

CEQA Documentation for Proposed Improvements at

RIVERSIDE AIRPORT

Riverside, California



**CEQA ENVIRONMENTAL DOCUMENTATION
For Proposed Improvements
At Riverside Airport**

for

**RIVERSIDE AIRPORT
Riverside, California**

Prepared for

CITY OF RIVERSIDE

by

Coffman Associates, Inc.

September 2013



TABLE OF CONTENTS

CONTENTS

RIVERSIDE AIRPORT Riverside, California

CEQA Environmental Documentation For Proposed Improvements At Riverside Airport

SECTION 1: MITIGATED NEGATIVE DECLARATION

SECTION 2: ENVIRONMENTAL INITIAL STUDY

**SECTION 3: MITIGATION MEASURE
MONITORING PROGRAM**

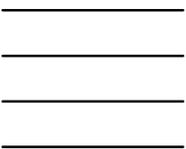
ATTACHMENT A: RUNWAY SAFETY ANALYSIS

**ATTACHMENT B: NOISE MODELING AND AIR QUALITY
INPUT ASSUMPTIONS**

**ATTACHMENT C: BIOLOGICAL STUDY FOR
PROPOSED IMPROVEMENTS
AT RIVERSIDE AIRPORT**

ATTACHMENT D: CULTURAL RESOURCES SURVEY

**ATTACHMENT E: PALEONTOLOGICAL RESOURCES
ASSESSMENT**





MITIGATED NEGATIVE DECLARATION



Draft Negative Declaration

AGENDA ITEM NO.:

WARD: 3

1. **Case Number:** NA
2. **Project Title:** Land Acquisition Reimbursement and Improvements for Riverside Airport
3. **Hearing Date:**
4. **Lead Agency:** City of Riverside Airport
5. **Address:** 6951 Flight Road
Riverside, CA 92504
6. **Contact Person:** Mark S. Ripley, Airport Director
Phone Number: (951) 351-6113
7. **Project Location:** This project is located at Riverside Airport, in the City of Riverside, in Riverside County. The regional location and project vicinity is shown in **Exhibit A**.
8. **Project Applicant/Project Sponsor's Name and Address:**
Mark S. Ripley, Airport Manager
6951 Flight Road
Riverside, CA 92504
9. **General Plan Designation:** Public Facilities/Institutions (no proposed change)
10. **Zoning:** Airport Zone (AIR) and Public Facility (PF) (no proposed change)
11. **Description of Project:** The purpose of the various airport improvements is two-fold. First, the improvements are needed to ensure that Federal Aviation Administration (FAA) airport design standards are upheld to the maximum extent practicable, particularly in relation to the Runway Protection Zone (RPZ) and Runway Safety Area (RSA), without significantly impairing use of the airfield. Secondly, the improvements are being undertaken to improve the efficiency and circulation on the airfield. The following sections briefly define the need for the various airport improvements.

RPZ. According to AC 5300-13, the RPZ's function is to enhance the protection of people and property on the ground. This is achieved through airport owner control over RPZs. Such control includes clearing RPZ areas (and maintaining them clear) of incompatible objects and activities. Control is preferably exercised through the acquisition of sufficient property interest in the RPZ. The City of Riverside has taken steps toward obtaining control of the Runway 9 RPZ with a 13.1-acre land purchase. No development is planned on the 13.1 acres.

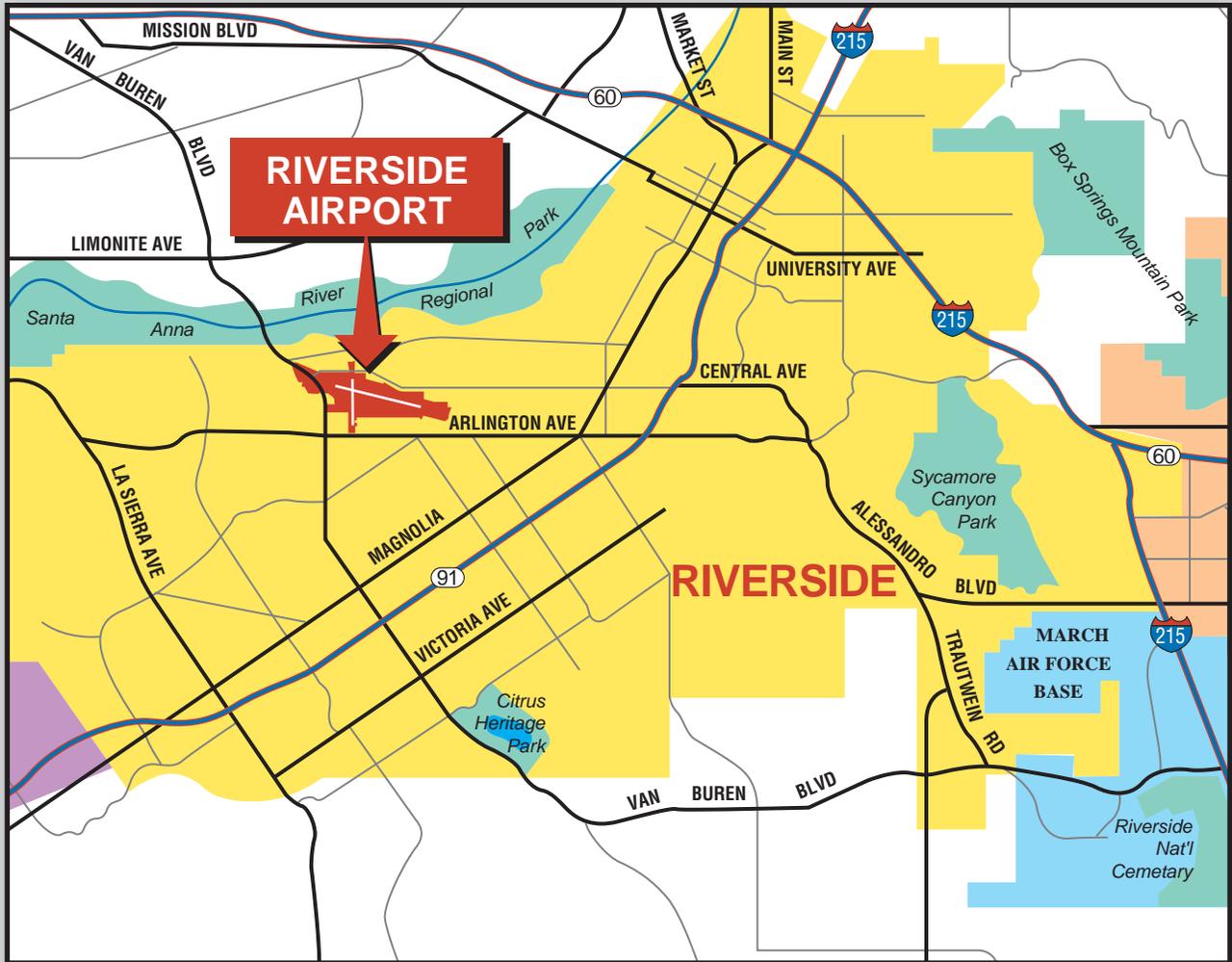


Exhibit A
LOCATION MAP

RSA Needs. Runway safety area criteria were established by the FAA to provide a level graded area adequate for emergency operations, including landing short or aborted take-offs. As defined in FAA Advisory Circular (AC) 150/5300-13, *Airport Design*, the RSA is “a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway.”

Analysis undertaken for the *2009 Riverside Airport Master Plan Update* determined that Runway 27 does not meet the current design criteria requirements for aircraft within the ARC C-II category. **Attachment A** provides a detailed RSA analysis for Riverside Airport. As depicted in **Table A** below, the Runway 27 RSA at Riverside Airport currently has only 100 feet of the required 1,000 feet to meet FAA’s design standards for ARC C-II aircraft. Two projects will need to be completed to bring the Runway 27 RSA into compliance with safety standards. First, approximately 2,700 feet of a 30-inch natural gas line will have to be relocated outside of the RSA. Second, approximately 155,000 cubic yards of fill will need to be brought in to bring the Runway 27 RSA up to standard.

TABLE A
Runway Safety Area Runway 27
Riverside Airport

Runway 27 Runway Safety Area	FAA ARC C-II Design Standard	Current Condition	Ultimate Condition
Width	400	400	400
Length	1,000	100	1,000

Note: All measurements in feet. **BOLD** = Does not meet standard
 Source: FAA AC 150/5300 - 13, *Airport Design*

North Side Development. Construction of 26 T-hangars and 91 box hangars on the west side of Runway 16-34 will use up the remaining portion of undeveloped property on the south side of Riverside Airport. The construction of the new T-hangars and box hangars addresses the short term need for hangar positions for smaller single and twin engine aircraft. However, hangar positions for larger turboprop and business jet aircraft remains deficient, having only five of the 18 hangar positions needed in the short term planning horizon. The north side of the airport offers nearly 30 acres of developable land for larger executive and conventional hangar development.

Grading the north side of the airport, developing gate controlled road access, aircraft apron, parallel taxiway, and connecting taxiways are the first steps for providing future hangar positions for larger turboprop and business jet aircraft. Up to 12 executive and conventional hangars are planned. The fill taken as a result of grading the north side of the airport has the added benefit of reducing the environmental impacts and cost of bringing fill from an off-airport site for the previously discussed Runway 27 RSA project. **Exhibit B** depicts the Proposed Project.

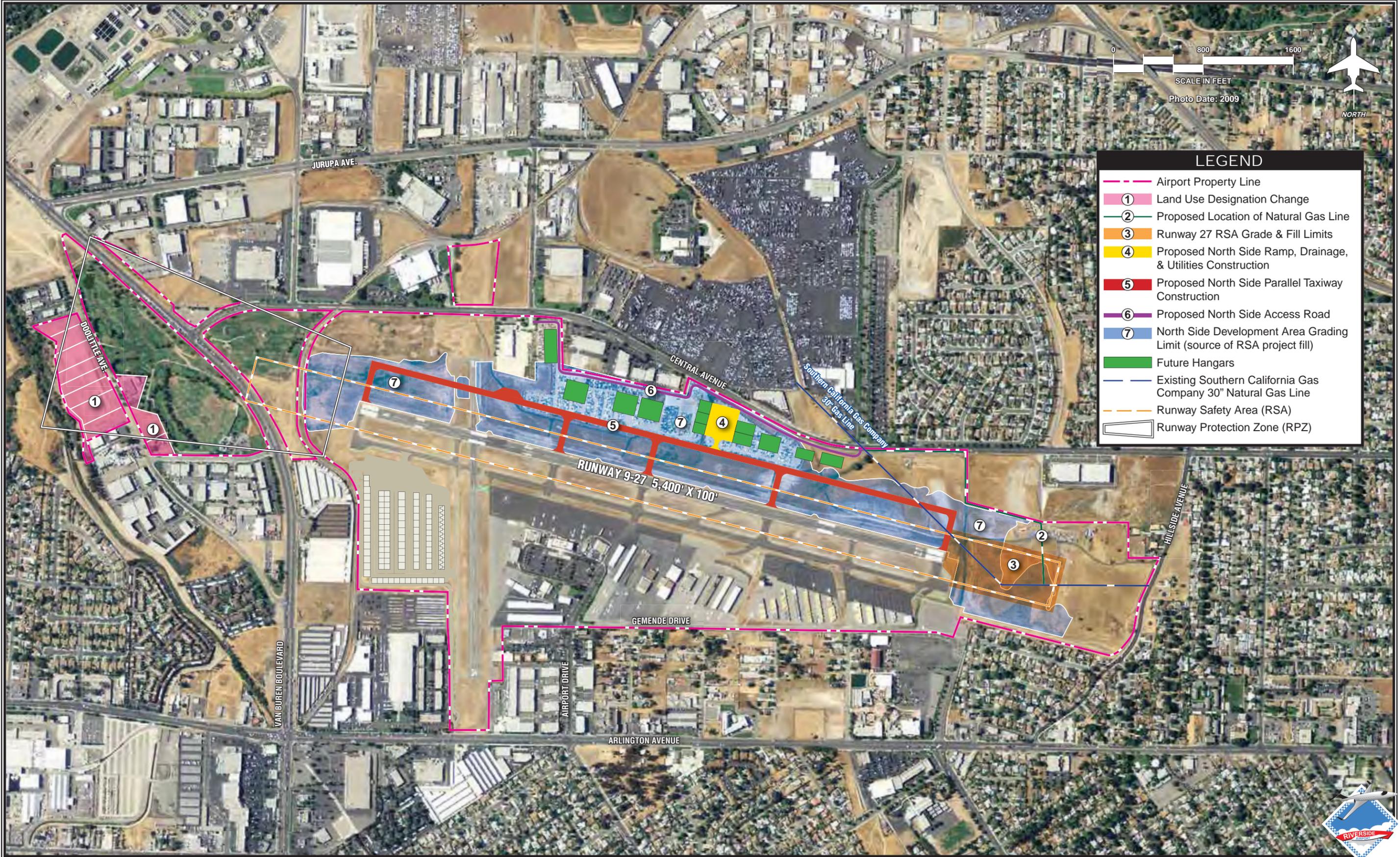
12. Surrounding land uses and setting: Briefly describe the project’s surroundings:

Adjacent Existing Land Use:

- North: Industrial Park and Residential
- East: Residential
- South: Commercial, Industrial Park and Residential
- West: Industrial Park and Residential

Adjacent zoning:

- North: Business and Manufacturing Park (BMP) and Single Family Residential (R-1-7000)
- East: Single Family Residential (R-1-7000)
- South: Commercial Retail (CR), Commercial General (CG), Business and Manufacturing Park (BMP), and Single Family Residential (R-1-7000)
- West: Business and Manufacturing Park (BMP), Commercial Retail (CR) and Multi-Family Residential (R-3-1500)



LEGEND

- Airport Property Line
- ① Land Use Designation Change
- ② Proposed Location of Natural Gas Line
- ③ Runway 27 RSA Grade & Fill Limits
- ④ Proposed North Side Ramp, Drainage, & Utilities Construction
- ⑤ Proposed North Side Parallel Taxiway Construction
- ⑥ Proposed North Side Access Road
- ⑦ North Side Development Area Grading Limit (source of RSA project fill)
- Future Hangars
- Existing Southern California Gas Company 30" Natural Gas Line
- Runway Safety Area (RSA)
- Runway Protection Zone (RPZ)

0 800 1600
SCALE IN FEET
Photo Date: 2009
NORTH



13. **Other public agencies whose approval is required (e.g., permits, financial approval, or participation agreement.):**
- a. City Planning & Building (review, permitting, project mitigation oversight)
 - b. Airport Administration (grant application, grant administration, project management)
 - c. Public Works (water, wastewater, surface transportation oversight)
 - d. Federal Aviation Administration (grant administration)
 - e. Water Quality Control Board (NPDES permit and SWPPP review)
 - f. U.S. Fish and Wildlife Service
 - g. California Fish and Wildlife
14. **Documents used and/or referenced in this review:**
- a. General Plan 2025
 - b. GP 2025 FPEIR
 - c. City of Riverside Zoning
 - d. City of Riverside Traffic Counts
 - e. 2009 Riverside Airport Master Plan Update
 - f. 2011 Environmental Assessment for Proposed Improvements at Riverside Airport (includes biological, cultural resource, and aircraft noise analysis studies)
 - g. Paleontological Resources Assessment Report
15. **Acronyms:**
- AICUZ - Air Installation Compatible Use Zone Study
 - AQMP - Air Quality Management Plan
 - AUSD - Alvord Unified School District
 - CDG - Citywide Design Guidelines
 - CEQA - California Environmental Quality Act
 - CMP - Congestion Management Plan
 - EMWD - Eastern Municipal Water District
 - EOP - Emergency Operations Plan
 - FAA - Federal Aviation Administration
 - FEMA - Federal Emergency Management Agency
 - FPEIR - GP 2025 Final Programmatic Environmental Impact Report
 - GIS - Geographic Information System
 - GP 2025 - General Plan 2025
 - LHMP - Local Hazard Mitigation Plan
 - MARB/MIP - March Air Reserve Base/March Inland Port
 - MJPA-JLUS - March Joint Powers Authority - Joint Land Use Study
 - MSHCP - Multiple-Species Habitat Conservation Plan
 - MVUSD - Moreno Valley Unified School District
 - NCCP - Natural Communities Conservation Plan
 - OEM - Office of Emergency Services
 - RCALUC - Riverside County Airport Land Use Commission
 - RCALUCP - Riverside County Airport Land Use Compatibility Plan
 - RCP - Regional Comprehensive Plan
 - RCTC - Riverside County Transportation Commission
 - RMC - Riverside Municipal Code
 - RPD - Riverside Police Department
 - RPU - Riverside Public Utilities
 - RPW - Riverside Public Works
 - RTP - Regional Transportation Plan
 - RUSD - Riverside Unified School District
 - SCAG - Southern California Association of Governments

SCAQMD - South Coast Air Quality Management District
SKR-HCP - Stephens' Kangaroo Rat - Habitat Conservation Plan
SWPPP - Storm Water Pollution Prevention Plan
USGS - United States Geologic Survey
WMWD - Western Municipal Water District
WQMP - Water Quality Management Plan

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

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

- | | | |
|--|---|--|
| <input checked="" type="checkbox"/> Aesthetics | <input type="checkbox"/> Agriculture & Forest Resources | <input checked="" type="checkbox"/> Air Quality |
| <input checked="" type="checkbox"/> Biological Resources | <input checked="" type="checkbox"/> Cultural Resources | <input checked="" type="checkbox"/> Geology/Soils |
| <input type="checkbox"/> Greenhouse Gas Emissions | <input checked="" type="checkbox"/> Hazards & Hazardous Materials | <input checked="" type="checkbox"/> Hydrology/Water Quality |
| <input type="checkbox"/> Land Use/Planning | <input type="checkbox"/> Mineral Resources | <input type="checkbox"/> Noise |
| <input type="checkbox"/> Population/Housing | <input type="checkbox"/> Public Services | <input type="checkbox"/> Recreation |
| <input type="checkbox"/> Transportation/Traffic | <input type="checkbox"/> Utilities/Service Systems | <input checked="" type="checkbox"/> Mandatory Findings of Significance |

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation which reflects the independent judgment of the City of Riverside, it is recommended that:

The City of Riverside finds that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

The City of Riverside finds that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

The City of Riverside finds that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

The City of Riverside finds that the proposed project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

The City of Riverside finds that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature _____

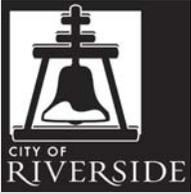
Date _____

Printed Name & Title _____

For City of Riverside



ENVIRONMENTAL INITIAL STUDY



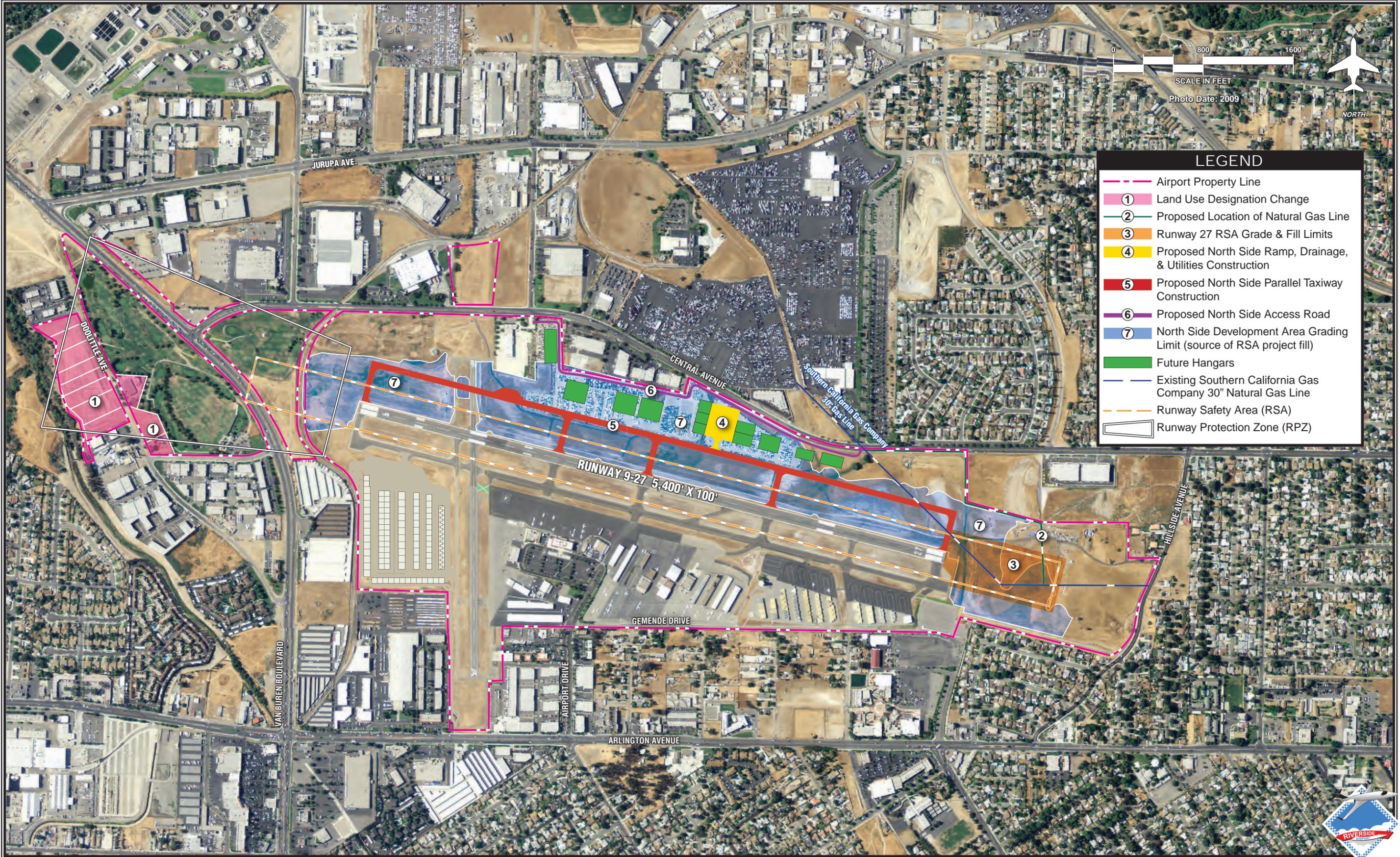
Environmental Initial Study

EVALUATION OF ENVIRONMENTAL IMPACTS:

- 1) A brief explanation is required for all answers except “No Impact” answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A “No Impact” answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
- 2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
- 3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.
- 4) “Negative Declaration: Less Than Significant With Mitigation Incorporated” applies where the incorporation of mitigation measures has reduced an effect from “Potentially Significant Impact” to a “Less Than Significant Impact.” The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from “Earlier Analyses,” as described in (5) below, may be cross-referenced).
- 5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
 - a. **Earlier Analysis Used.** Identify and state where they are available for review.
 - b. **Impacts Adequately Addressed.** Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
 - c. **Mitigation Measures.** For effects that are “Less than Significant with Mitigation Measures Incorporated,” describe the mitigation measure which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
- 6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

- 7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
- 8) The explanation of each issue should identify:
 - a. the significance criteria or threshold, if any, used to evaluate each question; and
 - b. the mitigation measure identified, if any, to reduce the impact to less than significance.

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
1. AESTHETICS. Would the project:				
a. Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>1a. Response: (Source: General Plan 2025 Figure CCM-4 – Master Plan of Roadways, General Plan 2025 FPEIR Figure 5.1-1 – Scenic and Special Boulevards and Parkways, Table 5.1-A – Scenic and Special Boulevards, and Table 5.1-B – Scenic Parkways)</p> <p>No Impact. Arlington Avenue (south of the Proposed Project) and Van Buren Boulevard (west of the Proposed Project) are both designated as scenic boulevards and parkways. Large residential and commercial industrial areas lay between the scenic boulevards and the Proposed Project construction sites. The Proposed Project is aviation-related and would occur in proximity to existing and long established airport facilities. The Proposed Project would also be compatible in size and scale with existing aviation-related development. Therefore, no adverse effect on scenic vistas is anticipated.</p>				
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>1b. Response: (Source: General Plan 2025 Figure CCM-4 – Master Plan of Roadways, General Plan 2025 FPEIR Figure 5.1-1 – Scenic and Special Boulevards, Parkways, Table 5.1-A – Scenic and Special Boulevards, Table 5.1-B – Scenic Parkways, the City’s Urban Forest Tree Policy Manual and Title 20 – Cultural Resources)</p> <p>Less than Significant Impact. No state scenic highway designations apply in the vicinity of Riverside Airport. No significant scenic resources, such as trees, rock outcroppings, or historic buildings within a state scenic highway, would be altered by the Proposed Project. Also see response to 5a. Cultural resources identified as part of the cultural resources survey are not eligible for listing on the National Register of Historic Places (NRHP) or local registers.</p>				
c. Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>1c. Response: (Source: General Plan 2025, General Plan 2025 FPEIR, Zoning Code, Citywide Design and Sign Guidelines, and 2009 Riverside Airport Master Plan)</p> <p>Less than Significant Impact. Riverside Airport is developed with aviation-related uses. The proposed aviation-related development identified in Exhibit A would be concentrated in the vicinity of this existing aviation development on the airport’s north and east side. None of the proposed aviation-related development would degrade the visual character or quality of the surrounding area. Therefore, the Proposed Project would have a less than significant impact on the visual character or quality of the surrounding area.</p>				
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>1d. Response: (Source: General Plan 2025, Title 19 – Article VIII – Chapter 19.556 – Lighting, Citywide Design and Sign Guidelines, and 2009 Riverside Airport Master Plan)</p> <p>Less than Significant with Mitigation Incorporated. New light sources on the airport would include those associated with new development on the north side. These new light sources would primarily be from taxiway lighting, security lighting, parking, and streetlights. The Proposed Project lighting would not have a significant impact, as the developments would occur totally within airport property. Moreover, the taxiway lighting systems are designed to be viewed from the air, and not the ground.</p> <p>Mitigation Measure AESTHETICS-1: To further reduce impacts related to light pollution, the City shall require at the time of issuing of building permits all developments that introduce light sources, or modifications to existing light sources, to have shielding devices or other light pollution limiting characteristics such as hoods or lumen restrictions.</p>				



LEGEND

- Airport Property Line
- ① Land Use Designation Change
- ② Proposed Location of Natural Gas Line
- ③ Runway 27 RSA Grade & Fill Limits
- ④ Proposed North Side Ramp, Drainage, & Utilities Construction
- ⑤ Proposed North Side Parallel Taxiway Construction
- ⑥ Proposed North Side Access Road
- ⑦ North Side Development Area Grading Limit (source of RSA project fill)
- Future Hangars
- Existing Southern California Gas Company 30" Natural Gas Line
- Runway Safety Area (RSA)
- Runway Protection Zone (RPZ)

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
2. AGRICULTURE AND FOREST RESOURCES:				
<p>In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effect, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and the forest carbon measurement methodology provided in the Forest Protocols adopted by the California Air Resources Board. Would the project:</p>				
<p>a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>2a. Response: (Source: General Plan 2025 – Figure OS-2, State of California’s Riverside County Important Farmland map 2008) <u>No Impact.</u> According to the State’s Important Farmland maps for Riverside County, there is no prime, unique or farmland of statewide importance located at the Airport. In addition, airport property is both planned and zoned for airport uses and this land has been cleared of any vegetation since 1993 (based upon a review of aerial photography) and has been part of the Airport. Farming practices are often in conflict with urban development, and it would not be desirable in most cases to reintroduce agriculture into these areas. Therefore, there are no impacts to prime, unique or farmland of statewide importance.</p>				
<p>b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>2b. Response: (Source: General Plan 2025 – Figure OS-3 - Williamson Act Preserves, General Plan 2025 FPEIR – Figure 5.2-4 – Proposed Zones Permitting Agricultural Uses, and Title 19) <u>No Impact.</u> There are no Williamson Act properties identified on Riverside Airport and the property is zoned for Public Facilities. Therefore, conflicts with agricultural farm land designated in the Williamson Act are not anticipated as a result of the Proposed Project implementation.</p>				
<p>c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)) or timberland (as defined in Public Resources Code section 4526)?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>2c. Response: (Source: GIS Map – Forest Data) <u>No Impact.</u> Proposed Project area is zoned Airport Zone (AIR) and Public Facility (PF). The Proposed Project is consistent with the existing zoning and there is no rezoning of forest land. The City has no forest land that can support 10% native tree cover nor does it have timberland.</p>				
<p>d. Result in the loss of forest land or conversion of forest land to non-forest use?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>2d. Response: (Source: GIS Map – Forest Data) <u>No Impact.</u> Proposed Project is contained within the current airport property boundary. There is no forest land on airport property. See 2c above.</p>				
<p>e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<p>2e. Response: (Source: General Plan – Figure OS-2 – Agricultural Suitability, Figure OS-3 -- Williamson Act Preserves, and GIS Map – Forest Data)</p> <p>No Impact. Figure OS-2 of the Open Space and Conservation Element of the <i>General Plan 2025</i> depicts the eastern and western portion of the project area as farmland of local importance. Local important farmland is land determined by the California Department of Conservation to be of significant economic importance locally. However, airport property is both planned and zoned for airport uses and this land has been cleared of any vegetation since 1993 and has been part of the Airport. Therefore, impacts to farmland of local importance or conversion of forest land to non-forest land will not occur. Also see response to 2c above.</p>				
<p>3. AIR QUALITY.</p>				
<p>Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:</p>				
<p>a. Conflict with or obstruct implementation of the applicable air quality plan?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>3a. Response: (Source: South Coast Air Quality Management District's 2007 Air Quality Management Plan (AQMP))</p> <p>Less than Significant Impact. The project is located within the South Coast Air Basin (SCAB) and is within the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAB is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. It includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties.</p> <p>The current regional air quality plan is the <i>2007 Air Quality Management Plan (AQMP)</i> adopted by the SCAQMD governing board on June 1, 2007. The SCAB is currently a federal and state nonattainment area for PM_{2.5} and ozone (O₃). The 2007 AQMP proposes attainment demonstration of the federal PM_{2.5} standards through more focused control of sulfur oxides (SO_x), directly-emitted PM_{2.5}, and nitrogen oxides (NO_x) supplemented with volatile organic compounds (VOC) by 2015. The 8-hour ozone control strategy includes additional NO_x and VOC reduction measures to meet the standard by 2024.</p> <p>Appendix III of the 2007 AQMP includes emissions inventories for baseline (2005) and forecast (2010, 2020, 2030) scenarios. The emissions inventories consider growth in airport-related emissions for general aviation airports, such as Riverside Airport. Therefore, anticipated increases in airport-related emissions resulting from operational growth at Riverside Airport are considered under the AQMP. Implementation of the projects included in the airport master plan will not conflict with or obstruct implementation of any of the control measures in these air quality plans.</p> <p>Additionally, the proposed improvements under consideration are outlined in the <i>Riverside Airport Master Plan Update</i>, adopted by the City of Riverside Council in August 2009. Implementation of the Proposed Projects and long term operation of the airport will not conflict with or obstruct implementation of any of the control measures in 2007 AQMP.</p>				
<p>b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

3b. Response: (Source: General Plan 2025 FPEIR Table 5.3-B SCAQMD CEQA Regional Significance Thresholds, South Coast Air Quality Management District's 2007 AQMP, FAA EDMS Model, EMFAC 2007 Model, URBEMIS 2007 Model, OFFROAD 2007 Model and Air Quality Analysis prepared by Coffman Associates, April 2011)

Less than Significant with Mitigation Incorporated. Operational Emissions: An airport operational emissions inventory for the Proposed Action Alternative was calculated using the FAA's Emissions and Dispersion Modeling System (EDMS), Version 5.1.3. EDMS is listed among the EPA's preferred guideline models and has been identified by the FAA as the only acceptable model for estimating aircraft emissions at airports. It calculates emissions of pollutants associated with an airport, including aircraft, ground support equipment, and automobiles.

EDMS does not calculate lead emissions; therefore, an assessment of these impacts cannot be made. Additionally, ozone emissions are not calculated by EDMS; however, volatile organic compounds (VOC) and nitrogen (NO_x) are precursors to ozone. Ground-level ozone is not emitted directly into the air, but is created by chemical reactions between NO_x and VOCs in the presence of sunlight. As a result, NO_x and VOCs, also referred to as reactive organic gases (ROGs), are a precursor to ozone. VOCs combine with sunlight and NO_x to form ozone emissions and are used to estimate ozone emissions. The fleet mix and operations levels utilized for the preparation of noise contours (**Attachment B**) were utilized for the emissions analysis.

Automobile trips associated with Riverside Airport were also included in the analysis. For purposes of this study, the annual vehicle trips associated with the airport were calculated according to the *Institute of Transportation Engineer's Trip Generation Manual*, 7th Edition, based on average daily operations at the airport.

Output data from the EDMS program are in pounds per day. **Table B** provides the projected air pollutant emissions associated with the operations at Riverside Airport under the existing condition (2010) and following implementation of the proposed improvements (2020). This includes emissions from aircraft, automobiles, ground support equipment, and fueling operations. EDMS output tables depicting emissions by source (aircraft, automobiles, ground support equipment) are included in **Attachment B**.

Riverside Airport, as an existing facility, accommodates 58,082 operations annually. For the purposes of this analysis, the existing emissions are considered as the baseline to which the projected changes in emissions will be compared. Based on the FAA's *Terminal Area Forecasts*, operations at the airport are projected to increase to 64,774 in the year 2020. These forecasts do not include implementation of the proposed improvements. With implementation of the proposed improvements, it is projected that operations will increase to 64,939 in 2020.

Table B also includes the *City of Riverside General Plan 2025 FPEIR, Table 5.3-B SCAQMD CEQA Regional Significance Thresholds* for operational emissions. As noted in the table, operational emissions for all pollutants will not exceed the regional significance thresholds.

TABLE B
Riverside Operational Emissions Inventory¹

	Operational Emissions (pounds per day)					
	CO	VOC ²	NO _x	SO ₂	PM ₁₀	PM _{2.5}
2010 (Baseline Condition, 58,082 operations)	1,862.0	36.5	12.6	3.1	0.3	0.3
2020 (Following project implementation, 64,939 operations)	2,071.8	41.2	11.1	3.5	0.2	0.2
Difference	209.80	4.70	-1.50	0.40	-0.10	-0.10
SCAQMD CEQA Regional Significance Threshold, Operation (pounds per day)	550	55	55	150	150	55
Yearly Emissions Exceeds Threshold?	No	No	No	No	No	No

- = Not applicable

¹ - Includes emissions from aircraft, automobiles, ground support equipment, and fueling operations based on 2009 Riverside Airport Master Plan operations estimates.

² - Also referred to as Reactive Organic Gases (ROGs)

Source: Coffman Associates analysis

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<p>Construction Emissions: Air emissions occurring due to construction activity vary based on the project's duration and level of activity. Construction emissions occur mostly as exhaust products from the operation of construction equipment and vehicles, but can also occur as fugitive dust emissions from land disturbance during material staging, demolition, and movement.</p>				
<p>Table C describes the anticipated emissions with construction and operation of the Proposed Action Alternative. To allow for a "worst case" evaluation, the 2012 Proposed Action emissions include construction emissions estimated to be generated during construction of the airport improvements. This construction is expected to occur over four years and is expected to be completed by 2015. The construction emissions inventory was prepared using the California Air Resources Board EMFAC2007 and OFFROAD2007 emissions models. The EMFAC2007 model evaluates highway vehicle emissions such as those from dump trucks or light-duty work trucks and the OFFROAD2007 model estimates emissions related to non-highway approved vehicles such as heavy construction equipment.</p>				
<p>TABLE C Construction Emissions Inventory by Year (Pounds Per Day)</p>				
Pollutant by Activity	2011	2012	2013	2014
Off-Road Equipment				
CO	1.081	0.822	0.145	0.427
VOC	0.236	0.163	0.028	0.074
NO _x	1.950	1.327	0.233	0.632
Sox	0.002	0.002	0.000	0.001
PM ₁₀	0.057	0.042	0.007	0.017
PM _{2.5}	0.012	0.009	0.001	0.003
On-Road Equipment/Vehicles				
CO	0.071	0.038	0.005	0.005
VOC	0.012	0.003	0.000	0.001
NO _x	0.045	0.019	0.001	0.007
Sox	0.001	0.001	0.000	0.000
PM ₁₀	0.002	0.001	0.000	0.000
PM _{2.5}	0.002	0.001	0.000	0.000
Paving				
VOC	0.000	0.037	0.000	0.011
Fugitive Dust				
PM ₁₀	122.246	23.285	0.728	10.915
PM _{2.5}	25.4273	4.8433	0.1514	2.2703
Total (Off-Road+On-Road+Paving+Fugitive Dust)				
CO	1.151	0.860	0.151	0.433
VOC	0.249	0.202	0.028	0.085
NO _x	1.995	1.346	0.233	0.638
SOx	0.003	0.002	0.000	0.001
PM ₁₀	122.306	23.327	0.734	10.932
PM _{2.5}	25.441	4.853	0.153	2.274
<p>- = Not applicable Source: Coffman Associates analysis</p>				

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

The EMFAC2007 and OFFROAD2007 models do not calculate lead emissions; therefore, an assessment of these impacts cannot be made. Additionally, similar to the aircraft emission model EDMS, ozone emissions are not calculated by the EMFAC2007 and OFFROAD2007. Therefore, VOC emissions are used to estimate ozone emissions.

Output data from the EMFAC2007 and OFFROAD2007 emissions models are expressed in tons per year. A summary of the construction emissions assumptions used for this analysis is included in **Attachment B**.

Emissions factors of 26.4 pounds per day per acre of land disturbed during site grading was used to estimate particulate matter (PM) fugitive dust emissions that would result from unpaved land disturbance. These factors were obtained from the *South Coast Air Quality Management District CEQA Air Quality Handbook*. For the purposes of this analysis, it was assumed that 25 percent of the documented project area (96.6 acres) would be disturbed on any given day and there would be an overall 84 percent control efficiency of fugitive emissions due to site watering and other mitigation.

Table D summarizes construction project emissions by year and includes the *City of Riverside General Plan 2025 FPEIR, Table 5.3-B SCAQMD CEQA Regional Significance Thresholds* for construction emissions. As indicated in the table, construction emissions do not exceed the regional significance thresholds for any of the five years evaluated.

TABLE D
Construction Emissions Inventory Summary (Years 1-4)

	Construction Emissions (Pounds Per Day)					
	CO	VOC	NO _x	SO ₂	PM ₁₀	PM _{2.5}
Year 1	1.151	0.249	1.995	0.003	122.246	25.427
Year 2	0.860	0.202	1.346	0.002	23.285	4.843
Year 3	0.151	0.028	0.233	0.000	0.728	0.151
Year 4	0.433	0.085	0.638	0.001	10.915	2.270
Regional Significance Threshold Construction (Pounds per Day)	550	75	100	150	150	55
Exceeds Threshold	No	No	No	No	No	No

- = Not applicable
Source: Coffman Associates analysis

Construction-related emissions will be short term and localized to the construction area. Best management practices (BMPs) will be implemented to reduce particulate emissions and were not considered as part of this analysis.

Mitigation Measure AIR QUALITY-1: To reduce fugitive dust emissions (PM₁₀) during project implementation, the following mitigation techniques will be employed: application of water to disturbed areas every three hours and all trucks hauling dirt, sand, soil, or other loose materials will be tarped with a fabric cover and will maintain a freeboard height of 12 inches. These measures are outlined in Table XI-A - Mitigation Measure Examples: Fugitive Dust From Construction and Demolition of the *SCAQMD Air Quality Handbook*.

Mitigation Measure AIR QUALITY-2: To mitigate for potential adverse impacts resulting from construction activities, development projects must abide by the SCAQMD's Rule 403 concerning Best Management Practices for construction sites in order to reduce emissions during the construction phase. Measures may include:

- Development of a construction traffic management program that includes, but is not limited to, rerouting construction related traffic off congested streets, consolidating truck deliveries, and providing temporary dedicated turn lanes for movement of construction traffic to and from site;
- Sweep streets at the end of the day if visible soil material is carried onto adjacent paved public roads;
- Wash off trucks and other equipment leaving the site;

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
--	--------------------------------	--	------------------------------	-----------

- Replace ground cover in disturbed areas immediately after construction;
- Keep disturbed/loose soil moist at all times;
- Suspend all grading activities when wind speeds exceed 25 miles per hour;
- Enforce a 15 mile per hour speed limit on unpaved portions of the construction site.

Mitigation Measure AIR QUALITY-3: To reduce diesel emissions associated with construction, construction contractors shall provide temporary electricity to the site to eliminate the need for diesel-powered electric generators, or provide evidence that electrical hook ups at construction sites are not cost effective or feasible.

Mitigation Measure AIR QUALITY-4: To reduce construction related particulate matter air quality impacts of City projects the following measures shall be required:

1. The generation of dust shall be controlled as required by the AQMD;
2. Grading activities shall cease during periods of high winds (greater than 25 mph);
3. Trucks hauling soil, dirt or other emissive materials shall have their loads covered with a tarp or other protective cover as determined by the City Engineer; and
4. The contractor shall prepare and maintain a traffic control plan, prepared, stamped and signed by either a licensed Traffic Engineer or a Civil Engineer. The preparation of the plan shall be in accordance with Chapter 5 of the latest edition of the Caltrans Traffic Manual and the State Standard Specifications. The plan shall be submitted for approval, by the engineer, at the preconstruction meeting. Work shall not commence without an approved traffic control plan.

c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	-------------------------------------	--------------------------

3c. Response: (Source: General Plan 2025 FPEIR Table 5.3-B SCAQMD CEQA Regional Significance Thresholds, South Coast Air Quality Management District’s 2007 AQMP, FAA EDMS Model, EMFAC 2007 Model, URBEMIS 2007 Model, OFFROAD 2007 Model and Air Quality Analysis prepared by Coffman Associates, April 2011)

Less than Significant Impact. As previously discussed, the SCAB is currently a federal and state nonattainment area for PM_{2.5} and ozone (O₃). **Table E** summarizes the projected net increase in emissions resulting from implementation of the proposed improvements. The table includes the federal *de minimis* threshold to which the net increase is compared. As indicated in the table, implementation of the proposed improvements will not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is designated as a non-attainment area. Additionally, as previously discussed, the operational and construction emissions related to the proposed improvements do not exceed the SCAQMD regional significance thresholds.

TABLE E
Proposed Project Emissions in Comparison to De Minimis Levels

Pollutant	Proposed Action Net Increase in Tons Per Year (tpy)		De Minimis Level	Exceeds De Minimis Level
	Proposed Action	No Action Emissions (2015)		
CO	0.61		100	No
VOC	0.155		10 ¹	No
NO _x	0.069		10 ¹	No
SO _x	0.014		100	No
PM ₁₀	0.004		70 ²	No
PM _{2.5}	0.005		100	No

Source: Coffman Associates analysis

¹ – Airport located within an “Extreme” nonattainment area for Ozone which requires more stringent *de minimis* thresholds.

² – Airport located within “Serious” nonattainment for PM₁₀ which requires more stringent *de minimis* thresholds.

Note: When comparing the results presented in Table E to previous tables, please note that Table E results are expressed in tons per year rather than pounds per day.

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
d. Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3d. Response: (Source: General Plan 2025 FPEIR Table 5.3-B SCAQMD CEQA Regional Significance Thresholds, South Coast Air Quality Management District's 2003 Air Quality Management Plan, URBEMIS 2007 Model, EMFAC 2007 Model and Air Quality Analysis prepared by Coffman Associates, April 2011)

Less than Significant Impact. To determine the cancer risk and other health impacts as a result of the proposed project, a health risk assessment (HRA)¹ was conducted for a number of receptors within the vicinity of the proposed project. Receptors were located to represent school children, offsite workers, residences, and recreational land uses. **Attachment B** provides details on background, methodologies, and assumptions for the HRA.

In terms of health risk and exposure, some receptors are considered more sensitive to air pollutants than others, owing to pre-existing health problems, proximity to the emissions source, or duration of exposure to air pollutants. Land uses such as primary and secondary schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because the very young, the old, and the infirm are more susceptible to respiratory infections and other air quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people in residential areas are often at home for extended periods. Recreational land uses are moderately sensitive to air pollution because vigorous exercise associated with recreation places a high demand on respiratory system function.

Cancer risk is defined as the lifetime probability (i.e., 70 years based on constant exposure) of developing cancer from exposure to carcinogenic substances. Cancer risks are expressed as the chance in one million of contracting cancer (i.e., number of cancer cases among one million people exposed).

Following guidelines established by the California Office of Environmental Health Hazard Assessment (OEHHA)² and SCAQMD³, the incremental cancer risks attributable to the Proposed Project were calculated by applying exposure parameters to modeled toxic air contaminants concentrations (TAC) from construction activities and operational conditions in order to determine the inhalation dose. The analysis used OEHHA guidance to select exposure parameters, including breathing rate, exposure duration, inhalation absorption factors, and age sensitivity factors.

The cancer risk related to the Proposed Project is summarized in **Table F**, and occurs primarily due to air toxic emissions from GSE (of diesel particulate matter [DPM]) and aircraft (of lead and 1,3-butadiene). The total risk due to the Proposed Project is estimated to be 0.09 and 0.59 in one million for offsite workers and residential exposures, respectively. The maximum exposed receptor for cancer risk is located to the north of the airport. The total risk at the nearest school is estimated at 0.03 in one million.

The contribution from the Proposed Project construction activities to the total risk is small as the activities are temporary when compared to the exposure lifetime; whereas, the operational activities are presumed to occur continuously for the population lifetime. Because all estimated cancer risks are less than 10 in one million, the impact of the Proposed Project is less than significant.

¹ An analysis designed to predict the generation and dispersion of air toxics in the outdoor environment, evaluate the potential for exposure of human populations, and to assess and quantify both the individual and population-wide health risks associated with those levels of exposure.

² California Office of Environmental Health Hazard Assessment (OEHHA), Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, August 2003. Available Online at: http://oehha.ca.gov/air/hot_spots/pdf/HRAguidefinal.pdf

³ South Coast Air Quality Management District (SCAQMD), *Supplemental Guidelines for Preparing Risk Assessments for the Air Toxic "Hot Spots" Information and Assessment Act (AB2588)*, June 2011.

ISSUES (AND SUPPORTING INFORMATION SOURCES):

Potentially Significant Impact

Less Than Significant With Mitigation Incorporated

Less Than Significant Impact

No Impact

TABLE F
Estimated Project Increment Cancer Risk

Source	Project Increment Cancer Risk	
	Offsite Worker	Residence
Construction	<0.01	0.01
Aircraft	<0.01	0.17
Ground Support Equipment	0.09	0.41
Auxiliary Power Units	<0.01	<0.01
Parking Lots	<0.01	0.01
Roadways	<0.01	<0.01
Total Cancer Risks	0.10	0.59
Significance Criteria	10.0	10.0

Values reflect rounding
Source: KB Environmental Sciences, Inc.; 2011.

Non-cancer adverse health risks, both for acute (short-term) and chronic (long-term) risks, are measured against a Hazard Index, which is defined by OEHHA as the ratio of the predicted exposure concentrations from the Proposed Project to published reference exposure levels (RELs) for non-carcinogens that can cause adverse health effects. The RELs are established by OEHHA based on epidemiological studies and evidence.

Thus, the estimated pollutant concentration is divided by the REL to determine the Hazard Quotient. Hazard Quotients for each substance with a non-carcinogenic effect that affects a certain organ system are added to produce an overall Hazard Index for that organ system. As a worst case scenario, it was assumed that all of the toxics with established RELs would affect the same target organ and the individual Hazard Quotients were summed to calculate an overall Hazard Index. If the resulting Hazard Index exceeds 1.0, the impact is considered to be significant.

The incremental acute and chronic health impacts related to the Proposed Project are summarized in **Table G**. The chronic impacts are primarily due to GSE and aircraft operations and the acute impacts are due to GSE and aircraft operations. Emissions of formaldehyde and acrolein contribute the greatest portion of the health impacts. The total acute and chronic Hazard Indices are below the significance threshold of 1.0, therefore the health impacts are less than significant.

TABLE G
Estimated Project Increment Health Impacts

Source	Residence		Offsite Worker	
	Chronic	Acute	Chronic	Acute
Construction	<0.01	<0.01	<0.01	<0.01
Aircraft	<0.01	0.10	<0.01	0.15
Ground Support Equipment	<0.01	0.02	0.01	0.22
Auxiliary Power Units	<0.01	<0.01	0.01	0.01
Parking Lots	<0.01	<0.01	<0.01	<0.01
Roadways	<0.01	<0.01	<0.01	<0.01
Total Hazard Index	<0.01	0.12	0.02	0.37
Significance Criteria	1.0	1.0	1.0	1.0

Values reflect rounding
Source: KB Environmental Sciences, Inc.; 2011.

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
e. Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<p>3e. Response: (Source: Air Quality Analysis prepared by Coffman Associates, April 2011) <u>Less than Significant Impact.</u> During construction, the various diesel-powered vehicles and equipment in use on the site would create odors. These odors are temporary and not likely to be noticeable beyond the project boundaries. Airport operations could result in intermittent odors affecting a small area, but would not affect a substantial number of people.</p>				
<p>4. BIOLOGICAL RESOURCES. Would the project:</p>				
<p>a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>4a. Response: (Source: General Plan 2025 FPEIR Figure 5.4-2 – MSHCP Area Plans, Figure 5.4-6 – MSHCP Narrow Endemic Plant Species Survey Area) <u>Less than Significant with Mitigation Incorporated.</u> The Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) is a comprehensive, multi-jurisdictional Habitat Conservation Plan (HCP) focusing on Conservation of species and their associated Habitats in Western Riverside County. Formulated and approved in conjunction with the federal (U.S. Fish and Wildlife Service [USFWS]) and state (California Department of Fish and Wildlife [CDFW]) agencies, the plan adequately conserves 146 species. Projects undertaken in compliance with the MSHCP do not have significant impacts to any of the 146 covered species.</p> <p><u>MSHCP Compliance:</u> The Project site is not in a criteria area, so site conservation was not required. Site-specific MSHCP requirements included habitat assessments for burrowing owls and three narrow endemic plant species (San Diego ambrosia, Brand's Phacelia, and San Miguel savory), in addition to the generally required habitat assessments for least Bell's vireo, southwestern willow flycatcher, western yellow-billed cuckoo, California linderiella, Riverside fairy shrimp, and vernal pool fairy shrimp. Potential habitat was determined to be located on the Project site only for San Diego ambrosia and burrowing owls. A focused survey for the San Diego Ambrosia on October 2, 2009 was negative. The burrowing owl focused survey observed a breeding pair in non-native grassland habitat immediately adjacent to the project site on airport grounds.</p> <p>Mitigation Measure BIOLOGICAL RESOURCES-1: To insure that take of Burrowing Owls does not occur, a 30-day preconstruction survey must be completed in the Proposed Project area Should Burrowing Owls be determined to occur within or adjacent to (within 150 meters) the project site, mitigation and monitoring measures should be determined through consultation with the CDFW and USFWS personnel assigned to oversight of the MSHCP plan area.</p> <p>Mitigation Measure BIOLOGICAL RESOURCES-2: To reduce raptor and non-raptor impacts to a less than significant level, construction and maintenance activities for the Proposed Project should be done outside of the nesting season, which (under the MSHCP Construction Guidelines, Volume I, Section 7.5.3) occurs from March 1 through June 30. If project grading and maintenance activities must occur during the nesting season, it is recommended that a qualified biologist conduct a pre-construction nest survey on the project site and within 150 feet (for non-raptor nests) and 500 feet (for raptor nests) of the Proposed Project footprint to identify any active nests that occur there. This survey should be carried out within one week of initiation of construction activities. If bird species protected under the Migratory Bird Treaty Act (MBTA), or California Fish and Wildlife Code Sections 2050 et seq., 3503, 3503.5, and 3513, are found nesting on or adjacent to the project site, a qualified biologist will monitor the nests daily during all phases of construction, and impose avoidance, noise barrier, or other standard mitigation measures as appropriate for the specie and circumstances, to ensure that the project does not significantly impact the nests.</p>				

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<p>No species not covered by the MSHCP will be significantly impacted, and the Project will be undertaken in full compliance with the plan. Thus, the Project will not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.</p>				
<p>b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>4b. Response: (Source: City of Riverside GIS/CADME USGS Quad Map Layer, and Natural Resource Conservation Service’s Web Soil Survey, and Attachment C, Biological Study for Proposed Improvements at Riverside Airport prepared by SWCA on December 2009) <u>No Impact.</u> There are no riparian areas on the Project site, and no sensitive natural communities. An area along the west edge of airport property proposed to be within the runway protection zone (RPZ) is classified as a riparian zone, but no construction is planned on or near that riparian zone.</p>				
<p>c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>4c. Response: (Source: City of Riverside GIS/CADME USGS Quad Map Layer, and Natural Resource Conservation Service’s Web Soil Survey, and Attachment C, Biological Study for Proposed Improvements at Riverside Airport prepared by SWCA on December 2009) <u>No Impact.</u> A review of the Natural Resource Conservation Service’s Web Soil Survey indicates that there are no hydric soils present at the airport.⁴ A wetland delineation conducted in accordance with standards established by the U.S. Army Corps of Engineers (USACE) and CDFW failed to show a federal nexus to any wetland on site. Because there is no federally protected wetland on site, there will be no substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.</p>				
<p>d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>4d. Response: (Source: MSHCP, General Plan 2025 –Figure OS-7 – MSHCP Cores and Linkage & Attachment C, Biological Study for Proposed Improvements at Riverside Airport prepared by SWCA on December 2009) <u>Less than Significant Impact.</u> The Riverside Airport and the Proposed Project site do not contain property designated in the MSHCP Core and Linkages area. Also see response to 4a.</p>				
<p>e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>4e. Response: (Source: MSHCP, Title 16 Section 16.72.040 – Establishing the Western Riverside County MSHCP Mitigation Fee, Title 16 Section 16.40.040 – Establishing a Threatened and Endangered Species Fees, City of Riverside Urban Forest Tree Policy Manual, & Attachment C, Biological Study for Proposed Improvements at Riverside Airport prepared by SWCA on December 2009)</p>				

⁴ NRCS web soil survey, <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>, accessed September 2009.

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<p><u>Less than Significant Impact.</u> No trees will be removed as part of this project. Because the Project will comply with the MSHCP, the Project will not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.</p>				
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>4f. Response: (Source: MSHCP, and Attachment C, Biological Study for Proposed Improvements at Riverside Airport prepared by SWCA on December 2009) <u>Less than Significant with Mitigation Incorporated.</u> Because the Project will comply with the MSHCP, the Project will not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan (see 4a, above for mitigation required pursuant to the MSHCP).</p>				
<p>5. CULTURAL RESOURCES. Would the project:</p>				
a. Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5a. Response: (Source: GP 2025 FPEIR Table 5.5-A Historical Districts and Neighborhood Conservation Areas and Attachment D, Cultural Resources Survey for the Proposed Riverside Improvement Project prepared by SWCA on January 2010) <u>Less than Significant with Mitigation Incorporated.</u> The archaeological sensitivity of the airport area is described as unknown on Exhibit 5.5-2 in the Riverside General Plan 2025. A cultural resource survey was completed in January 2010 to better understand the history of the Proposed Project site (included as Attachment D). In accordance with Title 20, a cultural resources survey was performed, which found no evidence that the Project would have significant adverse impacts to a historical resource as defined in § 15064.5. The survey identified three historic-period resources (33-17093, 33-17096, and 33-17097) in the Proposed Project area and found the sites to be not eligible for listing in the NRHP or local registers. In addition, the historic components of the two multi-component sites, (CA-RIV-8897/33-17092 and CARIV-8898/33-17094) identified in the Proposed Project area, were evaluated and found to be not eligible for listing in the NRHP or local registers as well. Impacts to these known resources would be considered less than significant. However, there is always the potential that unknown cultural resources might be discovered during construction. These potential impacts are less than significant with the following mitigation. Mitigation Measure CULTURAL RESOURCES-1: Prior to beginning project construction, the Project Applicant shall retain a Riverside County qualified archaeological monitor to monitor all ground-disturbing activities in an effort to identify any unknown historic resources. Any newly discovered cultural resource deposits shall be subject to a cultural resources evaluation and treated appropriately.</p>				
b. Cause a substantial adverse change in the significance of an archeological resource pursuant to § 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5b. Response: (Source: GP 2025 FPEIR Figure 5.5-1 - Archaeological Sensitivity and Figure 5.5-2 - Prehistoric Cultural Resources Sensitivity, Attachment D, Cultural Resources Study and Cultural Resources Survey for the Proposed Riverside Improvement Project prepared by SWCA on January 2010) <u>Less than Significant with Mitigation Incorporated.</u> The survey also identified a prehistoric archaeological site (CA-RIV-8899/33-17095) and the prehistoric portions of the two multi-component sites (CA-RIV-8897/33-17092 and CA-RIV-8898/33-17094) within the project area. These sites have not been formally evaluated for listing in the NRHP or local register. These sites are outside the grading area and are not anticipated to be impacted. However, the following mitigation will be implemented to ensure that unintentional disturbances do not occur. Mitigation Measure CULTURAL RESOURCES-2: At least 30 days prior to beginning project construction, the Project Applicant shall contact the Pechanga Tribe to notify the Tribe of grading, excavation, and the monitoring program, and to coordinate with the City of Riverside, and/or the FAA and the Tribe to develop a Cultural</p>				

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<p>Resources Treatment and Monitoring Agreement. The Agreement shall address the treatment of known cultural resources, the designation, responsibilities, and participation of Native American Tribal monitors during grading, excavation, and ground-disturbing activities; project grading and development scheduling; terms of compensation for the monitors; and treatment and final disposition of any cultural resources, sacred sites, and human remains discovered on the site.</p> <p>Mitigation Measure CULTURAL RESOURCES-3: Prior to beginning project construction, the Project Archaeologist shall file a pre-grading report with the City of Riverside and/or FAA (if required) to document the proposed methodology for grading activity observation which will be determined in consultation with the Pechanga Tribe. Said methodology shall include the requirement for a qualified archaeological monitor to be present and have the authority to stop and redirect grading activities. In accordance with the agreement required in Mitigation Measure CULTURAL RESOURCES-2, the archaeological monitor’s authority to stop and redirect grading will be exercised in consultation with the Pechanga Tribe in order to evaluate the significance of any archaeological resources discovered on the property. Tribal and archaeological monitors shall be allowed to monitor all grading, excavation, and groundbreaking activities, and shall also have the authority to stop and redirect grading activities.</p> <p>Mitigation Measure CULTURAL RESOURCES-4: The landowner shall relinquish ownership of all cultural resources, including sacred items, burial goods, and all native American archaeological artifacts that are found on the project area to the appropriate Tribe for proper treatment and disposition.</p> <p>Mitigation Measure CULTURAL RESOURCES-5: All sacred sites, should they be encountered within the project area, shall be avoided and preserved as the preferred mitigation, if feasible.</p> <p>Mitigation Measure CULTURAL RESOURCES-6: If inadvertent discoveries of subsurface archaeological/cultural resources are discovered during grading, the Developer, the project archaeologist, and the Tribe shall assess the significance of such resources and shall meet and confer regarding the mitigation for such resources. Pursuant to California Public Resources Code Section 21083.2(b), avoidance is the preferred method of preservation for archaeological resources. If the Developer, the project archaeologist, and the Tribe cannot agree on the significance or the mitigation for such resources, these issues will be presented to the Planning Director for decision. The Planning Director shall make the determination based on the provisions of the <i>California Environmental Quality Act</i> with respect to archaeological resources and shall take into account the religious beliefs, customs, and practices of the Tribe. Notwithstanding any other rights available under the law, the decision of the Planning Director shall be appealable to the Planning Committee and/or the City Council.</p>				
<p>c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5c. Response: (Source: General Plan 2025 Policy HP-1.3 and Attachment E, Paleontological Resources Assessment Report for the Proposed Riverside Airport Improvement Project prepared by SWCA on February 2010) <i>Less than Significant with Mitigation Incorporated.</i> The <i>Paleontological Resources Assessment Report for the Proposed Riverside Improvement Project</i> prepared by SWCA (Attachment E) found that the western portion of the Proposed Project area is, in part, underlain by geologic sediments determined to have a high paleontological sensitivity rating. Therefore, ground disturbances related to improvements to the Riverside Airport (such as mass grading, excavation, and/or trenching) within areas mapped as Quaternary old fan deposits are likely to result in adverse impacts to significant paleontological resources unless the following mitigation measures are implemented.</p> <p>Mitigation Measure CULTURAL RESOURCES-7: A Qualified Paleontologist will be retained to design and implement a paleontological monitoring and mitigation plan during pre-construction excavations associated with any development of the western portion of the Proposed Project site that may contain paleontologically sensitive areas.</p> <p>Mitigation Measure CULTURAL RESOURCES-8: All significant fossils and pertinent data recovered during construction monitoring will be prepared, identified, analyzed, and repositied in a public museum or other approved</p>				

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
curation facility. If significant fossils and pertinent data are not wanted, these items will be offered for reposit.				
d. Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5d. Response: (Source: GP 2025 FPEIR Figure 5.5-1 - Archaeological Sensitivity and Figure 5.5-2 - Prehistoric Cultural Resources Sensitivity and Attachment D, Cultural Resources Survey for the Proposed Riverside Improvement Project prepared by SWCA on January 2010) <u>Less than Significant with Mitigation Incorporated.</u> See responses to 5a and 5c. There is always the potential that unknown cultural resources might be discovered during construction. These potential impacts are less than significant with the following mitigation.</p> <p>Mitigation Measure CULTURAL RESOURCES-9: If human remains are encountered, California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the Riverside County Coroner has made the necessary findings as to origin. Further pursuant to California Public Resources Code Section 5097.98(b), remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made. If the Riverside County Coroner determines the remains to be Native American, the Native American Heritage Commission must be contacted within 24 hours. The Native American Heritage commission must then immediately identify the “most likely descendant(s)” of receiving notification of the discovery. The most likely descendant(s) shall then make recommendations within 48 hours, and engage in consultations concerning the treatment of the remains as provided in Public Resources Code Section 5097.98 and the Treatment Agreement described in Mitigation Measure CULTURAL RESOURCES-2.</p>				
6. GEOLOGY AND SOILS. Would the project:				
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>6i. Response: (Source: General Plan 2025 Figure PS-1 – Regional Fault Zones & General Plan 2025 FPEIR Appendix E – Geotechnical Report) <u>No Impact.</u> There are two major regional fault zones in western Riverside County (the Elsinore and San Jacinto Faults). There are no known faults traversing Riverside Airport. A review of the Riverside County geographical information indicated that the Proposed Project site is not located in an Alquist-Priolo Fault Hazard Zone or city fault zone. Therefore, no impact related to this issue will occur.</p>				
ii. Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>6ii. Response: (Source: General Plan 2025 FPEIR Appendix E – Geotechnical Report) <u>Less than Significant Impact.</u> The City of Riverside General Plan 2025 FPEIR Geotechnical Report also indicated peak ground acceleration (PGA) from the Elsinore and San Jacinto Faults ranged from .08 to .20. PGA is a measure of how hard the earth shakes in a given geographic area. These PGA levels are within the limits for current structural design (CBC/UBC) for non-critical structures, including most residential, commercial, and industrial buildings according to the City of Riverside General Plan 2025 FPEIR Geotechnical Report.</p>				
iii. Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>6iii. Response: (Source: General Plan 2025 Figure PS-1 – Regional Fault Zones, Figure PS-2 – Liquefaction</p>				

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<p><i>Zones, General Plan 2025 FPEIR Figure PS-3 – Soils with High Shrink-Swell Potential, and Appendix E – Geotechnical Report)</i></p> <p><u>Less than Significant with Mitigation Incorporated.</u> The City of Riverside General Plan 2025 FPEIR Geotechnical Report indicates that there is high probability for liquefaction along Runway 9-27 and low probability for liquefaction concerns in the Proposed Project area. The Proposed Project area is susceptible to subsidence. The proposed buildout of the north side development could expose people or structures to seismic-related ground failure. This potential impact can be mitigated to a less than significant level with the following mitigation.</p> <p>Mitigation Measure GEOLOGY-1: The project site will be reviewed for seismic stability by a qualified engineer. The engineer must identify areas requiring additional seismic protection, and must identify the appropriate development requirements to address any additional seismic impacts. New buildings will conform to the requirements of the Uniform Building Code.</p>				
iv. Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>6iv. Response: (Source: General Plan 2025 FPEIR Figure 5.6-1 – Areas Underlain by Steep Slope, Appendix E – Geotechnical Report, Title 18 – Subdivision Code, Title 17 – Grading Code, and for projects over 1 acre: Storm Water Pollution Prevention Plan SWPPP)</p> <p><u>Less than Significant Impact.</u> Per General Plan 2025 FPEIR Figure 5.6-1 – Areas Underlain by Steep Slope, the Proposed Project site is relatively level with slopes ranging from 0 to 10 percent. Therefore, the Proposed Project site is not anticipated to be subject to landslides.</p>				
b. Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>6b. Response: (Source: General Plan 2025 FPEIR Figure 5.6-1 – Areas Underlain by Steep Slope, Figure 5.6-4 – Soils, Table 5.6-B – Soil Types, Title 18 – Subdivision Code, Title 17 – Grading Code, and for projects over 1 acre: SWPPP)</p> <p><u>Less than Significant with Mitigation Incorporated.</u> While the Proposed Project site is located on a relatively level area per General Plan 2025 FPEIR Figure 5.6-1 – Areas Underlain by Steep Slope, construction activities have the potential to result in temporary water quality impacts, particularly suspended sediments, during and shortly after precipitation events in the construction phase. Recommendations established in FAA Advisory Circular 150/5370-10, Standards for Specifying Construction of Airports, Item P-156, Temporary Air and Water Pollution, Soil Erosion and Siltation Control, will be incorporated into project design specifications to further mitigate potential impacts. These standards include temporary measures to control water pollution, soil erosion, and siltation through the use of berms, fiber mats, gravels, mulches, slope drains, and other erosion control methods.</p> <p>In addition, the airport is currently operating under Regional Water Quality Control Board (RWQCB) National Pollutant Discharge Elimination System (NPDES) Permit Number CAG998001 for discharges of storm water and maintains a Stormwater Pollution Prevention Plan (SWPPP) in accordance with Environmental Protection Agency (EPA) regulations. The airport sponsor will comply with the NPDES program regarding filing a Notice of Intent prior to construction activities affecting more than one acre.</p> <p>The project design and construction of the Proposed Action Alternative will incorporate best management practices (BMPs) to reduce erosion, minimize sedimentation, and control non-storm water discharges in order to protect the quality of surface water features on and off the airport. BMPs are defined as nonstructural and structural practices that provide the most efficient and practical means of reducing or preventing pollution of storm water.</p> <p>Mitigation Measure GEOLOGY-2: During construction, erosion and sedimentation shall be minimized on the site by measures such as silt fences, covering of stockpiled soil materials, and other Best Management Practices (BMPs) as identified by the local RWQCB.</p>				
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<p>6c. Response: (Source: General Plan 2025 Figure PS-1 – Regional Fault Zones, Figure PS-2 – Liquefaction Zones, General Plan 2025 FPEIR Figure PS-3 – Soils with High Shrink-Swell Potential, Figure 5.6-1 - Areas Underlain by Steep Slope, Figure 5.6-4 – Soils, Table 5.6-B – Soil Types, and Appendix E – Geotechnical Report) <u>Less than Significant.</u> Based on a preliminary geotechnical study performed for a previously proposed project at the airport,⁵ the soils on the site are considered cohesive. Therefore, potential impacts related to soil instability are less than significant. Detailed site-specific geotechnical investigations will be conducted prior to the development of any structures on the airport to more fully assess soil conditions and to develop site-specific construction and design techniques.</p>				
<p>d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>6d. Response: (Source: General Plan 2025 FPEIR Figure 5.6-4 – Soils, Figure 5.6-4 – Soils, Table 5.6-B – Soil Types, Figure 5.6-5 – Soils with High Shrink-Swell Potential, Appendix E – Geotechnical Report, and California Building Code as adopted by the City of Riverside and set out in Title 16 of the Riverside Municipal Code) <u>Less than Significant with Mitigation Incorporated.</u> The western-most section of the project area is considered high for shrink/swell potential per the General Plan 2025 FPEIR Figure PS-3 – Soils with High Shrink-Swell Potential. There are no structures planned in the western portion of the Proposed Project area; only taxiway pavement is planned for this area. This potential impact can be mitigated to a less than significant level with Mitigation Measure GEOLOGY-3. Design of the taxiway segments will incorporate construction techniques to minimize the impact of the high shrink/swell potential.</p> <p>Mitigation Measure GEOLOGY 3: Detailed site-specific geotechnical investigations will be conducted prior to the development of structures on the airport to more fully assess soil conditions. Construction techniques and design solutions will be utilized to reduce any soil-related impacts below a level of significance.</p>				
<p>e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>6e. Response: <u>No Impact.</u> This issue is not relevant to the project as septic tanks or alternative wastewater systems are not proposed for the project.</p>				
<p>7. GREENHOUSE GAS EMISSIONS.</p>				
<p>Would the project:</p>				
<p>a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>7a. Response: (Source: Attachment B, GHG Analysis prepared by Coffman Associates on July 6, 2011) <u>Less than Significant Impact.</u></p> <p>Operational Emissions For the purposes of this analysis, the following recognized greenhouse gases (GHGs) were considered: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), perfluorocarbons (PFCs), hydrochlorofluorocarbons (HCFCs), and sulfur hexafluoride (SF₆).</p> <p>According to most international reviews, aviation emissions comprise a small but potentially important percentage of anthropogenic GHG and other emissions that contribute to global warming. The Intergovernmental Panel on</p>				

⁵ RMA Group Geotechnical Consultants 2006, Runway 9-27 and Taxiway "A", RMA Job No: 05-111-02, February 10.

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<p>Climate Change (IPCC) estimates that global aircraft emissions account for about 3.5 percent of the total quantity of GHG from human activities.⁶ In terms of U.S. contribution, the U.S. General Accounting Office (GAO) reports that aviation accounts for about 3 percent of total U.S. GHG emissions from human sources compared with other industrial sources, including the remainder of the transportation sector (23 percent) and industry (41 percent).⁷</p> <p>The scientific community is developing areas of further study to enable them to more precisely estimate aviation's effects on the global atmosphere. The FAA is currently leading or participating in several efforts intended to clarify the role that commercial aviation plays in GHG and climate change⁸. The most comprehensive and multi-year program geared toward quantifying climate change effects of aviation is the Aviation Climate Change Research Initiative (ACCRI) funded by FAA and the National Aeronautics and Space Administration (NASA). FAA also funds Project 12 of the Partnership for Air Transportation Noise & Emissions Reduction (PARTNER) research initiative to quantify the effects of aircraft exhaust and contrails on global and U.S. climate and atmospheric composition.</p> <p>Based on the FAA's Terminal Area Forecast Summary, Fiscal Years 2010-2030, the total number of aircraft operations for the United States for 2011 is estimated at 102,240,940. Based on the operations assumptions outlined in Attachment B, the 58,082 operations at Riverside Airport represent less than 0.006 percent of U.S. aviation activity. Therefore, assuming that greenhouse gases occur in proportion to the level of activity, greenhouse gas emissions associated with existing and future aviation activity at Riverside Airport would be expected to represent less than 0.0002 percent of U.S.-based greenhouse gases. Thus, greenhouse gases associated with aircraft operations will result in a less than significant impact.</p> <p>Construction Emissions</p> <p>GHGs associated with construction equipment exhaust emissions were calculated for carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). Based on the California Air Resources Board's <i>Local Government Operations Protocol For the Quantification and Reporting of Greenhouse Gas Emissions Inventories</i>, fuel emissions were normalized to CO₂ emissions (expressed as CO₂e using Global Warming Potential (GWP) factors published by the Intergovernmental Panel on Climate Change (IPCC). For this analysis, emissions calculated as part of the previously discussed construction emissions inventory were converted to metric tons and multiplied by the IPCC GWP factors for conversion to CO₂e. GWP factors used were 1 for CO₂, 21 for CH₄ and 310 for N₂O. Table H summarizes the yearly GHG emissions associated with construction of the proposed improvements.</p> <p>Currently, there are no published thresholds of significance established by any state or regional regulatory agency for measuring the impact of greenhouse gases from a project. SCAQMD supports state, federal, and international policies to reduce levels of ozone-depleting gases through its Global Warming Policy and rules and has established an interim GHG threshold. Based upon the prepared Climate Change Analysis for this project and the discussion above, the Proposed Project will not significantly impact the environment, thus a less than significant impact will occur directly, indirectly, and cumulatively in this regard.</p>				

⁶ IPCC Report as referenced in U.S. General Accounting Office (GAO) *Environment: Aviation's Effects on the Global Atmosphere Are Potentially Significant and Expected to Grow*; GAO/RCED-00-57, February 2000, p. 4.

⁷ Ibid, p. 14

⁸ ACRP Report 11 "Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories," 2009.

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

**TABLE H
Construction-Related Greenhouse Gas Emissions Summary (Metric Tons)**

Greenhouse Gas Emissions (Metric Tons)				
Greenhouse Gas	Year			
	2011	2012	2013	2014
CO ₂	31.780	8.391	0.837	1.928
N ₂ O	0.016	0.003	0.000	0.001
CH ₄	0.000	0.000	0.000	0.000
Greenhouse Gas Emissions - CO ₂ Equivalent (Metric Tons)				
	2011	2012	2013	2014
CO ₂	31.780	8.391	0.837	1.928
N ₂ O	4.811	0.942	0.039	0.327
CH ₄	0.003	0.001	<0.000	<0.000
Total	36.595	9.334	0.876	2.255

Source: Coffman Associates analysis.

b. Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
--	--------------------------	--------------------------	-------------------------------------	--------------------------

7b. Response: (Source: None)

Less than Significant Impact. The SCAQMD supports state, federal and international policies to reduce levels of ozone depleting gases through its Global Warming Policy and rules and has established an interim GHG threshold. In addition, the Proposed Project would comply with all SCAQMD applicable rules and regulations during construction of the project and, as demonstrated in the Climate Change Analysis, will not interfere with the State's goals of reducing GHG emissions to 1990 levels by the year 2020 as stated in the AB 32 and an 80 percent reduction in GHG emissions below 1990 levels by 2050 as stated in Executive Order S-3-05. Based upon the prepared Climate Change Analysis for this project and the discussion above, the Proposed Project will not conflict with any applicable plan, policy or regulation related to the reduction in the emissions of GHG and thus a less than significant impact will occur directly, indirectly and cumulatively in this regard.

8. HAZARDS & HAZARDOUS MATERIALS.

Would the project:

a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
---	--------------------------	--------------------------	-------------------------------------	--------------------------

8a. Response: (Source: General Plan 2025 Public Safety Element, GP 2025 FPEIR, California Health and Safety Code, Title 49 of the Code of Federal Regulations, California Building Code, Riverside Fire Department EOP, 2002 and Riverside Operational Area – Multi-Jurisdictional LHMP, 2004 Part 1, OEM's Strategic Plan)

Less than Significant Impact. The Proposed Project envisions changes to the airport to accommodate the expected increased usage of the facility. Potentially hazardous materials such as fuel, paint products, lubricants, solvents, and cleaning products may be used during the course of daily activities at the airport. The Proposed Project may result in an increase in the amount of hazardous materials routinely transported to the site (more airplanes utilizing the facility may result in increased usage of fuel). The transport of hazardous materials to the site will be conducted in accordance with all applicable state and federal laws. Compliance with all applicable laws and regulations will reduce the potential impact associated with the routine transport, use, or disposal of hazardous materials to a less than significant level. The City of Riverside's Emergency Management Office is responsible for coordinating the City's response to disasters as well as assisting residents to prepare for major events such as earthquakes, floods, hazardous material spills, plane crashes, train derailments, Africanized honey bees, and civil unrest.⁹

⁹ <http://www.riversideca.gov/fire/disasterpreparedness.asp>, accessed December 2011.

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>8b. Response: (Source: General Plan 2025 Public Safety Element, GP 2025 FPEIR Tables 5.7 A – D, California Health and Safety Code, Title 49 of the Code of Federal Regulations, California Building Code, City of Riverside’s EOP, 2002 and Riverside Operational Area – Multi-Jurisdictional LHMP, 2004 Part 1, OEM’s Strategic Plan)</p> <p>Less than Significant Impact. Due to the presence of hazardous materials on-site, the potential for an accidental release of hazardous materials into the environment is present at the airport. Hazardous materials and hazardous waste on-site will be handled in accordance with all applicable state and federal laws. The handling of hazardous materials and hazardous waste in accordance with all applicable state and federal laws will reduce the potential impacts associated with an accidental release of hazardous materials into the environment to a less than significant level.</p>				
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>8c. Response: (Source: General Plan 2025 Public Safety and Education Elements, GP 2025 FPEIR Table 5.7-D - CalARP RMP Facilities in the Project Area, Figure 5.13-2 – RUSD Boundaries, Table 5.13-D RUSD Schools, Figure 5.13-3 AUSD Boundaries, Table 5.13-E AUSD Schools, Figure 5.13-4 – Other School District Boundaries, California Health and Safety Code, Title 49 of the Code of Federal Regulations, California Building Code, Riverside County Office of Education website)</p> <p>Less than Significant Impact. The project site is not located within 0.25 miles of an existing district school. The Riverside Unified School District and Alvord Unified School District surround Riverside Airport. Adams Elementary School within the Riverside Unified School District, located 0.4 miles south of the Proposed Project site, is the closest district-operated school. The Harvest Christian School, located south of the airport, is approximately 0.28 miles from the Proposed Project site and is the closest private school.</p> <p>The Arlington Regional Learning Center, operated by the Riverside County Office of Education (RCOE), however, is located approximately 0.13 mile from the Airport. The Arlington Regional Learning Center is a K-12 alternative school that currently has 47 students and one full-time teacher.¹⁰ The RCOE is in the process of drafting a jurisdictional Local Hazard Mitigation Plan (LHMP) to be included in the County-wide LHMP in order to comply with Section 322 of the Federal Disaster Mitigation Act of 2000.¹¹</p> <p>Although the Proposed Project could involve the handling of additional hazardous materials, substances, or wastes within one-quarter mile of an existing school, both the Airport and the RCOE have, or will have, emergency response plans in place. Given that the Airport was an existing land use and hazardous materials handler prior to the construction of the Arlington Regional Learning Center, impacts associated with this issue are considered to be less than significant.</p>				
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>8d. Response: (Source: General Plan 2025 Figure PS-5 – Hazardous Waste Sites, GP 2025 FPEIR Tables 5.7-A – CERCLIS Facility Information, Figure 5.7-B – Regulated Facilities in TRI Information and 5.7-C – DTSC EnviroStor Database Listed Sites)</p> <p>No Impact. Per the General Plan 2025, the closest DTSC EnviroStor land use restricted site (Camp Anza) is located approximately 2,000 feet from the project area. The Closest CERCLIS site is 14,000 feet from the project</p>				

¹⁰ http://realestate.aol.com/schools-detail/Arlington-Regional-Learning-Center_Riverside_CA?id=77720&school-district-id=0600102830, accessed November 2011.

¹¹ http://www.rcoe.k12.ca.us/emergency/local_mitigation_plan.html, accessed November 2011.

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<p>site, according to Figure 5.7-B of the General Plan.</p> <p>The Environmental Protection Agency's <i>EnviroMapper for Envirofacts</i>¹² was also consulted regarding the presence of regulated hazardous sites. According to the <i>EnviroMapper</i> site, 12 hazardous waste sites were identified within the vicinity of the airport. These include Andrews Engineering, Daniels Creations, Dave's Wheel Alignment, Econo Firestone Tire, Harmon Industries, Horizon Coach Inc., Inland Empire Dry Cleaners, Masters Auto Repair, Mendocino Forest Products, Metal Container Corporation, Performance By Paul, and Rite Aid 5712 that are registered with the EPA. All 12 sites are outside the project area and would not be affected by the proposed development at the airport. Therefore, there are no impacts related to this issue.</p>				
<p>e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>8e. Response: (Source: General Plan 2025 Figure PS-6 – Airport Safety Zones and Influence Areas, and RCALUCP)</p> <p><u>Less than Significant Impact.</u> The Proposed Project consists of changes to Riverside Airport to safely accommodate existing and future business jet/turboprop aircraft that use this facility. The Proposed Project is consistent with the 2009 Riverside Airport Master Plan. On August 27, 2009, the Riverside County Airport Land Use Commission (RCALUC) found that the 2009 Riverside Airport Master Plan was consistent with the adopted Airport Land Use Compatibility Plan (ACLUP), with the one exception of a proposed runway extension. The Proposed Project, which does not involve a runway extension, is thus consistent with the ALUCP as well as the Airport's master plan.</p> <p>Areas surrounding the airport do have potential risks associated with airport use. However, the RCALUC has established policies which would lead to compatible land uses in and around the airport, thereby reducing the impacts associated with the safety of people residing or working in the project area to a less than significant level.</p>				
<p>f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>8f. Response: (Source: General Plan 2025 Figure PS-6 – Airport Safety Zones and Influence Areas, and RCALUCP)</p> <p><u>No Impact.</u> There are no private airstrips in the City of Riverside; the Project is not located within the vicinity of a private airstrip or heliport. There are no impacts associated with this issue.</p>				
<p>g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>8g. Response: (Source: GP 2025 FPEIR Chapter 7.5.7 – Hazards and Hazardous Materials, City of Riverside's EOP, 2002 and Riverside Operational Area – Multi-Jurisdictional LHMP, 2004 Part 1, and OEM's Strategic Plan)</p> <p><u>Less than Significant Impact with Mitigation Incorporated.</u> The sponsor and contractors of the Proposed Project will be required to design, construct, and maintain structures, roadways, and facilities to comply with applicable local, regional, state and/or federal requirements related to emergency access and evacuation plans. Construction activities which may temporarily restrict vehicular traffic will be required to implement adequate and appropriate measures to facilitate the passage of persons and vehicles through/around any required road closures. Adherence to these measures will reduce potential impacts related to this issue to a less than significant level.</p> <p>Mitigation Measure HAZARDS AND HAZARDOUS MATERIALS -1: The Proposed Project will be required to design, construct, and maintain structures, roadways, and facilities to comply with applicable local, regional, state, and/or federal requirements related to emergency access and evacuation plans.</p>				

¹² <http://www.epa.gov/enviro/emef/>, accessed March 2011.

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
h. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>8h. Response: (Source: General Plan 2025 Figure PS-7 – Fire Hazard Areas, GIS Map VHFSZ 2010, City of Riverside’s EOP, 2002, Riverside Operational Area – Multi-Jurisdictional LHMP, 2004 Part 1/Part 2 and OEM’s Strategic Plan)</p> <p>Less than Significant Impact. The nearest fire hazard areas with a moderate or high hazard rating are located 4.5 miles to the south and 6.5 miles east of the project area according to Figure PS-7 of the General Plan 2025. In addition, the project site is surrounded by airport, industrial, and residential development. Therefore, the project area is not readily subject to wildland fires. Impacts related to this issue have a less than significant level.</p>				
<p>9. HYDROLOGY AND WATER QUALITY. Would the project:</p>				
a. Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>9a. Response: Less than Significant with Mitigation Incorporated. Waste discharges include discharges of storm water and construction project discharges. A construction project resulting in the disturbance of one acre or more requires an NPDES permit. Construction project proponents are required to prepare a Storm Water Pollution Prevention Plan (SWPPP). Adherence to measures included in the SWPPP will reduce potential water quality impacts to a less than significant level.</p> <p>Mitigation Measure HYDROLOGY/WATER QUALITY-1: Construction of the planned improvements at the airport requires an update of the airport’s SWPPP and conformance with NPDES procedures.</p>				
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>9b. Response: (Source: General Plan 2025 Table PF-1 – RPU Projected Domestic Water Supply (AC-FT/YR), AND Table PF-2 – RPU Projected Water Demand)</p> <p>Less than Significant Impact. Water to the project site is provided by the Riverside Public Utilities (RPU) Department. The north side development will require an extension of the existing water main onto airport property. However, the installation of a parallel taxiway, connecting taxiways, gas line relocation, runway safety area grading, apron, access road, and aircraft hangars will result in only a small increase in water usage from ground water supplies provided by RPU. The parallel taxiway, runway safety area grading, apron, access road, and aircraft hangars will incrementally reduce the amount of land available for groundwater recharge. When compared to the groundwater basin’s total recharge area, the loss of permeable area on the 96.7-acre project site is insignificant.</p>				
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>9c. Response: (Source: Preliminary grading plan and Stormwater Pollution Prevention Plan)</p> <p>No Impact. It is anticipated that the Proposed Project will result in less than 15 percent of the 96.7-acre project area being paved. Stormwater will continue to remain in over-land flow in ditches that will continue mostly on the same flow path as the existing stormwater. A few pipe crossings under access taxiways also will be required. These pipe crossings will allow water to pond effectively and keep the 1-, 2- and 5-year storms from exceeding the current 1-, 2-, and 5-year max flow rates. At the far west end, where the terrain is flat and all taxiway run-off is directed, a</p>				

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
retention pond situation is planned to meter out absolute minimum water flows by using inlet and pipe controls that are also designed to safely pass a large (100-year) event. Because the actual site drainage pattern will not change, there will be no impacts from changed drainage patterns.				
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9d. Response: (Source: Preliminary grading plan and Stormwater Pollution Prevention Plan) <u>Less than Significant Impact.</u> The existing drainage pattern of the site or area, including the course of a stream or river, will not be altered. The amount or rate of surface runoff will not be substantially increased, as the additional impervious area is minimal, and within the stormwater system capacity.				
e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9e. Response: (Source: Preliminary grading plan and Stormwater Pollution Prevention Plan) <u>Less than Significant Impact.</u> The minimal additional runoff will be within the stormwater system capacity.				
f. Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9f. Response: <u>Less than Significant Impact.</u> The Proposed Project has the potential to cause changes in the quality of surface water. The installation of a parallel taxiway, connecting taxiways, gas line relocation, runway safety area grading, apron, access road, and aircraft hangars will require grading and excavation activities, which may allow eroded soils and other pollutants to enter drainage systems. Storm runoff from roadway surfaces tainted by sediment, petroleum products, commonly utilized construction materials, and to a lesser extent, trace metals such as zinc, copper, lead, cadmium and iron, may lead to the degradation of storm water in downstream channels. In accordance with the NPDES and as monitored by the City, developers are required to comply with NPDES and SWPPP requirements regarding the implementation of BMPs during construction. Therefore, impacts to surface water quality will be less than significant. See response to 9a and Mitigation Measure HYDROLOGY/WATER QUALITY-1.				
g. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9g. Response: <u>Less than Significant Impact.</u> Housing construction is not part of the Proposed Project. Therefore, the Proposed Project will not place housing within a 100-year flood hazard area, as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map.				
h. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9h. Response: (Source: General Plan 2025 Figure PS-4 – Flood Hazard Areas, and FEMA Flood Hazard Map panel number 06065C0705G) <u>No Impact.</u> According to General Plan 2025 Figure PS-4, Riverside Airport is not located within a flood hazard area. FEMA map number 06065C0705G confirms that all proposed development on the airport will not occur within a 100-year flood hazard area. Therefore, the Proposed Project would not impede or redirect 100-year flood flows.				
i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9i. Response: (Source: General Plan 2025 Figure PS-4 – Flood Hazard Areas, and FEMA Flood Hazard Maps panel number 06065C0705G) <u>No Impact.</u> Figure PS-4 of the General Plan 2025 also shows dam inundation areas for the City of Riverside. The				

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Proposed Project area is not located within any dam inundation areas. See also response to 9h.				
j. Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>9j. Response: (<i>Source: GP 2025 FPEIR Chapter 7.5.8 – Hydrology and Water Quality</i>) <u>No Impact.</u> The project site is not located near or immediately adjacent to an ocean or lake; therefore, the potential for inundation of the site by a seiche, tsunami, or mudflow is very low. For this reason, no impacts associated with this issue are considered as a result of the Proposed Project.</p>				
10. LAND USE AND PLANNING:				
Would the project:				
a. Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>10a. Response: (<i>Source: General Plan 2025 Land Use and Urban Design Element, Project site plan Figures LU-7 & LU-10 and City of Riverside GIS/CADME map layers</i>) <u>No Impact.</u> The Proposed Project is aviation-related development on Riverside Airport property. Conversion of land purchased by the City to airport property is consistent with the <i>General Plan 2025</i> LU-10. The site would not be located within or divide existing neighborhoods, nor would it introduce a barrier between residential uses; therefore, no impact related to this issue will occur.</p>				
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>10b. Response: (<i>Source: General Plan 2025, General Plan 2025 Figures LU-7 Redevelopment Areas & LU-10 – Land Use Policy Map, and 2009 Riverside Airport Master Plan</i>) <u>No Impact.</u> The Proposed Project is consistent with the current planned land uses for the site, as shown in the <i>General Plan 2025</i> Figure LU-10. Riverside Airport is designated as public facility and is surrounded by areas planned for light industrial, commercial office, and commercial retail. Property purchased by the City for RPZ protection is also consistent with <i>General Plan 2025</i> Figure LU-10. In addition, the project reflects the City of Riverside’s vision for the airport based upon the <i>2009 Riverside Airport Master Plan</i>. For these reasons, there is no impact associated with this issue.</p>				
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>10c. Response: (<i>Source: MSHCP</i>) <u>Less than Significant Impact.</u> The Project conforms to all applicable plans. Thus, there is no conflict, and this impact will be less than significant.</p>				
11. MINERAL RESOURCES.				
Would the project:				
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>11a. Response: (<i>Source: General Plan 2025 Figure – OS-1 – Mineral Resources</i>) <u>Less than Significant Impact.</u> The project site is classified as Mineral Resource Zone (MRZ) 4, areas where the available geologic information indicates that mineral deposits are likely to exist, however, the significance of the deposit is undetermined. No mineral extraction has occurred on-site. Development of the Proposed Project on the airport will not result in the loss of availability of statewide or locally important mineral resources. Adjacent properties do not include a state-classified or designated area or existing surface mine. Therefore, impacts related to this issue are less than significant.</p>				
b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
plan, specific plan or other land use plan?				
<p>11b. Response: (Source: General Plan 2025 Figure – OS-1 – Mineral Resources) <u>No Impact.</u> The project site is not classified as an area of locally important mineral resource recovery. No mineral extraction has occurred on-site. No impact related to this issue will occur.</p>				
12. NOISE.				
Would the project result in:				
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>12a. Response: (Source: General Plan 2025 Noise Element, Title 7, Noise Control of the Riverside Municipal Code, and 2011 Environmental Assessment for Proposed Improvements at Riverside Airport) <u>No Impact.</u> General Plan 2025 noise compatibility criteria states that noise-sensitive land uses (residential, schools, churches, hospitals, libraries, and nursing homes) are conditionally acceptable within the 60 CNEL Residential land uses are considered normally unacceptable within the 65 CNEL. The City of Riverside’s Municipal Code, however, states that 55 dbA is the exterior ambient noise standard for residential areas between the hours of 7 AM and 10 PM and that 45 dbA is the exterior ambient noise standard for residential areas between the hours of 10 PM and 7 AM.</p> <p>Federal standards also categorize residential uses within the 65 CNEL contour as incompatible. FAA Order 1050.1E, Appendix A, paragraph 14.3, defines a significant noise impact as one which would occur if the Proposed Project would cause noise-sensitive areas to experience an increase in noise of 1.5 CNEL or more, at or above the 65 CNEL noise exposure level when compared to the No Action Alternative for the same timeframe.</p> <p>An analysis of aircraft noise exposure was developed for the Proposed Project and No Action future conditions for the 2011 Environmental Assessment for Proposed Improvements at Riverside Airport. The noise analysis can be found in Attachment B. Future analysis time periods include the anticipated year of project implementation (2015) and five years beyond the implementation date (2020). Exhibit B depicts the existing (2010) noise condition at the airport based on Riverside Airport Traffic Control Tower counts for calendar year 2009. Three percent was added to account for itinerant nighttime activity when the tower is closed. As indicated on the exhibit, the 65 community noise equivalent level (CNEL) noise contour remains on airport property to the north, south, and west. The 65 CNEL noise exposure contour does extend off airport property in two areas on the east side of the airport. The 65 CNEL contour, which extends off airport property to the southeast, is near three homes. A grid point analysis was prepared for the three homes located immediately southeast of the airport near the 65 CNEL noise exposure contour. As seen on Exhibit B, the grid point analysis confirms the homes are outside the 65 CNEL. Therefore, there are no non-compatible land uses within the existing condition noise exposure contours.</p> <p><u>2015 Noise Condition</u></p> <p>Exhibit C depicts the forecast 2015 noise condition with implementation of the Proposed Project and No Action Alternative. Under the 2015 No Action Alternative condition, a total of three homes are located near the 65 CNEL contour southeast of airport property. A grid point analysis confirms the homes remain outside the 65 CNEL contour in the No Action Alternative condition. No noise-sensitive land uses are located within the 70 or 75 CNEL noise contour under this condition.</p> <p>The 2015 Proposed Action Alternative assumes that the FAA’s Terminal Area Forecast (TAF) for operations in 2015 will increase 13 percent for business jets and six percent for turboprop aircraft. As shown on Exhibit C, portions of the 65 CNEL contour continue to extend beyond airport property to the southeast. Portions of three homes are near the 65 CNEL noise contour southeast of the airport; however, a grid point analysis confirms the homes remain outside the 65 CNEL contour. No noise-sensitive land uses are located within the 70 or 75 CNEL noise contour under Proposed Project condition.</p>				



LEGEND

- Airport Property Line
- 75 CNEL (Community Noise Equivalent Level)

EXISTING	
House 1	63.9
House 2	64.6
House 3	63.6



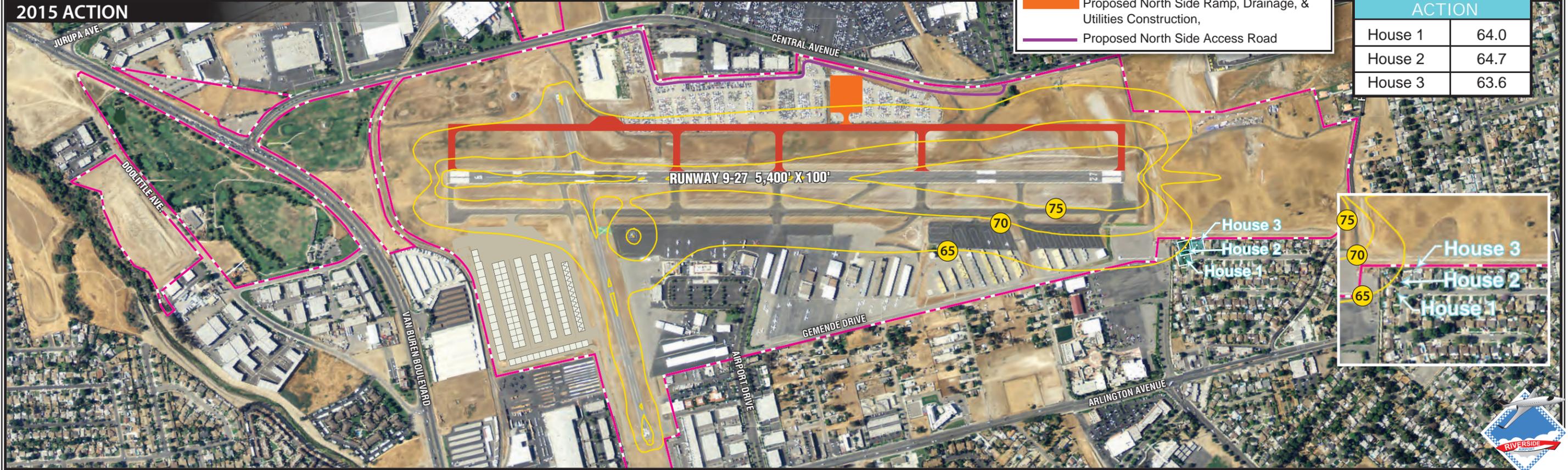
2015 NO ACTION



LEGEND	
	Airport Property Line
	CNEL (Community Noise Equivalent Level)
	New Taxiway
	Proposed North Side Ramp, Drainage, & Utilities Construction,
	Proposed North Side Access Road

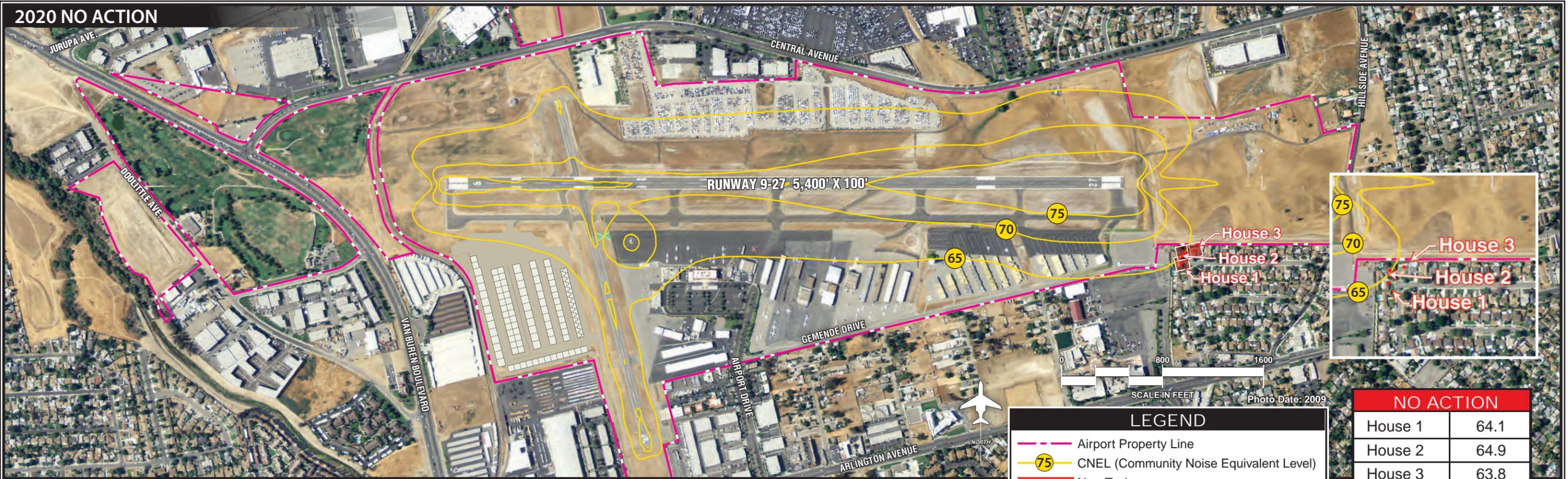
NO ACTION	
House 1	64.0
House 2	64.7
House 3	63.6
ACTION	
House 1	64.0
House 2	64.7
House 3	63.6

2015 ACTION



ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<p><u>2020 Noise Condition</u></p> <p>Exhibit D depicts the noise condition projected for 2020 for the Proposed Action Alternative condition. Under the 2020 No Action Alternative condition, a total of three homes are also located near the 65 CNEL contour southeast of airport property. A grid point analysis confirms the homes continue to remain outside the 65 CNEL contour in the No Action Alternative condition. No noise-sensitive land uses are located within the 70 or 75 CNEL noise contour under this condition.</p> <p>The 2020 Proposed Action Alternative assumes that the FAA's <i>Terminal Area Forecast</i> (TAF) for operations in 2020 will increase 15 percent for business jets and seven percent for turboprop aircraft. In this forecast condition, the same three homes continue to be located near the 65 CNEL noise exposure contour southeast of the airport; however, a grid point analysis confirms the homes remain outside the 65 CNEL contour. No noise-sensitive land uses are located within the 70 or 75 CNEL noise contour under the Proposed Project condition.</p> <p><u>Conclusion</u></p> <p>The Proposed Project will not result in an increase in the ambient noise levels that already exist in the airport area. No additional flights or changes to the flight patterns at the airport will occur as a result of the Proposed Project. Therefore, exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or applicable standards of other agencies will not occur as a result of the Proposed Project.</p>				
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>12b. Response: (Source: <i>General Plan 2025 Noise element, FPEIR Table 5.11-G – Vibration Source Levels For Construction Equipment, and 2011 Environmental Assessment for Proposed Improvements at Riverside Airport</i>) <u>Less than Significant Impact.</u> The Proposed Project will generate groundborne vibration and noise from construction activity. However, Proposed Project construction activities are temporary and will be contained on airport property. In addition, the City Municipal Code Section 7.35.010 restricts construction to specific hours of the day and certain days of the week. Therefore, keeping construction activities on airport property and implementation of the City Municipal Code, impacts related to excessive groundborne vibration due to construction activities are considered less than significant.</p>				
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>12c. Response: (Source: <i>General Plan 2025 Noise element, FPEIR Table 5.11-G – Vibration Source Levels For Construction Equipment, and 2011 Environmental Assessment for Proposed Improvements at Riverside Airport</i>) <u>Less than Significant Impact.</u> See response to 12a. There would be no noise-sensitive land uses located within the existing or future (2020) CNEL 65 noise contours for the airport.</p>				
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>12d. Response: (Source: <i>General Plan 2025 Noise element, FPEIR Table 5.11-G – Vibration Source Levels For Construction Equipment, and 2011 Environmental Assessment for Proposed Improvements at Riverside Airport</i>) <u>Less than Significant Impact.</u> The only temporary increase in ambient noise levels would occur during construction of the parallel taxiway, connecting taxiways, gas line relocation, runway safety area grading, apron, and access road. The sensitive noise receptors (residences) nearest potential sites of gas line relocation and runway safety area grading are over 100 feet from the construction site. Given the distance, no significant impacts are anticipated.</p>				
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>12e. Response: (Source: <i>General Plan 2025 Noise element, FPEIR Table 5.11-G – Vibration Source Levels For</i></p>				

2020 NO ACTION

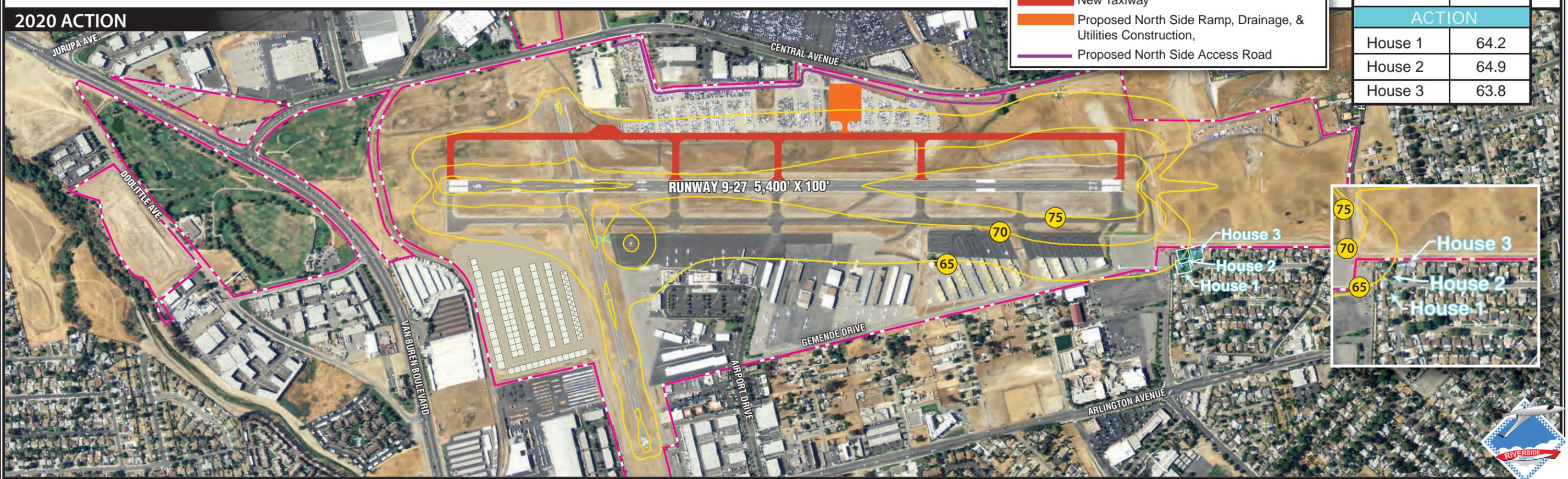


LEGEND

- Airport Property Line
- CNEL (Community Noise Equivalent Level)
- New Taxiway
- Proposed North Side Ramp, Drainage, & Utilities Construction,
- Proposed North Side Access Road

NO ACTION	
House 1	64.1
House 2	64.9
House 3	63.8
ACTION	
House 1	64.2
House 2	64.9
House 3	63.8

2020 ACTION



ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<p><i>Construction Equipment, and 2011 Environmental Assessment for Proposed Improvements at Riverside Airport</i>) <u>Less Than Significant Impact.</u> Riverside County Airport Land Use Commission has adopted an airport land use compatibility plan (ALUCP) for Riverside Airport. The Proposed Project involves constructing a parallel taxiway, connecting taxiways, gas line relocation, runway safety area grading, apron, and access road at this public airport. As discussed in the response to 12a, residents near the airport will not be exposed to noise levels that exceed the threshold of 65 CNEL in 2020. As a result, the Proposed Project would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project, resulting in a less than significant impact.</p>				
f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>12f. Response: (Source: General Plan 2025 Figure PS-6 – Airport Safety Zones and Influence Areas, RCALUCP) <u>No Impact.</u> There are no private airstrips within two miles of the proposed project.</p>				
<p>13. POPULATION AND HOUSING.</p>				
<p>Would the project result in:</p>				
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>13a. Response: (Source: General Plan 2025 Table LU-3 – Land Use Designations, FPEIR Table 5.12-A – SCAG Population and Households Forecast, Table 5.12-B – General Plan Population and Employment Projections–2025, Table 5.12-C – 2025 General Plan and SCAG Comparisons, Table 5.12-D - General Plan Housing Projections 2025, Capital Improvement Program and SCAG’s RCP and RTP, and 2009 Riverside Airport Master Plan) <u>Less than Significant Impact.</u> The Proposed Project will not induce growth not anticipated in the City’s General Plan 2025. Additionally, the project site is located in an urbanizing area, to which roadways and utility infrastructure have already been extended and municipal services provided. The proposed changes to the airport are consistent with the Riverside Airport Master Plan and the City’s plan for the airport. As the Proposed Project is consistent with the City of Riverside plan for the airport in that it accommodates growth. Therefore, no significant growth-inducing impacts will be associated with development of the project site.</p>				
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>13b. Response: <u>No Impact.</u> The Proposed Project aviation-related development will be constructed completely on airport property. No construction is planned on the property purchased by the City for airport RPZ protection. One residential structure exists on the property purchased by the City. The resident of the home is allowed to remain in the dwelling. Therefore, no housing would be displaced by the Proposed Project.</p>				
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>13c. Response: <u>No Impact.</u> See response to 13b.</p>				

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
14. PUBLIC SERVICES. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
a. Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
14a. Response: (Source: FPEIR Table 5.13-B – Fire Station Locations, Table 5.13-C – Riverside Fire Department Statistics and Ordinance 5948 § 1)				
<p><u>Less than Significant Impact.</u> The project site is not located near Fire Hazard Areas. Fire protection service is provided by a fire station located on the airport. Development of the Proposed Project (parallel taxiway, connecting taxiways, gas line relocation, runway safety area grading, apron, and access road) are not structures and will not have a significant effect on the demand for fire protection services. Aircraft hangar facilities will be equipped with fire suppression systems.</p>				
b. Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
14b. Response: (Source: General Plan 2025 Figure PS-8 – Neighborhood Policing Centers)				
<p><u>Less than Significant Impact.</u> Police protection service to the project site is provided by the City of Riverside Police Department. The Proposed Project will not result in a substantial increased demand for police protection services. The current security fencing will meet all federal standards for security. Adherence to these standards will reduce potential impacts related to the provision of police protection services to a less than significant level.</p>				
c. Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
14c. Response: (Source: FPEIR Figure 5.13-2 – RUSD Boundaries, Table 5.13-D – RUSD and Table 5.13-G – Student Generation for RUSD and AUSD By Education Level)				
<p><u>No Impact.</u> The Proposed Project consists of improvements to Riverside Airport. There will be no local population increase due to the implementation of the Proposed Project on Riverside Airport. Therefore, there will be no impact to the demand for school services.</p>				
d. Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
14d. Response: (Source: General Plan 2025 Figure PR-1 – Parks, Open Spaces and Trails, Table PR-4 – Park and Recreation Facilities, Parks Master Plan 2003, GP 2025 FPEIR Table 5.14-A – Park and Recreation Facility Types, and Table 5.14-C – Park and Recreation Facilities Funded in the Riverside Renaissance Initiative)				
<p><u>No Impact.</u> The Proposed Project consists of improvements to Riverside Airport on airport current property. Therefore, there will be no impact to existing or future planned parks.</p>				
e. Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
14e. Response: (Source: General Plan 2025 Figure LU-8 – Community Facilities, FPEIR Figure 5.13-5 - Library Facilities, Figure 5.13-6 - Community Centers, Table 5.3-F – Riverside Community Centers, Table 5.13-H – Riverside Public Library Service Standards)				
<p><u>Less than Significant Impact.</u> Maintenance of public facilities and infrastructure in the City of Riverside would not be significantly altered by Proposed Project improvements to Riverside Airport. The services and utilities required to operate and maintain these proposed improvements would be typical of other existing facilities at the airport and will not result in excessive wear and tear on the existing circulation, sewer, storm drain, or other public facilities. Therefore, a less than significant impact is expected from implementation of the Proposed Project.</p>				
<p>The Proposed Project does not include a residential component and is unlikely to significantly increase local or regional populations; therefore, the Proposed Project would not cause an increase in the use of other public facilities such as libraries or community centers in the area. No significant impacts associated with this issue will occur.</p>				

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
15. RECREATION.				
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>15a. Response: (Source: General Plan 2025 Figure PR-1 – Parks, Open Spaces and Trails, Table PR-4 – Park and Recreation Facilities, Figure CCM-6 – Master Plan of Trails and Bikeways, Parks Master Plan 2003, FPEIR Table 5.14-A – Park and Recreation Facility Types, and Table 5.14-C – Park and Recreation Facilities Funded in the Riverside Renaissance Initiative, Table 5.14-D – Inventory of Existing Community Centers, Riverside Municipal Code Chapter 16.60 - Local Park Development Fees, Bicycle Master Plan May 2007)</p> <p>No Impact. The Proposed Project does not include a residential component. The Proposed Project is unlikely to significantly increase local or regional populations; therefore, the Proposed Project would not cause an increase in the use of existing neighborhood or regional parks or other recreational facilities in the area. No impacts associated with this issue will occur.</p>				
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p>15b. Response:</p> <p>No Impact. The Proposed Project does not include recreational amenities or parkland. Because the Proposed Project does not include the construction of any housing, there will be no increase in population associated with the Proposed Project, and, therefore, the Proposed Project will not require the construction or expansion of recreational facilities in the area. No impacts associated with this issue will occur.</p>				
16. TRANSPORTATION/TRAFFIC.				
Would the project result in:				
a. Conflict with and applicable plan, ordinance or policy establishing measures of effectiveness for the performance 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>16a. Response: (Source: General Plan 2025 Figure CCM-4 – Master Plan of Roadways, FPEIR Figure 5.15-4 – Volume to Capacity (V/C) Ratio and Level of Service (LOS) (Typical 2025), Table 5.15-D – Existing and Future Trip Generation Estimates, Table 5.15-H – Existing and Typical Density Scenario Intersection Levels of Service, FPEIR page 5.15-29, City of Riverside Public Works Department Traffic Impact Analysis Preparation Guide, City of Riverside Public Works Department 24-Hour Traffic Volume Counts, and Federal Aviation Administration Terminal Area Forecasts, December 2010.)</p> <p>Less than Significant Impact. The Proposed Project includes the following aviation-related improvements: parallel taxiway, connecting taxiways, gas line relocation, runway safety area grading, apron, and access road. The proposed access road will provide gated automobile access from the north side of Riverside Airport onto Central Avenue in two locations. Gated access limits use of this access road to airport tenants only. The eastern-most access road intersection onto Central Avenue will be across from the Fremont Street/Central Avenue intersection. The western access road intersection onto Central Avenue will utilize the current intersection of Wilderness Avenue and Central Avenue. This intersection was being used to provide access to temporary automobile storage lots on airport property that have been recently discontinued to accommodate the Proposed Project. Approximately 1,500 to 2,000 automobiles were stored on the storage lots at one time. Approximately 50 to 125 vehicle trips are generated daily when automobiles are being prepared for shipment to dealerships.</p> <p>Vehicular trip generation for the proposed Master Plan was estimated based on the increase in daily flights</p>				

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<p>attributable to the Proposed Project. Trips were estimated based on the rates contained in <i>Trip Generation, 7th Edition, General Aviation Airport</i> (Land Use 022). Implementation of the Proposed Project is estimated to increase annual flight operations from 58,082 to 64,939 by the year 2020. The 6,857 flights per year increase is estimated to be an average daily increase of 19 flights. This daily increase in the number of flights will generate 37 vehicle trips daily (19 flights x 1.97 = 37).</p> <p>An assessment of a project's potential traffic impacts is conducted by examining its effect on average daily traffic (ADT) on Central Avenue. Central Avenue is a four-lane arterial with a center turn lane (approximately 88 feet wide). ADT counts from the City of Riverside Traffic Engineering Department at the intersection of Central Avenue and Van Buren are 14,245. At the intersection of Central Avenue and Fremont, the ADT was 10,632. The ADT for the intersection of Central Avenue and Hillsdale is 12,804. The Proposed Project will increase the ADT by 37. The <i>City of Riverside General Plan 2025</i> states that the Public Works Department defines the level of service (LOS) D as the minimum adequate service level on roadway links for planning and design purposes. The range for LOS D for an 88-foot wide arterial road is 19,400 to 21,999 per Exhibit D of the <i>City of Riverside Public Works Department Traffic Impact Analysis Preparation Guide</i>. The Proposed Project addition of 37 ADT will not increase the ADT up to the LOS D levels.</p> <p>The aviation-related uses in the Proposed Project result in a net decrease of 13 ADT when compared to the previous automobile storage use that existed on the north side of the airport. In addition, the Proposed Project ADT level will not increase Central Avenue up to LOS D levels. Therefore, the Proposed Project will have a less than significant impact on traffic.</p>				
<p>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?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>16b. Response: (Source: <i>General Plan 2025 Figure CCM-4 – Master Plan of Roadways, FPEIR Figure 5.15-4 – Volume to Capacity (V/C) Ratio and Level of Service (LOS) (Typical 2025), Table 5.15-D – Existing and Future Trip Generation Estimates, Table 5.15-H – Existing and Typical Density Scenario Intersection Levels of Service, FPEIR page 5.15-29, City of Riverside Public Works Department Traffic Impact Analysis Preparation Guide, and City of Riverside Public Works Department 24-Hour Traffic Volume Counts.</i>)</p> <p><u>Less than Significant Impact.</u> As discussed above, the quantity of vehicular trips generated by the Proposed Project will be 37 ADT. This will result in a less than significant impact to the existing and future roadway system in the project vicinity. The project's impact on the existing levels of service for the designated roads and highways would be negligible. Hence, any change in traffic levels due to the project, which would lead to exceeding the levels of service standards is not perceived.</p>				
<p>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?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>16c. Response: (Source: <i>General Plan 2025 Figure PS-6 – Airport Safety Zones and Influence Areas, RCALUCP, March Air Reserve Base/March Inland Port Comprehensive Land Use Plan (1999) and Air Installation Compatible Use Zone Study for March Air Reserve Base (August 2005)</i>)</p> <p><u>Less than Significant Impact.</u> The Proposed Project includes the following airport improvements: parallel taxiway, connecting taxiways, gas line relocation, runway safety area grading, apron, access road, and aircraft hangars. Implementation of the Proposed Project is estimated to increase annual flight operations from 58,082 to 64,939 by the year 2020 based upon FAA's December 2010 <i>Terminal Area Forecasts</i>. No change in air traffic patterns will result from the Proposed Project. Safety risks will be reduced with the grading of the Runway Safety Area to meet FAA safety standards.</p>				
<p>d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>16d. Response:</p> <p><u>Less than Significant Impact.</u> Any on-site or off-site improvements associated with the access road portion of the</p>				

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Proposed Project would be designed and constructed in accordance with the appropriate standard plans of the City of Riverside. As is required in the State of California, the engineering design plans for improvements to any public streets will be prepared by a registered engineer. Potential hazards would be mitigated to less than significant as part of the design process. The project will not create incompatibility between existing and proposed uses nor will it worsen any existing incompatibility. As a result, impacts associated with land use incompatibility are considered to be less than significant.				
e. Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
16e. Response: <u>Less than Significant Impact.</u> The project would not result in inadequate emergency access. A fire station is located on-airport and adequate access to the Proposed Project area already exists.				
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
16f. Response: (Source: FPEIR, General Plan 2025 Land Use and Urban Design, Circulation and Community Mobility and Education Elements, Bicycle Master Plan, School Safety Program – Walk Safe! – Drive Safe!) <u>Less than Significant Impact.</u> The Proposed Project includes only improvements to Riverside Airport on current airport property. Therefore, implementation would not result in conflicts with adopted policies, plans, or programs supporting alternative transportation.				
17. UTILITIES AND SERVICE SYSTEMS. Would the project result in:				
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
17a. Response: (Source: General Plan 2025 Figure PF-2 – Sewer Facilities Map, FPEIR Figure 5.16-5 – Sewer Service Areas, Table 5.16-K - Estimated Future Wastewater Generation for the City of Riverside’s Sewer Service Area, and Figure 5.8-1 – Watersheds) <u>Less than Significant Impact.</u> Under Section 402 of the Clean Water Act (CWA), the RWQCB issues National Pollutant Discharge Elimination System (NPDES) permits to regulate waste discharges to “waters of the nation,” which include rivers, lakes, and their tributary waters. Waste discharges include discharges of storm water and construction project discharges. A construction project resulting in the disturbance of more than one acre requires an NPDES permit. The Proposed Project will require a revision to their Storm Water Pollution Prevention Plan (SWPPP). Furthermore, prior to the issuance of building permits, requirements related to the payment of fees and/or the provision of adequate wastewater facilities will be required to satisfy Riverside Public Utilities (RPU). Because the project will comply with waste discharge prohibitions and water quality objectives established by the RWCQB and RPU, impacts related to this issue will be reduced to a less than significant level.				
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
17b. Response: (Source: General Plan 2025 Table PF-1 – RPU PROJECTED DOMESTIC WATER Supply (AC-FT/YR), Table PF-2 – RPU Projected Water Demand, RPU, FPEIR Table 5.16-G – General Plan Projected Water Demand for RPU Including Water Reliability for 2025, Table 5.16-K - Estimated Future Wastewater Generation for the City of Riverside’s Sewer Service Area, Figure 5.16-4 – Water Facilities and Figure 5.16-6 – Sewer Infrastructure) <u>Less than Significant Impact.</u> The Proposed Project includes the following airport improvements: parallel taxiway, connecting taxiways, gas line relocation, runway safety area grading, apron, access road, and aircraft hangars. Extension of water and sewer utilities will be necessary to support fire suppression and bathroom facilities for these aircraft hangars and support businesses (aircraft maintenance, aircraft sales, flight schools, etc.). This may include fire suppression for up to 12 aircraft hangars and a total of five to ten additional bathrooms for the Proposed Project. Water and wastewater conveyance and treatment services to Riverside Airport are provided by the RPU. RPU currently provides over 94,000 acre-feet of water (ac-ft/yr) to the City of Riverside and is projected to supply over				

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
108,000 ac-ft/yr by 2020. RPU's wastewater treatment plant has a capacity of forty million gallons per day, with capacity anticipated not to be reached before 2025. A planned expansion of the wastewater treatment plant will allow the facility ultimately to treat 52.2 million gallons of wastewater per day. Due to the nature of activities conducted at the airport, the Proposed Project is not expected to significantly increase water usage or the flow of wastewater from the project site. Due to the current existing capacity of the water and wastewater facilities, and the minimal increase in water and wastewater expected from the Proposed Project, impacts associated with sewer services are considered less than significant.				
c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
17c. Response: (Source: FPEIR Figure 5.16-2 - Drainage Facilities) <u>Less than Significant Impact.</u> Development of the Proposed Project will result in an increase in the amount of impermeable surfaces and, therefore, an increase in surface runoff. As previously stated in response to 17a, construction projects that disturb more than one acre require an NPDES permit. Under the NPDES permit, the SWPPP will be updated. Adherence to BMPs specified by the NPDES permit and SWPPP are expected to reduce potential impacts associated with this issue to a less than significant level.				
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
17d. Response: (Source: General Plan 2025 Table PF-1 – RPU PROJECTED DOMESTIC WATER Supply (AC-FT/YR), Table PF-2 – RPU Projected Water Demand, RPU, FPEIR Table 5.16-G – General Plan Projected Water Demand for RPU Including Water Reliability for 2025, Table 5.16-K - Estimated Future Wastewater Generation for the City of Riverside's Sewer Service Area, Figure 5.16-4 – Water Facilities and Figure 5.16-6 – Sewer Infrastructure) <u>Less than Significant Impact.</u> See response to 17b. Water is supplied to Riverside Airport from the RPU. Due to the nature of activities conducted at the airport, the Proposed Project is not expected to significantly increase water usage at the project site. Impacts associated with water usage for the Proposed Project are considered less than significant.				
e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
17e. Response: (Source: FPEIR Figure 5.16-5 - Sewer Service Areas, Figure 5.16-6 -Sewer Infrastructure, Table 5.16-K - Estimated Future Wastewater Generation for the City of Riverside's Sewer Service Area) <u>Less than Significant Impact.</u> Please refer to response 17b.				
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
17f. Response: (Source: FPEIR Table 5.16-A – Existing Landfills and Table 5.16-M – Estimated Future Solid Waste Generation from the Planning Area) <u>Less than Significant Impact.</u> The City of Riverside's solid waste generation is anticipated to increase to between 1,452 tons per day and 2,576 tons per day at build-out according to the <i>General Plan 2025</i> . This represents approximately 8% of the solid waste the landfills are allowed to accept daily under expected typical build-out and approximately 15% of the amount of solid waste in the future. The <i>General Plan 2025</i> does not anticipate that the capacity of the landfills as an isolated contributor will be exceeded. In addition, Public Resource Code Section 41780 requires every city and county to divert from landfills at least 50% of the waste generated within their jurisdiction, and the City has exceeded its required reduction in recent years and currently diverts 60%. Riverside Airport is also an active participant in the recycling program. Since the Proposed Project is not expected to cause a significant increase in employment at the airport and is an active participant in the recycling program, the impacts associated with solid waste disposal are considered to be less than significant.				

ISSUES (AND SUPPORTING INFORMATION SOURCES):	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
g. Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>17g. Response: (Source: California Integrated Waste Management Board 2002 Landfill Facility Compliance Study) <u>Less than Significant Impact.</u> The Proposed Project will be required to comply with applicable elements of AB 1327, Chapter 18 (California Solid Waste Reuse and Recycling Access Act of 1991) and other applicable local, state, and federal solid waste disposal standards, thereby ensuring that impacts associated with this issue are considered to be less than significant.</p>				
18. MANDATORY FINDINGS OF SIGNIFICANCE.				
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or an endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>18a. Response: (Source: General Plan 2025 FPEIR Figure 5.4-2 – MSHCP Area Plans, Figure 5.4-6 – MSHCP Narrow Endemic Plant Species Survey Area, Figure 5.4-8 – MSHCP Burrowing Owl Survey Area, MSHCP Section 6.1.2 - Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools, and Biological Study for Proposed Improvements at Riverside Airport prepared by SWCA in December 2009, Figure 5.5-1 - Archaeological Sensitivity, Figure 5.5-2 - Prehistoric Cultural Resources Sensitivity, Appendix D, Title 20 of the Riverside Municipal Code, and Cultural Resources Survey for the Proposed Riverside Improvement Project prepared by SWCA on January 2010) <u>Less than Significant with Mitigation Incorporated.</u> With implementation of project-related mitigation measures, no significant adverse effects on the habitat of a fish or wildlife species, either direct or indirect, would result from the project.</p>				
b. Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>18b. Response: (Source: FPEIR Section 6 – Long-Term Effects/ Cumulative Impacts for the General Plan 2025 Program) <u>Less than Significant with Mitigation Incorporated.</u> With implementation of the project-related mitigation measures contained in this Initial Study, the Proposed Project’s cumulative impacts associated with air quality and biological resources would be mitigated to less than significant. There are no other development projects that, in combination with the Proposed Project, would create a significant environmental impact associated with aesthetics, agricultural resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation/traffic, and utilities and service systems.</p>				
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>18c. Response: (Source: FPEIR Section 5 – Environmental Impact Analysis for the General Plan 2025 Program) <u>Less than Significant with Mitigation Incorporated.</u> With implementation of project-related mitigation measures, no substantial adverse effects on human beings, either direct or indirect, would result from the project.</p>				
<p>Note: Authority cited: Sections 21083 and 21087, Public Resources Code. Reference: Sections 21080(c), 21080.1, 21080.3, 21082.1, 21083, 21083.3, 21093, 21094, 21151, Public Resources Code; Sundstrom v. County of Mendocino, 202 Cal.App.3d 296 (1988); Leonoff v. Monterey Board of Supervisors, 222 Cal.App.3d 1337 (1990).</p>				

Staff Recommended Mitigation Measures

Impact Category	Mitigation Measures	Implementation Timing	Responsible Monitoring Party ¹³	Monitoring/Reporting Method
Aesthetics	Mitigation Measure AESTHETICS-1: To further reduce impacts related to light pollution, the City shall require at the time of issuing of building permits all developments that introduce light sources, or modifications to existing light sources, to have shielding devices or other light pollution limiting characteristics such as hoods or lumen restrictions.	Site plan review and prior to issuance of building permits.	Planning Division Airport Administration Building & Safety Division	Site Plan Review and Issuance of Building Permits.
Air Quality	Mitigation Measure AIR QUALITY-1: To reduce fugitive dust emissions (PM ₁₀) during project implementation, the following mitigation techniques will be employed: application of water to disturbed areas every three hours and all trucks hauling dirt, sand, soil, or other loose materials will be tarped with a fabric cover and will maintain a freeboard height of 12 inches. These measures are outlined in Table XI-A - Mitigation Measure Examples: Fugitive Dust From Construction and Demolition of the SCAQMD <i>Air Quality Handbook</i> .	During project construction.	Planning Division Airport Administration	Compliance with Project Conditions of Approval.
	Mitigation Measure AIR QUALITY-2: To mitigate for potential adverse impacts resulting from construction activities, development projects must abide by the SCAQMD’s Rule 403 concerning Best Management Practices for construction sites in order to reduce emissions during the construction phase. Measures may include: <ul style="list-style-type: none"> • Development of a construction traffic management program that includes, but is not limited to, rerouting construction related traffic off congested streets, consolidating truck deliveries, and providing temporary dedicated turn lanes for movement of construction traffic to and from site; • Sweep streets at the end of the day if visible soil material is carried onto adjacent paved public roads; • Wash off trucks and other equipment 	During project construction.	Planning Division Airport Administration	Compliance with Project Conditions of Approval.

¹³ All agencies are City of Riverside Departments/Divisions unless otherwise noted.

Impact Category	Mitigation Measures	Implementation Timing	Responsible Monitoring Party ¹³	Monitoring/Reporting Method
	leaving the site; <ul style="list-style-type: none"> • Replace ground cover in disturbed areas immediately after construction; • Keep disturbed/loose soil moist at all times; • Suspend all grading activities when wind speeds exceed 25 miles per hour; • Enforce a 15 mile per hour speed limit on unpaved portions of the construction site. 			
	Mitigation Measure AIR QUALITY-3: To reduce diesel emissions associated with construction, construction contractors shall provide temporary electricity to the site to eliminate the need for diesel-powered electric generators, or provide evidence that electrical hook ups at construction sites are not cost effective or feasible.	During project construction.	Planning Division Airport Administration	Compliance with Project Conditions of Approval.
	Mitigation Measure AIR QUALITY-4: To reduce construction related particulate matter air quality impacts of City projects the following measures shall be required: <ol style="list-style-type: none"> 1. The generation of dust shall be controlled as required by the AQMD; 2. Grading activities shall cease during periods of high winds (greater than 25 mph); 3. Trucks hauling soil, dirt or other emissive materials shall have their loads covered with a tarp or other protective cover as determined by the City Engineer; and 4. The contractor shall prepare and maintain a traffic control plan, prepared, stamped and signed by either a licensed Traffic Engineer or a Civil Engineer. The preparation of the plan shall be in accordance with Chapter 5 of the latest edition of the Caltrans Traffic Manual and the State Standard Specifications. The plan shall be submitted for approval, by the engineer, at the preconstruction meeting. Work shall not commence without an approved traffic control plan. 	During project construction.	Planning Division Airport Administration	Compliance with Project Conditions of Approval.

Impact Category	Mitigation Measures	Implementation Timing	Responsible Monitoring Party ¹³	Monitoring/Reporting Method
Biological Resources	<p>Mitigation Measure BIOLOGICAL RESOURCES-1: Burrowing Owls have been observed during field surveys. To insure that take of Burrowing Owls does not occur, a 30-day pre-construction survey must be completed in the Proposed Project area before construction starts. Should Burrowing Owls be determined to occur within or adjacent to (within 150 meters) of the project site, mitigation and monitoring measures should be determined through consultation with the CDFW and USFWS personnel assigned to oversight of the MSHCP plan area.</p>	Site-Specific Environmental Review and/or prior to the issuance of a grading permit.	Planning Division Airport Administration California Dept. of Fish and Wildlife U.S. Fish and Wildlife Service	Compliance with Project Conditions of Approval
	<p>Mitigation Measure BIOLOGICAL RESOURCES-2: To reduce raptor and non-raptor impacts to a less than significant level, construction and maintenance activities for the Proposed Project should be done outside of the nesting season, which (under the MSHCP Construction Guidelines, Volume I, Section 7.5.3) occurs from March 1 through June 30. If project grading and maintenance activities must occur during the nesting season, it is recommended that a qualified biologist conduct a pre-construction nest survey on the project site and within 150 feet (for non-raptor nests) and 500 feet (for raptor nests) of the Proposed Project footprint to identify any active nests that occur there. This survey should be carried out within one week of initiation of construction activities. If bird species protected under the MBTA, or California Fish and Wildlife Code Sections 2050 et seq., 3503, 3503.5, and 3513, are found nesting on or adjacent to the project site, a qualified biologist should monitor the nests daily during all phases of construction to ensure that the project does not impact the nests.</p>	Site-Specific Environmental Review.	Planning Division Airport Administration Qualified Biologist California Dept. of Fish and Wildlife U.S. Fish and Wildlife Service	Compliance with Project Conditions of Approval
Cultural Resources	<p>Mitigation Measure CULTURAL RESOURCES-1: Prior to beginning project construction, the Project Applicant shall retain a Riverside County qualified archaeological monitor to monitor all ground-disturbing activities in an effort to identify any unknown archaeological resources. Any newly</p>	Prior to issuance of grading permit.	Planning Division Airport Administration Registered Professional Archaeologist	Compliance with Project Conditions of Approval

Impact Category	Mitigation Measures	Implementation Timing	Responsible Monitoring Party ¹³	Monitoring/Reporting Method
	discovered cultural resource deposits shall be subject to a cultural resources evaluation.			
	Mitigation Measure CULTURAL RESOURCES-2: At least 30 days prior to beginning project construction, the Project Applicant shall contact the Pechanga Tribe to notify the Tribe of grading, excavation, and the monitoring program, and to coordinate with the City of Riverside, and/or the FAA and the Tribe to develop a Cultural Resources Treatment and Monitoring Agreement. The Agreement shall address the treatment of known cultural resources, the designation, responsibilities, and participation of Native American Tribal monitors during grading, excavation, and ground-disturbing activities; project grading and development scheduling; terms of compensation for the monitors; and treatment and final disposition of any cultural resources, sacred sites, and human remains discovered on the site.	Prior to issuance of grading permit.	Planning Division Airport Administration Registered Professional Archaeologist	Compliance with Project Conditions of Approval
	Mitigation Measure CULTURAL RESOURCES-3: Prior to beginning project construction, the Project Archaeologist shall file a pre-grading report with the City of Riverside and/or FAA (if required) to document the proposed methodology for grading activity observation which will be determined in consultation with the Pechanga Tribe. Said methodology shall include the requirement for a qualified archaeological monitor to be present and have the authority to stop and redirect grading activities. In accordance with the agreement required in Mitigation Measure CULTURAL RESOURCES-2, the archaeological monitor's authority to stop and redirect grading will be exercised in consultation with the Pechanga Tribe in order to evaluate the significance of any archaeological resources discovered on the property. Tribal and archaeological monitors shall be allowed to monitor all grading, excavation, and groundbreaking activities, and shall also have the authority to stop and redirect grading activities.	Prior to issuance of grading permit.	Planning Division Airport Administration Registered Professional Archaeologist Grading contractors	Compliance with Project Conditions of Approval

Impact Category	Mitigation Measures	Implementation Timing	Responsible Monitoring Party ¹³	Monitoring/Reporting Method
	<p>Mitigation Measure CULTURAL RESOURCES-4: The landowner shall relinquish ownership of all cultural resources, including sacred items, burial goods, and all native American archaeological artifacts that are found on the project area to the appropriate Tribe for proper treatment and disposition.</p>	Throughout construction process.	Planning Division Airport Administration Registered Professional Archaeologist Grading contractors	Compliance with Project Conditions of Approval
	<p>Mitigation Measure CULTURAL RESOURCES-5: All sacred sites, should they be encountered within the project area, shall be avoided and preserved as the preferred mitigation, if feasible.</p>	Throughout construction process.	Planning Division Airport Administration Registered Professional Archaeologist Grading contractors	Compliance with Project Conditions of Approval
	<p>Mitigation Measure CULTURAL RESOURCES-6: If inadvertent discoveries of subsurface archaeological/cultural resources are discovered during grading, the Developer, the project archaeologist, and the Tribe shall assess the significance of such resources and shall meet and confer regarding the mitigation for such resources. Pursuant to California Public Resources Code Section 21083.2(b), avoidance is the preferred method of preservation for archaeological resources. If the Developer, the project archaeologist, and the Tribe cannot agree on the significance or the mitigation for such resources, these issues will be presented to the Planning Director for decision. The Planning Director shall make the determination based on the provisions of the <i>California Environmental Quality Act</i> with respect to archaeological resources and shall take into account the religious beliefs, customs, and practices of the Tribe. Notwithstanding any other rights available under the law, the decision of the Planning Director shall be appealable to the Planning Committee and/or the City Council.</p>	Throughout construction process.	Planning Division Airport Administration Registered Professional Archaeologist Grading contractors	Compliance with Project Conditions of Approval Final report to City Planning Division from archaeologist, if resources are found

Impact Category	Mitigation Measures	Implementation Timing	Responsible Monitoring Party ¹³	Monitoring/Reporting Method
	<p>Mitigation Measure CULTURAL RESOURCES-7: A Qualified Paleontological will be retained to design and implement a paleontological monitoring and mitigation plan during pre-construction excavations associated with any development of the western portion of the Proposed Project site that may contain paleontologically sensitive areas.</p>	<p>Prior to issuance of grading permit.</p>	<p>Planning Division Airport Administration Registered Professional Archaeologist Grading contractors</p>	<p>Compliance with Project Conditions of Approval</p>
	<p>Mitigation Measure CULTURAL RESOURCES-8: All significant fossils and pertinent data recovered during construction monitoring will be prepared, identified, analyzed, and repositied in a public museum or other approved curation facility. If significant fossils and pertinent data are not wanted, these items will be offered for reposit.</p>	<p>Throughout construction process.</p>	<p>Planning Division Airport Administration Grading contractors</p>	<p>Compliance with Project Conditions of Approval Final report to City Planning Division from paleontologist, if resources are found</p>
	<p>Mitigation Measure CULTURAL RESOURCES-9: If human remains are encountered, California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the Riverside County Coroner has made the necessary findings as to origin. Further pursuant to California Public Resources Code Section 5097.98(b), remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made. If the Riverside County Coroner determines the remains to be Native American, the Native American Heritage Commission must be contacted within 24 hours. The Native American Heritage commission must then immediately identify the “most likely descendant(s)” of receiving notification of the discovery. The most likely descendant(s) shall then make recommendations within 48 hours, and engage in consultations concerning the treatment of the remains as provided in Public Resources Code Section 5097.98 and the Treatment Agreement described in Mitigation Measure CULTURAL RESOURCES-2.</p>	<p>Throughout construction process.</p>	<p>Planning Division Airport Administration Registered Professional Archaeologist Grading contractors</p>	<p>Compliance with Project Conditions of Approval</p>

Impact Category	Mitigation Measures	Implementation Timing	Responsible Monitoring Party ¹³	Monitoring/Reporting Method
Geology & Soils	Mitigation Measure GEOLOGY-1: The project site will be reviewed for seismic stability by a qualified engineer. The engineer must identify areas requiring additional seismic protection, and must identify the appropriate development requirements to address any additional seismic impacts. New buildings will conform to the requirements of the Uniform Building Code.	Site geotechnical study prior to issuance of building permits.	Planning Division Airport Administration Building & Safety Division Public Works Department	Issuance of approvals/ permits from the City of Riverside
	Mitigation Measure GEOLOGY-2: During construction, erosion and sedimentation shall be minimized on the site by measures such as silt fences, covering of stockpiled soil materials, and other Best Management Practices (BMPs) as identified by the local Regional Water Quality Control Board.	Throughout construction process.	Planning Division Airport Administration Public Works Department State Regional Water Quality Control Board Individual Contractors	Compliance with Project Conditions of Approval
	Mitigation Measure GEOLOGY-3: Detailed site-specific geotechnical investigations will be conducted prior to the development of structures on the airport to more fully assess soil conditions. Construction techniques and design solutions will be utilized to reduce any soil-related impacts below a level of significance.	Site geotechnical study prior to issuance of building permits.	Planning Division Airport Administration Building & Safety Division Public Works Department	Issuance of approvals/ permits from the City of Riverside
Hazards and Hazardous Materials	Mitigation Measure HAZARDS AND HAZARDOUS MATERIALS -1: Proposed Project will be required to design, construct, and maintain structures, roadways, and facilities to comply with applicable local, regional, state and/or federal requirements related to emergency access and evacuation plans.	Site plan review and prior to issuance of building permits.	Planning Division Airport Administration Building & Safety Division	Site Plan Review and Issuance of Building Permits
Hydrology/ Water Quality	Mitigation Measure HYDROLOGY/WATER QUALITY-1: Construction of the planned improvements at the airport requires an update of the airport's SWPPP and conformance with NPDES procedures.	Prior to issuance of building permits.	Planning Division Airport Administration Public Works Department State Regional Water Quality Control Board	Compliance with Project Conditions of Approval



MITIGATION MEASURE MONITORING PROGRAM

MITIGATION MEASURE MONITORING PROGRAM FOR PROPOSED IMPROVMENTS AT RIVERSIDE AIRPORT

The following mitigation and monitoring plan (MMP) has been prepared pursuant to Section 15097 of the *California Environmental Quality Act* (CEQA). Section 15097 requires all state and local agencies to establish monitoring or reporting programs for projects approved by a public agency whenever approval involves the adoption of either a “mitigated negative declaration” or specified environmental findings related to environmental impact reports.

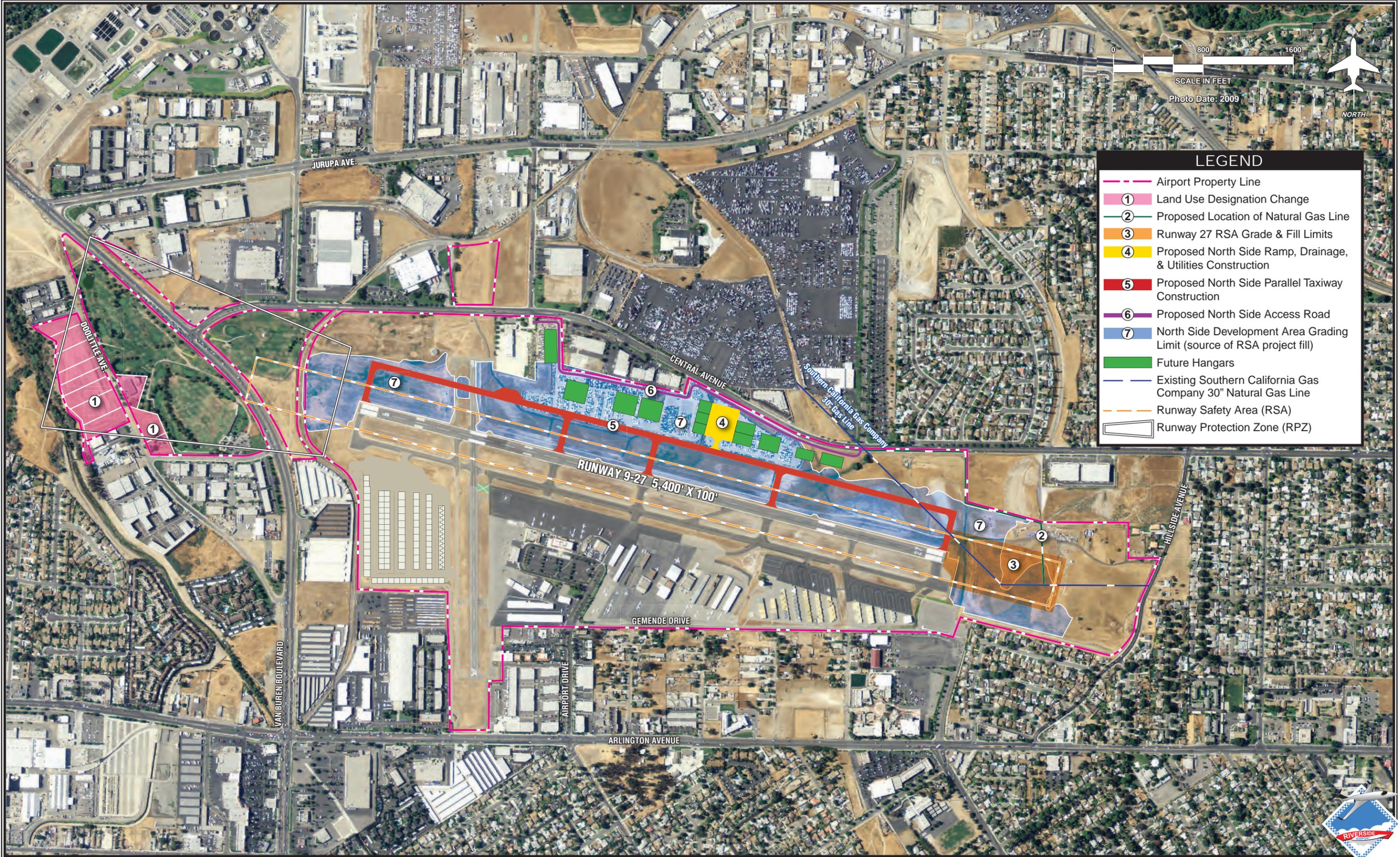
The following MMP for the proposed improvements at Riverside Airport describes the mitigation measures identified in the project Initial Study, and identifies responsible entities for implementing and monitoring the plan. The timing of the improvements are highly dependent upon aviation demand, availability of funding, and the ever-changing Federal Aviation Administration safety mandates. Therefore, a specific monitoring schedule is not practicable and project-specific monitoring of mitigation measures and verification reports will be undertaken as the improvements depicted on **Exhibit A** are pursued. The intent of the MMP is to identify and enforce a means for properly and successfully implementing the mitigation measures as identified within the Initial Study.

This MMP is intended to be used by the City of Riverside and mitigation monitoring personnel to ensure compliance with mitigation measures during project implementation. The MMP will provide for monitoring activities prior to construction, during construction, and following project completion.

The City of Riverside will be responsible for the following:

- On-site, day-to-day monitoring of construction activities.
- Reviewing construction plans and equipment staging/access plans to ensure conformance with adopted mitigation measures.
- Ensuring contractor knowledge of and compliance with the MMP.
- Obtaining assistance as necessary from technical experts in order to develop site-specific procedures for implementing the mitigation measures.
- Maintaining a log of all significant interactions, violations of permit conditions or mitigation measures, and necessary corrective measures.
- Reporting to City Council the status of the MMP at four points during implementation of the project: at the completion of the design phase, prior to groundbreaking, following project construction, and at the identified completion point of the mitigation measures.

The recommended mitigation measures for the proposed improvement projects are provided in the **Table A** below. The City of Riverside will comply with all applicable local, state, and federal laws when implementing the improvements depicted on **Exhibit A**. Where appropriate,



LEGEND

- Airport Property Line
- ① Land Use Designation Change
- ② Proposed Location of Natural Gas Line
- ③ Runway 27 RSA Grade & Fill Limits
- ④ Proposed North Side Ramp, Drainage, & Utilities Construction
- ⑤ Proposed North Side Parallel Taxiway Construction
- ⑥ Proposed North Side Access Road
- ⑦ North Side Development Area Grading Limit (source of RSA project fill)
- Future Hangars
- Existing Southern California Gas Company 30" Natural Gas Line
- Runway Safety Area (RSA)
- Runway Protection Zone (RPZ)



the City of Riverside will incorporate mitigation measures as outlined in **Table A**. Following completion of any project depicted on **Exhibit A**, the City of Riverside staff will prepare a report documenting the relative success of the measures. The mitigation implementation report will be maintained at the City of Riverside Airport offices and made available upon request.

Table A				
Mitigation Measure Monitoring Program				
Impact Category	Mitigation Measures	Implementation Timing	Responsible Monitoring Party¹	Monitoring/Reporting Method
Aesthetics	Mitigation Measure AESTHETICS-1: The City shall ensure that only low pressure sodium vapor lights will be used for non-airfield lighting in order to minimize light emissions in accordance with Riverside County Ordinance No. 655.	Site plan review and prior to issuance of building permits.	Planning Division Airport Administration Building & Safety Division	Site Plan Review and Issuance of Building Permits.
Air Quality	Mitigation Measure AIR QUALITY-1: To reduce fugitive dust emissions (PM ₁₀) during project implementation, the following mitigation techniques will be employed: application of water to disturbed areas every three hours and all trucks hauling dirt, sand, soil, or other loose materials will be tarped with a fabric cover and will maintain a freeboard height of 12 inches. These measures are outlined in Table XI-A - Mitigation Measure Examples: Fugitive Dust From Construction and Demolition of the SCAQMD <i>Air Quality Handbook</i> .	During project construction.	Planning Division Airport Administration	Compliance with Project Conditions of Approval.
Biological Resources	Mitigation Measure BIOLOGICAL RESOURCES-1: Burrowing Owls have been observed during field surveys. To insure that take of Burrowing Owls does not occur, a 30-day pre-construction survey must be completed in the Proposed Project area before construction starts. Should Burrowing Owls be determined to occur within or adjacent to (within 150 meters) of the project site, mitigation and monitoring measures should be determined through consultation with the CDFW and USFWS personnel assigned to oversight of the MSHCP plan area.	Site-Specific Environmental Review and/or prior to the issuance of a grading permit.	Planning Division Airport Administration California Dept. of Fish and Wildlife U.S. Fish and Wildlife Service	Compliance with Project Conditions of Approval
	Mitigation Measure BIOLOGICAL RESOURCES-2: To reduce raptor and non-raptor impacts to a less than significant level, construction	Site-Specific Environmental Review.	Planning Division Airport Administration	Compliance with Project Conditions of Approval

¹ All agencies are City of Riverside Departments/Divisions unless otherwise noted.

Table A**Mitigation Measure Monitoring Program**

Impact Category	Mitigation Measures	Implementation Timing	Responsible Monitoring Party¹	Monitoring/Reporting Method
	<p>and maintenance activities for the Proposed Project should be done outside of the nesting season, which (under the MSHCP Construction Guidelines, Volume I, Section 7.5.3) occurs from March 1 through June 30.</p> <p>Mitigation Measure BIOLOGICAL RESOURCES-3: If project grading and maintenance activities must occur during the nesting season, it is recommended that a qualified biologist conduct a pre-construction nest survey on the project site and within 150 feet (for non-raptor nests) and 500 feet (for raptor nests) of the Proposed Project footprint to identify any active nests that occur there. This survey should be carried out within one week of initiation of construction activities. If bird species protected under the MBTA, or California Fish and Wildlife Code Sections 2050 et seq., 3503, 3503.5, and 3513, are found nesting on or adjacent to the project site, a qualified biologist should monitor the nests daily during all phases of construction to ensure that the project does not impact the nests.</p>	Site-Specific Environmental Review.	Planning Division Airport Administration Qualified Biologist California Dept. of Fish and Wildlife U.S. Fish and Wildlife Service	Compliance with Project Conditions of Approval
Cultural Resources	<p>Mitigation Measure CULTURAL RESOURCES-1: Prior to beginning project construction, the Project Applicant shall retain a Riverside County qualified archaeological monitor to monitor all ground-disturbing activities in an effort to identify any unknown archaeological resources. Any newly discovered cultural resource deposits shall be subject to a cultural resources evaluation.</p> <p>Mitigation Measure CULTURAL RESOURCES-2: At least 30 days prior to beginning project construction, the Project Applicant shall contact the Pechanga Tribe to notify the Tribe of grading, excavation, and the monitoring program, and to</p>	Prior to issuance of grading permit.	Planning Division Airport Administration Registered Professional Archaeologist	Compliance with Project Conditions of Approval
		Prior to issuance of grading permit.	Planning Division Airport Administration Registered Professional Archaeologist	Compliance with Project Conditions of Approval

Table A**Mitigation Measure Monitoring Program**

Impact Category	Mitigation Measures	Implementation Timing	Responsible Monitoring Party¹	Monitoring/Reporting Method
	<p>coordinate with the City of Riverside, and/or the FAA and the Tribe to develop a Cultural Resources Treatment and Monitoring Agreement. The Agreement shall address the treatment of known cultural resources, the designation, responsibilities, and participation of Native American Tribal monitors during grading, excavation, and ground-disturbing activities; project grading and development scheduling; terms of compensation for the monitors; and treatment and final disposition of any cultural resources, sacred sites, and human remains discovered on the site.</p>			
	<p>Mitigation Measure CULTURAL RESOURCES-3: Prior to beginning project construction, the Project Archaeologist shall file a pre-grading report with the City of Riverside and/or FAA (if required) to document the proposed methodology for grading activity observation which will be determined in consultation with the Pechanga Tribe. Said methodology shall include the requirement for a qualified archaeological monitor to be present and have the authority to stop and redirect grading activities. In accordance with the agreement required in Mitigation Measure CULTURAL RESOURCES-2, the archaeological monitor's authority to stop and redirect grading will be exercised in consultation with the Pechanga Tribe in order to evaluate the significance of any archaeological resources discovered on the property. Tribal and archaeological monitors shall be allowed to monitor all grading, excavation, and groundbreaking activities, and shall also have the authority to stop and redirect grading activities.</p>	<p>Prior to issuance of grading permit.</p>	<p>Planning Division Airport Administration Registered Professional Archaeologist Grading contractors</p>	<p>Compliance with Project Conditions of Approval</p>

Table A**Mitigation Measure Monitoring Program**

Impact Category	Mitigation Measures	Implementation Timing	Responsible Monitoring Party¹	Monitoring/Reporting Method
	Mitigation Measure CULTURAL RESOURCES-4: The landowner shall relinquish ownership of all cultural resources, including sacred items, burial goods, and all native American archaeological artifacts that are found on the project area to the appropriate Tribe for proper treatment and disposition.	Throughout construction process.	Planning Division Airport Administration Registered Professional Archaeologist Grading contractors	Compliance with Project Conditions of Approval
	Mitigation Measure CULTURAL RESOURCES-5: All sacred sites, should they be encountered within the project area, shall be avoided and preserved as the preferred mitigation, if feasible.	Throughout construction process.	Planning Division Airport Administration Registered Professional Archaeologist Grading contractors	Compliance with Project Conditions of Approval
	Mitigation Measure CULTURAL RESOURCES-6: If inadvertent discoveries of subsurface archaeological/cultural resources are discovered during grading, the Developer, the project archaeologist, and the Tribe shall assess the significance of such resources and shall meet and confer regarding the mitigation for such resources. Pursuant to California Public Resources Code Section 21083.2(b), avoidance is the preferred method of preservation for archaeological resources. If the Developer, the project archaeologist, and the Tribe cannot agree on the significance or the mitigation for such resources, these issues will be presented to the Planning Director for decision. The Planning Director shall make the determination based on the provisions of the <i>California Environmental Quality Act</i> with respect to archaeological resources and shall take into account the religious beliefs, customs, and practices of the Tribe. Notwithstanding any other rights available under the law, the decision of the Planning Director shall be appealable to the Planning Committee and/or	Throughout construction process.	Planning Division Airport Administration Registered Professional Archaeologist Grading contractors	Compliance with Project Conditions of Approval Final report to City Planning Division from archaeologist, if resources are found

Table A				
Mitigation Measure Monitoring Program				
Impact Category	Mitigation Measures	Implementation Timing	Responsible Monitoring Party¹	Monitoring/Reporting Method
	the City Council.			
	Mitigation Measure CULTURAL RESOURCES-7: A Qualified Paleontological will be retained to design and implement a paleontological monitoring and mitigation plan during pre-construction excavations associated with any development of the western portion of the Proposed Project site that may contain paleontologically sensitive areas.	Prior to issuance of grading permit.	Planning Division Airport Administration Registered Professional Archaeologist Grading contractors	Compliance with Project Conditions of Approval
	Mitigation Measure CULTURAL RESOURCES-8: All significant fossils and pertinent data recovered during construction monitoring will be prepared, identified, analyzed, and repositied in a public museum or other approved curation facility. If significant fossils and pertinent data are not wanted, these items will be offered for reposit.	Throughout construction process.	Planning Division Airport Administration Grading contractors	Compliance with Project Conditions of Approval Final report to City Planning Division from paleontologist, if resources are found

Table A				
Mitigation Measure Monitoring Program				
Impact Category	Mitigation Measures	Implementation Timing	Responsible Monitoring Party¹	Monitoring/Reporting Method
	<p>Mitigation Measure CULTURAL RESOURCES-9: If human remains are encountered, California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the Riverside County Coroner has made the necessary findings as to origin. Further pursuant to California Public Resources Code Section 5097.98(b), remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made. If the Riverside County Coroner determines the remains to be Native American, the Native American Heritage Commission must be contacted within 24 hours. The Native American Heritage commission must then immediately identify the “most likely descendant(s)” of receiving notification of the discovery. The most likely descendant(s) shall then make recommendations within 48 hours, and engage in consultations concerning the treatment of the remains as provided in Public Resources Code Section 5097.98 and the Treatment Agreement described in Mitigation Measure CULTURAL RESOURCES-2.</p>	Throughout construction process.	Planning Division Airport Administration Registered Professional Archaeologist Grading contractors	Compliance with Project Conditions of Approval
Geology & Soils	<p>Mitigation Measure GEOLOGY-1: Where deemed necessary, new structural development should be the subject of a geotechnical study prior to construction. This study shall evaluate local geologic and soil conditions and identify appropriate construction measures that should be completed in terms of building foundation design to ensure the protection of occupants of the future buildings. New buildings shall conform to the requirements of the Uniform Building Code.</p>	Site geotechnical study prior to issuance of building permits.	Planning Division Airport Administration Building & Safety Division Public Works Department	Issuance of approvals/ permits from the City of Riverside

Table A**Mitigation Measure Monitoring Program**

Impact Category	Mitigation Measures	Implementation Timing	Responsible Monitoring Party¹	Monitoring/Reporting Method
	Mitigation Measure GEOLOGY-2: During construction, erosion and sedimentation shall be minimized on the site by measures such as silt fences, covering of stockpiled soil materials, and other Best Management Practices (BMPs) as identified by the local Regional Water Quality Control Board.	Throughout construction process.	Planning Division Airport Administration Public Works Department State Regional Water Quality Control Board Individual Contractors	Compliance with Project Conditions of Approval
	Mitigation Measure GEOLOGY-3: Detailed site-specific geotechnical investigations will be conducted prior to the development of any structures on the airport to identify the potential for geological hazards and to develop construction techniques and design solutions to minimize risks.	Site geotechnical study prior to issuance of building permits.	Planning Division Airport Administration Building & Safety Division Public Works Department	Issuance of approvals/permits from the City of Riverside
Hazards and Hazardous Materials	Mitigation Measure HAZARDS AND HAZARDOUS MATERIALS -1: Proposed Project will be required to design, construct, and maintain structures, roadways, and facilities to comply with applicable local, regional, state and/or federal requirements related to emergency access and evacuation plans.	Site plan review and prior to issuance of building permits.	Planning Division Airport Administration Building & Safety Division	Site Plan Review and Issuance of Building Permits
Hydrology/ Water Quality	Mitigation Measure HYDROLOGY/WATER QUALITY-1: Construction of the planned improvements at the airport requires an update of the airport's SWPPP and conformance with NPDES procedures.	Prior to issuance of building permits.	Planning Division Airport Administration Public Works Department State Regional Water Quality Control Board	Compliance with Project Conditions of Approval



Attachment A

RUNWAY SAFETY ANALYSIS

RUNWAY SAFETY AREA ANALYSIS

The FAA has established design criteria to define the physical dimensions of runways and taxiways, as well as the imaginary surfaces surrounding them which protect the safe operation of aircraft at the airport. FAA design criteria primarily center on the airport's critical design aircraft. The critical aircraft is the most demanding aircraft or family of aircraft which currently, or are projected to, conduct 500 or more operations (take-offs and landings) per year at the airport. Factors included in airport design are an aircraft's wingspan, approach speed, tail height and, in some cases, the instrument approach visibility minimums for each runway. The FAA has established the Airport Reference Code (ARC) to relate these critical aircraft factors to airfield design standards.

Analysis conducted in the *2009 Riverside Airport Master Plan Update* concluded that the current critical aircraft is defined by turboprops and small business jets in ARC B-II. There is a King Air turboprop and a Cessna Citation V - Model 560XL business jet based at the airport. Both of these aircraft operate on a frequent basis. These aircraft, in conjunction with itinerant activity, represent the current critical aircraft.

A wide range of transient jet aircraft in the ARC C-II category also operate at Riverside Airport. In order to discern the number and type of business jet operations, an analysis of instrument flight plan data was conducted in the *2009 Riverside Airport Master Plan Update*. Flight plan data was acquired for this study from the subscription database service, *AirportIQ*¹. The data available includes documentation of flight plans that are opened and closed on the ground at the airport. Flight plans that are opened or closed from the air are not credited to the airport. Therefore, it is likely that there are more business jet operations at the airport than are captured by this methodology, but they are not included in these calculations. No activity conducted under visual flight conditions is captured.

¹ www.AirportIQ.com

Table A1 shows general aviation business jets completing instrument flight plans conducted 583 operations at Riverside Airport in the 12-month period (September 26, 2006 – September 25, 2007) used for this study². The largest number of operations is conducted within approach category B with 399 operations. Business jets within approach categories C and D conducted an additional 184 operations.

TABLE A1 Business Jet Operations By Design Category September 26, 2006 - September 25, 2007 Riverside Airport	
Design Category	Operational Count¹
Approach Category B	399
Approach Category C	130
Approach Category D	54
Total	583

¹ Does not account for flight plans closed en route or aircraft that fly under visual flight rules.
Source: *Airport IQ; Coffman Associates analysis.*

Based upon the *AirportIQ* analysis and national trends, the *2009 Riverside Airport Master Plan Update* anticipates that operations by business jet aircraft in the ARC C-II category will continue and increase in the future. Therefore, future facilities at Riverside Airport will need to meet FAA design standards for aircraft in ARC C-II category.

Table A2 presents the design standards to be applied to the Runway 27 RSA at Riverside Airport. It also highlights the dimensions where the RSA does not meet FAA design standards.

TABLE A2 Runway Safety Area Runway 27 Riverside Airport			
Runway 27 Runway Safety Area	FAA ARC C-II Design Standard	Current Condition	Ultimate Condition
Width	400	400	400
Length	1,000	100	1,000

Note: All measurements in feet. **BOLD** = Does not meet standard
Source: *FAA AC 150/5300 - 13, Airport Design*

² *2009 Riverside Airport Master Plan Update*



Attachment B

NOISE MODELING AND AIR QUALITY INPUT ASSUMPTIONS

NOISE MODELING AND AIR QUALITY INPUT ASSUMPTIONS

This appendix includes information about the noise and air quality modeling assumptions.

AIRCRAFT NOISE ANALYSIS METHODOLOGY

The standard methodology for analyzing noise conditions at airports involves the use of a computer simulation model. The Federal Aviation Administration (FAA) has approved the Integrated Noise Model (INM) for use in Environmental Assessments (EAs).

INM describes aircraft noise in either the Yearly Day-Night Average Sound Level (DNL) or the Community Noise Equivalent Level (CNEL). DNL accounts for the increased sensitivity to noise at night (10:00 p.m. to 7:00 a.m.) and is the metric preferred by the FAA, Environmental Protection Agency (EPA), and Department of Housing and Urban Development (HUD), among others, as an appropriate measure of cumulative noise exposure. In California, however, these agencies accept the use of CNEL which, in addition to nighttime sensitivities, also accounts for increased sensitivities during the evening hours (7:00 p.m. to 10:00 p.m.). The FAA has accepted the State of California 65 CNEL metric as the threshold of significance for the noise analysis. Further noise analysis is required if the results of the noise analysis indicate a 1.5 CNEL increase in noise over any noise-sensitive area located within the 65 CNEL noise contour.

CNEL is defined as the average A-weighted sound level as measured in decibels during a 24-hour period. A 10 decibel weighting is applied to noise events occurring at night, and a 4.8 decibel weighting is applied to those occurring during the evening hours. CNEL is a summation metric which allows for objective analysis and can describe noise exposure comprehensively over a large area. In addition to being widely accepted, the primary benefit of using the CNEL metric is that it accounts for the average com-

munity response to noise as determined by the actual number and types of noise events and the time of day they occur.

The INM works by defining a network of grid points at ground level around the airport. It then selects the shortest distance from each grid point to each flight track and computes the noise exposure for each aircraft operation by aircraft type and engine thrust level, along each flight track. Corrections are applied for air-to-ground acoustical attenuation, acoustical shielding of the aircraft engines by the aircraft itself, and aircraft speed variations. The noise exposure levels for each aircraft are summed at each grid location. The DNL at all grid points is used to develop noise exposure contours for selected values (e.g., 65, 70, and 75 DNL). Noise contours are then plotted on a base map of the airport environs using the DNL metrics.

In addition to the mathematical procedures defined in the model, the INM has another very important element. This is a database containing tables correlating noise, thrust settings, and flight profiles for most of the civilian aircraft and many common military aircraft operating in the United States. This database, often referred to as the noise curve data, has been developed under FAA guidance based on rigorous noise monitoring in controlled settings. In fact, the INM database was developed through more than a decade of research, including extensive field measurements of more than 10,000 aircraft operations. The database also includes performance data for each aircraft to allow for the computation of airport-specific flight profiles (rates of climb and descent). The most recent version of the INM, Version 7.0b, was used for modeling the noise condition for the purposes of this EA.

INM INPUT

A variety of user-supplied input data is required to use the INM. This includes the airport elevation, average annual temperature, airport area terrain, a mathematical definition of the airport runways, the mathematical description of ground tracks above which aircraft fly, and the assignment of specific take-off weights to individual flight tracks. In addition, aircraft not included in the model's database may be defined for modeling, subject to FAA approval.

Activity Data

Airport activity is defined as the take-offs and landings by aircraft operating at the facility; this is also referred to as aircraft operations. Activity is further described as either *local*, indicating aircraft practicing take-offs and landings (i.e., performing touch-and-go's), or *itinerant*, referring to the initial departure from or final arrival at the airport.

Table B1 provides a summary of operations for the existing condition (2010) and two forecast years (2015 and 2020) for the Proposed Action and No Action alternatives.

Existing airport activity (i.e., take-offs and landings, or operations by aircraft) for 2010 was estimated using data collected from the FAA Enhanced Traffic Management System Counts (ETMSC)¹. Three percent was added to the itinerant operations to account for when the airport traffic control tower is closed (8:00 p.m. to 7:00 a.m.). Forecast operations were collected from the FAA *Terminal Area Fore-*

¹ aspm.faa.gov/main/etmsc.asp, FAA Enhanced Traffic Management System Counts (ETMSC)

*cast*². In the Proposed Action scenarios, business jet and turboprop operations were assumed to increase due the availability of facilities to accommodate these aircraft. In 2015, annual operations for business jets were assumed to increase 13 percent (from 655 to 740) and turboprops six percent (from 805 to 850). In 2020, annual operations for business jets were assumed to increase 15 percent (from 675 to 780) and turboprops seven percent (from 840 to 900).

Fleet Mix

The selection of individual aircraft types is important to the modeling process because different aircraft types generate different noise levels. The aircraft fleet mix was derived from an inventory of existing operations at the airport. **Table B1** summarizes the generalized fleet mix data input into the noise analysis.

Database Selection

In order to select the proper aircraft from the INM database, a review of the current fleet mix for Riverside Airport was conducted. Different aircraft types generate different noise levels; therefore, selection of individual aircraft plays an important role in the noise modeling process. The following paragraphs outline the database selections used for input into the INM.

Table B1 lists the annual operations by aircraft type. The included aircraft were selected to provide a realistic representation of airport operations. Flight plans, airline flight schedules, airfield observations, and based aircraft lists were used to determine the types of aircraft which frequently use the airport. To accurately represent the noise conditions at the airport, the INM provides aircraft noise data for many of the aircraft operating in the national fleet. For those aircraft not specifically identified in the INM, the FAA provides a list of appropriate substitute aircraft.

The FAA aircraft substitution list indicates that the general aviation single engine variable-pitch propeller model, the GASEPV, represents a number of single engine general aviation aircraft. Among others, these include the Beech Bonanza, Cessna 177 and 180, Piper Cherokee Arrow, and Cessna Caravan. The general aviation single engine fixed-pitch propeller model, the GASEPF, also represents several single engine general aviation aircraft. These include the Cessna 150 and 172, Piper Archer, and the Piper Tomahawk.

The FAA's substitution list included with the INM documentation identifies the BEC58P, the Beech Baron, as a substitute for light twin-engine aircraft such as Beech 50, Beech 55, Piper PA-23, PA-30, PA-34, Cessna 304, Cessna 310, and Cessna 401, among others. Additionally, the DCH6 is recommended for use in modeling the DeHavilland Dash 6, Beech King Air, and Mitsubishi MU-2. General aviation helicopter operations are represented by the H500D.

All the above choices conform to the Pre-Approved Substitution List published by the FAA Office of Environment and Energy (AEE) branch in Washington, D.C.

² <http://aspm.faa.gov/main/taf.asp>, FAA Terminal Area Forecast December 2010

TABLE B1
Operational Fleet Mix
Riverside Airport Aircraft Fleet Mix and Operations

Aircraft	INM	2010 ¹	2015 ²	2015 ^{2,3}	2020 ²	2020 ^{2,3}
	Designator	Existing	No Action	Proposed Action	No Action	Proposed Action
ITINERANT OPERATIONS						
<i>Turbojet</i>						
Business Jet	LEAR35	200	210	240	220	250
Business Jet	CNA500	160	165	180	175	210
Business Jet	MU3001	80	85	95	90	100
Business Jet	CNA55B	80	85	95	90	100
Business Jet	CL600	40	45	55	50	60
Business Jet	GIV0	40	45	55	50	60
Business Jet	LEAR25	40	20	20	0	0
Subtotal		640	655	740	675	780
<i>Piston/Turboprop/Helicopter</i>						
SEP (fixed)	GASEPF	13,900	14,300	14,300	15,200	15,200
SEP (variable)	GASEPV	13,900	14,300	14,300	15,200	15,200
MEP	BEC58P	1,490	1,538	1,538	1,739	1,739
Turboprop	DHC6	733	805	850	840	900
Helicopter	H500D	1,490	1,538	1,538	1,739	1,739
Subtotal		31,513	32,481	32,526	34,718	34,778
<i>Military</i>						
Helicopter	S70	44	80	80	80	80
Turboprop	C12	21	36	36	36	36
Subtotal		65	116	150	116	116
Total Itinerant		32,218	33,252	33,382	35,509	35,674
LOCAL OPERATIONS						
<i>Piston/Turboprop/Helicopter</i>						
SEP (fixed)	GASEPF	10,176	10,300	10,300	11,500	11,500
SEP (variable)	GASEPV	10,176	10,300	10,300	11,500	11,500
MEP	BEC58P	2,426	2,550	2,550	2,800	2,800
Helicopter	H500D	3,032	3,148	3,148	3,377	3,377
Subtotal		25,811	26,298	26,298	29,177	29,177
<i>Military</i>						
Helicopter	S70	53	88	88	88	88
Subtotal		53	88	88	88	88
Total Local		28,864	26,386	26,386	29,265	29,265
Total Operations		58,082	59,638	59,768	64,774	64,939

Source: ¹ Riverside Airport Traffic Control Tower (ATCT). Three percent added to the itinerant operations to account for when the ATCT is closed.

² FAA Terminal Area Forecasts (December 2010)

³ Coffman Associates analysis

Time-of-Day

The time of day at which operations occur is important as input to the INM due to the 10 decibel nighttime (10:00 p.m. to 7:00 a.m.) and 4.8 decibel evening (7:00 p.m. to 10:00 p.m.) weighting of flights. In calculating airport noise exposure, one operation at night has the same noise emission value as 10 operations during the day by the same aircraft. While Riverside Airport does have an airport traffic control tower (ATCT), it is closed between 8:00 p.m. and 7:00 a.m. Counts for nighttime activity were derived from interviews with airport users and airport staff. Information obtained from these interviews was used to determine evening and nighttime aircraft operations for modeling the noise exposure contours. **Table B2** depicts the evening and nighttime percentages. These percentages of operations were applied to both the Proposed Action and No Action scenarios.

TABLE B2
Day/Evening/Night Runway Use Percentages by Aircraft Type
Riverside Airport

Aircraft Type	Day	Evening	Night
Single Engine Piston	80%	18%	2%
Multi-Engine Piston	90%	9%	1%
Turboprop	90%	9%	1%
Business Jet	90%	9%	1%
Helicopter	90%	9%	1%

Source: *Riverside Airport Master Plan, 2009*

Runway Use

Runway usage data is another essential input to the INM. For modeling purposes, wind data analysis usually determines runway use percentages. Aircraft will normally land and take-off into the wind. However, wind analysis provides only the directional availability of a runway and does not consider pilot selection, primary runway operations, or local operating conventions.

The runway usage at the airport was established through discussions with the ATCT and airport staff. **Table B3** summarizes the runway use percentages for existing and forecast conditions.

TABLE B3
Existing and Future Runway Use by Aircraft Type
Riverside Airport

Runway	Arrivals and Departures			
	Business Jet	Turboprop	Piston	Military
9	10%	10%	9%	10%
27	90%	90%	88%	90%
16	0%	0%	1%	0%
34	0%	0%	2%	0%

Source: *Riverside Airport Master Plan, 2009*

Flight Tracks

A review of local and regional air traffic control procedures and radar flight tracks, conducted during the 1995 14 CFR Part 150 Noise Compatibility Study for the airport, was used to develop consolidated flight

tracks for use in the INM. The resulting analysis is a series of flight tracks describing the typical flight corridors used for aircraft arriving and departing Riverside Airport.

Flight Profiles

The standard arrival profile used in the INM program is a three-degree approach. No indication was given by airport staff that there was any variation on this standard procedure; therefore, the standard approach was included in the model as representative of local operating conditions.

INM Version 7.0b computes the take-off profiles based on the user-supplied airport elevation and average annual temperature entries in the input batch. At Riverside Airport, the elevation is 818 feet mean sea level (MSL) and the average annual temperature is 56.1 degrees Fahrenheit (F), based on information from the National Oceanic and Atmospheric Administration. If other than standard conditions (temperature of 59 degrees F and elevations of zero feet MSL) are specified by the user, the profile generator automatically computes the take-off profiles using the airplane performance coefficients in the database and equations in the Society of Aeronautical Engineers, *Aerospace Information Report 1845* (SAE/AIR 1845).

The INM computes separate departure profiles (altitude at a specified distance from the airport with associated velocity and thrust settings) for each of the various types of aircraft using the airport.

INM OUTPUT

Output data selected for calculation by the INM are annual average noise contours in CNEL. The CNEL is a measure of the 24-hour noise level of a community to allow for comparison between the No Action and proposed development alternatives.

Computer files developed from data described in the previous section provided input to the INM, which generated output files for years and alternatives being evaluated. In accordance with FAA Orders 1050.1E and 5050.4B, the 65, 70, and 75 CNEL noise contours were produced for each alternative. Contours were prepared for the following: existing condition (2010), year of implementation (2015), and five years beyond (2020). Exhibits depicting the noise exposure contours are included in Chapter Three (Section 3.3.8) and Chapter Four (Section 4.2.11)

AIR QUALITY ANALYSIS METHODOLOGY

Air emissions occurring due to construction activity vary based on the project's duration and level of activity. Construction emissions occur mostly as exhaust products from the operation of construction equipment and vehicles, but can also occur as fugitive dust emissions from land disturbance during material staging, demolition, and movement. Evaporative emissions also result from asphalt paving operations. The type of construction equipment commonly used can be categorized as both off- and on-road equipment. Off-road equipment is normally used for earthwork, paving, demolition, and other on-site activities, while on-road equipment is typically used to transport and deliver supplies, material, and employees.

The equipment activity levels and vehicle parameters associated with the proposed improvements (i.e., horsepower, fuel type, expected hours of use) were estimated based on the expected construction schedule for the RAL improvements. Equipment/vehicle emission factors were developed using the CARB-approved emissions models OFFROAD2007 (for off-road equipment) and EMFAC2007 (for on-road equipment). The emission factors were applied to the schedule-specific equipment parameters to calculate the total level of emissions expected from equipment use. The assumptions used for off-road and on-road equipment are included in **Table B4** and **B5**.

TABLE B4					
Off-Road Equipment Construction Assumptions Input for OFFROAD2007					
Riverside Airport					
	Hours				
Off Road Equipment	Year 1	Year 2	Year 3	Year 4	>4 Years
Pavers	0	80	0	40	200
Rollers	1440	480	0	200	1600
Scrapers	5600	320	40	200	160
Paving Equipment	0	80	0	60	240
Trenchers	480	160	120	260	1200
Excavators	720	80	80	80	400
Concrete/Industrial Saws	160	40	0	40	80
Cranes	0	0	120	0	40
Graders	1120	960	0	400	1600
Off-highway Trucks	240	480	80	280	0
Crushing/Proc. Equipment	480	0	0	0	0
Rough Terrain Forklifts	960	0	80	0	0
Rubber Tire Loaders	0	480	0	200	800
Tractors/Loaders/Backhoes	0	480	160	360	960
Crawler Tractor/Dozers	140	0	0	0	0
Skid Steer Loaders	960	960	160	480	2000
Source: Parsons-Brinckerhoff					

TABLE B5 On-Road Equipment Construction Assumptions Input for EMFAC2007 Riverside Airport										
	Year 1		Year 2		Year 3		Year 4		>4 Years	
On Road Vehicles	Days	Miles Per Day								
8 Cubic Yard Dump Truck (HDDV6)	0	0	0	0	20	1	0	0	650	15
16 Cubic Yard Dump Truck (HDDV8a)	100	8	20	15	0	0	20	15	470	15
Water Truck (HDDV7)	300	20	120	20	20	2	40	20	800	20
Pick Up Trucks (HDGV2b)	300	50	200	50	40	50	0	0	900	50

Following are the modeling outputs generated from the EDMS emissions model.

Attachment C



BIOLOGICAL STUDY FOR PROPOSED IMPROVEMENTS AT RIVERSIDE AIRPORT

Biological Study for Proposed Improvements at Riverside Airport in Riverside, Riverside County, California

Prepared for

Coffman Associates

Prepared by

SWCA Environmental Consultants

May 2011

**Biological Study for Proposed Improvements at Riverside Airport
in Riverside, Riverside County, California**

Prepared for:

Coffman Associates
237 NW Blue Parkway
Lee's Summit, Missouri 64063
Contact: David Fitz

Prepared by:

Michael Tuma, Taya Cummins, Michael Cady, David Daitch, and Shanee Stopnitzky

SWCA Environmental Consultants
625 Fair Oaks Avenue, Suite 190
South Pasadena, California 91030
(626) 240-0587
www.swca.com
Contact: Eleanor Gladding

SWCA Project No. 14079.01

May 2011

MANAGEMENT SUMMARY/ABSTRACT

Purpose and Scope: This document details the results of a biological study in support of proposed improvements (project) at the existing Riverside Municipal Airport (Airport) in the City of Riverside (City), Riverside County, California. The purpose of this document is to demonstrate project compliance with a number of federal, state, and local laws pertaining to the protection of sensitive natural resources, including the Federal Endangered Species Act (FESA), the Migratory Bird Treaty Act (MTBA), the Bald and Golden Eagle Protection Act (Eagle Act), the Clean Water Act (CWA), the California Environmental Quality Act (CEQA), the California Endangered Species Act (CESA), the Porter-Cologne Water Quality Act, and California Fish and Game Code Sections. This document was prepared to satisfy the project's permitting requirements for the MSHCP and CEQA review processes, which together combine to cover all of the sensitive natural resources protected by federal, state, and local policies that may be affected the proposed project. The MSHCP is a combined local Habitat Conservation Plan (HCP) implemented under Section 10(a)(1)(B) of FESA, and a Natural Community Conservation Plan (NCCP) implemented under Fish and Game Code Section 2800.

The Airport occurs over 78 parcels encompassing 351 acres; the expansion is proposed over a 132-acre area that includes all or portions of 28 parcels (Assessor Parcel Numbers 155060010, 155060011, 155060012, 155060013, 155280003, 155280004, 155280005, 155280006, 155280007, 155280008, 155280059, 155280060, 189170025, 189170026, 189210003, 189210004, 189210005, 189210006, 189210007, 189210010, 189210015, 189210024, 189210027, 189210028, 189220001, 189220002, 190210006, and 190270004). The proposed project consists of the upgrades to the existing runway (Runway 27) safety area (RSA) reimbursement of land acquired within the runway protection zone (RPZ) and north side parallel taxiway. Approximately 2,700 feet of a 30-inch natural gas line will be relocated out of the RSA. Second, approximately 155,000 cubic yards of fill will be brought in to bring the Runway 27 RSA up to Federal Aviation Administration (FAA) design standards. In order to reduce the environmental impacts of bringing fill from an off-airport site and to save costs, fill for the Runway 27 RSA will be taken from the north side of the airport. Removal of the needed fill from the north side will also prepare this area for a proposed parallel taxiway, connecting taxiways, north side access road (gated access), and north side ramp with drainage and utility improvements. As a discretionary action, the proposed project is subject to the requirements of the MSHCP and CEQA.

The services provided by SWCA included: conducting a literature and database search to determine the potential for occurrence of special-status species and sensitive habitats within and immediately adjacent to the project site; conducting a field visit to characterize the biological conditions of the project site and its immediate vicinity; conducting habitat assessments for MSHCP-covered species; conducting an analysis of potential impacts that the project could have on sensitive biological resources covered under both the MSHCP and CEQA; and recommending measures that would mitigate any potential impacts.

Dates of Investigation: The literature and database searches were performed on March 5, 10, and 11, 2008, and updated on October 13, 2009. The initial habitat assessment survey of the project site and adjacent lands within 150 meters was conducted on February 26, 2008. Step IIa focused burrow surveys for burrowing owl were conducted on June 18 and 19, 2009. Step IIb focused breeding season surveys for burrowing owl were conducted on June 24 and July 1, 8, and 15, 2009. A focused survey for San Diego ambrosia was conducted on October 2, 2009. A wetland delineation was conducted on October 30, 2009.

Findings of the Investigation: Five habitat types were identified in the project during the general biological field survey: urban or built up land, non-native grassland, artificial wet meadow, transitional bare areas, and ruderal habitats. Habitats identified on adjacent lands (within 150 meters) include: urban or built-up lands, non-native grasslands, and ruderal habitats. A total of 44 plant and 22 wildlife species were observed during the initial survey of the project site and immediate vicinity. This included the

observation of two special-status wildlife species: a flock of California horned larks observed on the project site in non-native grassland and ruderal habitats, and a breeding pair of burrowing owls observed in non-native grassland habitat immediately adjacent to the project site on Airport grounds.

A total of 91 special-status species have been recorded within the nine-quad project vicinity, including: 15 plants, four invertebrates, three fish, three amphibians, 13 reptiles, 39 birds, and 14 mammals. In addition, four sensitive habitats were identified. Ten species were assessed as being present or “may occur” within the project site based upon the habitats represented within the project site and species occurrences within the project vicinity. These included San Diego ambrosia, Plummer’s mariposa lily, northern harrier (foraging and nesting), white-tailed kite (foraging and nesting), Cooper’s hawk (foraging and nesting), burrowing owl (foraging and nesting), loggerhead shrike (foraging and nesting), California horned lark (foraging and nesting), coyote, and northwestern San Diego pocket mouse.

Habitat assessments for MSHCP-covered species determined that appropriate habitat for San Diego ambrosia, burrowing owl occurs within the project site. The project site does not contain suitable habitat for two other narrow endemic plant species (Brand’s phacelia and San Miguel savory), nor suitable habitat for least Bell’s vireo, southwestern willow flycatcher, yellow-billed cuckoo, or vernal pool shrimp species.]

Focused surveys for San Diego ambrosia within appropriate habitat resulted in no individuals of the species being found. Burrowing owls are present immediately adjacent to the project site, based upon observations during the general biological field survey and focused surveys. Both observations were made during the breeding season for burrowing owls, and included observations of a nesting pair in 2008 and a single individual in 2009. Additionally, appropriate nesting and/or foraging habitat for burrowing owl was observed over the majority of the project site, as well as several areas adjacent to (and within 150 meters) of the project site. Because the burrowing owl could inhabit the project site throughout the year (nesting season, post-nesting dispersal period, and winter season), construction associated with implementation of the project could potentially impact burrowing owls that inhabit the project site. As well, burrowing owls that inhabit appropriate burrowing owl habitat within 150 meters of the project site could be impacted by the construction phase of the project. Construction-generated noise and construction-related traffic have the potential to indirectly impact burrowing owls inhabiting these areas. Any impacts that disrupt the foraging and/or nesting of burrowing owls within or adjacent to the project site would be considered a violation of MSHCP requirements and the Migratory Bird Treaty Act of 1918 (MBTA), as well as a significant impact under the California Environmental Quality Act (CEQA).

Northern harrier, white-tailed kite, Cooper’s hawk, loggerhead shrike, and California horned lark may forage and nest within or adjacent to the project site. Because these species may nest within the project site, the project could potentially impact nests or young of these species. Any impacts that disrupt the nesting of these avian species within or adjacent to the project site would be considered a violation of MSHCP requirements, the MBTA, federal Endangered Species Act (FESA), and California Endangered Species Act (CESA), as well as a significant impact under CEQA.

The construction activities associated with the proposed project that result in ground disturbance and/or the removal of vegetation could have both direct and indirect impacts to actively nesting birds, including the nests of special-status species. Direct project impacts would include the destruction of active nests, eggs, or young located within vegetation removed within the project site. Indirect impacts would include noise and disturbance associated with the construction activities that cause birds in adjacent habitats to abandon their nests. Any impacts (direct or indirect) that result in the abandonment or destruction of an active nest or the destruction of eggs or young of any protected avian species, including special-status species, would be considered a violation of the MSHCP and the MBTA, and a significant impact under CEQA.

Signs of a coyote were observed within the project site, and Plummer's mariposa lily and northwestern San Diego pocket mouse may occur there. These species are covered under the MSHCP. Therefore, take of individuals and habitat for these species would not be considered a significant impact under CEQA, as payment of the MSHCP fees fully mitigates any project-related impacts to these species.

No sensitive habitats, as listed by California Department of Fish and Game (CDFG) (2003), were identified within the project site. No riparian/riverine or vernal pool habitat occurs within the project site. Implementation of the project, therefore, will not result in the loss of sensitive habitats. Since the project does not contain a wildlife corridor, project impacts on wildlife movement would be considered less than significant under CEQA. As well, the project site does not contain, nor is it directly adjacent to, any linkages connecting core areas, as defined by the MSHCP.

A formal delineation of the artificial wet meadow was conducted in accordance with standards established by the U.S. Army Corps of Engineers (USACE) and CDFG. The area delineated lacks a federal nexus, but a portion of it falls within CDFG guidelines for streambed and banks, and associated habitat. Impacts to this area would be significant under California Fish and Game Code (Sections 1601 through 1607) and would require a Streambed Alteration Agreement through the CDFG. Additionally, the CRWQCB may exert authority to regulate waste discharge into these waters under the Port-Cologne Water Quality Act. The drainage along the western boundary of the project site was mapped outside of the project area.

Recommendations: Since burrowing owls were detected during the breeding season during both the general biological field survey and focused surveys, mitigation may be required in order to prevent take of burrowing owls. Appropriate mitigation measures may only be developed through consultation with the CDFG and U.S. Fish and Wildlife Service (USFWS) personnel assigned to oversight of the MSHCP plan area. Mitigation may include preservation and enhancement (i.e., installation of artificial burrows, habitat restoration) of burrowing owl habitat at both onsite and offsite mitigation areas.

A pre-construction survey will be necessary in all appropriately identified burrowing owl habitat within and adjacent to the project site in order to determine whether burrowing owls are actively occupying the site. The pre-construction survey should be conducted prior to and within 30 days of ground-disturbing activities to ensure clearance of these areas, and to prevent take of burrowing owls. Should burrowing owls be determined to occur within or adjacent to (within 150 meters) the project site, mitigation and monitoring measures should be determined through consultation with the CDFG and USFWS personnel assigned to oversight of the MSHCP plan area.

During the construction phase of the project, a qualified biologist should monitor the project site weekly to determine whether burrowing owls have moved into appropriate burrowing owl habitats within and adjacent to the project site in order to prevent disturbance to or take of burrowing owls. Should burrowing owls be detected during monitoring of the construction phase of the project, the biologist should retain the authority to stop work within 150 feet of the area occupied by the owl(s), and monitor the project site daily until the owl(s) leaves the project site under its own accord, or until the owl(s) has been removed from the project site using mitigation measures approved through consultation with the CDFG and USFWS personnel assigned to oversight of the MSHCP plan area. If burrowing owls are determined to be nesting within the project site, mitigation should include those that protect nesting avian species.

Grading or vegetation clearing within the project site would likely impact any non-raptor nests located on or within 150 feet, and raptor nests located on or within 500 feet of the project site, including those of northern harrier, white-tailed kite, Cooper's hawk, burrowing owl, loggerhead shrike, and California horned lark. In order to reduce these impacts to a less than significant level, SWCA recommends that construction and maintenance activities of the project take place outside of the nesting season, which (under the MSHCP Construction Guidelines, Volume I, Section 7.5.3) occurs from March 1 through June

30. If project grading and maintenance activities occur outside of the nesting season, no further work is recommended. If project grading and maintenance activities must occur during the nesting season, it is recommended that a qualified biologist conduct a pre-construction nest survey on the project site and within 150 feet (for non-raptor nests) and 500 feet (for raptor nests) of the project footprint to identify any active nests that occur there. This survey should be carried out within one week of initiation of grading activities and maintenance activities. If bird species protected under the MBTA, FESA (16 U.S. Code [USC] 153 et seq.), or California Fish and Game Code Sections 2050 et seq., 3503, 3503.5, and 3513 are found nesting on or adjacent to the project site, SWCA recommends that a qualified biologist monitor the nests daily during all phases of construction and maintenance to ensure that the project does not impact the nests. Grading and maintenance activities should not be allowed within 150 feet of active non-raptor nests or 500 feet of active raptor nests until it has been determined by a qualified biologist that the chicks have fledged. Following fledging of the nestlings, the buffer area around the nest can be graded.

Numerous MSHCP-covered species occur, or may occur, within the project site, including Plummer's mariposa lily, northern harrier, white-tailed kite, Cooper's hawk, loggerhead shrike, California horned lark, coyote, and northwestern San Diego pocket mouse. Focused surveys are not required for these species, and take of individuals and their habitat is allowed under the MSHCP. No further action is necessary for plant, reptilian, and mammalian species; however, the Construction Guidelines detailed in Volume I, Section 7.5.3 of the MSHCP should be implemented with regard to protection of nesting avian species.

Impacts to the wet meadow would require a Streambed Alteration Agreement through the CDFG. Mitigation would be required to lessen impacts to jurisdictional areas to less than significant levels. Additionally, a Waste Discharge Requirement (WDR) or a waiver of WDR will be required by the California Regional Water Quality Control Board (CRWQCB).

TABLE OF CONTENTS

MANAGEMENT SUMMARY/ABSTRACT	ii
1. INTRODUCTION.....	2
1.1 Project Location	3
1.2 Project Description	3
2. SETTING	5
2.1 Environmental Setting.....	5
2.2 Soils.....	5
2.3 Regulatory Setting.....	6
2.3.1 Federal Regulations.....	6
2.3.2 State Regulations.....	7
3. METHODS.....	9
3.1 Literature and Database Search.....	9
3.2 MSHCP Conservation Summary Report Generator.....	10
3.3 Field Surveys.....	11
3.3.1 General Biological Field Survey	11
3.3.2 Special-status Species Habitat Assessments	11
3.3.3 Focused Surveys.....	12
3.3.4 Wetland Delineation.....	12
3.4 Assessment of Special-status Species Occurrence Potential.....	13
3.5 CEQA Impact Analysis.....	13
4. RESULTS.....	14
4.1 Field Surveys.....	14
4.1.1 General Biological Field Survey	14
4.1.2 Focused Surveys.....	14
4.1.3 Wetland Delineation.....	14
4.2 Biological Conditions Within and Adjacent to the Project Site	15
4.2.1 Habitat Types in the Project site.....	15
4.2.2 Habitats on Adjacent Lands (within 150 meters).....	22
4.3 Assessment of Special-status Species Occurrence Potential.....	22
4.3.1 Special-status Plants	23
4.3.2 Special Status Wildlife	25
4.4 Special-status Species Habitat Assessments	29
4.4.1 Burrowing Owl.....	29
4.4.2 Narrow Endemic Plants.....	30
4.4.3 Other MSHCP-Covered Species	30
4.5 Focused Surveys.....	30
4.5.1 San Diego Ambrosia	30
4.5.2 Burrowing Owl.....	30
4.6 Wetland Delineation.....	31
4.7 Assessment of Other Sensitive Biological Resources	37
4.7.1 Sensitive Habitats	37
4.7.2 Riparian/Riverine and Vernal Pool Habitat.....	37
4.7.3 Nesting Raptors, Migratory, and Native Avian Species.....	37
4.7.4 Wildlife Corridors	37
5. PROJECT IMPACT ANALYSIS.....	37
5.1 Sensitive Habitats	38
5.2 Jurisdictional Habitats	38
5.3 Wildlife Corridors	38

5.4	Special-status Species.....	38
5.4.1	Special-status Plants	38
5.4.2	Special-status Wildlife	38
6.	RECOMMENDATIONS	40
6.1	MSHCP Requirements	40
6.1.1	Burrowing Owl.....	40
6.1.2	Special-status Avian Species; Nesting Raptor, Migratory, and Native Avian Species.....	41
6.2	Other Sensitive Biological Resources	42
6.2.1	Jurisdictional Habitats	42
7.	REFERENCES	43

LIST OF FIGURES

Figure 1.	Project Location Map	4
Figure 2.	Vegetation Map	16
Figure 3.	Burrowing Owl Observation Locations.....	33
Figure 4a.	Overview Map of Wetland Areas	34
Figure 4b.	Riparian Zone on West Side of Project Site	35
Figure 4c.	Wet Meadow Area on North Side of Existing Airport Runway	36

LIST OF PHOTOGRAPHS

Photograph 1.	View of Non-native Grassland Habitat.....	17
Photograph 2.	View of Urban or Built-up Land Associated with Airport Operations.....	18
Photograph 3.	View of a Transitional Bare Area in the North-central Portion of the Project Site	19
Photograph 4.	View of Ruderal Habitat.....	20
Photograph 5.	View of Artificial Wet Meadow facing North.....	21
Photograph 6.	View of Drainage System Leading to Culvert at Upper Reach of Artificial Wet Meadow facing South along Fremont Street	21

LIST OF APPENDICES

Appendix A:	Western Riverside County MSHCP List of Covered Species
Appendix B:	Inventory of Plant and Wildlife Species Observed within the Project Site
Appendix C:	Assessment of Potential for Occurrence of Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

1. INTRODUCTION

This document details the results of a biological study in support of proposed improvements (project) at the existing Riverside Municipal Airport (Airport) in the City of Riverside (City), Riverside County, California. The Airport occurs over 78 parcels encompassing 351 acres; the expansion is proposed over a 132-acre area that includes all or portions of 28 parcels (Assessor Parcel Numbers 155060010, 155060011, 155060012, 155060013, 155280003, 155280004, 155280005, 155280006, 155280007, 155280008, 155280059, 155280060, 189170025, 189170026, 189210003, 189210004, 189210005, 189210006, 189210007, 189210010, 189210015, 189210024, 189210027, 189210028, 189220001, 189220002, 190210006, and 190270004).

The purpose of this document is to demonstrate project compliance with a number of federal, state, and local laws pertaining to the protection of sensitive natural resources. Paramount among these policies are the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) and the California Environmental Quality Act (CEQA). Together, these laws combine to cover all of the sensitive natural resources protected by federal, state, and local policies that may be affected the proposed project. The MSHCP is a combined local Habitat Conservation Plan (HCP) implemented under Section 10(a)(1)(B) of the federal Endangered Species Act (FESA), and a Natural Community Conservation Plan (NCCP) implemented under Fish and Game Code Section 2800. It fulfills requirements of the Migratory Bird Treaty Act (MTBA), the Bald and Golden Eagle Protection Act (Eagle Act), the California Endangered Species Act (CESA), and California Fish and Game Code Sections pertaining to the protection of state-listed species, nesting raptors, nesting native and migratory bird species, and Fully Protected species. It provides protection for 146 Covered Species and numerous sensitive habitats, and seeks to provide a framework for permitting incidental take of listed species and their habitat for all discretionary projects within the region while simultaneously conserving important ecosystem elements within a series of core conservation areas and their linkages throughout western Riverside County. In pursuing this ecosystem approach, the MSHCP covers far more than federally listed species. For example, one common species – the coyote – is protected under the MSHCP because of its recognized importance as a top predator in most (if not all) of the habitats within western Riverside County. Though the MSHCP is comprehensive in protecting Covered Species and their habitat, and aggressive in assembling conservation lands, not all sensitive natural resources are protected under the permit. The remaining natural resources, including jurisdictional habitats and several special-status species, are protected under CEQA. This act is a comprehensive environmental protection policy, which requires compliance with the MSHCP and policies included therein, as well as the Clean Water Act (CWA), the Porter-Cologne Water Quality Act, and California Fish and Game Code Sections pertaining to the protection of wetlands and wetland habitats, special-status species habitats, and native plants. CEQA also requires protection of wildlife movement corridors, wildlife species appearing on the California Department of Fish and Game (CDFG) Special Animals List (CDFG 2011), and native plant species ranked between 1 and 4 by the California Native Plant Society.

This document was prepared to satisfy the project's permitting requirements for the MSHCP and CEQA review processes. MSHCP review will be completed by City staff, Federal Aviation Administration (FAA) staff, U.S. Fish and Wildlife Service (USFWS) and CDFG agency personnel, and staff at the Western Riverside County Regional Conservation Authority (RCA), a multi-jurisdictional authority that oversees implementation and enforcement of the MSHCP. As the City is the lead agency under CEQA, review of this document for the project's CEQA compliance will be completed by City staff. Demonstrating project compliance with the MSHCP and CEQA may partially fulfill requirements specified under additional environmental legislation, including the National Environmental Policy Act (NEPA). Descriptions of these laws and how they pertain to the project are provided in Section 2.3 of this document.

1.1 PROJECT LOCATION

The Airport is located in a light industrial/manufacturing area at 6951 Flight Road, north of Arlington Road, south of Central Avenue, and east of Van Buren Boulevard in the City of Riverside, Riverside County, California. Specifically, it is located at an elevation of approximately 243 meters (797 feet) above mean sea level in the San Bernardino Meridian T2S, R5W, section 31 (Latitude/Longitude: 33.9529°N, 117.4414°W) on the U.S. Geologic Survey (USGS) Riverside West 7.5-minute Quadrangle, (1967 photorevised 1980) (Figure 1).

1.2 PROJECT DESCRIPTION

The proposed project consists of the upgrades to the existing runway (Runway 27) safety area (RSA), reimbursement of acquired land within the runway protection zone (RPZ), and a north side parallel taxiway. Approximately 2,700 feet of a 30-inch natural gas line will be relocated out of the RSA. Second, approximately 155,000 cubic yards of fill will be brought in to bring the Runway 27 RSA up to FAA design standards. In order to reduce the environmental impacts of bringing fill from an off-airport site and to save costs, fill for the Runway 27 RSA will be taken from the north side of the airport. Removal of the needed fill from the north side will also prepare this area for a proposed parallel taxiway, connecting taxiways, north side access road (gated access), and north side ramp with drainage and utility improvements. As a discretionary action, the proposed project is subject to the requirements of the MSHCP and CEQA.

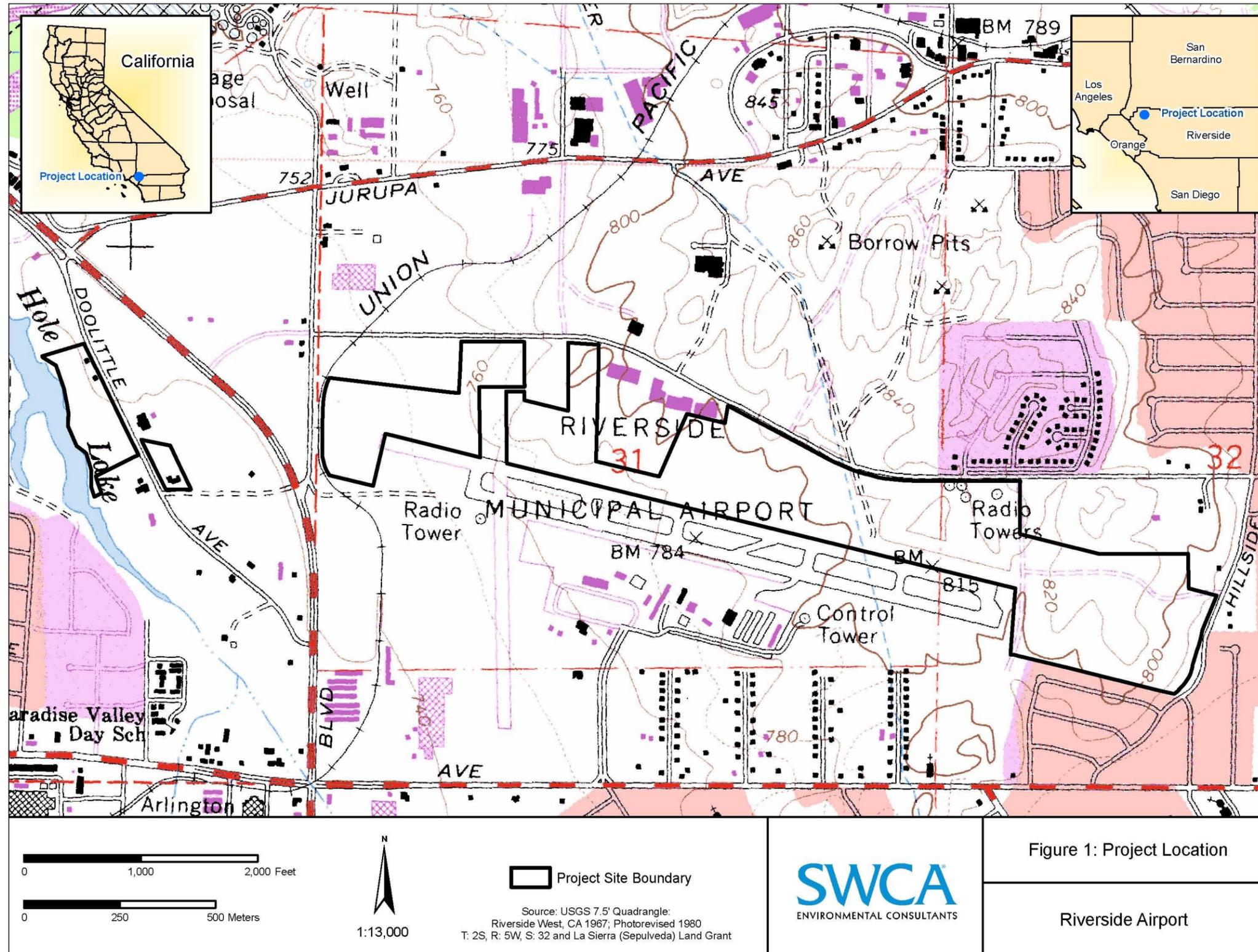


Figure 1: Project Location

Riverside Airport



Figure 1. Project Location Map

2. SETTING

2.1 ENVIRONMENTAL SETTING

The Airport is located in the southwestern California region within the south coast subregion. This subregion was previously dominated by coastal scrub and chaparral communities but has recently been urbanized, resulting in a great loss of undisturbed habitat (Hickman 1993). Specifically, the project site is located just south of the Santa Ana River and the Pedley Hills. The local climate is typical of a Mediterranean region with hot, dry summers and cooler, wetter winters. Temperatures range from daytime highs in the low 40s to low 100s degrees Fahrenheit (°F) to overnight lows in the mid 30s to low 90s °F. Average annual precipitation ranges from 12 inches per year in the coastal plain to 18 inches per year in the inland alluvial valleys, reaching 40 inches or more in the San Bernardino Mountains.

The Airport contains a mosaic of developed and undeveloped lands. Undeveloped lands have been modified, and contain transitional bare areas, ruderal habitats, and non-native grassland. Habitats immediately adjacent to the Airport are primarily developed, though several parcels of undeveloped lands border the Airport, and contain primarily non-native grassland and ruderal habitats. Detailed descriptions of the vegetation communities and habitats within and immediately adjacent to the Airport are provided in the Results section of this report.

2.2 SOILS

Soils within the project site include Porterville clay, Fallbrook sandy loam, Buren fine sandy loam, Arlington loam, and Terrace escarpments. These soil types are not classified as hydric.

Porterville clay (Map Unit Symbol: PtB; 0 to 5 percent slopes) is found on alluvial fans and foothills with slopes of 0 to 9 percent. It is formed in fine textured alluvium from basic and metabasic rocks. This soil may be gravelly or cobbly, with most of the gravel or cobbles concentrated on the surface. Rock fragments may cover as much as 45 percent of the surface. The soil is well-drained, with very slow to rapid runoff and slow permeability. The natural vegetation associated with the soil is composed of annual grasses, herbaceous forbs, and widely spaced shrubs (Natural Resources Conservation Service [NRCS] 1971). Within the project site these soils are located in the western portion of the airport property and on the isolated western parcels.

Fallbrook sandy loam soils (Map Unit Symbol: FaD2, 8 to 15 percent slopes, eroded; FaE2, 15 to 25 percent slopes, eroded) are found on rolling hills that have slopes of 5 to 75 percent. They consist of deep, well-drained soils that are formed from material weathered from granitic rocks. Usually the rock is deeply weathered and rock outcrops are common in some areas. The soils are well-drained, with medium to very rapid runoff and moderately slow permeability. The natural vegetation associated with the soils is composed of mainly annual grasses and forbs with considerable chaparral, chamise, flattop buckwheat, and other shrubs (NRCS 1971). Within the project site these soils are located in the eastern and northern portions of the airport property.

Buren fine sandy loam (Map Unit Symbol: BuC2, 2 to 8 percent slopes, eroded) is found on gently to strongly sloping alluvial fans and terraces. It is formed from alluvium derived mostly from basic igneous rocks and partly from other crystalline rocks. The soil is well-drained, with slow to medium runoff and moderately slow permeability in the Bt horizon and very slow in the Csi horizon. The natural vegetation associated with the soils is principally annual grasses and forbs with chaparral shrubs on eroded terrace slopes (NRCS 1971). Within the project site this soil is located in the center, north-central, and eastern boundary of the airport property.

Arlington loam (Map Unit Symbol: ArD, deep, 5 to 15 percent slopes) is found on nearly level to strongly sloping area and on alluvial fans and terraces. The soil is well-drained, with slow to medium runoff and slow permeability. The natural vegetation associated with the soil is mainly annual grasses and forbs (NRCS 1971). Within the project site this soil is located at the eastern end of the airport runway.

Terrace escarpments (Map Unit Symbol: TeG, 5 to 75 percent slopes, eroded) consist of steep, relatively smooth descending slopes at the ends of terraces. The natural drainage, subsoil permeability, and available water holding capacity are variable. Surface runoff is rapid and the erosion hazard is severe. Typically the soil material varies considerably in characteristics within short distances. This soil type is considered to be a hydric soil when it occurs in drainages and floodplains (NRCS 1971). Within the project site, this soil is located along the western edge of the isolated western parcels.

2.3 REGULATORY SETTING

2.3.1 Federal Regulations

Federal Endangered Species Act of 1973 (16 U.S. Code [USC] 1531-1544, 87 Stat. 884), as amended

The Federal Endangered Species Act (FESA) the 1973 Endangered Species Act provides for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend. FESA authorizes the Secretary of the Interior to make determinations, including listing of species as threatened and endangered and designating Critical Habitat for listed species. FESA prohibits the take, possession, sale, and transport of listed species. "Take" may include adverse impacts to listed species or their Critical Habitat, and includes actions that could result in "significant habitat modification or degradation." Applicants for projects that could result in adverse impacts to any federally listed species are required to obtain either a Biological Opinion from the U.S. Fish and Wildlife Service (USFWS) that authorizes the project or "action," or an Incidental Take Authorization. A Biological Opinion may be issued only during agency-to-agency consultations, as defined and authorized under Section 7 of FESA. During the Section 7 process, determinations are made regarding the proposed project and its potential to adversely affect the federally listed species, and reasonable and prudent mitigation measures required to avoid such effects. An Incidental Take Permit may be issued under Section 10(a)(1)(B) of FESA where a non-federal action may result in adverse affects to listed species or their Critical Habitat. An HCP is required as part of the Incidental Take permitting process. The purpose of the HCP and permit is to allow the project or action to proceed through identifying potential adverse affects that could cause take, and avoiding, minimizing, and/or mitigating for that take to the maximum extent practicable.

The proposed project is within the MSHCP, which serves as an HCP pursuant to Section 10(a)(1)(B) of FESA, as well as a Natural Communities Conservation Plan (NCCP) under the NCCP Act of 2001 (California Fish and Game Code 2800 et seq.). At the time of its implementation in 2004, the plan was the nation's largest HCP. It covers 146 species (Appendix A) and multiple habitats within a diverse landscape, and under multiple jurisdictions. The MSHCP allows participating jurisdictions to authorize take of Covered Species within the plan area. The MSHCP includes compensation requirements for take authorization, and prescribes protection and mitigation measures that are approved and monitored by multiple resource agencies, including USFWS and CDFG. The compensation provided by MSHCP-permitted actions and projects is used to assemble and manage a series of core conservation areas and numerous linkages between them.

Implementation of the MSHCP is overseen, administered, and enforced by the RCA, a joint authority formed by the County of Riverside and the 14 cities that are signatories to the MSHCP. The current project is an action proposed by the City, one of the signatories of the MSHCP. As part of the permitting process required under the MSHCP, City Planning Division staff will review technical documents pertaining to environmental compliance, and coordinate with RCA, USFWS, and CDFG staff to ensure that the proposed project meets the requirements of the MSHCP. Migratory Bird Treaty Act (16 USC 703 to 711)

The Migratory Bird Treaty Act of 1918 (MBTA) prevents the take of all migratory birds, including their nests and eggs.

Bald and Golden Eagle Protection Act (16 USC 668)

The Eagle Act specifically protects bald and golden eagles from being killed or their eggs taken.

Clean Water Act (33 USC §1251 et seq.; 1972)

Under provisions of the Clean Water Act, the U.S. Army Corps of Engineers (USACE) administers the day-to-day activities required by Section 404. These include the individual permit decisions, jurisdictional determinations, developing policy and guidance, and enforcing provisions of Section 404. The USACE will assert jurisdiction over the following categories of water bodies: traditional navigable waters (TNW); all wetlands adjacent to TNW; non-navigable tributaries of TNW that are relatively permanent (i.e., tributaries that typically flow year-round or have continuous flow at least seasonally); and wetlands that directly abut such tributaries. In addition, the agencies will assert jurisdiction over every water body that is not a Relatively Permanent Water Body (RPW) if that water body is determined (on the basis of a fact-specific analysis) to have a significant nexus with a TNW. The classes of water body that are subject to Clean Water Act jurisdiction, only if such a significant nexus is demonstrated, are: non-navigable tributaries that do not typically flow year-round or have continuous flow at least seasonally; wetlands adjacent to such tributaries; and wetlands adjacent to but that do not directly abut a relatively permanent, non-navigable tributary.

National Environmental Policy Act of 1969, as Amended

NEPA requires federal agencies to take into consideration the environmental consequences of proposed actions as well as input from state and local governments, Indian tribes, the public, and other federal agencies during their decision-making process. The Council on Environmental Quality (CEQ) was established under NEPA to ensure that all environmental, economic, and technical considerations are given appropriate consideration in this process.

2.3.2 State Regulations

California Endangered Species Act (Fish and Game Code Section 2050 et seq.)

Species listed under the California Endangered Species Act (CESA) cannot be taken or harmed, except under specific permit. As currently stated in the Act, “take” means to hunt, pursue, catch, capture, or kill, or to attempt to do so. As stated above, the proposed project is within the area covered by the MSHCP. The MSHCP also includes compensation requirements for take of state listed species and their habitat in accordance with CESA. The MSHCP also includes prescribed protection and mitigation measures approved by the California Department of Fish and Game (CDFG) for sensitive species.

Natural Community Conservation Act of 2003 (Fish and Game Code Section 2800 et seq.)

The Natural Community Conservation Planning (NCCP) program allows for the development of plans that protect natural communities at landscape scales while also allowing for regional economic growth. The NCCP was developed by the state of California to provide coordination between multiple jurisdictions in conserving ecosystems in manners that could not be met by CESA and FESA alone. The NCCP is most important in providing a method of coordination between local jurisdictions and state and federal agencies, as well as an articulation with HCPs permitted under FESA.

Fish and Game Code Sections 3511, 4700, 5050, and 5515

These Sections provide a provision for the protection of bird, mammal, reptile, amphibian, and fish species that are “fully protected.” Fully protected animals may not be harmed, taken, or possessed.

Fish and Game Code Section 3503

This Section states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this Code or any regulation made pursuant thereto.

Fish and Game Code Section 3503.5

This Section provides protection for all birds-of-prey, including their eggs and nests.

Fish and Game Code Section 3513

This Section makes it unlawful to take or possess any migratory non-game bird as designated in the MBTA.

Fish and Game Code Sections 1900 et seq., or Native Plant Protection Act

This Section lists threatened, endangered, and rare plants so designated by the California Fish and Game Commission.

Title 14, California Code of Regulations, Sections 670.2 and 670.5

These Sections list animals designated as threatened or endangered in California. The CDFG designates species considered to be indicators of regional habitat changes, or candidate species for future state listing, as California Species of Concern (CSC). CSC do not have special legal status, but are used by the CDFG as a management tool when considering the future use of any land parcel.

California Fish and Game Code (Sections 1601 through 1607)

These sections prohibit alteration of any lake or streambed, including intermittent and seasonal channels and many artificial channels, without execution of a Streambed Alteration Agreement through the CDFG. This applies to any channel modifications that would be required to meet drainage, transportation, or flood control objectives of the project. California Environmental Quality Act

CEQA requires that a project's effects on environmental resources must be analyzed and assessed using criteria determined by the lead agency. CEQA defines a rare species in a broader sense than the definitions of threatened, endangered, or California Species of Concern (SC). Under this definition, CDFG can request additional consideration of species not otherwise protected.

Porter-Cologne Water Quality Act (California Water Code B13000 *et seq.*)

The California Regional Water Quality Control Board (CRWQCB) regulates discharge of waste in any region that could affect the Waters of the State under the California Porter-Cologne Water Quality Act or Waters of the U.S. under Section 401 of the Federal Clean Water Act. Under the Porter-Cologne Act, a Report of Waste Discharge must be submitted prior to discharging waste, or proposing to discharge waste, within any region that could affect the quality of the Waters of the State (California Water Code Section 13260). Waste Discharge Requirements (WDRs) or a waiver of WDRs will then be issued by the CRWQCB. Waters of the State are defined as any surface water or groundwater, including saline waters, which are within the boundaries of the state (California Codes: Public Resource Code Section 71200).

3. METHODS

3.1 LITERATURE AND DATABASE SEARCH

SWCA biologists reviewed existing sources of information regarding the occurrence of special-status species, and assessed the potential for occurrence of these species within the project site. The review was conducted on March 5, 10, and 11, 2008, and updated on October 13, 2009. Special-status species are plants and animals in one or more of the following categories.

- Species listed or proposed for listing as threatened or endangered under FESA (50 CFR 17.12 [listed plants], 50 CFR 17.11 [listed animals], and various notices in the Federal Register [FR] [proposed species]).
- Species that are candidates for possible future listing as threatened or endangered under FESA (67 FR 40657, June 13, 2002).
- Species listed or proposed for listing by the State of California as threatened or endangered under CESA (14 California Code of Regulations [CCR] 670.5).
- Species that meet the definitions of rare or endangered under CEQA (State CEQA Guidelines Section 15380).
- Plants listed as rare under the California Native Plant Protection Act (California Fish and Game Code Section 1900 *et seq.*).
- Plants considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California" (Lists 1B and 2 in CNPS 2001).

- Plants listed by CNPS as plants about which more information is needed to determine their status and plants of limited distribution (Lists 3 and 4 in CNPS 2001), which may be included as special-status species on the basis of local significance or recent biological information.
- Animal species of special concern as listed by CDFG (2009).
- Animals fully protected in California (California Fish and Game Code Sections 3511 [birds], 4700 [mammals], 5050 [amphibians and reptiles], and 5515 [fish]).
- Animals included on the California Special Animals List (CDFG 2009) because of inclusion on one or more of several “watch lists,” including the International Union for Conservation of Nature (IUCN) Red List, the American Bird Conservancy (ABC) Green List, the Audubon WatchList, the Bureau of Land Management (BLM) Sensitive Species list, the California Department of Forestry and Fire Protection Sensitive Species list, the U.S. Forest Service (USFS) Sensitive Species list, the USFWS Birds of Conservation Concern list, the United States Bird Conservation (USBC) Watch List, bat species included on the Western Bat Working Group’s (WBWG) Regional Priority Matrix as High or Medium, and the Xerces Society Red list of pollinators.

The following sources of information were consulted prior to conducting the general biological field survey:

- The California Natural Diversity Database (CNDDDB) for the Riverside East USGS 7.5-minute quadrangle (USGS Quad) and the eight surrounding quadrangles in the project vicinity including: Fontana, San Bernardino South, Riverside East, Steele Peak, Lake Matthews, Corona South, Corona North, and Guasti.
- CNPS’s 2007 online *Inventory of Rare and Endangered Plants of California* for the Riverside East USGS 7.5-minute Quad and the eight surrounding quadrangles in the project vicinity including: Fontana, San Bernardino South, Riverside East, Steele Peak, Lake Matthews, Corona South, Corona North, and Guasti.
- USFWS, Carlsbad Fish & Wildlife Office Endangered and Threatened Species List (Riverside County).
- Interactive Species Map for Western Riverside County (<http://ecoregion.ucr.edu/maps.asp>) for a list of sensitive species within the vicinity (within five kilometers) of the project. This species list includes observations of MSHCP-covered species.

3.2 MSHCP CONSERVATION SUMMARY REPORT GENERATOR

Prior to initiating field surveys, we determined the MSHCP survey requirements for the proposed project area. A review of the Riverside County Integrated Plan (RCIP) MSHCP Conservation Summary Report Generator (<http://www.tlma.co.riverside.ca.us/gis/rciprepgen.html>) determined that the affected parcels within the project site are located within the overlay for four MSHCP Covered Species: burrowing owl (*Athene cunicularia*) and three narrow endemic plant species – San Diego ambrosia (*Ambrosia pumila*), Brand’s phacelia (*Phacelia stellaris*), and San Miguel savory (*Satureja chandleri*). In addition to requiring habitat assessments for these species, the MSHCP also requires that habitat assessments be performed on all project sites for the following Covered Species: least Bell’s vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), California linderiella (*Linderiella occidentalis santarosae*), Riverside fairy shrimp (*Streptocephalus woottoni*), and vernal pool fairy shrimp (*Branchinecta lynchi*).

3.3 FIELD SURVEYS

3.3.1 General Biological Field Survey

SWCA conducted a general biological field survey of the project site and adjacent lands within 150 meters to identify and characterize the vegetation types and assess wildlife habitats. During the visit, the project site was walked and plant communities were characterized. The purpose of this survey was to identify vegetation, land cover types, and any habitats, including riparian areas and vernal pools, with the potential to support sensitive wildlife species. The project site was also evaluated to determine whether habitat existed for other sensitive biological resources, including nesting birds. During this evaluation, SWCA biologists searched the project site for bird nests and nesting habitat.

Vegetation types and land cover types were recorded on aerial photographs and described in field notes. Natural vegetation communities were described using the California List of Terrestrial Natural Communities (CDFG 2003). When possible, Holland (1986) and Sawyer and Keeler-Wolf (1995) equivalents were assigned. Plant nomenclature followed *The Jepson Manual of Higher Plants of California* (Hickman 1993).

3.3.2 Special-status Species Habitat Assessments

Burrowing Owl

SWCA biologists conducted a walkover of the project site to ascertain the presence/absence of burrowing owl habitat. This survey was performed using guidelines for Step I Habitat Assessment as recommended in the revised burrowing owl survey instructions for the MSHCP (County of Riverside 2006), which rely heavily on survey methodology developed by the California Burrowing Owl Consortium (1993) and were approved by the CDFG (1995). Standard field methods included walking transects spaced at no more than 30 meters across the entire property and visually inspecting the vegetation, topography, and presence or absence of potential burrows (rodent burrows, boulders, berms, and concrete or asphalt debris piles). If burrowing owl habitat was identified within the project site, then adjacent lands within 150 meters (500 feet) of the project site were also surveyed for the presence of burrowing owl habitat. Although the purpose of the survey was not to look for burrowing owls, the locations of any burrowing owls or their sign observed on the project were documented with photographs, field notes, and global positioning system (GPS) technology.

Narrow Endemic Plant and Other MSHCP-covered Species

SWCA assessed the presence or absence of appropriate habitat for other MSHCP-covered species, including three narrow endemic plant species with overlays on the project site (San Diego ambrosia, Brand's Phacelia, San Miguel savory), as well as least Bell's vireo, southwestern willow flycatcher, western yellow-billed cuckoo, and vernal pool shrimp species. This included a characterization of the biological conditions within the project site, and an assessment of whether the habitats within the project site provided appropriate habitat for these species.

3.3.3 Focused Surveys

San Diego Ambrosia

Due to the determination of the occurrence of suitable habitat for the species, focused surveys for San Diego ambrosia were conducted within the identified wet meadow habitat by an SWCA botanist. Samples of *Ambrosia* spp. were collected in the field and identification of the species was made in the office using a dissection microscope and *The Jepson Manual of Higher Plants of California* (Hickman 1993) and *A Flora of Southern California Flora* (Munz 1974).

Burrowing Owl

Per MSHCP requirements, focused surveys were conducted by SWCA biologists within habitats determined to be appropriate for burrowing owl during Step I. These habitats include nonnative grassland, transitional bare areas, and ruderal habitats within the project site and on adjacent properties within 150 meters of the project site. The focused surveys (MSHCP protocol Step II surveys, County of Riverside 2006) included transects (spaced 10 to 30 meters apart) to identify burrows or other burrowing structures that could be used by burrowing owl (Step II, Part A). Any burrowing owl sightings, occupied burrows, and burrows with owl sign were documented with photographs, field notes, and GPS technology.

Dusk/dawn focused surveys were conducted over four separate visits (Step II, Part B). The surveys were conducted in the early evening, two hours before sunset to one hour after sunset. The focused surveys were conducted during the breeding season (March 1 through August 30), and were conducted during weather that was conducive to observing owls outside their burrows and their sign. The surveys were not conducted within five days of rain, which could eliminate sign of burrowing owl. Any burrowing owl sightings, occupied burrows, and burrows with owl sign were documented with photographs, field notes, and GPS technology.

3.3.4 Wetland Delineation

Due to the occurrence of the wet meadow in the north-central portion of the project area and a drainage with riparian vegetation along the western boundary of the project area, SWCA conducted a wetland delineation in accordance with regulations described in Part IV of *The Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). Preliminary studies to identify potential drainages and wetland areas within the project site was accomplished using 1:2400 (one inch = 100 feet) scaled topographical maps with contours at five-foot intervals. Aerial photographs were also used to identify areas of potential riparian or hydrophytic vegetation. Field surveys were then conducted to determine the structure and composition of onsite riparian and hydrophytic vegetation in order to verify all potential CDFG jurisdictional areas.

Measurements were taken using 100-foot fabric tape measures and mapping was conducted using 1:2400 (one inch = 100 feet) scaled topographical maps with a five-foot contour interval. Observation points were established at 30-50 foot intervals or where the width of the drainages noticeably varied. Measurements of USACE non-wetlands jurisdictional waters of the U.S. were taken at each observation point by finding the ordinary high water marks (OHWM) on each side of the drainage. OHWM are produced by the fluctuation of waters within a channel or body of water and can be identified by shelving, changes in soil characteristics, change in vegetation, lack of vegetation, the presence of vegetative or other debris, or anything else that distinguishes the area below from above.

At observation points where CDFG jurisdiction extended outside of USACE jurisdiction (in areas where riparian vegetation was present) measurements were taken from the limits of contiguous riparian vegetation. This included drainages where hydrophytic vegetation overhung the USACE jurisdiction and continued beyond the designated waters of the U.S.

3.4 ASSESSMENT OF SPECIAL-STATUS SPECIES OCCURRENCE POTENTIAL

Following the database searches and general biological field survey, SWCA assessed of the potential for occurrence for other special-status species not covered under the MSHCP. This consisted of assessing the biological conditions within the project site and the known occurrences of special status species within the project vicinity. During the assessment, each species was assigned to one of the following categories:

Present: Species is known to occur within the project site, based on recent (within 20 years) CNDDDB or other records, and/or was observed within the project site during the field survey(s).

May occur: Species is known to occur in the project vicinity (based on recent [within 20 years] CNDDDB or other records within five miles [10 miles for butterfly, bird, and bat species] and/or based on professional expertise specific to the project vicinity or species), and there is suitable habitat within the project site. Alternatively, there is suitable habitat within the project site and the project limits are within the known range of the species. For avian species, a distinction was made between occurrence potential on the project site as a forager, nester, and/or transient.

Not likely to occur: Species is known to occur in the vicinity of the project site (within five miles for plants and terrestrial animals or 10 miles for butterfly, bird, and bat species); however, there is poor quality or marginal habitat in the project site. If the species occurs at the project site, it would likely be as a migrant, and the species is not likely to reproduce (breed or nest) within the project site due to a lack of suitable habitat or because the project site is outside of their known breeding range.

Absent: There is no suitable habitat for the species within the project site, or the project site is located outside of the known range of the species. Alternatively, a species was surveyed for during the appropriate season with negative results for species occurrence.

3.5 CEQA IMPACT ANALYSIS

SWCA assessed potential impacts to biological resources, including special status species, within the project site within the context of CEQA . The analysis included identification of potentially significant impacts based on the CEQA thresholds from Appendix G of the CEQA Guidelines. To reduce or avoid potentially significant impacts, SWCA also identified mitigation measures, which are presented in the final section of this report. Thresholds used in analyzing impacts resulting from the proposed project include the following:

- Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS?
- Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFG or USFWS?

- Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?
- Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?
- Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

4. RESULTS

4.1 FIELD SURVEYS

4.1.1 General Biological Field Survey

SWCA biologists Michael Tuma and Taya Cummins conducted a general biological field survey of the project site on February 26, 2008, between 9:00a.m. and 11:45a.m. Conditions at the project site during the survey were clear with north/northwesterly winds of approximately seven miles per hour and an average temperature of 65°F.

4.1.2 Focused Surveys

San Diego Ambrosia

Focused surveys for San Diego ambrosia were conducted within the identified wet meadow habitat by SWCA Senior Biologist Ty Garrison, M.S. on October 2, 2009. Conditions at the project site during the survey were clear with east/northerly winds and an average temperature of 80°F.

Burrowing Owl

The burrowing owl burrow survey (Step IIa) was conducted by SWCA biologists Dr. David Daitch and Michael Cady on June 18 and 19, 2009. Temperature ranged from 80 to 95°F with sunny skies and wind speeds below five miles per hour.

The burrowing owl dusk/dawn focused surveys (Step IIb) were conducted on June 24 and July 1, 8, and 15, 2009, by SWCA biologists Dr. David Daitch, Michael Cady, and Shanee Stopnitzky. All four surveys were conducted from two hours before sunset to one hour after. Temperature ranged from 65 to 90°F with mostly sunny skies and wind speeds from five to 14 miles per hour.

4.1.3 Wetland Delineation

A wetland delineation was conducted in the area of the wet meadow in the north-central portion of the project area, and a demarcation of the eastern boundary of the riparian habitat located at the western edge of project area. The wetland delineation was conducted by SWCA Senior Biologist Ty Garrison and biologist Dr. David Daitch on October 30, 2009. Conditions at the project area during the survey were clear with east/northeasterly winds of approximately six miles per hour and an average temperature of 75°F.

4.2 BIOLOGICAL CONDITIONS WITHIN AND ADJACENT TO THE PROJECT SITE

The project site contains five habitat types: urban or built up land, non-native grassland, wet meadow, transitional bare areas, and ruderal habitats. Habitats identified on adjacent lands (within 150 meters) include: urban or built-up lands, non-native grasslands, and ruderal habitats. These habitat types are discussed in detail below and are depicted in.

4.2.1 Habitat Types in the Project site

Non-native Grassland

Non-native grasslands have a dense to sparse cover of low-growing annual grasses and forbs that germinate with the onset of the late fall rains and complete their life cycle by early summer (Holland 1986). Non-native grassland within the project site included the majority of the open fields surrounding runway and airport facilities (Figure 2; Photograph 1). Several bedrock outcrops were identified within the non-native grassland in the eastern half of the project site. The non-native grassland habitat is regularly mowed and herbicide is applied as necessary in select locations where mowing is not practicable. Dominant plant species identified within this habitat included non-native annual grasses and forbs such as slender wild oat (*Avena barbata*), rip-gut brome (*Bromus diandrus*), red brome (*Bromus madritensis* ssp. *rubens*), wild barley (*Hordeum murinum*), redstem filaree (*Erodium cicutarium*), wild radish (*Raphanus raphanistrum*), black mustard (*Brassica nigra*), western ragweed (*Ambrosia psilostachya*), and pygmy-weed (*Crassula connata*). Additionally, several Brazilian peppertrees (*Schinus*

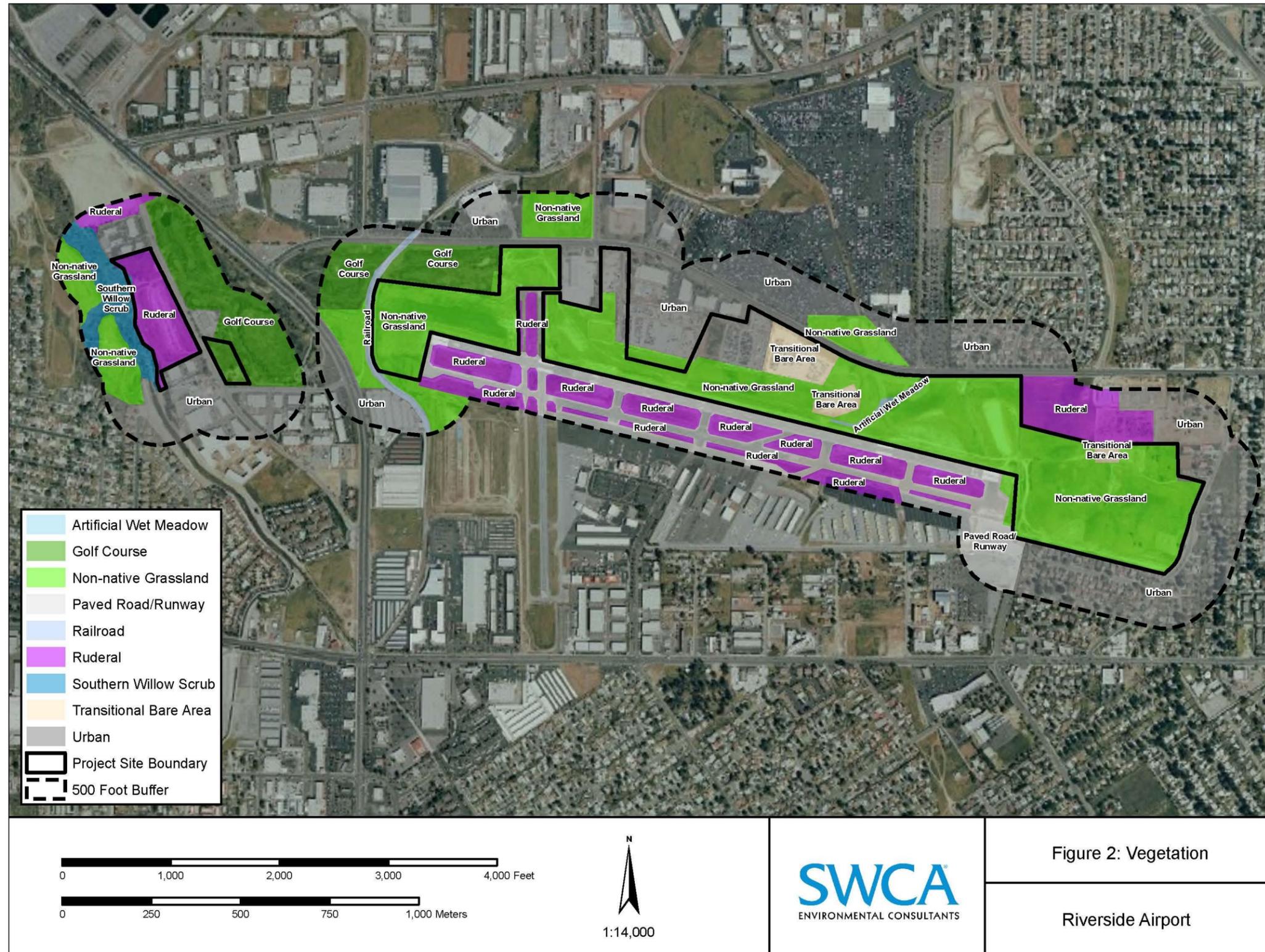


Figure 2. Vegetation Map

molle) were scattered throughout the eastern portion of the project site. A full inventory of plant species observed in this habitat is presented in Appendix B.

Wildlife species observed within this habitat included side-blotched lizard (*Uta stansburiana*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), burrowing owl, white-crowned sparrow (*Zonotrichia leucophrys*), western meadowlark (*Sturnella neglecta*), and California ground squirrel (*Spermophilus beecheyi*). A full inventory of wildlife species observed in this habitat is presented in Appendix A. The location for the burrowing owl sighting, which included a breeding pair at a burrow, is presented in Figure 3. Other species expected to occur in this habitat include San Diego gopher snake (*Pituophis catenifer annectens*), southern Pacific rattlesnake (*Crotalus oreganus helleri*), lesser goldfinch (*Carduelis psaltria*), valley pocket gopher (*Thomomys bottae*), California vole (*Microtus californicus*), and desert cottontail (*Sylvilagus audubonii*).



Photograph 1. View of Non-native Grassland Habitat

Urban or Built-up Land

Urban or Built-up Land is comprised of areas of intensive use with much of the land covered by structures or are entirely paved. Included in this category are cities, transportation, power, and communications facilities, and areas such as those occupied by mills, shopping centers, industrial and commercial complexes, and institutions that may, in some instances, be isolated from urban areas. These areas are characterized by buildings, asphalt, concrete, suburban gardens, and a systematic street pattern (Anderson et al. 1976). Urban or built-up land was identified throughout much of the project site, encompassing nine acres (Figure 2; Photograph 2). Within the project site, this habitat includes paved areas associated with the helipad, auto-auction car lot, and structures associated with airport operations. These areas are almost entirely paved and void of vegetation, aside from a few invasive opportunistic individuals such as red stem filaree and brome grasses.

Wildlife observed in this habitat included American crow (*Corvus brachyrhynchos*) and house sparrow (*Passer domesticus*) (Appendix B). Other wildlife species expected to occur within this habitat include rock dove (*Columba livia*) and European starling (*Sturnus vulgaris*).



Photograph 2. View of Navigational Aid on Urban or Built-up Land Associated with Airport Operations

Transitional Bare Areas

Transitional bare areas are defined as areas which are in transition from one land use activity to another (Anderson et al. 1976). Transitional bare areas encompass five acres within the project site and include a recently cleared area east of existing paved car lots, a small area just southeast of the recently cleared site, and a patch located along the northeastern boundary of the project site (Figure 2; Photograph 3). These areas have been recently disturbed and are void of vegetation aside from a few opportunistic species such as redstem filaree and brome grasses. Wildlife species commonly found in this type of habitat include western fence lizard (*Sceloporus occidentalis*) and killdeer (*Charadrius vociferus*).



Photograph 3. View of a Transitional Bare Area in the North-central Portion of the Project Site

Ruderal

Ruderal habitats are highly disturbed or modified habitats dominated by opportunistic and often invasive species. Although ruderal habitat is not pristine, it does provide some limited wildlife value by serving as food and cover for insects, reptiles, small mammals, songbirds, and raptors. Ruderal habitat identified within the project site adjacent to runway areas where vegetation is heavily disturbed on a regular basis (Figure 2; Photograph 4). Common plants that were identified within this habitat include black mustard, brome grasses, redstem filaree, and wild radish (Appendix B). Wildlife observed in this habitat included California horned lark (*Eremophila alpestris actia*) and house finch (*Carpodacus mexicanus*) (Appendix B). Other wildlife species expected to occur in this habitat includes California ground squirrel, burrowing owl, mourning dove (*Zenaida macroura*), and killdeer.



Photograph 4. View of Ruderal Habitat

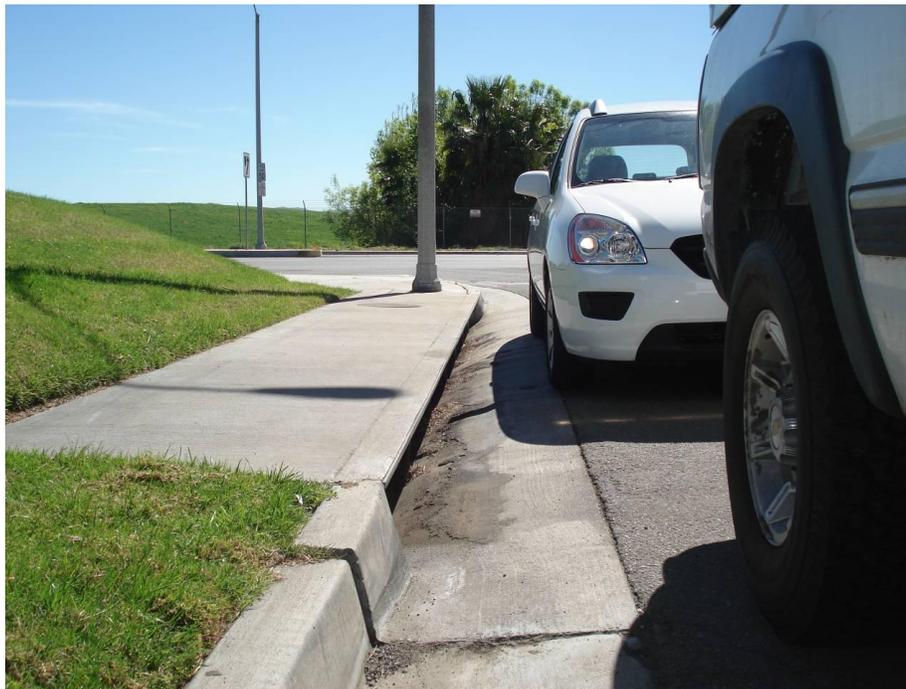
Artificial Wet Meadow

Wet meadows consist of a layer of herbaceous species including sedges, rushes, forbs, and grasses. Woody plants, if present, account for a minority of the total area cover (Mayer and Laudenslayer 1988). Wet meadows are characterized by moist to saturated soils throughout the much of the year with standing water present for only brief to moderate periods during the growing season that occur in road ditches, retention basins that catch run-off water, pond areas, and wetland edges. Wet meadows, therefore, do not usually support aquatic life such as fish but do attract large numbers of birds, small mammals, and insects. It was determined that the wet meadow in the north-central portion of the project site, which encompasses 0.22 acres, is artificially fed by a culvert which feeds surface street runoff onto the site along the northern boundary of the project site at Fremont Street and Central Avenue (Figures 4a and 4c; Photographs 5 and 6). A discussion of the jurisdictional character of this habitat is provided in Section 4.6.

Vegetation identified within this habitat included a wide variety of herbaceous species including curly dock (*Rumex crispus*), umbrella sedge (*Cyperus eragrostis*), broadleaf cattail (*Typha latifolia*), clover (*Trifolium* sp.), dallisgrass (*Paspalum dilatatum*), bullthistle (*Cirsium vulgare*), and narrowleaf plantain (*Plantago lanceolata*). Larger species observed included Mexican fan palm (*Washingtonia robusta*) and red willow (*Salix laevigata*) (Appendix B). Wildlife observed in the artificial wet meadow habitat included mourning dove, Anna's hummingbird (*Calyptra anna*), and song sparrow (*Melospiza melodia*) (Appendix B). Other wildlife species expected to occur in this habitat include Pacific chorus frog (*Pseudacris regilla*), great egret (*Ardea alba*), red-winged blackbird (*Agelaius phoeniceus*), and deer mouse, (*Peromyscus maniculatus*).



Photograph 5. View of Artificial Wet Meadow facing North



Photograph 6. View of Drainage System Leading to Culvert at Upper Reach of Artificial Wet Meadow facing South along Fremont Street

4.2.2 Habitats on Adjacent Lands (within 150 meters)

Non-native Grassland

Nonnative grassland habitats within 150 meters of the project site were identified on properties to the west and southwest of the project site (Figure 2). These habitats were continuous and of similar species composition to non-native grassland within the project site.

Urban or Built-up Land

Urban or built-up land dominated most of the area within 150 meters of the project site, and includes runways, parking lots, surface streets, residential and industrial development, and associated landscaped areas (Figure 2). These areas are almost entirely developed and void of vegetation, aside from ornamental plants and a few invasive opportunistic individuals such as red stem filaree and brome grasses.

Southern Willow Scrub

Southern willow scrub is typically composed of dense, broad-leafed, winter-deciduous riparian thickets dominated by willow (*Salix* spp.), with scattered emergent Fremont cottonwood (*Populus fremontii*) and western sycamore (*Platanus racemosa*). Most stands are too dense to allow much understory development. This habitat is found adjacent to the western margin of the isolated western portion of the project site. It is dominated by black willow (*Salix gooddingii*), but has a substantial nonnative component dominated by giant reed (*Arundo donax*), with scattered European olive (*Olea europaea*) and Canary Island date palm (*Phoenix canariensis*). Other plants observed within this habitat include castor bean (*Ricinus communis*) Fremont's cottonwood (*Populus fremontii*) tree tobacco (*Nicotiana glauca*), Chinese elm (*Ulmus parvifolia*), and water cress (*Nasturtium officinale*). This habitat includes a well developed streambed, with water flowing to the north and into the Santa Ana River, approximately ¾ mile to the north of the project site. Substantial disturbances were observed within this habitat, primarily the result of this area supporting a long-term homeless encampment.

Golf Course

A golf course was identified adjacent to and within 150 meters of the northwestern portion of the project site (Figure 2). This habitat consists of maintained turfgrass with patches of bare areas and undulating topography.

Ruderal

Ruderal habitats within the 150 meter buffer were identified adjacent to the northeastern portion of the project site (Figure 2). Vegetation consisted of similar species composition ruderal habitats within the project site.

4.3 ASSESSMENT OF SPECIAL-STATUS SPECIES OCCURRENCE POTENTIAL

A list of special-status species known to occur within the nine-quad vicinity of the project site was generated from several sources, including the CNDDDB (2009), the CNPS 2007 online *Inventory of Rare and Endangered Plants of California*, the Carlsbad Fish and Wildlife Office's Endangered and Threatened Species List, and the Interactive Species Map for Western Riverside County. A total of 91 special-status species were identified within this search area, including: 15 plants, four invertebrates, three

fish, three amphibians, 13 reptiles, 39 birds, and 14 mammals. In addition, four sensitive habitats were identified in the search area. Appendix C provides a list of all special-status plant and wildlife species identified by the database search as occurring in the nine-quad project vicinity. It also provides a description of typical habitat requirements, legal status, and an evaluation of the potential for occurrence within the project site. Below, we provide expanded descriptions for those species that were either present within the project site, or their occurrence potential was evaluated as “may occur” within the project site.

4.3.1 Special-status Plants

During the general biological field survey, habitats capable of supporting special-status plant species were evaluated within the study area. Based on the analysis provided in Appendix C, the following species were eliminated from further consideration because: (1) there is no suitable habitat within the project site AND there are no local records (within five miles) in the vicinity of the project site; and/or (2) the project site is outside of their known range. Alternatively, although there are records of these species within the project’s vicinity (within ten miles), there is no suitable habitat within the project site to support the occurrence of these species. These species were assessed as “absent:”

- Marsh sandwort
- Parry’s spineflower
- Salt marsh bird’s-beak
- Slender-horned spineflower
- Santa Ana River woollystar
- Mesa horkelia
- Southern California black walnut
- Coulter’s goldfields
- Rayless ragwort

Based on the analysis provided in Appendix C, the following species were eliminated from further consideration either because: although there are local records of their occurrence within the vicinity of the project site, habitat within the project site was determined to be to be marginal, limited, or otherwise unfavorable. These species were assessed as “not likely to occur:”

- Smooth tarplant
- Many-stemmed dudleya
- Robinson’s pepper-grass
- California spineflower

The following species have either been observed within the project site (present) or – based on the analysis provided in Appendix C – their occurrence potential was assessed as “may occur” within the project site due to the presence of suitable habitat and recent local records in the project vicinity. Brief species accounts for the following species are provided below:

- San Diego ambrosia
- Plummer’s mariposa lily

San Diego Ambrosia

The San Diego ambrosia (*Ambrosia pumila*) is a rhizomatous herb in the Asteraceae family that is listed as federally endangered, and listed by the CNPS as List 1B.1 (rare, threatened, or endangered in California and elsewhere; seriously endangered in California [more than 80 percent of occurrences threatened/high degree and immediacy of threat]), and is covered under the MSHCP.

This species is restricted to 15 extant populations in California (CNDDDB 2008), with 12 in western San Diego County and three in western Riverside County, California, and south to the vicinity of Cabo Colonet, along the west coast of Baja California, Mexico (Munz 1974; Reiser 1996; Wiggins 1980). San Diego ambrosia primarily occurs at low elevations generally less than 1600 feet in the Riverside populations and less than 600 feet in San Diego County (CNDDDB 2008; University of California Riverside [UCR] 2001; Munz 1974; Hickman 1993). It prefers coarse substrates on upper terraces of rivers and drainages as well as in open grasslands, openings in coastal sage scrub, and occasionally in clay soils in upland areas or in areas adjacent to vernal pools as well as in disturbed sites including roadsides and firebreaks. Common native plants found in association with this species include purple needlegrass (*Nassella pulchra*), saltgrass (*Distichlis spicata*), mule fat (*Baccharis salicifolia*), broom baccharis (*Baccharis sarothroides*), California buckwheat (*Eriogonum fasciculatum*), and turkey mullein (*Eremocarpus setigerus*). Nonnative associates include brome grasses (*Bromus* spp.), oat grasses (*Avena* spp.), and tocalote (*Centaurea melitensis*) (Burrascano 1997; DUDEK 1999).

The San Diego ambrosia is a clonal herbaceous perennial plant in the family Asteraceae (Hickman 1993) which reproduces vegetatively via underground rhizome-like roots from which aboveground growth arises, indicating that isolated populations may consist of only one or a few genetic individuals. Aboveground growth tends to fluctuate from year to year based on seasonal conditions and typically flowers from June through September (Munz 1974). Because populations may remain dormant in dry years and its vegetative similarity with other *Ambrosia* spp., survey results for this species may not be representative of the true population size. Competition from nonnative species may also negatively impact San Diego ambrosia populations. Oftentimes, multi-year surveys are necessary to determine presence or absence of the species in suitable habitats.

This species is threatened by habitat destruction, fragmentation, and degradation of habitat primarily by construction and maintenance of roadways and utility easements, development of recreational facilities, residential and commercial development, potential competition, encroachment, and other negative impacts from non-native plants; mowing and disking for fuel modification.

There is one historic record of this species within five miles of the project site (CNDDDB 2009). Suitable habitat for the San Diego ambrosia occurs within the project site, within and immediately adjacent to the artificial wet meadow. The San Diego ambrosia may occur within the project site.

Plummer's Mariposa Lily

Plummer's mariposa lily (*Calochortus plummerae*) is a bulbiferous herb listed as a 1B.2 CA-Endemic plant by the CNPS, and is covered by the MSHCP. This species, which typically blooms in May and June and dies back to the ground after flowering, occurs in mountains and foothills of Los Angeles, Orange, Riverside, and San Bernardino Counties at elevations up to 5,600 feet. Its habitats include chaparral, coastal sage scrub, grassland, woodlands, and pine forests. There is one recent record of this species within five miles of the project site (CNDDDB 2009). Suitable habitat for this species was observed in the non-native grassland within the project site. This species may occur within the project site.

4.3.2 Special Status Wildlife

During the general biological field survey, habitats were evaluated for their potential to support special-status wildlife species. Based on the analysis provided in Appendix C, the following species were eliminated from further consideration because: (1) there is no suitable habitat within the project site or its immediate vicinity AND there are no local records (within five miles, or 10 miles for bird, bat, and butterfly species) in the vicinity of the project site; and/or (2) the project site is outside of their known range. Alternatively, although there are records of these species within the project site vicinity, there is no suitable habitat within the project site or its immediate vicinity to support the occurrence of these species. These species were assessed as “absent.”

- Greenest tiger beetle
- Delhi Sands flower-loving fly
- Busck’s gallmoth
- A cuckoo wasp
- Arroyo chub
- Santa Ana speckled dace
- Santa Ana sucker
- Arroyo toad
- California red-legged frog
- Western pond turtle
- San Diego banded gecko
- Long-nosed leopard lizard
- Granite spiny lizard
- Southern sagebrush lizard
- Coast horned lizard
- Orange-throated whiptail
- Coastal whiptail
- California legless lizard
- San Bernardino ring-necked snake
- California red-sided garter snake
- Double-crested cormorant
- Least bittern
- Black-crowned night heron
- White-faced ibis
- Turkey vulture
- Sharp-shinned hawk
- Ferruginous hawk
- Golden eagle
- Bald eagle
- Mountain plover
- Western yellow-billed cuckoo
- Long-eared owl
- Black swift
- Vaux’s swift
- Williamson’s sapsucker
- Tree swallow
- Cactus wren
- Coastal California gnatcatcher
- Swainson’s thrush
- Nashville warbler
- Yellow warbler
- Wilson’s warbler
- Yellow-breasted chat
- Southern California rufous-crowned sparrow
- Bell’s sage sparrow
- Lincoln’s sparrow
- Yuma myotis
- Pallid bat
- Pocketed free-tailed bat
- California mastiff bat
- Brush rabbi

Based on the analysis provided in Appendix C, the following species were eliminated from further consideration either because: (1) there are no recent local records of their occurrence in the vicinity of the project site; OR (2) although there are local records (recent or historic) of their occurrence within the vicinity of the project site, habitat within the project site was determined to be to be marginal, limited, or otherwise unfavorable; OR (3) the project site does not likely provide suitable habitat for a sustaining population of this species. Additionally, avian species may have been eliminated from further consideration because: (1) they would use the project site only as a migrant; OR (2) they are not likely to

be resident or reproduce there due to a lack of appropriate habitat or because the project site is outside of their known breeding range. These species were assessed as “not likely to occur:”

- Western spadefoot
- Two-striped garter snake
- Northern red-diamond rattlesnake
- American bittern
- Swainson’s hawk
- Downy woodpecker
- Southwestern willow flycatcher
- Least Bell’s vireo
- Purple martin
- Tricolored blackbird
- Western yellow bat
- Long-tailed weasel
- American badger
- Bobcat
- Stephens’ kangaroo rat
- San Diego desert woodrat
- San Diego black-tailed jackrabbit

The following species have either been observed within the project site (present) or – based on the analysis provided in Appendix C – their occurrence potential was assessed as “may occur” within the project site due to the presence of suitable habitat and recent local records in the project vicinity. Brief species accounts for the following species are provided below:

- Northern harrier
- White-tailed kite
- Cooper’s hawk
- Burrowing owl
- Loggerhead shrike
- California horned lark
- Coyote
- Northwestern San Diego pocket mouse

Northern Harrier

The northern harrier (*Circus cyaneus*) is a California Species of Special Concern, is covered under the MSHCP, and its nests protected under the MBTA. The northern harrier prefers coastal prairies, marshes, grasslands, swamps, and other open areas. Nests are built on the ground or on a mound of dirt or vegetation and are constructed of sticks and are lined inside with grass and leaves. Their breeding season is from March through June. Northern harriers hunt by flying low to the ground in open areas, where they prey primarily on small rodents (mice and voles), amphibians, small reptiles, small rabbits, and other birds. According to the Interactive Species Map for Western Riverside County, there are five recent records from three sites within five kilometers of the project site. Suitable foraging and nesting habitat is

located within the non-native grassland habitat in the project site. Foraging habitat is located across most of the project site, including non-native grassland and ruderal habitats where rodents are abundant. Suitable nesting areas are located within and adjacent to the artificial wet meadow. This species may nest and forage within the project site.

White-tailed Kite

The white-tailed kite (*Elanus leucurus*) is a California Species of Special Concern and a California Fully Protected species, is covered under the MSHCP, and its nests protected under the MBTA. This species ranges throughout California, primarily along the coast and Central Valley. They require relatively open habitat for foraging, as well as trees (isolated or within stands) for nesting and roosting. Habitats with abundant prey populations (un-grazed or little grazed grasslands, agriculture, and grass dominated wetlands) support more kites. This small raptor species preys primarily on small rodents. According to the Interactive Species Map for Western Riverside County, there are ten recent records from five sites within five kilometers of the project site. There is suitable foraging habitat throughout the non-native grassland and ruderal habitats within the project site, and suitable nesting habitat in scattered trees located throughout the non-native grassland in the western portion of the project site, as well as within trees along the artificial wet meadow. This species may forage and nest within the project site.

Cooper's Hawk

Cooper's hawk (*Accipiter cooperii*) is a California Species of Special Concern, is covered under the MSHCP, and its nests protected under the MBTA. This species occurs throughout North America, where it inhabits woodlands and woodland edges. In southern California, preferred nesting habitats of this species include oak and riparian woodlands dominated by sycamores and willows. Cooper's hawks in the region prey on small birds and rodents in riparian woodlands and sometimes in scrub and chaparral communities. This species has become increasingly common in urban parks and residential areas throughout southern California in recent years. According to the Interactive Species Map for Western Riverside County, there are 16 recent records from eight sites within five kilometers of the project site. There is suitable foraging and nesting habitat throughout the scattered trees in the non-native grassland in the western portion of the project site, and in trees along the artificial wet meadow. This species may forage and nest within the project site.

Burrowing Owl

The western burrowing owl is a California Species of Special Concern, is covered under the MSHCP, and its nests protected under the MBTA. In North America, the species ranges from southwestern Canada into Central America. Within California, it occurs primarily in agricultural and grassland areas of interior and coastal valleys. The burrowing owl currently occupies most of its historic range; however, it is declining throughout much of this range and, due to loss of habitat through development, has been nearly extirpated from coastal southern California. Burrowing owls require large, open expanses of sparsely vegetated areas on gently rolling or level terrain, with an abundance of active small mammal burrows, particularly those of the California ground squirrel. The burrows of these rodents are an important habitat feature for burrowing owls, as they modify and use squirrel (and other rodent) burrows for refugia, roosting, and nesting. They sometimes use artificial features, such as pipes, culverts, and nest boxes in areas where squirrel burrows are scarce (Robertson 1929).

Burrowing owls are crepuscular, foraging at or near dawn and dusk. They hunt by using short flights, running along the ground, hovering, or by using an elevated perch from which prey is spotted. They are opportunistic foragers (Haug et al. 1993), and their prey includes invertebrates and small vertebrates

(Thomsen 1971). Their diet is composed of a variety of foods, primarily mice (*Peromyscus* spp. and *Microtus* spp.) and beetles. Beetles are taken with more frequency; however, per biomass, *Peromyscus* mice are dominant, followed by *Microtus* mice (Marti 1974). Although they eat mostly insects and small mammals, burrowing owls also may take reptiles, birds, and carrion. During the breeding season, there are significant declines in the percentage of vertebrate prey in the diet and increases in the percentage of invertebrate prey consumed (Haug et al. 1993). Males typically hunt for vertebrate resources during crepuscular periods, whereas females hunt for invertebrate prey during diurnal periods (Poulin and Todd 2006).

Breeding occurs from March through August, with a peak in April and May. The male attracts a female to the burrow and defends the nest site by calling in front of the burrow. One burrow is typically used for nesting; however, satellite burrows are usually found within the immediate vicinity of the nest burrow within the owl's territory. The nest chamber is lined with excrement, pellets, debris, grass, and/or feathers; sometimes it is unlined. The shredded excrement of predators is a preferred nest lining, as this technique probably provides insulation within the nest cavity, as well as scent camouflage from mammalian predators (Johnsgard 2002). Within California, clutch size ranges from one to eleven eggs, with an average of seven (Landry 1979). The young emerge from the burrow at about two weeks and can fly by about four weeks (Zarn 1974). Martin (1973) reported that 95 percent of the young fledged in one population, with a mean reproductive success of 4.9 young per pair. Burrowing owls in southern California may winter in the nesting burrow or a nearby burrow following successful fledging of juveniles, but are more likely to disperse from the nesting area if the nest fails (Catlin et al. 2005; Rosier et al. 2006).

Little is understood about the migratory movements of this species. Breeding populations from the northern range of the species are apparently migratory, though southern California populations are probably year-round residents (Thomsen 1971). Increases in winter population sizes within southern California are probably the result of immigration of owls from more northerly areas (Coulombe 1971). Nesting burrowing owls banded in Idaho have been observed wintering in southern California (Brian W. Smith, personal communication, November 2006). Male burrowing owls that are year-round residents in southern California may overwinter in burrows within nesting areas, as this allows them to retain possession of their burrows and territories, as well as maintain the burrows (Johnsgard 2002:165).

There are 11 recent records and one historic record of this species within ten miles of the project site (CNDDDB 2009). According to the Interactive Species Map for Western Riverside County, there are five historic records at two sites within five kilometers of the project site. Suitable foraging and nesting habitat for burrowing owl occurs over much of the project site, within grassland and ruderal habitats. Additionally, burrowing owls were observed foraging and nesting within the project site during surveys that were completed in 2008.

Loggerhead Shrike

The loggerhead shrike (*Lanius ludovicianus*) is a California Species of Special Concern, is covered under the MSHCP, and its nests protected under the MBTA. This species is an uncommon but widespread resident of southern California. Loggerhead shrikes prefer open habitats interspersed with shrubs, trees, poles, fences, or other perches from which they can hunt. They are primarily monogamous and are territorial throughout the year. Nests are built in densely-vegetated shrubs or trees, often containing thorns or near fences with barbs, which offer protection from predators and upon which prey items are impaled. There is one recent record within ten miles of the project site (CNDDDB 2009). Additionally, according to the Interactive Species Map for Western Riverside County, there are 20 recent records from eight sites within five kilometers of the project site. There is suitable foraging habitat throughout the project site in non-native grassland and ruderal habitats. Suitable nesting habitat is located within trees along the

artificial wet meadow, and in trees scattered throughout the non-native grassland in the western portion of the project site. This species may forage and nest within the project site.

California Horned Lark

The California horned lark (*Eremophila alpestris actia*) is a California Species of Special Concern, and is covered under the MSHCP, and its nests protected under the MBTA. This species is a short-distance migrant that occupies short-grass prairie, “bald” hills, mountain meadows, open coastal plains, fallow grain fields, alkali flats in coastal regions. It nests on the ground in open, sparsely vegetated grasslands and avoids areas dominated by dense vegetation. There are two recent records of this species within ten miles of the project site (CNDDDB 2009). Additionally, according to the Interactive Species Map for Western Riverside County, there are 13 historic records from one site within five kilometers of the project site. A flock of approximately eight California horned larks was observed within ruderal habitats adjacent to the airport runway and taxiways during the survey of the project site. Suitable foraging and nesting habitat occurs along the runway and taxiways and adjacent ruderal habitats, as well as transitional bare areas within the project site. This species may forage and nest within the project site.

Coyote

The coyote (*Canis latrans*) is the largest Canid carnivore within southern California. It is covered under the MSHCP. Coyotes utilize many habitats types and often are found in urban areas adjacent to open space. Primary habitats include grassland, coast scrub, and broken forests. According to the Interactive Species Map for Western Riverside County, there are two historic records from two sites within five kilometers of the project site. Sign of this species (scat) was observed within the non-native grassland habitat within the project site. Suitable habitat for this species is present throughout the project site in non-native grassland and ruderal habitats. This species may occur within the project site.

Northwestern San Diego Pocket Mouse

The northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*) is a California Species of Special Concern, and is covered under the MSHCP. It inhabits coastal sage scrub, sage scrub/grassland ecotones, and chaparral communities. In western Riverside County, the northwestern San Diego pocket mouse is commonly found in disturbed grassland and open sage scrub vegetation with sandy loam to loam soils. There are two recent records of this species within five miles of the project site (CNDDDB 2009). Additionally, according to the Interactive Species Map for Western Riverside County, there are two recent records from two sites within five kilometers of the project site. Appropriate habitat for this species is present within the non-native grassland habitat throughout the project site. This species may occur within the project site.

4.4 SPECIAL-STATUS SPECIES HABITAT ASSESSMENTS

4.4.1 Burrowing Owl

The majority of the project site supports suitable habitat for burrowing owl. This includes the non-native grassland habitat, transitional bare areas, and ruderal habitat (Figure 2). Numerous California ground squirrels and their burrows were observed throughout the project site during the survey. Suitable habitat for burrowing owl also exists within 150 meters of the project site within non-native grassland and ruderal habitats (Figure 2).

4.4.2 Narrow Endemic Plants

San Diego Ambrosia, Brand’s Phacelia, and San Miguel Savory

Suitable habitat for San Diego ambrosia occurs within and adjacent (within 50 meters) to the wet meadow (Figure 2). Suitable habitat for Brand’s phacelia, and San Miguel savory was not identified within the project site. San Miguel Savory occurs within chaparral, cismontane woodland, coastal scrub, riparian woodland, and valley and foothill grassland in rocky, gabbroic, or metavolcanic soils. Brand’s phacelia occurs in coastal dunes and coastal scrub.

4.4.3 Other MSHCP-Covered Species

Southwestern Willow Flycatcher, Least Bell’s Vireo, and Yellow-billed Cuckoo

Suitable habitat for southwestern willow flycatcher, least Bell’s vireo, and yellow-billed cuckoo, which includes dense riparian vegetation associated with open water, was not identified within the project site. The artificial wet meadow supports two large willows and other nonnative trees that produce a closed canopy, but this area is not subject to conservation requirements under the MSHCP. Additionally, this small stand does not contain additional habitat elements (open water) that are associated with breeding by these bird species. The southern willow scrub habitat located along the western border of the project site is highly disturbed, narrowly confined, and does not contain elements typically associated with breeding least Bell’s vireo, southwestern willow flycatcher, or yellow-billed cuckoo.

Vernal Pool Shrimp

No vernal pools that would support vernal pool shrimp species were identified within the project site. Ponding water was noted in the north central portion of the project site, but this ponding occurred in an area that was recently disturbed by construction activities, and did not contain indicators that characterize vernal pools, such as vernal pool obligate plants.

4.5 FOCUSED SURVEYS

4.5.1 San Diego Ambrosia

Representative samples of several types of *Ambrosia* spp. were collected from the wetland area and returned to SWCA’s Pasadena office for identification. Using a dissection microscope and *The Jepson Manual of Higher Plants of California* (Hickman 1993) and *A Flora of Southern California Flora* (Munz 1974), the samples were identified as *A. psilostachya* and *A. acanthicarpa*. San Diego Ambrosia *A. pumila* was not identified and is assumed to be absent from the project site.

4.5.2 Burrowing Owl

Three burrows were identified during the Step IIa focused burrowing owl surveys as having been formerly occupied by burrowing owl. During two of the Step IIb surveys, a single burrowing owl was observed within one of the burrows. The location of this burrowing owl observation is presented in Figure 3.

A breeding pair of burrowing owls was detected immediately adjacent to the project site on Airport grounds during the general biological field survey on February 26, 2008. This observation included the sighting of two adult owls at one burrow, and an ancillary burrow with fresh sign located approximately 20 meters to the north (Figure 3). The burrow that had been occupied by this pair had been filled in and was no longer viable for occupation, as observed in 2009.

4.6 WETLAND DELINEATION

The artificial wet meadow located in the north-central portion of the project site (Figure 4a and 4c) consists of a single narrow channel approximately three to four feet in width in the northern portion, which dissipates into sheet flow as the water flows south. Water enters into the wet meadow as street runoff through a culvert (draining the residential and industrial areas to the north of the airport) and terminates via percolation and evaporation approximately 350 feet south of the culvert. The northern portion of the wet meadow is dominated by black willow (*Salix gooddingii*), shamel ash (*Fraxinus uhdei*), and broad-leaved cattail (*Typha latifolia*), with Mexican fan palm (*Washingtonia robusta*) occurring sporadically. The black willow and broad-leaved cattail are obligate wetland species. The southern portion of the wet meadow is dominated by dallisgrass (*Paspalum dilatatum*) and bitter dock (*Rumex obtusifolius*), with an unidentified sedge (*Scirpus* sp.) and nightshade (*Solanum xanti*) rarely occurring. The dallisgrass and bitterdock are facultative species that are equally likely to occur in wetlands or non-wetlands. Because the wetland is artificial, it is not subject to MSHCP requirements for species protection in riparian/riverine habitats. However, the northern area of the wet meadow is considered jurisdictional under the CDFG because of the defined streambed and bank and wetland obligate species. The southern portion of the wet meadow lacks a defined streambed and bank and is dominated by species that are not wetland obligates.

The northern portion of the artificial wet meadow has a defined streambed and bank and supports riparian vegetation that can be utilized by wildlife for foraging and nesting activities. Accordingly, the CDFG asserts jurisdiction over such habitat, so a Streambed Alteration Agreement must be obtained for any impacts proposed. The artificial wet meadow is not a jurisdictional water of the U.S. because it is not considered a TNW; it is not a wetlands adjacent to TNW; it is not a non-navigable tributary of TNW that is relatively permanent (i.e., tributaries that typically flow year-round or have continuous flow at least seasonally); and it is not a wetlands that directly abut such tributaries. In addition, the wet meadow is not a RPW if that has a significant nexus with a TNW. The classes of water body that are subject to Clean Water Act jurisdiction only if such a significant nexus is demonstrated are: non-navigable tributaries that do not typically flow year-round or have continuous flow at least seasonally; wetlands adjacent to such tributaries; and wetlands adjacent to but that do not directly abut a relatively permanent, non-navigable tributary. A significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or an insubstantial effect on the chemical, physical, and/or biological, integrity of a TNW. Principal considerations when evaluating significant nexus include the volume, duration, and frequency of the flow of water in the tributary and the proximity of the tributary to a TNW, plus the hydrologic, ecologic, and other functions performed by the tributary and all of its adjacent wetlands. While all waters of the U.S. also fall under the category of waters of the State, some Waters of the State may be identified beyond the delineation of Waters of the U.S., and the CRWQCB may exert authority to regulate waste discharge into these waters under the Port-Cologne Water Quality Act even if the waters do not fall under USACE Federal jurisdiction. If discharge into waters of the State is proposed, then a Waste Discharge Requirement (WDR) or a waiver of WDR will be required by the CRWQCB (Sections 3830 through 3869, Title 23 of the CCR).

The riparian habitat and its associated drainage along the western boundary of the project site were mapped outside of the project area, while not occurring within the project site, USACE, CDFG, and

CRWQCB asserts jurisdiction over the southern willow scrub located along the western margin of the isolated western portion of the project area. This riparian habitat includes a well developed streambed, with water flowing to the north and into the Santa Ana River, approximately $\frac{3}{4}$ mile to the north of the project area. Additionally, the habitat around this natural drainage is subject to species conservation under the MSHCP.

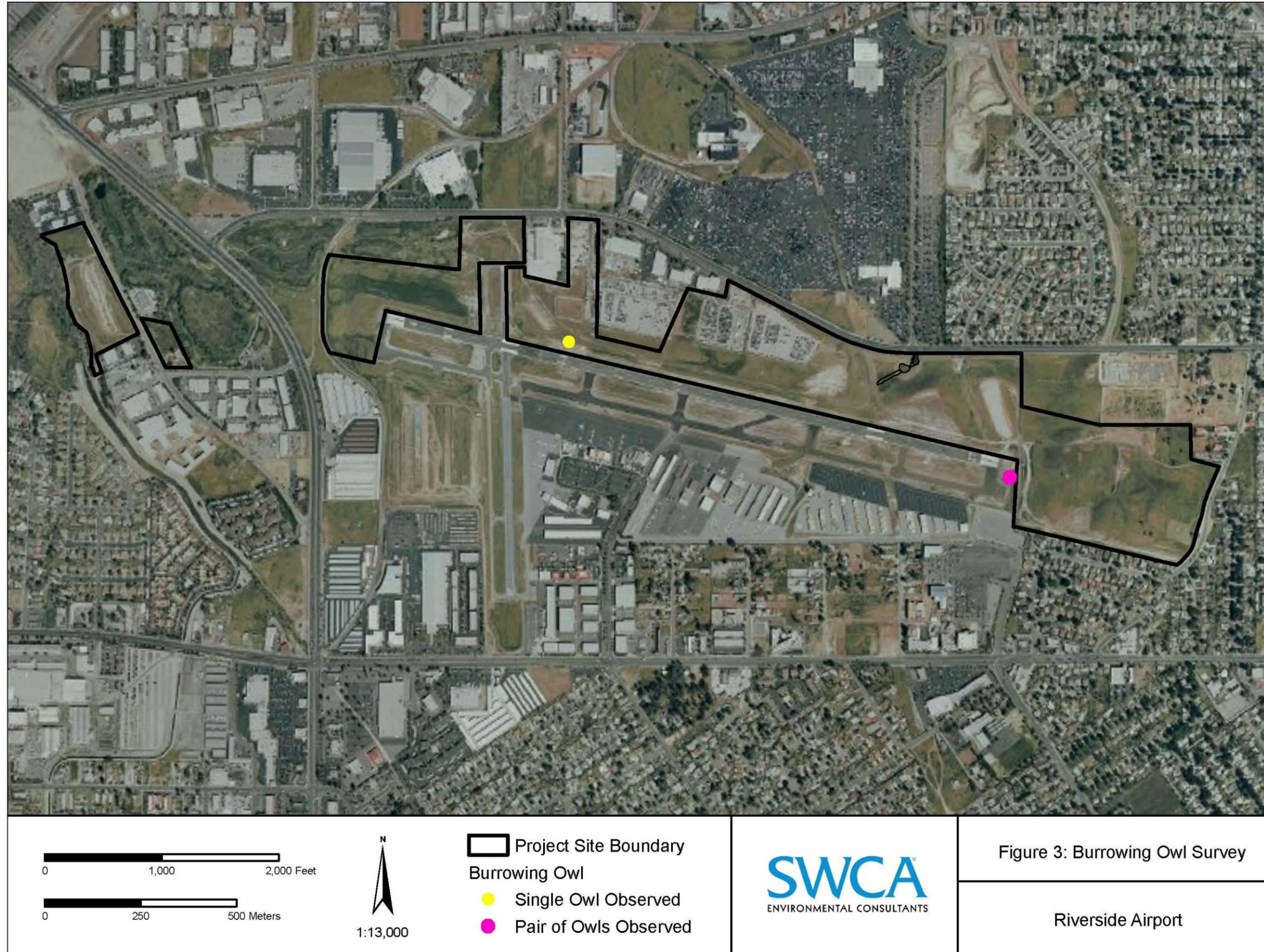


Figure 3. Burrowing Owl Observation Locations

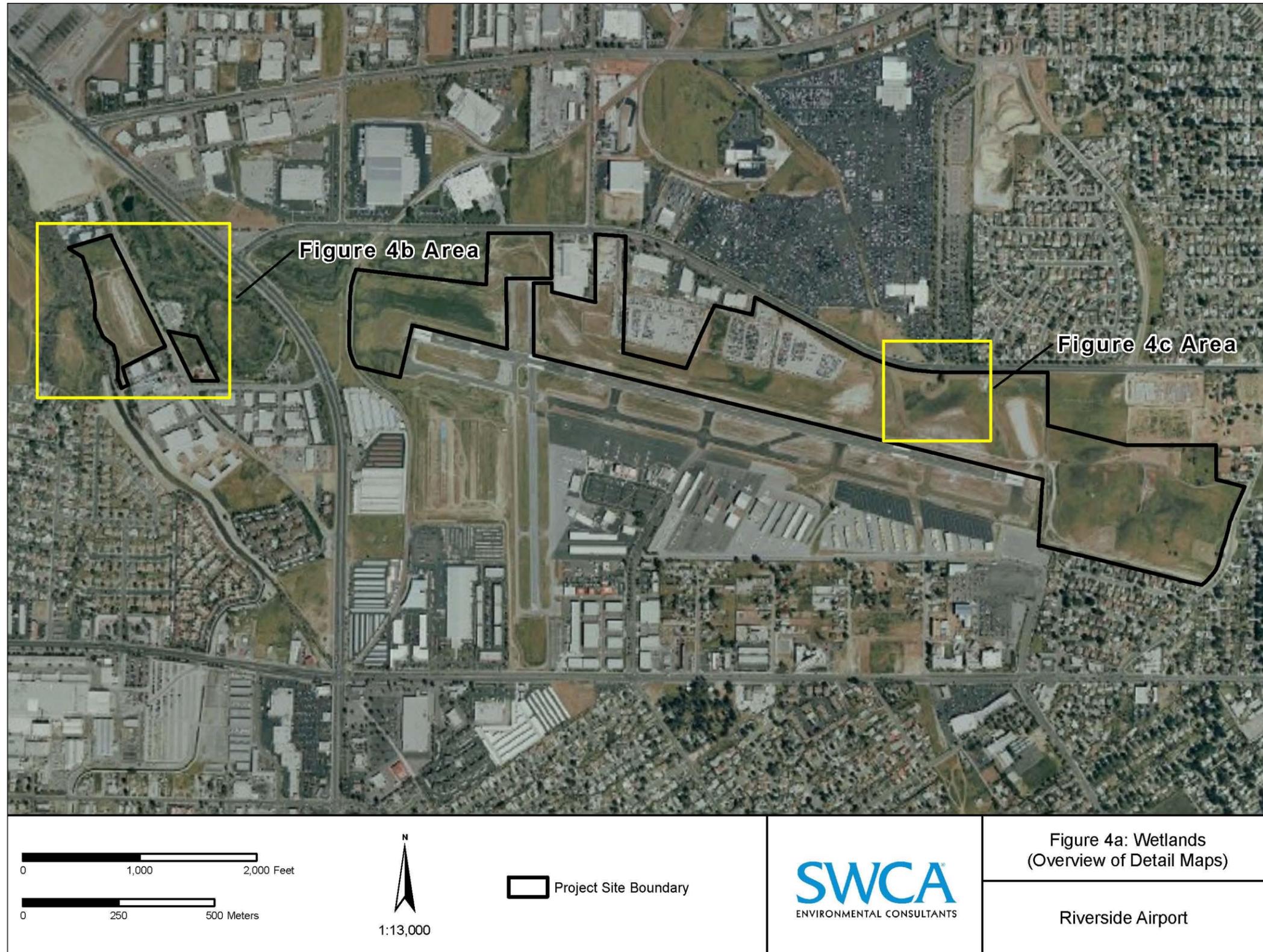


Figure 4a. Overview Map of Wetland Areas

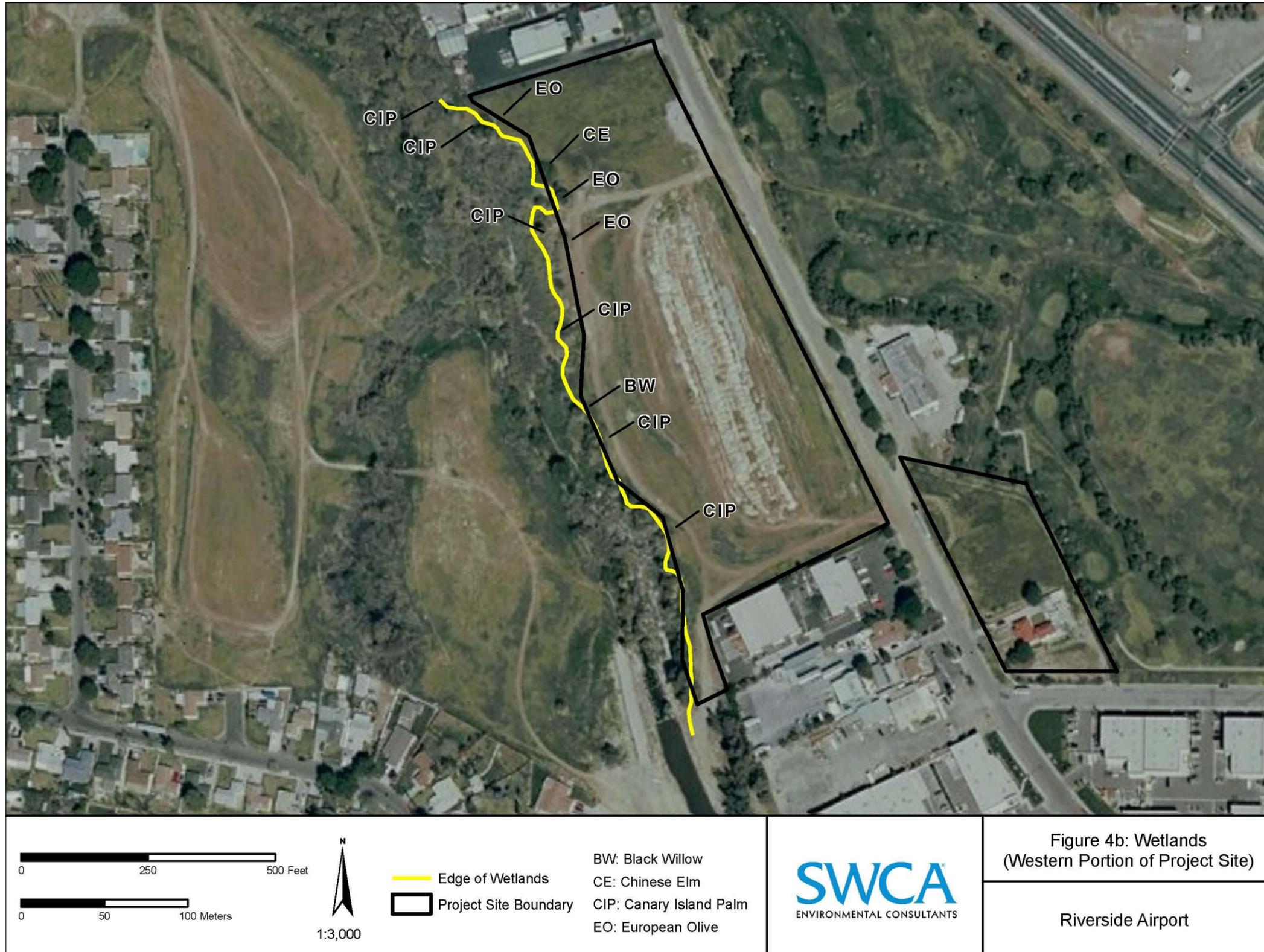


Figure 4b. Riparian Zone on West Side of Project Site

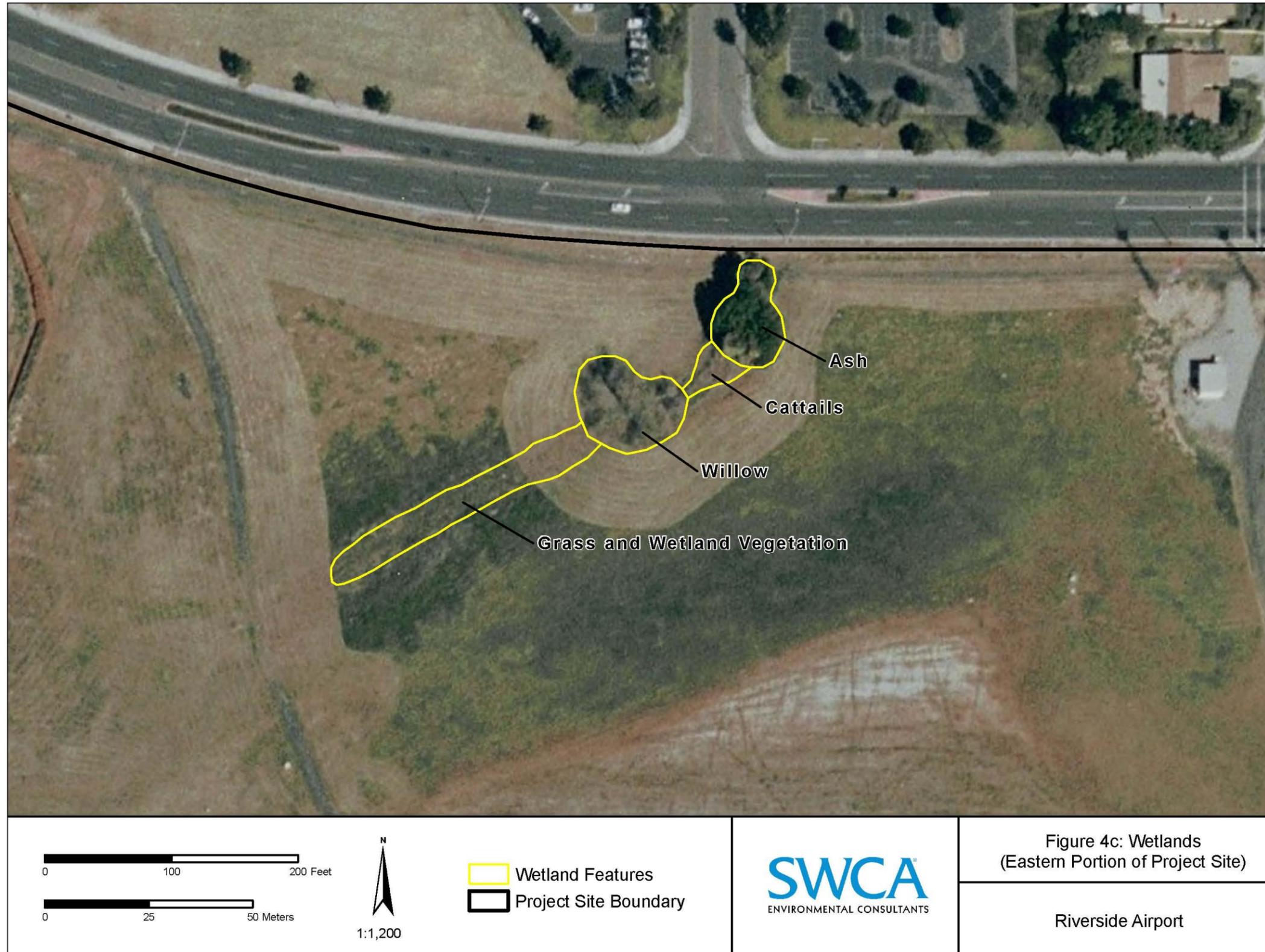


Figure 4c. Artificial Wet Meadow Area on North Side of Existing Airport Runway

4.7 ASSESSMENT OF OTHER SENSITIVE BIOLOGICAL RESOURCES

4.7.1 Sensitive Habitats

None of the habitats identified within the project site are considered high priority habitats that would be protected under CEQA.

4.7.2 Riparian/Riverine and Vernal Pool Habitat

No riparian/riverine or vernal pool habitat that would be protected under the MSHCP occurs within the project site. The artificial wet meadow observed within the central portion of the project site does not qualify as riparian/riverine habitat under MSHCP rules, as this habitat is man-made. Likewise, ponding water noted in the north central portion of the project site was also of anthropogenic origin, rather than being a natural vernal pool. The western border of the project site is immediately adjacent to a riparian/riverine habitat (Figure 2).

4.7.3 Nesting Raptors, Migratory, and Native Avian Species

Appropriate nesting habitat for birds protected under the MBTA and Fish and Game Codes 3503, 3503.5, and 3513 occurred over the majority of the project site, including non-native grassland, landscaped areas within urban or built-up lands, ruderal habitat, transitional bare areas, and scattered shrubs and trees within and adjacent to the project site.

4.7.4 Wildlife Corridors

A wildlife movement corridor, also called a wildlife corridor, habitat linkage, or landscape linkage, is a patch of habitat connecting two or more larger areas of habitat that would otherwise be isolated from one another. Wildlife corridors are protected under CEQA, particularly if there is evidence of wildlife movement and linkage between larger patches of open space. Wildlife corridors promote gene flow, allow re-colonization of areas following catastrophic events such as fire, prevent the loss of biodiversity by linking suitable habitat areas, and help to ensure the survival of native species that cannot compete with invasive, nonnative species in fragmented habitats.

The project site is bordered on all sides by development. There is a small riparian corridor along the former Hole Lake situated northwest of the Airport that connects the Santa Ana River riparian corridor to the open space areas associated with the Airport. However, the Airport itself does not provide a connection to other open space areas. Therefore, the project site does not serve as a wildlife corridor since it does not link two or more open space areas.

5. PROJECT IMPACT ANALYSIS

This section assesses the potential for the project to impact sensitive biological resources present within the project site, as well as special-status species that may occur there. The sensitive resources are described in the context of the policies (MSHCP and/or CEQA) that protect them.

5.1 SENSITIVE HABITATS

No sensitive habitats, as listed by CDFG (2003) and protected under CEQA, were identified within the project site. Implementation of the project therefore will not result in the loss of sensitive habitats. Likewise, there are no riparian/riverine or vernal pool habitats, as defined under the MSHCP, within the project site.

5.2 JURISDICTIONAL HABITATS

The northern portion of the artificial wet meadow is jurisdictional under Fish and Game Code 1600 et seq. The proposed project includes filling this area, which would be considered a significant impact under Fish and Game Code, Water Code, and CEQA, unless mitigated.

The riparian areas located along the western margin of the isolated western portion of the project site are considered jurisdictional waters under the USACE, CDFG, and CRWQCB. The boundary of the project site is adjacent to the boundary of the jurisdictional lands (Figure 4a and 4b), but no development is currently proposed for this portion of the project site. If these jurisdictional wetlands are avoided during development, no permitting will be required. However, if development will occur anywhere within the bounds of this wetland, permitting through the USACE, CDFG, and CRWQCB would be required and involve a complete wetlands delineation and appropriate mitigation.

5.3 WILDLIFE CORRIDORS

Since the project does not contain a wildlife corridor, project impacts on wildlife movement would be considered less than significant under CEQA. As well, the project site does not contain, nor is it directly adjacent to, any linkages connecting core areas, as defined by the MSHCP.

5.4 SPECIAL-STATUS SPECIES

5.4.1 Special-status Plants

No special-status plant species protected under CEQA or covered under the MSHCP were identified within the project site. Appropriate habitat for San Diego ambrosia occurs within the project site, but a focused survey for this species was negative for occurrence. Habitat for two other narrow endemic plant species identified by the MSHCP online report generator, Brand's Phacelia and San Miguel savory, is not found onsite and both species are determined to be absent from the project site. No impacts to these species will occur as a result of the proposed project.

Plummer's mariposa lily may occur within the project site, but this species is covered under the MSHCP. Therefore, take of individuals and habitat for this species would not be considered a significant impact under CEQA, as payment of the MSHCP fees fully mitigates any project-related impacts to this species.

5.4.2 Special-status Wildlife

Provided below is a discussion of impacts to special-status wildlife species that were either present within the project site or that may occur there.

Northern Harrier, White-tailed Kite, Cooper's Hawk, Loggerhead Shrike, and California Horned Lark

Northern harrier, white-tailed kite, Cooper's hawk, loggerhead shrike, and California horned lark may forage and nest within the project site. Because these species may nest within the project site, the project could potentially impact nests or young of these species. Any impacts that disrupt the nesting of these avian species within or adjacent to the project site would be considered a violation of MSHCP requirements and the MBTA, as well as a significant impact under CEQA.

Least Bell's Vireo and Southwestern Willow Flycatcher

Southwestern willow flycatcher and least Bell's vireo may forage and nest immediately adjacent to the project site within the southern willow scrub habitat located along the western margin of the isolated western portion of the project site. Because these species may nest adjacent to the project site, construction activities associated with the project could potentially impact nests or young of these species. Any impacts that disrupt the nesting of these avian species within or adjacent to the project site would be considered a violation of MSHCP requirements, the MBTA, CESA, and FESA, as well as a significant impact under CEQA.

Burrowing Owl

Burrowing owls were observed within the project site. Additionally, appropriate nesting and/or foraging habitat for burrowing owl was observed over the majority of the project site, as well as several areas adjacent to (and within 150 meters) of the project site. Because the burrowing owl could inhabit the project site throughout the year (nesting season, post-nesting dispersal period, and winter season), construction associated with implementation of the project could potentially impact burrowing owls that inhabit the project site. As well, burrowing owls that inhabit appropriate burrowing owl habitat within 150 meters of the project site could be impacted by the construction phase of the project. Construction-generated noise and construction-related traffic have the potential to indirectly impact burrowing owls inhabiting these areas. Any impacts that disrupt the foraging and/or nesting of burrowing owls within or adjacent to the project site would be considered a violation of MSHCP requirements and the MBTA, as well as a significant impact under CEQA.

Nesting Raptors, Migratory, and Native Avian Species

The construction activities associated with the proposed project that result in ground disturbance and/or the removal of vegetation could have both direct and indirect impacts to actively nesting birds, including the nests of special-status species. Direct project impacts would include the destruction of active nests, eggs, or young located within vegetation removed within the project site. Indirect impacts would include noise and disturbance associated with the construction activities that cause birds in adjacent habitats to abandon their nests. Any impacts (direct or indirect) that result in the abandonment or destruction of an active nest or the destruction of eggs or young of any protected avian species, including special-status species, would be considered a violation of the MSHCP and the MBTA, and a significant impact under CEQA.

Coyote and Northwestern San Diego Pocket Mouse

Sign for coyote was observed within the project site and northwestern San Diego pocket mouse may occur there. These species are covered under the MSHCP. Therefore, take of individuals and habitat for

these species would not be considered a significant impact under CEQA, as payment of the MSHCP fees fully mitigates any project-related impacts to these species.

Special-status Avian Species; Nesting Raptors, Migratory, and Native Avian Species

The construction and maintenance activities associated with the proposed project that result in the removal of vegetation could have both direct and indirect impacts to actively nesting birds, including the nests of special-status species. Under the MSHCP, the breeding season for birds is considered to occur from March 1 to June 30; implementation of the project during this period could result in both direct and indirect impacts. Direct project impacts would include the destruction of active nests, eggs, or young located within vegetation removed within the proposed project alignment. Indirect impacts would include noise and disturbance associated with the construction activities that cause birds in adjacent habitats to abandon their nests. Any impacts (direct or indirect) that result in the abandonment or destruction of an active nest or the destruction of eggs or young of any protected avian species, including special-status species, would be considered a significant impact under CEQA and a violation of the MSHCP and the MBTA.

6. RECOMMENDATIONS

6.1 MSHCP REQUIREMENTS

The impact analysis determined that the proposed project could impact one special-status species: burrowing owl. Additionally, the proposed project could potentially impact the nesting activities of migratory and native avian species (including raptors) that nest within or immediately adjacent to the project site, including those of several special-status avian species covered under the MSHCP. Since the project is located within the MSHCP plan area, adherence to MSHCP guidelines pertaining to these species will reduce potential impacts to a less than significant level under CEQA. The following guidelines are recommended.

6.1.1 Burrowing Owl

Mitigation

Since burrowing owls were detected during the breeding season, during both the general biological field survey and focused surveys, mitigation may be required in order to prevent take of burrowing owls. Appropriate mitigation measures may only be developed through consultation with the CDFG and USFWS personnel assigned to oversight of the MSHCP plan area. Mitigation may include preservation and enhancement (i.e., installation of artificial burrows, habitat restoration) of burrowing owl habitat at both onsite and offsite mitigation areas.

Pre-construction Survey

A pre-construction survey will be necessary in all appropriately identified burrowing owl habitat within and adjacent to the project site in order to determine whether burrowing owls are actively occupying the site. The pre-construction survey should be conducted prior to and within 30 days of ground-disturbing activities to ensure clearance of these areas, and to prevent take of burrowing owls. Should burrowing owls be determined to occur within or adjacent (within 150 meters) to the project site, mitigation and

monitoring measures should be determined through consultation with the CDFG and USFWS personnel assigned to oversight of the MSHCP plan area.

Monitoring

During the construction phase of the project, a qualified biologist should monitor the project site weekly to determine whether burrowing owls have moved into appropriate burrowing owl habitats within and adjacent to the project site in order to prevent disturbance to or take of burrowing owls. Should burrowing owls be detected during monitoring of the construction phase of the project, the biologist should retain the authority to stop work within 150 feet of the area occupied by the owl(s), and monitor the project site daily until the owl(s) leaves the project site under its own accord, or until the owl(s) has been removed from the project site using mitigation measures approved through consultation with the CDFG and USFWS personnel assigned to oversight of the MSHCP plan area. If burrowing owls are determined to be nesting within the project site, mitigation should include those that protect nesting avian species, as presented in Section 6.1.2.

6.1.2 Special-status Avian Species; Nesting Raptor, Migratory, and Native Avian Species

Grading or vegetation clearing within the project site would likely impact any non-raptor nests located on or within 150 feet, and raptor nests located on or within 500 feet of the project site, including those of northern harrier, white-tailed kite, Cooper's hawk, burrowing owl, loggerhead shrike, and California horned lark. In order to reduce these impacts to a less than significant level, SWCA recommends that construction of the project take place outside of the nesting season, which (under the MSHCP Construction Guidelines, Volume I, Section 7.5.3) occurs from March 1 through June 30. If project grading and maintenance activities occur outside of the nesting season, no further work is recommended. If project grading and maintenance activities must occur during the nesting season, it is recommended that a qualified biologist conduct a pre-construction nest survey on the project site and within 150 feet (for non-raptor nests) and 500 feet (for raptor nests) of the project footprint to identify any active nests that occur there. This survey should be carried out within one week of initiation of grading and maintenance activities. If bird species protected under the MBTA or California Fish and Game Code Sections 3503, 3503.5, and 3513 are found nesting on or adjacent to the project site, SWCA recommends that a qualified biologist monitor the nests daily during all phases of construction to ensure that the project does not impact the nests. Grading and maintenance activities should not be allowed within 150 feet of active non-raptor nests or 500 feet of active raptor nests until it has been determined by a qualified biologist that the chicks have fledged. Following fledging of the nestlings, the buffer area around the nest can be graded.

Other MSHCP-Covered Species

Numerous MSHCP-covered species occur, or may occur, within the project site, including Plummer's mariposa lily, northern harrier, white-tailed kite, Cooper's hawk, loggerhead shrike, California horned lark, coyote, and northwestern San Diego pocket mouse. Focused surveys are not required for these species, and take of individuals and their habitat is allowed under the MSHCP. No further action is necessary for plant, reptilian, and mammalian species; however, the Construction Guidelines detailed in Volume I, Section 7.5.3 of the MSHCP should be implemented with regard to protection of nesting avian species (see Section 6.1.2).

6.2 OTHER SENSITIVE BIOLOGICAL RESOURCES

6.2.1 Jurisdictional Habitats

Impacts to the wet meadow would require a Streambed Alteration Agreement through the CDFG. Mitigation would be required to lessen impacts to jurisdictional areas to less than significant levels under CEQA. Additionally, a WDR or a waiver of WDR will be required by the CRWQCB.

7. REFERENCES

- Anderson, J. R., E. E. Hardy, J. T. Roach, and R. E. Witmer. 1976. A land use and land cover classification system for use with remote sensor data. *U.S. Geological Survey Professional Paper* 964. U.S. Government Printing Office, Washington, D.C., USA.
- Bent, A. C. 1938. Life Histories of North American Birds of Prey. Part 2. U.S. National. Museum Bulletin 170. 482 pp.
- Bent, A. C. 1950. Life histories of North American wagtails, shrikes, vireos, and their allies. U. S. National Museum, Bulletin 197.
- Brown, B. T. 1993. Bell's Vireo. In *The Birds of North America*, No. 34 (A. Poole, P. Stettenheim, and F. Gill, Eds) Philadelphia: The Academy of Natural Sciences; Washington D.C.: The American Ornithologists' Union. California Burrowing Owl Consortium. 1993. Burrowing Owl Survey Protocol and Mitigation Guidelines. Technical Report, California Burrowing Owl Consortium. Alviso, California. 13 pp.
- Burrascano, C. 1997. A petition to the State of California Fish and Game Commission to list *Ambrosia pumila* as Endangered. Unpublished report.
- California Burrowing Owl Consortium. 1993. Burrowing owl survey protocol and mitigation guidelines. Report dated April 1993.
- California Department of Fish and Game (CDFG). 1995. Staff Report on Burrowing Owl Mitigation. Letter dated October 17, 1995, Department of Fish and Game. Sacramento, California. 10 pp.
- California Department of Fish and Game (CDFG). 2003. List of California Terrestrial Natural Communities Recognized by The California Natural Diversity Database. Wildlife and Habitat Data Analysis Branch, Department of Fish and Game.
- California Native Plant Society (CNPS). 2007. Inventory of Rare and Endangered Plants (online edition). California Native Plant Society. Sacramento, California, USA. Accessed 2007 from <http://www.cnps.org/inventory>.
- California Natural Diversity Data Base (CNDDB). 2009. Data Base Record Search of Information on Threatened , Endangered, Rare, or Otherwise Sensitive Species and Communities in the Vicinities of: Riverside West. California Department of Fish and Game, State of California Resources Agency, Sacramento, California.
- Coulombe, J. N. 1971. Behavior and population ecology of the burrowing owl (*Speotyto cunicularia*) in the Imperial Valley of California. *Condor* 73:162-176.
- County of Riverside. 2006. Burrowing Owl Survey Instructions for the Western Riverside Multiple Species Habitat Conservation Plan Area. Environmental Programs Department. 4pp.
- Dudek and Associates, Inc. August 26, 1999. City of San Diego Mission Trails Regional Park, San Diego Ambrosia Management Plan, unpublished report, 36 pp. + appendices.
- Eng, L.L., D. Belk and C.H. Eriksen. 1990. California Anostraca: distribution, habitat and status. *Journal of Crustacean Biology* 10: 247-277.

- Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual-Technical Report Y-87-1 (online edition)*. U.S. Army Corps of Engineers Waterways Experiment Station. Accessed October 2009 from <http://www.saj.ACOE.army.mil/permit/documents/87manual.pdf>.
- Eriksen, C. and D. Belk. 1999. Fairy Shrimps of California's Puddles, Pools, and Playas. Mad River Press, Inc., Eureka, California.
- Halterman, M. D. 1991. Distribution and Habitat Use of the Yellow-Billed Cuckoo (*Coccyzus americanus occidentalis*) on the Sacramento River, California, 1987-90, MS Thesis: California State University: Chico, CA.
- Haug, E. A., B. A. Millsap, and M. S. Martell. 1993. Burrowing Owl (*Speotyto cunicularia*). In *The Birds of North America*, No. 130 Edited by A. Poole and F. Gill. The Academy of Natural Sciences, Philadelphia and The American Ornithologists' Union, Washington, D.C.
- Hickman, J. C. (ed.). 1993. *The Jepson Manual*. University of California Press, Berkeley, California.
- Holland, R. F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. California Department of Fish and Game, Sacramento, California
- Hughes, J. 1999. Yellow-billed cuckoo (*Coccyzus americanus*). Pp. 1-28 in A. Poole, F. Gill, eds. *The Birds of North America*, Vol. 418. Philadelphia, PA: The Birds of North America.
- Johnsgard, P. 2002. *North American Owls*. Second edition. Smithsonian Institution Press. Washington DC. Pg 165.
- Marti, C. D. 1974. Feeding ecology of four sympatric owls. *Condor* 76:45-61.
- Martin, D. J. 1973. Selected aspects of burrowing owl ecology and behavior. *Condor* 75:446-456.
- Mayer, K. E. and W. F. Laudenslayer, Jr. 1988. *A Guide to the Wildlife Habitats of California*. California Department of Forestry and Fire Protection, Sacramento.
- Munz, P.A. 1974. *A Flora of Southern California*. University of California Press, Berkeley, California.
- Natural Resources Conservation Service (NRCS) (formerly the Soil Conservation Service [SCS] of the U.S. Department of Agriculture). 1971. *Soil Survey of Western Riverside Area, California*. November.
- Resier, Craig H. 1995. Rare plants of San Diego County. *Sierra Club-San Diego Chapter*. 16 Dec. 2004. <http://sandiego.sierraclub.org/rareplants>
- Robertson, J. M. 1929. Some observations on the feeding habits of the burrowing owl. *Condor* 31:38-39.
- Rosenberg, K. V., Ohmart, R. D., and Anderson, B. W. 1982. Community organization of riparian breeding birds: Response to an annual resource peak: *The Auk*, v. 99, p. 260-274.
- Sawyer, J. O. and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society, Sacramento, California.
- Thomsen, L. 1971. Behavior and ecology of burrowing owls on the Oakland Municipal airport. *Condor* 73:177-192.

- U.S. Fish and Wildlife Service (USFWS). 1985. Sensitive species management plan for the Western Yellow-billed Cuckoo. Portland, OR.
- U.S. Fish and Wildlife Service (USFWS). 1993. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Three Vernal Pool Plants and the Riverside Fairy Shrimp. Federal Register 58: 41384-41392.
- U.S. Fish and Wildlife Service (USFWS). 1994. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Three Vernal Pool Plants and the Riverside Fairy Shrimp. Federal Register 59: 48153.
- U.S. Fish and Wildlife Service (USFWS). 1995. Endangered and Threatened Species: The Southwest Willow Flycatcher; Final Rule. The Federal Register, February 27, 1995. Volume 60. Number 38.
- U.S. Fish and Wildlife Service (USFWS). 1998. Draft recovery plan for the least Bell's vireo. Portland, OR.
- University of California, Riverside (UCR). 2001. Understanding the plants and animals of Riverside County Multiple Species Habitat Conservation Plan. Accessed 2008 from <http://ecoregion.ucr.edu>.
- Weaver, K.L. 1998. Coastal sage scrub variations of San Diego County and their influence on the distribution of the California gnatcatcher. *Western Birds* 29:392-405.
- Wiggins, I.L. 1980. *Flora of Baja California*. Stanford, California: Stanford Univ. Press. 1025p.
- Zarn, M. 1974. Habitat management series for unique or endangered species. Burrowing Owl, Report No. 11. Bureau of Land Management, Denver. 25 pp.

Appendix A:
Western Riverside County MSHCP List of Covered Species (N=146)

INVERTEBRATES/CRUSTACEANS
Riverside fairy shrimp <i>Streptocephalus woottoni</i>
Santa Rosa Plateau fairy shrimp <i>Linderiella santarosae</i>
vernal pool fairy shrimp <i>Branchinecta lynchi</i>
INVERTEBRATES/INSECTS
Delhi Sands flower-loving fly <i>Rhaphiomidas terminatus abdominalis</i>
Quino checkerspot butterfly <i>Euphydryas editha quino</i>
FISH
arroyo chub <i>Gila orcutti</i>
Santa Ana sucker <i>Catostomus santaanae</i>
AMPHIBIANS
arroyo toad <i>Bufo californicus</i>
California red-legged frog <i>Rana aurora draytonii</i>
coast range newt <i>Taricha tarosa tarosa</i>
mountain yellow-legged frog <i>Rana mucosa</i>
western spadefoot <i>Scaphiopus hammondi</i>
REPTILES
Belding's orange-throated whiptail <i>Cnemidophorus hyperythrus beldingi</i>
coastal western whiptail <i>Cnemidophorus tigris multiscutatus</i>
granite night lizard <i>Xantusia henshawi henshawi</i>
granite spiny lizard <i>Sceloporus orcutti</i>

northern red-diamond rattlesnake <i>Crotalus ruber ruber</i>
San Bernardino mountain kingsnake <i>Lampropeltis zonata parvirubra</i>
San Diego banded gecko <i>Coleonyx variegatus abbottii</i>
San Diego horned lizard <i>Phrynosoma coronatum blainvillei</i>
San Diego mountain kingsnake <i>Lampropeltis zonata pulchra</i>
southern rubber boa <i>Charina bottae umbratica</i>
southern sagebrush lizard <i>Sceloporus graciosus vandenburgianus</i>
western pond turtle <i>Clemmys marmorata pallida</i>
BIRDS
American bittern <i>Botaurus lentiginosus</i>
bald eagle <i>Haliaeetus leucocephalus</i>
Bell's sage sparrow <i>Amphispiza belli belli</i>
black swift (breeding) <i>Cypseloides niger</i>
black-crowned night heron <i>Nycticorax nycticorax</i>
burrowing owl <i>Athene cunicularia hypugaea</i>
cactus wren <i>Campylorhynchus brunneicapillus</i>
California horned lark <i>Eremophila alpestris actia</i>
California spotted owl <i>Strix occidentalis occidentalis</i>
coastal California gnatcatcher <i>Polioptila californica californica</i>
Cooper's hawk <i>Accipiter cooperii</i>
double-crested cormorant <i>Phalacrocorax auritus</i>

downy woodpecker <i>Picooides pubescens</i>
ferruginous hawk <i>Buteo regalis</i>
grasshopper sparrow <i>Ammodramus savannarum</i>
golden eagle <i>Aquila chrysaetos</i>
great blue heron <i>Ardea herodias</i>
least Bell's vireo <i>Vireo bellii pusillus</i>
Lincoln's sparrow <i>Melospiza lincolni</i>
loggerhead shrike <i>Lanius ludovicianus</i>
Macgillivray's warbler <i>Oporornis tolmiei</i>
merlin <i>Falco columbarius</i>
mountain plover (wintering) <i>Charadrius montanus</i>
mountain quail <i>Oreortyx pictus</i>
Nashville warbler <i>Vermivora ruficapilla</i>
northern goshawk <i>Accipiter gentilis</i>
northern harrier (breeding) <i>Circus cyaneus</i>
osprey <i>Pandion haliaetus</i>
peregrine falcon <i>Falco peregrinus</i>
prairie falcon (breeding) <i>Falco mexicanus</i>
purple martin <i>Progne subis</i>
sharp-shinned hawk <i>Accipiter striatus</i>
So. California rufous-crowned sparrow <i>Aimophila ruficeps canescens</i>

southwestern willow flycatcher <i>Empidonax traillii extimus</i>
Swainson's hawk <i>Buteo swainsoni</i>
tree swallow <i>Tachycineta bicolor</i>
tricolored blackbird (colony) <i>Agelaius tricolor</i>
turkey vulture (breeding) <i>Cathartes aura</i>
western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>
white-faced ibis <i>Plegadis chihi</i>
white-tailed kite <i>Elanus leucurus</i>
Williamson's sapsucker <i>Sphyrapicus thyroideus</i>
Wilson's warbler <i>Wilsonia pusilla</i>
yellow warbler <i>Dendroica petechia brewsteri</i>
yellow-breasted chat <i>Icteria virens</i>
MAMMALS
Aguanga kangaroo rat <i>Dipodomys merriami collinus</i>
bobcat <i>Lynx rufus</i>
brush rabbit <i>Sylvilagus bachmani</i>
coyote <i>Canis latrans</i>
Dulzura kangaroo rat <i>Dipodomys simulans</i>
long-tailed weasel <i>Mustela frenata</i>
Los Angeles pocket mouse <i>Perognathus longimembris brevinasus</i>
mountain lion <i>Puma concolor</i>

northwestern San Diego pocket mouse <i>Chaetodipus fallax fallax</i>
San Bernardino flying squirrel <i>Glaucomys sabrinus californicus</i>
San Bernardino kangaroo rat <i>Dipodomys merriami parvus</i>
San Diego black-tailed jackrabbit <i>Lepus californicus bennettii</i>
San Diego desert woodrat <i>Neotoma lepida intermedia</i>
Stephens' kangaroo rat <i>Dipodomys stephensi</i>
PLANTS
beautiful hulsea <i>Hulsea vestita ssp. callicarpa</i>
Brand's phacelia <i>Phacelia stellaris</i>
California beardtongue <i>Penstemon californicus</i>
California bedstraw <i>Galium californicum ssp. primum</i>
California black walnut <i>Juglans californica var. californica</i>
California muhly <i>Muhlenbergia californica</i>
California Orcutt grass <i>Orcuttia californica</i>
chickweed oxytheca <i>Oxytheca caryophylloides</i>
Cleveland's bush monkeyflower <i>Mimulus clevelandii</i>
cliff cinquefoil <i>Potentilla rimicola</i>
Coulter's goldfields <i>Lasthenia glabrata ssp. coulteri</i>
Coulter's matilija poppy <i>Romneya coulteri</i>
Davidson's saltscale <i>Atriplex serenana var. davidsonii</i>
Engelmann oak <i>Quercus engelmannii</i>

Fish's milkwort <i>Polygala cornuta</i> var. <i>fishiae</i>
graceful tarplant <i>Holocarpha virgata</i> ssp. <i>elongata</i>
Hall's monardella <i>Monardella macrantha</i> ssp. <i>hallii</i>
Hammitt's clay-cress <i>Sibaropsis hammittii</i>
heart-leaved pitcher sage <i>Lepechinia cardiophylla</i>
intermediate mariposa lily <i>Calochortus weedii</i> var. <i>intermedius</i>
Jaeger's milk-vetch <i>Astragalus pachypus</i> var. <i>jaegeri</i>
Johnston's rock cress <i>Arabis johnstonii</i>
lemon lily <i>Lilium parryi</i>
little mousetail <i>Myosurus minimus</i>
long-spined spine flower <i>Chorizanthe polygonoides</i> var. <i>longispina</i>
many-stemmed dudleya <i>Dudleya multicaulis</i>
Mojave tarplant <i>Deinandra mohavensis</i>
mud nama <i>Nama stenocarpum</i>
Munz's mariposa lily <i>Calochortus palmeri</i> var. <i>munzii</i>
Munz's onion <i>Allium munzii</i>
Nevin's barberry <i>Berberis nevinii</i>
ocellated Humboldt lily <i>Lilium humboldtii</i> ssp. <i>ocellatum</i>
Orcutt's brodiaea <i>Brodiaea orcuttii</i>
Palmer's grapplinghook <i>Harpagonella palmeri</i>
Palomar monkeyflower <i>Mimulus diffusus</i>

Parish's brittlescale <i>Atriplex parishii</i>
Parish's meadowfoam <i>Limnanthes gracilis var. parishii</i>
Parry's spine flower <i>Chorizanthe parryi var. parryi</i>
Payson's jewelflower <i>Caulanthus simulans</i>
peninsular spine flower <i>Chorizanthe leptotheca</i>
Plummer's mariposa lily <i>Calochortus plummerae</i>
prostrate navarretia <i>Navarretia prostrate</i>
prostrate spine flower <i>Chorizanthe procumbens</i>
Rainbow manzanita <i>Arctostaphylos rainbowensis</i>
round-leaved filaree <i>Erodium macrophyllum</i>
San Diego ambrosia <i>Ambrosia pumila</i>
San Diego button-celery <i>Eryngium aristulatum var. parishii</i>
San Jacinto Mountains bedstraw <i>Galium angustifolium ssp. jacinticum</i>
San Jacinto Valley crownscale <i>Atriplex coronata var. notatior</i>
San Miguel savory <i>Satureja chandleri</i>
Santa Ana River woollystar <i>Eriastrum densifolium ssp. sanctorum</i>
shaggy-haired alumroot <i>Heuchera hirsutissima</i>
slender-horned spine flower <i>Dodecahema leptoceras</i>
small-flowered microseris <i>Microseris douglasii var. platycarpha</i>
small-flowered morning-glory <i>Convolvulus simulans</i>
spreading navarretia <i>Navarretia fossalis</i>

sticky-leaved dudleya <i>Dudleya viscida</i>
thread-leaved brodiaea <i>Brodiaea filifolia</i>
Vail Lake ceanothus <i>Ceanothus ophiochilus</i>
vernal barley <i>Hordeum intercedens</i>
Wright's trichocoronis <i>Trichocoronis wrightii</i> var. <i>wrightii</i>
Yucaipa onion <i>Allium marvinii</i>

**Appendix B:
Inventory of Plant and Wildlife Species Observed
within the Project Site**

Inventory of Plant Species Observed within the Project site

Common Name	Scientific Name	Habitat
ANGIOSPERM (DICOTS)		
Sumac Family	Anacardiaceae	
Brazilian peppertree	<i>Schinus molle</i>	Non-native grassland, Southern willow scrub
Sunflower Family	Asteraceae	
Western ragweed	<i>Ambrosia psilostachya</i> var. <i>Californica</i>	Non-native grassland, artificial wet meadow
Tarragon	<i>Artemisia dracunculis</i>	Non-native grassland
Mulefat	<i>Baccharis salicifolia</i>	Artificial wet meadow
Tocalote	<i>Centaurea meletensis</i>	Non-native grassland
Bullthistle	<i>Cirsium vulgare</i>	Artificial wet meadow
African Daisy	<i>Dimorphotheca aurantiaca</i>	Non-native grassland, ruderal
Common sunflower	<i>Helianthus annuus</i>	Artificial wet meadow
Prickly lettuce	<i>Lactuca seriola</i>	Artificial wet meadow, ruderal
Goldfields	<i>Lasthenia glabrata</i>	Non-native grassland
California aster	<i>Lessingia filaginifolia</i>	Non-native grassland
Bristly ox-tongue	<i>Picris echioides</i>	Non-native grassland, ruderal
Borage Family	Boraginaceae	
Rancher's fireweed	<i>Amsinckia menziesii</i>	Non-native grassland
Winged pectocarya	<i>Pectocary penicilata</i>	Non-native grassland
Mustard Family	Brassicaceae	
Black mustard	<i>Brassica nigra</i>	Non-native grassland, ruderal
Mediterranean mustard	<i>Hirshfeldia incana</i>	Non-native grassland, ruderal
Water Cress	<i>Nasturtium officinale</i>	Southern willow scrub
Wild radish	<i>Raphanus raphanistrum</i>	Non-native grassland, ruderal
London rocket	<i>Sisymbrium irio</i>	Non-native grassland, ruderal
Cactus family	Cactaceae	
Mission cactus	<i>Opuntia occidentalis</i>	Southern willow scrub
Chenopod Family	Chenopodiaceae	
Lamb's quarters	<i>Chenopodium album</i>	Non-native grassland, ruderal
Chenopod (unidentified)	<i>Chenopodium</i> sp.	Artificial wet meadow
California thistle	<i>Cirsium occidentale</i>	southern willow scrub
Russian thistle	<i>Salsola tragus</i>	Non-native grassland, Ruderal, Southern willow scrub
Stonecrop Family	Crassulaceae	
Pygmy-weed	<i>Crassula connata</i>	Non-native grassland, ruderal

Inventory of Plant Species Observed within the Project site

Common Name	Scientific Name	Habitat
Spurge Family	Euphorbiaceae	
Doveweed	<i>Eremocarpus setigerus</i>	Non-native grassland
Castor bean	<i>Ricinus communis</i>	Southern willow scrub
Pea Family	Fabaceae	
Miniature lupine	<i>Lupinus bicolor</i>	Non-native grassland
Succulent lupine	<i>Lupinus succulentus</i>	Non-native grassland
Clover	<i>Trifolium sp.</i>	Artificial wet meadow, ruderal
Geranium Family	Geraniaceae	
Redstem filarree	<i>Eodium cicutarium</i>	Non-native grassland, ruderal
Mint Family	Lamiaceae	
Horehound	<i>Marrubium vulgare</i>	Southern willow scrub
Mallow Family	Malvaceae	
Cheeseweed	<i>Malva parviflora</i>	Non-native grassland, ruderal
Olive Family	Oleaceae	
Shamel Ash	<i>Fraxinus uhdei</i>	Artificial wet meadow
European Olive	<i>Olea europaea</i>	Southern willow scrub
Plantain Family	Plantaginaceae	
Narrowleaf plantain	<i>Plantago lanceolata</i>	Artificial wet meadow, non-native grassland, ruderal
Phlox Family	Polemoniaceae	
Chaparral gilia	<i>Gilia angelensis</i>	Non-native grassland
Buckwheat Family	Polygonaceae	
Curly dock	<i>Rumex crispus</i>	Artificial wet meadow
Bitter dock	<i>Rumex obtusifolius</i>	Artificial wet meadow
Purslane family	Portulacaceae	
Fringed redmaids	<i>Calandrinia ciliata</i>	Non-native grassland
Rose family	Rosaceae	
California blackberry	<i>Rubus discolor</i>	Southern willow scrub
Willow Family	Salicaceae	
Red willow	<i>Salix laevigata</i>	Artificial wet meadow
Black willow	<i>Salix gooddingii</i>	Artificial wet meadow, Southern willow scrub
Arroyo willow	<i>Salix lasiolepis</i>	Southern willow scrub
Simarouba family	Simaroubaceae	
Tree-of-heaven	<i>Ailanthus altissima</i>	Southern willow scrub
Nightshade family	Solinaceae	

Inventory of Plant Species Observed within the Project site

Common Name	Scientific Name	Habitat
Tree tobacco	<i>Nicotiana glauca</i>	Southern willow scrub
Nightshade	<i>Solanum xanti</i>	Artificial wet meadow
Elm Family	Ulmaceae	
Chinese elm	<i>Ulmus parvifolia</i>	Southern willow scrub
Grape family	Vitaceae	
California wild grape	<i>Vitis californica</i>	Southern willow scrub
ANGIOSPERM (MONOCOTS)		
Palm Family	Arecaceae	
Mexican fan palm	<i>Washingtonia robusta</i>	Artificial wet meadow
Canary Island date palm	<i>Phoenix canariensis</i>	Southern willow scrub
Sedge Family	Cyperaceae	
Umbrella sedge	<i>Cyperus eragrostis</i>	Artificial wet meadow
Grass Family	Poaceae	
<i>Giant reed</i>	<i>Arundo donax</i>	Southern willow scrub
Slender wild oat	<i>Avena barbata</i>	Non-native grassland
Rip-gut brome	<i>Bromus diandrus</i>	Non-native grassland
Red brome	<i>Bromus madritensis ssp. rubens</i>	Non-native grassland
Foxtail barley	<i>Hordeum murinum</i>	Non-native grassland
Common barley	<i>Hordeum vulgare</i>	Non-native grassland
Dallis grass	<i>Paspalum dilatatum</i>	Artificial wet meadow
Mediterranean grass	<i>Schismus arabicus</i>	Non-native grassland, ruderal
Cattail Family	Typhaceae	
Broadleaved cattail	<i>Typha latifolia</i>	Artificial wet meadow

Inventory of Wildlife Species Observed within the Project site

Common Name	Scientific Name	Habitat
Side-blotched lizard	<i>Uta stansburiana</i>	Non-native grassland
Mallard	<i>Anas platyrhynchos</i>	Non-native grassland
Turkey vulture	<i>Cathartes aura</i>	Non-native grassland
Red-tailed hawk	<i>Buteo jamaicensis</i>	Non-native grassland
American kestrel	<i>Falco sparverius</i>	Non-native grassland
Western gull	<i>Larus occidentalis</i>	Non-native grassland
Rock dove	<i>Columba livia</i>	Urban or built-up land
Mourning dove	<i>Zenaida macroura</i>	Non-native grassland, artificial wet meadow
Burrowing owl	<i>Athene cunicularia</i>	Non-native grassland
Anna's hummingbird	<i>Calypte anna</i>	Artificial wet meadow
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>	Non-native grassland
Western kingbird	<i>Tyrannus verticalis</i>	Non-native grassland
American crow	<i>Corvus brachyrhynchos</i>	Non-native grassland, urban or built-up land, golf course
Horned lark	<i>Eremophila alpestris</i>	Non-native grassland, ruderal
Northern mockingbird	<i>Mimus polyglottos</i>	Non-native grassland, urban or built-up land
Song sparrow	<i>Melospiza melodia</i>	Non-native grassland, artificial wet meadow
White-crowned sparrow	<i>Zonotrichia leucophrys</i>	Non-native grassland, ruderal
Western meadowlark	<i>Sturnella neglecta</i>	Non-native grassland, artificial wet meadow
House finch	<i>Carpodacus mexicanus</i>	Non-native grassland, ruderal, urban or built-up land
House sparrow	<i>Passer domesticus</i>	Urban or built-up land
Coyote	<i>Canis latrans</i>	Non-native grassland
California ground squirrel	<i>Spermophilus beecheyi</i>	Non-native grassland

Appendix C:
Assessment of Potential for Occurrence of Special-status Plant and Wildlife
Species Known to Occur within the Project Vicinity

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
Plants								
<i>Ambrosia pumila</i>	San Diego ambrosia	FE	None	MSHCP	1B.1	Chaparral, coastal scrub, valley and foothill grassland, vernal pools.	Disturbed areas in sandy loam or clay soils, 20-415m.	Absent: Focused surveys for the species were conducted by an SWCA biologist with experience surveying for the plant. No individuals of the species were found in the wet meadow onsite.
<i>Arenaria paludicola</i>	Marsh sandwort	FE	SE		1B.1	Bogs and fens, freshwater marshes and swamps.	Within dense mats of <i>Typha</i> , <i>Juncus</i> , and <i>Scirpus</i> , etc., 3-170m.	Absent: Though there is one historic record (1899) within five miles, there is no suitable habitat within the project site.
<i>Calochortus plummerae</i>	Plummer's mariposa lily	None	None	MSHCP	1B.2 CA-Endemic	Coastal scrub, chaparral, valley and foothill grassland, cismontane woodland, lower montane coniferous forest.	Occurs on rocky and sandy sites, usually of granitic or alluvial material, 100-1700m.	Absent: Focused surveys for the species were conducted by an SWCA biologist with experience surveying for the plant. No individuals of the species were found in the non-native grasslands onsite.
<i>Centromedia pungens</i> ssp. <i>laevis</i>	Smooth tarplant	None	None	MSHCP	1B.1 CA-Endemic	Valley and foothill grassland, chenopod scrub, meadows, playas, riparian woodland.	Alkali meadow, alkali scrub; also in disturbed place, 0-480m.	Not likely to occur: Though there is suitable habitat within the project site, particularly within and adjacent to the artificial wet meadow, there is only an historic record (1905) within five miles.
<i>Chorizanthe parryi</i> var. <i>parryi</i>	Parry's spineflower	None	None	MSHCP	List 3.2 CA-Endemic	Chaparral, coastal scrub	Sandy or rocky soils, openings within vegetation, 40-1705m.	Absent: Though there are two historic records (1903, 1917) within five miles, there is no suitable habitat within the project site.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
<i>Cordylanthus maritimus</i> ssp. <i>maritimus</i>	Salt marsh bird's-beak	FE	SE		1B.2	Coastal dunes, coastal salt marshes.	Slightly raised hummocks, 0-30m	Absent: Though there is one historic record (1888) within five miles, there is no suitable habitat within the project site.
<i>Dodecahema leptoceras</i>	Slender-horned spineflower	FE	SE	MSHCP	1B.1 CA-Endemic	Chaparral, coastal scrub (alluvial fan sage scrub). Historically from Los Angeles, Riverside and San Bernardino Counties. Extirpated from much of range.	Flood deposited terraces and washes. Associates include <i>Encelia</i> , <i>Dalea</i> , and <i>Lepidospartum</i> , 200-760m.	Absent: Though there is one historic record (1923) within five miles, there is no suitable habitat within the project site.
<i>Dudleya multicaulis</i>	Many-stemmed dudleya	None	None	MSHCP	1B.2 CA-Endemic	Chaparral, coastal scrub, valley and foothill grassland.	In heavy, often clay-type soils or grassy slopes, 15-790m.	Not likely to occur: Though there is one recent record (1996) within five miles and one historic record (1986) within five kilometers, the habitat within the project site is considered marginal.
<i>Eriastrum densifolium</i> ssp. <i>sanctorum</i>	Santa Ana River woollystar	FE	SE	MSHCP	1B.1 CA-Endemic	Coastal scrub, chaparral. Formerly known from Orange and San Bernardino Counties, now known from one extended population.	In sandy or gravelly soils on river floodplains or terraced fluvial deposits, 91-610m.	Absent: Though there is one recent record (1994) within five miles and one historic record (1986) within five kilometers, there is no suitable habitat within the project site.
<i>Horkelia cuneata</i> ssp. <i>puberula</i>	Mesa horkelia	None	None		1B.1 CA-Endemic	Chaparral, cismontane woodland, coastal scrub.	Sandy or gravelly soils, 70-810m.	Absent: Though there is one historic record (1940) within five miles, there is no suitable habitat within the project site.
<i>Juglans californica californica</i>	Southern California black walnut	None	None	MSHCP	4.2 CA-Endemic	Chaparral, cismontane woodland, and coastal scrub.	Alluvial soils, 50-900m.	Absent: Though there is one recent record (1991) within five kilometers, this conspicuous species was not observed within the project site.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	Coulter's goldfields	None	None	MSHCP	1B.1	Coastal salt marshes, playas, valley and foothill grasslands, vernal pools.	Usually found on alkaline soils in playas, sinks, and grasslands, 1-1220m.	Absent: Though there is one recent record (1989) within five miles, there is no suitable habitat within the project site.
<i>Lepidium virginicum</i> var. <i>robinsonii</i>	Robinson's pepper-grass	None	None		1B.2	Chaparral, coastal scrub.	Dry soils, shrubland, 1-885m.	Not likely to occur: Though there is one recent record (1998) within five miles, the habitat within the project site is considered marginal.
<i>Mucronea californica</i>	California spineflower	None	None		4.2 CA-Endemic	Chaparral, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland.	Sandy soils, 0-1400m.	Not likely to occur: Though there is suitable habitat within the project site, there is only an historic record (1904) within five kilometers.
<i>Senecio aphanactis</i>	Rayless ragwort	None	None		2.2	Chaparral, cismontane woodland, and coastal scrub.	Drying alkaline flats. 15-1800m.	Absent: There is only an historic record (1909) within five miles, and there is no suitable habitat within the project site.
Invertebrates								
<i>Cicindela tranquebarica viridissima</i>	Greenest tiger beetle	None	None			Inhabits the woodlands adjacent to the Santa Ana River basin.	Usually found in open spots between trees.	Absent: Though there is one recent record (1987) within five miles, there is no suitable habitat within the project site.
<i>Rhaphiomidas terminatus abdominalis</i>	Delhi Sands flower-loving fly	FE	None	MSHCP		Found only in areas of the Delhi Sands formation in southwestern San Bernardino and northwestern Riverside Counties.	Requires fine, sandy soils, often with wholly or partly consolidated dunes and sparse vegetation.	Absent: There is only an historic record (1941) within five miles, and there is no suitable habitat within the project site.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
<i>Carolella busckana</i>	Busck's gallmoth	None	None			Unknown	Unknown	Absent: There is only an historic record (1906) within five miles, and there is no suitable habitat within the project site.
<i>Ceratochrysis longimala</i>	A cuckoo wasp	None	None			Unknown	Unknown	Absent: There is only an historic record (1906) within ten miles, and there is no suitable habitat within the project site.
Fish								
<i>Gila orcutti</i>	Arroyo chub	None	SC	MSHCP, FSS		Los Angeles basin in southern coastal streams.	Slow water stream sections with mud or sand bottoms. Feed heavily on aquatic vegetation and associated invertebrates.	Absent: Though there are three recent records (1995, 1996, and 2001) within five miles, and three records (last record from 1997) within 5 kilometers, there is no suitable habitat within the project site.
<i>Rhinichthys osculus</i> ssp. 3	Santa Ana speckled dace	None	SC	FSS		Headwaters of Santa Ana and San Gabriel Rivers. May be extirpated from the Los Angeles River system.	Requires permanent flowing streams with summer water temperatures of 17-20° C. Usually inhabits shallow cobble and gravel riffles.	Absent: Though there is one recent record (1996) within five miles and two records (last record 1995) within five kilometers, there is no suitable habitat within the project site.
<i>Catostomus santaanae</i>	Santa Ana sucker	FT	SC	MSHCP, IUCN:VU, FSS		Endemic to Los Angeles basin south coastal streams.	Habitat generalists, but prefer sand-rubble-boulder bottoms, cool, clear water and algae.	Absent: Though there are five recent records (2001, 2004, and three in 1991) within five miles, and three records (last record from 1997) within five kilometers, there is no suitable habitat within the project site.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
Amphibians								
<i>Spea hammondi</i>	Western spadefoot	None	SC	MSHCP, BLMS, IUCN:NT		Occurs primarily in grassland habitat, but can be found in valley-foothill hardwood woodlands.	Vernal pools or rain pools that persist with more than three weeks of standing water. Riparian habitats with suitable water resources may also be utilized.	Not likely to occur: Though there two records (no dates given) within five kilometers, the artificial wet meadow habitat within the project site is of recent origin, and this species has likely not dispersed into the project site.
<i>Bufo californicus</i>	Arroyo toad	FE	SC	MSHCP, IUCN:EN		Semi-arid regions near washes or intermittent streams, including valley-foothill and desert riparian, and desert wash.	Rivers with sandy banks, willows, cottonwoods, and sycamores; loose, gravelly areas of streams in drier parts of range.	Absent: There are only three historic records (last record from 1907) within five kilometers, and there is no suitable habitat within the project site.
<i>Rana aurora draytonii</i>	California red-legged frog	FT	SC	MSHCP, IUCN:NT		Deep-water pools with dense stands of overhanging willows and an intermixed fringe of cattails	Dense, shrubby or emergent riparian vegetation closely associated with deep (greater than 2 1/3-foot deep) still or slow moving water	Absent: There are only two historic records (last record from 1974) within five kilometers, and there is no suitable habitat within the project site.
Reptiles								
<i>Emys marmorata pallida</i>	Southwestern pond turtle	None	SC	MSHCP, IUCN:VU		Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation.	Require basking sites and sandy, open upland sites for egg-laying.	Absent: There are only three historic records (last record from 1974) within five kilometers, and there is no suitable habitat within the project site.
<i>Coleonyx variegatus abbotti</i>	San Diego banded gecko	None	None	MSHCP		Primarily a desert species, but also occurs cismontane chaparral, desert scrub, and open sand dunes.	Rocks, boards, fallen yucca stems, cow dung, and other litter serve as diurnal refugia.	Absent: Though there is one recent record (2003) within five miles, and two historic records (last record 1974) within five kilometers, there is no suitable habitat within the project site.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
<i>Gambelia wislizenii</i>	Long-nosed leopard lizard	None	SC	MSHCP		Woodlands and brushy habitats including bunch grass, alkali bush, sagebrush, creosote bush, or other scattered low plants.	Prefers sandy or gravelly flats and plains, or hardpan. The greatest densities of this species have been observed in creosote flats.	Absent: There is only one historic record (no date given) within five kilometers, and there is no suitable habitat within the project site.
<i>Sceloporus orcuttii</i>	Granite spiny lizard	None	None	MSHCP		Chaparral, coastal scrub, riparian woodland, yellow pine forest, pinyon-juniper woodlands.	Closely tied to fractured granodiorite rock outcrops, often present under granite flakes on boulders.	Absent: Though there are three historic records (last record from 1917) within five kilometers, there is no suitable habitat within the project site.
<i>Sceloporus graciosus vandenburganus</i>	Southern sagebrush lizard	None	SC	MSHCP		Montane chaparral, hardwood and conifer habitats, juniper habitats, and sage scrub habitats at higher elevations.	Prefers open ground, good light and scattered low bushes, and is usually found near bushes, brush heaps, logs, or rocks.	Absent: There is only one historic record (no date given) within five kilometers, and there is no suitable habitat within the project site.
<i>Phrynosoma coronatum</i>	Coast horned lizard	None	SC	MSHCP		Inhabits coastal sage scrub and chaparral in arid and semi-arid climate conditions.	Prefers friable, rocky or shallow sandy soil.	Absent: Though there is one historic record (1951) within five miles, and three records (last record from 1990) within five kilometers, there is no suitable habitat within the project site.
<i>Aspidoscelis hyperythra beldingi</i>	Orange-throated whiptail	None	SC	MSHCP, IUCN:DD		Inhabits low elevation coastal scrub, chaparral and valley-foothill hardwood habitats.	Prefers washes and other sandy areas with patches of brush and rocks. Perennial plants necessary for its major food - termites.	Absent: Though there are two recent records (1989 and 2003) and three historic records (1951, 1963, and one with no date given) within five miles, and two records (last record from 1974) within five kilometers, there is no suitable habitat within the project site.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
<i>Aspidoscelis tigris stejnegeri</i>	Coastal whiptail	None	None	MSHCP		Found in deserts and semi-arid areas with sparse vegetation and open areas. Also found in woodland and riparian areas.	Sandy or rocky soils, soils may be compacted or firm.	Absent: Though there is one recent record (2001) within five miles, and one record (no date given) within five kilometers, there is no suitable habitat within the project site.
<i>Anniella pulchra</i>	California legless lizard	None	SC	FSS		Sandy or loose loamy soils under sparse vegetation.	Soil moisture is essential. They prefer soils with a high moisture content.	Absent: There are only two historic records (last record from 1974) within five kilometers, and there is no suitable habitat within the project site.
<i>Diadophis punctatus modestus</i>	San Bernardino ring-necked snake	None	None	MSHCP, FSS		Most common in open, relatively rocky areas. Often in somewhat moist microhabitats near intermittent streams.	Avoids moving through open or barren areas by restricting movements to areas of surface litter or herbaceous vegetation.	Absent: Though there is one record (no date given) within five kilometers, there is no suitable habitat within the project site.
<i>Thamnophis sirtalis infernalis</i>	California red-sided garter snake	None	SC	MSHCP		Marshes, meadows, sloughs, ponds and slow-moving water courses	Marsh and upland habitats for foraging; refugia near permanent water with riparian vegetation, and meadows adjacent to marshlands	Absent: Though there are two historic records (last record from 1974) within five kilometers, there is no suitable habitat within the project site.
<i>Thamnophis hammondi</i>	Two-striped garter snake	None	SC	MSHCP, BLMS, FSS, IUCN:DD		Wetland habitats such as streams, creeks and pools	Streams with rocky beds and bordered by willows, also ponds, lakes, wetlands and vernal pools; mixed oak, oak woodlands and chaparral on coastal slopes	Not likely to occur: Though there is one historic record (1974) within five kilometers, the artificial wet meadow habitat within the project site is of recent origin, and this species has likely not dispersed into the project site.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
<i>Crotalus ruber ruber</i>	Northern red-diamond rattlesnake	None	SC	MSHCP		Chaparral, woodland, grassland, and desert areas.	Occurs in rocky areas and dense vegetation. Needs rodent burrows, cracks in rocks or surface cover objects.	Not likely to occur: Though there is one recent (2003) and two historic records (1959 and 1939) within five miles, and two records (no date given) within five kilometers, habitat is marginal within the project site.
Birds								
<i>Phalacrocorax auritus albociliatus</i>	Double-crested cormorant	None	SC	MSHCP, IUCN:LC		Require lakes, rivers, reservoirs, estuaries, or use the ocean for foraging. Nest on mainland in tall trees, wide rock ledges on cliffs, or rugged slopes near (or in) the aquatic environments.	Perching sites must be barren of vegetation.	Absent: Though there are six recent records (last record from 1998) within five kilometers, there is no suitable foraging or nesting habitat within the project site.
<i>Botaurus lentiginosus</i>	American bittern	None	None	MSHCP, IUCN:LC		Emergent habitat of freshwater marshes and vegetated borders of ponds and lakes.	Marshes, meadows, and along the edges of shallow ponds.	Not likely to occur: Though there are four recent records (last record from 1999) within five kilometers, the artificial wet meadow habitat within the project site is considered marginal foraging and nesting habitat.
<i>Ixobrychus exilis hesperis</i>	Least bittern	None	SC	IUCN:LC		Dense, emergent vegetation with clumps of woody vegetation.	Usually near open water.	Absent: Though there is one recent record (1999) within five kilometers, there is no suitable habitat within the project site.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
<i>Nycticorax nycticorax</i>	Black-crowned night heron	None	None	MSHCP, BLMS, IUCN:LC		Various wetland habitats, including salt, brackish, and freshwater marshes, swamps, streams, lakes, and agricultural fields.	Nests in a platform of sticks placed in tree or cattails. Nests colonially; more than a dozen nests may be in a single tree.	Absent: Though there are eight recent records (last record from 1999) within five kilometers, there is no suitable habitat within the project site.
<i>Plegadis chihi</i>	White-faced ibis	None	SC	MSHCP, IUCN:LC		Forages in shallow lacustrine waters, muddy ground of wet meadows, marshes, ponds, lakes, rivers, flooded fields, and estuaries.	Extensive marshes are required for nesting. The species prefers shallow, grassy marshes and nests in dense, fresh emergent wetland.	Absent: Though there are two recent records (last record from 1999) within five kilometers, there is no suitable habitat within the project site.
<i>Cathartes aura</i>	Turkey vulture	None	None	MSHCP		Forested or partly forested areas with nest sites such as rock outcrops, fallen trees, and abandoned buildings that are isolated from human and perhaps other mammalian disturbance.	Uses large trees, rock outcrops, and riparian thickets for roosting, perching, and sunning.	Absent: There are six recent records (last record from 1999) within five kilometers of project site. Though this species was observed foraging over the project site, there is no suitable nesting habitat there.
<i>Circus cyaneus</i>	Northern harrier	None	SC	MSHCP, IUCN:LC		Coastal salt marsh and fresh-water marsh. Nest and forage in grasslands, from salt grass in desert sink to mountain springs.	Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	May occur: There are five recent records (last record from 1999) within five kilometers, and suitable foraging and nesting habitat within the project site, particularly within and adjacent to the artificial wet meadow.
<i>Elanus leucurus</i>	White-tailed kite	None	FP	MSHCP		Nests in rolling foothills/valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland.	Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	May occur: There are ten recent records (last record from 1999) within five kilometers, and there is suitable foraging and nesting habitat within the project site.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
<i>Accipiter cooperii</i>	Cooper's hawk	None	SC	MSHCP, IUCN:LC		Woodland, chiefly of open, interrupted or marginal type.	Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms, on river floodplains; also live in oaks.	May occur: There are 16 recent records (last record from 1999) within five kilometers, and there is suitable foraging and nesting habitat within the project site.
<i>Accipiter striatus</i>	Sharp-shinned hawk	None	SC	MSHCP, IUCN:LC		Found in ponderosa pine, black oak, riparian deciduous, mixed conifer, and Jeffrey pine habitats but prefers riparian areas.	Requires north facing slopes with plucking perches. Nests usually within 275 ft of water.	Absent: Though there are five recent records (last record from 1999) within five kilometers, the project site is outside of the known breeding range of this species. May occasionally forage over the project site.
<i>Buteo swainsoni</i>	Swainson's hawk	None	ST	MSHCP, ABC, Audubon, USBC, FSS, BCC		Open desert, sparse shrub lands, grassland, or cropland containing scattered, large trees or small groves.	Nests in scattered trees within grassland, shrubland, or agricultural landscapes, especially along stream courses or in open woodlands.	Not likely to occur: Though there is one recent record (1999) within five kilometers, the nesting habitat within the project site is considered marginal. May forage within the project site during winter.
<i>Buteo regalis</i>	Ferruginous hawk	None	SC	MSHCP, Audubon, BLMS, IUCN:NT, BCC		Open grasslands, sagebrush flats, desert scrub, low foothills surrounding valleys and fringes or pinyon-juniper habitats.	Mostly eats lagomorphs, ground squirrels, and mice.	Absent: Though there are two recent records (last record from 1992) within five kilometers, the project site is outside of the known breeding range of this species. May forage within the project site during winter.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
<i>Aquila chrysaetos</i>	Golden eagle	None	SC, FP	MSHCP, BLMS, CDFS, IUCN:LC, BCC		Rolling foothill or coast-range terrain, where open grassland turns to scattered oaks, sycamores, or large digger pines.	Cliff-walled canyons provide nesting habitat in most parts of range; also large trees in open areas.	Absent: There is only an historic record (1910) within five kilometers, and there is no suitable nesting habitat within the project site. May forage within the project site.
<i>Haliaeetus leucocephalus</i>	Bald eagle	FD	SE, FP	MSHCP, CDFS, IUCN:LC		Ocean shorelines, lake margins, and river courses for both nesting and wintering. Most nests within one mile of water.	Nests in large, old-growth, or dominant live tree with open branches, especially Ponderosa Pine. Roosts communally in winter.	Absent: Though there are five historic records (1981 and four from 1975) within ten miles, there is no suitable foraging or nesting habitat within the project site.
<i>Charadrius montanus</i>	Mountain plover	None	SC	MSHCP, ABC, Audubon, BLMS, IUCN:VU, USBC, BCC		Nest in dry, open, shortgrass prairies or grasslands and winter in shortgrass plains, plowed fields, open sagebrush areas, and sandy deserts Relatively open areas with little vegetative cover where it forages for insects.	Relatively open areas with little vegetative cover where it forages for insects.	Absent: Though there are three historic records (1909) within five kilometers, there is no suitable foraging or nesting habitat within the project site.
<i>Coccyzus americanus occidentalis</i>	Western yellow-billed cuckoo	FC	SE	MSHCP, IUCN:LC, FSS, BCC		Riparian forest nester, along the broad, lower flood-bottoms of larger river systems.	Nests in riparian thickets of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.	Absent: Though there is one recent record (1989) and three historic records (1919, 1930, 1977) within ten miles, and four records (last record from 1993) within five kilometers, there is no suitable foraging or nesting habitat within the project site.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
<i>Asio otus</i>	Long-eared owl	None	SC			Found in dense riparian bottomlands with tall willows and cottonwoods; also, belts of live oak paralleling stream courses.	Require adjacent open land productive of mice and the presence of old nests of crows, hawks, or magpies for breeding.	Absent: Though there is one historic record (1889) within five kilometers, there is no suitable foraging or nesting habitat within the project site.
<i>Athene cunicularia</i>	Burrowing owl	None	SC	MSHCP, BLMS, IUCN:LC, BCC		Open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation.	Subterranean nester, dependent upon burrowing mammals, especially California ground squirrel.	Present: Breeding pair observed within the project site during initial habitat assessment (Step I) and one individual observed during dusk/dawn surveys (Step IIb). In addition, there are 11 recent records (1989, 1998, 2003, 2005, 2007, two in 2002, and four in 2006) and one historic record (1986) within ten miles, and five historic records (last record 1974) within five kilometers of the project site. Suitable foraging and nesting habitat occurs throughout the majority of the project site.
<i>Cypseloides niger borealis</i>	Black swift	None	SC	MSHCP, IUCN:LC, FSS		Forages near nest sites over a variety of habitats.	Nests in moist crevices or caves on sea cliffs above the surf, or on cliffs behind, or adjacent to, waterfalls in deep canyons,	Absent: Though there is one recent record (1999) within five kilometers, there is no suitable nesting habitat within the project site.
<i>Chaetura vauxi vauxi</i>	Vaux's swift	None	SC	IUCN:LC		Nest sites associated only with old growth stands of Douglas-fir. Forages over most terrains and habitats.	Roosts in hollow trees and snags, and occasionally in chimneys and buildings.	Absent: Though there are four recent records (last record from 1999) within five kilometers, there is no suitable nesting habitat within the project site.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
<i>Picoides pubescens turatii</i>	Downy woodpecker	None	None	MSHCP		Generally nests in deciduous (often willow) woodlands, deciduous growth/oak woodlands, orchards, suburban plantings, and occasionally in conifers.	Requires abundant snags, and tree/shrub, tree/herbaceous, and shrub/herbaceous ecotones.	Not likely to occur: Though there are 22 recent records (last record from 1999) within five kilometers, the habitat within the project site is considered marginal for foraging and nesting.
<i>Sphyrapicus thyroideus thyroideus</i>	Williamson's sapsucker	None	None	MSHCP		Montane spruce-fir, Douglas fir, lodgepole pine, ponderosa pine forests and mixed deciduous-coniferous forest, oak-juniper and pine-oak forests	Cavity-nester, most often in Aspen trees.	Absent: Though there is one recent record (1998) within five kilometers, there is no suitable foraging or nesting habitat within the project site.
<i>Empidonax traillii extimus</i>	Southwestern willow flycatcher	FE	SE	MSHCP, Audubon, USBC		Restricted to riparian woodlands along streams and rivers with mature, dense stands of willows (<i>Salix</i> spp.), cottonwoods (<i>Populus</i> spp.) or smaller spring fed or boggy areas with willows or alders (<i>Alnus</i> spp.).	Nests from zero to 13 feet above ground in thickets of trees and shrubs approximately 13 to 23 feet tall with a high percentage of canopy cover and dense foliage.	Not likely to occur: Though there is one recent record (1991) within ten miles, and six records (last record from 1999) within five kilometers, the southern willow scrub community immediately adjacent to the project site is marginal foraging and nesting habitat for the species.
<i>Lanius ludovicianus</i>	Loggerhead shrike	None	SC	MSHCP, IUCN:LC, BCC		Savannah, scrub, orchards, grassland.	Nests in dense, thorny shrubs and small trees. Uses thorns and barb wire fences to hook prey items.	May occur: There is one recent record (1994) within ten miles, and 20 records (last record in 1999) within five kilometers, and suitable foraging and nesting habitat within the project site.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
<i>Vireo bellii pusillus</i>	Least Bell's vireo	FE	SE	MSHCP, ABC, Audubon, IUCN:NT, USBC, BCC		Summer resident of southern California. Inhabits low riparian growth in vicinity of water or in dry river bottoms, below 2,000 ft.	Nests placed along margins of bushes or twigs projecting into pathways, usually willow, <i>Baccharis</i> , mesquite.	Not likely to occur: Though there are ten recent records (1987, 1994, 1999, 2004, 2007, two from 2001, and three from 2003) and two historic records (1983, 1978) within ten miles and 10 recent records (last record from 1999) within five kilometers, the southern willow scrub community immediately adjacent to the project site is marginal foraging and nesting habitat for the species.
<i>Eremophila alpestris actia</i>	California horned lark	None	SC	MSHCP, IUCN:LC		Open habitats, usually where trees and large shrubs are absent.	Breed in level or gently sloping shortgrass prairie, montane meadows, "bald" hills, opens coastal plains, fallow grain fields, and alkali flats	Present: This species was observed within the project site. In addition, there are two recent records (both from 1992) within ten miles, and 13 historic records (last record from 1896) within five kilometers. There is suitable foraging and nesting habitat within the project site.
<i>Tachycineta bicolor</i>	Tree swallow	None	None	MSHCP		Frequents valley foothill and montane riparian habitats below 2,700 meters (9000 ft) for breeding within its range.	Nests almost exclusively in cavity-containing trees or snags with cavities that are near, or preferably in, water. Forage primarily over and around ponds, marshes, rivers, lakes, and estuaries.	Absent: Though there are seven recent records (last record from 1999) within five kilometers, there is no suitable nesting habitat within the project site. May forage over the project site.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
<i>Progne subis subis</i>	Purple martin	None	SC	MSHCP, FSS, IUCN: LC		Forage over a variety of habitats usually near water.	Breed in tall sycamores, pines, and other large trees in or near oak woodlands or open coniferous forest.	Not likely to occur: Though there is one recent record (1999) within five kilometers, the habitat within the project site is considered marginal for nesting. May occasionally forage and suitable foraging within the project site.
<i>Campylorhynchus brunneicapillus cousei</i>	Cactus wren	None	SC	MSHCP		Southern California coastal sage scrub.	Requires tall <i>Opuntia</i> cactus for nesting and roosting.	Absent: Though there are nine historic records (last record from 1908) within five kilometers, there is no suitable foraging or nesting habitat within the project site.
<i>Polioptila californica californica</i>	Coastal California gnatcatcher	FT	SC	MSHCP, ABC, Audubon, IUCN:LC, USBC		Obligate permanent resident of coastal sage scrub below 2,500 ft in southern California.	Low, coastal sage scrub, in arid washes, on mesas and slopes. Prefers stands dominated by <i>Artemisia californica</i> .	Absent: Though there are 41 recent records (dates from 1988-2008) and two historic record (1928 and 1924) within ten miles, and 11 records (last record in 1998) within five kilometers, there is no suitable foraging or nesting habitat within the project site.
<i>Catharus ustulatus</i>	Swainson's thrush	None	None	FSS, MSHCP		Nests and forages near water in wooded riparian habitats.	Willow thickets of the lowlands along shaded streams.	Absent: Though there are two recent records (last record 1999) within five kilometers, there is no suitable foraging or nesting habitat within the project site.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
<i>Vermivora ruficapilla ridgwayi</i>	Nashville warbler	None	None	MSHCP		Breeds in pine, hardwood and conifer forests in the Sierras and in montane chaparral habitats	In summer habitat in the San Gabriel and San Bernardino Mountains, where breeding is presumed but not observed to occur, individuals are found on shaded slopes within mixed coniferous forests with California black oaks and yellow pines and brush communities with Manzanita.	Absent: Though there are two recent records (last record from 1997) within five kilometers, there is no suitable foraging or nesting habitat within the project site.
<i>Dendroica petechia brewsteri</i>	Yellow warbler	None	SC	MSHCP, IUCN:LC		Riparian woodlands. Prefers willows, cottonwoods, aspens, sycamores, and alders for nesting and foraging.	Low, bushy, open-canopy riparian woodland.	Absent: Though there is one recent record (2000) within ten miles, and 15 recent records (last record from 1999) within five kilometers, there is no suitable foraging or nesting habitat within the project site.
<i>Wilsonia pusilla pileolata</i>	Wilson's warbler	None	None	MSHCP		Breeding habitats include montane meadows and low, dense willow thickets often on steep slopes.	Prefer native willow habitat during spring migration.	Absent: Though there are 13 recent records (last record from 1999) within five kilometers, there is no suitable foraging or nesting habitat within the project site.
<i>Icteria virens</i>	Yellow-breasted chat	None	SC	MSHCP, IUCN:LC		Found in dense, relatively wide riparian woodlands and thickets of willows, vine tangles, and dense brush with well-developed understories. Nesting areas are associated with streams, swampy ground, and the borders of small ponds.	Nests in low, dense riparian, consisting of willow, blackberry, wild grape; forage and nest within 10 ft of the ground.	Absent: Though there is one recent record (2000) within ten miles, and 23 recent records (last record from 1999) within five kilometers, there is no suitable foraging or nesting habitat within the project site.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
<i>Aimophila ruficeps canescens</i>	Southern California rufous-crowned sparrow	None	SC	MSHCP, IUCN:LC		Resident in southern California coastal sage scrub and sparse mixed chaparral.	Frequents relatively steep, often rocky hillsides with grass and forb patches.	Absent: Though there are four recent records (1997, 1999, 2001, and 2003) within ten miles and one recent record (1999) within five kilometers, there is no suitable foraging or nesting habitat within the project site.
<i>Amphispiza belli belli</i>	Bell's sage sparrow	None	SC	MSHCP, IUCN:LC, BCC		Nests in hard chaparral dominated by fairly dense stands of chamise. Found in coastal sage scrub in south of range.	Nests located on the ground beneath shrub or in a shrub 6-18 inches above ground.	Absent: Though there are two recent records (1999, 2001) within ten miles, and nine historic records (last record from 1891) within five kilometers there is no suitable foraging or nesting habitat within the project site.
<i>Zonotrichia lincolnii alticola</i>	Lincoln's sparrow	None	None	MSHCP		Breeds in wet montane meadows of corn lily, sedges and low willows.	Prefer dense, low underbrush often in disturbed edges with grasses and weeds mixed with shrubs.	Absent: Though there are five recent records (last record from 1993) within five kilometers, there is no suitable foraging or nesting habitat within the project site.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
<i>Agelaius tricolor</i>	Tricolored blackbird	None	SC	MSHCP, ABC, Audubon, BLMS, IUCN:LC, USBC, BCC		Highly colonial species, most numerous in the Central Valley and vicinity. Largely endemic to California.	Requires open water, protective nesting substrate and foraging area with insect prey within a few km of the colony.	Not likely to occur: Though there are two recent (1992, 1999) and one historic (1950) records within ten miles, and six historic records (last record from 1974) within five kilometers, the habitat within the project site (drainage in the artificial wet meadow) is considered marginal for nesting. May forage within the project site during winter.
Mammals								
<i>Myotis yumanensis</i>	Yuma myotis	None	None	BLMS, IUCN:LC, WBWG:LM		Riparian, desert scrub, moist woodlands and forests. Nursery colonies usually are in buildings, caves and mines, and under bridges.	Near open water. Nursery colonies usually are in buildings, caves and mines, and under bridges.	Absent: Though there is one recent record (1997) within ten miles, there is no suitable roosting habitat within the project site. May occasionally forage over the project site.
<i>Lasiurus xanthinus</i>	Western yellow bat	None	SC	WBWG:H, IUCN:LC		Found in wooded areas and desert scrub.	Roosts in foliage, particularly in palm trees.	Not likely to occur: Though there are four recent (1989, 1999, and two from 1996) and two historic (1984, 1981) records within ten miles, the habitat within the project site is considered marginal.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
<i>Antrozous pallidus</i>	Pallid bat	None	SC	BLMS, IUCN:LC, FSS, WBWG:H		Deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting.	Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites. Arid, low elevations (<6,000 feet); roost in deep crevices in rock faces, buildings, or bridges.	Absent: Though there is one historic record (1974) within five kilometers, there is no suitable roosting habitat within the project site. May occasionally forage over the project site.
<i>Nyctinomops femorosaccus</i>	Pocketed free-tailed bat	None	SC	IUCN:LC, WBWG:M		Variety of arid areas within pine-juniper woodlands, desert scrub, palm oasis, desert wash, and desert riparian.	Rocky areas with high cliffs.	Absent: Though there is one recent record (1997) and four historic records (1986, 1988, and two in 1985) within ten miles, there is no suitable roosting habitat within the project site. May occasionally forage over the project site.
<i>Eumops perotis californicus</i>	California mastiff bat	None	SC	BLMS, IUCN:LC, WBWG:H		Many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral, etc.	Roosts in crevices in cliff faces, high buildings, trees and tunnels.	Absent: Though there are three recent records (1992, 1993, and 1997) and two historic records (1933, 1954) within ten miles, there is no suitable roosting habitat within the project site. May occasionally forage over the project site.
<i>Mustela frenata latriostra</i>	Long-tailed weasel	None	None	MSHCP		Chaparral, coastal scrub, grassland, riparian forest.	Areas supporting large populations of small mammals (burrows) and birds. Appears to be partially restricted to habitats in close proximity to standing water.	Not likely to occur: Though there is suitable habitat within the project site, there are only two historic records (last record from 1974) within five kilometers.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
<i>Taxidea taxus</i>	American badger	None	SC	IUCN:LC		Grasslands, savannas, and mountain meadows.	Friable soils, and relatively open, uncultivated ground.	Not likely to occur: Though there is suitable habitat within the project site, there is only an historic record (1974) within five kilometers.
<i>Canis latrans clepticus</i>	Coyote	None	None	MSHCP		Chaparral, coastal scrub, grassland, short-grass prairie, semiarid sagebrush, and broken forests.	Natal dens are associated with brush-covered slopes, thickets, hollow logs, rocky ledges, and burrows.	Present: Sign of this species was observed within the project site. In addition, there are two historic records (last record from 1974) within five kilometers, and there is suitable habitat within the project site.
<i>Lynx rufus californicus</i>	Bobcat	None	None	MSHCP		Primarily in foothills comprised of chaparral, but also in coastal scrub, grassland, woodland, and riparian forest.	Rocky and brushy areas near springs or other perennial water sources.	Not likely to occur: Though there is suitable habitat within the project site, there is only an historic record (1974) within five kilometers.
<i>Chaetodipus fallax fallax</i>	Northwestern San Diego pocket mouse	None	SC	MSHCP, IUCN:DD		Coastal scrub, chaparral, grasslands.	Sandy, herbaceous areas, usually in association with rocks or coarse gravel.	May occur: There are two recent (1994 and 1995) records within five miles, and two recent records (last record in 1995) within five kilometers, and there is suitable habitat within the project site.
<i>Dipodomys stephensi</i>	Stephens' kangaroo rat	FE	ST	MSHCP		Primarily annual and perennial grasslands, but also occurs in coastal scrub and sagebrush with sparse canopy cover.	Prefers buckwheat, chamise, brome grass and filaree. Will burrow into firm soil.	Not likely to occur: Though there are four recent records (1989, 1991, and two from 1990) within five miles, the dense non-native grassland within the project site is considered marginal habitat.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
<i>Neotoma lepida intermedia</i>	San Diego desert woodrat	None	SC	MSHCP, IUCN:DD		Coastal scrub, chaparral, grassland, oak woodland.	Particularly abundant around rock outcrops, boulders, cholla cacti patches, rocky cliffs and slopes, and areas of dense undergrowth.	Not likely to occur: Though there is one historic record (1974) within five kilometers, the dense non-native grassland within the project site is considered marginal habitat.
<i>Lepus californicus bennettii</i>	San Diego black-tailed jackrabbit	None	SC	MSHCP, IUCN:LC		Coastal sage scrub habitats in southern California.	Intermediate canopy stages of shrub habitats and open shrub/herbaceous and tree/herbaceous edges.	Not likely to occur: Though there are two recent records (1997 and 2001) within five miles, and two historic records (last record 1974), the dense non-native grassland within the project site is considered marginal habitat.
<i>Sylvilagus bachmani cinerascens</i>	Brush rabbit	FE	SE	MSHCP, IUCN:LC		Most often in chaparral, but also coastal scrub and oak woodland.	Brushy areas; concentrate their activities at the edge of brushy habitats.	Absent: Though there is one historic record (1974) within five kilometers, there is no suitable habitat within the project site.
Habitats								
Southern California Arroyo Chub/Santa Ana Sucker Stream		None	None			Streams having sand, rubble, or boulder bottoms of clear water with riparian vegetation comprised of <i>Alnus rhombifolia</i> , <i>Platanus racemosa</i> , and <i>Salix</i> spp.	Streams within Southern California known to host Arroyo Chub/Santa Ana Sucker	Absent: Not identified within the project site.
Southern Cottonwood Willow Riparian Forest		None	None			Sub-irrigated and frequently overflowed lands along rivers and streams.	Dominated by <i>Populus fremontii</i> , <i>P. trichocarpa</i> , and tree willows; tall, open, broadleaved winter-deciduous riparian forest with a shrubby willow understory.	Absent: Not identified within the project site.

Special-status Plant and Wildlife Species Known to Occur within the Project Vicinity

Scientific Name	Common Name	Federal Status	State Status	Other	CNPS Status	General Habitat	Micro Habitat	Potential For Occurrence
Southern Sycamore Alder Riparian Woodland		None	None			Very rocky streambeds subject to seasonally high-intensity flooding.	Dominated by <i>Platanus racemosa</i> and often <i>Alnus rhombifolia</i> ; tall, open, broadleaved winter-deciduous streamside stands which seldom form a closed canopy.	Absent: Not identified within the project site.
Southern Willow Scrub		None	None			Dense, broadleaved, winter-deciduous riparian thickets. Loose, sandy or fine gravelly alluvium deposited near stream channels during flood flows.	Dominated by <i>Salix</i> spp., with scattered emergent <i>Populus fremontii</i> and <i>Platanus racemosa</i> . Along major rivers of coastal southern California.	Absent: Not identified within the project site.

Status Codes:

Federal

- FT = Federal Threatened
- FE = Federal Endangered
- FPT = Federal Proposed Threatened
- FPE = Federal Proposed Endangered
- FPD = Federal Proposed Delisting
- FC = Federal Candidate
- FD = Federal Delisted

State

- CE = California listed as Endangered
- CT = California listed as Threatened
- CR = California Rare Species
- SC = California Species of Special Concern
- FP = California Fully Protected

Other

- FSS = Forest Service Sensitive
- BLMS = Bureau of Land Management Sensitive
- CDFS = California Dept. of Forestry Sensitive
- MSHCP = Western Riverside County MSHCP-covered Species
- IUCN = International Union for Conservation of Nature and Natural Resources
- CR: Critically Endangered
- DD: Data Deficient
- EN: Endangered
- LC: Least Concern
- NT: Near Threatened
- VU: Vulnerable

WBWG = Western Bat Working Group

- H: High Priority
- MH: Medium-High Priority
- M: Medium Priority
- LM: Low-Medium Priority
- USBC = The United States Bird Conservation Watch List
- ABC = The American Bird Conservancy Green List
- Audubon = WatchList
- Xerces = Xerces Society
- CI: Critically Imperiled
- DD: Data Deficient
- IM: Imperiled
- VU: Vulnerable

CNPS

- List 1B = Plants rare or endangered in California and elsewhere
- List 2 = Rare, threatened, or endangered in California, but more common elsewhere.
- List 3 = We need more information about this plant (Review List).
- 0.1 = Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
- 0.2 = Fairly endangered in California (20-80% occurrences threatened)
- 0.3 = Not very endangered in California (<20% of occurrences threatened)
- CA-Endemic = Plant's native range is confined to California



Attachment D

CULTURAL RESOURCES SURVEY

**Cultural Resources Survey for the
Proposed Riverside Airport
Improvement Project
City and County of Riverside, California**

Prepared for

Coffman Associates

Prepared by

SWCA Environmental Consultants

May 2011

CONFIDENTIAL – NOT FOR PUBLIC DISTRIBUTION

**CULTURAL RESOURCES SURVEY FOR THE
PROPOSED RIVERSIDE AIRPORT IMPROVEMENT PROJECT,
CITY AND COUNTY OF RIVERSIDE, CALIFORNIA**

Prepared for

Coffman Associates
237 N.W. Blue Parkway, Suite 100
Lee's Summit, Missouri 64063
816.524.3500

Prepared by

John Dietler, Ph.D., RPA,
William Sawyer, M.A., Shannon Carmack, B.A.,
and
Susan Underbrink, M.A.,

SWCA Environmental Consultants
150 S. Arroyo Parkway, 2nd Floor
Pasadena, California 91105
(626) 240-0587
www.swca.com

USGS 7.5-Minute Quadrangles
Riverside West, California

SWCA Project No. 14079

SWCA Cultural Resources Report Database No. 2009-405

Final
May 25, 2011

Key Words: cultural resources survey; intensive; 145.7 acres; positive results; City of Riverside; Riverside County, CA-RIV-1711; CA-RIV-8897; CA-RIV-8898; CA-RIV-8899; P-33-11633; P-33-17093; P-33-17096; P-33-17097; prehistoric; American period; bedrock milling; historic artifacts; foundation; trough; water tank; Township 2S, Range 5W

MANAGEMENT SUMMARY

Purpose and Scope: SWCA Environmental Consultants (SWCA) was retained by Coffman Associates on behalf of the Riverside Airport to conduct a cultural resources survey, for proposed improvements to the Riverside Airport. The purpose of the various airport improvements is two-fold. First, the improvements are needed to ensure that Federal Aviation Administration (FAA) airport design standards are upheld to the maximum extent practicable, particularly in relation to the runway protection zones (RPZ) and runway safety area (RSA), without significantly impairing use of the airfield. Secondly, the improvements are being undertaken to improve the efficiency and circulation on the airfield. The project consists of 145.7 acres, situated on four discontinuous areas, located in the city and county of Riverside, California.

This technical report was prepared to comply with current federal environmental review policies. National Environmental Policy Act (NEPA) guidelines require the identification of historic properties, and that project-related effects on those properties be considered as part of the environmental assessment process. That adherence includes Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, as required by the Advisory Council on Historic Preservation (ACHP), and with regulations contained in 36 Code of Federal Regulations (CFR), Part 800. Section 106 of the NHPA defines “historic properties” as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places. Effects under Section 106 of the NHPA are delineated in the “Criteria of Effect and Adverse Effect” (36 CFR Section 800.5(1)).

Dates of Investigation: SWCA archaeologist Susan Underbrink completed a cultural resources literature search at the Eastern Information Center (EIC) on February 26, 2008. SWCA contacted the Native American Heritage Commission (NAHC) on February 26, 2008, requesting a search of the Sacred Lands File for traditional cultural resources and a list of Native American contacts. We attempted to contact each of these contacts by mail on February 28 and by telephone on March 19 and 20, 2008. SWCA cultural resources specialists conducted intensive surveys of the area of potential effects (APE) on February 27, 2008, November 4, 2009, and January 17, 2010. This report was finalized in April 2011.

Investigation Constraints: Ground-surface visibility ranged from low to high throughout the project area. Visibility was between zero and 100 percent throughout the project. Within the western segment of the project area, one acre was obstructed by tall vegetation and transient camps and consequently subjected only to reconnaissance level survey.

Summary of Findings: The records and literature search indicated that 47 previously recorded cultural resources are located within a one-mile radius of the APE, including 16 prehistoric archaeological sites or isolates, 5 historic archaeological sites, and 26 buildings and/or historic structures. Of these 47 previously recorded resources, two are within the APE and three are adjacent. This indicates that there is a moderate to high sensitivity for historic-period buildings and archaeological resources in the APE. The records and literature search also identified 14 previously conducted cultural resources studies within a one-mile radius of the APE. Three of these studies cover portions of the project APE.

The NAHC Sacred Lands File search for traditional cultural resources failed to indicate the presence of Native American cultural resources in the immediate vicinity of the proposed project area. The NAHC response included a list of 12 Native American groups and/or individuals for Riverside County who may have knowledge of cultural resources in the project area. SWCA sent letters describing the proposed project along with location maps via U.S. mail to these 12 groups. Responses were received from two of the 12 Native American groups. These responses are documented in Table 5. The Pechanga Tribe has

requested formal government-to-government consultation regarding the project with the FAA or its representative.

The field surveys identified six cultural resources, all in the eastern portion of the project area. These include one bedrock milling archaeological site (CA-RIV-8899/33-17095), two sites containing bedrock milling features and historic refuse scatters (CA-RIV-8897/33-17092 and CA-RIV-8898/33-17094), one built environment resource, a water tank (33-17096), one historic site containing a refuse scatter and feature (33-17093) and one historic site containing built environment resources (concrete features) and a refuse scatter (33-17097). The three bedrock milling sites (CA-RIV-8897/33-17092, CA-RIV-8898/33-17094, and CA-RIV-8899/33-17095) may be affiliated or synonymous with previously recorded, but poorly mapped CA-RIV-1711 (33-01711). Although recorded here as three separate prehistoric or multi-component archaeological sites, these may actually represent a single component Ethnographic period occupation.

Evaluations and Recommendations: One previously recorded residence (33-11633) was documented within the project area, however the building was found not eligible for listing in the CRHR and NRHP. No further action is recommended regarding this property. A reportedly Ethnographic period archaeological site, CA-RIV-1711 (33-01711), may be located within the APE. It is discussed below.

Three of the newly recorded historic-period resources (33-17093, 33-17096, and 33-17097) have been evaluated in the course of this study and found not eligible for listing in the NRHP or local registers. Resource 33-17093 lacks integrity; does not embody the distinctive characteristics of a type, period, or method of construction, represent the work of a master, or possess high artistic values; and it has no significant associations to events or persons important to history (Criteria A, B, and C). Furthermore, it is not likely to yield information important in history (Criterion D). Resources 33-17096 and 33-17097 do not warrant further evaluation under Criteria A, B, or C because they no longer retain integrity sufficient to convey their association with significant events or persons. It is also not likely to yield information important in history (Criterion D). None of these resources are eligible as a contributor to a historic district, nor do they qualify for local listing. Thus any impacts to these three resources would be less than significant.

The three bedrock milling archaeological sites (CA-RIV-8897/33-17092, CA-RIV-8898/33-17094, and CA-RIV-8899/33-17095) within the project area have not been formally evaluated for listing in the NRHP or local register. If previously recorded CA-RIV-1711 (33-01711) is located within the APE, it almost certainly corresponds to one or more of these three sites. Thus mitigation applied to the three newly recorded bedrock milling sites would also address any project impacts to CA-RIV-1711 (33-01711). None of these sites has been formally evaluated for listing in the NRHP or local register.

Impacts to those unevaluated resources should be avoided during project improvements. If project engineering plans change such that that impact avoidance is not possible, additional mitigation measures are required to address these impacts. SWCA recommends that a qualified archaeologist be present to monitor ground-disturbing activities during grading at these three locations. SWCA also recommends that, prior to initiation of ground-disturbing activities, a qualified archaeologist conduct a worker cultural awareness training session. In the event that cultural resources are discovered during ground-disturbing activities, such as grading, grubbing, and vegetation clearing, work in the immediate area must be halted and the project archaeologist should be notified immediately to evaluate the resource(s) encountered. Lastly, a Native American tribe has recommended that a Native American monitor observe all archaeological studies and all ground-disturbing activities conducted in connection with the project.

Disposition of Data: This report will be filed with Coffman Associates; the Eastern Information Center located at the University of California, Riverside; and SWCA Environmental Consultants. All field notes and records related to the project will remain on file at the Pasadena office of SWCA.

Archaeological and other heritage resources can be damaged or destroyed through uncontrolled public disclosure of information regarding their location. This document contains sensitive information regarding the nature and location of archaeological sites which should not be disclosed to the general public or unauthorized persons.

Information regarding the location, character, or ownership of a cultural resource is exempt from the Freedom of Information Act pursuant to 16 USC 470w-3 (National Historic Preservation Act) and 16 USC Section 470(h)(h) (Archaeological Resources Protection Act).

CONTENTS

Management Summary	i
Introduction.....	1
Project Description	2
Regulatory Setting	3
National Register of Historic Places (National Register)	3
Environmental Setting.....	6
Climate.....	6
Hydrology	6
Geology	6
Ecological Setting.....	7
Vegetation Communities	7
Faunal Resources.....	12
Cultural Setting.....	13
Prehistoric Overview	13
Early Man Period/San Dieguito/Paleo-Coastal (ca. 10,000–6000 B.C.)	14
Milling Stone Period (ca. 6000–3000/1000 B.C.)	15
Intermediate Period (ca. 3000/1000 B.C.–A.D. 500/650)	16
Late Prehistoric Period (ca. A.D. 500/650–A.D. 1769).....	17
Ethnographic Overview	19
Luiseño	19
Cahuilla.....	20
Historic Overview.....	23
Spanish Period (1769–1822)	23
Mexican Period (1822–1848)	24
American Period (1848–Present).....	24
Local History: City of Riverside.....	25
Pre-field Research.....	25
Literature Search.....	25
Prior Studies in One-Mile Radius of APE.....	26
Previously Recorded Cultural Resources within One-Mile Radius of APE.....	27
Historic Maps.....	30
Native American Consultation.....	30
Methods.....	33
Field Survey.....	33
Cultural Resource Recordation.....	33
Results and Evaluations	34
CA-RIV-8897 (33-17092): Bedrock Milling Feature and Historic Artifact Scatter.....	34
33-17093: Historic Feature and Artifact Scatter.....	38
CA-RIV-8898 (33-17094): Bedrock Milling Feature and Historic Artifact Scatter.....	39
Locus A	39
Locus B.....	40
Locus C.....	40
Locus D	40
CA-RIV-8899 (33-17095): Bedrock Milling Features	40
33-17096: Historic Water Tank.....	41
33-17097: Historic Features and Artifact Scatter	42
Summary and Recommendations.....	43

Avoidance of Potentially Eligible Archaeological Sites.....	44
Monitoring of Ground-Disturbing Activity	44
NRHP Evaluation of Archaeological Sites	47
Native America Monitoring of Ground-Disturbing Activity and Archaeological Testing.....	47
Worker Cultural Awareness Training	48
Inadvertent Discoveries	48
Human Remains.....	48
References.....	49

FIGURES

Figure 1. Project Location Map	5
Figure 2. SWCA Survey Coverage	35
Figure 3. Cultural Resources Identified During Survey (CONFIDENTIAL).....	36
Figure 4. Avoidance and Monitoring Recommendation.....	45
Figure 5. Cultural Resources and Ground Disturbance (CONFIDENTIAL).....	46

TABLES

Table 1. Major Flora Indigenous to the Project Vicinity	7
Table 2. Major Fauna Indigenous to the Project Vicinity	12
Table 3. Prior Cultural Resources Studies within One Mile of the Project Area.....	26
Table 4. Previously Recorded Cultural Resources within One Mile of the Project Area	27
Table 5. Consultation with Local Native American Groups.....	31
Table 6. Recommended Mitigation for Cultural Resources within the APE.....	47

PHOTOGRAPHS

Photograph 1. View to the north of CA-RIV-8897 (33-17092).....	37
Photograph 2. Close-up of 33-17093.	38
Photograph 3. View northeast of Locus B, CA-RIV-8898 (33-17094)	39
Photograph 4. View south of CA-RIV-8899 (33-17095).....	41
Photograph 5. View east of 33-17096.....	42
Photograph 6. View of 33-17097	43

APPENDICES

APPENDIX A: Records Search Bibliography
APPENDIX B: Native American Scoping Documents
APPENDIX C: California Department of Parks & Recreation Series 523 Forms

INTRODUCTION

Contracting Data: Coffman Associates retained SWCA Environmental Consultants (SWCA) to conduct an intensive cultural resources survey for the proposed improvements to Riverside Airport. SWCA's investigation included a literature search and records review, a Sacred Lands File search, Section 106 consultation and an intensive pedestrian survey of the proposed direct area of potential effect (APE) for any prehistoric or historic cultural resources. The project will be completed under regulatory oversight of the Federal Aviation Administration (FAA) with proposed runway safety area improvements; therefore, this report was prepared to identify historic properties, as defined by Section 106 of the National Historic Preservation Act (NHPA).

Regulatory Setting: Current environmental review policies, in compliance with National Environmental Policy Act (NEPA) guidelines, require the identification of historic properties, and that consideration of project-related effects on those properties be considered as part of the environmental assessment process. This report was prepared to comply with Section 106 of the NHPA of 1966, as amended, as required by the Advisory Council on Historic Preservation (ACHP), and with regulations contained in 36 Code of Federal Regulations (CFR), Part 800. These regulations require that federal agencies to consider the effects of proposed projects on historic properties as part of the environmental assessment process.

Section 106 of the NHPA of 1966 (as amended) defines "historic properties" as:

Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR Part 800 Protection of Historic Properties, §800.16 Definitions [1]).

Effects under Section 106 of the NHPA are delineated in the "Criteria of Effect and Adverse Effect" (36 CFR Section 800.5(1)). Adverse or negative effects that may be caused by undertakings on historic properties include, but are not limited to:

1. Physical destruction of or damage to all or part of the property;
2. Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;
3. Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
4. Neglect of a property resulting in its deterioration or destruction; and
5. Transfer, lease, or sale of the property (36 CFR Part 800.9 [b])

Under 36 CFR Part 800.9 (c) there can be "effects of an undertaking that would otherwise be found to be adverse [but] may be considered... not adverse for the purpose of these regulations," when the following applies:

1. When the historic property is of value only for its potential contribution to archeological, historical, or architectural research, and when such value can be substantially preserved through the conduct of appropriate research, and such research is conducted in accordance with applicable professional standards and guidelines
2. When the undertaking is limited to the rehabilitation of buildings and structures and is conducted in a manner that preserves the historical and architectural value of affected historic property

through conformance with the *Secretary... [of the Interior's] Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* or

3. When the undertaking is limited to the transfer, lease, or sale of a historic property, and adequate restrictions or conditions are included to ensure preservation of the property's significant historic features.

As described above, Section 106 of NHPA requires federal agencies to take into account effects of undertakings on historic properties and to allow the Advisory Council the opportunity to comment on those undertakings, following these regulations (36 CFR Part 800),

Properties that may be historic resources within the identified project APE were evaluated for National Register of Historic Places (National Register) eligibility, according to criteria set forth in 36 CFR Part 60.4. The age criterion for inclusion in the National Register is 50 years and older, except in cases of overriding significance (criteria consideration G).

If a proposed project and its related impacts would adversely affect the values of an archaeological or built environment site that is either listed in or determined eligible for inclusion in the National Register, such effects/impacts would be considered significant.

Report Format: The report meets the Secretary of the Interior's Standards and Guidelines and follows contemporary professional standards for the preparation of historic resources reports, as well as *Archaeological Resource Management Reports: Recommended Contents and Format* recommended by the California Office of Historic Preservation (1990).

PROJECT DESCRIPTION

The proposed project (Figure 1) will include improvements to the existing runway and airport property, in order to enhance the protection of people and property on the ground. Improvements included in the proposed project include reimbursement for land purchased within the runway protection zone (RPZ), relocation of existing gas line out of the Runway Safety Area (RSA), introduction of 155,000 cubic yards of fill into the RSA, addition of new parallel taxiway and connecting taxiways, aircraft apron construction and construction of new access road with drainage and utility improvements to be completed on the north side of the runway.

Area of Potential Effects: A proposed project-specific APE was established in accordance with 36 CFR Part 800.16(d), which defines an APE as:

the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

The proposed project APE was delineated to ensure identification of significant historical resources that may be directly or indirectly affected by the proposed project and are listed in or eligible for inclusion in the National Register. The proposed direct or archaeological APE is the proposed project right-of-way and/or areas of direct ground disturbance, which includes areas for staging and temporary building activities. The direct APE is limited to areas where project-related construction activities would or may result in ground disturbance and potential mitigation sites for state listed species.

Project Personnel: The report was prepared by SWCA Cultural Resources Specialists William Sawyer, Susan Underbrink, and Shannon Carmack. Underbrink, Sawyer, Jessica DeBusk, Charles Cisneros and John Covert conducted field surveys for the project. Architectural Historian Sonnier Francisco conducted preliminary building research for the project. John Dietler, SWCA Cultural Resources Principal Investigator and Certified Archaeological Consultant for the County of Riverside (Certification #227), reviewed the report. Ms. Underbrink, Mr. Sawyer, and Dr. Dietler are Registered Professional Archaeologists (RPA) who exceed the Secretary of the Interior's Professional Qualifications Standards (PQS) (36 CFR Part 61, Archaeology: Secretary of the Interior's Standards and Guidelines [as amended and annotated]) in archaeology. SWCA GIS Specialists Chad Flynn and Chris Query created the maps and figures used in the report; Jaimie Jones served as technical editor.

REGULATORY SETTING

The study was completed under the provisions of NHPA Section 106 (36 CFR Part 800). Cultural resources are considered during federal undertakings chiefly under Section 106 of NHPA of 1966 (as amended) through one of its implementing regulations, 36 CFR 800 (Protection of Historic Properties), as well as NEPA. Properties of traditional religious and cultural importance to Native Americans are considered under Section 101(d)(6)(A) of NHPA. Other federal laws include the Archaeological Data Preservation Act of 1974, the American Indian Religious Freedom Act of 1978, the Archaeological Resources Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1989, among others.

Section 106 of NHPA (16 United States Code [USC] 470f) requires federal agencies to take into account the effects of their undertakings on any district, site, building, structure, or object that is included in or eligible for listing in the National Register and to afford the ACHP a reasonable opportunity to comment on such undertakings (36 CFR 800.1). Under Section 106, the significance of affected historic properties is evaluated and mitigation measures are proposed to reduce those effects.

Significant cultural resources are those properties that are listed in, or eligible for listing in, the National Register in accord with criteria listed at 36 CFR 60.4 (ACHP 2000).

National Register of Historic Places (National Register)

The National Register is the nation's official list of districts, sites, buildings, structures, and objects worthy of preservation. Currently, the National Register includes approximately 80,000 listings, including icons of American architecture, engineering, culture, and history. According to Section 106, an "historic property" is defined as:

Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR Part 800 Protection of Historic Properties, Section 800.16 Definitions[1][1]).

Overseen by the National Park Service (NPS), under the Department of the Interior, the National Register was authorized under the NHPA, as amended. Its listings encompass all National Historic Landmarks as well as historic areas administered by NPS.

National Register guidelines for evaluation of significance were developed to be flexible and to recognize accomplishments of all who have made significant contributions to the nation's history and heritage. Its criteria were designed to guide state and local governments, federal agencies, and others in evaluating potential entries in the National Register. For a property to be listed in or determined eligible for listing, it must be demonstrated to possess integrity and to meet at least one of the following criteria. It must demonstrate:

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 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.

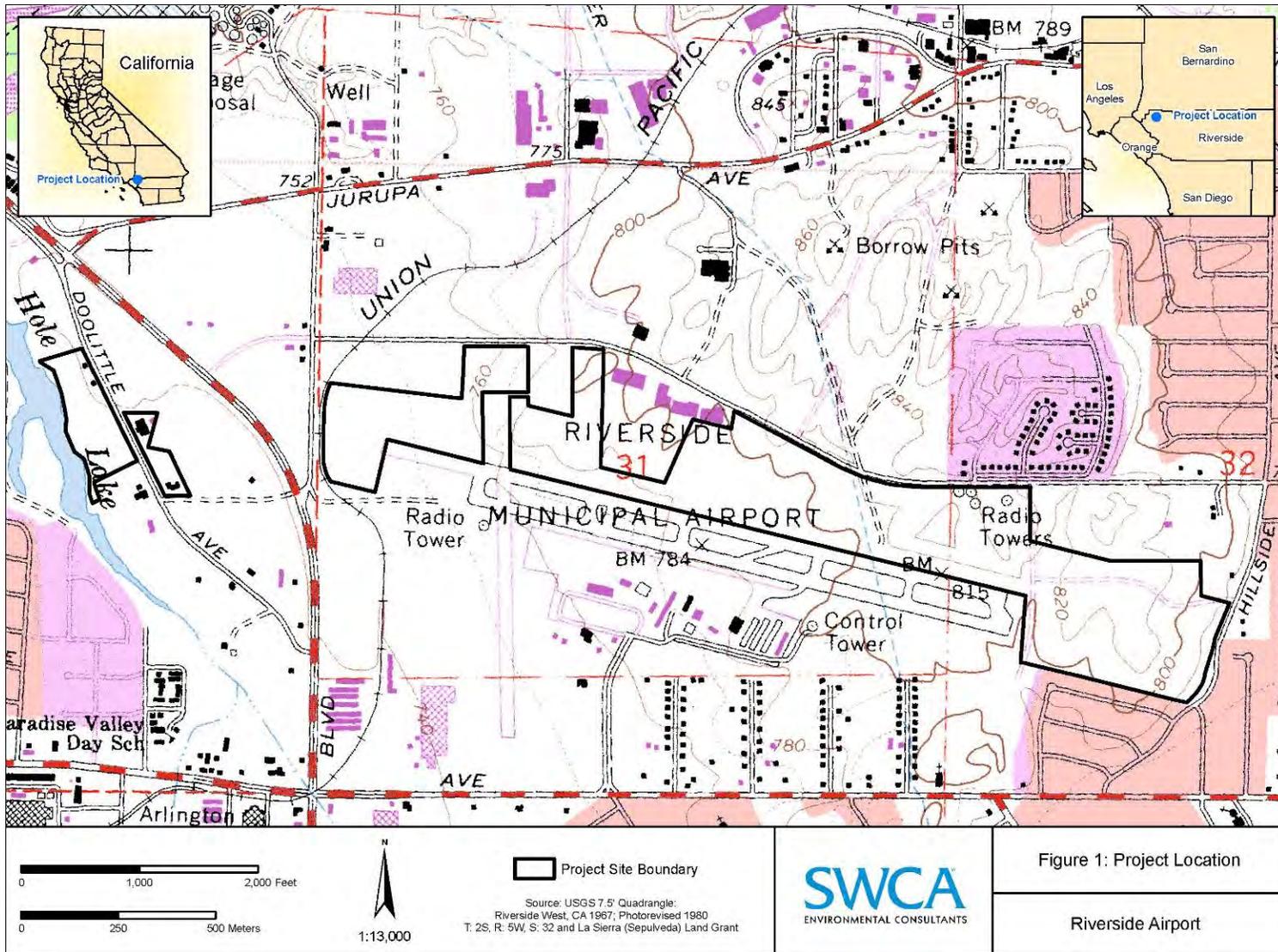


Figure 1. Project Location Map

ENVIRONMENTAL SETTING

The project area is located in the southwestern California region, and more specifically, within the south coast subregion. This subregion was previously dominated by coastal scrub and chaparral communities but has recently been urbanized, resulting in a great loss of undisturbed habitat (Hickman 1993).

CLIMATE

Today, the project area has generally hot, dry summers, with maximum temperatures ranging from 28.8 degrees to 33.3 degrees Centigrade (84 to 92 degrees Fahrenheit [°F]), and winter lows ranging from zero degrees to 6.6 degrees Centigrade (32°F to 44°F) (Munz and Keck 1968:17). The average annual precipitation is 28 centimeters (11 inches), with most occurring between November and March. The uplands generally have a warm Mediterranean-type climate with occasional summer thundershowers. Due to the low quantity of precipitation, there is little natural perennial surface water in the watershed; the rivers do not typically convey large volumes of water. River flow today includes highly treated discharges from wastewater treatment plants, as well as urban and irrigation runoff.

HYDROLOGY

The project area is located within the Santa Ana River watershed, with the Santa Ana River channel itself located approximately 150 meters (492 feet) south of the project area. The Santa Ana River watershed includes much of the Pomona, San Bernardino, and San Jacinto Valleys, and receives water from the southern flanks of the San Gabriel and San Bernardino Mountains and the flanks of the several smaller hill ranges surrounding the Santa Ana River. Lake Elsinore is the only natural freshwater lake of any size within the watershed, and is located approximately 32 km (20 miles) south of the project area.

The project area is flanked on the eastern side by a small, unnamed ephemeral drainage that drains directly into the Santa Ana River. The drainage has been extensively modified in recent times, and no longer retains its original shape and drainage pattern.

GEOLOGY

The project is positioned near the northern end of the Perris Block, which lies within the geomorphic province known as the Peninsular Ranges Province. Rivers in this province, including the Santa Ana River, drain westward into the Pacific Ocean. The Perris Block is a structurally stable, internally unfaulted mass of crustal rocks bounded on the west by the Elsinore-Chino fault zones, on the east by the San Jacinto fault zone, and on the north by the Cucamonga fault zone (Morton and Cox 1994, 2001; Morton and Matti 1989). On the south, the Perris Block is bounded by a series of sedimentary basins that lie between Temecula and Anza (Morton and Matti 1989).

Approximately 90 to 120 million years ago, during the Cretaceous period, a major episode of mountain building known as the Nevadan Orogeny caused the formation of massive granitic intrusions in what is today the Sierra Nevada mountain range. The granitic rocks of the Peninsular Ranges also formed around this time. Although similar in age and composition, the Peninsular granitics are generally less silicic and more calcic than typical Sierran granitics. The magma that fed the Peninsular and Sierran batholiths originated from melting crustal material during subduction of the Pacific Plate beneath the western edge of North America (Norris and Webb 1990). During the Miocene, about 25 to 29 million years ago, the Pacific plate was completely overridden by the North American plate. About 5 million years ago, the

Sierra Nevada Range, Coast Ranges, Transverse Ranges, and the Peninsular Ranges began to uplift. Studies on the nature and distribution of clasts shed from the Transverse and Peninsular Ranges and deposited on the Perris block suggest that the Peninsular Ranges formed further south of their present location and moved north along the San Andreas Fault (Morton and Matti 1989).

Across the Perris Block as a whole are a wide variety of plutonic rocks (including tonalite, quartz diorite, granodiorite, granite, and sparse small bodies of gabbro and diorite) that are part of the Peninsular Range Batholith (Morton and Cox 2001; Morton and Kennedy 1991)—sometimes called the Southern California Batholith. A batholith is a large mass of igneous rock that upwelled from deep in the earth’s crust, resulting in thousands of granitic boulders on the rounded hills in the project area and many more in the greater area. These boulders have the potential to form rock shelters and suitable outcrops as the basis for bedrock grinding features. The alluvial units that became deposited over and around these granitoid bodies consist variously of fluvial sand, gravel and cobbles, and strongly eroded gravel and pebbly sand. In the project vicinity, these sediments contain clasts of mylonite, quartzite, and plutonic rocks derived from the western San Bernardino Mountains, and have been interpreted as erosional remnants of a paleo-Santa Ana River that flowed further south than its present-day course (Morton and Cox 2001).

ECOLOGICAL SETTING

The ecological setting within and adjacent to the project area contains a mosaic of disturbed/developed areas and native vegetation communities. Though most of the uplands adjacent to the Santa Ana River have been developed and/or disturbed, there are remnant patches of upland habitat that indicate the range of habitats, and resources therein, that were likely available to the prehistoric inhabitants of the project area vicinity.

Vegetation Communities

Vegetation in the general vicinity of the project area consists of the following communities and, more specifically, includes those communities that likely existed near the project area in the past. Several communities, particularly those located along the Santa Ana River channel, still exist today. The description is based on data presented in Holland (1986), Holland and Keil (1995), and Sawyer and Keeler-Wolf (1995). A list of plants typical of vegetation communities within the project area vicinity is presented in Table 1, and the vegetation communities described below.

Table 1. Major Flora Indigenous to the Project Vicinity

Common Name	Scientific Name
Coastal Sage Scrub Community	
California sagebrush	<i>Artemisia californica</i>
California buckwheat	<i>Eriogonum fasciculatum</i>
Sages and chia	<i>Salvia</i> spp.
Encelias	<i>Encelia</i> spp.
Coast prickly pear	<i>Opuntia littoralis</i>
Monkeyflowers	<i>Mimulus</i> spp.
Deerweed	<i>Lotus scoparius</i>
Nightshades	<i>Solanum</i> spp.
Chaparral yucca	<i>Yucca whipplei</i>
Rock-rose	<i>Helianthemum scoparium</i>

Table 1. Major Flora Indigenous to the Project Vicinity

Common Name	Scientific Name
Golden yarrow	<i>Eriophyllum confertiflorum</i>
Lilies	<i>Bloomeria</i> and <i>Brodiaea</i> spp.
Onions	<i>Allium</i> spp.
Sanicles	<i>Sanicula</i> spp.
Lomatiums	<i>Lomatium</i> spp.
Soap plants	<i>Chlorogalum</i> spp.
Grasses	<i>Melica</i> , <i>Muhlenbergia</i> , <i>Nassella</i> , and <i>Vulpia</i> spp.
Live-forevers	<i>Dudleya</i> spp.
Grassland Community	
Grasses	<i>Melica</i> , <i>Muhlenbergia</i> , <i>Nassella</i> , and <i>Vulpia</i> spp.
Geophytes	
Onions	<i>Allium</i> spp.
Wildcelery	<i>Apiastrum angustifolium</i>
Common golden star	<i>Bloomeria crocea</i>
Brodiaeas	<i>Brodiaea</i> spp
Mariposa lily and allies	<i>Calochortus</i> spp.
Blue dicks	<i>Dichelostemma capitata</i>
Muillas	<i>Muilla</i> spp.
Blue-eyed grass	<i>Sisyrinchium bellum</i>
Live-forevers	<i>Dudleya</i> spp.
Herbaceous Plants	
Yellow fiddleneck	<i>Amsinckia menziesii</i>
Calandrinias	<i>Calandrinia</i> spp.
Common calyptidium	<i>Calyptidium monardum</i>
Suncups	<i>Camissonia</i> spp.
Owl's-clovers	<i>Castilleja</i> spp.
Chinese houses	<i>Collinsia heterophylla</i>
Cryptanthas	<i>Cryptantha</i> spp.
Delphiniums	<i>Delphinium</i> spp.
California poppy	<i>Eschscholzia californica</i>
Gilias	<i>Gilia</i> spp.
Tarweeds	<i>Hemizonia</i> spp.
Coast goldfields	<i>Lasthenia californica</i>
Common tidy-tips	<i>Layia platyglossa</i>
Linanthus	<i>Linanthus</i> spp.
Lomatiums	<i>Lomatium</i> spp.
Lotus	<i>Lotus</i> spp.
Lupines	<i>Lupinus</i> spp.
Microseris	<i>Microseris</i> spp.
Popcorn flowers	<i>Plagiobothrys</i> spp.
Sanicles	<i>Sanicula</i> spp.
Checker mallow	<i>Sidalcea malvaeflora</i>
Clovers	<i>Trifolium</i> spp.
Sub-shrubs	

Table 1. Major Flora Indigenous to the Project Vicinity

Common Name	Scientific Name
Astragalus	<i>Astragalus</i> spp.
Goldenbushes	<i>Ericameria</i> spp.
Buckwheats	<i>Eriogonum</i> spp.
Gum plant	<i>Grindelia camporum</i>
Goldenbushes	<i>Hazardia</i> spp.
Coast goldenbush	<i>Isocoma menziesii</i>
California aster	<i>Lessingia filaginifolia</i>
Deerweed	<i>Lotus scoparius</i>
Coast Live Oak Woodland Community	
Overstory	
Coast live oak	<i>Quercus agrifolia</i>
Western sycamore	<i>Platanus racemosa</i>
California walnut	<i>Juglans californica</i>
Willows	<i>Salix</i> spp.
Mid-story	
California blackberry	<i>Rubus ursinus</i>
Creeping snowberry	<i>Symphoricarpos mollis</i>
Toyon	<i>Heteromeles arbutifolia</i>
Currants	<i>Ribes</i> spp.
California bay	<i>Umbellularia californica</i>
Western poison oak	<i>Toxicodendron diversilobum</i>
Understory Species	
Bracken fern	<i>Pteridium aquilinum</i>
California polypody	<i>Polypodium californicum</i>
Fiesta flower	<i>Pholistorma auritum</i>
Indian lettuce	<i>Claytonia perfoliata</i>
Riparian Scrub/Woodland Community	
Overstory Species	
Box elder	<i>Acer negundo</i>
Big-leaf maple	<i>A. macrophyllum</i>
Valley oak	<i>Quercus lobata</i>
Coast live oak	<i>Q. agrifolia</i>
White alder	<i>Alnus rhombifolia</i>
Oregon ash	<i>Fraxinus latifolia</i>
California dogwood	<i>Cornus californica</i>
California bay	<i>Umbellularia californica</i>
Western sycamore	<i>Platanus racemosa</i>
Fremont's cottonwood	<i>Populus fremontii</i>
California walnut	<i>Juglans californica</i>
Mid-story Species	
Willows	<i>Salix</i> spp.
Mexican elderberry	<i>Sambucus mexicana</i>
Wild grape	<i>Vitis girdiana</i>

Table 1. Major Flora Indigenous to the Project Vicinity

Common Name	Scientific Name
Western poison-oak	<i>Toxicodendron diversilobum</i>
Understory Species	
Mugwort	<i>Artemisia douglasiana</i>
Monkeyflowers	<i>Mimulus</i> spp.
California rose	<i>Rosa californica</i>
Creeping snowberry	<i>Symphoricarpos mollis</i>
Freshwater Marshland	
Cattails	<i>Typha</i> spp.
Bulrushes	<i>Scirpus</i> spp.
Sedges	<i>Carex</i> spp.
Spike rushes	<i>Eleocharis</i> spp.
Flatsedges	<i>Cyperus</i> spp.
Smartweed	<i>Polygonum</i> spp.
Watercress	<i>Rorippa</i> spp.
Yerba mansa	<i>Anemopsis californica</i>
Pennywort	<i>Hydrocotyle</i> spp.
Pondweeds	<i>Potamogeton</i> spp.
Water-parsley	<i>Oenanthe sarmentosa</i>
Chaparral Community	
Shrubs	
Manzanitas	<i>Arctostaphylos</i> spp.
Wild-lilacs	<i>Ceanothus</i> spp.
Silk-tassel bushes	<i>Garrya</i> spp.
Oaks	<i>Quercus</i> spp.
Coffeeberry, redberry	<i>Rhamnus</i> spp.
Sugarbush and lemonade berry	<i>Rhus</i> spp.
Laurel sumac	<i>Malosma laurina</i>
Mountain-mahogany	<i>Cercocarpus betuloides</i>
Toyon	<i>Heteromeles arbutifolia</i>
Holly-leaf cherry	<i>Prunus ilicifolia</i>
Mission manzanita	<i>Xylococcus bicolor</i>
Vines	
Wild cucumbers	<i>Marah</i> spp.
Dodders	<i>Cuscuta</i> spp.
Chaparral-peas	<i>Lathyrus</i> spp.
Bedstraws	<i>Galium</i> spp.
Western poison-oak	<i>Toxicodendron diversilobum</i>
Honeysuckles	<i>Lonicera</i> spp.
Herbaceous Plants	
Lupines	<i>Lupinus</i> spp.
California threadstem	<i>Pterostegia drymarioides</i>
Indian lettuce	<i>Claytonia perfoliata</i>
Everlastings	<i>Gnaphalium</i> spp.

Table 1. Major Flora Indigenous to the Project Vicinity

Common Name	Scientific Name
Phacelias	<i>Phacelia</i> spp.
Gilias	<i>Gilia</i> spp.
Whispering bells	<i>Emmenanthe penduliflora</i>
Fiesta-flowers	<i>Pholistoma</i> spp.

Note: Sources include Holland and Keil (1995), Sawyer and Keeler-Wolf (1995), Holland (1986), Keeley (1990), Keeley and Keeley (1988), and Barbour and Major (1977)

Coastal Sage Scrub Community

In prehistoric times coastal sage scrub was common to Riverside and nearby areas, and provided a very rich resource for the prehistoric inhabitants. Seeds are the primary resource within the coastal sage scrub community, but edible stems, stalks, shoots, greens, roots, bulbs, and some berries also occur in these areas. Resources from coastal sage scrub communities are primarily available in the spring. Coastal sage scrub is characterized by a suite of low, aromatic, drought-tolerant shrubs and sub-shrub species. This vegetation community likely occurred over most of the project area in the prehistoric past. Remnant patches of this community were observed along the slopes north and east of the project area, including the hillside where a prehistoric archaeological site was identified during the survey.

Valley and Foothill Grassland

The grassland community near Riverside is quite varied. A primary resource for prehistoric inhabitants would have been seeds from the many annual grasses that grew in the area, as well as the many blossoms, greens, and bulbs that became available during the spring. Valley and foothill grasslands occur in a variety of forms ranging from scattered perennial bunch grasses (typically *Nassella pulchra* or *N. lepida*) to stands dominated by native perennial grasses in an assemblage of geophytes (plants with underground bulbs or corms), and herbaceous annual species. Valley and foothill grasslands also support an abundance of native geophytes, herbaceous plants, and sub-shrubs. The project area and its immediate vicinity likely contained grassland community prehistorically, particularly in open areas between stands of coastal sage scrub.

Coast Live Oak Woodland Community

Oak woodlands occur in sheltered valleys where the soil is deep. Acorns were a primary food resource for the native inhabitants, at least during the latter part of the archaeological sequence. Acorns become available in the fall, thus providing a rich resource during the time of year when other plants are far past their peak availability. As the name implies, coast live oak woodland is dominated by coast live oak (*Quercus agrifolia*), but is well represented by a number of other species. In drier areas, coast live oak woodland will mix with common chaparral and coastal sage scrub species. Coast live oak woodlands vary from savanna-like, with few to no woody associates, to dense woodlands. Oak woodlands likely occurred prehistorically along ephemeral drainages in the uplands surrounding the Santa Ana River, possibly within the drainage located along the eastern side of the project area.

Riparian Scrub/Forest

Riparian scrub is a mid-successional-stage community that typically matures into riparian forest; therefore, species composition between these habitat types is very similar. Riparian forest can revert to

riparian scrub through disturbances or frequent flooding events. This community exists along streams and around seeps and springs and continues to occur along the Santa Ana River channel. Many plants within this community, as well as animals attracted to the water and vegetation, would have provided abundant subsistence resources for prehistoric and historic period inhabitants.

Freshwater Marshland

Freshwater marshlands were likely an important part of the prehistoric environment, particularly along the Santa Ana River channel. Freshwater marshland is characterized by an abundance of perennial monocots up to 2 meters in height. Species commonly occurring in freshwater marshlands include cattails (*Typha* spp.), bulrushes (*Scirpus* spp.), sedges (*Carex* spp.), and spikerush (*Eleocharis* spp.), among others.

Chaparral

The chaparral community exists on higher elevated slopes surrounding the Santa Ana River Valley, and may have required a day’s walk by prehistoric inhabitants from the valley floor. Numerous shrub species occur in chaparral habitat, providing an abundance of seeds, berries, bulbs, shoots, and roots.

Faunal Resources

Wildlife species common to the vegetation communities in the vicinity of the project and available for exploitation by the local prehistoric peoples would have included mule deer (*Odocoileus hemionus*), cottontail (*Sylvilagus auduboni*), jackrabbit (*Lepus californicus*), and wood rats (*Neotoma* spp.); California quail (*Callipepla californica*), dove (*Zenaidura macroura*), and other birds, including waterfowl, associated with the marshes; and various types of reptiles, amphibians, fish, and insects. Although pronghorn antelope (*Antilocapra americana*) were barely noted by Euro-American settlers (Sleeper 1982), they were quite common in 1769 throughout the plains and valleys when the Portolá expedition traveled through the region, whereas deer were less common (Brown 2001:308, 325). Predators included mountain lion (*Felis concolor*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), and gray fox (*Urocyon cinereoargenteus*). A list of common vertebrate species that likely occurred in the project area vicinity, and that may have been harvested by the prehistoric occupants, are presented in Table 2.

Table 2. Major Fauna Indigenous to the Project Vicinity

Common Name	Scientific Name
Reptiles	
Coachwhip	<i>Masticophis flagellum</i>
California whipsnake	<i>Masticophis lateralis</i>
Gopher snake	<i>Pituophis catenifer</i>
California kingsnake	<i>Lampropeltis getula californiae</i>
Southern Pacific rattlesnake	<i>Crotalus oreganus helleri</i>
Western pond turtle	<i>Emys marmorata</i>
Birds	
Upland Communities	
California quail	<i>Callipepla californica</i>
Mourning dove	<i>Zenaida macroura</i>
California thrasher	<i>Toxostoma redivivum</i>

Table 2. Major Fauna Indigenous to the Project Vicinity

Common Name	Scientific Name
Red-tailed hawk	<i>Buteo jamaicensis</i>
Burrowing owl	<i>Athene cunicularia</i>
Greater roadrunner	<i>Geococcyx californianus</i>
Riparian and Marshland Communities	
Egrets	<i>Egretta</i> spp.
Hérons	<i>Ardea, Butorides, Nycticorax, and Nyctanassa</i> spp.
American bittern	<i>Botaurus lentiginosus</i>
Geese	<i>Branta</i> spp.
Wood duck	<i>Aix sponsa</i>
Ducks	<i>Anas, Aythya, and Bucephala</i> spp.
Mergansers	<i>Mergus</i> and <i>Lophodytes</i> spp.
Ruddy duck	<i>Oxyura jamaicensis</i>
Mammals	
Pocket gopher	<i>Thomomys bottae</i>
California ground squirrel	<i>Spermophilus beecheyi</i>
Dusky-footed woodrat	<i>Neotoma fuscipes</i>
Brush rabbit	<i>Sylvilagus bachmani</i>
Desert cottontail	<i>Sylvilagus audubonii</i>
Black-tailed jackrabbit	<i>Lepus californicus</i>
Mule deer	<i>Odocoileus hemionus</i>
Coyote	<i>Canis latrans</i>
Gray fox	<i>Urocyon cinereoargenteus</i>
Striped skunk	<i>Mephitis mephitis</i>
Long-tailed weasel	<i>Mustela frenata</i>
Raccoon	<i>Procyon lotor</i>
Bobcat	<i>Felis rufus</i>
Mountain lion	<i>Felis concolor</i>

CULTURAL SETTING

PREHISTORIC OVERVIEW

Numerous chronological sequences have been devised to understand cultural changes for various areas within southern California over the past century. Building on early studies and focusing on data synthesis, Wallace (1955, 1978) developed a prehistoric chronology for the southern California coastal region, which is still widely used today and is applicable to near-coastal and many inland areas, including western Riverside County. Four periods are presented in Wallace's prehistoric sequence: Early Man, Milling Stone, Intermediate, and Late Prehistoric. As noted by Moratto (1984:159), Wallace's (1955) synthesis lacked chronological precision due to the lack of absolute dates at the time of its creation, but remains generally valid today.

In addition to Wallace's classic summary, a regional synthesis developed by Warren (1968) will be referred to in the following discussion. This synthesis is supported by a larger archaeological database for

southern California, which includes the advent and increased use of radiocarbon dating after the 1950s. Using the concepts of cultural ecology and cultural tradition, Warren (1968) proposed a series of six prehistoric traditions. Three of these traditions, the San Dieguito Tradition, Encinitas Tradition, and Campbell Tradition, correlate with Wallace's Early Man, Milling Stone, and Intermediate periods. The Chumash Tradition, Tatic Tradition (formerly "Shoshonean"), and Yuman Tradition are represented within Wallace's Late Prehistoric period. As noted further, these ecologically based traditions are applicable to specific regions within southern California.

Some revisions have been made to Wallace's 1955 synthesis using radiocarbon dates and projectile point assemblages (e.g., Koerper and Drover 1983; Koerper et al. 2002; Mason and Peterson 1994). The summary of prehistoric chronological sequences for southern California coastal and near-coastal areas presented below is a composite of information in Wallace (1955) and Warren (1968), as well as more recent studies, including Koerper and Drover (1983). The chronology formulated by Koerper and Drover (1983) is based on the results of their excavations at a multi-component village site (CA-ORA-119-A) near the University of California, Irvine, in Orange County.

Early Man Period/San Dieguito/Paleo-Coastal (ca. 10,000–6000 B.C.)

When Wallace (1955) defined the Early Man period in the mid-1950s, there was little evidence of human presence on the southern California coast prior to 6000 B.C. Archaeological work in the intervening years has identified numerous older sites dating prior to 10,000 years ago, including sites on the coast and Channel Islands (e.g., Erlandson 1991; Johnson et al. 2002; Moratto 1984; Rick et al. 2001:609). The earliest accepted dates for occupation are from two of the northern Channel Islands, located off the coast of Santa Barbara. On San Miguel Island, Daisy Cave clearly establishes the presence of people in this area about 10,000 years ago (Erlandson 1991:105). On Santa Rosa Island, human remains have been dated from the Arlington Springs site to approximately 13,000 years ago (Johnson et al. 2002).

In what is now Orange County, there are sites dating from 9,000 to 10,000 years ago (Macko 1998a:41; Mason and Peterson 1994:55–57). Known sites dating to the Early Man period are rare in western Riverside County. One exception is the Elsinore site (CA-RIV-2798-B), which has deposits dating as early as 6630 cal. B.C. (Grenda 1997:260).

Recent data from coastal and inland sites during this period indicate that the economy was a diverse mixture of hunting and gathering, with a major emphasis on aquatic resources in many coastal areas (e.g., Jones et al. 2002) and on Pleistocene lakeshores in eastern San Diego County (see Moratto 1984:90–92).

A Paleo-Coastal Tradition was proposed and recently referenced to highlight the distinctive marine and littoral focus identified within the southern California coastal archaeological record prior to the emergence of the Encinitas Tradition during the succeeding Milling Stone period (Mason and Peterson 1994:57–58; Moratto 1984:104). At coastal sites, there is abundant evidence that marine resources such as fish, sea mammals, and shellfish were exploited by Paleo-Coastal Tradition peoples.

At near-coastal and inland sites, it is generally considered that an emphasis on hunting may have been greater during the Early Man period than in later periods, although few Clovis-like or Folsom-like fluted points have been found in southern California (e.g., Dillon 2002; Erlandson et al. 1987). In Riverside County, only one isolated fluted point has been identified on the surface of a site in the Pinto Basin in the central part of the county (Campbell and Campbell 1935; Dillon 2002:113). Common elements in many San Dieguito Tradition sites include leaf-shaped bifacial projectile points and knives, stemmed or shouldered projectile points (e.g., Silver Lake and Lake Mojave series), scrapers, engraving tools, and crescents (Warren 1967:174–177; Warren and True 1961:251–254). Use of the atlatl (spear-throwing stick) during this period facilitated launching spears with greater power and distance. Subsistence patterns

shifted around 6000 B.C. coincident with the gradual desiccation associated with the onset of the Altithermal, a warm and dry period that lasted for about 3,000 years. After 6000 B.C., a greater emphasis was placed on plant foods and small animals.

Milling Stone Period (ca. 6000–3000/1000 B.C.)

The Milling Stone period of Wallace (1955, 1978) and the Encinitas Tradition of Warren (1968) are characterized by an ecological adaptation to collecting, and by the dominance of the principal ground stone implements generally associated with the horizontal motion of grinding small seeds—namely, milling stones (metates, slabs) and handstones (manos), which are typically shaped. Milling stones occur in large numbers for the first time, and are even more numerous near the end of this period. As testified by their toolkits and shell middens in coastal sites, people during this period practiced a mixed food procurement strategy. Subsistence patterns varied somewhat as groups became better adapted to their regional or local environments.

Milling Stone period sites are common in the southern California coastal region between Santa Barbara and San Diego, and at many inland locations, including the Prado Basin in western Riverside County and the Pauma Valley in northeastern San Diego County (e.g., Herring 1968; Langenwalter and Brock 1985; Sawyer and Brock 1999; Sutton 1993). Wallace (1955, 1978) and Warren (1968) relied on several key coastal sites to characterize the Milling Stone period and Encinitas Tradition, respectively. These include the Oak Grove Complex in the Santa Barbara region, Little Sycamore in southwestern Ventura County, Topanga Canyon in the Santa Monica Mountains, and La Jolla in San Diego County. The Encinitas Tradition was proposed to extend into San Diego County, where it apparently continued alongside the following Campbell Tradition, which occurred primarily in the Santa Barbara–Ventura County region beginning around 3000 B.C.

Of the numerous Milling Stone period sites identified in the region, the most well known is the Irvine site (CA-ORA-64), which has occupation levels dating between ca. 6000 and 4000 B.C. (Drover et al. 1983; Macko 1998b). Along coastal Orange County, Koerper and Drover (1983:11) mark the transition at the end of the Milling Stone around 1000 B.C., whereas Wallace’s mid-1950s scheme has the period ending at 3000 B.C. Based on radiocarbon dates from the Newport Coast Archaeological Project (NCAP), Mason and Peterson (1994) propose a timeline for the Milling Stone similar to that advanced by Koerper and Drover (1983). The chronological schemes advanced for coastal Orange County also apply to many southern California near-coastal and inland areas, including much of western Riverside County.

During the Milling Stone period and Encinitas Tradition, stone chopping, scraping, and cutting tools are abundant, and generally made from locally available raw material. Projectile points, rather large and generally leaf-shaped, and bone tools, including awls, are generally rare. The large points are associated with the spear, and probably with an atlatl. Items made from shell, including beads, pendants, and abalone dishes, are generally rare. Evidence of weaving or basketry is present at a few sites. Cogged stones and discoidals are often purposefully buried or “cached,” and are found mainly in sites along the coastal drainages from southern Ventura County southward, with a few specimens inland at Cajon Pass, and in abundance at some Orange County sites (Dixon 1968:63; Moratto 1984:149). Kowta (1969) attributes the presence of numerous scraper-planes in Milling Stone sites to the preparation of agave or yucca for food or fiber. The mortar and pestle, associated with the vertical motion of pounding foods, such as acorns, were introduced during the Milling Stone, but are not common.

Two types of artifacts that are considered diagnostic of the Milling Stone period are the cogged stone and discoidal, most of which have been found within sites dating between 4000 and 1000 B.C. (Moratto 1984:149). The cogged stone is best described as a ground stone object that has variant forms of gear-like

teeth on the perimeter, which is produced from a variety of materials. The function of cogged stones is unknown, but has been interpreted as ritualistic or ceremonial in nature (Dixon 1968:64-65; Eberhart 1961:367). Similar to cogged stones, discoidals are found in the archaeological record subsequent to the introduction of the cogged stone. Both discoidals and cogged stones have been found together at some Orange County sites, such as CA-ORA-83/86/144 (Van Bueren et al. 1989:772), CA-ORA-950 (Ron Bissell, personal communication 1999), and Los Cerritos Ranch (Dixon 1975 in Moratto 1984:150).

Koerper and Drover (1983) suggest that Milling Stone period sites represent migratory settlement patterns of hunters and gatherers who used marine resources during the winter and inland resources the remainder of the year. More recent research indicates that residential bases or camps were moved to resources in a seasonal round (de Barros 1996; Koerper et al. 2002; Mason et al. 1997; Tuma 2004), or that some sites were occupied year-round with portions of the village population leaving at certain times of the year to exploit available resources (Cottrell and Del Chario 1981). Regardless of settlement system, it is clear that subsistence strategies during the Milling Stone period included the following: hunting of small and large terrestrial mammals, sea mammals, and birds; collecting shellfish and other shore species; extensive use of seed and plant products; the processing of yucca and agave; and nearshore fishing with barbs or gorges (Kowta 1969; Reinman 1964; Tuma 2004). As evidenced by the abundant milling equipment found at these sites throughout the region, the processing of small seeds was an important component of their subsistence practices.

Characteristic mortuary practices during the Milling Stone period or Encinitas Tradition include extended and loosely flexed burials, some with red ochre, and few grave goods such as shell beads and milling stones interred beneath cobble or milling stone cairns. “Killed” milling stones, exhibiting holes, may occur in the cairns. Reburials are common in the Los Angeles County area, with flexed burials oriented to the north common in Orange and San Diego Counties. Evidence of wattle-and-daub structures and walls have been identified at some sites in the San Joaquin Hills and Newport Coast area spanning all cultural periods (Koerper 1995; Mason et al. 1991, 1992, 1993; Strudwick 2004).

Intermediate Period (ca. 3000/1000 B.C.–A.D. 500/650)

Following the Milling Stone, Wallace’s Intermediate period and Warren’s Campbell Tradition in Santa Barbara, Ventura, and parts of Los Angeles Counties, date from approximately 3000 B.C. to A.D. 500 and are characterized by a shift toward a hunting and maritime subsistence strategy, along with a wider use of plant foods. The Campbell Tradition (Warren 1968) incorporates David B. Rogers’ (1929) Hunting Culture and related expressions along the Santa Barbara coast. In the San Diego region, the Encinitas Tradition (Warren 1968) and the La Jolla Culture (Moriarty 1966; M. Rogers 1939, 1945) persist with little change during this time.

Temporal placement of the Intermediate is generally recognized as ranging between 3000 B.C. and A.D. 500 (Wallace 1955; Warren 1968). In Orange County, researchers have estimated the Intermediate period began around 1000 B.C. and lasted until ca. A.D. 650 (3000–1300 B.P.) (Koerper and Drover 1983:11; Mason and Peterson 1994). A more recent evaluation, based on some 1,300 calibrated radiocarbon dates from sites in Orange County, suggests a date of 1400 B.C. for the start of the Intermediate, marked by single-piece circular fishhooks and coinciding with the transition from the Middle to Late Holocene (Koerper et al. 2002:67–68). Another researcher sees the Intermediate not as a cultural period, but as a transition between the Milling Stone and the later Late Prehistoric period based on his investigations at sites in the Bonita Mesa area near upper Newport Bay (Peterson 2000). This idea may simply reflect sub-regional or area-specific trends at sites in and around Newport Bay rather than an accurate depiction of the cultural period dynamics in Orange County and the greater southern California region.

Although sites in the Prado Basin and Perris Reservoir area have cultural components that date to this period (Bettinger 1974:160; Grenda 1995:25), the Intermediate period in western Riverside County is still not as well understood as it is in coastal areas (e.g., Van Bueren et al. 1986:11). The following discussion is thus based mainly on information gathered from coastal and near-coastal sites in southern California.

During the Intermediate period, there is a pronounced trend toward greater adaptation to regional or local resources. For example, the remains of fish, land mammals, and sea mammals are increasingly abundant and diverse in sites along the California coast in the referenced region. Related chipped stone tools suitable for hunting are more abundant and diversified, and shell fishhooks become part of the toolkit during this period. Larger knives, a variety of flake scrapers, and drill-like implements are common during this period. Projectile points include large side-notched, stemmed, and lanceolate or leaf-shaped forms. Koerper and Drover (1983) consider Gypsum Cave and Elko series points, which have a wide distribution in the Great Basin and Mojave deserts between ca. 2000 B.C. and A.D. 500, to be diagnostic of this period. Bone tools, including awls, are more numerous than in the preceding period, and the use of asphaltum adhesive is now common.

Mortars and pestles become more common during this period, gradually replacing manos and metates as milling stone implements. In addition, hopper mortars and stone bowls, including steatite vessels, appear to enter the toolkit at this time. This shift appears to correlate with a diversification in subsistence resources. Many archaeologists believe this change in milling stones signals a shift away from the processing and consumption of hard seed resources to the increasing importance of the acorn (e.g., Glassow et al. 1988; True 1993). It has been argued that mortars and pestles may have been used initially to process roots (e.g., tubers, bulbs, and corms associated with marshland plants), with acorn processing beginning at a later point in prehistory (Glassow 1997:86) and continuing to European contact.

Characteristic mortuary practices during the Intermediate period include fully flexed burials, placed face down or face up, and oriented toward the north or west (Warren 1968:2–3). Red ochre is common, and abalone shell dishes are infrequent. Interments sometimes occurred beneath cairns or broken artifacts. Shell, bone, and stone ornaments, including charmstones, are more common than in the preceding Encinitas Tradition. Some later sites include Olivella shell and steatite beads, mortars with flat bases and flaring sides, and a few small points. The broad distribution of steatite from the Channel Islands and obsidian from distant inland regions, among other items, attest to the growth of trade, particularly during the later part of this period.

Late Prehistoric Period (ca. A.D. 500/650–A.D. 1769)

Wallace (1955, 1978) places the beginning of the Late Prehistoric around A.D. 500. In Orange County, the start of this period is recognized at a slightly later date, ca. A.D. 650 (Koerper and Drover 1983; Mason and Peterson 1994). In all chronological schemes for southern California, the Late Prehistoric period lasts until European contact occurred in A.D. 1769.

During the Late Prehistoric period, there was an increase in the use of plant food resources in addition to an increase in land and sea mammal hunting. There was a concomitant increase in the diversity and complexity of material culture during this period, demonstrated by more classes of artifacts. The recovery of a greater number of small, finely chipped projectile points, usually stemless with convex or concave bases, suggests an increased utilization of the bow and arrow rather than the atlatl and dart for hunting. In Orange County, Cottonwood series triangular projectile points in particular are diagnostic of this period (Koerper and Drover 1983). Other items include steatite cooking vessels and containers, the increased presence of smaller bone and shell circular fishhooks, perforated stones, arrow shaft straighteners made of

steatite, a variety of bone tools, and personal ornaments made from shell, bone, and stone. There is also an increased use of asphalt for waterproofing and as an adhesive.

During the Late Prehistoric, sites contain beautiful and complex objects of utility, art, and decoration. Ornaments include drilled whole Chione (venus clam) and drilled abalone. Steatite effigies become more common, with pecten shell rattles common in middens. In Orange County, for example, pecten shell rattles are concentrated in the Late Prehistoric midden at CA-ORA-119A, and other time-sensitive artifacts, including abalone ornaments and drilled Chione shells, are also present (Koerper and Drover 1983:19–20). Most of the rock art found today in the Chumash sphere is thought to date to this period. Mortuary customs are elaborate, including cremation and interment, with abundant grave goods.

By A.D. 1000, fired clay smoking pipes and ceramic vessels begin to appear at some sites (Meighan 1954; Warren and True 1984). The scarcity of pottery in coastal and near-coastal sites implies ceramic technology was not well developed in that area, or that ceramics were obtained by trade with neighboring groups to the south and east. The lack of widespread pottery manufacture is usually attributed to the high quality of tightly woven and watertight basketry that functioned in the same capacity as ceramic vessels.

Another feature typical of Late Prehistoric period occupation is an increase in the frequency of obsidian imported from the Obsidian Butte source in Imperial County, California. Obsidian Butte was exploited after ca. A.D. 1000 after its exposure by the receding waters of Holocene Lake Cahuilla (Wilke 1978). A Late Prehistoric period component of the Elsinore site (CA-RIV-2798-A) produced two flakes that originated from Obsidian Butte (Grenda 1997:255; Towner et al. 1997:224-225). Although about 16 percent of the debitage at the Peppertree site (CA-RIV-463) at Perris Reservoir is obsidian, no sourcing study was done (Wilke 1974:61). The site contains a late Intermediate to Late Prehistoric period component and it is assumed that most of the obsidian originated from Obsidian Butte. In the earlier Milling Stone and Intermediate periods, most of the obsidian found at sites within Orange County and many inland areas came from northern sources, mostly the Coso volcanic field. This also appears to be the case within Prado Basin and other interior sites that have yielded obsidian (e.g., Grenda 1995:59; Taşkıran 1997:46). The presence of Grimes Canyon (Ventura County) fused shale at southern California archaeological sites is also thought to be typical of the Late Prehistoric period (Demcak 1981; Hall 1988).

During this period, there is an increase in population size accompanied by the advent of larger, more permanent villages (Wallace 1955:223). Large populations and, in places, high population densities are characteristic, with some coastal and near-coastal settlements containing as many as 1,500 people. Many of the larger settlements were permanent villages, where people resided year-round. The populations of these villages may have also increased seasonally.

In Warren's (1968) cultural ecological scheme, the period between A.D. 500 and European contact is divided into three regional patterns. The Chumash Tradition is present mainly in the region of Santa Barbara and Ventura Counties; the Takic or Numic Tradition in the Los Angeles, Orange, and western Riverside Counties region; and the Yuman Tradition in the San Diego region. The seemingly abrupt changes in material culture, burial practices, and subsistence focus at the beginning of the Late Prehistoric period are considered the result of a migration to the coast of peoples from inland desert regions to the east. In addition to the small triangular and triangular side-notched points similar to those found in the desert regions in the Great Basin and Lower Colorado River, Colorado River pottery and the introduction of cremation in the archaeological record are diagnostic of the Yuman Tradition in the San Diego region. This combination certainly suggests a strong influence from the Colorado Desert region.

In Los Angeles, Orange, and western Riverside Counties, similar changes (introduction of cremation, pottery, and small triangular arrow points) are considered the result of a Takic migration to the coast from inland desert regions. This Takic or Numic Tradition was formerly referred to as the "Shoshonean wedge"

or “Shoshonean intrusion” (Warren 1968). This terminology, used originally to describe a Uto-Aztecan language group, is generally no longer used in order to avoid confusion with ethnohistoric and modern Shoshonean groups who spoke Numic languages (Heizer 1978:5; Shipley 1978:88, 90). Modern Gabrielino/Tongva, Juaneño, and Luiseño in this region are considered the descendants of the prehistoric Uto-Aztecan, Takic-speaking populations that settled along the California coast during this period, or perhaps somewhat earlier.

ETHNOGRAPHIC OVERVIEW

The following ethnographic overview provides pertinent information regarding the Luiseño and Cahuilla, both of whom occupied lands near Riverside. Kroeber (1925:Plate 57) indicates that the Luiseño occupied the area around Riverside, whereas Bean (1978) places the area around Riverside within the Cahuilla territory. Because of the apparent overlap, both ethnographic groups are discussed.

Luiseño

Luiseño is a term derived for the Native Americans administered by the Mission San Luis Rey, and later applied specifically to the Payomkawichum ethnic nation who resided in the region near the mission. Payomkawichum means the “western people,” and applies to the closely related coastal Luiseño who lived north of the mission. The Luiseño language derives from the Cupan segment of the Takic language branch, a part of the Uto-Aztecan linguistic family (Mithun 2001:539–540).

Luiseño territory included the northern half of San Diego County and the western edge of Riverside County. Along the coast, their territory extended from Agua Hedionda Creek northward to Aliso Creek, and inland to the Palomar Mountains at the south and east of Santiago Peak towards the north (Bean and Shippek 1978). Their northern neighbors were the Juaneño (Acjachemen), who spoke a Luiseño dialect. Many contemporary Juaneño and coastal Luiseño identify themselves as descendents of the indigenous people who lived in the local area, termed the Acjachemen Nation.

The Luiseño resided in permanent villages with 50 to 400 people, but during certain seasons inhabited camps that included many fewer people. Village social structure revolved around lineages and clans. Smaller villages generally included a single lineage, whereas larger villages were clan-centered with people from multiple lineages. Each clan/village owned a resource territory that was politically independent, but maintained ties to other nearby clans through economic, religious, and social networks.

Luiseño nuclear families resided in dome-shaped dwellings (*kish*) made of willow poles covered with interlaced tule reeds. The chief’s residence was generally larger than the others to accommodate his large family, ceremonial regalia, and ceremonial food processing activities. Other village structures included a ceremonial enclosure (*vamkech*), a semi-subterranean sweat lodge, and menstrual huts. During acorn harvest season, simple lean-tos were constructed in the upper foothills. The ceremonial enclosure and chief’s home were generally located in the center of the village.

Luiseño socio-political structure included three hierarchical social classes: (1) an elite class that included chiefly families, lineage heads, and other ceremonial specialists; (2) a “middle class” of established and successful families; and (3) people of disconnected or wandering families and war captives (Bean 1976:109–111). Native leadership focused on the *Nota*, or clan chief, who conducted community rites and regulated ceremonial life in conjunction with a council of elders (*puuplem*) composed of lineage heads and ceremonial specialists. The council discussed and decided matters of community significance, which were then implemented by the *Nota* and his staff.

Luiseno mortuary practices included cremation and burial of the dead. Specific individuals were tasked with managing the cremations and compensated for their services. A specialist practiced ritual cannibalism on high-ranking shamans. The death of those of high rank, and perhaps others, was commemorated on the first anniversary.

Like other indigenous California groups, the primary food staple was the acorn (Bean and Shippek 1978:552), with other plant resources, fish, shellfish, waterfowl, and marine and terrestrial mammals supplementing the diet. Villages were situated near reliable sources of water to facilitate daily leaching of milled acorn flour, and to provide potable water. Acorn mush (*weewish*) was prepared in various ways and served as gruel, cakes, or fried (these were sometimes sweetened with honey or sugar-laden berries), or made into a stew with greens and meat. Other plant foods such as pine nuts were in the diet, as were seeds from grass, manzanita, sunflower, sage, chia, lemonade berry, wild rose, holly-leaf cherry, prickly pear, and lamb's-quarter. Seeds were parched, ground, and prepared in ways similar to the weewish variations. Greens in the diet included thistle, miner's lettuce, white sage, and clover, among others. Thimbleberries, elderberries, and wild grape were eaten raw or dried. Cooked yucca buds, blossoms, pods, and stalks provided an important addition to the community's food resources. The diet also included bulbs, roots, and tubers, as well as mushrooms and tree fungus. Various teas or medicinal cures were made from flowers, fruits, stems, or roots. Large and small mammalian prey included deer, antelope, rabbit, jackrabbit, wood rat, mice, and ground squirrel. Birds such as quail and duck were included in the diet, as were fish, including trout and salmon from rivers and creeks.

The first direct European contact with the Luiseno was in July 1769 by the Spanish expedition led by Gaspar de Portolá. During the next six years, eight missions and forts were founded north and south of Luiseno territory. In 1776, Mission San Juan Capistrano was founded in proximity to the Luiseno, causing the population of the five northern Luiseno villages to be halved within 15 years. In 1798, Mission San Luis Rey was established within Luiseno territory, and the proselytizing among the Payomkawichum began in earnest (Engelhardt 1921:8). The Luiseno were not forced to live at the mission; consequently, the disruption of traditional lifeways and deaths from introduced diseases were less devastating than was experienced by many other indigenous California groups.

Several Luiseno leaders signed the statewide 1852 treaty—locally known as the Treaty of Temecula (an interior Luiseno village)—but the U.S. Congress never ratified it. However, by 1875, the government established reservations for the Luiseno in the Palomar Mountains and nearby valleys, including Pala, Pauma, Rincon, Pechanga, La Jolla, and San Pasqual (CIAP 2003). No reservations were established for the remaining coastal people, whose lands had already been usurped by the Mexican ranchos. Today, the San Luis Rey group is actively petitioning the Bureau of Indian Affairs' Office of Federal Acknowledgement to review their request for federal recognition. By 2003 there were 1,340 enrolled members on four Luiseno reservations; today there are more than 2,000 Luiseno, including non-enrolled but active members of the community.

Cahuilla

The Cahuilla, like Luiseno, spoke dialects that are a branch of the Takic family of the Uto-Aztecan linguistic stock (Bean and Shippek 1978; Kroeber 1925). The name "Cahuilla" possibly derives from a native word meaning "master, boss" (Bean 1978:575). *Ivi'lyu'atam* is the traditional term for the linguistically and culturally defined Cahuilla cultural nationality, and "refers to persons speaking the Cahuilla language and recognizing a commonly shared cultural heritage" (Bean 1972:85).

Evidence suggests the Cahuilla migrated to southern California about 2,000 to 3,000 years ago, most likely from the southern Sierra Nevada ranges of east-central California with other related socio-linguistic

(Takis speaking) groups (Moratto 1984:559). The Cahuilla settled in a territory that extended west to east from the present-day city of Riverside to the central portion of the Salton Sea in the Colorado Desert, and south to north from the San Jacinto Valley to the San Bernardino Mountains. Though 60 percent of Cahuilla territory was in the Lower Sonoran Desert environment, 75 percent of their diet came from plant resources acquired in Upper Sonoran and Transition environmental zones (Bean 1978:576).

Cahuilla socio-political organization included three primary levels (Bean 1978:580). The highest level was the cultural nationality, encompassing everyone speaking a common language. Next were two patrimoieties called the Wildcats (*tuktum*) and the Coyotes (*'istam*): every clan of the Cahuilla belonged to one or the other. The third basic level of socio-political organization was the many political-ritual-corporate units called sibs, or patrilineal clans (Bean 1978:580). Anthropologists have designated groups of Cahuilla clans by their geographical location into Pass, Desert, and Mountain, which though implying dialectical and ceremonial differences between these groupings, actually results from proximity rather than actual differences in social connections (Strong 1970). In reality, a continuum of minor differences existed between the clans. Lineages within a clan cooperated in many ways, including defense, communal subsistence activities, and religious ceremonies. While most lineages owned their own village site and particular resource area, much of the territory was open to all Cahuilla people.

Each lineage within a sib had a defined territory that, among the Cahuilla of the Coachella Valley desert, was formed around springs in mountain canyons and the alluvial fans that spread from these canyons out onto the desert floor. Villages in these canyons were occupied year-round. They were situated to take maximum advantage of natural resources such as climate, water, food, and materials. Individuals or groups would periodically leave the villages for gathering, hunting, visiting, or trading activities. The sibs and lineages would maintain formal associations among themselves for protection, for religious ceremonies, and help with large projects. The relationship between these groups was maintained through intermarriage and ceremonial reciprocity (Bean 1972).

Cahuilla villages were usually located in canyons or on alluvial fans near a source of accessible water such as springs or where large wells could be dug. Each family and lineage had houses (*kish*) and granaries for the storage of food, and ramadas for work and cooking. Sweat houses and song houses (for non-religious music) commonly occurred at these villages. Each community built a separate house for the lineage or clan leader. The clan leader also had a ceremonial house, or *kĩš' ?ámnawet*, where major religious ceremonies were held. Houses and ancillary structures were often spaced apart, causing villages to sometimes spread over a mile or two.

Each lineage maintained ownership rights to various resource-collecting locations, “including food collecting, hunting, and other areas. Individuals also owned specific areas or resources, e.g., plant foods, hunting areas, mineral collecting places, or sacred spots used only by shamans, healers and the like” (Bean 1990:2). A variety of game was hunted, including mountain sheep, cottontail, jackrabbit, mice, and wood rats, as well as carnivores such as mountain lion, coyote, wolf, bobcat, and fox. Various birds were also consumed, including quail, chukker, and dove, plus various reptiles, amphibians and insects.

The Cahuilla used more than 200 desert and mountain plants (Bean and Saubel 1972). Key plant foods included acorns, screwbean and honey mesquite, piñon nuts, prickly-pear cactus fruit and leaves, and yucca blossoms and stalks. They also gathered hard seeds from manzanita, sunflowers, sages, lemonade berry, wild rose, buckwheat, and coyote gourd (calabazilla). Fruits, berries (toyon, grape, blackberry, and elderberry, which was also used for medicine), tubers, and greens (chenopodium, clover, Miner’s lettuce, and white sage [Dale 1985]) were also gathered (Bean and Smith 1978:538-539; O’Neil 2001). The amole tuber served for making tools and soap. Numerous additional plants were used for making medicine, twine, basketry, ornamentation, and tools, and as well as in religious ceremonies (O’Neil 2001).

The territory used by the Cahuilla was a productive environment well suited to a sophisticated hunting and gathering economy. Studies (Bean and Lawton 1993) suggest that aboriginal people in southern California improved the structure and productivity of the environment through controlled burning, selective harvesting and pruning, replanting, seed re-broadcast, and possibly limited irrigation. Human-induced burning, whether accidental or intentional, potentially influenced fire-adapted plant associations in the past few thousand years. It has been suggested (e.g., Bean and Lawton 1993:37–42, 46–51; King 1993:296–298), for example, that burning the native vegetation helped create and maintain the park-like aspect of many California landscapes described by early Spanish diarists. The emphasis on fire suppression that began during colonial times and which largely continues today is partially responsible for the current distribution of brush and paucity of grasslands in areas that looked quite different to European explorers and missionaries (Timbrook et al. 1993:129–134).

The Cahuilla adopted limited agriculture by the time of Euro-American contact. Bean (1978:578) suggests that their “proto-agricultural techniques and...marginal agriculture” included beans, squash, and corn, which they potentially adopted from the Colorado River groups to the east. Certainly by the time of the first Romero Expedition in 1823–1824 they observed corn, pumpkins, and beans growing in small gardens localized around springs in the Thermal area of the Coachella Valley (Bean and Mason 1962:104). By the 1850s, the inhabitants of Toro village supplied food to travelers from crops produced at their village: “We camped at this place and were surrounded by crowds of Indians anxious to trade melons, squashes, corn, and barley, for pork, bacon, or other articles” (Hoyt 1948:19). The introduction of barley and other grain crops provides evidence for the introduction of European plants via the mission or local Mexican rancheros. Despite the increasing use and diversity of crops, no evidence exists to indicate that small-scale agriculture provided anything more than a supplement to Cahuilla subsistence or that it altered their social organization (i.e., no effect on the basic division of labor or created new social roles).

The Cahuilla used a wide variety of tools and implements when they gathered and collected food resources. Hunting was achieved using bow and arrow, traps, nets, slings, and blinds for land mammals and birds, and nets for fish when Lake Cahuilla was filled. Throwing sticks were used to procure individual rabbits and hares, whereas clubs and large nets were used during communal rabbit drives. Food processing was achieved using a variety of tools: portable and bedrock mortars, basket hopper mortars, pestles, manos and metates, bedrock grinding slicks, hammerstones and anvils, woven strainers and winnowers, leaching baskets and bowls, woven parching trays, knives, bone saws, and wooden drying racks. Food was consumed from woven, carved wood, and pottery vessels. Ground meal and unprocessed hard seeds were stored in large, finely woven baskets, whereas unprocessed mesquite beans were stored in large granaries woven from willow branches and placed on raised platforms to protect them from vermin.

The Cahuilla produced pottery vessels, and also obtained them via trade with Yuman-speaking groups across the Colorado River and to the south. Pottery was introduced to the Cahuilla during the Late Prehistoric period. The art of constructing pottery was later adopted by the Cahuilla, who used the paddle and anvil technique. Typical culinary wares included jars, cooking vessels, and ladles. Ceramic pipes were also commonly manufactured and used. Ceramic ollas (large, round pots with small necks) were used for storing seeds, and were frequently cached in caves and rockshelters with foodstuffs sealed in to be used during anticipated hunting and gathering forays (Bean 1978:578–579).

Spanish mission outposts, known as *assistencias*, were established near Cahuilla territory at San Bernardino and San Jacinto by 1819, though interaction with Europeans was less intense in the Cahuilla region than it was for coastal groups. The topography and lack of water made the inland area inhabited by the Cahuilla less attractive to colonists than the coastal valley regions. By the 1820s, however, the Pass Cahuilla experienced consistent contact with the ranchos of Mission San Gabriel, whereas the Mountain

Cahuilla frequently received employment from private rancheros and were recruited to Mission San Luis Rey.

The Romero-Pacheco Expedition during the winter of 1823 passed through the Coachella Valley in an unsuccessful attempt to establish a route from San Gabriel to Tucson via the upper Colorado River. They passed by the village of Toro with its great mesquite thickets on the north side and walk-in wells at the village site (Bean and Mason 1962:37). This scene has been identified as the village of *Pūichekiva*. Underground water supported the large stands of mesquite, the major plant resource for the local Cahuilla. Water was sufficiently close to the surface that the Cahuilla excavated walk-in wells, which reached a depth of 12 to 15 feet. Blake described this same village complex in 1853, indicating that the well water was used for household purposes as well as mesquite and crop irrigation (Bean et al. 1991:78). Crops included melons, squashes, corn, and barley.

Mexican ranchos were located near Cahuilla territory along the upper Santa Ana and San Jacinto rivers by the 1830s, providing the opportunity for the Cahuilla to earn money ranching and to learn new agricultural techniques. The Bradshaw Trail, established in 1862, was the first major east-west stage and freight route through the Coachella Valley. Traversing the San Gorgonio Pass, the trail connected gold mines on the Colorado River to the coast. Bradshaw developed his trail using the model employed for the Cocomaricopa trail, which had maps and guides provided by local Native Americans. Journals by early travelers along the Bradshaw Trail described encounters with Cahuilla villages and walk-in wells as they journeyed through the Coachella Valley.

The continued expansion of immigrants into the region introduced the Cahuilla to European diseases. The single worst recorded event was a smallpox epidemic in 1862–1863. By 1891, only 1,160 Cahuilla remained within what was left of their territory, down from an aboriginal population of 6,000 to 10,000 (Bean 1978:583-584). By 1974, approximately 900 people claimed Cahuilla descent, most of who resided on reservations.

Between 1875 and 1891, the United States established ten reservations for the Cahuilla within their territory: Agua Caliente, Augustine, Cabazon, Cahuilla, Los Coyotes, Morongo, Ramona, Santa Rosa, Soboba, and Torres-Martinez (Bean 1978:585). Four of these reservations are shared with other Native American groups, including the Chemehuevi, Cupeño, and Serrano. The Cahuilla on the Morongo Reservation established the Malki Museum in 1965, which today is a respected repository for artifacts and ethnographic knowledge. The museum publishes books on Native American lifeways, and the *Journal of California and Great Basin Anthropology*.

HISTORIC OVERVIEW

Post-Contact history for the state of California is divided into three periods: the Spanish period, the Mexican period, and the American period. Each of these periods is briefly described below.

Spanish Period (1769–1822)

The first Europeans to observe what became southern California were members of the A.D. 1542 expedition of Juan Rodriguez Cabrillo. Cabrillo and other early explorers sailed along the coast, and made limited expeditions into Alta (upper) California between 1529 and 1769. Spanish, Russian, and British explorers briefly visited Alta California during this nearly 250-year span. Eventual Spanish settlement of California in the spring of 1769 marked the devastating disruption of the indigenous cultures.

Gaspar de Portolá established the first Spanish settlement in Alta California at San Diego in 1769, and with Father Junipero Serra founded the first of 21 missions (Mission San Diego de Alcalá) built by the Spanish and Franciscan Order between 1769 and 1823. Portolá continued north, reaching San Francisco Bay on October 31, 1769. Pedro Fages, who sought a site for a mission, and Lt. Colonel Juan Bautista De Anza, a Spanish military officer from Tubac, Arizona, who surveyed an overland trail from the Mexican interior to San Francisco Bay, made later expeditions to Alta California in 1772 and 1774, respectively (Grunsky 1989:2–3). De Anza’s diary provides the first recorded Euro-American entry into the region. De Anza later led a group of colonists and their livestock through the San Jacinto Valley and across the Santa Ana Narrows on their way to settle San Francisco Bay between 1775 and 1776. The Juan Bautista de Anza National Historic Trail—approved by Congress in 1990 and mapped by the National Park Service in 1996—and the National Millennial Trail (designated in 1999) both commemorate the trail as a heritage tourism automobile route (California Highways 2004).

The process of converting the local Native American population to Christianity through baptism and relocation to the mission grounds began in this region by the Franciscan padres at Mission San Juan Capistrano, which was established in 1776. People from the interior region were converted within 10 years of establishing Mission San Juan Capistrano. Mission San Luis Rey was founded 20 years later, and as it grew and expanded its influence, it established ranchos east of San Juan Capistrano. This expansion created territorial conflicts with Mission San Juan Capistrano.

Mexican Period (1822–1848)

After the Mexican Revolution (1810–1821) against the Spanish crown, all Spanish holdings in North America (including both Alta and Baja California) became part of the new Mexican republic. With the onset of the Mexican period, an era of extensive land grants was begun, in contrast to the Spanish colonization through missions and presidios. Most of the land grants to Mexican citizens in California (*Californios*) were in the interior, granted to increase the population away from the more settled coastal areas where the Spanish had concentrated their settlements. The Mexican period is also marked by exploration by American fur trappers west of the Sierra Nevada Mountains.

American Period (1848–Present)

The Mexican-American War ended with the signing of the Treaty of Guadalupe Hidalgo in 1848, making California a territory of the United States. The discovery of gold in 1848 at Sutter’s Mill near Sacramento and the resulting Gold Rush era greatly influenced the history of the state and the nation. The tens of thousands of people who rushed to the gold fields had a devastating impact on the lives of indigenous Californians, with the introduction and concentration of diseases, the loss of land and territory (including traditional hunting and gathering locales), violence, malnutrition, and starvation. Thousands of settlers and immigrants continued to pour into the state, particularly after the completion of the transcontinental railroad in 1869.

One year after discovering gold, nearly 90,000 people journeyed to the California gold fields. A portion of Captain John Sutter’s Mexican land grant, known as *New Helvetia*, became the bustling Gold Rush boomtown of Sacramento. California became the 31st state in 1850 largely as a result of the Gold Rush. By 1853, the population of the state exceeded 300,000; Sacramento became the state capital in 1854.

Riverside County formed 40 years later in 1893, created from portions of nearby San Bernardino and San Diego Counties. The City of Riverside, located on the Santa Ana River channel, is the county seat and was founded in 1870. Part of California’s “Inland Empire,” many Riverside County residents work in and commute to the greater Los Angeles metropolitan area.

Local History: City of Riverside

The first recorded Euro-American entry into the region surrounding the project area comes from Lt. Colonel Juan Bautista de Anza's 1774 expedition along an overland trail from the Mexican interior to San Francisco Bay. Following his initial mapping survey, de Anza led a group of more than 200 settlers and their livestock in 1775–1776 through the San Jacinto Valley and across the Santa Ana Narrows on their way to found a mission and presidio in San Francisco.

In 1838, San Diego merchant Juan Bandini gained a land grant from the Mexican government that entitled him to a great extent of the Santa Ana River drainage, which he named Rancho Jurupa. A group of Euro-American investors in 1870 bought a substantial portion of the rancho, and then surveyed a 1-square-mile town site for their new colony that they named Riverside. They built irrigation canals to divert water from the Santa Ana River, supplying the water needed to found the modern California citrus industry (City of Riverside 2004).

As Riverside began to grow and develop into a larger city, the Atchison, Topeka and Santa Fe Railway extended the Chicago railroad's main line through Riverside in 1882, connecting Barstow with Los Angeles. The Southern Pacific Railroad extended a branch line to Riverside in 1892. Resulting from the influx of people and industry, Riverside County was formed in 1893 with Riverside as the county seat (Hansen and Mermilliod 2002).

Further expansion of California and western commerce in 1904 brought the San Pedro, Los Angeles and Salt Lake Railroad across the Santa Ana River and through Riverside to connect the thriving capitals of California and Utah. That year, a massive 984-foot-long concrete viaduct across the Santa Ana's Anza Narrows was built by the "Salt Lake Route" (part of the Union Pacific Railroad [UPRR] after 1921, which it remains today) to gain access from the north bank into Riverside on the south side of the river. After completion, the bridge briefly held the title "largest concrete structure in the world" (National Park Service 1991). The railroad established a depot for "Jurupa" just south of the river (between present Jurupa Avenue and Mountain View Avenue), and in 1908 the Riverside Land and Irrigation Company platted housing tracts around the railroad station. A handful of suburban-styled homes appeared by the 1920s in the area. The surviving 1910s and 1920s houses along Jurupa Avenue and Florence Street represent this early 20th century attempt at Riverside suburban settlement.

PRE-FIELD RESEARCH

LITERATURE SEARCH

On February 26, 2008, SWCA archaeologist Susan Underbrink conducted a cultural resources records search at the Eastern Information Center (EIC), located at the University of California, Riverside (Appendix A). The EIC maintains data on resources for the California Historical Resources Information System (CHRIS) for Riverside, Inyo, and Mono Counties. The purpose of this records search was to determine whether the project area had been the subject of earlier cultural resources studies and whether cultural resources had been previously recorded in or near the project area. Information regarding archaeological sites, historical resources, and studies within a one-mile radius of the study area was compiled. In addition to official maps and records, the following sources of information at the EIC were consulted as part of the records search:

- National Register of Historic Places – Listed Properties (2008)
- California Register of Historical Resources

- California Inventory of Historical Resources (2008)
- California State Historical Landmarks (1996 and updates)
- California Points of Historical Interest (1992 and updates)
- Office of Historic Preservation Historic Property Directory and Determinations of Eligibility (2008)

Prior Studies in One-Mile Radius of APE

The EIC records search identified fourteen previously conducted cultural resource studies within a one-mile radius of the proposed project area (Table 3). Three of these studies covered portions of the proposed project area; one of these identified the presence of cultural resources within the direct APE.

**Table 3. Prior Cultural Resources Studies within
One Mile of the Project Area**

Report #	Title	Author(s) / Date
RI-00117	La Loma-Mira Loma Transmission Line: Expected Impact on Archaeological Values	Wilke, P. and S. Hammond / 1973
RI-00141	Archaeology of Proposed Additions to the Indian Hills Housing Development, City of Pedley, Riverside County, California	Schlanger, S. / 1974
RI-00939	Letter Report: City of Riverside Senior Citizens Center	Swenson, J. / 1980
RI-02125	An Archaeological Assessment of 970+ acres of land located on March Air Force Base, Riverside County, California	Swope, K. / 1987
RI-02307	Cultural Resources Survey, Upper Santa Ana River, California	Hampson, R. et al. / 1988
RI-03395	Cultural and Biological Resources Assessment of Jurupa Avenue Extension, Approximately 1 Mile, City of Riverside, Riverside County, California	Jertberg, P., and Kirtland, K. / 1991
RI-03839	Cultural Resources Survey for the Army Camp Anza UST Removal and Disposal Project, Riverside County, California	Mason, R. / 1994
RI-03959 **	A Phase I Cultural Resources Investigation of the Proposed Van Buren Golf Center, Located at Van Buren Boulevard and Central Avenue, City of Riverside, Riverside County, California	McKenna, J. / 1996
RI-04404**	Final Cultural Resources Inventory Report for the Williams Communications, Inc., Fiber Optic Cable System Installation Project, Riverside to San Diego, California Vol I-III	Jones and Stokes Associates, Inc. / 2000
RI-5154	A Phase I Cultural Resource Survey for Global Premiere, Riverside County, California	Hudlow, S. / 2004
RI-5354	Historical/Archaeological Resources Survey Report	CRM Tech / 2005
RI-05753	Historical / Archaeological Resources Survey Report, Assessor's Parcel No. 193-122-21, Arlington Area, City of Riverside, Riverside County, California	Dahdul, M. / 2002
RI-0500**	Historical/Archaeological Resources Survey Report, Riverside Gateway Project, City of Riverside, Riverside County, California	Love, B. and B. Tang / 2002
RI-6155	Letter Report: Records Search and Site Visit Results for Cingular Tele Facility SB-355-01 (Arlington Inn)	Aislin-Kay, M. and Taniguchi, C. / 2004

** Portion of study runs through current proposed project area

Previously Recorded Cultural Resources within One-Mile Radius of APE

The EIC record search indicated that there are 47 previously recorded cultural resources within one mile of the direct APE (Table 4). These include 16 prehistoric archaeological sites or isolates, five historic archaeological sites, and 26 historic buildings and/or structures within one mile of the proposed project. There are no properties listed in the NRHP, ADOE, or HPD within the boundaries of the project area. California Historic Landmark No. 787, which commemorates the de Anza crossing of the Santa Ana River in 1775 and 1776, is located northeast of the proposed project near the existing Union Pacific Railroad bridge (P-33-3361). Two previously recorded resources appear to be located within the direct APE: a single-family residence (P-33-11633) and an archaeological site (CA-RIV-1711). Discussion of the previously recorded cultural resource follows the table.

Table 4. Previously Recorded Cultural Resources within One Mile of the Project Area

Primary Number/ Trinomial	Resource Description	Recorded by / Date	National/California Register Eligibility	Proximity to APE
33-000127/ CA-RIV-127	Prehistoric: Granitic outcrop of milling features bisected by a Union Pacific Railroad bridge (CA-RIV-3361-H)	Coorhart / 1951 Haenszel, A. / 1971 Kirkish, A. / 1972 Hall, M. / 1975 McCarthy, D. / 1987 Sorensen, J. et al. / 1987	Not evaluated	Outside
33-000325	Prehistoric: Jurupa Bluffs- unspecified artifacts in River bottom	Heller, R. / 1967 Reynolds/ 1971	Not evaluated	Outside
33-000494/ CA-RIV-494	Prehistoric: Groundstone, and lithic artifact scatter, was field checked in 1975, and surface collected 1979, 2006 field check-completely destroyed due to development	Galt, A./1971 Hall, M. / 1975 Anonymous 1979 Chambers Group / 2006	Not eligible	Outside
33-000560/ CA-RIV-560	Prehistoric: Sparse scatter of flakes with a possible rock feature	Kirkish, A. / 1972 Hall, C. / 1975	Not evaluated	Outside
33-000561/ CA-RIV-561	Prehistoric: Sparse scatter of flakes and ground stone	Sorensen, J. et al. / 1972 Hammond, S. / 1973 Hall, C. / 1975	Not evaluated	Outside
33-000619/ CA-RIV-619	Prehistoric: Sparse scatter of flakes and ground stone	Hammond, S. / 1973 Hall, C. / 1975	Not evaluated	Outside
33-000620/ CA-RIV-620	Prehistoric: Bedrock milling feature site	Hammond, S. / 1973 Hall, C. / 1975 McCarthy, D. / 1987 Parr, R. / 1988 McLean, K., and Bouscaren, C. / 2007	Not evaluated	Outside
33-000679/ CA-RIV-679	Prehistoric: Several red pictographs on a large granite boulder	Haenszel, A. / 1967	Not evaluated	Outside

Table 4. Previously Recorded Cultural Resources within One Mile of the Project Area

Primary Number/ Trinomial	Resource Description	Recorded by / Date	National/California Register Eligibility	Proximity to APE
33-001711/ CA-RIV-1711	Prehistoric: Bedrock milling with mortars, manos and metates	Smith, G. / 1939 Haenszel, A. / 1971	Not evaluated	Within*
CA-RIV-3355	Prehistoric: bedrock milling features	Schmidt, J. et al. / 1987	Not evaluated	Outside
CA-RIV-3359H	Scatter of historical debris that includes glass shards, ceramic sherds, and metal cans	Sorensen, J. et al. / 1987	Not evaluated	Outside
CA-RIV-3361	Union Pacific Railroad Bridge over Santa Ana River; construction completed in 1904	Sorensen, J. et al. / 1987 SWCA / 2004	Not evaluated	Outside
CA-RIV-3363	Prehistoric: Bedrock milling feature	Sorensen, J. et al. / 1987	Not evaluated	Outside
CA-RIV-3375	Prehistoric: Bedrock milling feature	Parr, R. / 1988	Not evaluated	Outside
33-9651	Historic-era complex of earthen dams built circa 1915 and associated with the Willitts J. Hole Ranch	Collet, R. / 2000	Status Code, 5S3, locally eligible	Outside
33-9766	De Anza Crossing of the Santa Ana River 1775 and 1776; located near the Union Pacific Railroad Bridge (CA-RIV-3361H)	Arbuckle, J. / 1979	Status Code 1CL, California Historic Landmark No. 787	Outside
33-11397 / CA-RIV-6785	Prehistoric: Lithic scatter consisting of seven flakes and one mano fragment	Love, B. et al. / 2002	Status Code 6Z, not eligible for NRHP	Adjacent
33-11398/ CA-RIV-6786H	Historic archaeological site consisting of several wood pillars, concrete pylons, and concrete footings	Love, B. et al. / 2002	Not evaluated	Adjacent
33-11592	Prehistoric: Isolated bifacial mano and flake	Smallwood, J. / 2002	Status Code 6Z, not eligible for NRHP	Adjacent
33-11633	Historic: 6870 Doolittle Avenue	Tang, B. / 2002	Status Code 6Z, not eligible for NRHP	Within
33-11634	Historic: 4922 Arlington Avenue	Tang, B. / 2002	Status Code 5S1, City of Riverside Structure of Merit	Outside
33-11635	Historic: 4948 Arlington Avenue	Tang, B. / 2002	Status Code 5S1, City of Riverside Structure of Merit	Outside
33-12177	Historic: 6735 Capistrano Way	Tibbet, C. / 2000	Status Code 5D3, local district contributor	Outside
33-12178	Historic: 6755 Capistrano Way	Tibbet, C. / 2000	Status Code 5D3, local district contributor	Outside
33-12179	Historic: 6765 Capistrano Way	Tibbet, C. / 2000	Status Code 5D3, local district contributor	Outside
33-12180	Historic: 6710 Streeter Avenue	Tibbet, C. / 2000	Status Code 5S3, locally eligible	Outside

Table 4. Previously Recorded Cultural Resources within One Mile of the Project Area

Primary Number/ Trinomial	Resource Description	Recorded by / Date	National/California Register Eligibility	Proximity to APE
33-12181	Historic: 5218 Central Avenue	Tibbet, C. / 2000	Status Code 5S3	Outside
33-12182	Historic: 5181 Sierra Street	Tibbet, C. / 2000	Status Code 5S3	Outside
33-12735	Historic: Isolated amethyst bottle fragment	Romani, G. and Wakefield, S. / 1987	Not evaluated	Outside
33-12736	Historic: Isolated amethyst jar base and additional fragments	Romani, G. and Wakefield, S. / 1987	Not evaluated	Outside
33-13252	Historic: Wastewater treatment plant on Acorn Street	SWCA / 2004	Not evaluated	Outside
33-13253	Historic: 7297 Jurupa Avenue	SWCA / 2004	Not evaluated	Outside
33-13254	Historic: 6091 Jurupa Avenue	SWCA / 2004	Not evaluated	Outside
33-13255	Historic: 5868 Jurupa Avenue	SWCA / 2004	Not evaluated	Outside
33-13256	Historic; 6019 Florence Street	SWCA / 2004	Not evaluated	Outside
33-13257	Historic: 5000 Jurupa Avenue	SWCA / 2004	Not evaluated	Outside
33-13258	Historic: 5748 Jurupa Avenue	SWCA / 2004	Not evaluated	Outside
33-13260	Historic: Martha McLean-Anza Narrows Park	SWCA / 2003	Not evaluated	Outside
33-13261	Historic: 5876 Jurupa Avenue	SWCA / 2004	Not evaluated	Outside
33-13531	Prehistoric: Bedrock milling site	Maxon, P., and Paige P. / 2003	Not evaluated	Outside
33-14890	Historic: 5530 Mountain View Avenue	Smallwood, J. / 2005	Status Code 6Z, not eligible for NRHP	Outside
33-16019	Historic: Steel truss bridge	Mock, K., and Hollins, J. / 2006	Status Code 6Z, not eligible for NRHP	Outside
33-16020	Historic: Gauging station	Mock, K., and Hollins, J. / 2006	Status Code 6Z, not eligible for NRHP	Outside
33-16021	Historic: Retaining wall	Mock, K., and Hollins, J. / 2006	Status Code 6Z, not eligible for NRHP	Outside
33-16737/ CA-RIV-8761	Bedrock milling site containing two milling slicks	Knell, E., and Tuma, M. / 2007	Not evaluated	Outside
33-16848	Historic: Santa Ana River Trunk Sewer line	McLean, K., and Bouscaren, C. / 2007	Not evaluated	Outside
33-16851	Historic: De Anza Trail Monument marker	McLean, K., and Bouscaren, C. / 2007	Status Code 6Z, not eligible for NRHP	Outside

*This site does not appear on EIC maps, and its site record contains conflicting locational data. See accompanying text.

CA-RIV-1711 (33-01711): Squires Village Site

This reportedly Ethnohistoric period bedrock milling site, labeled the Squires Village site and also designated SBCM 42, was initially recorded in 1938 or 1939 based on the notes of an informant, Arthur

Squires, who lived in the vicinity in early 1900s. Mr. Squires described the site as “the main village of the Sabobos [the Soboba Band of Luiseño Indians]” that was located 0.25-mile from his house on Hillside Avenue, between Arlington Avenue and Central Avenue. The site contained stone pestles, granite boulders with grinding surfaces, and broken pottery. Squires went on to note that “this village was the last to move to the Soboba Res. at San Jacinto” (Smith 1939). The site’s location is indicated by a hand-drawn map that accompanies the 1939 site record that is not to scale, as well as UTM coordinates in the 1971 site record update. The UTM data (Zone 11, NAD 1927, 460420 m E, 3756820 m N) place the site about 150 m north of the project APE, but the hand-drawn map may place the site within the easternmost portion of the APE. Maps in the possession of Pechanga Cultural Resources, Temecula Band of Luiseño Mission Indians (A. Hoover 2011, personal communication to J. Dietler) place the site within the eastern direct APE. Thus, while the precise location of the site is unclear, it is possible that it is located within the APE.

33-11633

Located at 6780 Doolittle Avenue is the Pasquale Solazzo Residence, a Spanish Eclectic style home and associated out buildings. The property was found not eligible for listing in the CRHR or NRHP, as it is unremarkable in architectural style and is not associated with events or persons important to history (Love and Tang 2002).

HISTORIC MAPS

A review of the USGS 1901 Elsinore, California 30-minute and 1901 and 1942 Riverside, California 15-minute quadrangles indicated that Hillside, Arlington and Van Buren avenues were established prior to 1901. Sometime between 1905 and 1942, several dirt roads were constructed along the south side of the Santa Ana River. No buildings are depicted in the vicinity of the project area on any of these maps.

NATIVE AMERICAN CONSULTATION

SWCA Archaeologist Susan Underbrink contacted the California Native American Heritage Commission (NAHC) by letter on February 26, 2008, to request a review of the Sacred Lands File for Native American cultural resources (Appendix B). The reply from the NAHC, dated February 28, 2008, stated that the results of the Sacred Lands File search failed to indicate the presence of Native American cultural resources in the immediate vicinity of the proposed project area. The NAHC reply included a list of 12 Native American groups and/or individuals for Riverside County who may have knowledge of cultural resources in the project area. SWCA sent letters describing the proposed project and its related APE, along with location maps, via U.S. mail to these 12 groups on February 28, 2008. Ms. Underbrink followed up with each group via telephone or email on March 19 and 20, 2008, and made subsequent follow-ups, as necessary. At the request of the FAA, John Dietler contacted Temecula Band of Luiseño Mission Indians on April 15, 2011 for additional information. The results of the consultation are described in detail in Table 5 below.

Table 5. Consultation with Local Native American Groups

Native American Contact	Date Letter Sent	Date of Follow-up Correspondence/ Reply	Summary of Consultation
Anthony Madrigal, Jr., Chairperson Cahuilla Band of Indians P.O. Box 391760 Anza, CA 92536	2/28/08	Left telephone message on 03/19/08	Message left on voice mail on 3/19/08. No response received. No further action necessary.
Harold Arres, Cultural Resources Manager Soboba Band of Luiseño Indians P.O. Box 487 San Jacinto, CA 92581	2/28/08	Left telephone message on 3/19/08	Message left on voice mail on 3/19/08. No response received. No further action necessary.
Anna Hoover, Pechanga Cultural Resources Temecula Band of Luiseño Mission Indians PO Box 2183 Temecula, CA 92593	2/28/08	Responded 3/3/08 via telephone and sent letter 3/19/08	<p>On 3/3/08, Anna Hoover, Cultural Analyst for the tribe, contacted SWCA Archaeologist Susan Underbrink, requesting the inclusion of a Native American observer during the recordation of the sites found during the field survey. A representative from the tribe cultural resources center was scheduled to accompany archaeologists to record the sites on March 11, 2008, but was unable to attend.</p> <p>On March 19, 2008 Ms. Hoover sent a letter to Ms. Underbrink, restating the previous conversation and adding requests for site records and notification on project updates.</p> <p>On February 18, 2011 Ms. Hoover sent a letter to Mark McClardy at the FAA, which was provided to SWCA reiterating her requests outlined above. She also noted the presence of site CA-RIV-1711 within the APE, requested the execution of an agreement between the FAA or its designee and the Pechanga Tribe specifying appropriate treatment of inadvertent discoveries of cultural resources, and requested mitigation that required Pechanga tribal monitors during all archaeological studies and ground-disturbing activities associated with the project.</p> <p>On April 15, 2011, SWCA Principal Investigator John Dietler telephoned Ms. Hoover to discuss the location of CA-RIV-1711. In addition to the site location data, Ms. Hoover reiterated her requests for government-to-government consultation with an FAA representative, mitigation requiring Native American monitoring of ground-disturbing activities, and project updates.</p>

Table 5. Consultation with Local Native American Groups

Native American Contact	Date Letter Sent	Date of Follow-up Correspondence/ Reply	Summary of Consultation
Cindi Alvitre Ti'At Society 6515 E. Seaside Walk #C Long Beach, CA 90803	2/28/08	Left telephone message on 3/19/08	Message left on voice mail on 3/19/08. No response received. No further action necessary.
Joseph Hamilton, Chairman Ramona Band of Cahuilla Mission Indians PO Box 391670 Anza, CA 92539	2/28/08	Left telephone message on 3/20/08	Message left on voice mail on 3/20/08. No response received. No further action necessary.
Anthony Morales, Chairperson Gabrieleno/Tongva San Gabriel Band of Mission Indians P.O. Box 693 San Gabriel, CA 91778	2/28/08	Telephoned on 3/19/08 and 3/20/08	Telephoned on 3/19/08 and 3/20/08. No answering machine. No response received. No further action necessary.
John Marcus, Chairman Santa Rosa Band of Mission Indians P.O. Box 609 Hemet, CA 92546	2/28/08	Telephoned 3/19/08	Telephoned 3/19/08. Terry Hughes, Tribal Administrator responded on behalf of the Tribe and Mr. Marcus, stating that the project was not in their jurisdiction and that they had no concerns. However he stated the No further action necessary.
Sam Dunlap, Tribal Secretary Gabrielino Tongva Nation 761 Terminal Street, Bldg 1 2 nd Floor Los Angeles, CA 90021	2/28/08	Telephoned 3/19/08	Telephoned 3/19/08, line disconnected. No response received. No further action necessary.
Ms. Susan Frank Gabrielino Band of Mission Indians P.O. Box 3021 Beaumont, CA 92223	2/28/08	Left telephone message on 3/19/08	Message left on voice mail on 3/19/08. No response received. No further action necessary.
Goldie Walker Serrano Nation of Indians 6588 Valaria Drive Highland, CA 92346	2/28/08	Left telephone message on 3/20/08	Message left on voicemail on 3/20/08. No response received. No further action necessary.
Robert Martin, Chairperson Morongo Band of Mission Indians 11581 Potrero Road Banning, CA 92220	2/28/08	Sent email on 3/19/08	Sent email on 3/19/08. No response received. No further action necessary.

Table 5. Consultation with Local Native American Groups

Native American Contact	Date Letter Sent	Date of Follow-up Correspondence/ Reply	Summary of Consultation
Ann Brierty Environmental Department San Manuel Band of Mission Indians 101 Pure Water Lane Highland, CA 92346	2/28/08	Left telephone message on 3/20/08	Message left on voicemail on 3/20/08. No response received. No further action necessary.

METHODS

FIELD SURVEY

On February 27, 2008, SWCA archaeologists Susan Underbrink, William A. Sawyer, and Jessica DeBusk conducted an intensive pedestrian survey of the main 132.9-acre APE (Figure 1). In October 2009, the APE was revised to include two additional parcels, located west of the original APE. These two new parcels comprise an area of approximately 11.8 acres. On November 4, 2009, SWCA archaeologists Jessica DeBusk and Charles Cisneros conducted an intensive survey of this area. An additional 1-acre parcel, containing two buildings was added to the APE, near the northwestern edge of the project area in January 2010. On January 17, 2010 this parcel was surveyed by SWCA archaeologist John Covert. SWCA architectural historian Sonnier Francisco conducted preliminary research to determine the age of the buildings.

During the surveys, archaeologists conducted parallel transects spaced 10 to 20 meters apart in unpaved areas. The archaeologists inspected parcels for the presence of surface archaeological sites and artifacts, as well as evidence of features associated with historic activity in the area, where ground visibility and access permitted. They navigated with global positioning system (GPS) receivers, topographic maps, and aerial photographs. Project documentation included field notes and numerous digital photographs, including general overviews of each parcel, photographs of any buildings located on the parcels, and overviews of the surrounding properties during the surveys. Preliminary research for the project included a review of historic aerials, assessor parcel information, building permits and data located on the City of Riverside website. All field notes, digital photographs, and records related to the current study are on file at the SWCA Pasadena, California, office.

CULTURAL RESOURCE RECORDATION

SWCA archaeologists Underbrink, Sawyer, and DeBusk recorded the location of cultural resources within the project area between February 28 and March 11, 2008, using a Garmin GPS with submeter accuracy. California Department of Parks and Recreation (DPR) series 523 forms, a field notebook, and a digital camera were used to record site characteristics and survey conditions. Copies of the field notes and digital photographs are available at the SWCA Pasadena office. No cultural resources were recorded during the subsequent field surveys.

RESULTS AND EVALUATIONS

Within the eastern portion of the project, the areas directly adjacent to the runway were highly disturbed. There were gravel access roads throughout the project area. Vegetation throughout most of the area was extremely dense; the grasses were knee-high and obscured between 70 and 90 percent of the ground surface. The soils in the project area were generally sandy and silty, with coarse sands derived from the decomposing quartz diorite bedrock underlying the area (Figure 2).

The western portion of the APE consists of three parcels. This area is heavily disturbed with modern refuse and concrete debris. Vegetation consists of sage scrub and weeds, and visibility ranged from zero percent to 100 percent. The areas with fair visibility showed signs of disturbance, including tire tracks and cleared vegetation. The local soil consists of light yellow sandy silt that is extremely compact. For safety reasons, approximately 1 acre along the southern boundary of the western project area could not be surveyed. A densely vegetated drainage in this area contains transient living quarters.

Two previously unrecorded buildings were identified during the field survey, within the western portion of the APE. Located at 6775 Doolittle Avenue, the buildings consist of a large, rectangular concrete block warehouse that faces east towards Doolittle Avenue, with a smaller, similar building situated to the rear. SWCA archaeologist John Covert photographed the buildings and architectural historian Sonnier Francisco conducted preliminary research on the buildings. A review of assessors parcel data, building permits and historic aerial photographs revealed that the larger building was constructed in 1962, for use as a machine shop. The smaller building was constructed in 1974, also for use as a machine shop (City of Riverside, var). The buildings are now part of the adjacent golf course property (Historic Aerials.com, var.). These simple, utilitarian type concrete buildings were constructed in 1962 and 1974 and are less than 50 years of age; the buildings were not documented on DPR forms or evaluated for historic significance and are not considered historic properties or historical resources.

Six new cultural resources were located during the field survey, all in the eastern project area. These include one prehistoric bedrock milling archaeological site (CA-RIV-8899/33-17095), two multi-component sites containing bedrock milling features and historic refuse scatters (CA-RIV-8897/33-17092 and CA-RIV-8898/33-17094), one built environment resource, a water tank (33-17096), one site containing a historic refuse scatter and historic feature (33-17093) and one multi-component site containing built environment resources (concrete features) and a historic refuse scatter (33-17097). SWCA archaeologists Underbrink and Sawyer recorded the six sites on March 11, 2008 (Figure 3). DPR forms for these resources are included in Appendix C.

CA-RIV-8897 (33-17092): BEDROCK MILLING FEATURE AND HISTORIC ARTIFACT SCATTER

This is a multi-component archaeological site with prehistoric and historic resources detected on the site surface, which measures approximately 18 x 18 m (254 m²). It sits at the base of a small knoll in a relatively flat area. Heavy vegetation of various grasses surrounds the site. The area was mowed the day before the site was recorded so the ground visibility was about 50 percent (Photograph 1).

The prehistoric component consists of a single quartz diorite boulder among a bedrock outcrop, with seven milling slicks at different elevations. The boulder is 8.5 m north-south x 4.3 m east-west. Five of the milling slicks are in poor condition, with cracks and exfoliation. Two of the slicks have heavy polish and very slight depth. One slick has a well-defined inner portion with high polish and an outer area evidencing much less use. No prehistoric artifacts were observed.



Figure 2. SWCA Survey Coverage

Exact location of identified resources is not disclosed to protect resource integrity



Photograph 1. View to the north of CA-RIV-8897 (33-17092)

The historic component is a surface scatter of highly fragmented historic artifacts located around and within the bedrock outcrop, particularly the east side. Approximately 300 glass, 30 ceramic, 10 metal, and a few fragments of other material (such as brick) were counted within the 18 × 18 m area. Artifact density diminishes with distance. The glass artifacts have maker's marks and manufacturing attributes spanning the period between the early to mid twentieth century, with a few pieces that may be attributable to late nineteenth century historic activity in the area.

Bottle glass fragments were observed in a variety of colors (colorless, sun-colored amethyst, amber/brown, aqua, and blue). Some exhibited manufacturing techniques found mainly before the 1920s; these include prescription bottle necks with hand-tooled finishes and a number of sun-colored amethyst glass fragments. One soda bottle neck displays the Codd marble stopper system that was manufactured mainly between the late 1870s to about 1900 (Munsey 1970:104, 250).

Other bottle and jar pieces were machine-made with maker's marks ranging from the 1920s to the early 1960s. Glass maker's marks included Hazel Atlas Glass Company, 1920-1964 and Glass Containers, Inc., circa 1940s (Toulouse 1971:220, 239). One bottle fragment is embossed with the phrase "Federal Law Forbids Sale or Reuse of this Bottle," placing it in the post-Prohibition era, after 1933 (Munsey 1970:126). Other glass artifacts noted are a canning jar lid liner, a milk bottle, a pressed glass bowl lid, and flat (window) glass.

Some glass fragments are associated with modern recreational activity in the area, including beer, liquor, and various beverage bottles. Ceramic artifacts consist of plates, bowls, and cups; primarily whitewares, with a few porcelain fragments. There are blue transfer prints, floral decals, and hand painted floral motifs on the whitewares and the decorations cannot be assigned to any particular decorative style or chronological period. No ceramic maker's marks were found. Several salt-glazed stoneware sherds may derive from beverage or ink bottles. Brown-glazed earthenware sewer pipe fragments, unglazed earthenware, and blue-glazed earthenware flower pots are also present. All of the ceramic artifacts fit within the time frame assigned to the glass artifacts.

The few metal artifacts found at this site comprise highly corroded food or beverage can fragments, wire nails, a paint can, and sheet metal fragments. One brass shotgun shell is stamped "WINCHESTER/NO.

10/NEW RIVAL” on the base, which was manufactured before 1920 (Farrar 2008). Miscellaneous artifacts include concrete and brick fragments, and a graphite D-cell battery core.

There is no observable connection between this site and two nearby bedrock milling sites. Site CA-RIV-8898 (33-17094), which also contains historical artifacts, is located approximately 50 m to the west, while CA-RIV-8899 (33-17095) is located approximately 50 m to the northwest. It is possible that all three of these sites are associated or synonymous with CA-RIV-1711, the Squires Village site. In 1939, an informant familiar with the site described it as the main village of the Soboba Band of Luiseño Indians, occupied in the early 1900s prior to their resettling at the Soboba Reservation. If accurate, the site may be a single component Ethnographic period site.

Site CA-RIV-8897 (33-17092), consisting of a single bedrock boulder with seven milling slicks and late 19th/early 20th century refuse, cannot be evaluated for NRHP significance without formal archaeological testing.

33-17093: HISTORIC FEATURE AND ARTIFACT SCATTER

This historic archaeological site consists of one feature and a refuse scatter. The entire site measures 87 × 57 feet (3,893 square feet) The feature is a square hole with inside dimensions of 47 inches north-south × 46 inches east-west. The hole is approximately 28 inches deep, but the bottom is very soft and could have been filled for safety reasons. A capped metal pipe was found in the bottom, but there is no way to determine if this pipe is part of the feature or subsequent fill. A sidewall profile shows that bedrock is capped with 9 inches of concrete to the surface. There is a peppertree 10 feet to the west (Photograph 2).



Photograph 2. Close-up of 33-17093.

A light scatter of historic refuse is located mainly north of the hole and includes approximately 10 ceramic sherds, 20 bottle glass fragments, a two-inch thick concrete slab, a two-inch diameter metal water pipe section, miscellaneous metal hardware and can fragments, and a scallop (*Argopecten* sp. or similar) shell fragment. The typologically diagnostic ceramics include a cup-bottom mold fragment circa 1910 and a Chinese globular jar fragment. Whether the artifacts and the hole are associated is unknown.

33-17093 consists of one historic feature and a historic refuse scatter. Both lack integrity and have no significant associations to events or persons important to history (Criteria A, B and C). Furthermore, it is not likely to yield information important in history (Criterion D). Further, the site does not qualify for local listing. It is recommended that 33-17093 be assigned California Historical Resources Status Code (Status Code) “6Z, Found ineligible for N[ational] R[egister], C[alifornia] R[egister], or Local designation through survey evaluation” (California Office of Historic Preservation 2003).

CA-RIV-8898 (33-17094): BEDROCK MILLING FEATURE AND HISTORIC ARTIFACT SCATTER.

This multi-component archaeological site comprises a single bedrock milling feature and a surface scatter of historic artifacts in and around bedrock outcrops. The site boundary encompasses an area of ca. 55.5 × 35 m (1,526 m) and includes four loci (named A-D) with light artifact scatters. Each locus is associated with either a non-native peppertree or a bedrock outcrop; a light scatter of glass, ceramics, and metal is found between the loci. Although the area was recently mowed, the surface visibility was under 50 percent, so all materials may not have been observed. The peppertrees on the site are probably associated with the historic activity responsible for the deposition of the artifacts. The trees appear to be old themselves, having been cut back or trimmed on occasion since they were first planted (Photograph 3).



Photograph 3. View northeast of Locus B, CA-RIV-8898 (33-17094)

Locus A

This locus consists of historic material scattered in and around a bedrock outcrop. The locus measures 6 × 6 m (19.7 x 19.7 feet) or 28 square meters. Cultural material includes five bottle glass fragments (various types), a brown, glazed stoneware jar sherd, one leather fragment, and two pieces of whiteware ceramic. The stoneware sherd appears to be from a utilitarian vessel of a type that is often found associated with Chinese occupation, post 1885 in this region of southern California (e.g., Brott 1987).

Locus B

This locus includes historic artifacts and a prehistoric milling feature located around a large bedrock outcrop adjacent to a large peppertree. The locus measures 14 × 15 m (45.9 x 49.2 feet) or 165 square meters. Historic refuse is found in and around the outcrop and tree, and includes approximately 20 pieces of glass, ceramic, metal, concrete, and milled wood. A “LIQUOZONE” bottle body sherd was identified; these were manufactured from the mid 1890s to the early twentieth century (Fike 1987:68).

One small milling slick was found on a small bedrock exposure that is flush to the ground and located in the southwest portion of the locus.

Locus C

This locus is a light scatter of approximately 20 historic artifacts including bottle glass and ceramic fragments, scattered around a peppertree. The locus measures 8 × 8 m (26.2 x 26.2 feet) or 50 square meters. No diagnostic materials were observed.

Locus D

This locus is a light scatter of historic materials including bottle glass, ceramic fragments, metal (probably food cans), brown, glazed stoneware (Chinese), and a brown earthenware ceramic sherd that may be Native American in origin. The locus measures 10 × 9 m (32.8 x 29.5 feet) or 71 square meters. Again, the scatter is concentrated around a peppertree.

The historic material at this site is scattered across a gentle slope, amongst bedrock exposures and peppertrees. The milled wood, concrete, and household refuse found at Locus B may indicate that a habitation locus was close by; however the small amount of refuse suggests short term or limited use of the area. No historic material was found upslope from these loci.

The datable historic materials from all loci indicate an American period time range of ca. 1885 to 1920. Additionally, two fragments of Chinese earthenware and one brown earthenware sherd, possibly Native American in origin, were found at loci A and D, and suggest access to multi-ethnic resources.

There is no observable connection between this site and two nearby bedrock milling sites. Site CA-RIV-8897 (33-17092), which also contains historical artifacts, is located approximately 50 m to the east, while CA-RIV-8899 (33-17095) is located approximately 50 m to the northeast. It is possible that all three of these sites are associated or synonymous with CA-RIV-1711, the Squires Village site. In 1939, an informant familiar with the site described it as the main village of the Soboba Band of Luiseño Indians, occupied in the early 1900s prior to their resettling at the Soboba Reservation. If accurate, these sites may represent a single component Ethnographic period occupation.

Site CA-RIV-8898 (33-17094), consisting of a single bedrock boulder with one milling slick, an earthenware sherd of possible Native American origin, and late 19th/early 20th century refuse, cannot be evaluated for NRHP significance without formal archaeological testing.

CA-RIV-8899 (33-17095): BEDROCK MILLING FEATURES

This prehistoric archaeological site consists of four milling slicks on three boulders, within an 8 × 6.7 m (42 m) area. All of the slicks are in fair to poor condition. One is covered with soil, and is in fair condition; the other three have high polish and are well-defined. Two slicks on one boulder have eroded

edges. No artifacts were found in association, but the ground visibility was extremely limited due to heavy grass vegetation (Photograph 4).



Photograph 4. View south of CA-RIV-8899 (3317095)

There is no observable connection between this site and two nearby bedrock milling sites. Site CA-RIV-8897 (33-17092), is located approximately 50 m to the southeast, while CA-RIV-8898 (33-17094) is located approximately 50 m to the southwest. It is possible that all three of these sites are associated or synonymous with CA-RIV-1711, the Squires Village site. In 1939, an informant familiar with the site described it as the main village of the Soboba Band of Luiseño Indians, occupied in the early 1900s prior to their resettling at the Soboba Reservation. If accurate, these sites may represent a single component Ethnographic period occupation.

Site CA-RIV-8899 (33-17095), consisting of a four milling slicks on three boulders, cannot be evaluated for NRHP significance without formal archaeological testing.

33-17096: HISTORIC WATER TANK

This resource is a historic, above-ground water tank. It is a composite tank consisting of a concrete base with a vertical extension made from galvanized steel with riveted joints. The rim of the tank is reinforced with 1½-inch diameter steel pipe. Although no longer symmetrical, the tank measures 114 inches (290 cm) in diameter and about 43 inches (109 cm) in height. The concrete base is clad with a galvanized steel skirt and is attached to the upper extension with a six-inch strip of galvanized steel with riveted joints. The concrete is four inches thick and its depth was not determined. The tank is directly adjacent to a peppertree and a dirt track access road. There are no intake or outlet pipes or holes evident on the tank. No other historic material was observed near the tank primarily due to poor surface visibility (Photograph 5).



Photograph 5. View east of 33-17096

33-17096 consists of one deteriorating steel water tank, a structure considered to be a ubiquitous resource throughout Riverside County and southern California. 33-17096 does not warrant further evaluation under Criteria A, B, or C because it no longer retains integrity sufficient to convey its association with significant events or persons. Furthermore, it is not likely to yield information important in history (Criterion D). The site is also not eligible as a contributor to a historic district. Further, the site does not qualify for local listing. It is recommended that 33-17096 be assigned California Historical Resources Status Code (Status Code) “6Z, Found ineligible for N[ational] R[egister], C[alifornia] R[egister], or Local designation through survey evaluation” (California Office of Historic Preservation 2003).

33-17097: HISTORIC FEATURES AND ARTIFACT SCATTER

This historic archaeological site has several components including a linear concrete feature, concrete standpipe, small concrete trough, palm tree stumps, and a small concrete slab; all of which lack integrity. The site measures 131.2 x 111.5 feet. The linear concrete feature appears to be a trough adjacent to a low-profile concrete standpipe presently located under a peppertree. The trough disappears about 10 m directly west of the standpipe, probably having been destroyed by ground disturbance in the area. The trough is 15 inches wide and the walls are 2.25 inches thick. This feature was probably part of a water conveyance system (Photograph 6).

The concrete standpipe is 20 inches in diameter and stands about 10 inches above the duff-covered ground surface. Some wire is wrapped around the perimeter, probably to hold together the broken upper portion. This pipe probably fed water to the trough located just to the south.

The un-reinforced concrete slab is located about 15.5 m (50.9 feet) northwest of the trough and standpipe. The slab is 52 inches long, 24 inches wide, and 4 inches thick, and is cardinally positioned. The purpose of this slab is unclear. Another peppertree is located about 2.7 m (8.9 feet) south of the slab. Between the slab and peppertree there is a scatter of concrete and brick fragments with some pieces of sheet metal.

Along the eastern edge of the site and north of the peppertrees are two palm tree stumps that are about 13 m (42.7) apart and aligned north to south. Palm trees were often used to mark historic residences at the

beginning of the twentieth century. No house foundations or midden was observed, but ground visibility was generally poor throughout the area.



Photograph 6. View of 33-17097

Resource 33-17097 does not warrant further evaluation under Criteria A, B, or C because it no longer retains integrity sufficient to convey its association with significant events or persons. No evidence was discovered to warrant consideration under Criterion D. The site is also not eligible as a contributor to a historic district. Further, the site does not qualify for local listing. It is recommended that 33-17097 be assigned California Historical Resources Status Code (Status Code) “6Z, Found ineligible for N[atational] R[egister], C[alifornia] R[egister], or Local designation through survey evaluation” (California Office of Historic Preservation 2003).

SUMMARY AND RECOMMENDATIONS

The goal of this project is to identify cultural resources within the Riverside Airport Improvement project area and provide management recommendations for those resources. One previously recorded residence (33-11633) was documented within the project area, however the building was found not eligible for listing in the CRHR and NRHP. No further action is recommended regarding this property. A reportedly Ethnographic period archaeological site, CA-RIV-1711 (33-01711), may be located within the APE. It is discussed below.

The field surveys identified six cultural resources, all in the eastern portion of the project area. These include one bedrock milling archaeological site (CA-RIV-8899/33-17095), two sites containing bedrock milling features and historic refuse scatters (CA-RIV-8897/33-17092 and CA-RIV-8898/33-17094), one built environment resource, a water tank (33-17096), one historic site containing a refuse scatter and feature (33-17093) and one historic site containing built environment resources (concrete features) and a refuse scatter (33-17097).

Three of the historic-period resources (33-17093, 33-17096, and 33-17097) have been evaluated and found to be not eligible for listing in the NRHP or local registers. Any impacts to these resources would be less than significant.

The three bedrock milling sites (CA-RIV-8897/33-17092, CA-RIV-8898/33-17094, and CA-RIV-8899/33-17095) may be affiliated or synonymous with previously recorded, but poorly mapped CA-RIV-1711 (33-01711). Although recorded here as three separate prehistoric or multi-component archaeological sites, these may actually represent a single component Ethnographic period occupation. If CA-RIV-1711 (33-01711) is located within the APE, it almost certainly corresponds to one or more of these three sites. Thus mitigation applied to the three newly recorded bedrock milling sites would also address any project impacts to CA-RIV-1711 (33-01711). None of these sites has been formally evaluated for listing in the NRHP or local register. To the extent possible, impacts to those resources should be avoided during project improvements. If avoidance is not feasible, formal NRHP evaluation and data recovery may be necessary to mitigate impacts to these resources.

AVOIDANCE OF POTENTIALLY ELIGIBLE ARCHAEOLOGICAL SITES

Resource avoidance would be accomplished by marking the boundaries of sensitive archaeological areas with a highly visible and reasonably sturdy barrier (e.g., orange fencing with wooden stakes). This barrier should be erected under the direct supervision of an archaeologist, and should be checked for integrity periodically for the duration of the ground-disturbing elements of the project by an archaeologist. For the current project, the three unevaluated sites are located in a tight grouping immediately east of the proposed limits of grading. A single exclusion barrier should encompass the three sites and an additional 5-meter (16.4-foot) buffer (Figures 4 and 5). The barrier should be accompanied by signs that read “Environmentally Sensitive Area: No Ground Disturbance.” It is critical that these signs do *not* mention archaeological resources so as not to attract looters and vandals.

MONITORING OF GROUND-DISTURBING ACTIVITY

The easternmost portion of the project area is situated on a hillside. The field survey and research indicate that this area is ideal for human occupation. Three prehistoric archaeological sites were identified within this area; CA-RIV-8899/33-17095, CA-RIV-8897/33-17092 and CA-RIV-8898/33-17094. Due to high archaeological sensitivity within the APE, SWCA recommends that a qualified archaeologist be present to monitor ground-disturbing activities within this area during initial grading for the project (see Figure 4). SWCA recommends that the monitor work under the direction of an archaeologist who meets the Secretary of the Interior’s Professional Qualification Standards (NPS 1983). If monitoring is conducted in conjunction with site avoidance, special attention should be paid to the southeastern portion of this area, in the vicinity of the three prehistoric archaeological sites.

SWCA recommends that a Monitoring Plan is established prior to implementation of this project. Implementation of a Monitoring Plan during ground disturbance in highly sensitive archaeological areas will ensure cultural resources are identified and protected and also ensure that, if cultural resources are discovered or if previously identified resources are affected in an unanticipated manner, such resources receive mitigation to lessen the impact to less than significant.

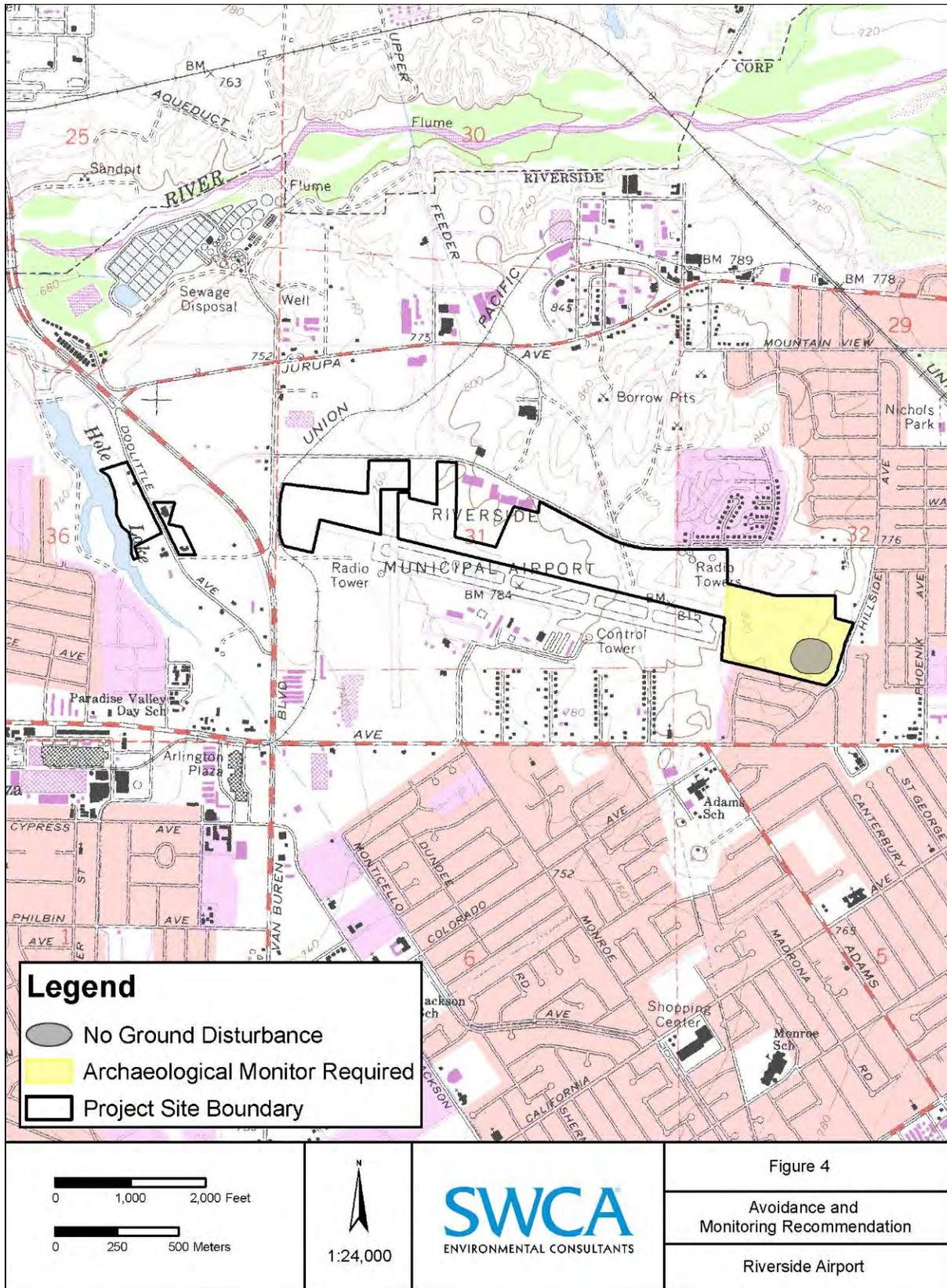


Figure 4. Avoidance and Monitoring Recommendation

Exact location of identified resources is not disclosed to protect resource integrity

NRHP EVALUATION OF ARCHAEOLOGICAL SITES

If project plans change such that resource avoidance is not feasible, an archaeological testing and significance evaluation program will be needed to establish the NRHP eligibility of sites CA-RIV-8897 (33-17092), CA-RIV-8898 (33-17094), CA-RIV-8899 (33-17095), and possibly CA-RIV-1711 (33-01711). Such a testing program will either determine that a resource is not NRHP eligible, leading to a finding of no significant impacts, or that it is NRHP eligible. Archaeological resources that are found to be NRHP eligible typically qualify for listing under Criterion D (a resource that has yielded, or may be likely to yield, information important in prehistory or history). Where resource avoidance remains unfeasible, an archaeological data recovery program may be used to exhaust the data potential of the resource, thus reducing impacts to less than significant. Site-specific mitigation plans should be prepared for each of the potentially eligible resources that are to be affected by development (Table 6).

Table 6. Recommended Mitigation for Cultural Resources within the APE

Trinomial	Primary Number	Temporary Name	Resource Description	NRHP Eligibility Recommendation	Treatment Recommendation
CA-RIV-1711	33-01711		Ethnographic: Bedrock milling site	May be eligible under Criterion D	If site is within APE, it has been re-recorded as CA-RIV-8897, 8898, and/or 8899. See below for treatment of those sites.
	33-11633	CRM Tech 824-3H	Historic: 6870 Doolittle Avenue, a residence and out buildings	Not eligible	No further work
CA-RIV-8897	33-17092	RMA-1	Multi-component: Prehistoric bedrock milling site and historic refuse scatter	May be eligible under Criterion D	Avoid or test
	33-17093	RMA-2	Historic: feature and refuse scatter	Not eligible	No action; project will not cause adverse effect
CA-RIV-8898	33-17094	RMA-3	Multi-component: Prehistoric bedrock milling site and historic refuse scatter	May be eligible under Criterion D	Avoid or test
CA-RIV-8899	33-17095	RMA-4	Prehistoric: bedrock milling site	May be eligible under Criterion D	Avoid or test
	33-17096	RMA-5	Historic: Steel water tank	Not eligible	No action; project will not cause adverse effect
	33-17097	RMA-6	Historic: water features and refuse scatter	Not eligible	No action; project will not cause adverse effect

NATIVE AMERICA MONITORING OF GROUND-DISTURBING ACTIVITY AND ARCHAEOLOGICAL TESTING

The Pechanga Cultural Resources office of the Temecula Band of Luiseño Mission Indians has requested mitigation requiring that Native American monitors be present during all archaeological studies and all ground-disturbing activities conducted in connection with the project.

WORKER CULTURAL AWARENESS TRAINING

SWCA further recommends that, prior to initiation of ground-disturbing activities, qualified archaeologists conduct a short awareness training session for all construction workers and supervisory personnel. The course would explain the importance of and legal basis for the protection of significant archaeological resources. Each worker would also learn the proper procedures to follow in the event cultural resources or human remains/burials are uncovered during ground-disturbing activities. These procedures include work curtailment or redirection and the immediate contact of their supervisor and the archaeological monitor. It is recommended that this worker education session include visuals of artifacts (prehistoric and historic) that might be found in the project vicinity, and that it take place on-site immediately prior to the start of ground disturbance. The approximately 30- to 45-minute training session may be conducted on site by video, PowerPoint presentation, or related media.

INADVERTENT DISCOVERIES

In the event that cultural resources are exposed during ground-disturbing activities, the archaeological monitor must be empowered to temporarily halt construction activities (e.g., grading, grubbing, vegetation clearing) in the immediate vicinity of the discovery while the resources are evaluated for significance. Construction activities could continue in other areas. If the discovery proves to be significant, additional work, such as data recovery excavation, may be warranted and would be discussed in consultation with the lead agency.

Prehistoric materials within the APE might include flaked or ground stone tools, tool-making debris, pottery, culturally modified animal bone, fire-affected rock (FAR), or soil darkened by cultural activities (midden). Historic materials might include building remains, metal, glass, ceramic artifacts, or other debris greater than 50 years old.

In the event that prehistoric or ethnohistoric cultural resources are exposed during ground-disturbances, SWCA recommends contacting the appropriate tribal contacts regarding the find because local tribal representatives have indicated that the project area is an area of concern.

HUMAN REMAINS

The discovery of human remains is always a possibility during ground disturbances; State of California Health and Safety Code Section 7050.5 addresses these findings. This code section states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to PRC Section 5097.98. The Riverside County Coroner must be notified of the find immediately. If the human remains are determined to be prehistoric in age, the Coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendant (MLD). The MLD shall complete the inspection of the site within 48 hours of notification and may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

REFERENCES

- Aislin-Kay, M. and Taniguchi, C.
2003 Records Search and Site Visit Results for Cingular Telecommunications Facility Candidate SB-355-01 (Arlington Inn) 6843 Arlington Avenue, Riverside, Riverside County, CA. On file, Eastern Information Center, University of California, Riverside.
- Barbour, Michael G. and Jack Major (editors)
1977 *Terrestrial Vegetation of California*. John Wiley and Sons, New York.
- Bean, Lowell J.
1972 *Mukat's People: The Cahuilla Indians of Southern California*. University of California Press, Los Angeles.
1976 Social Organization in Native California. In *Native California: A Theoretical Retrospective*, edited by Lowell J. Bean and Thomas C. Blackburn, pp. 99–124. Ballena Press, Socorro, New Mexico.
1978 Cahuilla. In *California*, edited by Robert F. Heizer, pp. 575–587. Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.
1990 *Ethnography of the Toro Canyon Cahuilla*. Prepared for George Berkey and Associates, Inc. Cultural Systems Research, Inc., Menlo Park, California.
- Bean, Lowell J., and Harry W. Lawton
1993 Some Explanations for the Rise of Cultural Complexity in Native California with Comments on Proto-Agriculture. In *Before the Wilderness: Environmental Management by Native Californians*, edited by Thomas C. Blackburn and Kat Anderson, pp. 27–54. Ballena Press, Menlo Park, California.
- Bean, Lowell J., and William B. Mason
1962 *The Romero Expeditions, 1823-1826*. Palm Springs Desert Museum, Palm Springs, California.
- Bean, Lowell J., and Katherine Siva Saubel
1972 *Temalpakh: Cahuilla Indian Knowledge and Usage of Plants*. Malki Museum Press, Morongo Indian Reservation, California.
- Bean, Lowell J., and Florence C. Shipek
1978 Luiseño. In *California*, edited by Robert F. Heizer, pp. 550–563. Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.
- Bean, Lowell J., and Charles R. Smith
1978 Gabrielino. In *California*, edited by Robert F. Heizer, pp. 538–549. Handbook of North American Indians, Vol. 8, William G. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.
- Bean, Lowell J., Sylvia B. Vane, and Jackson Young
1991 The Cahuilla Landscape: The Santa Rosa and San Jacinto Mountains. *Ballena Press Anthropological Papers No. 37*. Ballena Press, Menlo Park, California.

Bettinger, Robert L.

- 1974 The Dead Dog Site (Ca-Riv-202). In *Perris Reservoir Archeology: Late Prehistoric Demographic Change in Southeast California*, edited by James F. O'Connell, Philip J. Wilke, Thomas F. King, and Carol L. Mix, pp. 79–93. California Department of Parks and Recreation, Archaeological Reports 14.

Brott, Clark W.

- 1987 Utilitarian Stoneware from the Wong Ho Leun Site: A Pictorial Essay. In *Wong Ho Leun: An American Chinatown*, Volume 2, Archaeology, edited by the Great Basin Foundation, pp. 233-247. Great Basin Foundation, San Diego.

Brown, Alan K. (Editor/Translator)

- 2001 *A Description of Distant Roads: Original Journals of the First Expedition into California, 1769-1770*, by Juan Crespi. San Diego State University Press, California.

California Highways

- 2004 "Trails and Roads: De Anza Trail." Electronic documents, www.cahighways.org and www.cahighways.org/deanza.html, accessed February 2, 2004.

Campbell, Elizabeth W. C., and William H. Campbell

- 1935 The Pinto Basin Site: An Ancient Aboriginal Camping Ground in the California Desert. *Southwest Museum Papers* 9:1–51.

CIAP (California Indian Assistance Program)

- 2003 *2004 Field Directory of the California Indian Community*. California Indian Assistance Program, Sacramento.

City of Riverside

- Var. Building Permits. Online. <http://aquarius.riversideca.gov/permits/Browse.aspx?dbid=1>
- 2004 History of Riverside. Electronic document, <http://www.riversideca.gov/empire/history.htm>, accessed January 30, 2004.

Cottrell, Marie, and Kathleen Del Chario

- 1981 *Archaeological Investigations of the Tomato Springs Sites*. Report on file, South Central Coastal Information Center, California State University, Fullerton.

CRM Tech

- 2005 Historical/Archaeological Resources Survey Report: Assessors Parcel Number 190-370-021, City of Riverside, Riverside County, CA. On file, Eastern Information Center, University of California, Riverside.

Dale, Nancy

- 1985 *Flowering Plants: The Santa Monica Mountains, Coastal and Chaparral Regions of Southern California*. Capra Press, Santa Barbara, California.

Dahdul, M.

- 2002 Historical Archaeological Resources Survey Report: Assessor Parcel No. 193-122-021, Arlington Area, City of Riverside, Riverside County, California. On file, Eastern Information Center, University of California, Riverside.

de Barros, Philip

- 1996 *San Joaquin Hills Transportation Corridor: Results of Testing and Data Recovery at CA-ORA-1357*. Report on file, South Central Coastal Information Center, California State University, Fullerton

Demcak, Carol R.

- 1981 *Fused Shale As a Time Marker in Southern California: Review and Hypothesis*. Unpublished Master's Thesis, Department of Anthropology, California State University, Long Beach.

Dillon, Brian D.

- 2002 *California Paleo-Indians: Lack of Evidence, or Evidence of a Lack?* In *Essays in California Archaeology: A Memorial to Franklin Fenenga*, edited by William J. Wallace and Francis A. Riddell, pp. 110–128. Contributions of the University of California Archaeological Research Facility, No. 60, Berkeley.

Dixon, E. James

- 1968 *Cogged Stones and Other Ceremonial Cache Artifacts in Stratigraphic Context at ORA-58, a Site in the Lower Santa Ana River Drainage, Orange County*. *Pacific Coast Archaeological Society Quarterly* 4(3):57–68.

Drover, Christopher E., Henry C. Koerper, and Paul E. Langenwaller II

- 1982 *Early Holocene Adaptation on the Southern California Coast: A Summary Report of Investigations at the Irvine Site (CA-ORA-64), Newport Bay, Orange County, California*. *Pacific Coast Archaeological Society Quarterly* 19(2 & 3):1–84.

Eberhart, Hal

- 1961 *The Cogged Stones of Southern California*. *American Antiquity* 26:361–370.

Engelhardt, Zephyrin, O. F. M.

- 1921 *San Luis Rey Mission*. The James H. Berry Company, San Francisco.

Erlandson, Jon M.

- 1991 *Early Maritime Adaptations on the Northern Channel Islands*. In *Hunter-Gatherers of Early Holocene Coastal California*, edited by J. M. Erlandson and R. H. Colten, pp. 101–111. Costen Institute of Archaeology, University of California, Los Angeles.

Erlandson, Jon M., Theodore Cooley, and Richard Carrico

- 1987 *A Fluted Projectile Point Fragment from the Southern California Coast: Chronology and Context at CA-SBA-1951*. *Journal of California and Great Basin Anthropology* 9:120–128.

Farrar, Jon

- 2008 *The Art and History of Shotshells*. Electronic document, <http://www.ngpc.state.ne.us/nebland/articles/history/shotshells.asp>, accessed March 21, 2008. Nebraskaland magazine, Nebraska Game and Parks Commission.

Fike, Richard E.

- 1987 *The Bottle Book: A Comprehensive Guide to Historic Embossed Medicine Bottles*. Gibbs M. Smith, Inc., Salt Lake City.

Glassow, Michael A.

- 1997 *Middle Holocene Cultural Development in the Central Santa Barbara Channel Region*. In *Archaeology of the California Coast during the Middle Holocene*, edited by J. M. Erlandson

- and M. A. Glassow, pp.73–90. *Perspectives in California Archaeology*, Vol. 4. Institute of Archaeology, University of California, Los Angeles.
- Glassow, Michael A, L. Wilcoxon, and J. M. Erlandson
1988 Cultural and Environmental Change During the Early Period of Santa Barbara Channel Prehistory. In *The Archaeology of Prehistoric Coastlines*, edited by G. Bailey and J. Parkington, pp. 64–77. Cambridge University Press, Cambridge.
- Governor’s Office of Planning and Research
1998 *CEQA, California Environmental Quality Act Statutes and Guidelines*. Governor’s Office of Planning and Research, Sacramento, California. Electronic document, <http://ceres.ca.gov/ceqa/rev/approval.html>.
- Grenda, Donn R.
1995 *Prehistoric Game Monitoring on the Banks of Mill Creek: Data Recovery at CA-RIV-2804, Prado Basin, Riverside County, California*. Statistical Research Technical Series No. 52. Statistical Research, Inc., Tucson, Arizona.
1997 *Continuity and Change: 8,500 Years of Lacustrine Adaptation on the Shores of Lake Elsinore*. Statistical Research Technical Series No. 59. Statistical Research, Inc., Tucson, Arizona.
- Grunsky, F. R.
1989 *Pathfinders of the Sacramento Region*. Elk Grove Library.
- Hall, Matthew C.
1988 For the Record: Notes and Comments on “Obsidian Exchange in Prehistoric Orange County.” *Pacific Coast Archaeological Society Quarterly* 24(4):34–48.
- Hampson, R. et al.
1988 Cultural Resources Survey, Upper Santa Ana River, California. On file, Eastern Information Center, University of California, Riverside.
- Hansen, Janet L., and Jennifer A. Mermilliod
2002 *Historic Property Survey Report for the Jurupa Avenue Railroad Underpass/ Mountain View Avenue Grade Crossing Closure Project*. Planning Department, City of Riverside, California.
- Heizer, Robert F.
1978 Introduction. In *California*, edited by Robert F. Heizer, pp. 1–6. Handbook of North American Indians, Vol. 8, William G. Sturtevant, general editor, Smithsonian Institution, Washington D.C.
- Herring, Alike
1968 Surface Collections from ORA-83, A Cogged Stone Site at Bolsa Chica, Orange County, California. *Pacific Coast Archaeological Society Quarterly* 4(3):3–37.
- Hickman, J. C. (ed.)
1993 *The Jepson Manual*. University of California Press, Berkeley, California.

Historic Aerials.com

- Var. Historic Aerials, 6775 Doolittle Avenue, Riverside California. Online.
<http://www.historicaerials.com>.

Holland, R. F.

- 1986 Preliminary descriptions of the terrestrial communities of California. Nongame Heritage Program, California Department of Fish and Game.

Holland, V. L., and David J. Keil

- 1995 California Vegetation. Kendall/Hunt Publishing Company, Dubuque, Iowa.

Hoyt, Franklin

- 1948 History of Coachella Valley. In *The Periscope* (1990). A Publication of the Coachella Valley Historical Society. Indio, California.

Hudlow, S.

- 2004 A Phase I Cultural Resources Survey for Global Premiere, Mecca, Riverside County, California. On file, Eastern Information Center, University of California, Riverside.

Jertberg, P., and Kirtland, K.

- 1991 Cultural and Biological Resources Assessment of Jurupa Avenue Extension, Approximately 1 Mile, City of Riverside, Riverside County, California. On file, Eastern Information Center, University of California, Riverside.

Johnson, J. R., T. W. Stafford, Jr., H. O. Ajie, and D. P. Morris

- 2002 Arlington Springs Revisited. In *Proceedings of the Fifth California Islands Symposium*, edited by D. R. Brown, K. C. Mitchell, and H. W. Chaney, pp. 541–545. Santa Barbara Museum of Natural History, Santa Barbara, California.

Jones, Terry L., Richard T. Fitzgerald, Douglas J. Kennett, Charles Miksicek, John L. Fagan, John Sharp, and Jon M. Erlandson

- 2002 The Cross Creek Site and Its Implications for New World Colonization. *American Antiquity* 67:213–230.

Jones and Stokes Associates, Inc.

- 2000 Final Cultural Resources Inventory Report for the Williams Communications, Inc., Fiber Optic Cable System Installation Project, Riverside to San Diego, California VOL I-IV. On file, Eastern Information Center, University of California, Riverside.

Keeley, J. E.

- 1990 The California Valley grassland. In *Endangered Plant Communities of Southern California*, edited by A. A. Schoenherr, pp.3–23. Southern California Botanists Special Publication No. 3, Fullerton, California.

Keeley, J. E., and S. C. Keeley

- 1988 Chaparral. In *North American Terrestrial Vegetation*, edited by M. G. Barbour and W. D. Billings, pp. 165–207. Cambridge University Press, Cambridge, United Kingdom.

King, Chester

- 1993 Fuel Use and Resource Management: Implications for the Study of Land Management in Prehistoric California and Recommendations for a Research Program. In *Before the*

Wilderness: Environmental Management by Native Californians, edited by Thomas C. Blackburn and Kat Anderson, pp. 279–298. Ballena Press, Menlo Park, California.

Koerper, Henry C.

- 1995 *The Christ College Project: Archaeological Investigations at CA-ORA-378, Turtle Rock, Irvine, California*, Volume II. Report on file, South Central Coastal Information Center, California State University, Fullerton.

Koerper, Henry C., and Christopher E. Drover

- 1983 Chronology Building for Coastal Orange County, The Case from CA-ORA-119-A. *Pacific Coast Archaeological Society Quarterly* 19(2):1–34.

Koerper, Henry C., Roger D. Mason, and Mark L. Peterson

- 2002 Complexity, Demography, and Change in Late Holocene Orange County. In *Catalysts to Complexity, Late Holocene Societies of the California Coast*, edited by Jon M. Erlandson and Terry L. Jones, pp. 63–81. Perspectives in California Archaeology Vol. 6. Costen Institute of Archaeology, University of California, Los Angeles.

Kowta, Makoto

- 1969 The Sayles Complex, A Late Milling Stone Assemblage from the Cajon Pass and the Ecological Implications of its Scraper Planes. *University of California Publications in Anthropology* 6:35–69.

Kroeber, Alfred J.

- 1925 *Handbook of the Indians of California*. Bureau of American Ethnology Bulletin 78. Dover Publications, Inc., New York.

Langenwalter, Paul E. II, and James Brock

- 1985 *Phase II Archaeological Studies of the Prado Basin and the Lower Santa Ana River*. Report on file, U.S. Army Corps of Engineers, Los Angeles District.

Love, B. and B. Tang

- 2002 Historic Building Evaluation, 6630-6642 Brockton Avenue, City of Riverside, Riverside County, CA. On file, Eastern Information Center, University of California, Riverside.

McKenna, J.

- 1996 A Phase I Cultural Resources Investigation of the Proposed Van Buren Golf Center, Located at Van Buren Boulevard and Central Avenue, City of Riverside, Riverside County, California. On file, Eastern Information Center, University of California, Riverside.

Macko, Michael E.,

- 1998a *The Muddy Canyon Archaeological Project: Results of Phase II Test Excavations and Phase III Data Recovery Excavations at Archaeological Sites within the Crystal Cove Planned Community, Phase IV, Tentative Tract 15447, San Joaquin Hills, Orange County, California*. Report on file, South Central Coastal Information Center, California State University, Fullerton.
- 1998b Neolithic Newport. In *Executive Summary: Results of Implementing Mitigation Measures Specified in the Operation Plan and Research Design for the Proposed Newporter North Residential Development at ORA-64*. Report on file, South Central Coastal Information Center, California State University, Fullerton.

Mason, Roger D.

- 1994 Cultural Resources Survey for the Army Camp Anza UST Removal and Disposal Project, Riverside County, California. On file, Eastern Information Center, University of California, Riverside.

Mason, Roger E., Brant A. Brechbiel, Mark L. Peterson, Clay A. Singer, Paul E. Langenwalter II, and Robert O. Gibson

- 1991 *Newport Coast Archaeological Project: Results of Data Recovery at the Late Small Rockshelters, CA-ORA-674, CA-ORA-677, CA-ORA-678, CA-ORA-1206, CA-ORA-1210, CA-ORA-676, CA-ORA-682, CA-ORA-679, and CA-ORA-1204.* Report on file, South Central Coastal Information Center, California State University, Fullerton.

Mason, Roger D., Brant A. Brechbiel, Clay A. Singer, Patricia A. Singer, Wayne H. Bonner, Robert O. Gibson, Mark L. Peterson, and Lisa Panet Klug

- 1992 *Newport Coast Archaeological Project: Results of Data Recovery at the French Flat Complex Sites, CA-ORA-232, CA-ORA-233, CA-ORA-671, CA-ORA-672, and CA-ORA-1205.* Report on file, South Central Coastal Information Center, California State University, Fullerton.

Mason, Roger D., Brant A. Brechbiel, Clay A. Singer, Mark L. Peterson, Linda Panet Klug, Wayne H. Bonner, Robert O. Gibson, and Patricia A. Singer

- 1993 *Newport Coast Archaeological Project: Results of Data Recovery at the Pelican Hills Sites, CA-ORA-662, CA-ORA-677, CA-ORA-678, CA-ORA-1206, CA-ORA-1210, CA-ORA-676 and CA-ORA-1203, Volume 1.* Report on file, South Central Coastal Information Center, California State University, Fullerton.

Mason, Roger D., Henry C. Koerper, and Paul E. Lagenwalter II

- 1997 Middle Holocene adaptations on the Newport Coast of Orange County. In *Archaeology of the California Coast during the Middle Holocene*, edited by Jon M. Erlandson and Michael A. Glassow, pp. 35–60. UCLA Institute of Archaeology, Los Angeles.

Mason, Roger D., and Mark L. Peterson

- 1994 *Newport Coast Archaeological Project: Newport Coast Settlement Systems—Analysis and Discussion, Volume 1, part 1 of 2.* Prepared by The Keith Companies. Report on file, South Central Coastal Information Center, California State University, Fullerton.

Meighan, Clement W.

- 1954 A Late Complex in Southern California Prehistory. *Southwestern Journal of Anthropology* 10(2):215–227.

Mithun, Marianne

- 2001 *The Languages of Native North America.* Reprinted. Originally published 1999. Cambridge University Press, Cambridge, United Kingdom.

Moratto, Michael

- 1984 *California Archaeology.* Academic Press, New York.

Moriarty, James R. III

- 1966 Cultural phase divisions suggested by typological change coordinated with stratigraphically controlled radiocarbon dating in San Diego. *The Anthropological Journal of Canada* 4(4):20–30.

Morton, D. M., and B. F. Cox

1994 Geologic Map of the Riverside East 7.5-Minute Quadrangle, Riverside County, California: U.S. Geological Survey Open-File Report 88-754.

2001 Geologic Map of the Riverside West 7.5-Minute Quadrangle, Riverside County, California: U.S. Geological Survey Open-File Report 01-451.

Morton, D. M., and Kennedy, M. P.

1991 Geologic Map of the Bachelor Mountain 7.5-Minute Quadrangle, Riverside County, California: U.S. Geological Survey Open-File Report 03-103.

Morton, D. M., and J. C. Matti

1989 A Vanished Late Pliocene to Early Pleistocene Alluvial-Fan Complex in the Northern Perris Block, Southern California. In *Conglomerates in Basin Analysis: A Symposium Dedicated to A.O. Woodford*, edited by I. P. Colburn, P. L. Abbott, and J. Minch, Pacific Section S.E.P.M., Vol. 62, p. 73–80.

Munsey, Cecil

1970 *The Illustrated Guide to Collecting Bottles*. Hawthorn Books, Inc., New York.

Munz, Philip A., and David D. Keck

1968 *A California Flora with Supplement*. University of California Press, Berkeley.

National Park Service

1991 *Historic American Engineering Record*. HAER No. CA 123, HAER CAL 33-RIVSI.V.

Norris, R. M., and Webb, R. W.

1990 *Geology of California*, second edition. John Wiley and Sons, New York.

Office of Archaeology and Historic Preservation

1997 National Register of Historic Places. U.S. Department of the Interior, National Park Service, Office of Archaeology and Historic Preservation.

Office of Historic Preservation

1990 *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format*. Department of Parks and Recreation, Office of Historic Preservation, Sacramento, California.

O'Neil, Stephen

2001 *Ethnobotanical Research in the Bolsa Chica Region*. Prepared for Dr. Nancy Whitney Desautels. Scientific Research Systems, Inc., Temecula, California.

Peterson, Mark L.

2000 *Bonita Mesa Archaeological Project*. The Intermediate Period: A Non-Traditional Approach to a Revised Interpretation of Human Settlement Systems of the Newport Bay and San Joaquin Hills Region of Orange County, California. Volume I. Report on file, South Central Coastal Information Center, California State University, Fullerton.

Reinman, Fred M.

1964 Maritime Adaptations on San Nicolas Island, California. *University of California Archaeological Survey Annual Report 1963–1964*:47–80.

- Rick, Torben C., Jon M. Erlandson, and René Vellanoweth
2001 Paleocoastal Marine Fishing on the Pacific Coast of the Americas: Perspectives from Daisy Cave, California. *American Antiquity* 66:595–613.
- Rogers, David B.
1929 *Prehistoric Man of the Santa Barbara Coast*. Santa Barbara Museum of Natural History, Santa Barbara, California.
- Rogers, Malcom J.
1939 Early lithic industries of the lower basin of the Colorado River and adjacent desert areas. *San Diego Museum of Man Papers* 3.
1945 An Outline of Yuman Prehistory. *Southwestern Journal of Anthropology* 1(2):167–198.
- Sawyer, J. O., and T. Keeler-Wolf
1995 *A Manual of California vegetation*. California Native Plant Society. Sacramento, California.
- Sawyer, William A., and James Brock
1999 *Archaeology of Foothill Ranch, El Toro, California*. Report on file, South Central Coastal Information Center, California State University, Fullerton.
- Schlanger, S.
1974 Archaeology of Proposed Additions to the Indian Hills Housing Development, City of Pendley, Riverside County, California. Report on file, Eastern Information Center, University of California, Riverside.
- Shipley, William F.
1978 Native Languages of California. In *California*, edited by Robert F. Heizer, pp. 80–90. Handbook of North American Indians, Vol. 8, William G. Sturtevant, general editor, Smithsonian Institution, Washington D.C.
- Sleeper, Jim
1982 *Jim Sleeper's Orange County Almanac of Historical Oddities. Being a County Report, plainly Related in such a Manner as to Revive many Matters hitherto considered of such little Consequence as to be Overlooked in Previous Compendiums, Together with such Facts, Names, Dates and similar Impedimentia, many of them wholly Accurate, which may Prove Useful if not Rewarding to the Prudent Reader*. OCUSA Press, Trabuco Canyon, California.
- Strong, W. Duncan
1970 Aboriginal Society in Southern California. Reprinted. Classics in California Anthropology, 2. Malki Museum Press, Banning, California. Originally published 1929, *University of California Publications in American Archaeology and Ethnology* 26.
- Strudwick, Ivan H.
2004 The Use of Fired Clay Daub from CA-ORA-269 in the Identification of Prehistoric Dwelling Construction Methods, San Joaquin Hills, Orange County, California. Paper presented at the meeting of the Southern California Academy of Sciences, California State University, Long Beach, May 15, 2004.
- Sutton, Mark Q.
1993 On the Subsistence Ecology of the “Late Inland Millingstone Horizon” in Southern California. *Journal of California and Great Basin Anthropology* 15(1):134–140.

Swenson, J.

- 1980 Letter Report- SW ¼ of the NW ¼ of the SW ¼ of Section 33, City of Riverside for Senior Citizens Center. Report on file, Eastern Information Center, University of California, Riverside.

Swope, Karen

- 1987 An Archaeological Assessment of 970+ Acres of Land Located on March Air Force Base, Riverside County California. Report on file, Eastern Information Center, University of California, Riverside.

Taşkıran, Ayşe

- 1997 Lithic Analysis. In *Hunting the Hunters: Archaeological Testing at CA-RIV-653 and CA-RIV-1098, Riverside County, California*, edited by Donn R. Grenda and Deborah W. Gray, pp. 41-53. Statistical Research Technical Series No. 65. Statistical Research, Inc., Tucson, Arizona.

Timbrook, Jan, John R. Johnson, and David D. Earle

- 1993 Vegetation Burning by the Chumash. In *Before the Wilderness: Environmental Management by Native Californians*, edited by Thomas C. Blackburn and Kat Anderson, pp. 117-150. Ballena Press, Menlo Park, California.

Toulouse, Julian Harrison

- 1971 *Bottle Makers and Their Marks*. Thomas Nelson, Inc., New York.

Towner, Ronald H., Keith B. Knoblock, and Alex V. Benitez

- 1997 Flaked and Ground Stone Analyses. In *Continuity and Change: 8,500 Years of Lacustrine Adaptation on the Shores of Lake Elsinore* by Donn R. Grenda, pp. 167-248. Statistical Research Technical Series No. 59. Statistical Research, Inc., Tucson, Arizona.

True, Delbert L.

- 1993 Bedrock Milling Elements as Indicators of Subsistence and Settlement Patterns in Northern San Diego County, California. *Pacific Coast Archaeological Society Quarterly* 29(2):1-26.

Tuma, Michael W.

- 2004 Middle to Late Archaic Period Changes in Terrestrial Resource Exploitation Along the Los Peñasquitos Creek Watershed in Western San Diego County: Vertebrate Faunal Evidence from the Scripps Poway Parkway Site (CA-SDI-4608). *Journal of California and Great Basin Anthropology* 24(1):53-68.

Van Bueren, Thad M., L. Mark Raab, and Elizabeth Skinner

- 1986 *Archaeological Investigations at CA-RIV-2803 and -2804, Prado Flood Control Basin, California*. INFOTEC Research, Inc., Sonora, California. Submitted to the U.S. Army Corps of Engineers, Los Angeles District.

Van Bueren, Thad M., Susan K. Goldberg, Michael J. Moratto, Portia Lee, and Jerrel H. Sorrenson

- 1989 *Inventory and Evaluation of Cultural Resources: Bolsa Chica Mesa and Huntington Beach Mesa, Orange County, California*. Prepared by Infotech Research, Inc. Copies on file at the South Central Coastal Information Center, California State University, Fullerton.

Wallace, William J.

- 1955 Suggested Chronology for Southern California Coastal Archaeology. *Southwestern Journal of Anthropology* 11:214-230.

- 1978 Post-Pleistocene Archaeology, 9000 to 2000 B.C. In *California*, edited by Robert F. Heizer, pp. 25–36. Handbook of North American Indians, Vol. 8, William G. Sturtevant, general editor, Smithsonian Institution, Washington D.C.

Warren, Claude N.

- 1967 The San Dieguito Complex: A Review and Hypothesis. *American Antiquity* 32:233–236.
- 1968 Cultural Tradition and Ecological Adaptation on the Southern California Coast. In *Archaic Prehistory in the Western United States*, edited by Cynthia Irwin-Williams, pp. 1–14. Eastern New Mexico University Contributions in Anthropology No. 1. Portales.

Warren, Claude N., and D. L. True

- 1961 The San Dieguito Complex and its Place in California Prehistory. *Archaeological Survey Annual Report for 1960-1961*: 246–337. University of California, Los Angeles.
- 1984 The Desert Region. In *California Archaeology*, edited by Michael J. Moratto, with contributions by D.A. Fredrickson, C. Raven, and C. N. Warren, pp. 339–430. Academic Press, Orlando.

Wilke, Philip J.

- 1974 The Peppertree Site (Ca-Riv-463). In *Perris Reservoir Archeology: Late Prehistoric Demographic Changes in Southeastern California*, edited by James F. O’Connell, Philip J. Wilke, Thomas F. King, and Carol L. Mix, pp.49–63. California Department of Parks and Recreation Archeology Reports No. 14.
- 1978 Late Prehistoric Human Ecology at Lake Cahuilla, Coachella Valley, California. *Contributions of the University of California Archaeological Research Facility* No. 38.

Wilke, Philip J., and Stephen Hammond

- 1973 *La Loma-Mira Loma Transmission Line: Expected Impact on Archaeological Values*. Report on file, Eastern Information Center, University of California, Riverside

APPENDIX A:
Records Search Bibliography

Eastern Information Center Report Listing

Report No.	Year	Author(s)	Title	Affiliation	Pages	Resources	Survey	Acreage	Monitoring
RI-00117	1973	WILKE, PHILIP J.; S.R. HAMMOND	LA LOMA-MIRA LOMA TRANSMISSION LINE: EXPECTED IMPACT ON ARCHAEOLOGICAL VALUES.	ARCHAEOLOGICAL RESEARCH UNIT, U.C. RIVERSIDE	19	13	1000	0	0
RI-00141	1974	SCHLANGER, SARAH H.	ARCHAEOLOGY OF PROPOSED ADDITIONS TO THE INDIAN HILLS HOUSING DEVELOPMENT, CITY OF PEDLEY, RIVERSIDE COUNTY, CALIFORNIA.	ARCHAEOLOGICAL RESEARCH UNIT, U.C. RIVERSIDE	4	0	1000	0	0
RI-00939	1980	SWENSON, JAMES D.	LETTER REPORT - SW 1/4 OF THE NW 1/4 OF THE SW 1/4 OF SECTION 33, CITY OF RIVERSIDE FOR SENIOR CITIZENS CENTER	ARCHAEOLOGICAL RESEARCH UNIT, U.C. RIVERSIDE	2	0	10	0	0
RI-02125	1987	SWOPE, KAREN K.	AN ARCHAEOLOGICAL ASSESSMENT OF 970+ ACRES OF LAND LOCATED ON MARCH AIR FORCE BASE, RIVERSIDE COUNTY, CALIFORNIA	ARCHAEOLOGICAL RESEARCH UNIT, U.C. RIVERSIDE	15	19	970	0	0
RI-02307	1988	HAMPSON, R.P.; J. SORENSEN; S.K. GOLDBERG; M.T. SWANSON; J.ARNOLD	CULTURAL RESOURCES SURVEY, UPPER SANTA ANA RIVER, CALIFORNIA	GREENWOOD AND ASSOCIATES	158	15	3860	0	0
RI-03395	1991	JERTBERG, PATRICIA; KAREN KIRTLAND	CULTURAL AND BIOLOGICAL RESOURCES ASSESSMENT OF JURUPA AVENUE EXTENSION, APPROXIMATELY 1 MILE, CITY OF RIVERSIDE, RIVERSIDE COUNTY, CALIFORNIA	LSA ASSOCIATES	21	0	12	0	0
RI-03839	1994	MASON, ROGER D.	CULTURAL RESOURCES SURVEY FOR THE ARMY CAMP ANZA UST REMOVAL AND DISPOSAL PROJECT, RIVERSIDE COUNTY, CALIFORNIA	CHAMBERS GROUP, INC.	18	0	1	0	0
RI-03959	1996	MCKENNA, JEANETTE A.	A PHASE I CULTURAL RESOURCES INVESTIGATION OF THE PROPOSED VAN BUREN GOLF CENTER, LOCATED AT VAN BUREN BOULEVARD AND CENTRAL AVENUE, CITY OF RIVERSIDE, RIVERSIDE COUNTY, CALIFORNIA	MCKENNA ET AL	22	0	40	0	0
RI-04404	2000	JONES AND STOKES ASSOCIATES, INC.	FINAL CULTURAL RESOURCES INVENTORY REPORT FOR THE WILLIAMS COMMUNICATIONS, INC., FIBER OPTIC CABLE SYSTEM INSTALLATION PROJECT, RIVERSIDE TO SAN DIEGO, CALIFORNIA VOL I-IV.	JONES AND STOKES ASSOCIATES, INC.	252	20	12	0	0
RI-05154	2004	HUDLOW, SCOTT	A PHASE I CULTURAL RESOURCE SURVEY FOR GLOBAL PREMIERE, MECCA, RIVERSIDE COUNTY, CALIFORNIA	HUDLOW CULTURAL RESOURCE ASSOCIATES	21	0	4	0	0

Eastern Information Center Report Listing

Report No. Year Author(s)

Title

Affiliation

Pages Resources Survey Acreage Monitoring

Report No.	Year	Author(s)	Title	Affiliation	Pages	Resources	Survey	Acreage	Monitoring
R1-05354	2005	CRM TECH	HISTORICAL/ARCHAEOLOGICAL RESOURCES SURVEY REPORT: ASSESSOR'S PARCEL NUMBER 190-370-021, CITY OF RIVERSIDE, RIVERSIDE COUNTY, CA	CRM TECH	23	1	2	0	
R1-05753	2002	DAHDL, MARIAM; DANIEL BALLESTER; BAI TANG; MICHEAL HOGAN	HISTORICAL/ARCHAEOLOGICAL RESOURCES SURVEY REPORT: ASSESSOR PARCEL NO. 193-122-021, ARLINGTON AREA, CITY OF RIVERSIDE, RIVERSIDE COUNTY, CALIFORNIA	CRM TECH	20	0	9	0	
R1-05902	2002	LOVE, BRUCE; BAI TANG	HISTORIC BUILDING EVALUATION, 6630-6642 BROCKTON AVENUE, CITY OF RIVERSIDE, RIVERSIDE COUNTY, CA	CRM TECH	16	1	0	0	
R1-06155	2004	AISLIN-KAY, MARNIE; CHRISTEEN TANIGUCHI	LETTER REPORT: RECORDS SEARCH AND SITE VISIT RESULTS FOR CINGUAR TELECOMMUNICATIONS FACILITY CANDIDATE SB-355-01 (ARLINGTON INN), 6843 ARLINGTON AVENUE, RIVERSIDE, RIVERSIDE COUNTY, CA	MICHAEL BRANDMAN ASSOCIATES	15	0	--1	0	

APPENDIX B:
Native American Scoping Documents



Orange County Office
23392 Madero, Suite L
Mission Viejo, CA 92691
Tel 949.770.8042 Fax 949.458.9058
www.swca.com

February 26, 2008

Mr. Dave Singleton
Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, CA 95814
Sent via Fax

Re: Riverside Municipal Airport Expansion

Dear Mr. Singleton:

We are requesting on behalf of our client that a review of the Sacred Lands file be conducted for a new proposed project the Riverside Municipal Airport Expansion in the City of Riverside, Riverside County. At this time the study will consist of a literature research, field reconnaissance, and report.

The study area is located on the USGS 7.5-Minute Riverside West Quadrangle, in Township 2 South, Range 5 West, in Sections 31 and 32, San Bernardino Base and Meridian. Enclosed is a portion of the Riverside West, USGS 7.5 Quadrangle, showing the project area.

Along with the Sacred Lands file review for the proposed project location please also identify any Federally-recognized Native American groups or representatives to contact for consultation regarding the proposed project.

If you require any additional information or have any questions, please contact me at (949) 770-8042 or sunderbrink@swca.com.

Thank you for your help.

Sincerely,

A handwritten signature in blue ink that reads "Susan Underbrink". The signature is written in a cursive, flowing style.

Susan Underbrink, MA, RPA
Project Manager – Cultural Resources

STATE OF CALIFORNIAArnold Schwarzenegger, Governor**NATIVE AMERICAN HERITAGE COMMISSION**

915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
e-mail: ds_nahc@pacbell.net



February 28, 2008

Susan Underbrink, MA, RPA
Project Manager-Cultural Resources
SWCA
Orange County Office
23392 Madera, Suite L
Mission Viejo, CA 92691

Fax #: 949-458-9058
Number of pages: 3

Re: Proposed Riverside Municipal Airport Expansion, Riverside County.

Dear Ms. Underbrink:

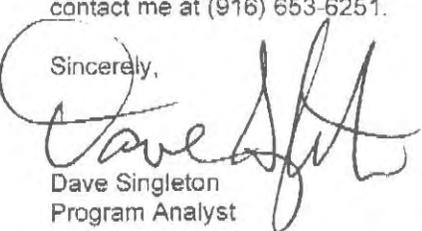
The Native American Heritage Commission was able to perform a record search of its Sacred Lands File (SLF) for the affected project area. The SLF failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the Sacred Lands File does not guarantee the absence of cultural resources in any 'area of potential effect (APE).'

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Enclosed are the nearest tribes that may have knowledge of cultural resources in the project area. A List of Native American contacts are attached to assist you. The Commission makes no recommendation of a single individual or group over another. It is advisable to contact the person listed; if they cannot supply you with specific information about the impact on cultural resources, they may be able to refer you to another tribe or person knowledgeable of the cultural resources in or near the affected project area (APE).

Lack of surface evidence of archeological resources does not preclude the existence of archeological resources. Lead agencies should consider avoidance, as defined in Section 15370 of the California Environmental Quality Act (CEQA) when significant cultural resources could be affected by a project. Also, Public Resources Code Section 5097.98 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery. Discussion of these should be included in your environmental documents, as appropriate.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,


Dave Singleton
Program Analyst

Attachment: Native American Contact List

**Native American Contacts
Riverside County
February 28, 2008**

Cahuilla Band of Indians
Anthony Madrigal, Jr., Chairperson
P.O. Box 391760 Cahuilla
Anza , CA 92539
tribalcouncil@cahuilla.net
(951) 763-2631

(951) 763-2632 Fax

Pechanga Band of Mission Indians
Paul Macarro, Cultural Resource Center
P.O. Box 1477 Luiseno
Temecula , CA 92593
(951) 308-9295 Ext 8106
(951) 676-2768
(951) 506-9491 Fax

Ramona Band of Mission Indians
Joseph Hamilton, vice chairman
P.O. Box 391670 Cahuilla
Anza , CA 92539
admin@ramonatribe.com
(951) 763-4105
(951) 763-4325 Fax

San Manuel Band of Mission Indians
Henry Duro, Chairperson
26569 Community Center Drive Serrano
Highland , CA 92346
(909) 864-8933
(909) 864-3724 - FAX
(909) 864-3370 Fax

Soboba Band of Mission Indians
Chairperson
P.O. Box 487 Luiseno
San Jacinto , CA 92581
varres@soboba-nsn.gov
(951) 654-2765
(951) 654-4198 - Fax

Ti'At Society
Cindi Alvitre
6515 E. Seaside Walk, #C Gabrielino
Long Beach , CA 90803
calvitre@yahoo.com
(714) 504-2468 Cell

Gabrieleno/Tongva San Gabriel Band of Mission
Anthony Morales, Chairperson
PO Box 693 Gabrielino Tongva
San Gabriel , CA 91778
ChiefRBwife@aol.com
(626) 286-1632
(626) 286-1758 - Home
(626) 286-1262 Fax

Santa Rosa Band of Mission Indians
John Marcus, Chairman
P.O. Box 609 Cahuilla
Hemet , CA 92546
srtribaloffice@aol.com
(951) 658-5311
(951) 658-6733 Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native American with regard to cultural resources for the proposed Riverside Municipal Airport Expansion Project located in the City of Riverside, Riverside County, California for which a Sacred Lands File search and Native American Contacts list were requested.

**Native American Contacts
Riverside County
February 28, 2008**

Gabrielino/Tongva Council / Gabriellno Tongva Nation
Sam Dunlap, Tribal Secretary
 761 Terminal Street; Bldg 1, 2nd floor
 Los Angeles, CA 90021
 office @tongvatribes.net
 (213) 489-5001 - Officer
 (909) 262-9351 - cell
 (213) 489-5002 Fax

Morongo Band of Mission Indians
Robert Martin, Chairperson
 11581 Potrero Road
 Banning, CA 92220
 Robert_Martin@morongo.org
 (951) 849-8807
 (951) 755-5200
 (951) 922-8146 Fax

Gabrielino Band of Mission Indians of CA
Ms. Susan Frank
 PO Box 3021
 Beaumont, CA 92223
 (951) 897-2536 Phone/Fax

Serrano Nation of Indians
Goldie Walker
 6588 Valaria Drive
 Highland, CA 92346
 (909) 862-9883

Morongo Band of Mission Indians
Cultural Resources-Project Manager
 49750 Seminole Drive
 Cabazon, CA 92230
 britt_wilson@morongo.org
 (951) 755-5206
 (951) 755-5200/323-0822-cell
 (951) 922-8146 Fax

Soboba Band of Luiseno Indians
Harold Arres, Cultural Resources Manager
 P.O. Box 487
 San Jacinto, CA 92581
 harres@soboba-nsn.gov
 (951) 654-2765
 FAX: (951) 654-4198

San Manuel Band of Mission Indians
Ann Brierty, Environmental Department
 101 Pure Water Lane
 Highland, CA 92346
 abrierty@sanmanuel-nsn.gov
 (909) 863-5899 EXT-4321

(909) 862-5152 Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native American with regard to cultural resources for the proposed Riverside Municipal Airport Expansion Project located in the City of Riverside, Riverside County, California for which a Sacred Lands File search and Native American Contacts list were requested.



Orange County Office
23392 Madero, Suite L
Mission Viejo, CA 92691
Tel 949.770.8042 Fax 949.458.9058
www.swca.com

February 28, 2008

Morongio Band of Mission Indians
Robert Martin, Chairperson
11581 Potrero Road
Banning, CA 92220

Sent Via E-Mail

RE: Riverside Municipal Airport Expansion

Dear Mr. Martin,

SWCA Environmental Consultants has been retained to conduct a cultural resources survey for the Riverside Municipal Airport Expansion in the city of Riverside, Riverside County, California. As part of the process of identifying cultural resources issues for this project the Native American Heritage Commission (NAHC) was contacted by SWCA to conduct a Sacred Lands File search and to provide a list of Native American individuals and/or tribal organizations that may have knowledge of cultural resources in or near the project area. The NAHC search failed to indicate the presence of Native American cultural resources in the immediate vicinity of the project area, but did recommend that we consult with you directly regarding your knowledge of the presence of cultural resources that may be impacted by this project.

The project comprises approximately 131 acres of land. The study area is located on the USGS 7.5-Minute Riverside West Quadrangle, in Township 2 South, Range 5 West, Sections 31 and 32 (see enclosed map).

If you have any knowledge of cultural resources that may exist within or near the project area and wish to have your concerns considered, please contact Susan Underbrink at (949) 770-8042, sunderbrink@swca.com, or at the above address at your earliest convenience. Thank you for your assistance.

This consultation is project-specific and is not intended to constitute as SB 18 consultation, should that be required for this project.

Sincerely,

A handwritten signature in blue ink that reads "Susan Underbrink".

Susan Underbrink
Project Manager-Cultural Resources
Enclosure: Map



Orange County Office
23392 Madero, Suite L
Mission Viejo, CA 92691
Tel 949.770.8042 Fax 949.458.9058
www.swca.com

February 28, 2008

Santa Rosa Band of Mission Indians
Mr. John Marcus, Chairperson
P.O. Box 609
Hemet, CA 92546

Sent via E-mail

RE: Riverside Municipal Airport Expansion

Dear Mr. Marcus,

SWCA Environmental Consultants has been retained to conduct a cultural resources survey for the Riverside Municipal Airport Expansion in the city of Riverside, Riverside County, California. As part of the process of identifying cultural resources issues for this project the Native American Heritage Commission (NAHC) was contacted by SWCA to conduct a Sacred Lands File search and to provide a list of Native American individuals and/or tribal organizations that may have knowledge of cultural resources in or near the project area. The NAHC search failed to indicate the presence of Native American cultural resources in the immediate vicinity of the project area, but did recommend that we consult with you directly regarding your knowledge of the presence of cultural resources that may be impacted by this project.

The project comprises approximately 131 acres of land. The study area is located on the USGS 7.5-Minute Riverside West Quadrangle, in Township 2 South, Range 5 West, Sections 31 and 32 (see enclosed map).

If you have any knowledge of cultural resources that may exist within or near the project area and wish to have your concerns considered, please contact Susan Underbrink at (949) 770-8042, sunderbrink@swca.com, or at the above address at your earliest convenience. Thank you for your assistance.

This consultation is project-specific and is not intended to constitute as SB 18 consultation, should that be required for this project.

Sincerely,

A handwritten signature in blue ink that reads "Susan Underbrink".

Susan Underbrink
Project Manager-Cultural Resources
Enclosure: Map



Orange County Office
23392 Madero, Suite L
Mission Viejo, CA 92691
Tel 949.770.8042 Fax 949.458.9058
www.swca.com

February 28, 2008

Gabrielino/Tongva San Gabriel Band of Mission Indians
Mr. Anthony Morales, Chairperson
P.O. Box 693
San Gabriel, CA 91778

Sent via E-mail

RE: Riverside Municipal Airport Expansion

Dear Mr. Morales,

SWCA Environmental Consultants has been retained to conduct a cultural resources survey for the Riverside Municipal Airport Expansion in the city of Riverside, Riverside County, California. As part of the process of identifying cultural resources issues for this project the Native American Heritage Commission (NAHC) was contacted by SWCA to conduct a Sacred Lands File search and to provide a list of Native American individuals and/or tribal organizations that may have knowledge of cultural resources in or near the project area. The NAHC search failed to indicate the presence of Native American cultural resources in the immediate vicinity of the project area, but did recommend that we consult with you directly regarding your knowledge of the presence of cultural resources that may be impacted by this project.

The project comprises approximately 131 acres of land. The study area is located on the USGS 7.5-Minute Riverside West Quadrangle, in Township 2 South, Range 5 West, Sections 31 and 32 (see enclosed map).

If you have any knowledge of cultural resources that may exist within or near the project area and wish to have your concerns considered, please contact Susan Underbrink at (949) 770-8042, sunderbrink@swca.com, or at the above address at your earliest convenience. Thank you for your assistance.

This consultation is project-specific and is not intended to constitute as SB 18 consultation, should that be required for this project.

Sincerely,

A handwritten signature in blue ink that reads "Susan Underbrink".

Susan Underbrink
Project Manager-Cultural Resources
Enclosure: Map



Orange County Office
23392 Madero, Suite L
Mission Viejo, CA 92691
Tel 949.770.8042 Fax 949.458.9058
www.swca.com

February 28, 2008

Ti'At Society
Ms. Cindi Alvitre
6515 E. Seaside Walk, #C
Long Beach, CA 90803

Sent via E-mail

RE: Riverside Municipal Airport Expansion

Dear Ms. Alvitre,

SWCA Environmental Consultants has been retained to conduct a cultural resources survey for the Riverside Municipal Airport Expansion in the city of Riverside, Riverside County, California. As part of the process of identifying cultural resources issues for this project the Native American Heritage Commission (NAHC) was contacted by SWCA to conduct a Sacred Lands File search and to provide a list of Native American individuals and/or tribal organizations that may have knowledge of cultural resources in or near the project area. The NAHC search failed to indicate the presence of Native American cultural resources in the immediate vicinity of the project area, but did recommend that we consult with you directly regarding your knowledge of the presence of cultural resources that may be impacted by this project.

The project comprises approximately 131 acres of land. The study area is located on the USGS 7.5-Minute Riverside West Quadrangle, in Township 2 South, Range 5 West, Sections 31 and 32 (see enclosed map).

If you have any knowledge of cultural resources that may exist within or near the project area and wish to have your concerns considered, please contact Susan Underbrink at (949) 770-8042, sunderbrink@swca.com, or at the above address at your earliest convenience. Thank you for your assistance.

This consultation is project-specific and is not intended to constitute as SB 18 consultation, should that be required for this project.

Sincerely,

A handwritten signature in blue ink that reads "Susan Underbrink".

Susan Underbrink
Project Manager-Cultural Resources
Enclosure: Map



Orange County Office
23392 Madero, Suite L
Mission Viejo, CA 92691
Tel 949.770.8042 Fax 949.458.9058
www.swca.com

February 28, 2008

Soboba Band of Luiseno Indians
Harold Arres, Cultural Resources Manager
P.O. Box 487
San Jacinto, CA 92581

Sent Via E-mail

RE: Riverside Municipal Airport Expansion

Dear Mr. Arres,

SWCA Environmental Consultants has been retained to conduct a cultural resources survey for the Riverside Municipal Airport Expansion in the city of Riverside, Riverside County, California. As part of the process of identifying cultural resources issues for this project the Native American Heritage Commission (NAHC) was contacted by SWCA to conduct a Sacred Lands File search and to provide a list of Native American individuals and/or tribal organizations that may have knowledge of cultural resources in or near the project area. The NAHC search failed to indicate the presence of Native American cultural resources in the immediate vicinity of the project area, but did recommend that we consult with you directly regarding your knowledge of the presence of cultural resources that may be impacted by this project.

The project comprises approximately 131 acres of land. The study area is located on the USGS 7.5-Minute Riverside West Quadrangle, in Township 2 South, Range 5 West, Sections 31 and 32 (see enclosed map).

If you have any knowledge of cultural resources that may exist within or near the project area and wish to have your concerns considered, please contact Susan Underbrink at (949) 770-8042, sunderbrink@swca.com, or at the above address at your earliest convenience. Thank you for your assistance.

This consultation is project-specific and is not intended to constitute as SB 18 consultation, should that be required for this project.

Sincerely,

A handwritten signature in blue ink that reads "Susan Underbrink".

Susan Underbrink
Project Manager-Cultural Resources
Enclosure: Map



Orange County Office
23392 Madero, Suite L
Mission Viejo, CA 92691
Tel 949.770.8042 Fax 949.458.9058
www.swca.com

February 28, 2008

San Manuel Band of Mission Indians
Ann Brierty, Environmental Department
101 Pure Water Lane
Highland, CA 92346

Sent via E-mail

RE: Riverside Municipal Airport Expansion

Dear Ms. Brierty,

SWCA Environmental Consultants has been retained to conduct a cultural resources survey for the Riverside Municipal Airport Expansion in the city of Riverside, Riverside County, California. As part of the process of identifying cultural resources issues for this project the Native American Heritage Commission (NAHC) was contacted by SWCA to conduct a Sacred Lands File search and to provide a list of Native American individuals and/or tribal organizations that may have knowledge of cultural resources in or near the project area. The NAHC search failed to indicate the presence of Native American cultural resources in the immediate vicinity of the project area, but did recommend that we consult with you directly regarding your knowledge of the presence of cultural resources that may be impacted by this project.

The project comprises approximately 131 acres of land. The study area is located on the USGS 7.5-Minute Riverside West Quadrangle, in Township 2 South, Range 5 West, Sections 31 and 32 (see enclosed map).

If you have any knowledge of cultural resources that may exist within or near the project area and wish to have your concerns considered, please contact Susan Underbrink at (949) 770-8042, sunderbrink@swca.com, or at the above address at your earliest convenience. Thank you for your assistance.

This consultation is project-specific and is not intended to constitute as SB 18 consultation, should that be required for this project.

Sincerely,

A handwritten signature in blue ink that reads "Susan Underbrink".

Susan Underbrink
Project Manager-Cultural Resources
Enclosure: Map



Orange County Office
23392 Madero, Suite L
Mission Viejo, CA 92691
Tel 949.770.8042 Fax 949.458.9058
www.swca.com

February 28, 2008

Gabrielino/Tongva Council/Gabrielino Tongva Nation
Sam Dunlap, Tribal Secretary
761 Terminal Street; Bldg 1, 2nd Floor
Los Angeles, CA 90021

Sent via E-mail

RE: Riverside Municipal Airport Expansion

Dear Mr. Dunlap,

SWCA Environmental Consultants has been retained to conduct a cultural resources survey for the Riverside Municipal Airport Expansion in the city of Riverside, Riverside County, California. As part of the process of identifying cultural resources issues for this project the Native American Heritage Commission (NAHC) was contacted by SWCA to conduct a Sacred Lands File search and to provide a list of Native American individuals and/or tribal organizations that may have knowledge of cultural resources in or near the project area. The NAHC search failed to indicate the presence of Native American cultural resources in the immediate vicinity of the project area, but did recommend that we consult with you directly regarding your knowledge of the presence of cultural resources that may be impacted by this project.

The project comprises approximately 131 acres of land. The study area is located on the USGS 7.5-Minute Riverside West Quadrangle, in Township 2 South, Range 5 West, Sections 31 and 32 (see enclosed map).

If you have any knowledge of cultural resources that may exist within or near the project area and wish to have your concerns considered, please contact Susan Underbrink at (949) 770-8042, sunderbrink@swca.com, or at the above address at your earliest convenience. Thank you for your assistance.

This consultation is project-specific and is not intended to constitute as SB 18 consultation, should that be required for this project.

Sincerely,

A handwritten signature in blue ink that reads "Susan Underbrink". The signature is written in a cursive, flowing style.

Susan Underbrink
Project Manager-Cultural Resources
Enclosure: Map



Orange County Office
23392 Madero, Suite L
Mission Viejo, CA 92691
Tel 949.770.8042 Fax 949.458.9058
www.swca.com

February 28, 2008

Pechanga Cultural Resources Department
Ms. Anna Hoover, Cultural Analyst
P.O. Box 2183
Temecula, CA 92593

Sent via E-mail

RE: Riverside Municipal Airport Expansion

Dear Ms. Hoover,

SWCA Environmental Consultants has been retained to conduct a cultural resources survey for the Riverside Municipal Airport Expansion in the city of Riverside, Riverside County, California. As part of the process of identifying cultural resources issues for this project the Native American Heritage Commission (NAHC) was contacted by SWCA to conduct a Sacred Lands File search and to provide a list of Native American individuals and/or tribal organizations that may have knowledge of cultural resources in or near the project area. The NAHC search failed to indicate the presence of Native American cultural resources in the immediate vicinity of the project area, but did recommend that we consult with you directly regarding your knowledge of the presence of cultural resources that may be impacted by this project.

The project comprises approximately 131 acres of land. The study area is located on the USGS 7.5-Minute Riverside West Quadrangle, in Township 2 South, Range 5 West, Sections 31 and 32 (see enclosed map).

If you have any knowledge of cultural resources that may exist within or near the project area and wish to have your concerns considered, please contact Susan Underbrink at (949) 770-8042, sunderbrink@swca.com, or at the above address at your earliest convenience. Thank you for your assistance.

This consultation is project-specific and is not intended to constitute as SB 18 consultation, should that be required for this project.

Sincerely,

A handwritten signature in blue ink that reads "Susan Underbrink".

Susan Underbrink
Project Manager-Cultural Resources
Enclosure: Map



Orange County Office
23392 Madero, Suite L
Mission Viejo, CA 92691
Tel 949.770.8042 Fax 949.458.9058
www.swca.com

February 28, 2008

Cahuilla Band of Indians
Anthony Madrigal, Jr., Chairperson
P.O. Box 391760
Anza, CA 92539

Via E-mail

RE: Corona Medical Building

Dear Mr. Madrigal,

SWCA Environmental Consultants has been retained to conduct a cultural resources survey for the Riverside Municipal Airport Expansion in the city of Riverside, Riverside County, California. As part of the process of identifying cultural resources issues for this project the Native American Heritage Commission (NAHC) was contacted by SWCA to conduct a Sacred Lands File search and to provide a list of Native American individuals and/or tribal organizations that may have knowledge of cultural resources in or near the project area. The NAHC search failed to indicate the presence of Native American cultural resources in the immediate vicinity of the project area, but did recommend that we consult with you directly regarding your knowledge of the presence of cultural resources that may be impacted by this project.

The project comprises approximately 131 acres of land. The study area is located on the USGS 7.5-Minute Riverside West Quadrangle, in Township 2 South, Range 5 West, Sections 31 and 32 (see enclosed map).

If you have any knowledge of cultural resources that may exist within or near the project area and wish to have your concerns considered, please contact Susan Underbrink at (949) 770-8042, sunderbrink@swca.com, or at the above address at your earliest convenience. Thank you for your assistance.

This consultation is project-specific and is not intended to constitute as SB 18 consultation, should that be required for this project.

Sincerely,

A handwritten signature in blue ink that reads "Susan Underbrink".

Susan Underbrink
Project Manager-Cultural Resources
Enclosure: Map



Orange County Office
23392 Madero, Suite L
Mission Viejo, CA 92691
Tel 949.770.8042 Fax 949.458.9058
www.swca.com

February 28, 2008

Ramona Band of Mission Indians
Mr. Joseph Hamilton, Vice Chairman
P.O. Box 391670
Anza, CA 92539

Sent via E-mail

RE: Corona Medical Building

Dear Mr. Hamilton,

SWCA Environmental Consultants has been retained to conduct a cultural resources survey for the Riverside Municipal Airport Expansion in the city of Riverside, Riverside County, California. As part of the process of identifying cultural resources issues for this project the Native American Heritage Commission (NAHC) was contacted by SWCA to conduct a Sacred Lands File search and to provide a list of Native American individuals and/or tribal organizations that may have knowledge of cultural resources in or near the project area. The NAHC search failed to indicate the presence of Native American cultural resources in the immediate vicinity of the project area, but did recommend that we consult with you directly regarding your knowledge of the presence of cultural resources that may be impacted by this project.

The project comprises approximately 131 acres of land. The study area is located on the USGS 7.5-Minute Riverside West Quadrangle, in Township 2 South, Range 5 West, Sections 31 and 32 (see enclosed map).

If you have any knowledge of cultural resources that may exist within or near the project area and wish to have your concerns considered, please contact Susan Underbrink at (949) 770-8042, sunderbrink@swca.com, or at the above address at your earliest convenience. Thank you for your assistance.

This consultation is project-specific and is not intended to constitute as SB 18 consultation, should that be required for this project.

Sincerely,

A handwritten signature in blue ink that reads "Susan Underbrink". The signature is written in a cursive style.

Susan Underbrink
Project Manager-Cultural Resources
Enclosure: Map



Orange County Office
23392 Madero, Suite L
Mission Viejo, CA 92691
Tel 949.770.8042 Fax 949.458.9058
www.swca.com

February 28, 2008

Ramona Band of Mission Indians
Mr. Joseph Hamilton, Vice Chairman
P.O. Box 391670
Anza, CA 92539

Sent via E-mail

RE: Corona Medical Building

Dear Mr. Hamilton,

SWCA Environmental Consultants has been retained to conduct a cultural resources survey for the Riverside Municipal Airport Expansion in the city of Riverside, Riverside County, California. As part of the process of identifying cultural resources issues for this project the Native American Heritage Commission (NAHC) was contacted by SWCA to conduct a Sacred Lands File search and to provide a list of Native American individuals and/or tribal organizations that may have knowledge of cultural resources in or near the project area. The NAHC search failed to indicate the presence of Native American cultural resources in the immediate vicinity of the project area, but did recommend that we consult with you directly regarding your knowledge of the presence of cultural resources that may be impacted by this project.

The project comprises approximately 131 acres of land. The study area is located on the USGS 7.5-Minute Riverside West Quadrangle, in Township 2 South, Range 5 West, Sections 31 and 32 (see enclosed map).

If you have any knowledge of cultural resources that may exist within or near the project area and wish to have your concerns considered, please contact Susan Underbrink at (949) 770-8042, sunderbrink@swca.com, or at the above address at your earliest convenience. Thank you for your assistance.

This consultation is project-specific and is not intended to constitute as SB 18 consultation, should that be required for this project.

Sincerely,

Susan Underbrink
Project Manager-Cultural Resources



Orange County Office
23392 Madero, Suite L
Mission Viejo, CA 92691
Tel 949.770.8042 Fax 949.458.9058
www.swca.com

February 28, 2008

Serrano Nation of Indians
Goldie Walker
6588 Valaria Drive
Highland, CA 92346

RE: Riverside Municipal Airport Expansion

Dear Ms. Walker,

SWCA Environmental Consultants has been retained to conduct a cultural resources survey for the Riverside Municipal Airport Expansion in the city of Riverside, Riverside County, California. As part of the process of identifying cultural resources issues for this project the Native American Heritage Commission (NAHC) was contacted by SWCA to conduct a Sacred Lands File search and to provide a list of Native American individuals and/or tribal organizations that may have knowledge of cultural resources in or near the project area. The NAHC search failed to indicate the presence of Native American cultural resources in the immediate vicinity of the project area, but did recommend that we consult with you directly regarding your knowledge of the presence of cultural resources that may be impacted by this project.

The project comprises approximately 131 acres of land. The study area is located on the USGS 7.5-Minute Riverside West Quadrangle, in Township 2 South, Range 5 West, Sections 31 and 32 (see enclosed map).

If you have any knowledge of cultural resources that may exist within or near the project area and wish to have your concerns considered, please contact Susan Underbrink at (949) 770-8042, sunderbrink@swca.com, or at the above address at your earliest convenience. Thank you for your assistance.

This consultation is project-specific and is not intended to constitute as SB 18 consultation, should that be required for this project.

Sincerely,

A handwritten signature in cursive script that reads "Susan Underbrink".

Susan Underbrink
Project Manager-Cultural Resources
Enclosure: Map



Orange County Office
23392 Madero, Suite L
Mission Viejo, CA 92691
Tel 949.770.8042 Fax 949.458.9058
www.swca.com

February 28, 2008

Gabrielino Band of mission Indians of CA
Ms. Susan Frank
P.O. Box 3021
Beaumont, CA 92223

RE: Riverside Municipal Airport Expansion

Dear Ms. Frank,

SWCA Environmental Consultants has been retained to conduct a cultural resources survey for the Riverside Municipal Airport Expansion in the city of Riverside, Riverside County, California. As part of the process of identifying cultural resources issues for this project the Native American Heritage Commission (NAHC) was contacted by SWCA to conduct a Sacred Lands File search and to provide a list of Native American individuals and/or tribal organizations that may have knowledge of cultural resources in or near the project area. The NAHC search failed to indicate the presence of Native American cultural resources in the immediate vicinity of the project area, but did recommend that we consult with you directly regarding your knowledge of the presence of cultural resources that may be impacted by this project.

The project comprises approximately 131 acres of land. The study area is located on the USGS 7.5-Minute Riverside West Quadrangle, in Township 2 South, Range 5 West, Sections 31 and 32 (see enclosed map).

If you have any knowledge of cultural resources that may exist within or near the project area and wish to have your concerns considered, please contact Susan Underbrink at (949) 770-8042, sunderbrink@swca.com, or at the above address at your earliest convenience. Thank you for your assistance.

This consultation is project-specific and is not intended to constitute as SB 18 consultation, should that be required for this project.

Sincerely,

A handwritten signature in cursive script that reads "Susan Underbrink".

Susan Underbrink
Project Manager-Cultural Resources
Enclosure: Map



PECHANGA CULTURAL RESOURCES
Temecula Band of Luiseño Mission Indians

Post Office, Box 2183 • Temecula, CA 92593
Telephone (951) 308-9295 • Fax (951) 506-9491

March 19, 2008

VIA E-Mail and USPS

RE: Request for Information for Riverside Municipal Airport Expansion (SWCA)

Dear Ms. Underbrink:

The Tribe appreciates your request for information regarding the above referenced project. After reviewing the provided maps, we have determined that the project area is not within reservation lands although it is within our ancestral territory. At this time, we are interested in commenting and participating in this project based upon traditional knowledge of the area and the newly recorded cultural site identified by your firm.

Currently, the Tribe requests the following:

- 1) Notification once the Project begins the entitlement process, if it has not already;
- 2) Copies of all archaeological reports, applicable site records and environmental documents;
- 3) Government to government consultation with the Lead Agency; and
- 4) Additionally, in the event that subsurface cultural resources are identified, the Tribe requests consultation with the project proponent and Lead Agency regarding the treatment and disposition of all artifacts.

As a sovereign governmental entity, the Tribe is entitled to appropriate and adequate government-to-government consultation regarding the proposed project. We would like you and your client to know that the Tribe does not consider initial inquiry letters from project consultants to constitute appropriate government-to-government consultation, but rather tools to obtain further information about the project area. Therefore, the Tribe reserves its rights to participate in the formal environmental review process, including government-to-government consultation with the Lead Agency, and requests to be included in all correspondence regarding this project.

Please note that we are interested in participating in surveys within Luiseño ancestral territory. Prior to conducting any surveys, please contact the Cultural Department to schedule specifics. If you have any additional questions or comments, please contact me at ahover@pechanga-nsn.gov or 951-308-9295.

Sincerely,


Anna M. Hoover
Cultural Analyst

Chairperson:
Germaine Arenas

Vice Chairperson:
Mary Bear Magee

Committee Members:
Evie Gerber
Darlene Miranda
Bridgett Barcello Maxwell

Director:
Gary DuBois

Coordinator:
Paul Macarro

Cultural Analyst:
Anna Hoover

Monitor Supervisor:
Aurelia Marruffo



PECHANGA CULTURAL RESOURCES
Temecula Band of Luiseño Mission Indians

Post Office, Box 2183 • Temecula, CA 92593
Telephone (951) 308-9295 • Fax (951) 506-9491

February 18, 2011

VIA E-MAIL and USPS

Mark McClardy
Manager, Airports Division, Western-Pacific Region
U.S. Department of Transportation
Federal Aviation Administration
P. O. Box 92007
Los Angeles, CA 90009-2007

Re: Pechanga Tribe Comments on the Request for Section 106 Tribal Consultation for the Proposed Riverside Airport Improvements

Dear Mr. McClardy:

Thank you for inviting us to participate in Section 106 Consultation on the above named Project. This comment letter is written on behalf of the Pechanga Band of Luiseño Indians (hereinafter, "the Tribe"), a federally recognized Indian tribe and sovereign government. The Tribe formally requests to be notified and involved in the entire NEPA (and/or CEQA) environmental review process for the duration of the above referenced project (the "Project").

Please add the Tribe to your distribution list(s) for public notices and circulation of all documents, including environmental review documents, archeological reports and all documents pertaining to this Project. The Tribe further requests to be directly notified of all public hearings and scheduled approvals concerning this Project. The Tribe also requests that these comments be incorporated into the record of approval for this Project as well.

The Tribe submits these comments concerning the Project's potential impacts to cultural resources in conjunction with the environmental review of the Project. The Tribe reserves the right to fully participate in the environmental review process, as well as to provide further comment on the Project's impacts to cultural resources and potential mitigation for such impacts. Further, the Tribe reserves the right to participate in any regulatory processes necessary and provide comment on issues pertaining to those regulatory processes and Project approval. The Tribe thanks the Federal Aviation Administration and the City of Riverside for consulting with the Pechanga Band early and looks forward to continuing consultations to identify sensitive Native American resources and areas for the duration of the Project.

Chairperson:
Germaine Arenas

Vice Chairperson:
Mary Bear Magee

Committee Members:
Evie Gerber
Darlene Miranda
Bridgett Barcello Maxwell
Aurelia Marruffo
Richard B. Searce, III

Director:
Gary DuBois

Coordinator:
Paul Macarro

Cultural Analyst:
Anna Hoover

Monitor Supervisor:
Jim McPherson

**THE FEDERAL AVIATION ADMINISTRATION (FAA) MUST INCLUDE
INVOLVEMENT OF AND CONSULTATION WITH THE PECHANGA TRIBE IN ITS
ENVIRONMENTAL REVIEW PROCESS**

It has been the intent of the Federal Government¹ and the State of California² that Indian tribes be consulted with regard to issues which impact cultural and spiritual resources, as well as other governmental concerns. The responsibility to consult with Indian tribes stems from the unique government-to-government relationship between the United States and Indian tribes. This arises when tribal interests are affected by the actions of governmental agencies and departments. In this case, it is undisputed that the Riverside Airport lies within the Pechanga Tribe's traditional territory. Therefore, in order to comply with NEPA/CEQA and other applicable Federal and California law, it is imperative that the FAA and the City of Riverside consult with the Tribe in order to guarantee an adequate knowledge base to appropriately evaluate the Project's effects, as well as generating adequate avoidance and mitigation measures.

PECHANGA CULTURAL AFFILIATION TO PROJECT AREA

The Pechanga Tribe asserts that the Project area is part of Luiseño, and therefore the Tribe's, aboriginal territory as evidenced by the existence of Luiseño place names, *tóota yixélval* (rock art, pictographs, petroglyphs), and a Luiseño artifact record in the vicinity of the Project.

The Pechanga Tribe's knowledge of our ancestral boundaries is based on reliable information passed down to us from our elders; published academic works in the areas of anthropology, history and ethno-history; and through recorded ethnographic and linguistic accounts. Many anthropologists and historians who have presented boundaries of the Luiseño traditional territory have included the City of Riverside area in their descriptions (Drucker 1937; Heiser and Whipple 1957; Kroeber 1925; Smith and Freers 1994), and such territory descriptions correspond with what was communicated to the Pechanga people by our elders. While historic accounts and anthropological and linguistic theories are important in determining traditional Luiseño territory, the Pechanga Tribe asserts that the most critical sources of information used to define our traditional territories are our songs, creation accounts, and oral traditions.

Luiseño history originates with the creation of all things at *'éxva Teméeku*, known today as the City of Temecula, and dispersing out to all corners of creation (what is today known as Luiseño territory). It was at Temecula that the first human *Wuyóot* lived and taught the people, and here that he became sick, finally expiring at Lake Elsinore. Many of our songs relate the tale

¹ See e.g., Executive Memorandum of April 29, 1994 on Government-to-Government Relations with Native American Tribal Governments, Executive Order of November 6, 2000 on Consultation and Coordination with Indian Tribal Governments, Executive Memorandum of September 23, 2004 on Government-to-Government Relationships with Tribal Governments, and Executive Memorandum of November 5, 2009 on Tribal Consultation

² See California Public Resource Code §5097.9 et seq.; California Government Code §§65351, 65352.3 and 65352.4

of the people taking the dying *Wuyóot* to the many hot springs at Elsinore, where he died (DuBois 1908). He was cremated at *'éxva Teméeku*. It is the Luiseño creation account that connects Elsinore to Temecula, and thus to the Temecula people who were evicted and moved to the Pechanga Reservation, and now known as the Pechanga Band of Luiseño Mission Indians (the Pechanga Tribe). From Elsinore, the people spread out, establishing villages and marking their territories. The first people also became the mountains, plants, animals and heavenly bodies.

While only briefly outlined here, the Tribe has specific information about the proposed area, based upon our songs and stories, and our indigenous place names, which cannot be found in sources outside the Tribe. We also maintain further information gathered from academic works that demonstrate that the Luiseño people, who occupied what we know today as the City of Riverside, are ancestors of the present-day Luiseño/Pechanga people, and as such, Pechanga is culturally affiliated to this geographic area.

The Tribe welcomes the opportunity to meet with the FAA and the City of Riverside to further explain and provide documentation concerning our specific cultural affiliation to lands within your jurisdiction.

PROJECT IMPACTS TO CULTURAL RESOURCES AND REQUESTED TRIBAL INVOLVEMENT

The Tribe is aware of at least one cultural resource located within the Proposed Project boundaries that may be impacted by earthmoving (CA-RIV-1711). At this time, the Tribe requests to continue consultation, be involved and participate with the FAA in assuring that an adequate environmental assessment is completed, and in developing all monitoring and mitigation plans and measures for the duration of the Project. In this respect, the Tribe would like to partner with the FAA and City of Riverside in reviewing and evaluating any potential impacts and proposing mitigation for such impacts. In addition, given the sensitivity of the this area, it is the position of the Pechanga Tribe that, at a minimum, mitigation should require Pechanga tribal monitors be present during all archaeological studies and all ground-disturbing activities conducted in connection with the Project, including but not limited to archaeological excavations, geologic testing, brushing, grubbing, etc. As such, the Tribe would ask that the FAA's consultant contact the Tribe when it expects to do the cultural resources survey(s) so that the Tribe might participate directly in such surveys.

The CEQA Guidelines, which provide a good source of guidance for Project within the State of California regardless of whether NEPA or CEQA is the primary environmental law being followed, state that lead agencies should make provisions for inadvertent discoveries of cultural resources (CEQA Guidelines §15064.5). As such, it is the position of the Pechanga Tribe that an agreement specifying appropriate treatment of inadvertent discoveries of cultural resources be executed between the FAA or its designee and the Pechanga Tribe. This may also be addressed in a Programmatic Agreement, as appropriate.

The Tribe believes that adequate cultural resources assessments and management must always include a component which addresses inadvertent discoveries. Every major State and Federal law dealing with cultural resources includes provisions addressing inadvertent discoveries (See e.g.: CEQA (Cal. Pub. Resources Code §21083.2(i); 14 CCR §1506a.5(f)); Section 106 (36 CFR §800.13); NAGPRA (43 CFR §10.4)). Moreover, most state and federal agencies have guidelines or provisions for addressing inadvertent discoveries (See e.g.: FHWA, Section 4(f) Regulations - 771.135(g); CALTRANS, Standard Environmental Reference - 5-10.2 and 5-10.3). Because of the extensive presence of the Tribe's ancestors within the Project area, it is not unreasonable to expect to find vestiges of that presence. Such cultural resources and artifacts are significant to the Tribe on a much deeper level than just being scientifically important, as they are reminders of their ancestors. Moreover, the Tribe is expected to protect and assure that all cultural sites of its ancestors are appropriately treated in a respectful manner. Therefore, as noted previously, it is crucial to adequately address the potential for inadvertent discoveries early on in the environmental process.

Further, the Pechanga Tribe believes that if human remains are discovered, State law would apply and the mitigation measures for the permit must account for this. According to the California Public Resources Code, § 5097.98, if Native American human remains are discovered, the Native American Heritage Commission must name a "most likely descendant," who shall be consulted as to the appropriate disposition of the remains. Given the Project's location in Pechanga territory, the Pechanga Tribe intends to assert its right pursuant to California law with regard to any remains or items discovered in the course of this Project. In addition, the Native American Graves Protection and Repatriation Act may also apply to the discovery of human remains and associated/unassociated funerary and grave goods and which must be addressed by the FAA and the City of Riverside.

PECHANGA TRIBAL INVOLVEMENT

The Pechanga Tribe will itself be engaging in further assessment of the Project area, in consultation with tribal elders, to identify more specific information about this culturally sensitive area. The Tribe will also be offering proposed mitigation once it has completed the assessment of the Project. Moreover, the Tribe possesses necessary information about the archaeological and cultural sensitivity that an archaeological survey alone will not reveal, and should be consulted with at the earliest possible stage of the environmental review to assist in identifying and mitigating the cultural resources impacts for this Project. Given that Native American cultural resources may be affected by the Project, the Pechanga Tribe requests to be involved and participate with the FAA and the City of Riverside in creating mitigation plans for the duration of the Project.

CONCLUSION

Based upon the fact that the Tribe believes that here will be a finding of historic properties impacted by the Project, a programmatic agreement will likely be necessary to properly avoid and mitigate proposed impacts. As such, the Tribe urges the FAA to require a thorough investigation and analysis of impacts to cultural resources in the EA, in consultation with the Pechanga Tribe, in order to properly assess the effects on such resources and adopt appropriate mitigation measures.

The Pechanga Tribe looks forward to working together with the Federal Aviation Administration and the City of Riverside in protecting the invaluable Luiseño cultural resources found in the Project area. Please contact me at 951-770-8100 X8104 once you have had a chance to review these comments so that we might address the issues concerning the Project as well as scheduling monitors to participate during the archaeological studies. Thank you.

Sincerely,



Anna Hoover
Cultural Analyst

Cc Pechanga Office of the General Counsel

APPENDIX C:
California Department of Parks & Recreation
Series 523 Forms

Exact location of identified resources is not disclosed to protect resource integrity



Attachment E

PALEONTOLOGICAL RESOURCES ASSESSMENT

**Resources Assessment Report for the
Proposed Riverside Airport
Improvements, City of Riverside,
Riverside County, California.**

Prepared for

Coffman Associates

Prepared by

**SWCA Environmental Consultants
Pasadena Office**

February 2010

PALEONTOLOGICAL RESOURCES ASSESSMENT REPORT FOR THE PROPOSED RIVERSIDE AIRPORT IMPROVEMENTS, RIVERSIDE, RIVERSIDE COUNTY, CALIFORNIA.

SWCA PROJECT NUMBER: 14079

SUBMITTED TO:

Coffman Associates
237 NW Blue Parkway, Suite 100
Lee's Summit, Missouri 64063

SUBMITTED BY:

SWCA Environmental Consultants
625 Fair Oaks Avenue, Suite 190
South Pasadena, California 91030



Jessica L. DeBusk, SWCA Project Manager and Paleontology Lead



Cara Corsetti, SWCA Office Principal and Qualified Paleontologist

PROJECT SUMMARY

PURPOSE AND SCOPE

SWCA Environmental Consultants was retained by Coffman Associates on behalf of Riverside Airport to conduct paleontological resources services for the proposed Riverside Airport improvements. The scope of services included a museum records search and literature review, pedestrian field survey, and preparation of this technical report that includes recommendations for Project-specific mitigation measures.

DATES OF INVESTIGATION

The museum records search was performed on February 28, 2008. The pedestrian field survey was conducted on February 26, 2008. This technical report was completed in February 2010.

RESULTS OF THE INVESTIGATION

According to geologic mapping by Morton and Cox (2001), the project area is underlain by the following geologic units, from oldest to youngest: Cretaceous age quartz diorite, Quaternary old alluvial fan deposits (middle to late Pleistocene in age), and Recent artificial fill. Records maintained by the San Bernardino County Museum (SBCM) indicate that no paleontological localities have been previously recorded within the project boundaries nor were any fossils observed during the field survey.

Pleistocene age alluvial deposits in Riverside County and throughout southern California have yielded numerous scientifically significant fossil localities. Vertebrate fossil specimens recovered from this unit represent extinct taxa such as mammoths, mastodons, ground sloths, dire wolves, short-faced bears, saber-toothed cats, horses, camels, and bison. Therefore, these geologic sediments are determined to have a high paleontological sensitivity. Cretaceous quartz diorite and artificial fill are not considered to be paleontologically sensitive.

RECOMMENDATIONS

The project area is in part underlain by geologic sediments determined to have a high paleontological sensitivity rating; therefore, ground disturbances related to improvements to the Riverside Airport (such as mass grading, excavation, and/or trenching) within areas mapped as Quaternary old fan deposits are likely to result in adverse impacts to significant paleontological resources unless proper mitigation measures are implemented.

SWCA recommends that a Qualified Paleontologist be retained to design and implement a paleontological monitoring and mitigation plan during pre-construction excavations associated with any development of the project site that may occur in paleontologically sensitive areas. All fossils and pertinent data recovered during construction monitoring should be prepared, identified, analyzed, and repositied in a public museum (such as the SBCM) or other approved curation facility.

DISPOSITION OF DATA

This report will be filed with Coffman Associates. A copy will be retained at SWCA Environmental Consultants, along with maps, photos, field notes, and all other records relating to the project.

TABLE OF CONTENTS

PROJECT SUMMARY	iii
Purpose and Scope.....	iii
Dates of Investigation.....	iii
Results of the Investigation	iii
Recommendations	iii
Disposition of Data.....	iii
INTRODUCTION	1
Definition and Significance of Paleontological Resources	1
RESOURCE ASSESSMENT GUIDELINES	2
Laws, Ordinances, Regulations, and Standards.....	2
Professional Standards	2
Paleontological Sensitivity	3
PROJECT LOCATION	4
PROJECT PERSONNEL	4
METHODS	4
GEOLOGY AND PALEONTOLOGY	6
Geologic Setting.....	6
Site Specific Geology and Paleontology	6
Cretaceous Quartz Diorite (Kqd)	7
Old Alluvial Fan Deposits (Qof _a)	7
Artificial Fill (Qaf).....	7
RESULTS	7
CONCLUSIONS	11
RECOMMENDED MITIGATION MEASURES	12
REFERENCES	13

LIST OF FIGURES

Figure 1. Project Location Map	5
Figure 2. Geologic Map	8
Figure 3. Paleontological Sensitivity Map	9

LIST OF TABLES

Table 1. Paleontological assessment and resource sensitivity summary for geologic units occurring within the Riverside Airport Expansion project area.....	11
--	----

LIST OF PHOTOGRAPHS

Photograph 1. View looking east at previous ground disturbances in the north-northeast portion of the project area.....	10
Photograph 2. View of existing site conditions; looking southwest from the northeast portion of the project area.....	10
Photograph 3. View of quartz diorite outcrop looking northwest from the southeast corner of the project area.....	11

INTRODUCTION

This report presents the findings of a comprehensive literature review, museum records search, and field survey conducted for the Riverside Airport improvements project area located in the City of Riverside, Riverside County, California. This study was performed in order to evaluate the paleontological sensitivity of the project area and vicinity, assess potential project-related impacts on paleontological resources, and provide recommendations for project-specific mitigation measures. This study was conducted in accordance with the professional guidelines established by the Society of Vertebrate Paleontology (SVP) (1995) and the Riverside County General Plan.

DEFINITION AND SIGNIFICANCE OF PALEONTOLOGICAL RESOURCES

Paleontology is a multidisciplinary science that combines elements of geology, biology, chemistry, and physics in an effort to understand the history of life on earth. Paleontological resources, or fossils, are the remains, imprints, or traces of once-living organisms preserved in rocks and sediments. These include mineralized, partially mineralized, or unmineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. The fossil record is the only evidence that life on earth has existed for more than 3.6 billion years. Fossils are considered nonrenewable resources because the organisms they represent no longer exist. Thus, once destroyed, a fossil can never be replaced. Fossils are an important scientific and educational resource because they are used to:

- Study the phylogenetic relationships between extinct organisms, as well as their relationships to modern groups
- Elucidate the taphonomic, behavioral, temporal, and diagenetic pathways responsible for fossil preservation, including biases in the fossil record
- Reconstruct ancient environments, climate change, and paleoecological relationships
- Provide a measure of relative geologic dating, which forms the basis for biochronology and biostratigraphy, and which is an independent and supporting line of evidence for isotopic dating
- Study the geographic distribution of organisms and tectonic movements of landmasses and ocean basins through time
- Study patterns and processes of evolution, extinction, and speciation
- Identify past and potential future human-caused effects to global environments and climates (Murphey and Daitch, 2007).

RESOURCE ASSESSMENT GUIDELINES

Paleontological resources are limited, nonrenewable resources of scientific, cultural, and educational value and are afforded protection under federal (National Environmental Policy Act, or NEPA), state (California Environmental Quality Act, or CEQA), and local (Riverside County) laws and regulations. This study satisfies project requirements in accordance with CEQA (13 PRC, 2100 et seq.) and Public Resources Code Section 5097.5 (Stats 1965, c 1136, p. 2792). This analysis also complies with guidelines and significance criteria specified by the SVP (1995) and Riverside County.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Fossils are classified as nonrenewable scientific resources and are protected by various laws, ordinances, regulations, and standards (LORS) across the country. The SVP (1995) has established professional standards for the assessment and mitigation of adverse impacts to paleontological resources. This paleontological assessment was conducted in accordance with the LORS, which are applicable to paleontological resources within the Project area.

PROFESSIONAL STANDARDS

The SVP has established standard guidelines (SVP, 1995) that outline professional protocols and practices for the conducting of paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation. Most practicing professional vertebrate paleontologists adhere closely to the SVP's assessment, mitigation, and monitoring requirements as specifically provided in its standard guidelines. Most state regulatory agencies with paleontological LORS accept and utilize the professional standards set forth by the SVP.

As defined by the SVP (1995:26), significant nonrenewable paleontological resources are defined as:

...Fossils and fossiliferous deposits here restricted to vertebrate fossils and their taphonomic and associated environmental indicators. This definition excludes invertebrate or paleobotanical fossils except when present within a given vertebrate assemblage. Certain invertebrate and plant fossils may be defined as significant by a project paleontologist, local paleontologist, specialists, or special interest groups, or by lead agencies or local governments.

As defined by the SVP (1995:26), significant fossiliferous deposits are defined as:

A rock unit or formation which contains significant nonrenewable paleontologic resources, here defined as comprising one or more identifiable vertebrate fossils, large or small, and any associated invertebrate and plant fossils, traces and other data that provide taphonomic, taxonomic, phylogenetic, ecologic, and stratigraphic information (ichnites and trace fossils generated by vertebrate animals, e.g., trackways, or nests and middens which provide datable material and climatic information). Paleontologic resources are considered to be older than recorded history and/or older than 5,000 years BP [before present].

Based on the significance definitions of the SVP (1995), all identifiable vertebrate fossils are considered to have significant scientific value. This position is adhered to because vertebrate fossils are relatively uncommon, and only rarely will a fossil locality yield a statistically significant number of specimens of

the same genus. Therefore, every vertebrate fossil found has the potential to provide significant new information on the taxon it represents, its paleoenvironment, and/or its distribution. Furthermore, all geologic units in which vertebrate fossils have previously been found are considered to have high sensitivity. Identifiable plant and invertebrate fossils are considered significant if found in association with vertebrate fossils or if defined as significant by project paleontologists, specialists, or local government agencies.

A geologic unit known to contain significant fossils is considered to be “sensitive” to adverse impacts if there is a high probability that earth-moving or ground-disturbing activities in that rock unit will either disturb or destroy fossil remains directly or indirectly. This definition of sensitivity differs fundamentally from that for archaeological resources as follows:

It is extremely important to distinguish between archaeological and paleontological (fossil) resource sites when defining the sensitivity of rock units. The boundaries of archaeological sites define the areal extent of the resource. Paleontologic sites, however, indicate that the containing sedimentary rock unit or formation is fossiliferous. The limits of the entire rock formation, both areal and stratigraphic, therefore define the scope of the paleontologic potential in each case [SVP, 1995].

Many archaeological sites contain features that are visually detectable on the surface. In contrast, fossils are contained within surficial sediments or bedrock, and are therefore not observable or detectable unless exposed by erosion or human activity. In summary, paleontologists cannot know either the quality or quantity of fossils prior to natural erosion or human-caused exposure. As a result, even in the absence of surface fossils, it is necessary to assess the sensitivity of rock units based on their known potential to produce significant fossils elsewhere within the same geologic unit (both within and outside of the study area), a similar geologic unit, or based on whether the unit in question was deposited in a type of environment that is known to be favorable for fossil preservation. Monitoring by experienced paleontologists greatly increases the probability that fossils will be discovered during ground-disturbing activities and that, if these remains are significant, successful mitigation and salvage efforts may be undertaken in order to prevent adverse impacts to these resources.

PALEONTOLOGICAL SENSITIVITY

Paleontological sensitivity is defined as the potential for a geologic unit to produce scientifically significant fossils. This is determined by rock type, past history of the geologic unit in producing significant fossils, and fossil localities recorded from that unit. Paleontological sensitivity is derived from the known fossil data collected from the entire geologic unit, not just from a specific survey. In its “Standard Guidelines for the Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources,” the SVP (1995:23) defines four categories of paleontological sensitivity (potential) for rock units: high, low, undetermined, and no potential:

- **High Potential.** Rock units from which vertebrate or significant invertebrate fossils or suites of plant fossils have been recovered and are considered to have a high potential for containing significant nonrenewable fossiliferous resources. These units include, but are not limited to, sedimentary formations and some volcanic formations that contain significant nonrenewable paleontologic resources anywhere within their geographical extent and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. Sensitivity comprises both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, or botanical, and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, ecologic, or stratigraphic

data. Areas that contain potentially datable organic remains older than Recent, including deposits associated with nests or middens, and areas that may contain new vertebrate deposits, traces, or trackways are also classified as significant.

- **Low Potential.** Reports in the paleontological literature or field surveys by a qualified vertebrate paleontologist may allow determination that some areas or units have low potentials for yielding significant fossils. Such units will be poorly represented by specimens in institutional collections.
- **Undetermined Potential.** Specific areas underlain by sedimentary rock units for which little information is available are considered to have undetermined fossiliferous potentials.
- **No Potential.** Metamorphic and granitic rock units do not yield fossils and therefore have no potential to yield significant nonrenewable fossiliferous resources.

For geologic units with high potential, full-time monitoring is generally recommended during any project-related ground disturbance. For geologic units with low potential, protection or salvage efforts will not generally be required. For geologic units with undetermined potential, field surveys by a qualified vertebrate paleontologist should be conducted to specifically determine the paleontologic potential of the rock units present within the study area.

PROJECT LOCATION

The Riverside Airport is located northeast of the intersection of Van Buren Boulevard and Arlington Avenue at 6951 Flight Road in the City of Riverside, Riverside County, California. The study area encompasses approximately 132 acres proposed for future improvements within the northern portion of the airport property. The study area is mapped within Sections 31 and 32, Township 2 South, Range 5 West on the Riverside West, CA 7.5' USGS Quadrangle (1967; Photorevised 1980) (Figure 1).

PROJECT PERSONNEL

SWCA Paleontology Lead Jessica DeBusk requested the museum records search, reviewed published and unpublished literature, conducted the field survey, and authored this technical report. Geographic Information Systems (GIS) Specialist Chris Query produced the graphics. SWCA Office Principal and Qualified Paleontologist, provided quality assurance and quality control (QA/QC) review of this technical report.

METHODS

A detailed review of museum collections records was performed by the Division of Geological Sciences at the San Bernardino County Museum (SBCM) for the purposes of (1) determining whether there are any known vertebrate fossil localities in or near the project area, (2) identifying the geologic units present in the project area, and (3) determining the paleontological sensitivity ratings of those geologic units in order to assess potential impacts to nonrenewable paleontological resources. Published and unpublished literature and geologic maps were reviewed, and mitigation measures specific to this project were developed in accordance with the SVP's professional standards (1995) and Riverside County guidelines.

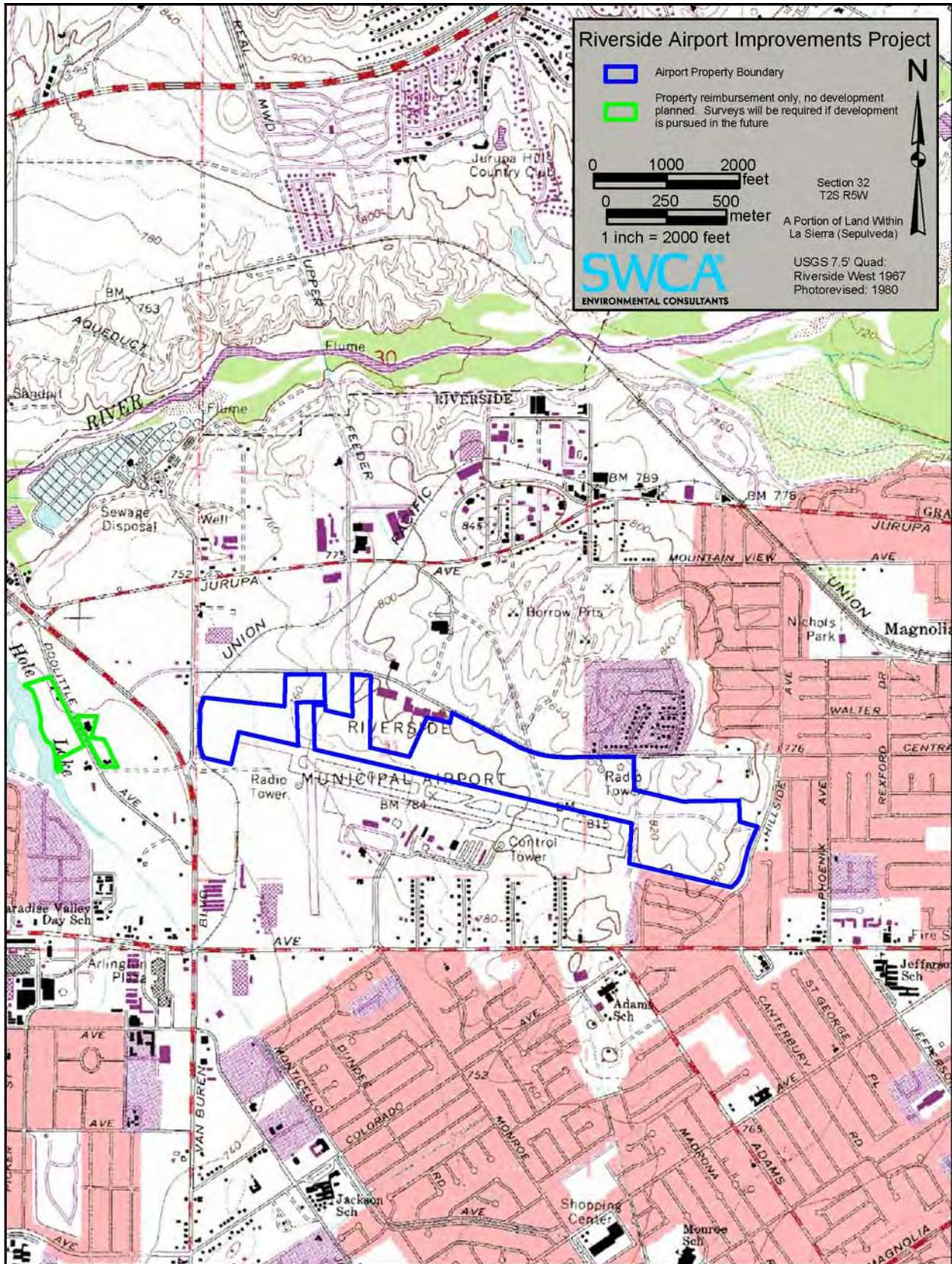


Figure 1. Project Location Map

A field survey of the project area was conducted for the purposes of inspecting the study area for surface fossils or exposures of potentially fossil-bearing geologic units, and determining areas in which fossil-bearing geologic units could be exposed during any future project-related ground disturbances. All accessible areas within the project boundaries were visually inspected via pedestrian transects spaced at a maximum interval of 30 meters.

GEOLOGY AND PALEONTOLOGY

GEOLOGIC SETTING

The geologic history of this region begins during the Mesozoic era, approximately 150 million years ago (Ma). During the Cretaceous Period, approximately 90 to 120 Ma, a major episode of mountain building known as the Nevadan Orogeny caused the formation of massive granitic intrusions in what is today the Sierra Nevada mountain range. At about the same time, the granitic rocks of the Peninsular Ranges were also forming. Although similar in age and composition, the Peninsular granitics are generally less silicic and more calcic than typical Sierran granitics. The magma that fed the Peninsular and Sierran batholiths originated from the melting of crustal material during the subduction of the Pacific plate beneath the western edge of North America, similar to the current situation along the western coast of South America (Norris and Webb, 1990).

During the Miocene, about 25 to 29 Ma, the Pacific plate became completely overridden by the North American plate. Tangential motion replaced convergent motion when the Pacific plate's mid-ocean ridge reached the subduction zone, and the ridge became a transform fault and shear boundary between the two plates (the San Andreas Fault). The Pacific plate is now moving northwest in relation to the North American plate, and it is believed that about 350 miles (560 km) of total displacement has occurred along the fault zone. The San Andreas plate boundary through California has been extensively studied but much is still unknown about the causes, timing, and triggering of major earthquakes along this boundary.

About 5 Ma, the Sierra Nevadas, the Coast Ranges, the Transverse Ranges, and the Peninsular Ranges began to be uplifted. Studies on the nature and distribution of clasts shed from the Transverse and Peninsular Ranges and deposited on the Perris block area suggest that the Peninsular Ranges were formed much further south of their present location and have been moved by the San Andreas Fault (Morton and Matti, 1989).

SITE SPECIFIC GEOLOGY AND PALEONTOLOGY

The project area is located on the Perris block within the northern region of the Peninsular Ranges. The Perris block is a relatively stable structural block that is bounded on the north by the Cucamonga fault zone and on the south by a series of sedimentary basins that lie between Temecula and Anza (Morton and Matti, 1989). Across the Perris block are a wide variety of plutonic rocks that are part of the Peninsular Ranges Batholith (PRB), including tonalite, quartz diorite, granodiorite, granite, and sparse small bodies of gabbro and diorite (Morton and Cox, 2001; Morton and Kennedy, 1991). The northern part of the Perris block is dominated by alluvial deposition associated with the Santa Ana River system. These alluvial fan deposits variously consist of sand, gravel and cobbles, and strongly eroded gravel and pebbly sands surrounding and overlying these granitic outcrops. Elevations of these fans range from 200 meters at the distal ends and 500 to 600 meters at the proximal ends (Morton and Miller, 2006). The Project area is underlain by both granitic rocks and alluvial fan deposits, discussed in more detail below.

Cretaceous Quartz Diorite (Kqd)

Plutonic igneous rock of Cretaceous age underlies the majority of the project area (Figure 2). This locally prominent geologic rock unit is composed of medium to coarse grained, slightly to well foliated, biotite hornblende quartz diorite. Exploratory geotechnical borings conducted by RMA Group (2006) throughout the project site confirm the presence of this unit either at the surface or immediately beneath artificial fill. Plutonic igneous rocks do not contain paleontological resources due to their molten origin and this geologic unit is not considered to be paleontologically sensitive.

Old Alluvial Fan Deposits (Qof_a)

Geologic mapping by Morton and Cox (2001) indicates that the project area is partially underlain by Quaternary old alluvial fan deposits of late to middle Pleistocene age (1.8 Ma to 10,000 years BP). This geologic deposit is composed of moderate to slightly indurated reddish brown arenaceous sediments derived from the Santa Ana River (RMA Group, 2006; Morton and Cox, 2001). These sediments are present in the low lying regions of the study area (See Figure 2).

Pleistocene age alluvial and fluvial deposits in Riverside County and throughout southern California have yielded numerous scientifically significant fossil localities. Vertebrate fossil specimens recovered from this unit represent extinct taxa such as mammoths, mastodons, ground sloths, dire wolves, short-faced bears, saber-toothed cats, horses, camels, and bison. Therefore, these geologic sediments are determined to have a high paleontological sensitivity.

Artificial Fill (Qaf)

The Project area is partially underlain by artificial fill that is likely related to the development of the existing airport runways and facilities. It consists of brown silty sand and is possibly derived from onsite soil and bedrock, as it is similar in composition. According to geotechnical investigations, artificial fill is present at depths of up to 5 feet below the current grade and is overlying Cretaceous quartz diorite. Artificial fill is the result of human construction and is not considered to be paleontologically sensitive.

RESULTS

Museum collections maintained by the SBCM contain no recorded vertebrate fossil localities within the boundaries of the project area; however, numerous scientifically significant fossil localities have been identified within Quaternary old alluvial fan deposits and alluvial sediments of similar age and lithology throughout Riverside County and elsewhere in southern California.

A paleontological field survey of the project area was performed on February 26, 2008. Field methods included a pedestrian walkover, photographic documentation, and site characterization and description. Much of the surface of the study area was either disturbed by previous grading activities (Photograph 1), covered by vehicular roadways (Photograph 2), or relatively undisturbed but obscured by dense grasses and vegetation (Photograph 3). No paleontological resources were discovered on the surface of the Project area during the field survey; however, based on the results of the records search and literature review, the paleontological sensitivity of the geologic units underlying the project area were determined to range from zero to high (Table 1). A paleontological sensitivity map was created using these findings (Figure 3).

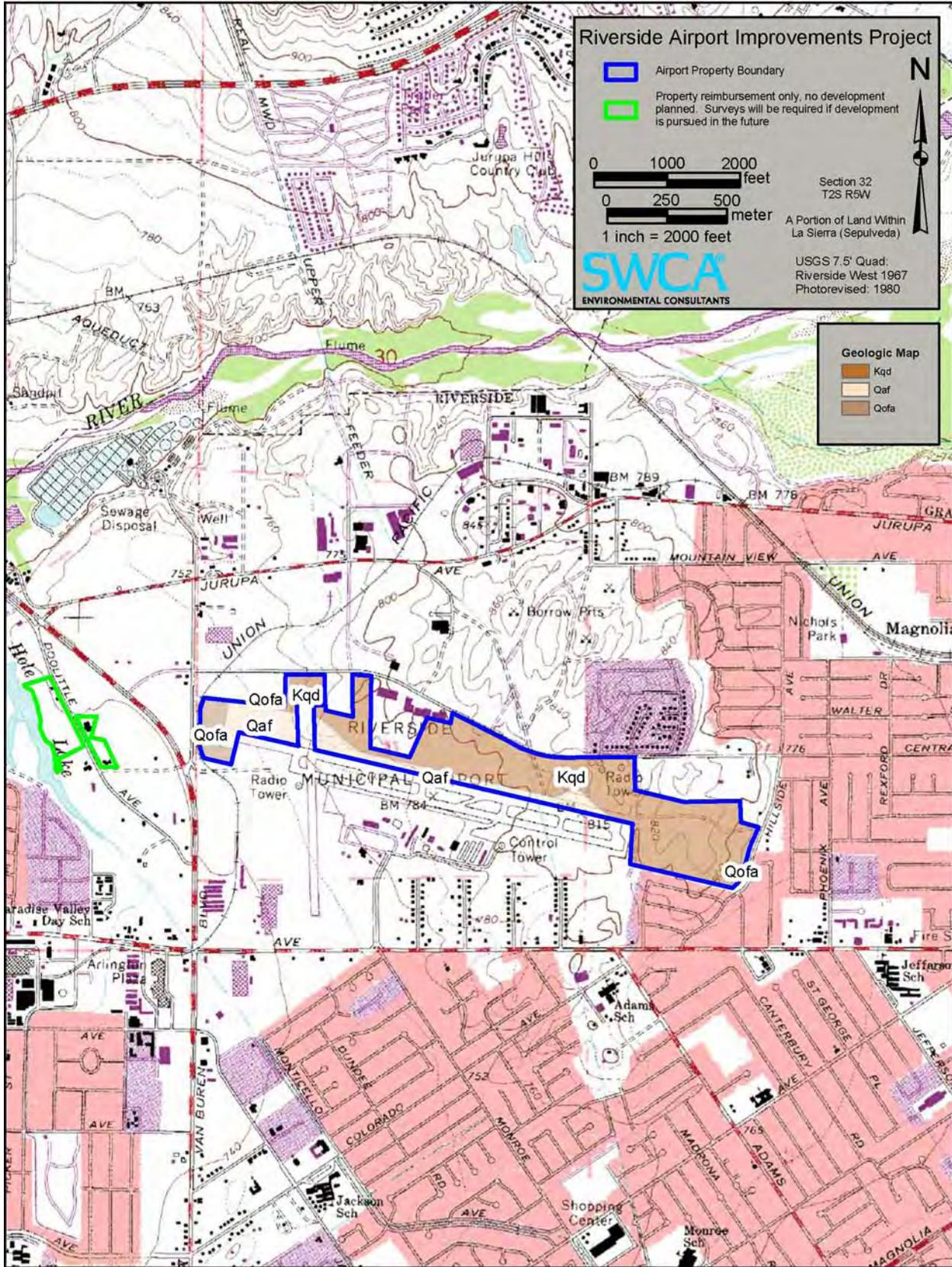


Figure 2. Geologic Map

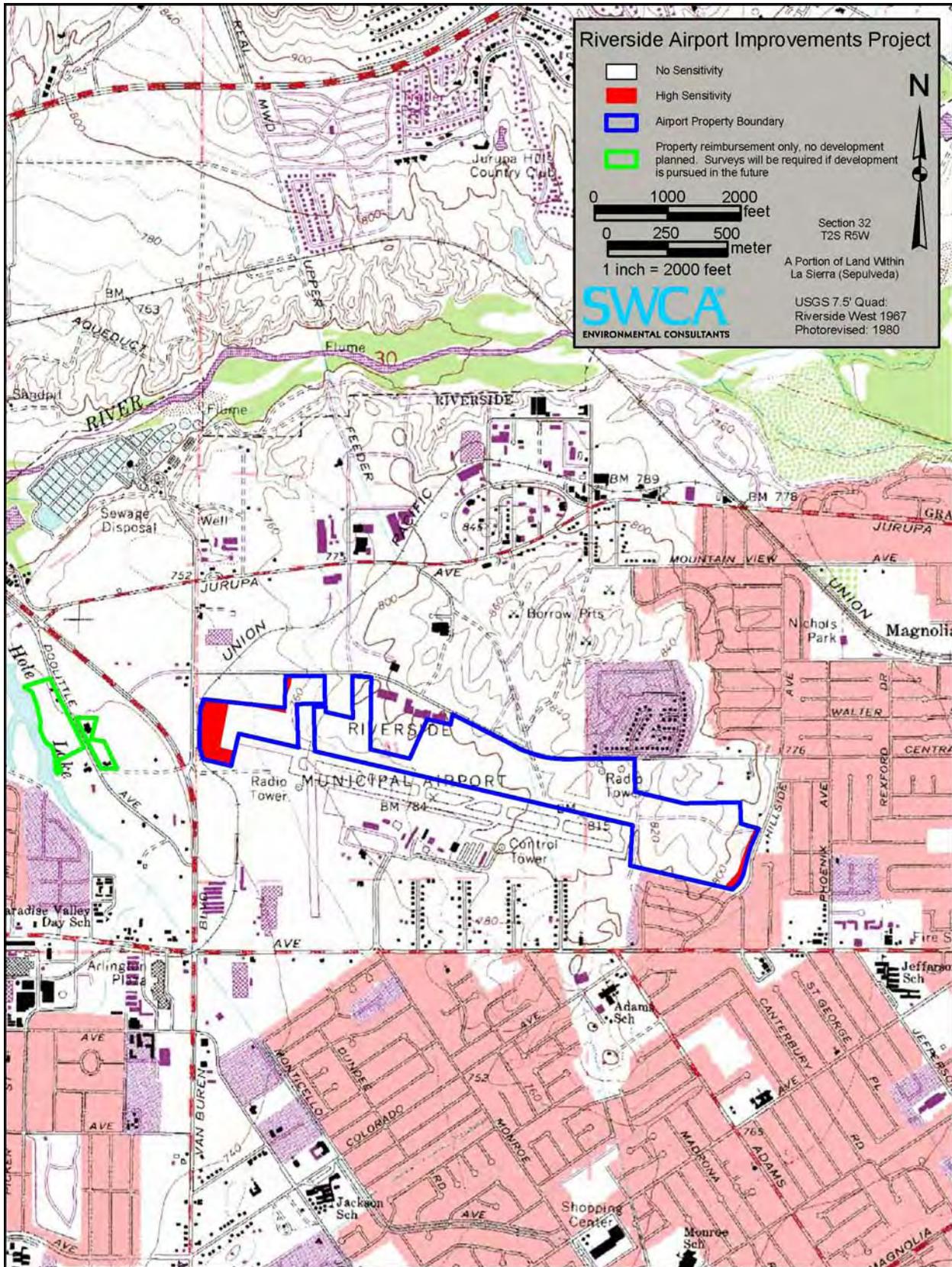


Figure 3. Paleontological Sensitivity Map



Photograph 1. View looking east at previous ground disturbances in the north-northeast portion of the project area.



Photograph 2. View of existing site conditions; looking southwest from the northeast portion of the project area.



Photograph 3. View of quartz diorite outcrop looking northwest from the southeast corner of the project area.

Table 1. Paleontological assessment and resource sensitivity summary for geologic units occurring within the Riverside Airport Expansion project area.

Geologic Unit	Age	Known Fossil Types	Paleontological Sensitivity
Quartz diorite	Cretaceous	None	Zero
Quaternary old alluvial fan deposits	Middle to late Pleistocene	Terrestrial vertebrates	High
Artificial fill	Holocene	None	Zero

CONCLUSIONS

The destruction of fossils as a result of human-caused ground disturbance has a significant cumulative impact, as it makes biological records of ancient life permanently unavailable for study by scientists. Implementation of proper mitigation measures can, however, reduce the impacts to the paleontological resources to below the level of significance. The project area is in part underlain by geologic sediments determined to have a high paleontological sensitivity rating; therefore, any project-related ground disturbances (such as mass grading, excavation, and/or trenching) within areas underlain by Quaternary old fan deposits are likely to result in adverse impacts to significant paleontological resources unless proper mitigation measures are implemented. Project-related ground disturbances within Cretaceous quartz diorite and/or artificial fill are not likely to impact paleontological resources, and will not require any further mitigation.

RECOMMENDED MITIGATION MEASURES

The following mitigation measures have been developed in accordance with the SVP (1995) standards and Riverside County guidelines and meet the paleontological requirements of CEQA. These mitigation measures have been used throughout California and have been demonstrated to be successful in protecting paleontological resources while allowing timely completion of construction.

- A. All project-related ground disturbances that could potentially impact paleontologically sensitive Quaternary old alluvial fan deposits will be monitored by a qualified paleontological monitor on a full-time basis, as this geologic unit is considered to have a high paleontological sensitivity. Ground disturbances in Cretaceous quartz diorite and artificial fill will not require construction monitoring, as these units are not determined to be paleontologically sensitive.
- B. A Qualified Paleontologist will be retained to supervise monitoring of construction excavations and to produce a Paleontological Monitoring and Mitigation Plan for the proposed project.
- C. Paleontological resource monitoring will include inspection of exposed rock units during active excavations within sensitive geologic sediments. The monitor will have authority to temporarily divert grading away from exposed fossils in order to professionally and efficiently recover the fossil specimens and collect associated data.
- D. At each fossil locality, field data forms will be used to record pertinent geologic data, stratigraphic sections will be measured, and appropriate sediment samples will be collected and submitted for analysis.
- E. Recovered fossils will be prepared to the point of curation, identified by qualified experts, listed in a database to facilitate analysis, and repositied in a designated paleontological curation facility. The most likely repository is the SBCM or the Natural History Museum of Los Angeles County. (LACM).
- F. The Qualified Paleontologist will prepare a final monitoring and mitigation report to be filed with the client, the lead agency, and the repository.

REFERENCES

- Morton, D. M. and Cox, B. F. 2001. Geologic Map of the Riverside West 7.5-Minute Quadrangle, Riverside County, California: U.S. Geological Survey Open-File Report 01-451.
- Morton, D.M. and Miller, F.K. 2006. Geologic map of the San Bernardino and Santa Ana 30' x 60' quadrangles, California. Geology and Description of Map Units, version 1.0. U.S. Geological Survey, Open File Report 2006-1217 Online version 1.0.
- Morton, D. M. and Kennedy, M. P. 1991. Geologic Map of the Bachelor Mountain 7.5-Minute Quadrangle, Riverside County, California: U.S. Geological Survey Open-File Report 03-103.
- Morton, D. M., and Matti, J. C. 1989. A vanished late Pliocene to early Pleistocene alluvial-fan complex in the northern Perris block, Southern California.: In Conglomerates in Basin Analysis: A Symposium Dedicated to A.O. Woodford, edited by I. P. Colburn, P. L. Abbott, and J. Minch , Pacific Section S.E.P.M., Vol. 62, p. 73–80.
- Murphey, P.C., and Daitch, D., 2007, Paleontological overview of oil shale and tar sands areas in Colorado, Utah and Wyoming: U.S. Department of Energy, Argonne National Laboratory Report prepared for the U.S. Department of Interior Bureau of Land Management, 468 p. and 6 maps, scale 1:500,000.
- Norris, R. M. and Webb, R. W. 1990. Geology of California, second edition. John Wiley & Sons, New York, p. 277–300.
- RMA Group Geotechnical Consultants, 2006. Geotechnical Investigation for Runway 9-27 and Taxiway “A” Reconstruction, Riverside Municipal Airport, Riverside, CA. Prepared for Associated Engineers, Inc. February 10, 2006.
- Society of Vertebrate Paleontology. 1995. Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources: Standard Guidelines. Society of Vertebrate Paleontology News Bulletin. v. 163, p. 22–27.