energy, 2017. AECOM, 2017. esri, 2016.

1.6 0 1.6 Miles

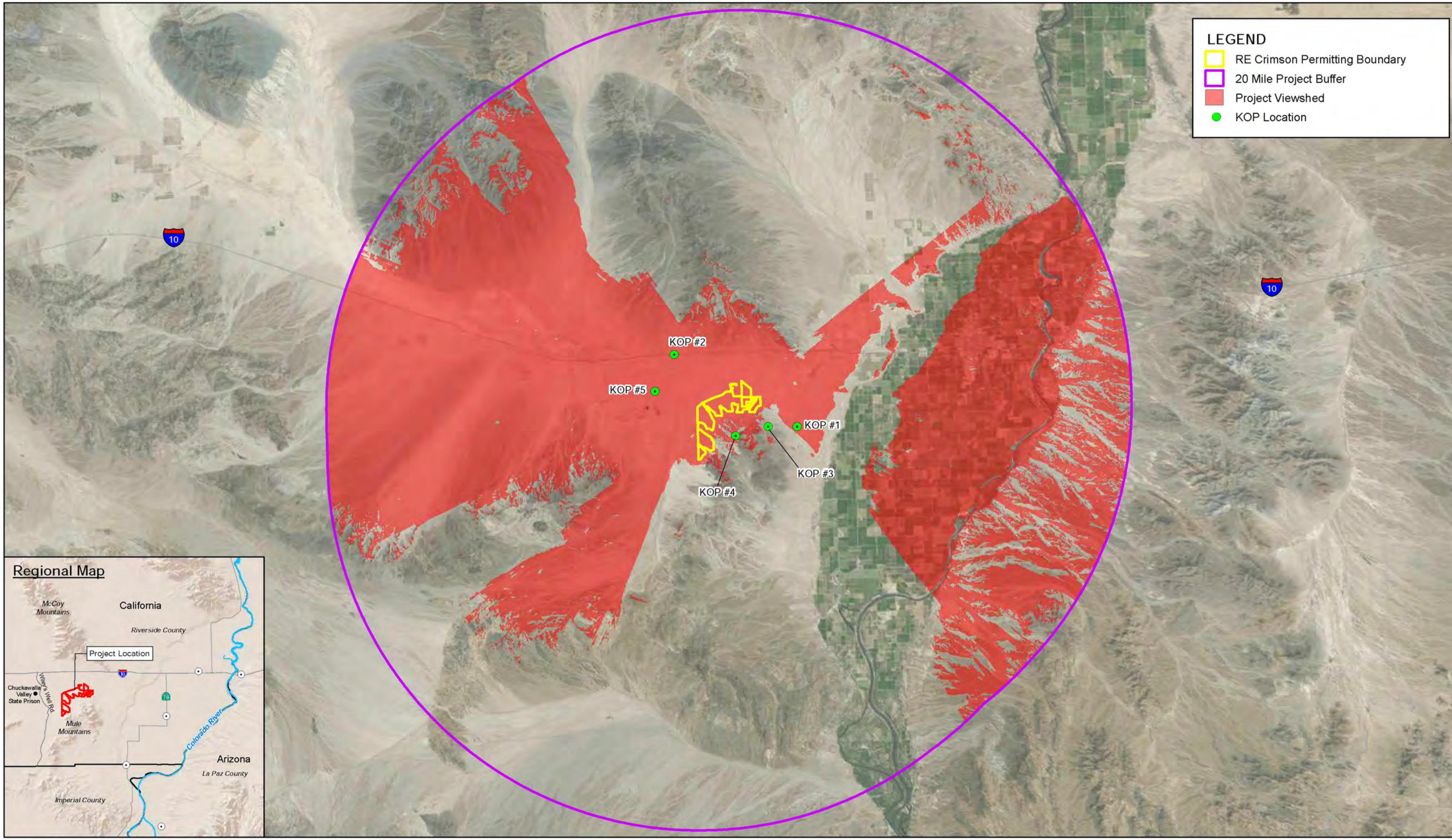
Scale: 1:101,376

Figure 2-1. VISUAL RESOURCE MANAGEMENT (VRM) CLASSES WITHIN PERMIT AREA

DATE: 10/16/2017

RE Crimson Solar - Riverside County, CA

Path: U:\Projects\Recurrent Energy\60487757_Crimson\900-Work\920-GIS\map_docs\mxd\Visual\VRM_5miles_Crimson.mxd, jason.sokol, 10/16/2017, 10:48:33 AM



Source: Recurrent Energy, 2017. AECOM, 2017. esri, 2016.

5 0 5 Miles

Scale: 1:316,800 1 in = 5 miles

FIGURE 3-1
VIEWSHED FOR GEN-TIE TRANSMISSION POLES

DATE: 11/13/2017

RE Crimson Solar - Riverside County, CA

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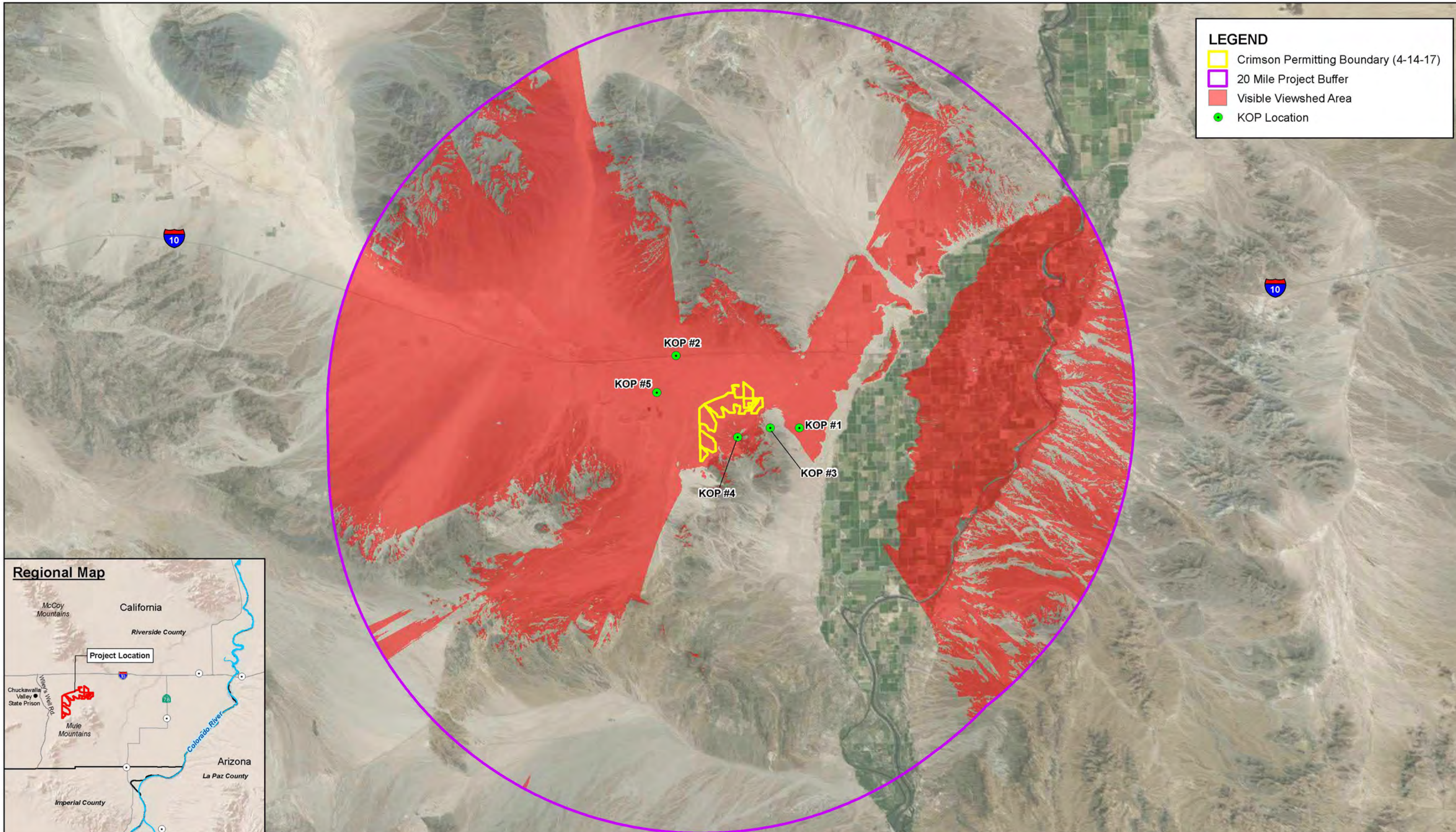


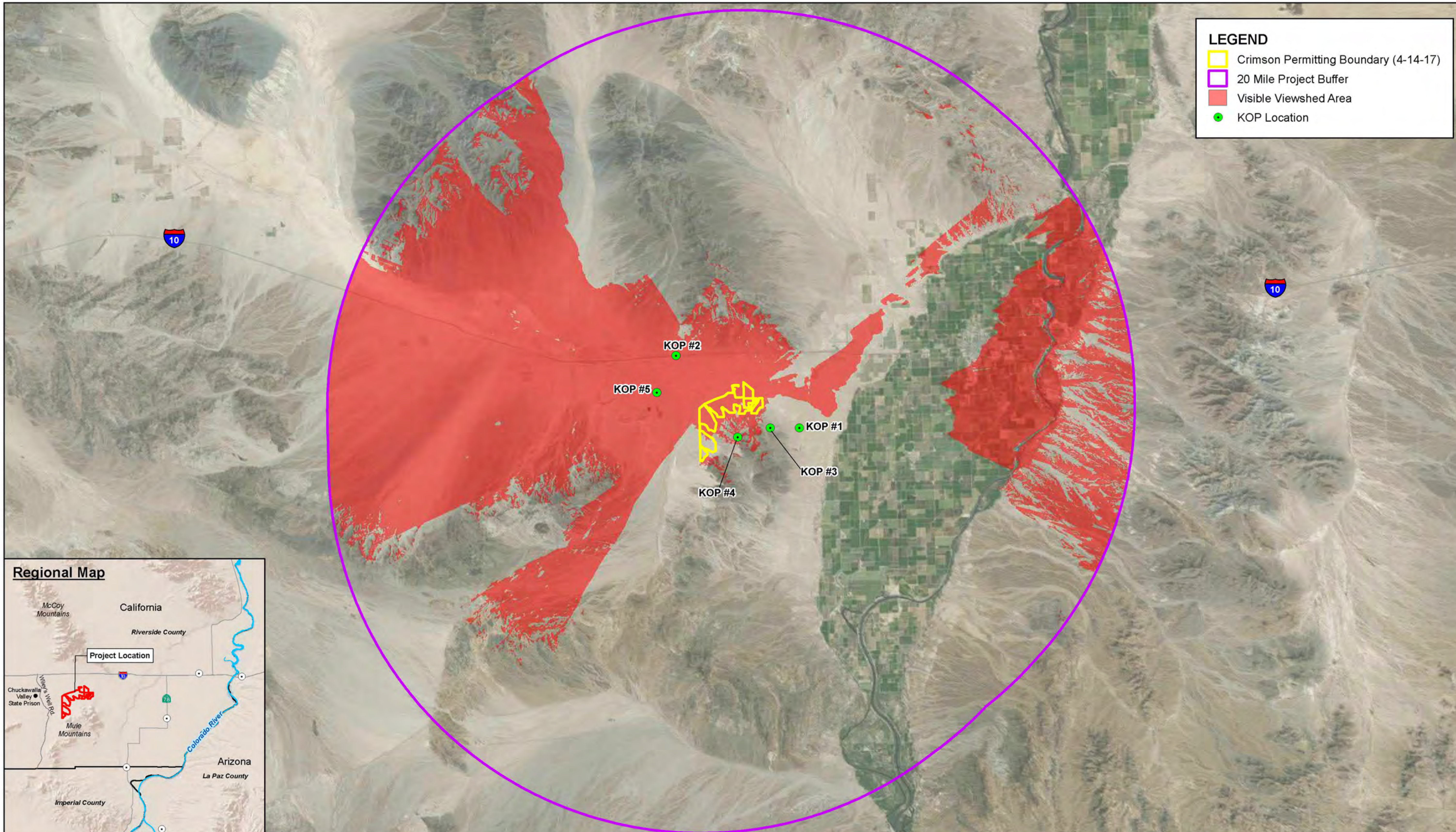
Source: Recurrent Energy, 2017. AECOM, 2017. esri, 2016.

5 0 5 Miles

Scale: 1:316,800 1 in = 5 miles

FIGURE 3-2
PV SOLAR ARRAY VIEWSHED

DATE: 11/13/2017



Source: Recurrent Energy, 2017. AECOM, 2017. esri, 2016.

5 0 5 Miles

Scale: 1:316,800 1 in = 5 miles

FIGURE 3-3
VIEWSHED FOR SUBSTATIONS AND SWITCHYARDS

DATE: 11/13/2017

RE Crimson Solar - Riverside County, CA

Path: U:\Projects\Recurrent Energy\60487757_Crimson\900-Work\920-GIS\map_docs\mxd\Visual\Viewshed_Substation_Switchyard.mxd, jason.sokol, 11/13/2017, 3:03:07 PM

Source: Recurrent Energy, 2017. AECOM, 2017. esri, 2016.

1 0 1 Miles

Scale: 1:63,360 1 in = 1 miles

FIGURE 4-1 VISUAL RESOURCE INVENTORY RATINGS: SCENIC QUALITY RATING UNITS

DATE: 10/17/2017

RE Crimson Solar - Riverside County, CA

Path: U:\Projects\Recurrent Energy\60487757_Crimson\900-Work\920-GIS\map_docs\mxd\Visual\VRI_Ratings_Figure_ZoomIn.mxd, jason.sokol, 10/17/2017, 5:36:55 PM

Source: Recurrent Energy, 2017. AECOM, 2017. esri, 2016.

1 0 1 Miles

Scale: 1:63,360 1 in = 1 miles

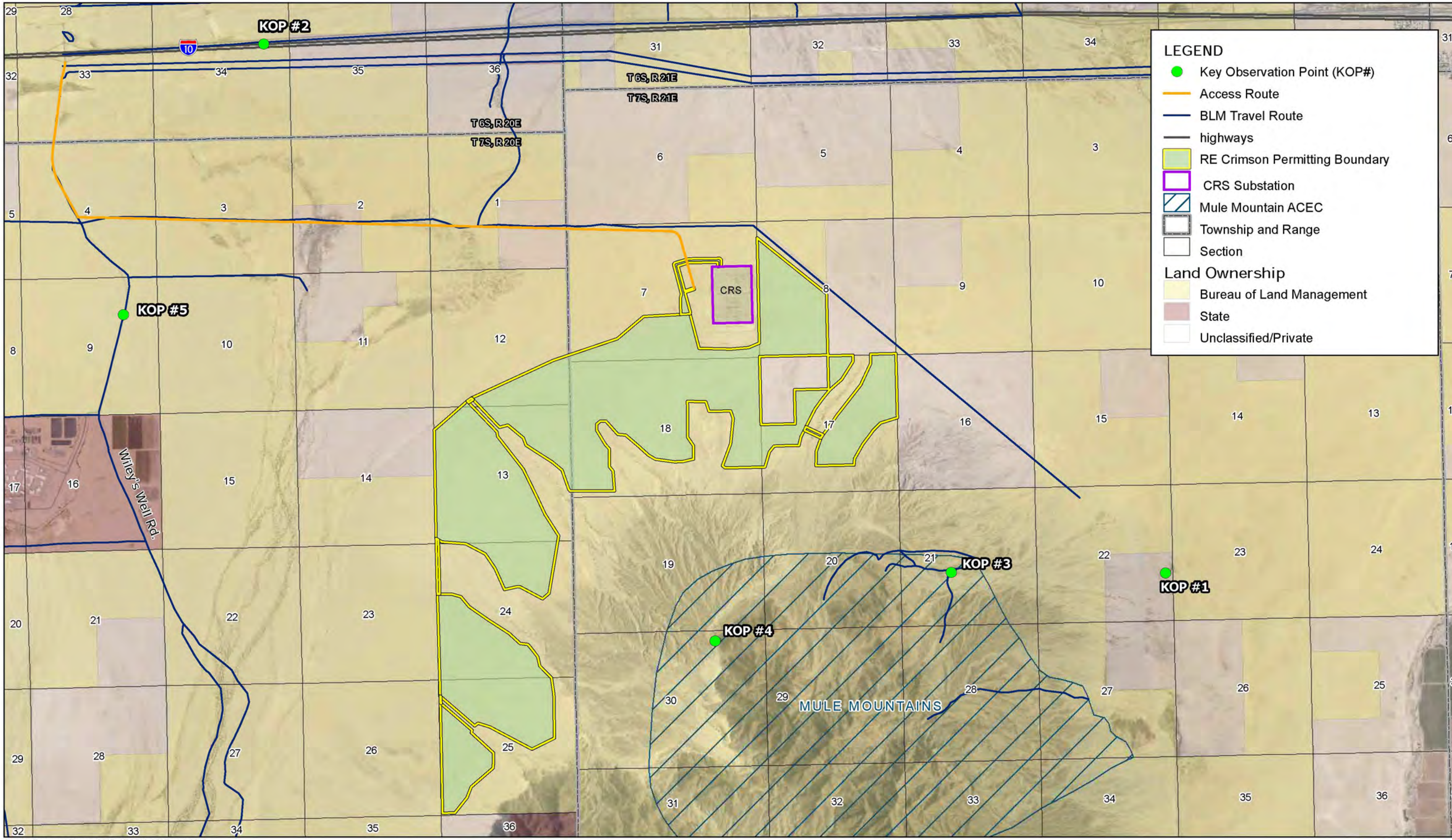
FIGURE 4-2

VISUAL RESOURCE INVENTORY RATINGS: SENSITIVITY LEVEL RATING UNITS

DATE: 12/18/2017

RE Crimson Solar - Riverside County, CA

Path: U:\Projects\Recurrent Energy\60487757_Crimson\900-Work\920-GIS\map_docs\mxd\Visual\VRI_Sensitivity_Level_Rating_Fig4_2.mxd, jason.sokol, 12/18/2017, 10:47:05 AM



Source: Recurrent Energy, 2017. AECOM, 2017. esri, 2016.

FIGURE 4-3
KEY OBSERVATION POINTS

3,600 0 3,600 Feet

Scale: 1:43,200 1 in = 3,600 feet

DATE: 11/13/2017

RE Crimson Solar - Riverside County, CA

Path: U:\Projects\Recurrent Energy\60487757_Crimson\900-Work\920-GIS\map_docs\mxd\Visual\Fig4-3_Key_Observation_Points.mxd, jason.sokol, 11/13/2017, 2:38:23 PM

Figure 4-4
Existing Conditions
Key Observation Point 1

Figure 4-5
Existing Conditions
Key Observation Point 2

Figure 4-6
Existing Conditions
Key Observation Point 3

Figure 4-7
Existing Conditions
Key Observation Point 4

Figure 4-8
Existing Conditions
Key Observation Point 5

Figure 5-1
Simulation of RE Crimson Solar Project
Key Observation Point 1

Figure 5-2
Simulation of RE Crimson Solar Project
Key Observation Point 2

Figure 5-3
Simulation of Crimson Solar Project
Key Observation Point 3

Figure 5-4
Simulation of RE Crimson Solar Project
Key Observation Point 4

Figure 5-5
Simulation of RE Crimson Solar Project
Key Observation Point 5

RE	Recurrent Energy LLC
ROD	Record of Decision
ROW	Right-of-Way
SCE	Southern California Edison
SEZ	Solar Energy Zone
SLA	Sensitivity Level Analysis
SLRU	Sensitivity Level Rating Unit
SQRU	Scenic Quality Rating Unit
VRI	Visual Resource Inventory
%	percent