APPENDIX D2

PALEONTOLOGICAL RECORDS SEARCH

PALEONTOLOGICAL RESOURCES ASSESSMENT REPORT

SANTA ANA RIVER BOTTOM MAINTENANCE FACILITY PROJECT

Assessor's Parcel Nos. 181-220-005 and -006
City of Jurupa Valley, Riverside County, California

For Submittal to:

Riverside County Regional Park and Open-Space District
4600 Crestmore Road
Jurupa Valley, CA 92509

Prepared for:

UltraSystems Environmental, Inc.
16431 Scientific Way
Irvine, CA 92618

Prepared by:

Ron Schmidtling, Principal Paleontologist
Frank Raslich, Report Writer
CRM TECH
1016 East Cooley Drive, Suite A/B
Colton, CA 92324

January 23, 2024

Approximately 10 acres
USGS Riverside West, Calif., 7.5' (1:24,000) quadrangle
Jurupa (Rubidoux) Land Grant, T2S R5W, San Bernardino Baseline and Meridian
CRM TECH Project No. 4080P

EXECUTIVE SUMMARY

Between November 2023 and January 2024, at the request of UltraSystems Environmental, Inc., CRM TECH performed a paleontological resource assessment on approximately 10 acres of land of vacant land in the City of Jurupa Valley, Riverside County, California. The subject property of the study consists of portions of Assessor's Parcel Nos. 181-220-005 and -006, located on the north bank of the Santa Ana River and to the south portion of the Rancho Jurupa Park, in a portion of the Jurupa (Rubidoux) land grant lying within Township 2 South, Range 5 West, San Bernardino Baseline and Meridian, as depicted in the United States Geological Survey Riverside West, California, 7.5' quadrangle.

The study is part of the environmental review process for the proposed Santa Ana River Bottom Maintenance Facility Project, including associated road and fence line alignments. The Riverside County Regional Park and Open-Space District (RCRPOD), as the project proponent and the lead agency, required the study in compliance with the California Environmental Quality Act (CEQA). The purpose of the study is to provide the RCRPOD with the necessary information and analysis to determine whether the proposed project would adversely affect any significant, nonrenewable paleontological resources, as required by CEQA, and to design a paleontological mitigation program, if necessary.

In order to identify any paleontological resource localities that may exist in or near the project area and to assess the probability for such resources to be encountered during the project, CRM TECH initiated a paleontological records search, conducted a literature review, and carried out a systematic field survey of the project area, in accordance with the guidelines of the Society of Vertebrate Paleontology. The results of these research procedures indicate that the project area is situated upon alluvial deposits of Holocene age, which have a low potential to contain significant, nonrenewable paleontological resources. Although early Holocene or late Pleistocene sediments of higher paleontological sensitivity may be present subsurface, they likely occur at a substantial depth, beyond the extent of disturbance by typical development projects.

No paleontological localities were previously identified in or near the project area, nor was any evidence of fossil remains observed during the current survey. Based on these findings, the proposed project's potential to impact significant, nonrenewable paleontological resources appears to be low. Therefore, CRM TECH recommends to the RCRPOD a conclusion of *No Impact* regarding paleontological resources.

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INTRODUCTION

Between November 2023 and January 2024, at the request of UltraSystems Environmental, Inc., CRM TECH performed a paleontological resource assessment on approximately 10 acres of land of vacant land in the City of Jurupa Valley, Riverside County, California (Fig. 1). The subject property of the study consists of portions of Assessor's Parcel Nos. 181-220-005 and -006, located on the north bank of the Santa Ana River and to the south portion of the Rancho Jurupa Park, in a portion of the Jurupa (Rubidoux) land grant lying within Township 2 South, Range 5 West, San Bernardino Baseline and Meridian, as depicted in the United States Geological Survey Riverside West, California, 7.5' quadrangle (Figs. 2, 3).

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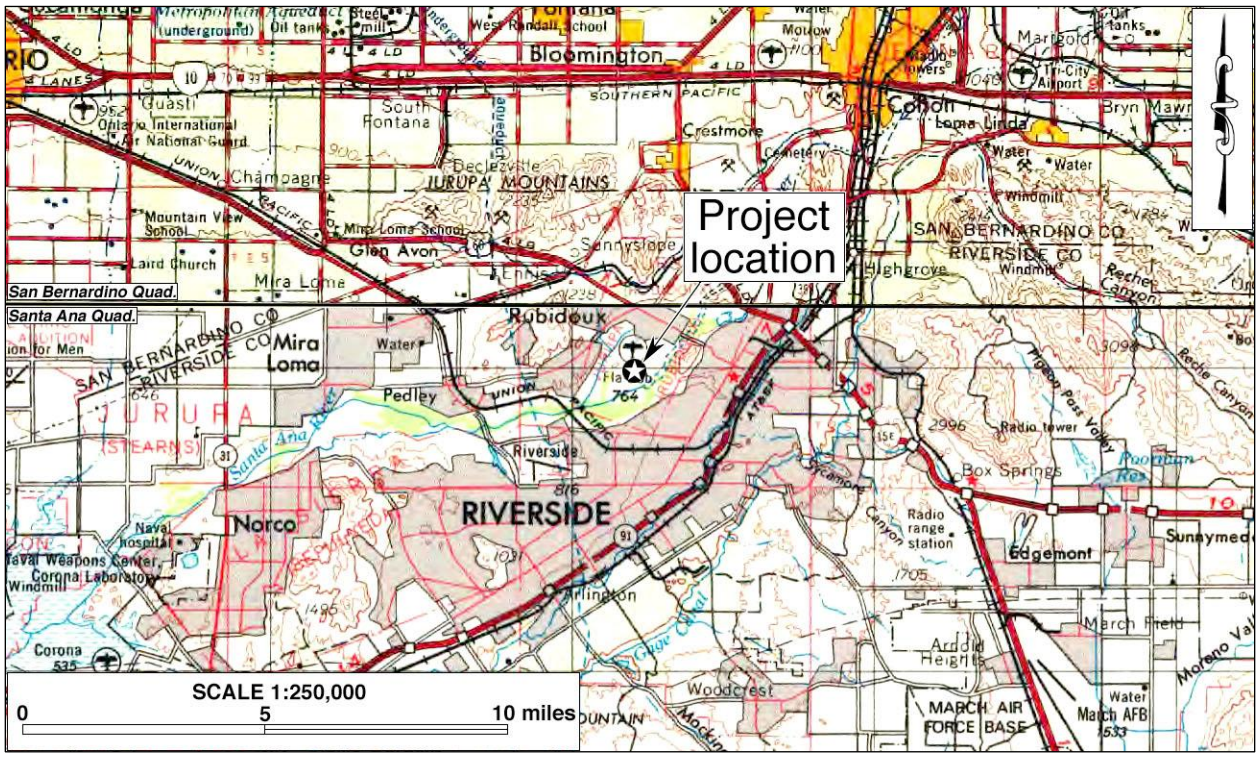

Figure 1. Project vicinity. (Based on USGS San Bernardino and Santa Ana, Calif., 120'x60' quadrangles)

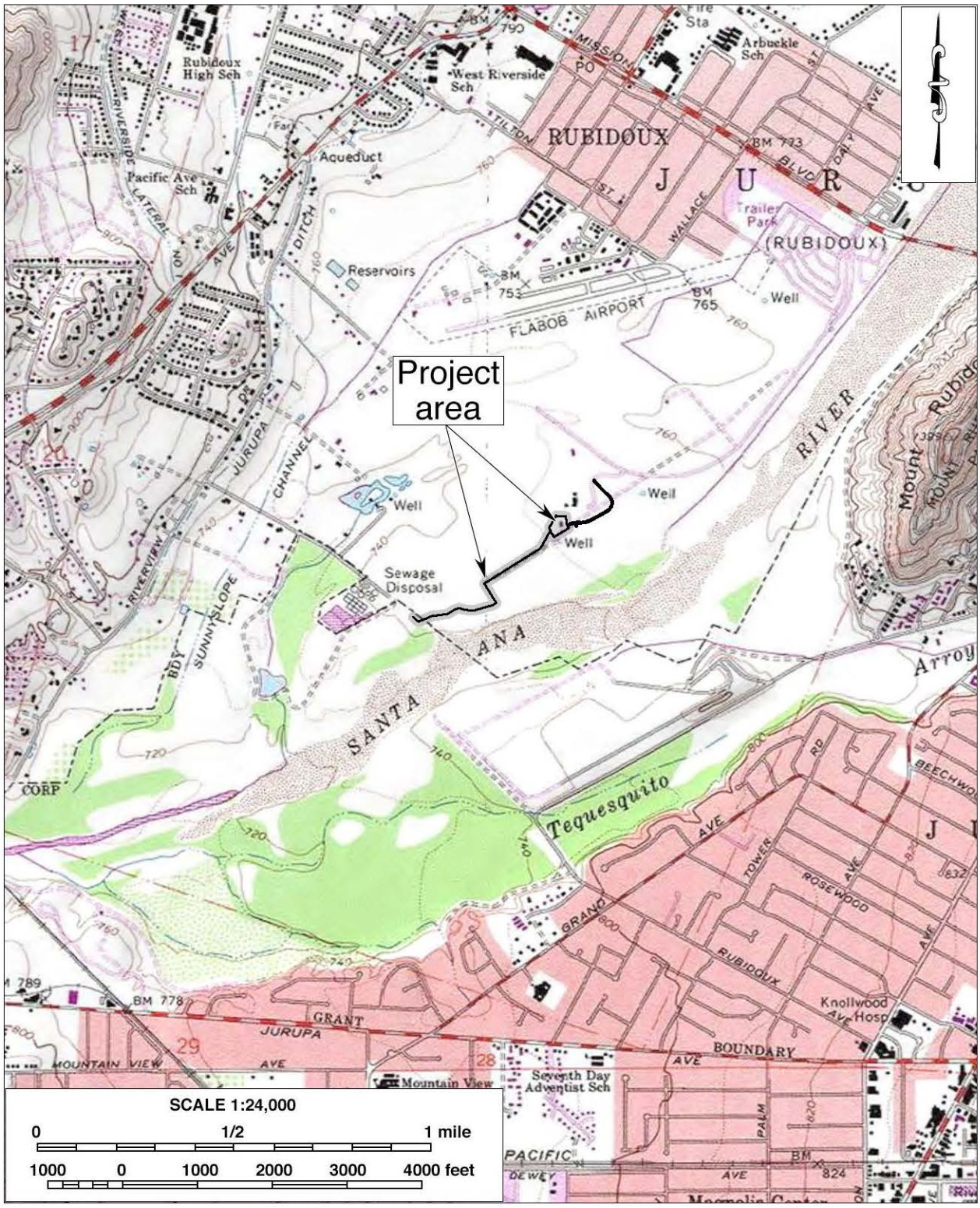

Figure 2. Project location. (Based on USGS Riverside West, Calif., 7.5' quadrangle)

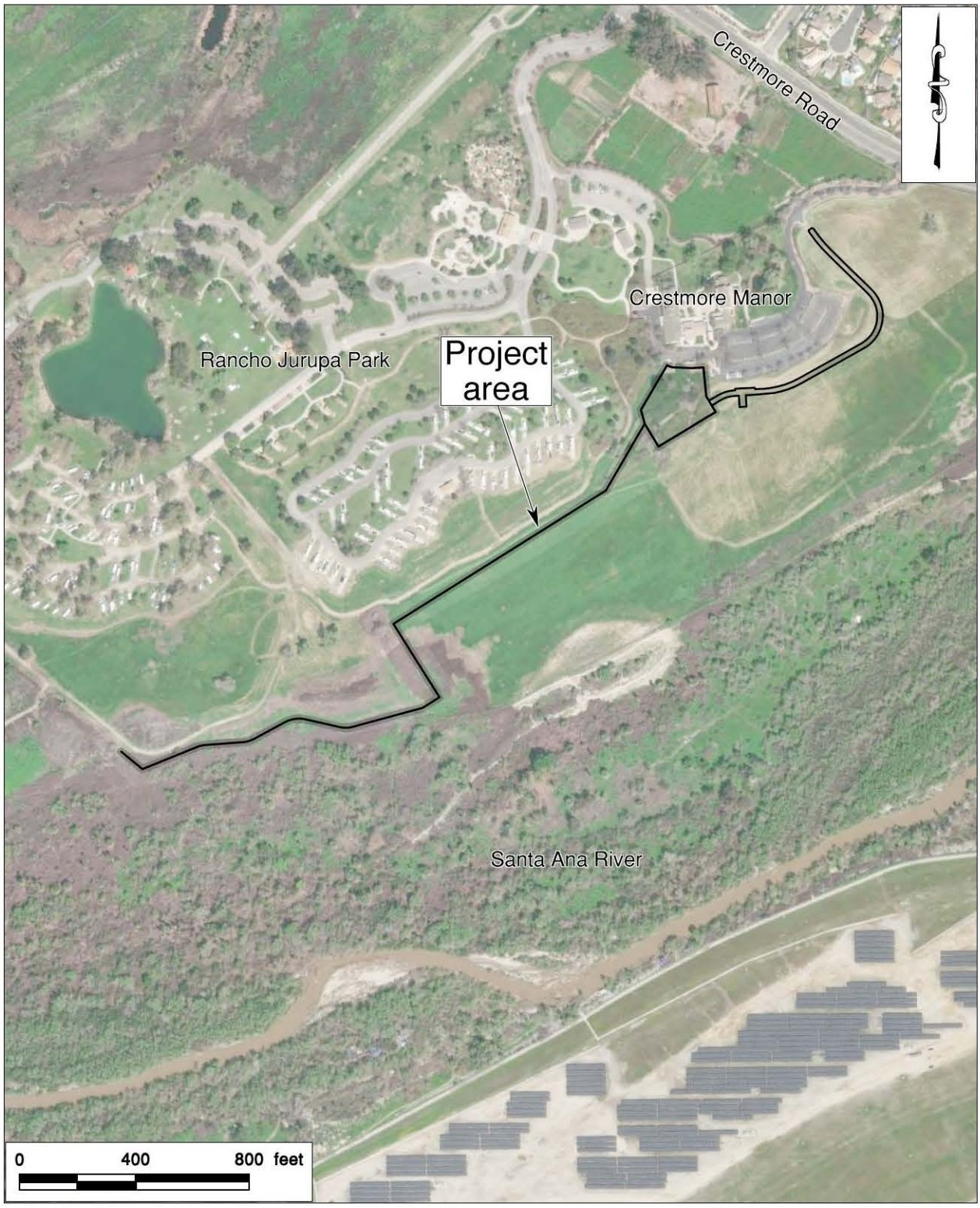

Figure 3. Recent satellite image of the project area. (Based on Google Earth imagery)

field survey of the project area, in accordance with the guidelines of the Society of Vertebrate Paleontology. The following report is a complete account of the methods, results, and final conclusion of this study. Personnel who participated in the study are named in the appropriate sections below, and their qualifications are provided in Appendix 1.

PALEONTOLOGICAL RESOURCES

DEFINITION

Paleontological resources represent the remains of prehistoric life, exclusive of any human remains, and include the localities where fossils were collected as well as the sedimentary rock formations in which they were found. The defining character of fossils or fossil deposits is their geologic age, typically older than recorded human history and/or older than the middle Holocene Epoch, which dates to circa 5,000 radiocarbon years (Society of Vertebrate Paleontology 2010:11).

Common fossil remains include marine and freshwater mollusk shells; the bones and teeth of fish, amphibians, reptiles, and mammals; leaf imprint assemblages; and petrified wood. Fossil traces, another type of paleontological resource, include internal and external molds (impressions) and casts created by these organisms. These items can serve as important guides to the age of the rocks and sediments in which they are contained and may prove useful in determining the temporal relationships between rock deposits from one area and those from another as well as the timing of geologic events. They can also provide information regarding evolutionary relationships, development trends, and environmental conditions.

Fossil resources generally occur only in areas of sedimentary rock (e.g., sandstone, siltstone, mudstone, claystone, or shale). Because of the infrequency of fossil preservation, fossils, particularly vertebrate fossils, are considered nonrenewable paleontological resources. Occasionally fossils may be exposed at the surface through the process of natural erosion or because of human disturbances; however, they generally lay buried beneath the surficial soils. Thus, the absence of fossils on the surface does not preclude the possibility of their being present within subsurface deposits, while the presence of fossils at the surface is often a good indication that more remains may be found in the subsurface.

SIGNIFICANCE CRITERIA

According to guidelines proposed by Eric Scott and Kathleen Springer (2003:6) of the San Bernardino County Museum, paleontological resources can be considered to be of significant scientific interest if they meet one or more of the following criteria:

1. The fossils provide information on the evolutionary relationships and developmental trends exhibited among organisms, living or extinct;
2. The fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein;
3. The fossils provide data regarding the development of biological communities or the interactions between paleobotanical and paleozoological biotas;

4. The fossils demonstrate unusual or spectacular circumstances in the history of life; and/or
5. The fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations.

PALEONTOLOGICAL SENSITIVITY

The fossil record is unpredictable, and the preservation of organic remains is rare, requiring a particular sequence of events involving physical and biological factors. Skeletal tissue with a high percentage of mineral matter is the most readily preserved within the fossil record; soft tissues not intimately connected with the skeletal parts, however, are the least likely to be preserved (Raup and Stanley 1978). For this reason, the fossil record contains a biased selection not only of the types of organisms preserved but also of certain parts of the organisms themselves. As a consequence, paleontologists are unable to know with certainty, the quantity of fossils or the quality of their preservation that might be present within any given geologic unit.

Sedimentary units that are paleontologically sensitive are those geologic units (mappable rock formations) with a high potential to contain significant nonrenewable paleontological resources. More specifically, these are geologic units within which vertebrate fossils or significant invertebrate fossils have been determined by previous studies to be present or are likely to be present. These units include, but are not limited to, sedimentary formations that contain significant paleontological resources anywhere within their geographical extent as well as sedimentary rock units temporally or lithologically amenable to the preservation of fossils.

A geologic formation is defined as a stratigraphic unit identified by its lithic characteristics (e.g., grain size, texture, color, and mineral content) and stratigraphic position. There is a direct relationship between fossils and the geologic formations within which they are enclosed and, with sufficient knowledge of the geology and stratigraphy of a particular area, it is possible for paleontologists to reasonably determine the formation's potential to contain significant nonrenewable vertebrate, invertebrate, marine, or plant fossil remains.

The paleontological sensitivity for a geologic formation is determined by the potential for that formation to produce significant nonrenewable fossils. This determination is based on what fossil resources the particular geologic formation has produced in the past at other nearby locations. Determinations of paleontologic sensitivity must consider not only the potential to yield a large collection of fossil remains but also the potential to yield a few fossils that can provide new and significant taxonomic, phylogenetic, and/or stratigraphic data.

The Society of Vertebrate Paleontology issued a set of standard guidelines intended to assist paleontologists to assess and mitigate any adverse effects/impacts to nonrenewable paleontological resources. The guidelines defined four categories of paleontological sensitivity for geologic units that might be impacted by a proposed project, as listed below (Society of Vertebrate Paleontology 2010:1-2):

- **High Potential**: Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered.
- **Undetermined Potential**: Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment.

- **Low Potential**: Rock units that are poorly represented by fossil specimens in institutional collections, or based on general scientific consensus only preserve fossils in rare circumstances.
- **No Potential**: Rock units that have no potential to contain significant paleontological resources, such as high-grade metamorphic rocks and plutonic igneous rocks.

SETTING

The City of Jurupa Valley is located in the Peninsular Ranges geomorphic province, close to where it adjoins the Transverse Ranges province (Jenkins 1980:40-41; Harms 1996:131). The Peninsular Ranges province is bounded by the Transverse Ranges province on the north, the Colorado Desert province on the northeast, and the Pacific Ocean on the west (*ibid.*). This province consists of a well-defined geologic and physiographic unit occupying the southwest portion of the State of California and extending southward to the southern tip of Baja California (Jahns 1954:Plate 3, 29; Harden 2004:465; Harms 1996:130).

The Peninsular Ranges province is made up of a series of northwest-southeast trending structural blocks consisting of uplifted mountains that are separated by valley basins developed along the intervening fault zones. The mountains are made up mainly of igneous intrusive rocks, metasedimentary rocks, and some metavolcanic rocks (Harden 2004:466-468). The non-crystalline rocks in the eastern portion of the mountains contain mainly metasedimentary rocks of Paleozoic and older age, while the crystalline basement rocks consist mainly of Mesozoic-age granitic rocks with some scattered gabbroic intrusions (*ibid.*:466-468, 471-472).

The project location lies in the Jurupa Valley, a broad inland valley characterized by wide expanses of level alluvial plain interrupted periodically by steep, boulder-laden hills that rise to elevations above 1,400 feet above mean sea level. The Jurupa Valley is a part of the San Bernardino Valley region of inland southern California. The ambient environment of the region is characterized by a temperate Mediterranean climate, with seasonal average temperatures ranging between 35 and 90 degrees Fahrenheit. Annual rainfall is approximately 11 inches on average, most of which occurs between November and April.

The San Bernardino Valley, a structurally depressed trough, is filled with sediments of Miocene through Recent age, while isolated rocky knolls in and around the valley, such as the Jurupa Mountains and Mount Rubidoux, are composed of up-lifted basement rock (Clarke 1978-1979:15). The geographical features are some of the many tectonically controlled basins and ridges within the Perris Block, one of the structural blocks in the Peninsular Ranges province. The Santa Ana River, the main natural waterway in the San Bernardino Valley, runs through the low area between the Jurupa Mountains and Mount Rubidoux.

The Jurupa Valley is in the central portion of the Perris Block. Situated between the San Jacinto and Elsinore-Chino fault zones, the Perris Block includes many similar valley-and-ridge systems (English 1926). It is bounded on the north by the Cucamonga (San Gabriel) Fault and on the south by a vaguely delineated boundary near the southern end of the Temecula Valley (*ibid.*). This structural block is considered to have been active since Pliocene time (Woodford et al. 1971:3421). Colluvial/alluvial sediments of varying thickness derived from the erosion of the elevated portions of

Figure 4. Typical landscapes in the project area. *Left*: view to the southwest; *right*: view to the northeast. (Photographs taken on January 9, 2024)

the region fill the low-lying areas of the Perris Block. The Pliocene- and Pleistocene-age nonmarine sedimentary rocks found filling the valley areas have produced a few vertebrate fossils, as well as a few invertebrate fossil remains (Mann 1955:13).

The project area lies across undeveloped land that was once used for agriculture, within the Santa Ana River floodplain. The immediate surrounding area also features mostly vacant, formerly agricultural land, with recreational facilities of the Rancho Jurupa Park adjacent to the northwest (Fig. 3). The terrain in the vicinity is relatively level, with an undulated surface leading to rolling hills nearby (Fig. 4). Elevations within the project boundaries vary approximately from 740 feet to 750 feet above mean sea level.

The ground surface in the project area shows evidence of past disturbances, including dirt access roads and disking marks over most of the property. Although the property was used as agricultural fields some time ago, it has since been reclaimed by a dense growth of low-lying natural vegetation. In its undisturbed state, flora within the project area would have been typical of the California floristic province, represented by the coastal sage scrub plant community, commonly referred to as "soft chaparral." While native species such as coyote gourd, jimsonweed, and buckwheat remain present, the project area currently contains primarily introduced plant species such as wild mustard, foxtails, and the typical amalgamation of intrusive grasses and small shrubs.

METHODS AND PROCEDURES

RECORDS SEARCH

The paleontological records search service for this study was provided by the Western Science Center (WSC) in Hemet. The WSC maintains files of regional paleontological localities as well as supporting maps and documents. The records search results were used to identify previously performed paleontological resource assessments and known paleontological localities within a one-

mile radius of the project location. A copy of the records search results is attached to this report in Appendix 2.

LITERATURE REVIEW

In conjunction with the records search, CRM TECH report writer Frank Raslich reviewed geological literature pertaining to the project vicinity under the direction of principal paleontologist Ron Schmidtling. Sources consulted during the review include primarily published literature on regional geology, topographic, geologic, and soil maps of the Jurupa Valley area, the Riverside County GIS database on paleontological sensitivity, aerial and satellite photographs available at the Nationwide Environmental Title Research (NETR) Online website and through the Google Earth software, and other materials in the CRM TECH library, including unpublished reports produced during similar surveys in the vicinity.

FIELD SURVEY

On January 9, 2024, Ron Schmidtling and paleontological surveyor Daniel Ballester carried out the field survey of the project area. The survey was conducted on foot by walking along either side of the linear portions of the project area and a number of parallel transects spaced 7.5 meters (approximately 25-foot) apart across the open field. In this way, the ground surface in the project area was systematically and carefully examined to determine soil types, verify the geological formations, and search for indications of paleontological remains. Ground visibility was moderate to good (50%-85%) throughout the survey, with light vegetation growth on much of the property except where the vegetation had been cleared or alone dirt access roads.

RESULTS AND FINDINGS

RECORDS SEARCH

The records search by the WSC identified no known paleontological localities within the project area or within a one-mile radius (Stoneburg 2023; see App. 2). According to the WSC, the geologic formation that the project area rests upon consists entirely of alluvial sand, gravel, and clay deposits from the Holocene epoch (*ibid*.). These sediments are considered to have high preservation value but are unlikely to contain fossil remains because of their relatively young age (*ibid*.).

The WSC notes that the Recent alluvial deposits on the surface in this area are underlain by early Holocene or late Pleistocene sediments of higher paleontological sensitivity. However, these earlier, potentially fossiliferous sediments occur at a substantial depth, beyond the extent of disturbance by typical development projects (Stoneburg 2023). Therefore, the WSC concludes that "excavation activity associated with the development of the project area is unlikely to be paleontologically sensitive, but caution during development should be observed" (*ibid*.).

LITERATURE REVIEW

Morton (2003) and Morton and Miller (2006) mapped the surface sediments in the project area as *Qa*, namely "alluvial sand, gravel and clay of level areas covered with soil," Holocene in age (Fig.

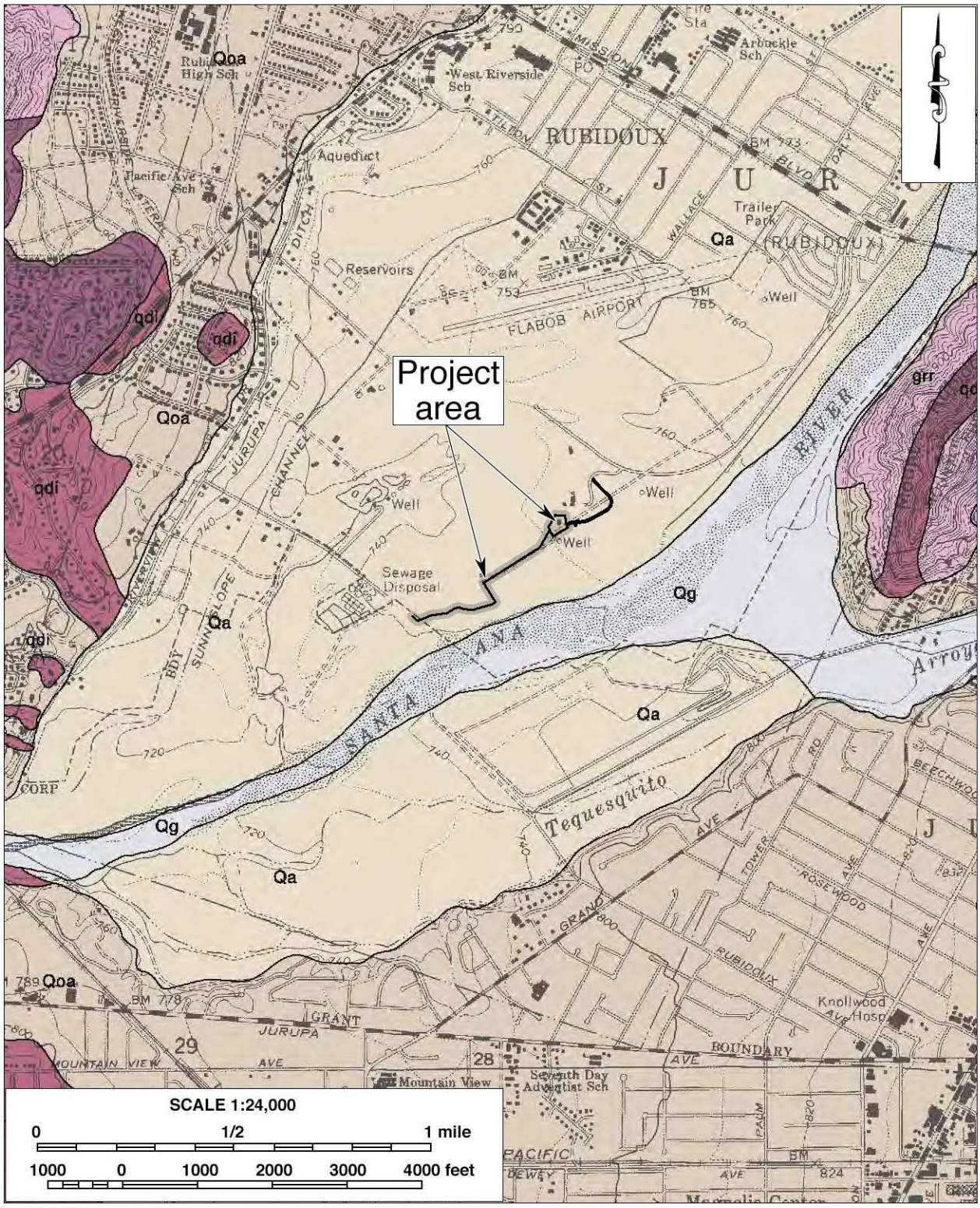

Figure 5. Geological map of the project vicinity. (Source: Morton 2003)

5). Riverside County paleontological sensitivity map classifies the project area as having a low potential to contain significant paleontological resources, indicating that fossils are unlikely to be encountered in this area (RCIT n.d.; County of Riverside 2015:4.9-11).

FIELD SURVEY

The field survey yielded negative findings for potential paleontological resources, and no surficial indications of any fossil remains were discovered within or adjacent to the project area. Granitic boulders occur naturally onsite, with two areas having superficial circular orientations. The surface soil in the project area appears to be composed of Recent alluvial deposits, being in the floodplain of the Santa Ana River. As the project area once contained cultivated farmland (NETR Online 1938-1996), the surface soils have evidently been disturbed in the past. The depth of the Recent alluvial deposits are difficult to determine as they are composed of similar rock material caused by erosion of the hills and displacement of soil deposits from the large drainages leading out of the nearby Mount Roubidoux to the northeast.

CONCLUSION AND RECOMMENDATIONS

CEQA guidelines (Title 14 CCR App. G, Sec. V(c)) require that public agencies in the State of California determine whether a proposed project would "directly or indirectly destroy a unique paleontological resource" during the environmental review process. The present study, conducted in compliance with this provision, is designed to identify any significant, non-renewable paleontological resources that may exist within or adjacent to the project area, and to assess the possibility for such resources to be encountered in future excavation and construction activities.

The results of the records search and the literature research indicate that the project area is situated upon alluvial deposits of Holocene age, which have a low potential to contain significant, nonrenewable paleontological resources. Although early Holocene or late Pleistocene sediments of higher paleontological sensitivity may be present subsurface, they likely occur at a substantial depth, beyond the extent of disturbance by typical development projects.

No paleontological localities were previously identified in or near the project area, nor was any evidence of fossil remains observed during the current survey. Based on these findings, the proposed project's potential to impact significant, nonrenewable paleontological resources appears to be low. Therefore, CRM TECH recommends to the RCRPOD a conclusion of *No Impact* regarding paleontological resources.

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APPENDIX 1:
PERSONNEL QUALIFICATIONS

PRINCIPAL PALEONTOLOGIST
Ron Schmidtling, M.S.

Education

1995	M.S., Geology, University of California, Los Angeles.
1991	Pasadena City College, Pasadena, California.
1985	B.A., Archaeology, Paleontology, Ancient Folklore, and Art History, University of Southern Mississippi, Hattiesburg.

Professional Experience:

2020-	Principal Paleontologist, CRM TECH, Colton, California.
2014-	Instructor of Earth Science, History of Life, Ecology, and Evolutionary Biology, Columbia College Hollywood, Reseda, California.
2013, 2015	Volunteer, excavation of a camarasaur and a diplodocid in southern Utah, Natural History Museum of Los Angeles County, California.
1993-2014	Consultant, Getty Conservation Institute, Brentwood, California.
1999-2001	Archaeological and Paleontological Monitor, Michael Brandman Associates, Irvine, California.
1997	Department of Archaeology, University of California, Los Angeles.
1994	Scientific Illustrator and Teaching Assistant, Department of Earth and Space Sciences and Department of Biological Sciences, University of California, Los Angeles.

Memberships

AAPS (Association of Applied Paleontological Sciences), USA; CSEOL (Center for the Study of Evolution and the Origin of Life), Department of Earth Sciences, University of California, Los Angeles.

Publications and Reports

Author, co-author, and contributor on numerous paleontological publications and paleontological resource management reports.

REPORT WRITER
Frank J. Raslich, M.A.

Education

2016-	Ph.D. candidate, Michigan State University, East Lansing.
2010	M.A., Anthropology, Michigan State University, East Lansing.
2005	B.A., Anthropology, University of Michigan, Flint.
2019	Grant and Research Proposal Writing for Archaeologists; Society for American Archaeology online seminar.
2014	Bruker Industries Tracer S1800 pXRF Training; presented by Dr. Bruce Kaiser, Bruker Scientific.

Professional Experience

2022-	Project Archaeologist/Report Writer, CRM TECH, Colton, California.
2022	Archaeological Monitor, Agua Caliente Band of Cahuilla Indians, Palm Springs, California.
2014-2022	Board of Directors, Ziibiwing Center of Anishinabe Culture and Lifeways, Saginaw Chippewa Indian Tribe of Michigan.
2008-2021	Archaeological Consultant, Saginaw Chippewa Indian Tribe of Michigan.
2019	Archaeologist, Sault Tribe of Chippewa Indians and Little Traverse Bay Band of Odawa Indians.
2016-2018	Adjunct Lecturer, Michigan State University, East Lansing.
2017-2018	Adjunct Lecturer, University of Michigan, Flint.
2009-2017	Teaching Assistant, Michigan State University, East Lansing.
2008-2014	Research Assistant, Intellectual Property Issues in Cultural Heritage, Simon Fraser University, British Columbia, Canada.
2010-2013	Research Assistant, Michigan State University, East Lansing.
2009-2011	Archaeologist/Crew Chief, Saginaw Chippewa Indian Tribe of Michigan.

Publications

2017	Preliminary Results of a Handheld X-Ray Fluorescence (pXRF) Analysis on a Marble Head Sarcophagus Sculpture from the Collection of the Kresge Art Center, Michigan State University. Submitted to Jon M. Frey, Department of Art, Art History, and Design, Michigan State University, East Lansing.
2013	Geochemical Analysis of the Dickenson Group of the Upper Peninsula, Michigan: A study of an Accreted Terrane of the Superior Province. Geological Society of America *Abstracts with Programs* 45:4(53).

PALEONTOLOGICAL MONITOR/FIELD DIRECTOR
Daniel Ballester, M.S.

Education

2013	M.S., Geographic Information System (GIS), University of Redlands, California.
1998	B.A., Anthropology, California State University, San Bernardino.
1997	Archaeological Field School, University of Las Vegas and University of California, Riverside.
1994	University of Puerto Rico, Rio Piedras, Puerto Rico.
2021	"An Introduction to Geoarchaeology: How Understanding Basic Soils, Sediments, and Landforms can make you a Better Archaeologist." SAA Online Seminar.
2007	Certificate in Geographic Information Systems (GIS), California State University, San Bernardino.

- Cross-trained in paleontological field procedures and identifications by CRM TECH Geologist/Paleontologist Harry M. Quinn.

Professional Experience

2002-	Field Director/GIS Specialist, CRM TECH, Riverside/Colton, California.
2011-2012	GIS Specialist for Caltrans District 8 Project, Garcia and Associates, San Anselmo, California.
2009-2010	Field Crew Chief, Garcia and Associates, San Anselmo, California.
2009-2010	Field Crew, ECorp, Redlands.
1999-2002	Project Paleontologist/Archaeologist, CRM TECH, Riverside, California.
1998-1999	Field Crew, K.E.A. Environmental, San Diego, California.
1998	Field Crew, A.S.M. Affiliates, Encinitas, California.
1998	Field Crew, Archaeological Research Unit, University of California, Riverside.

Paleontological and Cultural Resources Management Reports

Co-author and contributor to numerous paleontological and cultural resources management reports since 2002.

APPENDIX 2

RECORDS SEARCH RESULTS

WESTERN SCIENCE CENTER

December 22nd, 2023

CRM TECH
Nina Gallardo
1016 E. Cooley Drive, Suite A/B
Colton, CA

Dear Ms. Gallardo,

This letter presents the results of a record search conducted for the Santa Ana River Bottom Project in the City of Riverside, Riverside County, California. The project site is located along the Santa Ana River in the Township 2 South, Range 5 West, on the Jurupa/Rubidoux Land Grant on the *Riverside West CA* USGS 7.5 minute quadrangle.

The geologic units underlying this project are mapped entirely as alluvial sand, gravel, and clay deposits from the Holocene epoch (Dibblee and Minch, 2004). Holocene alluvial units are considered to be of high preservation value, but material found is unlikely to be fossil material due to the relatively modern associated dates of the deposits. However, if development requires any substantial depth of disturbance, the likelihood of reaching Pleistocene alluvial sediments would increase. The Western Science Center does not have localities within the project area or within a 1 mile radius.

While the presence of any fossil material is unlikely, if excavation activity disturbs deeper sediment dating to the earliest parts of the Holocene or Late Pleistocene periods, the material would be scientifically significant. Excavation activity associated with the development of the project area is unlikely to be paleontologically sensitive, but caution during development should be observed.

If you have any questions, or would like further information, please feel free to contact me at bstoneburg@westerncentermuseum.org.

Sincerely,

Brittney Elizabeth Stoneburg, MSc
Collections Manager

2345 Searl Parkway ♦ Hemet, CA 92543 ♦ phone 951.791.0033 ♦ fax 951.791.0032 ♦ WesternScienceCenter.org